ARKAL
FILTRATION SYSTEMS

A Clear View of Tomorrow

Technical Product Guide

ARKAL
FILTRATION SYSTEMS

Company Overview

Arkal Filtration Systems

is one of the world's leading water filtration and treatment companies with over 30 years of experience. Our capabilities include the entire range-from initial concept design and engineering, to supply, installation and commissioning of water filtration and treatment systems for agricultural, industrial, commercial and municipal market segments.

Industrial, municipal and commercial applications benefit from Arkal's advanced technologies, resulting in efficient and cost effective filtration and water treatment systems using precision filtration from 400 down to 20 microns. Arkal's systems have proven to be reliable, low-maintenance, high performance units, currently hard at work in industrial installations around the world; from Austin Energy in Texas and the City of Lausanne, Switzerland; to the huge Gerber Baby Foods factory in Costa Rica. Other industrial clients include Volkswagen, Intel and Palmolive, to name but a few.

Arkal's product range for industrial, municipal and commercial applications is wide and uniquely adaptable. Mechanical filtration includes a variety of modular Spin Klin® automatic disc filtration systems, screen and media filters, which are selected according to inlet water quality, working conditions, process and application requirements

Arkal's patented Spin Klin® disc filtration technology revolutionized the water filtration industry. Spin Klin® modular units use a stack of compressed grooved discs to filter suspended particles. The disc element "spins" clean in the automatic backwash mode. Spin Klin® technology is applied to different designs, utilizing advanced materials to offer a wide range of solutions.

DESIGN PARAMETERS

FOR SIZING THE FILTER BATTERY

Each product page contains a "Filtration grade / Water quality" table that is used for selecting the right product, size and filtration grade for the customer's specific needs.

DESIGN PARAMETERS

Filtration Grade

The filtration grade defines the size of the particles in microns that are retained by the filter.

There are two basic definitions:

- Absolute Filtration Grade:
  The filter removes 100% of the particles above the declared size.

- Nominal Filtration Grade:
  Depending on the manufacturer's definitions, the filter removes 80-99% of the particles above the declared size.

Arkal filters particle removal.

Independent tests have shown that Arkal filters remove 85-99% of the suspended particles at the declared filtration grade, depending on specific particle characteristics.

Flow Rate

The system design should consider the maximum flow rate that may run through the filtration unit at the required filtration grade and water quality.

Water Quality

Clogging Factors:

1. Suspended mineral solids, such as sand, silt and clay.
2. Large Microorganisms such as zooplankton and macro-algae.
3. Colonies and agglomerations of small microorganisms such as bacteria, micro-algae and protozoa.
4. Deposits of dissolved minerals such as calcium carbonates, oxidized iron or manganese.

Water Quality Determination:

Water quality is directly related to the water source. The main types of water sources and water quality levels are generally as follows:

A. Good Quality

- Municipal supply.
- Well water from a steadily flowing aquifer, with the well being properly maintained, no presence of iron or manganese.

B. Average Quality

- Clear surface water (lakes and ponds, slow flowing rivers and canals).
- Treated wastewater after tertiary or quaternary treatment.
- Circulated cooling water.

C. Poor Quality

- Well water from a poor quality aquifer.
- Surface water (lakes and ponds, rivers and canals) in hot climates with increased biological growth and no chemical treatment.
- Treated wastewater after secondary (biological) treatment.
- Industrial process waste water.

D. Very Poor Quality

- Well water from a well, which has collapsed, or with high concentrations of iron or manganese.
- Surface water affected by floods and storm water without sedimentation facilities.
- Raw municipal and industrial wastewater.

Technical parameters for Spin Klin filters

Water quality	Color Code	Micron size	Maximum Flow for one Spin Klin Spine *		Required Minimum Water Pressure for BW **		Required Water Flow for BW for one Spin Klin Spine		Required Air Flow Rate		Required Compressed Air Pressure for AAF BW	
			m^3/h	GPM	Bar	psi	m^3/h	GPM			Bar	psi
Average	Gray	20	5	22	5	72						
Poor	Gray	20	3	13	5	72						
Average	Purple	40	8	35	5	72						
Poor	Purple	40	6	22	5	72						
Average	Green	55	10	44	5	72						
Poor	Green	55	7	31	5	72						
Average	Brown	70	12	53	4	58						
Poor	Brown	70	8	35	4	58	10	44	270 L / Min	10 Ft^3 / Min	6 8	87-116
Average	**Black**	**100**	**13**	**57**	**3.5**	**51**						
Poor	**Black**	**100**	**10**	**44**	**3.5**	**51**						
Average	**Red**	**130**	**15**	**66**	**2.8**	**41**						
Poor	**Red**	**130**	**12**	**53**	**2.8**	**41**						
Average	Yellow	200	20	88	2.8	41						
Poor	Yellow	200	16	70	2.8	41						
Poor/average	Blue	400	20	88	2.8	41						

* Exact flow rate depends on inlet water quality. Please consult with your local distributor or manufacturers' representative.

** Certain operating conditions may allow for slightly lower pressure required for backwash.

Please consult with your local distributor or manufacturers' representative.

ARKAL FILTRATION SYSTEMS

DATA SHEET FOR (PLANT) PROJECT :

Industry

- Agriculture
- Aquaculture
- Landscape & Golf
- Chemical
- Food & Beverage
- Electronic
- Metal Manufacturing
- Mining
- Petroleum / Refinery
- Pharmaceutical
- Plastic Manufacturing
- Pulp & Paper
- Textile
- Drinking Water
- Municipal Water Reuse
- Other ……..

Application

Protection of…

- Cooling Tower
- Closed Cooling Circuit
- Sealing Water
- Nozzles (dia. Size?)
- Drippers (Irrigation)
- Mini-sprinklers
- MF/UF Membranes
- Cartridges
- Media Filters
- Other ……..

Water Source

- Process water
- Wastewater
- Municipal supply
- Lake / Pond
- River
- Seawater
- Well / Groundwater
- Other ……..

Water Quality

Contaminant Type:

- Algae / Biological
- Dust / Mineral particles
- Fibers
- Metal
- Other ……..

Particle Load & Size:

TSS		mg/L
VSS		mg/L
Turbidity		NTU
SDI		
BOD/COD/TOC		mg/L

Particle Size Distribution

add analysis

Chemical Composition:

add analysis

Technical Data

Flow Rate

Nominal		m^3/hr / gpm
Maximum		m^3/hr / gpm

Constant Supply Requirement

- Yes
- No

Design Pressure

Inlet Pressure		bar / PSI
Max. headloss allowed		bar / PSI

Foot Print

Length		m / ft
Width		m / ft
Height		m / ft

Pipe Connections

Connection standard		
Diameter		inch

Please add P&ID drawings

Required Filtration Grade

	µm

Preferred Construction Material:

PP / PA / SS / Coated cast iron

Backwash & Control Data

Backwash Pressure Sources

External source water pressure		bar / PSI
Booster pump - from outlet pipe or tank		bar / PSI
Air Pressure		bar / PSI

Power Availability

Air activated valves		AC	
Water activated valves		DC	
Voltage 220v			
Voltage 110v		50Hz	
3 Phase		60Hz	

Backwash control

Backwash Controller	
PLC	
Customers Controller	

Material Compatibility

Fluid temperature		°C
pH		

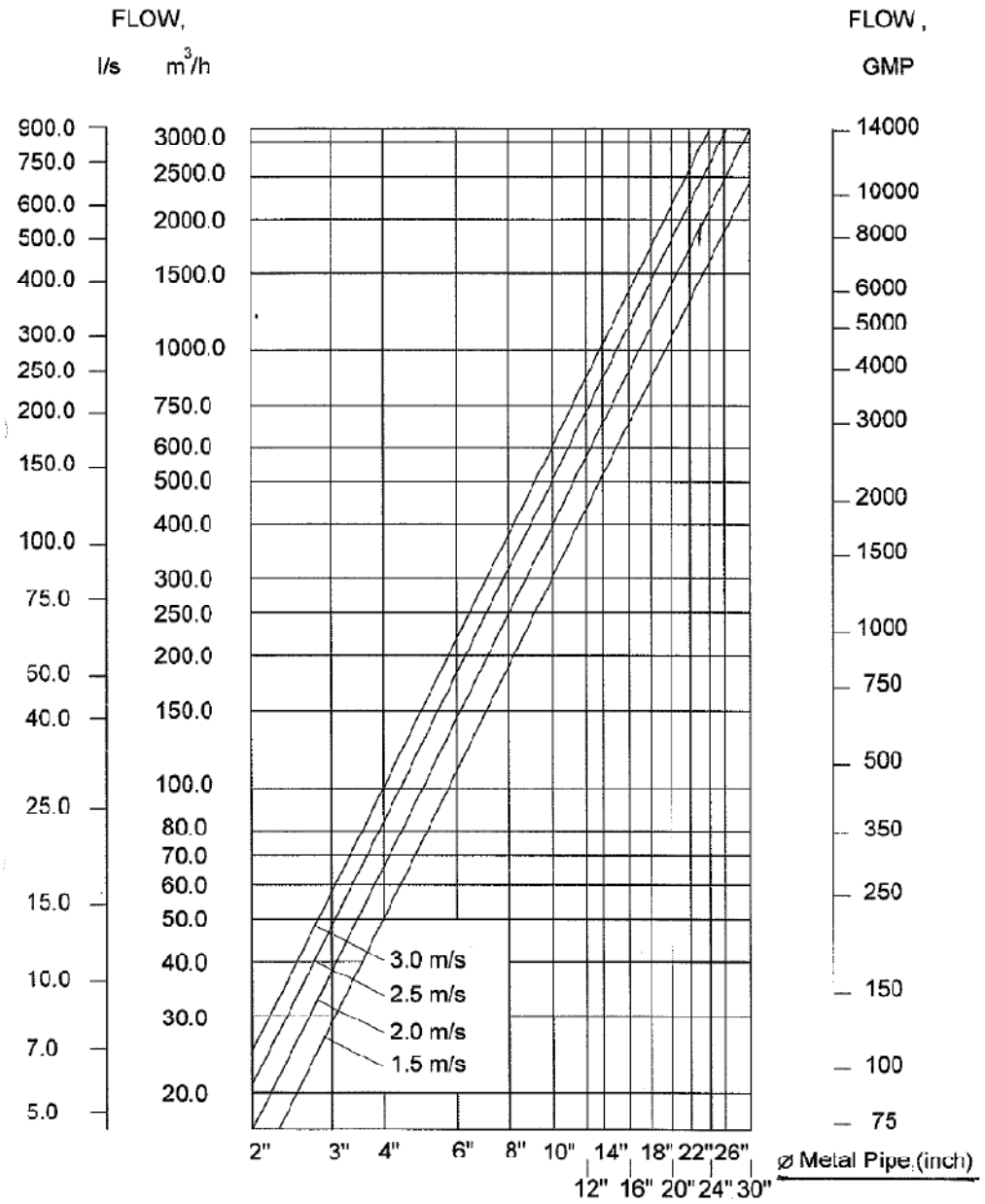
Chemicals in water:

Name	
Concentration	
Exposure time	

Special Requirements:

Submitted by:	
Email address:	
Phone number:	
Date:	

Pipe Diameter Design – Metal Pipes



Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Pipe Diameter Design – Plastic Pipes

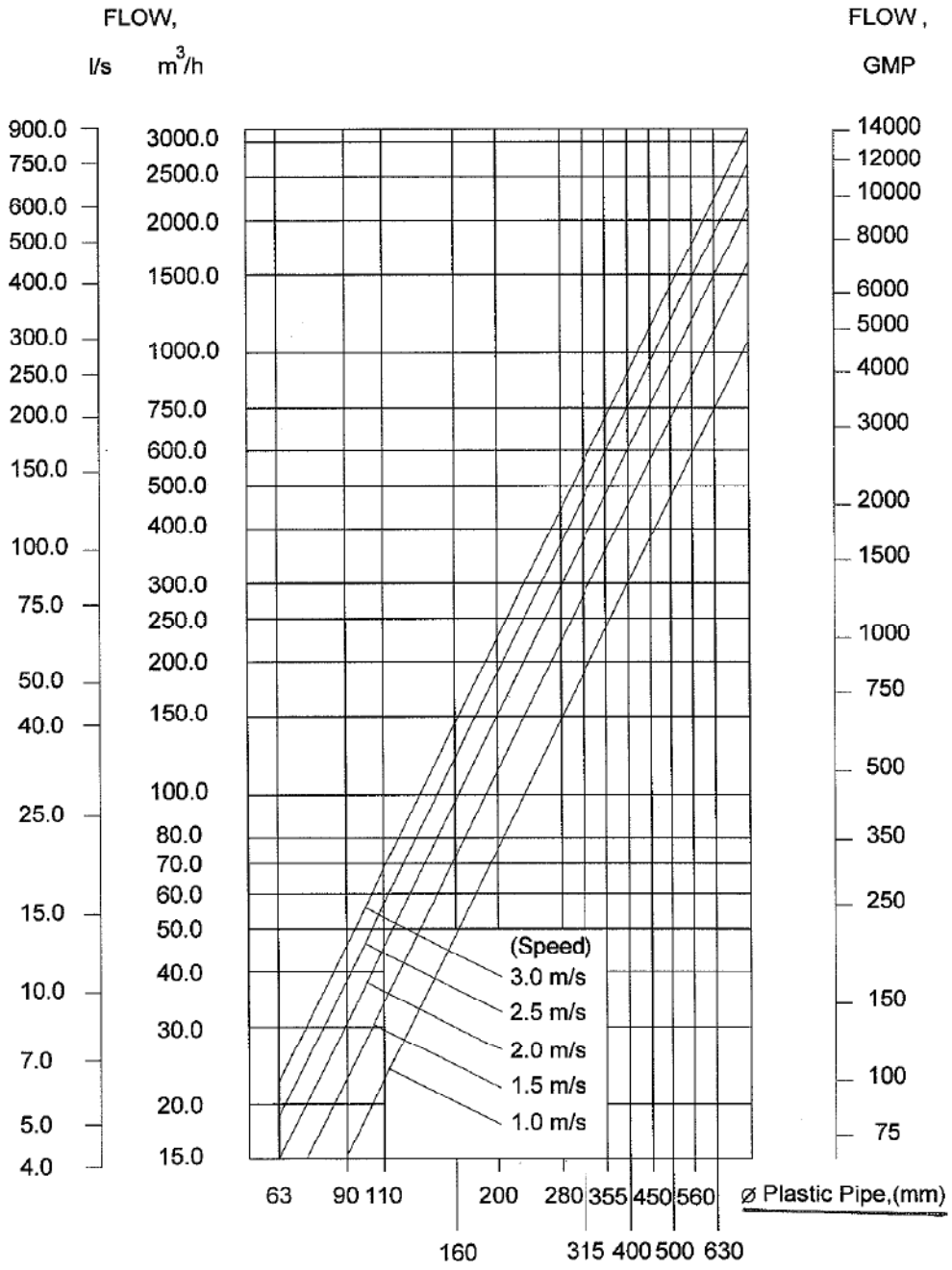


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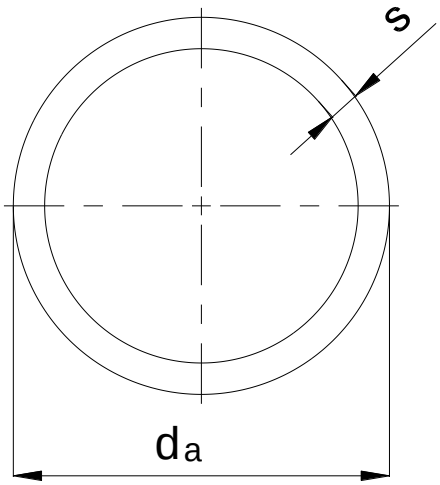
Table of polypropylene pipes wall thickness and pipes weight

Rohr d_a mm	SDR 17.6 PN10 Reihe 4	
	s mm	≈ kg/m
16	1.8	0.08
20	1.9	0.107
25	2.3	0.164
32	3.0	0.267
40	3.7	0.412
50	4.6	0.638
63	5.8	1.01
75	6.9	1.42
90	8.2	2.03
110	10.0	3.01
125	11.4	3.91
140	12.8	4.9
160	14.6	6.39
180	16.4	8.07
200	18.2	9.95
225	20.5	12.59
250	22.8	15.5
280	25.5	19.5
315	28.7	24.6
355	32.3	31.2
400	36.4	39.7
450	41.0	50.2



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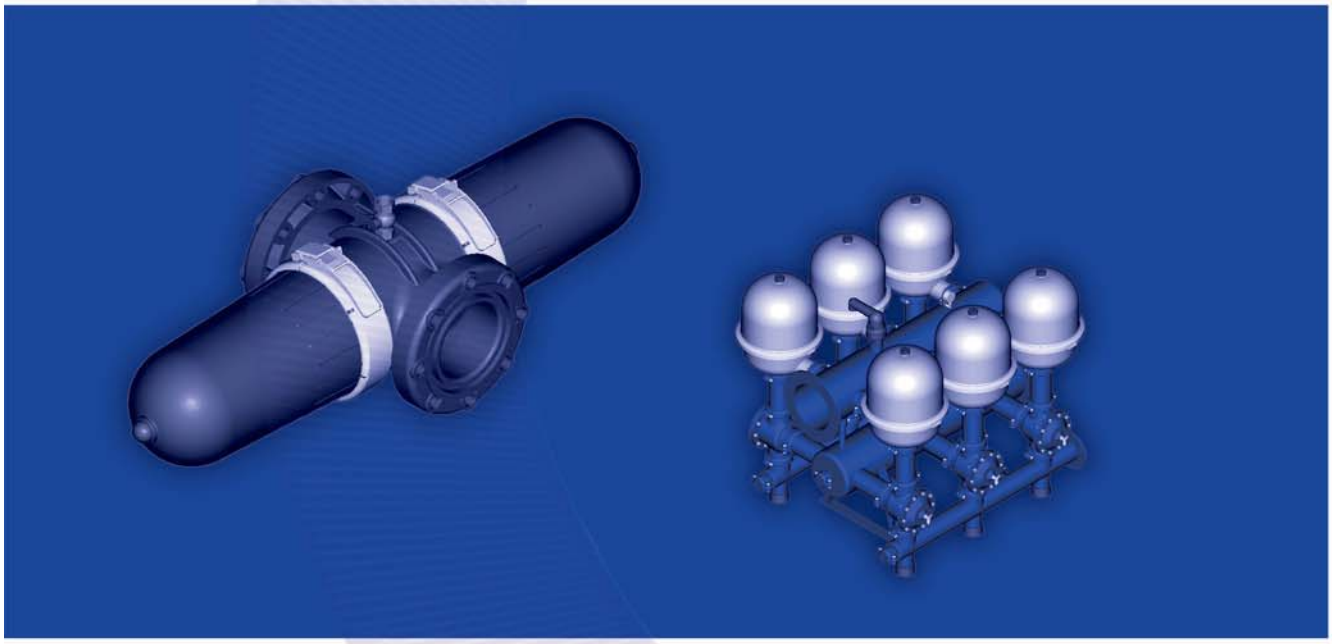
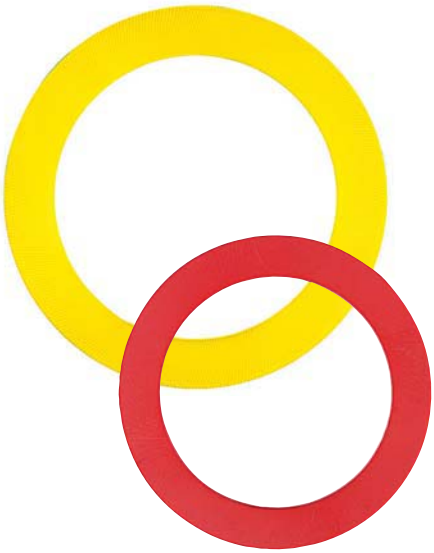


Disc Filtration Technology

- Micron-precise filtration of solids.
- The innovative depth filter design captures and retains large amounts of solids.
- Long-term operation and minimal maintenance required.
- Disc filtration elements are factory assembled and ready for use.

Disc Filtration Technology

Arkal's Filtration Systems use a specially designed disc filtration technology.



Color-coded polypropylene or Nylon discs are grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of intersecting grooves which trap the solids. The stack is enclosed in a corrosion and pressure resistant housing.

During filtration, the discs are tightly compressed together by a combination of the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolating from the outer diameter to the inner diameter of the element. Depending on the micron rating (See table), there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration (Figure below).

Table of Filtration Grades of the Discs and Color Code

Color Code	Blue	Yellow	Red	Black	Brown	Green	Purple	Gray
Micron	400	200	130	100	70	55	40	20
Mesh	40	80	120	140				
PP								
Nylon								

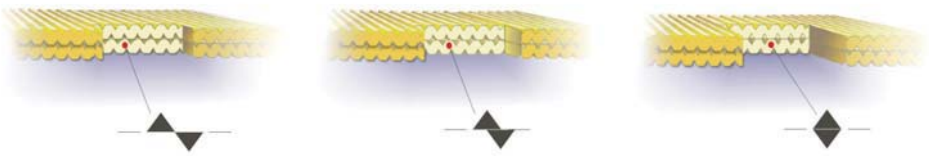


Table Of Filtration Grades Of The Discs Color Code

Color Code	Blue	Yellow	Red	Black	Brown	Green	Purple	Grey
Micron	400	200	130	100	70	55	40	20
Mesh	40	80	120	140				
PP								
Nylon								

Arkal Filters – Manual & Automatic

	White	Blue	Yellow	Red	Black	Brown	Green	Purple	Grey
¾"		P	P	P	P		p		
1"		P	P	P	P		P		
1" Super		P	P	P	P		P		
1½"		P	P	P	P		P		
1½" Spuer		P	P	P	P		P		
2" Leader		P	P/N	P/N	P/N	P/N	P/N	P	P/N
2" Line		P	P/N	P/N	P/N	P/N	P/N	P	P/N
2" Dual		P	P/N	P/N	P/N	P/N	P/N	P	P/N
2" Super		P	P/N	P/N	P/N	P/N	P/N	P	P/N
2" Dual Lite		P	P/N	P/N	P/N	P/N	P/N	P	P/N
3" Leader		P	P/N	P/N	P/N	P/N	P/N	P	P/N
3" Twin		P	P/N	P/N	P/N	P/N	P/N	P	P/N
3" Super Angle	P	P	P	P	P		P		P
4" Super Angle	P	P	P	P	P		P		P
4" Super Leader	P	P	P	P	P		P		P
6" Super Leader	P	P	P	P	P		P		P
2" Spin Klin		P	P/N	P/N	P/N	P/N	P/N	P	P/N
3" Spin Klin		P	P/N	P/N	P/N	P/N	P/N	P	P/N
4" SK Galaxy		P	P/N	P/N	P/N	P/N	P/N	P	P/N
3"- 4" Apollo		P	P	P	P		P		P
6" SK Galaxy		P	P/N	P/N	P/N	P/N	P/N	P	P/N
12" SK Super Flow		P	P/N	P/N	P/N	P/N	P/N	P	P/N

P – Polypropylene Discs

N – Nylon Discs

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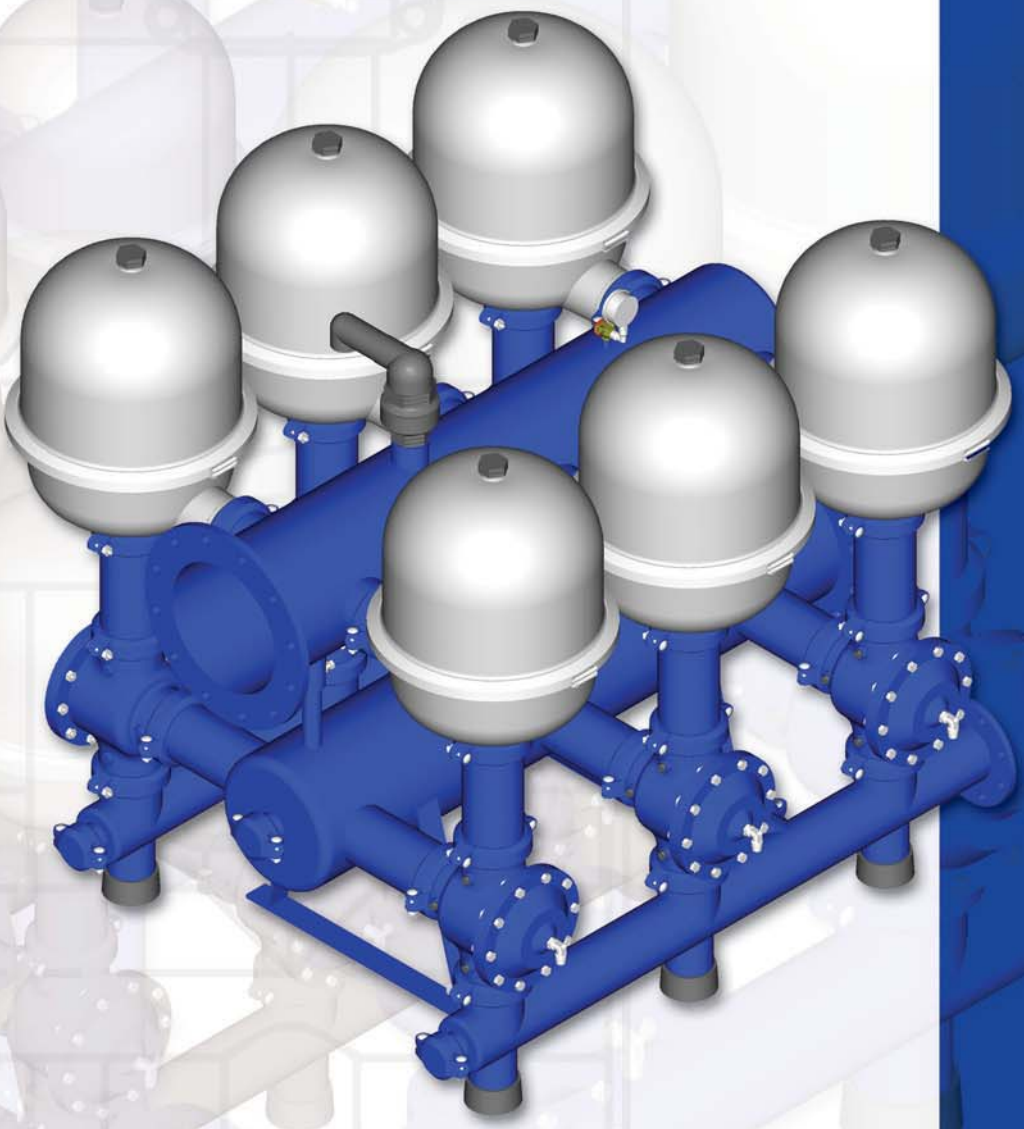
FILTRATION SYSTEMS

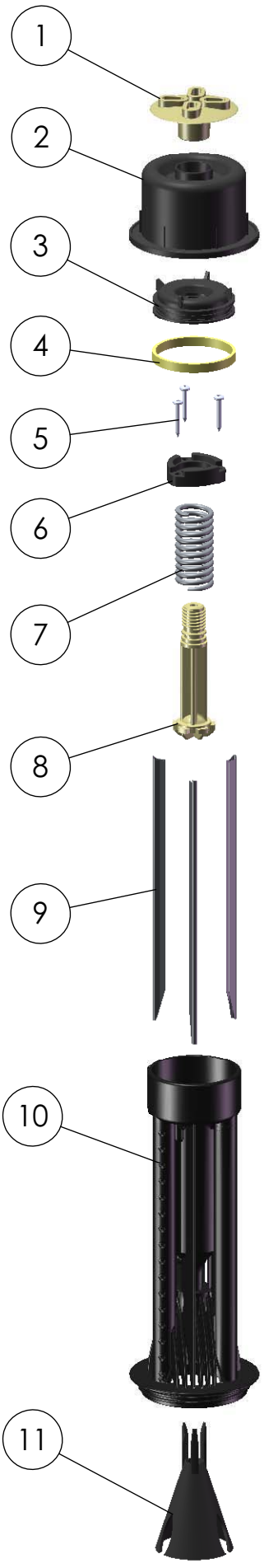
Spin Klin



Spare Parts Spin Klin

ARKAL S.K. SPINE 2.7

Cat. no.: 2199 1002



PARTS LIST

No:	DESCRIPTION	Cat. No.:	MATERIAL
1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
3	S.K. SPINE PISTON	2530 0216	R.P.A.
4	SLIDING WASHER	2253 1225	P.E.
5	FASTENING BOLTS 10*11/4	5040 1009	S.S.
6	S.K. SPINE CLAMPING DISC	2507 0206	R.P.A.
7	SPRING	5044 0028	S.S.
8	S.K. SPINE SCREW	2530 0213	R.P.A.
9	ANTI FRICTION ELEMENT	5076 0009	S.S.
10	S.K. SPINE BODY MOD. 2.7	2502 0227	R.P.A.
11	CONE MEMBRANE	5006 0008	N.R.

MATERIALS:

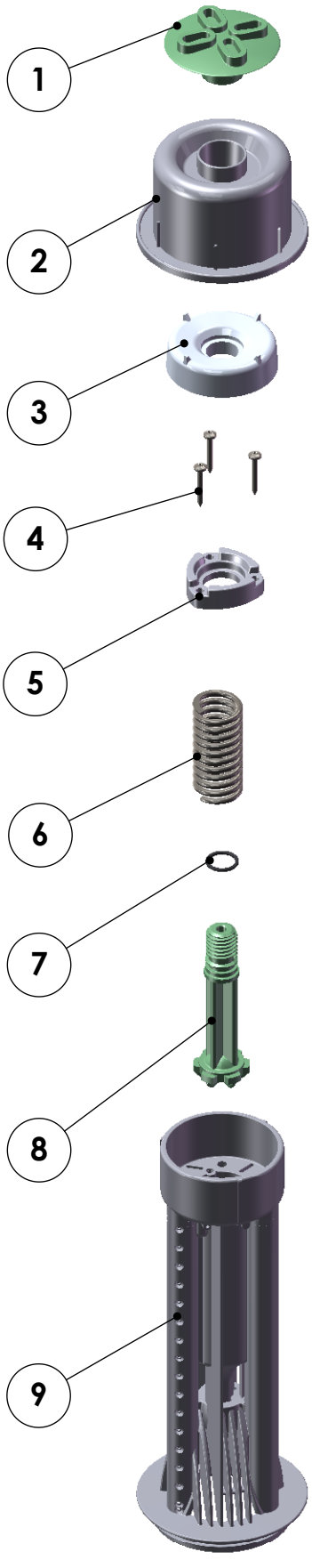
1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) S.S. - STAINLESS STEEL

4) N.R. - NATURALE RUBBER

No:	Cat. No.:	DESCRIPTION	MATERIAL
1	2506 6224G	S.K.BUTTRFLYNUT GREEN	R.P.P.
2	2506 6226	S.K.TIGHTENING CYLINDER GRAY	R.P.P.
3	2530 0217	S.K. SPINE PISTON	P.E.
4	5040 1009	FASTENING BOLTS 10X11/4	S.S.
5	2507 6206	S.K.SPINE CLAMPING DISC	R.P.A.
6	5044 0028 86	SPRING	S.S.
7	5003 2115	O-RING 2-115	EPDM
8	2530 6213G	S.K.SPINE SCREW GREEN	R.P.P.
9	2502 6227	S.K.SPINE BODY MOD. 2.7.	R.P.P.
10	5006 0010	CONE MEMBRANE 1.6	N.R.



MATERIALS:

P.P -POLYPROPYLENE

R.P.A.-REINFORCED POLYAMIDE

S.S. -STAINLESS STEEL

N.R. -NATURALE RUBBER

R.P.P. -REINFORCED POLYPROPYLENE

MODIFIC.	DATE	DESCRIPTION	SING

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BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: ARKAL S.K. SPINE 2.7 L.C.E. | PAGE___OF___

TITLE: ASSEMBLY DRAWING | CATALOGUE No: 2199 1008LC

SOLIDWORKS FILE CODE: SK SPINE 2.7 | FILE CODE: 2199 1008LC | MATERIAL:

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DRAWN	HELEN	15.11.09	PALLET-XXX (5200 XXXX)	DISK-2S
CHECKED	OMRY	15.11.09	TRIWALL-XXX (5201 XXXX)	
APPROVED	OMRY	15.11.09	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	15.11.09		

PATH- Z:\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\

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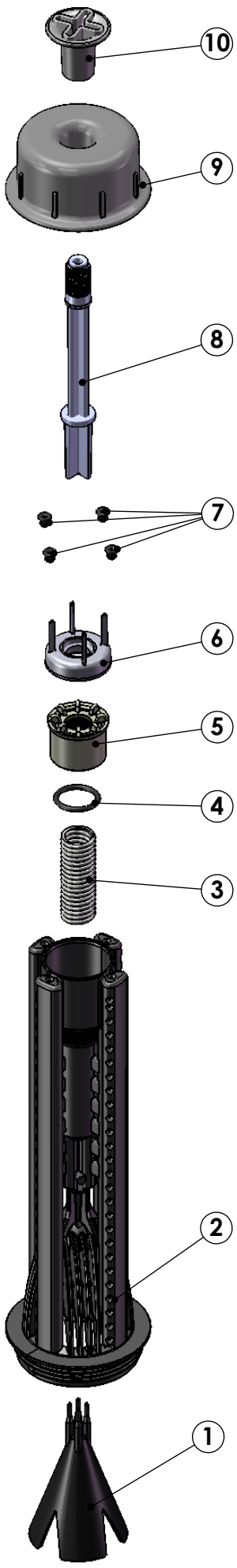
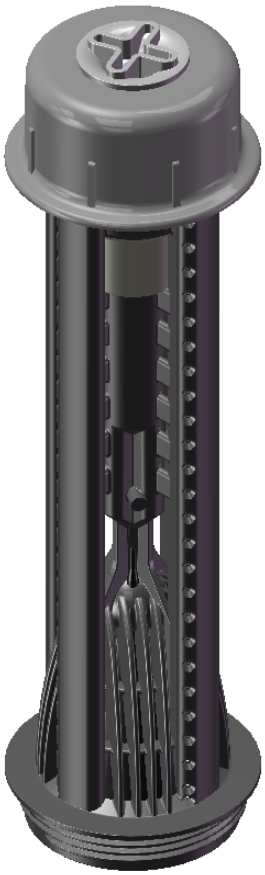


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
1	5006 0041	CONIC SEAL 4"S.K	1	N.R.
2	2502 0304	SPINE BODY 4" S.K	1	R.P.A.
3	5044 0030 188	METAL SPRING 4"S.K	1	S.S.
4	5003 2327	O-RING 2-327 EPDM	1	EPDM
5	2506 0406	SPRING HOLDER 4"S.K	1	R.P.P.
6	2530 0418	INTER CAP 4"S.K	1	P.E.
7	5006 0007	SEAL PLUG	4	N.R.
8	2530 0420	SPRING SHAFT	1	R.P.P.
9	2506 0405	TIGHTENING CYLINDER 4" S.K	1	R.P.P.
10	2506 0402	TIGHTENING NUT	1	R.P.P.



MATERIALS:

S.S. - STAINLESS STEEL
R.P.P. - REINFORCED POLYPROPYLENE
P.E. -POLYETHYLENE
N.R -NATURALE RUBBER
R.P.A. - REINFORCED POLYAMIDE

MODIFIC.	DATE	DESCRIPTION	SING

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ISRAEL

PROJECT: ARKAL S.K.SPINE MODEL 4" | PAGE___OF___

TITLE | CATALOGUE No: 2199 1040

SOLIDWORKS FILE CODE: 2199 1040 | FILE CODE: 2199 1040 | MATERIAL:

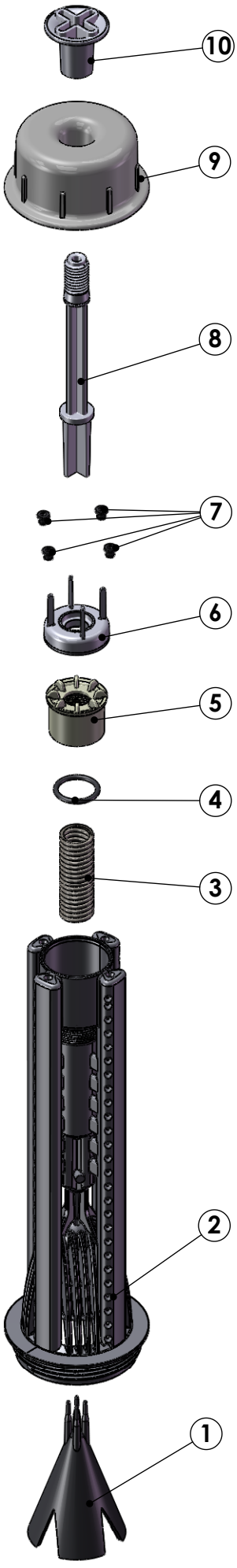
	NAME	DATE
DRAWN	HELEN	19.10.08
CHECKED	GADI	19.10.08
APPROVED	GADI	19.10.08
B.O.M.	MARINA	19.10.08

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP: DISK-2S
DRAWING:

SW-Print: 12/04/2009

PATH- Z:\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	MATERIAL
1	5006 0042	CONIC SEAL 4"S.K	1	NR
2	2502 0304	SPINE BODY 4" S.K	1	RPA
3	5044 0030 210	SPRING F/SPINE 4"SK	1	SST
4	5003 2327	O-RING 2-327 EPDM	1	EPDM
5	2506 0406	SPRING HOLDER 4"S.K	1	RPP
6	2530 0418	INTER CAP 4"S.K	1	PE
7	5006 0007	SEAL PLUG	4	NR
8	2530 0420	SPRING SHAFT	1	RPP
9	2506 0405	TIGHTENING CYLINDER 4" S.K	1	RPP
10	2506 0402	TIGHTENING NUT	1	RPP

MATERIALS:

SST - STAINLESS STEEL
RPP - REINFORCED POLYPROPYLENE
PE -POLYETHYLENE
NR - NATURALE RUBBER
RPA - REINFORCED POLYAMIDE
EPDM- ETHYLENE PROPYLENE RUBBER

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: ARKAL S.K.SPINE MODEL 4" | PAGE___OF___

TITLE: ASSEMBLY DRAWING | CATALOGUE No: 2199 1040LC

SOLIDWORKS FILE CODE: 2199 1040 | FILE CODE: 2199 1040LC | MATERIAL:

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CHECKED	GADI	04.08.09
APPROVED	GADI	04.08.09
B.O.M.	MARINA	04.08.09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP: DISK-2S

DRAWING:

SW-Print:04/08/2009

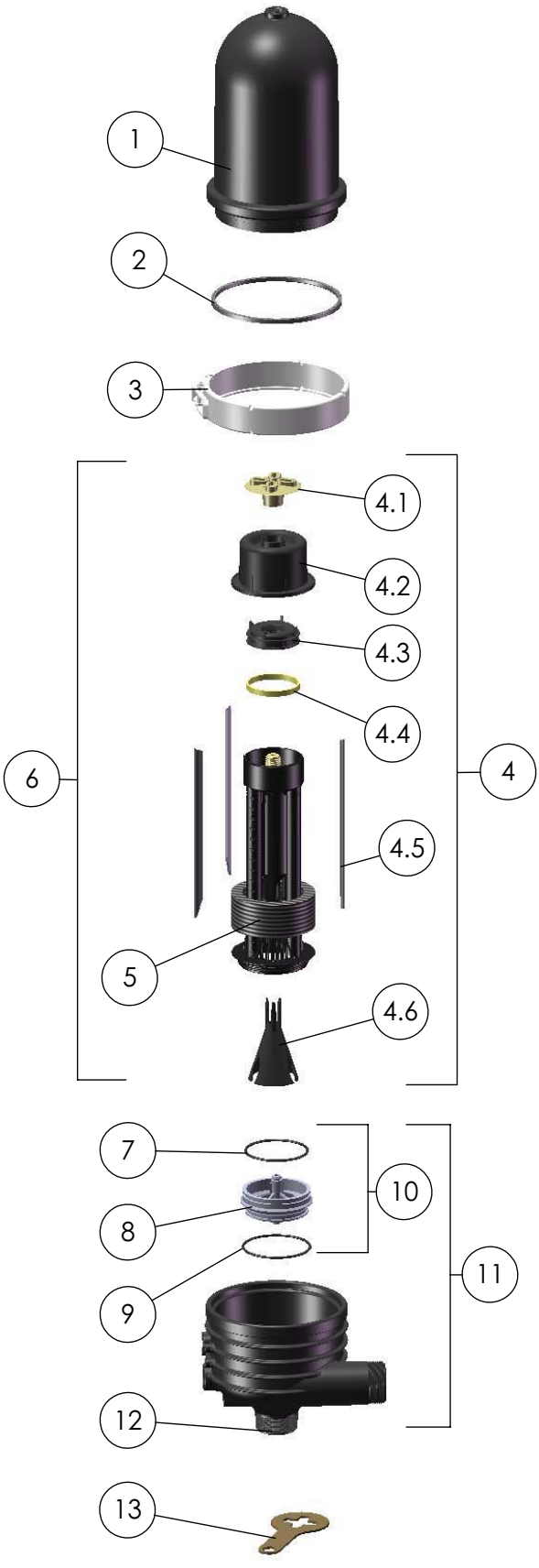
PATH- Z:\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\

ARKAL 2" S.K. FILTER

Cat. no.: 1225 0___ THREADED CONNECTION

PARTS LIST

No:	DESCRIPTION	Cat. No.:	MATERIAL
1	FILTER COVER TRASPARENT COVER	2501 0220 2501 9220	R.P.A. P.C.
2	HYDRAULIC SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	S.K. MODEL 2.7 SPINE	2199 1002	
4.1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
4.2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
4.3	S.K. SPINE PISTON	2530 0216	R.P.A.
4.4	SLIDING WASHER	2253 1225	P.E.
4.5	ANTI FRICTION ELEMENT	5076 0009	S.S.
4.6	CONE MEMBRANE	5006 0008	N.R.
5	DISCS SET	2022 1___	P.P.
6	FILTER ELEMENT	2123 ___	
7	"O" RING 2*234	5003 2234	EPDM
8	SPINE ADAPTER	2503 0324	R.P.P.
9	"O" RING 2*237	5003 2237	EPDM
10	COMPLETE ADAPTER	2234 0324	
11	BODY COMPLEX	2224 0252	
12	2" S.K. BODY THREADED OUT	2500 0252	R.P.A.
13	"BUTTERFLY" NUT WRENCH	5076 0028	G.S.



MATERIALS:

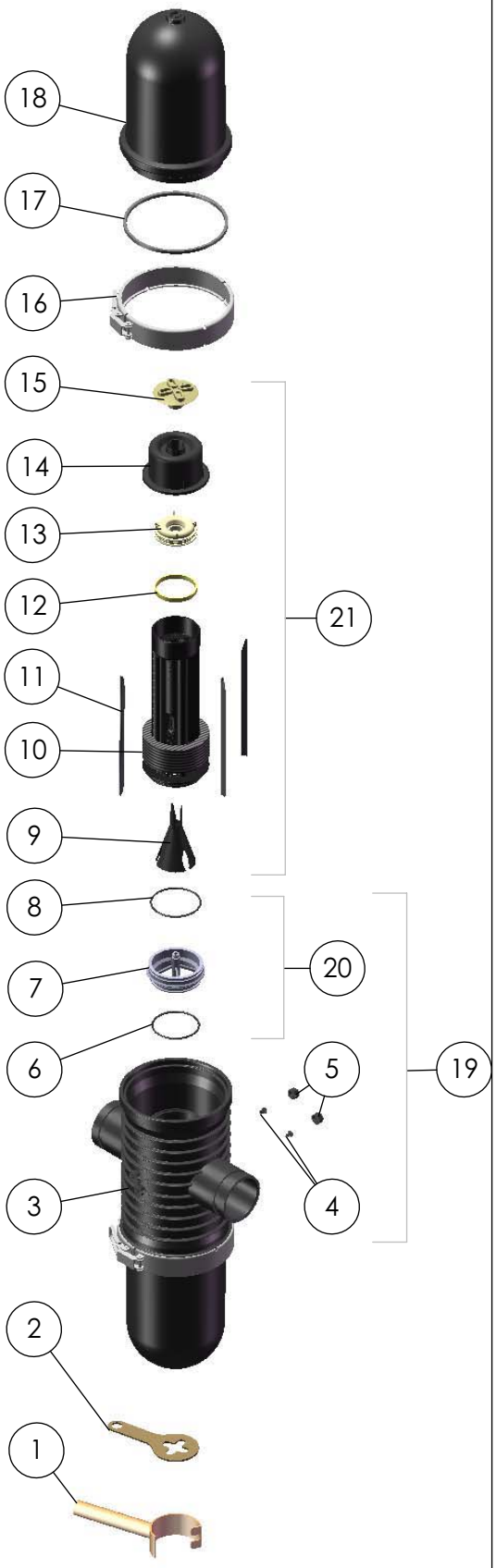
1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) G.S. - GALVANIZED STEEL
4) S.S. - STAINLESS STEEL
5) N.R. - NATURALE RUBBER

ARKAL 3" S.K. FILTER

DIFFERENTIAL 2.7-MODEL
Cat.no.:1356M1___ VICTAULIC ENDS

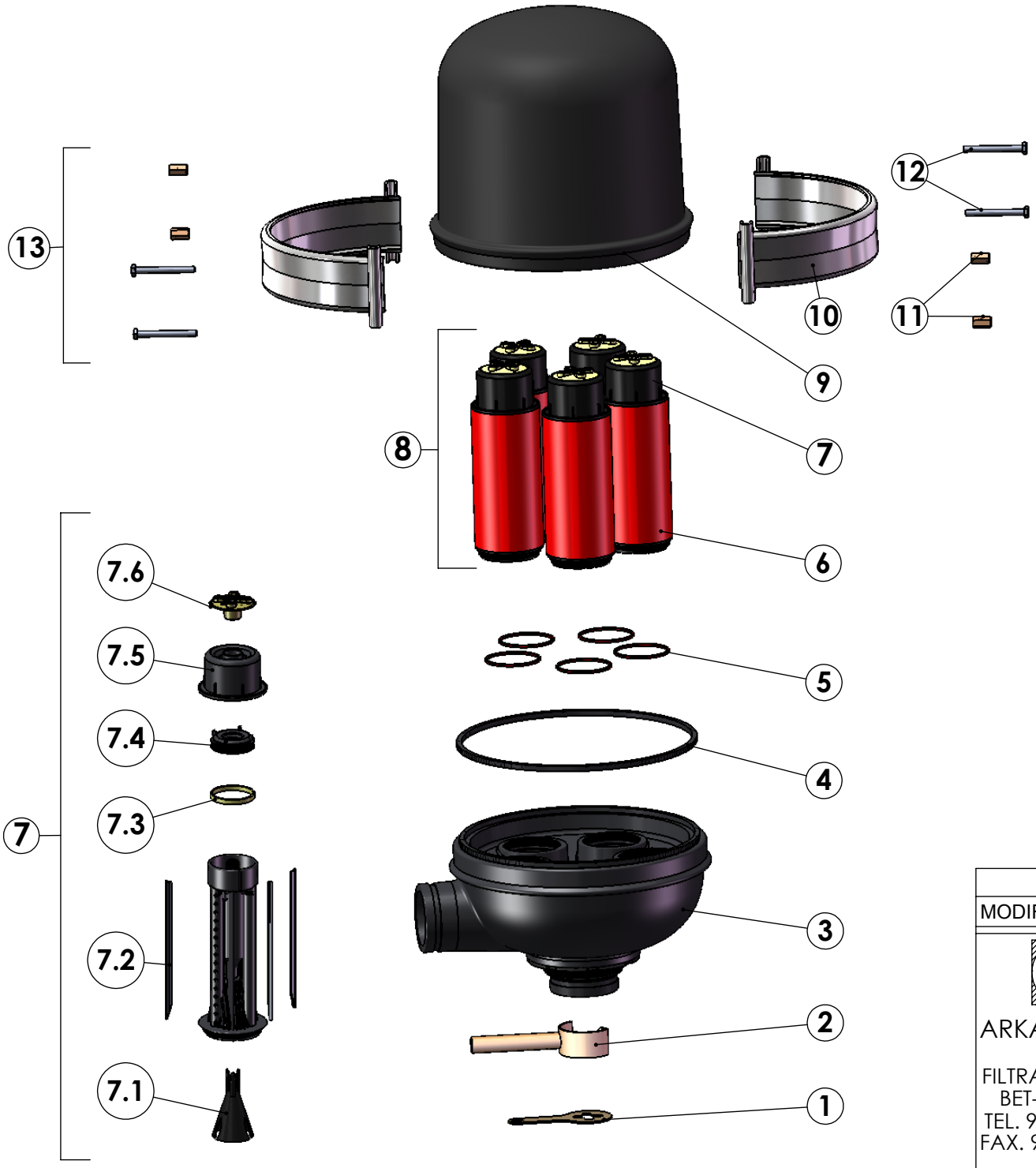
PARTS LIST

No:	CAT.No:	DESCRIPTION	MATERIALS
1	5076 0019	SK SPINE WRENCH	G.S.
2	5076 0028	"BUTTERFLY" NUT WRENCH	G.S.
3	2500 0303	FILTER BODY	R.P.A.
4	5006 0004	GAUGE PORT SEAL	EPDM
5	2511 0103	GAUGE PORT NUT	R.P.P.
6	5003 2234	"O" RING 2*234	EPDM
7	2503 0324	SPINE ADAPTER	R.P.P.
8	5003 2237	"O" RING 2*237	EPDM
9	5006 0008	CONE MEMBRANE	N.R.
10	2022 1___	DISC SET	P.P.
11	5076 0009	ANTI FRICTION ELEMENT	S.S.
12	2253 1225	SLIDING WASHER	P.E.
13	2530 0216	SK-2 SPINE PISTON	R.P.A.
14	2506 0226	TIGHTENING CYLINDER-2	R.P.A.
15	2506 0224	BUTTRF.NUT F.SK-2	R.P.A.
16	5042 0030	3" ARKAL CLAMP	S.S.
17	5005 0002	2" COVER SEAL	EPDM
18	2501 0210 2501 9220	FILTER COVER TRANSPARENT COVER	R.P.A. P.C.
19	2234 1004	FILTER BODY COMPLETE	
20	2234 0324	COMPLETE ADAPTER	
21	2199 1002	S.K.SPINE MODEL 2	



MATERIALS:

R.P.A.-REINFORCED POLYAMIDE
S.S. -STAINLESS STEEL
G.S. -GALVANIZED STEEL
N.R. -NATURAL RUBBER
P.C. -POLYCARBONATE
P.E. -POLYETHYLENE
R.P.P. -REINFORCED POLYPROPYLENE



No:	DESCRIPTION	CAT. No:	MATERIAL
1	SK BATTER.NUT WRENCH	5076 0028	G.S.
2	SK SPINE WRENCH	5076 0019	G.S.
3	FILTER BODY ASSEM.	2249 1005	
4	SEAL FOR GALAXY	5006 0012	EPDM
5	FLAT SEAL	2507 0408	P.E.
6	DISC SET	2022 1___	P.P.
7	S.K. MODEL 2.7 SPINE	2199 1002	
7.1	CONE MEMBRANE	5006 0008	N.R.
7.2	ANTI FRICTION ELEMENT	5076 0009	S.S.
7.3	SLIDING WASHER	2253 1225	P.E.
7.4	S.K. SPINE PISTON	2530 0216	R.P.A.
7.5	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
7.6	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
8	FILTER ELEMENT	2123 ___	
9	FILTER COVER	2501 0402	P.P.
10	CLAMP HALF	5042 0044	S.S.
11	M10*30 NUT	5040 8140	BRASS
12	M10*100 BOLT	5040 3410	S.S.
13	CLAMP COMPLEX	2253 0044	

MATERIALS:

1) P.P - POLYPROPILENE
2) R.P.A.- REINFORCED POLYAMIDE
3) S.S. - STAINLESS STEEL
4) N.R. - NATURALE RUBBER
5) G.S. - GALVANIZED STEEL
6) P.E. - POLYETILENE

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: ARKAL 4" S.K. POLYPROPYLENE "GALAXY" FILTER				PAGE___OF___
TITLE: 4" S.K. "GALAXY"				CATALOGUE No: 1494 1___
SOLIDWORKS FILE CODE: 4" GALAXY 1494 1___XXX		FILE CODE: 1494 1___PE		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	HELEN	25/03/2009	PALLET-XXX (5200 XXXX) TRIWALL-XXX (5201 XXXX)	DISK-2S
CHECKED				
APPROVED			FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	25/03/2009		

PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\4 INCH FILTERS\4" GALAXY\

SW-Print:25/03/2009

ARKAL 4" S.K. ALUMINUM "GALAXY" FILTER

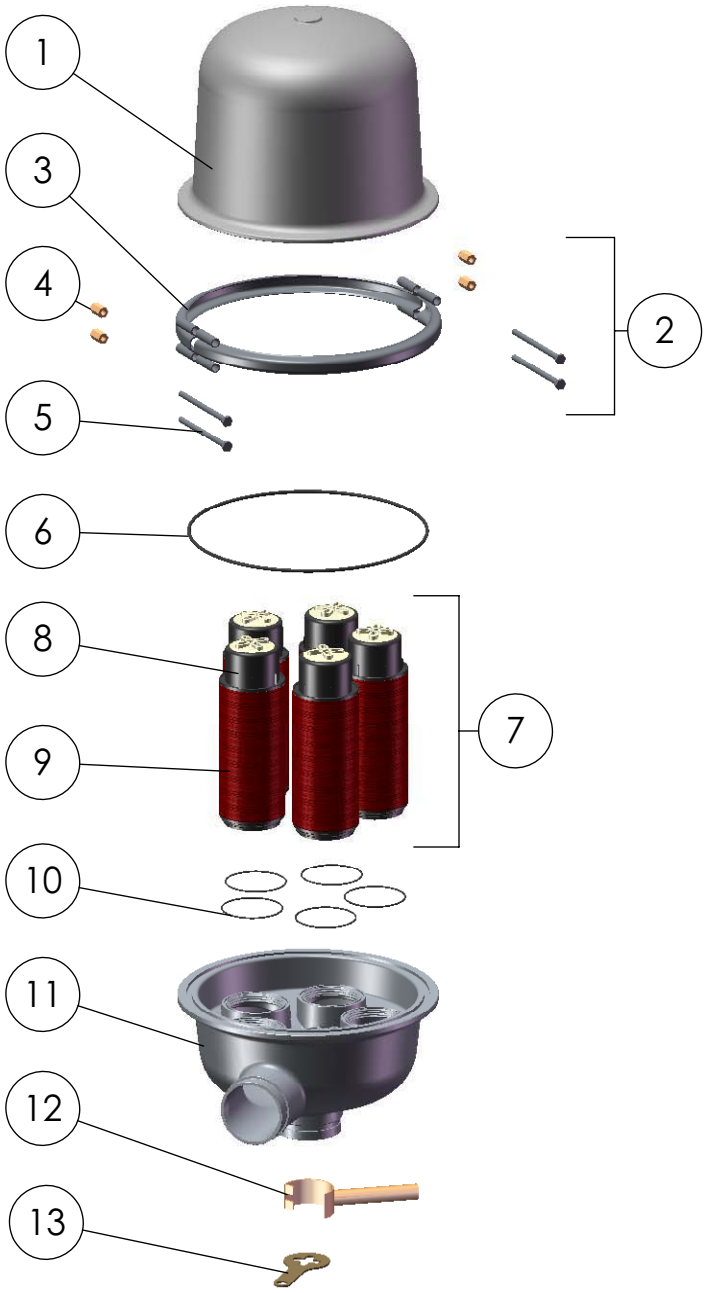
Cat. no.: 1491M1___

PARTS LIST

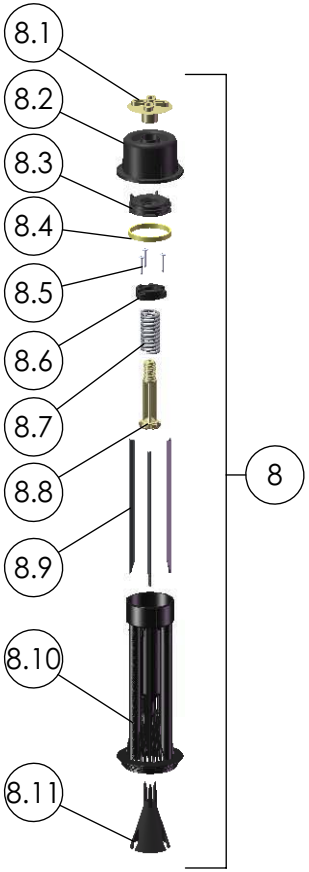
No:	DESCRIPTION	Cat. No.:	MATERIAL
1	FILTER COVER	5035 0003AHT	ALUM
2	CLAMP COMPLETE	2253 1453	
3	CLAMP HALF	5042 0453	S.S.
4	NUT M10*30	5040 8140	BRASS
5	BOLT M10*160	5040 0160	S.S.
6	"O" RING 2*461	5003 2461	EPDM
7	FILTER ELEMENT	2123 ___	
8	S.K. MODEL 2.7 SPINE	2199 1002	
8.1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
8.2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
8.3	S.K. SPINE PISTON	2530 0216	R.P.A.
8.4	SLIDING WASHER	2253 1225	P.E.
8.5	FASTENING BOLTS 10*11/4	5040 1009	S.S.
8.6	S.K. SPINE CLAMPING DISC	2507 0206	R.P.A.
8.7	SPRING	5044 0028	S.S.
8.8	S.K. SPINE SCREW	2530 0213	R.P.A.
8.9	ANTI FRICTION ELEMENT	5076 0009	S.S.
8.10	S.K. SPINE BODY MOD. 2.7	2502 0227	R.P.A.
8.11	CONE MEMBRANE	5006 0008	N.R.
9	DISC SET	2022 1___	P.P.
10	"O" RING 2*243	5003 2243	EPDM
11	FILTER HOUSING	5035 0001AHT	ALUM
12	SPINE WRENCH	5076 0019	G.S.
13	"BUTTERFLY" NUT WRENCH	5076 0028	G.S.

MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) G.S. - GALVANIZED STEEL
4) S.S. - STAINLESS STEEL
5) N.R. - NATURALE RUBBER
6) ALUM - ALUMINUM



S.K. MODEL 2.7 SPINE



ARKAL 4" S.K. STAINLESS STEEL "GALAXY" FILTER

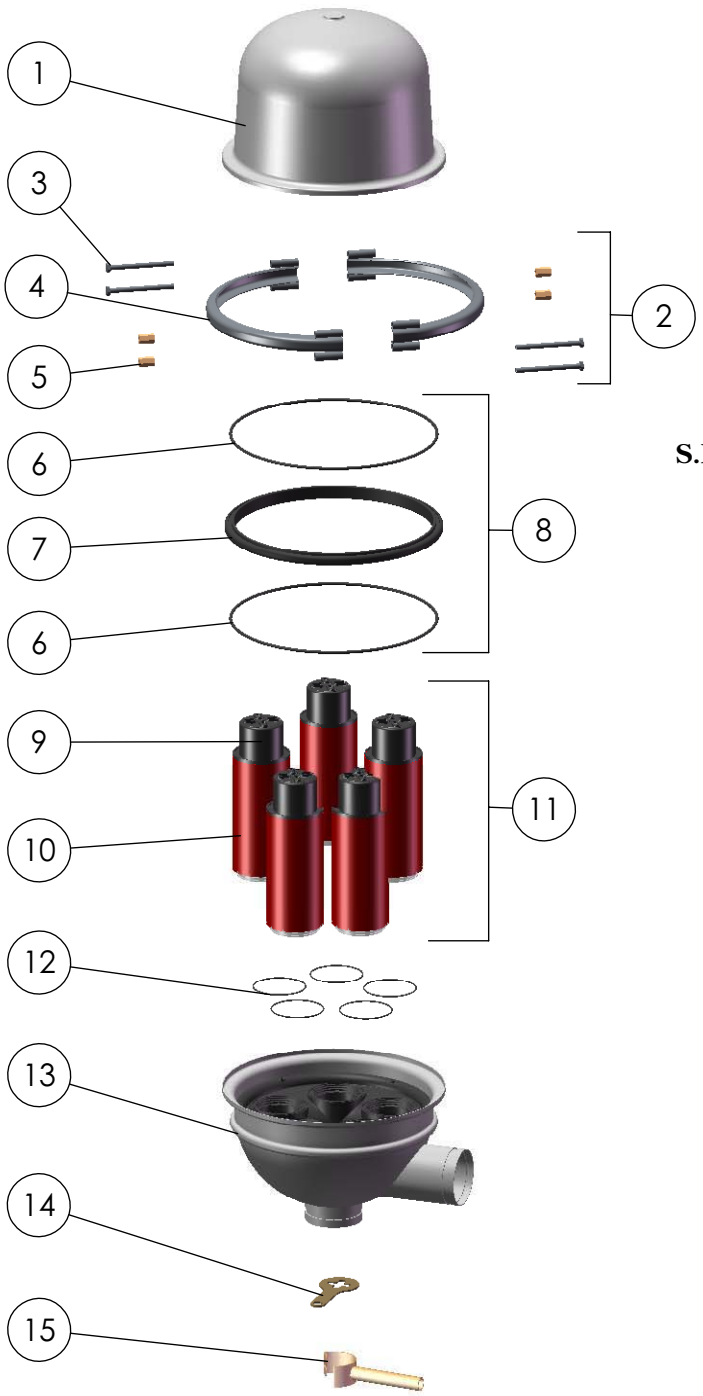
Cat. no.: 1498M1___

PARTS LIST

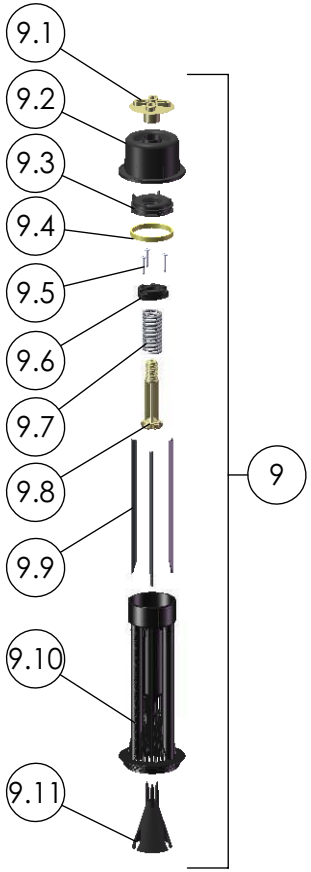
No:	DESCRIPTION	Cat. No.:	MATERIAL
1	FILTER COVER	5036 0013L	S.S.
2	CLAMP COMPLETE	2253 2444L	
3	BOLT	5040 0160	S.S.
4	CLAMP HALF	5042 1444L	S.S.
5	NUT	5040 8140	BRASS
6	"O" RING 2*461	5003 2461	EPDM
7	SEAL SUPPORT RING	2530 0407	P.P.
8	SEAL COMPLETE	2253 0407	
9	S.K. MODEL 2.7 SPINE	2199 1002	P.P.
9.1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
9.2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
9.3	S.K. SPINE PISTON	2530 0216	R.P.A.
9.4	SLIDING WASHER	2253 1225	P.E.
9.5	FASTENING BOLTS 10*11/4	5040 1009	S.S.
9.6	S.K. SPINE CLAMPING DISC	2507 0206	R.P.A.
9.7	SPRING	5044 0028	S.S.
9.8	S.K. SPINE SCREW	2530 0213	R.P.A.
9.9	ANTI FRICTION ELEMENT	5076 0009	S.S.
9.10	S.K. SPINE BODY MOD. 2.7	2502 0227	R.P.A.
9.11	CONE MEMBRANE	5006 0008	N.R.
10	DISC SET	2022 1___	P.P.
11	FILTER ELEMENT	2123 ___	
12	"O" RING	5003 1043	EPDM
13	FILTER HOUSING	5036 0111	
14	"BUTTERFLY" NUT WRENCH	5076 0028	G.S.
15	SPINE WRENCH	5076 0019	G.S.

MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) G.S. - GALVANIZED STEEL
4) S.S. - STAINLESS STEEL
5) N.R. - NATURALE RUBBER



S.K. MODEL 2.7 SPINE



ARKAL 4" S.K. COATED "GALAXY" FILTER

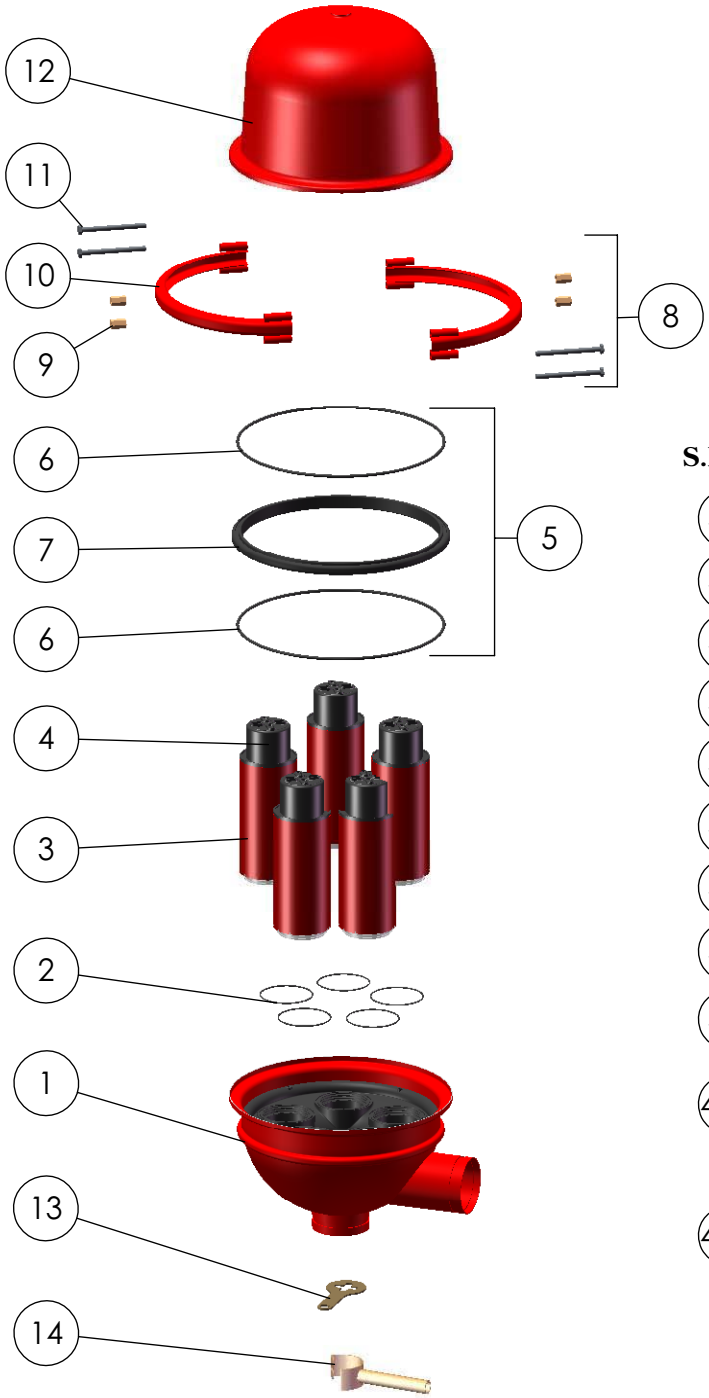
Cat. no.: 1493M1___

PARTS LIST

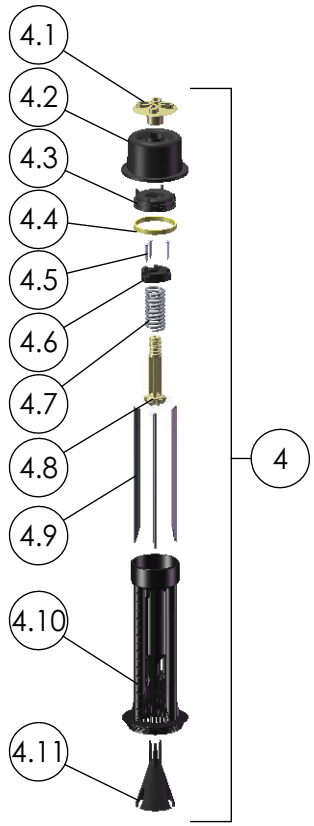
No:	DESCRIPTION	Cat. No.:	MATERIAL
1	FILTER HOUSING	5035 0111	
2	"O" RING	5003 1043	EPDM
3	DISC SET	2022 1___	P.P.
4	S.K. MODEL 2.7 SPINE	2199 1002	P.P.
4.1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
4.2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
4.3	S.K. SPINE PISTON	2530 0216	R.P.A.
4.4	SLIDING WASHER	2253 1225	P.E.
4.5	FASTENING BOLTS 10*11/4	5040 1009	S.S.
4.6	S.K. SPINE CLAMPING DISC	2507 0206	R.P.A.
4.7	SPRING	5044 0028	S.S.
4.8	S.K. SPINE SCREW	2530 0213	R.P.A.
4.9	ANTI FRICTION ELEMENT	5076 0009	S.S.
4.10	S.K. SPINE BODY MOD. 2.7	2502 0227	R.P.A.
4.11	CONE MEMBRANE	5006 0008	N.R.
5	SEAL COMPLETE	2253 0407	
6	"O" RING 2*461	5003 2461	EPDM
7	SEAL SUPPORT RING	2530 0407	P.P.
8	CLAMP COMPLETE	2253 2444	
9	NUT	5040 8140	BRASS
10	ARCH	5042 1444RED	S.S.
11	BOLT	5040 0160	S.S.
12	FILTER COVER	5035 0013	C.S.
13	"BUTTERFLY" NUT WRENCH	5076 0028	G.S.
14	SPINE WRENCH	5076 0019	G.S.

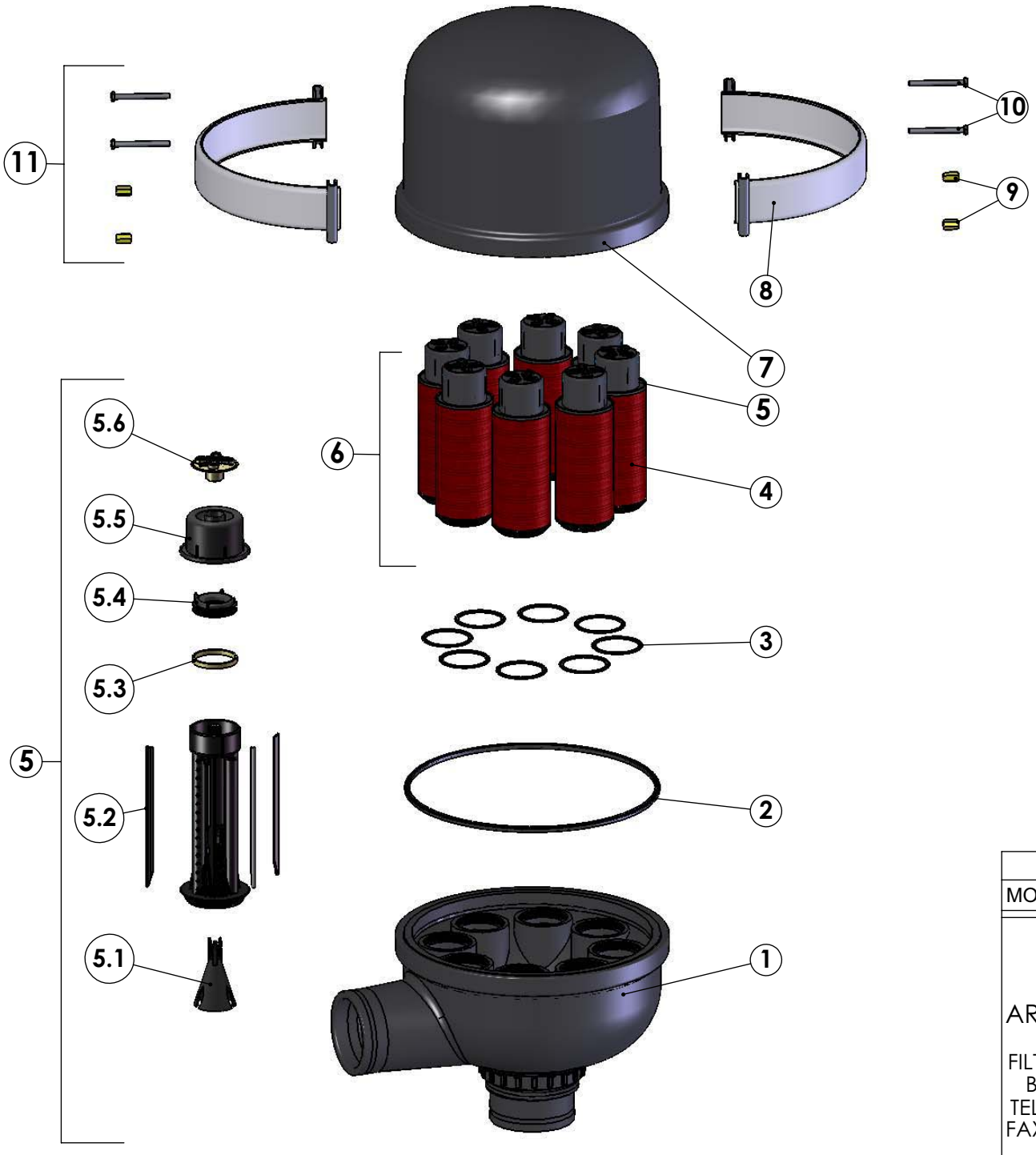
MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) G.S. - GALVANIZED STEEL
4) S.S. - STAINLESS STEEL
5) N.R. - NITRILE RUBBER
6) C.S. - COATED STEEL



S.K. MODEL 2.7 SPINE





No:	DESCRIPTION	CAT. No:	MATERIAL
1	BODY COMPL 6" "GALAXY"	2241 1001	
2	HYDRAULIC SEAL	5005 0006	EPDM
3	FLAT SEAL	5006 0014	EPDM
4	DISC SET	2022 1___	P.P.
5	S.K. MODEL 2.7 SPINE	2199 1002	---
5.1	CONE MEMBRANE	5006 0008	N.R.
5.2	ANTI FRICTION ELEMENT	5076 0009	S.S.
5.3	SLIDING WASHER	2253 1225	P.E.
5.4	S.K. SPINE PISTON	2530 0216	R.P.A.
5.5	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
5.6	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
6	FILTER ELEMENT	2123 ___	
7	FILTER COVER	2501 0603	P.P
8	CLAMP HALF	5042 0046	S.S.
9	M10*30 NUT	5040 8140	BRASS
10	M10*100 BOLT	5040 3410	S.S.
11	CLAMP COMPLEX	2253 0046	

MATERIALS:

1) P.P- POLYPROPILENE
2) R.P.A.-REINFORCED POLYAMIDE
3) S.S. - STAINLESS STEEL
4) N.R. -NATURALE RUBBER

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: ARKAL 6" S.K. POLYPROPYLENE "GALAXY" FILTER — PAGE___OF___

TITLE — CATALOGUE No: 1497 1_

SOLIDWORKS FILE CODE: 1497 1___X — FILE CODE: 1497 1___PE — MATERIAL:

	NAME	DATE
DRAWN	HELEN	30/12/2008
CHECKED		
APPROVED		
B.O.M.	MARINA	30/12/2008

FILE CODE DRAWINGS: PALLET-XXX (5200 XXXX) TRIWALL-XXX (5201 XXXX)

FILE CODE DRAWING OF MAN.

BACKUP: DISK-2S

DRAWING:

PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\6 INCH FILTERS\6 INCH GALAXY\

SW-Print:30/12/2008

ARKAL SUPER FLOW MEDIA FILTER

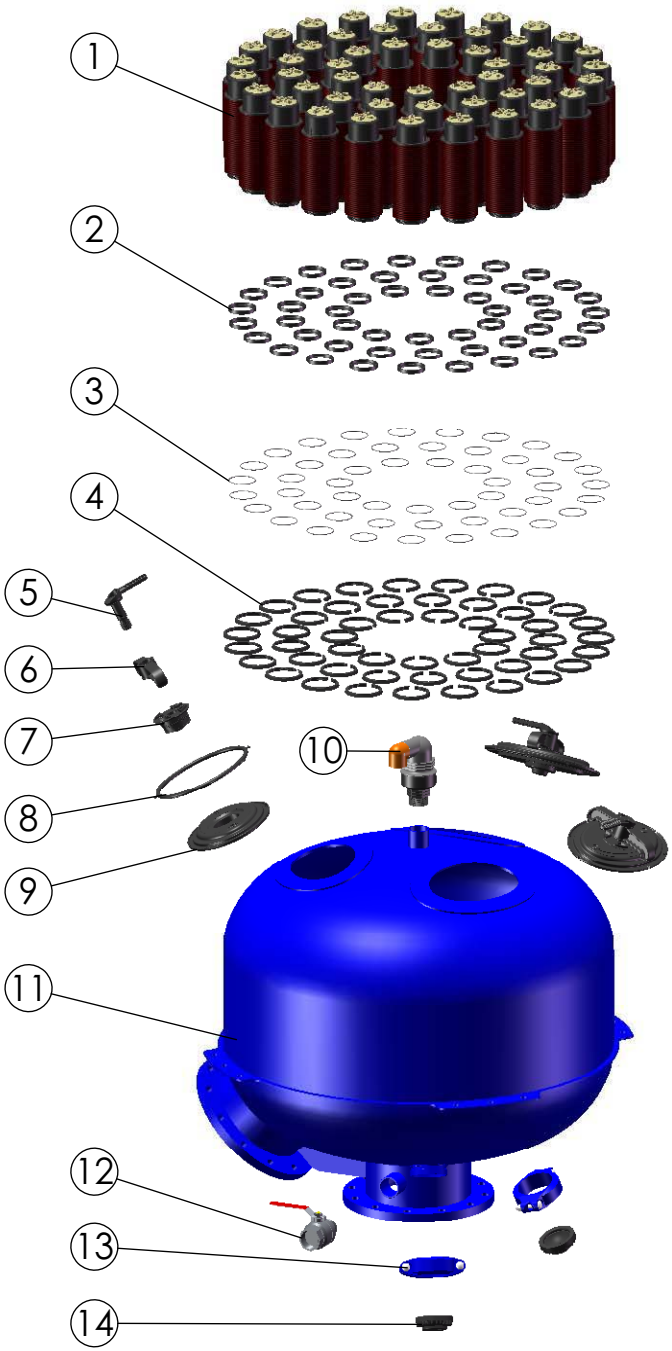
Cat. no.: 1482 7BL___

PARTS LIST

No:	DESCRIPTION	Cat. No.:	MATERIAL
1	S.K. MODEL 2.7 SPINE COMPLETE	2123 ____	---
2	SPINE SEAL HOLDER	2507 1202	P.P.
3	"O" RING 2*235	5003 2235	EPDM
4	SPINE CONIC SEAT	2503 0404	R.P.P.
5	TIGHTENING SCREW	2820 0038	R.P.A.
6	EXTENDED BRIDGE	2820 0034	R.P.A.
7	LOWER PLUG	2820 0340	R.P.A.
8	COVER SEAL	5005 0548	EPDM
9	COVER	2820 0321	R.P.A.
10	2" BARAK AIR REL. VALVE	5048 0206	---
11	FILTER BODY	5038 7012BL	ST37COATED RAL 5010
12	2" F/M BALL TAP	5054 0118	BRASS
13	4" VIC. CONNECTOR BL	5032 0405	G.E.
14	4" VIC. CAP PL	2530 0400	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) S.S. - STAINLESS STEEL



PATH: FILTERS\SUPER FLOW

12.05.2008

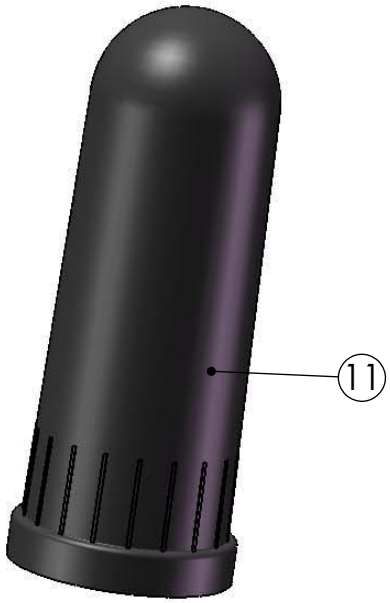
ITEM No:	PART NUMBER	DESCRIPTION	QTY.
1	2237 1011	3"ANG. SK4 VIC BODY COMP	1
2	5054 0212	1/4"*1/2" BALL TAP	1
3	5006 0004	GAUGE PORT SEAL	2
4	2511 0103	GAUGE STOPER 3MM HOL	2
5	5005 0004	3"-4"HYDRAULIC SEAL	1
6	5042 0060	CLAMP F/SUPER LEADER	1
7	5002 2355	O-RING 2-355 NITRILE	1
8	2140 4___	3-4" FILT.ELEM. S.K.	1
9	2033 4___	3-4" DISC SET	1
10	2199 1040	S.K.SPINE MODEL 4 PP	1
11	2501 0602	6"FILTER COVER	1

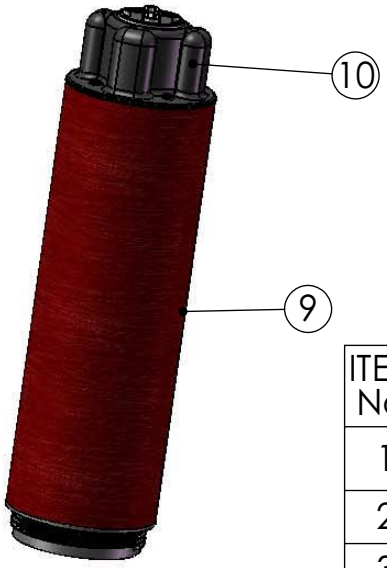
MODIFIC.	DATE	DESCRIPTION	SING

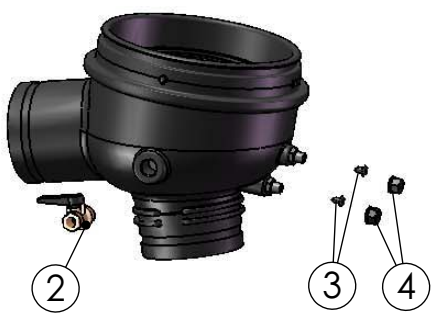
ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3"APOLLO ANGLE FILTER
PAGE___OF___
TITLE: ASSEMBLY DRAWING
CATALOGUE No: 1376 1___
SOLIDWORKS FILE CODE:
FILE CODE: 1376 1___PE
MATERIAL:

	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	HELEN	03.11.08	PALLET-XXX (5200 XXXX)	DISK-2S
CHECKED	GADI	03.11.08	TRIWALL-XXX (5201 XXXX)	
APPROVED	GADI	03.11.08	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	03.11.08		







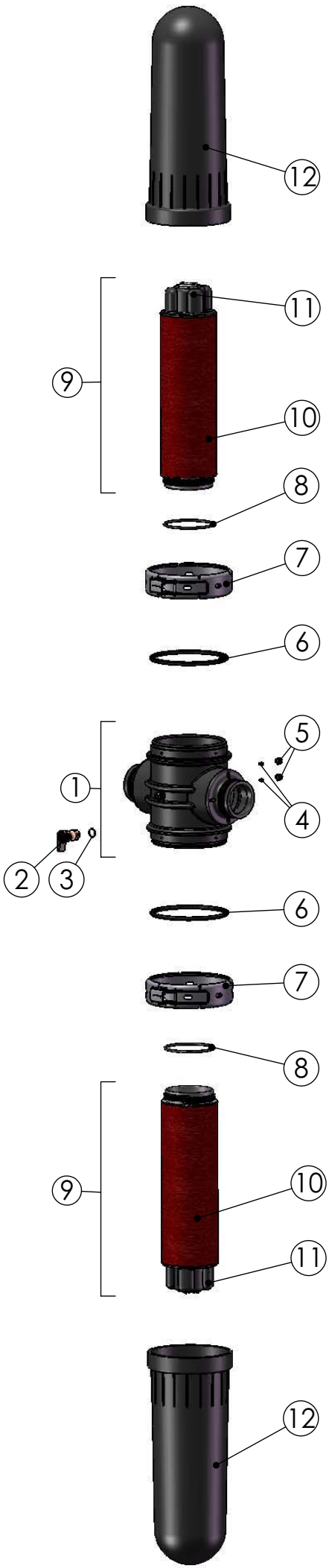
ITEM No:	PART NUMBER	DESCRIPTION	QTY.
1	2247 1011	4"ANG SK4 VIC BODY COMP	1
2	5054 0212	1/4"*1/2" BALL TAP	1
3	5006 0004	GAUGE PORT SEAL	2
4	2511 0103	GAUGE STOPER 3MM HOL	2
5	5005 0004	3"-4"HYDRAULIC SEAL	1
6	5042 0060	CLAMP F/SUPER LEADER	1
7	5002 2355	O-RING 2-355 NITRILE	1
8	2140 4___	3-4" FILT.ELEM. S.K.	1
9	2033 4___	4"PAIR DISC SET 018M	1
10	2199 1040	S.K.SPINE MODEL 4 PP	1
11	2501 0602	6" FILTER COVER PP	1

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4" APOLLO ANGLE FILTER				PAGE___OF___
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1416 1___
SOLIDWORKS FILE CODE:		FILE CODE: 1416 1___PE		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	HELEN	03.11.08	PALLET-XXX (5200 XXXX)	DISK-2S
CHECKED	GADI	03.11.08	TRIWALL-XXX (5201 XXXX)	
APPROVED	GADI	03.11.08	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	03.11.08		

SW-Print:05/11/2008



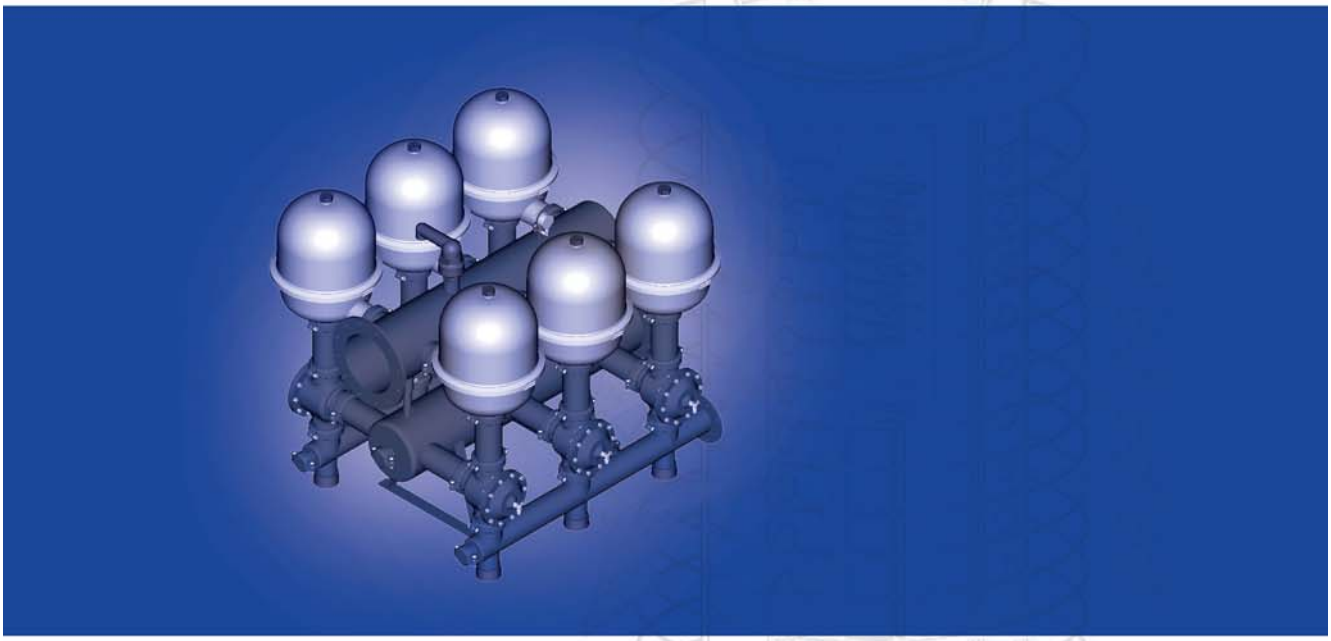
ITEM No:	PART NUMBER	DESCRIPTION	QTY
1	2200 0402	4"DOUB VIC BODY COMP+SPINE BASE PP	1
2	5054 0112	3/4" -SN TAP	1
3	5003 2311	O-RING 2-311 EPDM	1
4	5006 0004	GAUGE PORT SEAL	2
5	2511 0103	GAUGE STOPER 3MM HOL	2
6	5005 0004	3"-4"HYDRAULIC SEAL	2
7	5042 0060	CLAMP F/SUPER LEADER	2
8	5002 2355	O-RING 2-355 NITRILE	2
9	2140 4___	3-4" FILT.ELEM. S.K.	2
10	2033 4___	3-4" DISC SET S.K	2
11	2199 1040	S.K.SPINE MODEL 4 PP	2
12	2501 0602	6" FILTER COVER	2

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4" APOLLO TWIN FILTER				PAGE___OF___
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1446 1___
SOLIDWORKS FILE CODE:		FILE CODE: 1446 1___PE		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	HELEN	29.10.08	PALLET-XXX (5200 XXXX)	DISK-2S
CHECKED	GADI	05.11.08	TRIWALL-XXX (5201 XXXX)	
APPROVED	GADI	05.11.08	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	05.11.08		

SW-Print:06/11/2008



Spin Klin® TECHNOLOGY

FULLY AUTOMATIC DISC FILTERS

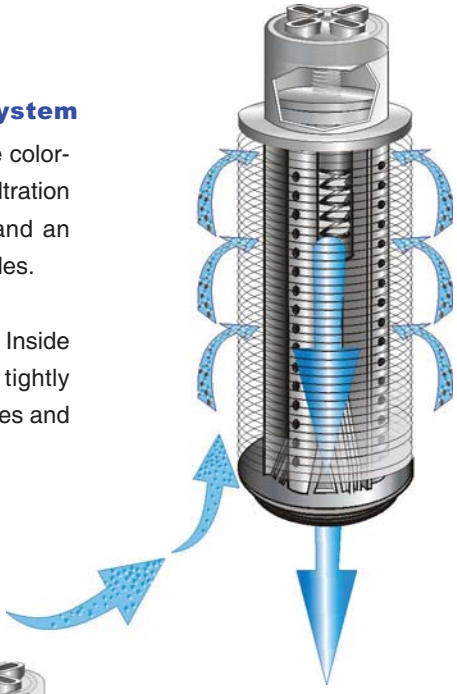
- ARKAL's Spin Klin® technology uses color-coded polypropylene discs, which are diagonally grooved on both sides to a precise micron size.
- The discs are then stacked on a patented, automatic, reverse backwash Spin Klin® spine creating a depth filtration unit.
- When stacked, the top grooves run opposite to the bottom grooves creating a depth filtration unit with a significant number of intersections which trap the solids.
- The stack is enclosed in a corrosion and pressure resistant housing.
- Arkal provides a wide range of automatic Spin Klin® filtration systems utilizing either polyester coated carbon steel, stainless steel or polypropylene manifolds.

Spin Klin® Technology - Spin Klin® spine model II

Spin Klin® spine - The Core of the Spin Klin® Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes.

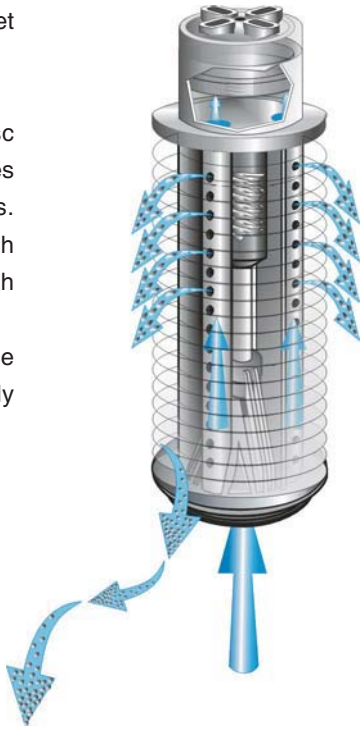
The spine assembly is specially designed to compress the filter element. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.



Spin Klin® Automatic Backwash Operation

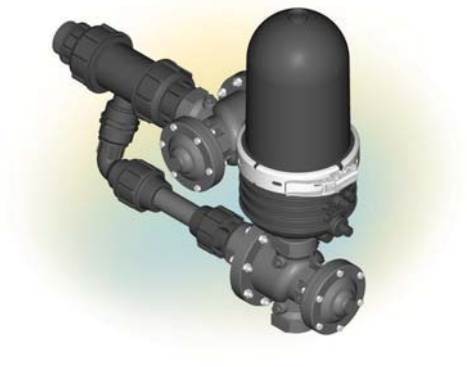
Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The valve inlet part shuts as the drain port is opened.

During the backwash process, the disc compression is released. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine.
The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



2" Compact All Plastic

Filtration Unit



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	2.8	**psi**	40.6
Filtration surface area	**cm²**	880	**in²**	136.4
Filtration volume	**cm³**	1,320	**in³**	80.5
Backwash water volume	**lit**	33	**gal**	8.7
Min. Backwash flow rate	**m3/h**	10	**gpm**	44

Maximum Filtration Flow Rate / Water Quality

Filtration Grade	Water Quality	m³/h	gpm
400-100 µ	Good	20	88
	Average	15	66
	Poor	10	44
	Very Poor	8 *	35*
70-55 µ	Good	10	44
	Average	8*	35*
	Poor	6*	26*
	Very Poor	4*	18*
40-20 µ	Good	5*	22*
	Average	4*	18*
	Poor	3*	13*
	Very Poor	2*	9*

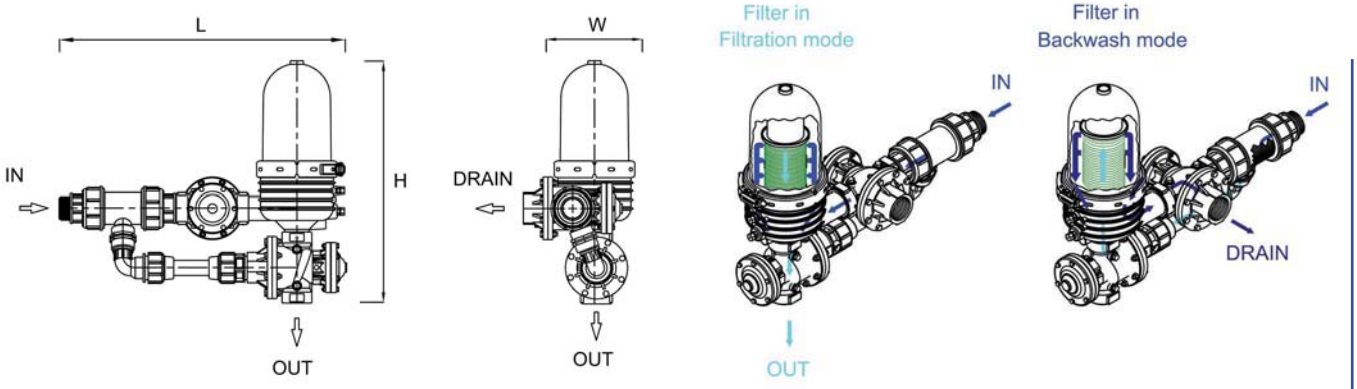
* External source or Air aided backwash is necessary

2" Compact All Plastic

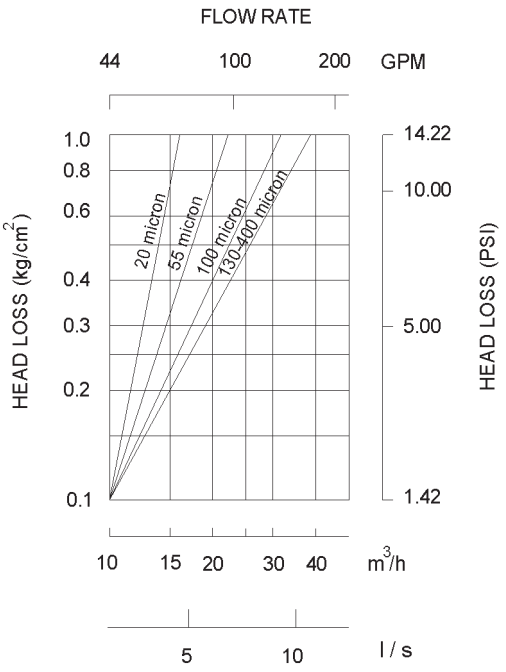
Filtration Unit

Dimensions and Weights

D Inlet\Outlet diameter	**mm**	50	**inch**	2
L Length	**mm**	751	**inch**	29 5/8
H Height	**mm**	655	**inch**	25 7/8
W Width	**mm**	243	**inch**	9 5/8
Shipping weight (approx.)	**kg**	28.6	**lbs**	63



Head Loss Chart, Clean State



All Plastic 2" Compact filtration units are available with:

Non Corrosive material valves

ARKAL SPIN KLIN
Automatic Backwash Filtration Systems
2” Compact Stand Alone (new)
Operation, Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 2” Spin Klin Compact Filter. All Arkal Filtration Systems are easy to install, use and service and do not require special skills to operate them.

For proper operation and maintenance of the filtration system please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, please read the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service and / or maintenance.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water contact with the electronic control unit.
4. Confirm that filter weight, when full, does not exceed support construction limitations.
6. Prior to installation confirm that line pressure does not exceed filter's operational pressure rating (10 bar).
7. Please note, that during normal operation the filter enters into backwash mode automatically, without prior warning.
8. Use only original parts when servicing the filter.
9. Arkal cannot accept responsibility for any changes or modifications to the equipment.

Special Note

Before opening the filter clamp, make sure that there is no system pressure in the filter.

3. Description and Operation

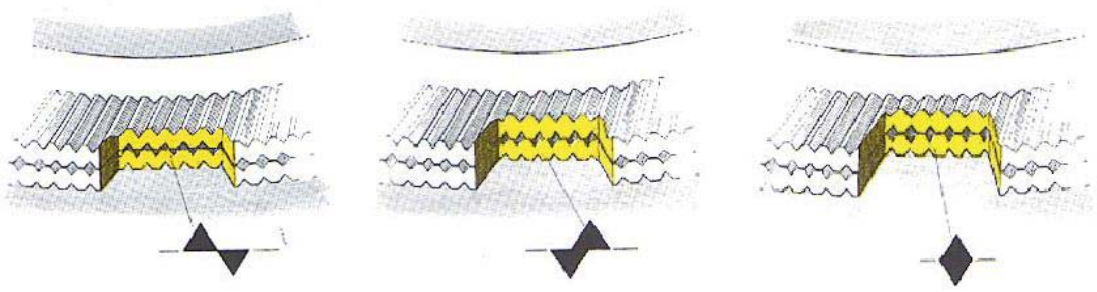
3.1 Disc Filtration Technology

Arkal Filtration Systems uses a specially designed disc filtration technology. Thin, color-coded polypropylene discs are diagonally grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of ridges and valleys, which trap the solids. The stack is enclosed in a corrosion proof and pressure resistant housing.

During the filtration process, the filtration discs are tightly compressed together by the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolates from the outer diameter to the inner diameter of the element. Depending on the micron rating, there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration.

Table of Disc Filtration Grades and Color Code

Disc Color	Blue	Yellow	Red	Black	Brown	Green	Purple	Gray
Mesh	40	80	120	140				
Micron	400	200	130	100	70	55	40	20



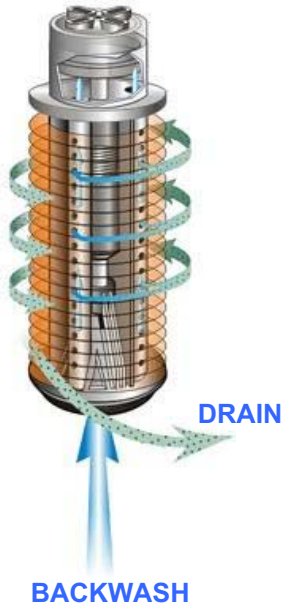
3.2 Spin Klin Technology – Spin Klin Spine Model II

Spin Klin Spine – The Core of the Spin Klin Filtration System

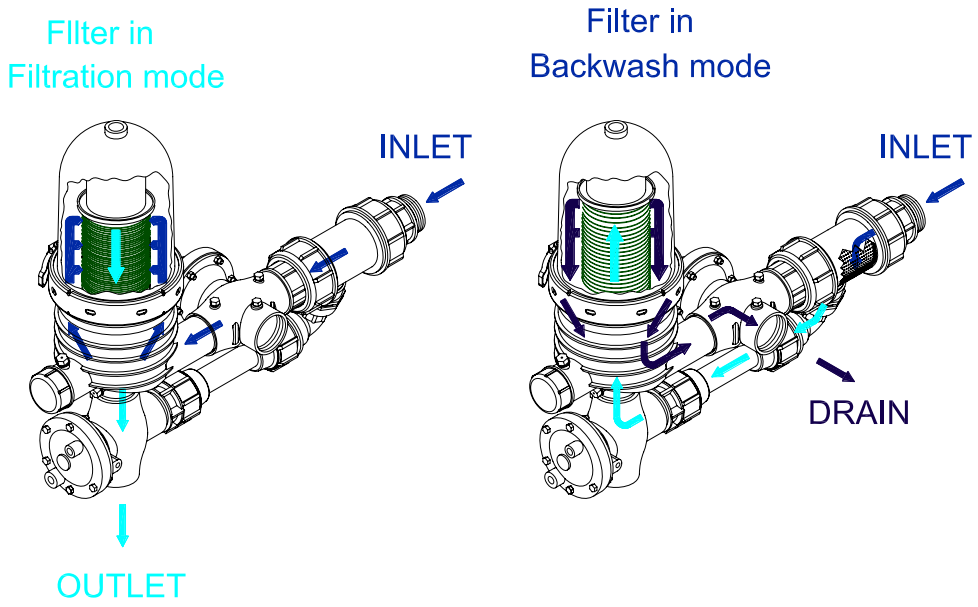
The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) each successive unit of the Spin Klin® system goes into the backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of filtered water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of Operation



The Filtration Process

Water flows through the inlet valve via the bypass filter pipe and into the 2” SPIN KLIN filter where it is filtered. The filtered water then flows through the outlet valve, for downstream use.

The Backwash Process

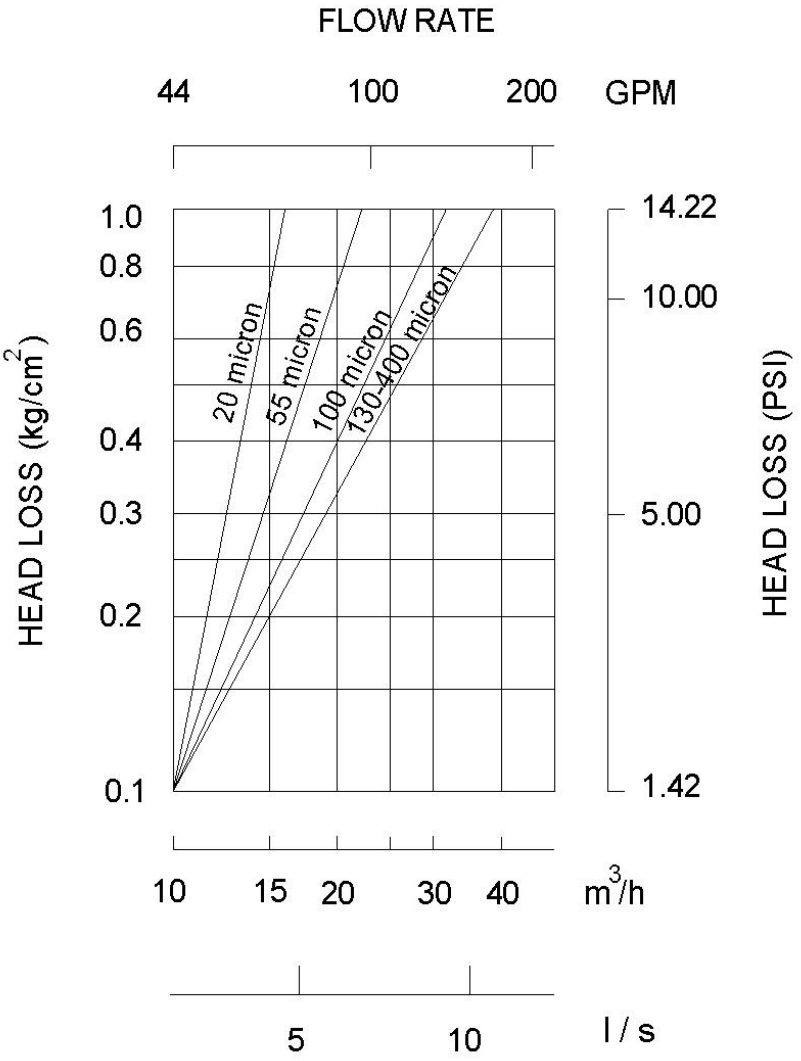
Command based on pressure differential or time settings is sent from the controller to (two) separate components in the filter:

1. Inlet valve Enters backwash mode (entrance closed, drain opens).
2. Outlet valve Enters backwash mode (downstream closed, filter bypass opens).
Water flows via the bypass filter screen, through the bypass into the outlet valve. It enters the main filter (which is open), where jets of water flush the grooves in the discs as the discs spin. The water carries away impurities toward the inlet valve. At the end of the backwashing process (20 seconds) the backwash command is withdrawn, the discs are compressed and the SPIN KLIN returns to the filtration mode. The inlet and outlet valves return to the filtration mode. Water flows once again into the filter, carrying with it the impurities that are collected on the bypass filter screen during backwash.

4. Technical Data

Parameters	METRIC	US
Maximum pressure	10 bar	145 psi
Maximum flow rate	20 M^3/h	88 gpm
Minimum flow rate	8 m^3/h	35 gpm
Minimum backwash pressure	2.8 bar	40.6 psi
Filtration surface area	880 cm^2	136.4 in^2
Filtration volume	1320 cm^3	80.5 in^3
Backwash water volume	33 liters	8.7 gal

5. Headloss Chart



6. Initial Installation & Operation Instructions

A. Installation

1. Remove from package, check contents.
2. Ensure correct orientation of INLET & OUTLET.
3. Connect the BACKWASH pipe to the Drain port.
4. Check that the filter cover is closed correctly.

B. Controller

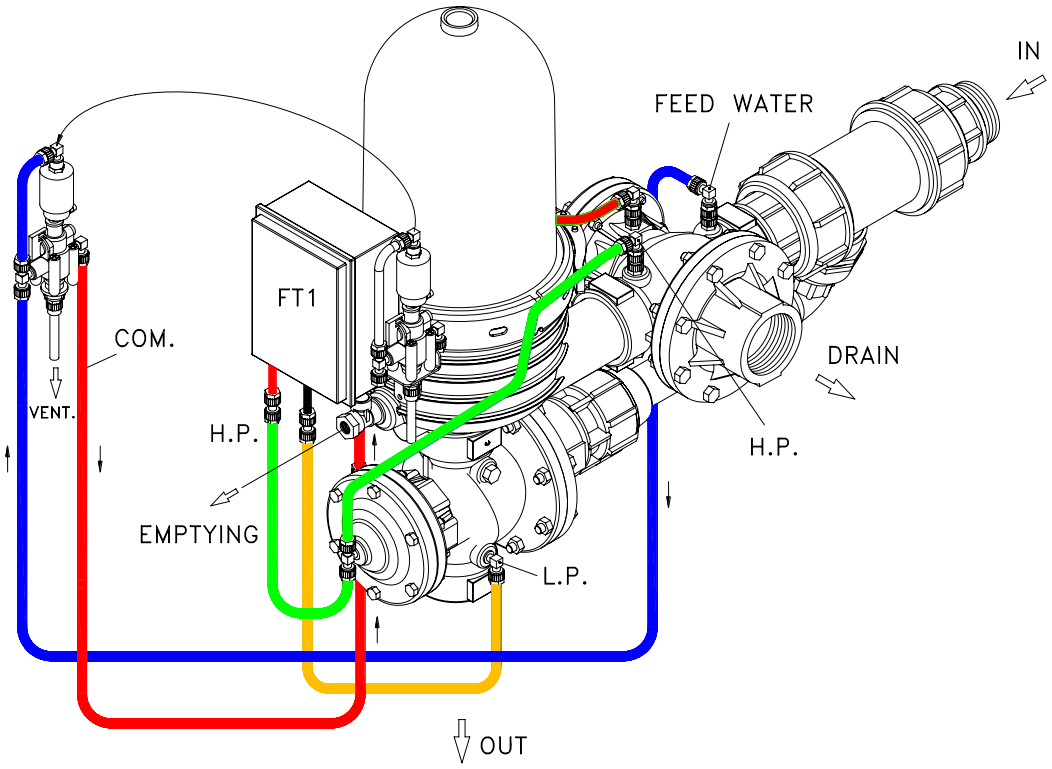
1. Refer to manufacturer's handbook before installing controller.
2. Check that the power is suitable for the solenoids & controller.
3. Make sure the solenoid manual switch is set to automatic.
4. Check that the pressure differential gauge is connected to the appropriate outlets – the high pressure & low pressure pipes (High pressure is to the center of differential pressure meter).
5. Set the starting point on the P.D. GAUGE to 5m (7 psi) above the filtration level.

C. Start Up Operation

1. Start backwash cycle. Check that the system is functioning correctly (to achieve maximum flushing effectiveness, use a minimum pressure of 2.8 bar (40.6 psi).
2. The bypass filter can be cleaned manually.

Initial Operation

1. Gradually open the inlet valve (make sure that the outlet valve, if installed, is open). **<u>WARNING</u> Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning**.
2. Check the filter assembly and its connections for leaks.
3. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as backwash starts.
4. Verify that the hydraulic backwash valve closes after 20 seconds.
5. Verify that the backpressure during backwash is at least 28m (40.6 psi).
6. When the filter is clean, verify that the differential pressure between inlet and outlet does not exceed 3 m (5 PSI).
7. Check that the differential pressure indicator is set to 5m (7 psi)
8. Perform an additional backwash cycle manually by rotating the operation handle (turn clockwise 90°) located on the solenoid valve



7. Maintenance & Periodical Checks

1.5V Battery Replacement

The 1.5V battery enables the electronic control unit's operation. The battery can last for 3000 flushing cycles, but should be replaced every six months. Use **ONLY ALKALINE** type battery.

1. Remove the front cover of the electronic control unit
2. Disconnect and remove the used batteries.
3. Connect new batteries according to the correct polarity.
4. Secure the electronic control unit-cover with the plastic cover.
   WARNING Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning.
5. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as flushing starts.
6. Verify that the hydraulic backwash valve closes after 20 seconds.
7. Perform an additional backwash cycle manually, by rotating the operation handle (turn clockwise 90°) located on the solenoid.

FILTRON FT1+DP 3W (DC)

- The “FILTRON FT1+DP 3W” is a backwashing controller for a single station automatic filter.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor).
- The unit activates 3 wired 12v DC latching solenoid.
- For convenience, the controller can be powered either by 6v DC or 12v DC.
- The system will detect problems of endless looping if after 7 consecutive cycles; the DP sensor keeps demanding the start of a new cycle.

Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing duration is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			**FLUSHING DURATION**		
1 – ON 0 - OFF	**S1** **1 2 3 4**	**meaning**	1 – ON 0 - OFF	**S2** **1 2 3 4**	**meaning**
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	8 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	10 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	12 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	16 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	20 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	25 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	30 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	45 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	1 min.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	3 min.
14	1 0 1 1	24 hours	14	1 0 1 1	4 min.
15	0 1 1 1	72 hours	15	0 1 1 1	5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	6 min.

Installing the DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table. As long as the pressure difference is lower than the set point there is no flushing request signal generated, but when the pressure difference is higher, it will trigger a flushing cycle within 5 seconds.

Position No.	S3 (1-ON ; 0-OFF)	Set-point	
	1 2 3 4	Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.136	2
02	0 1 0 0	0.272	4
03	1 1 0 0	0.408	6
04	0 0 1 0	0.545	8
05	1 0 1 0	0.680	10
06	0 1 1 0	0.816	12
07	1 1 1 0	0.953	14
08	0 0 0 1	1.089	16
09	1 0 0 1	1.225	18
10	0 1 0 1	1.361	20
11	1 1 0 1	1.497	22
12	0 0 1 1	1.634	24
13	1 0 1 1	1.770	26
14	0 1 1 1	1.906	28
15	1 1 1 1	2.042	30

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP7 – For selection of the powering mode 6v or 12v.

JP8 – Enables or disables detection of "endless looping" problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 – Immediate or delayed reaction to the DP signal. When the upper pin of the jumper is free, then the reaction to the flushing request signal of the

DP will trigger the next cycle after 5 seconds, otherwise it will be immediate.

Summary of the beeping sound indications

1 beep every 15 sec- normal operation

2 beeps every 15 sec- endless looping problem detected

3 beeps every 15 sec- low battery

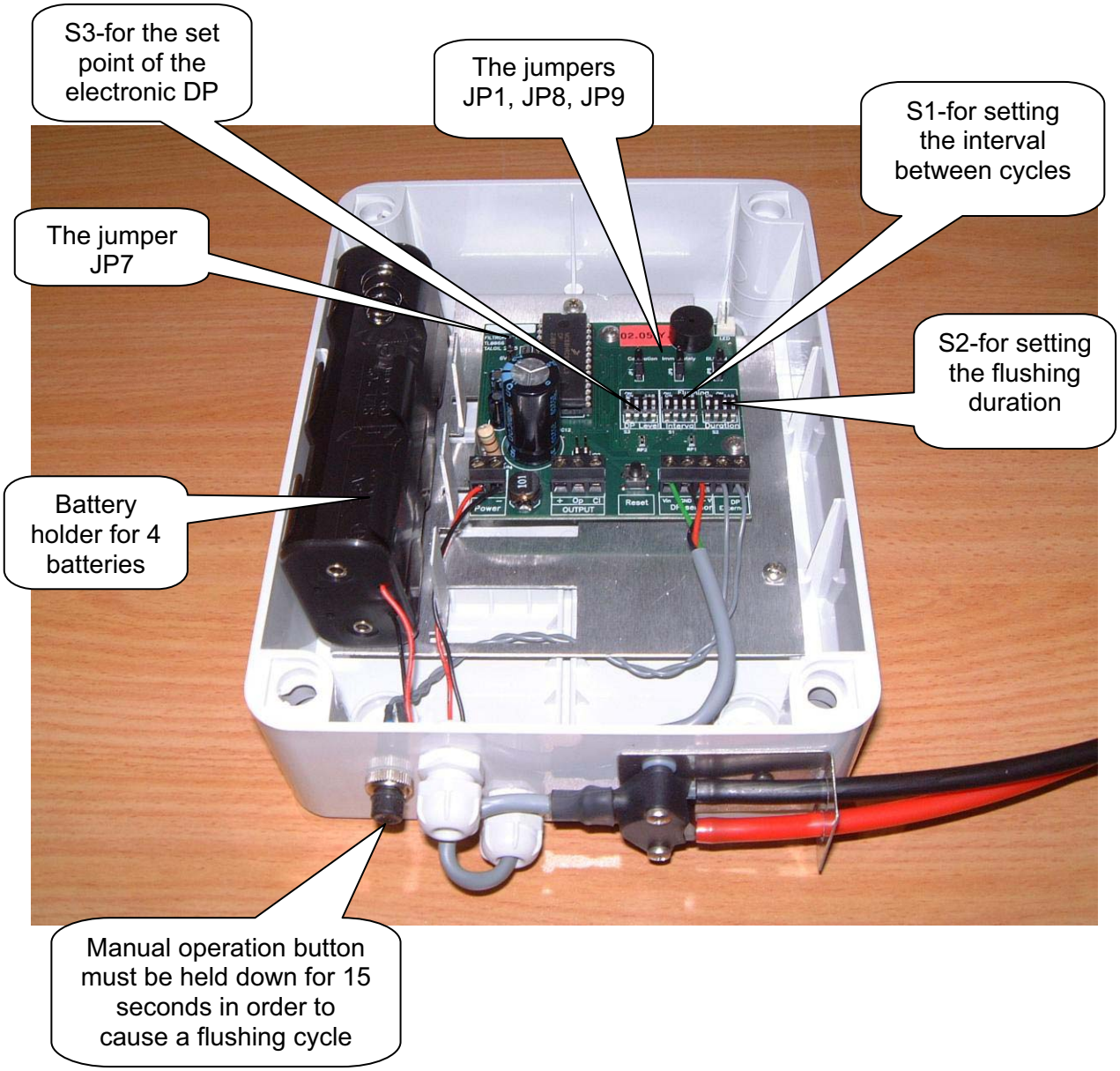
6 beeps on power up or after RESET – indicates being in calibration mode.

Calibration

Calibration is required whenever the DP sensor is replaced. Prior to entering calibration mode the pressure difference sensed by the sensor must be zero, if necessary, disconnect the red and black command tubes from the system. Change the position of JP1 so that the right side pin remains free and push the RESET button. The 6 beeps will indicate the execution of the calibration process. Change the position of JP1 back to its normal position with the left side pin free, return the command tubes and push the RESET button again.

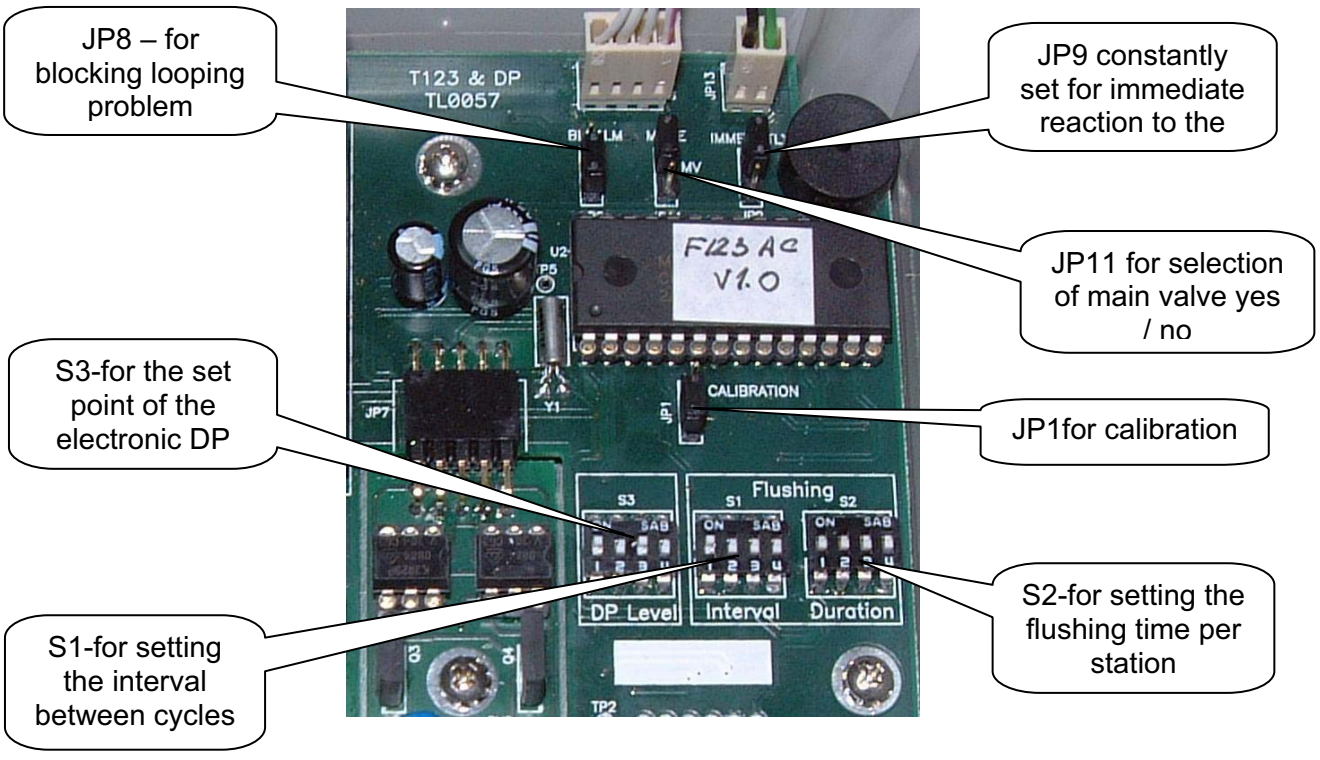
How to handle endless looping problems

The system will detect an "endless looping problem" after 7 consecutive flushing cycles. The problem can be recognized by the double beep sounded every 15 sec, and it means that the flushing request signal keeps arriving from the active DP sensor. In this case the system stops referring to the sensor and continues flushing based on the defined interval between cycles. The cause of the problem must first be detected and removed, and then push the RESET button to signal the controller that the problem was solved.


S3-for the set point of the electronic DP
The jumpers JP1, JP8, JP9
S1-for setting the interval between cycles
The jumper JP7
S2-for setting the flushing duration
Battery holder for 4 batteries
Manual operation button must be held down for 15 seconds in order to cause a flushing cycle

FILTRON 1/2/3+DP (AC)

- The “FILTRON 1/2/3+DP” is a controller for backwashing automatic filters of one, two or three stations.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor). Optionally a regular electromechanical DP can be used.
- The unit is equipped with a RESET button that when pushed generates a RESET signal and triggers a flushing cycle.
- The unit is equipped with two LED indicators, the green one indicates that the unit is energized and the red one indicates the operation statuses.
- Optionally a main valve can be controlled in place of the last station.
- Activates solenoids of 24v AC.
- Can be powered either by 110v AC or 220v AC.
- When working by DP, the system will detect problems of endless looping if after 7 consecutive cycles, the start of a new cycle is still requested by the DP sensor.



Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing time per station is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			FLUSHING TIME PER STATION		
1 – ON 0 - OFF	**S1** **1 2 3 4**	**meaning**	1 – ON 0 - OFF	**S2** **1 2 3 4**	**meaning**
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	6 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	7 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	8 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	9 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	10 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	11 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	12 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	13 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	15 sec.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	2.5 min.
14	1 0 1 1	24 hours	14	1 0 1 1	3 min.
15	0 1 1 1	72 hours	15	0 1 1 1	3.5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	4 min.

Installing the electronic DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table.

Position No.	S3 (1-ON ; 0-OFF) 1 2 3 4	Set-point	
		Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

How does an automatic backflush cycle occur ?

An automatic backflush cycle results of pressure difference between the inlet and outlet of the filter. When the pressure difference exceeds the set point for more than 15 seconds, a flushing request signal is generated. When using the electronic DP the actual reading is compared with the value selected by S3. When using an external DP the indication of excess pressure arrives in form of a closed contact at the "External DP" terminals.

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP8 – Enables or disables detection of “endless looping” problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 -The jumper is constantly set for immediate reaction to the DP flushing request signal. The lower pin is free.

JP11 - Defines whether or not a main valve has to be controlled by the system. When the upper pin of the jumper is free, no main valve is defined.

Summary of the beeping sound indications

1 beep every 15 sec - normal operation

2 beeps every 15 sec - endless looping problem detected

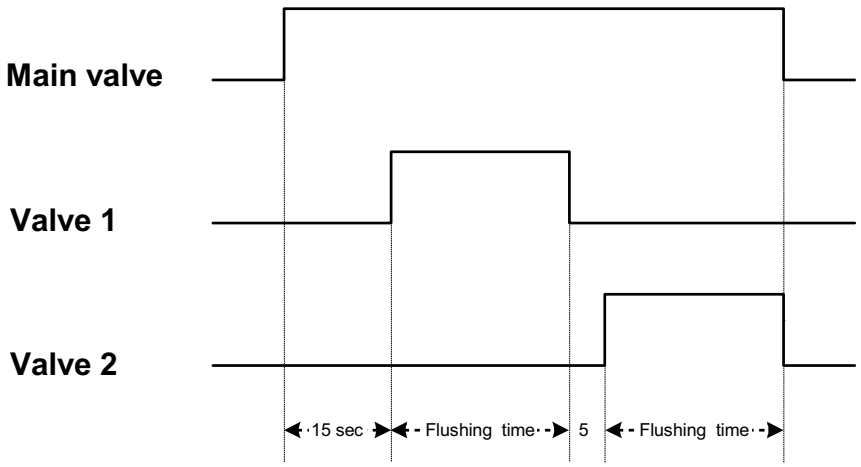
6 beeps on power up - indicates being in calibration mode. Usually this should not happen but when it does, it means that the position of JP1 has been set to calibration mode (lower pin free) the process must be completed as follows: make sure that the pressure difference sensed by the electronic DP is zero (if necessary, disconnect the red and black command tubes), and push the RESET button. Change the position of JP1 back to its normal position and push the RESET button again.

Endless looping problems

The problem of endless looping will be declared if after 7 consecutive flushing cycles the request signal for another cycle is still there. A consecutive flushing cycle happens when after termination of a previous flushing cycle (triggered by the DP) the flushing request signal still exists. However, if the flushing signal was removed, but for less than the stabilization time (T0=30 seconds) and then returned, another cycle will be triggered, which will be considered a consecutive cycle. If the stabilization time was completed without appearance of the DP signal, the counter of the consecutive cycles is cleared.

The problem is indicated by 2 beeps of the buzzer every 15 sec and by fast flushing of the red LED. When detecting “endless looping problem", the unit stops referring to the DP sensor and continues flushing by the defined interval only. The cause of the problem must first be detected and removed, and then the RESET button has to be pushed to signal the controller that the problem was solved.

Timing Diagram



THE RED LED BEHAVIOR	THE MEANING
Constantly ON	Waiting between cycles
Blinking once in a second	Flushing in progress
Blinking fast	DP problem, waiting between cycles
3 blinks per second	DP problem, flushing by time in progress
Double blink	While changing positions of the switches
LED is OFF	Problem with the controller

Bypass Filter Maintenance

Instructions

1. Close the inlet water valve and release the pressure.
2. Use a wrench to release tightening nuts.
3. Unscrew the nut completely.
4. Twist the bypass filter.
5. Remove the internal screen element.
6. Rinse the screen element properly.
7. Reassemble in reverse order of above steps (5 thru 2).
8. Open the 2” inlet valve.

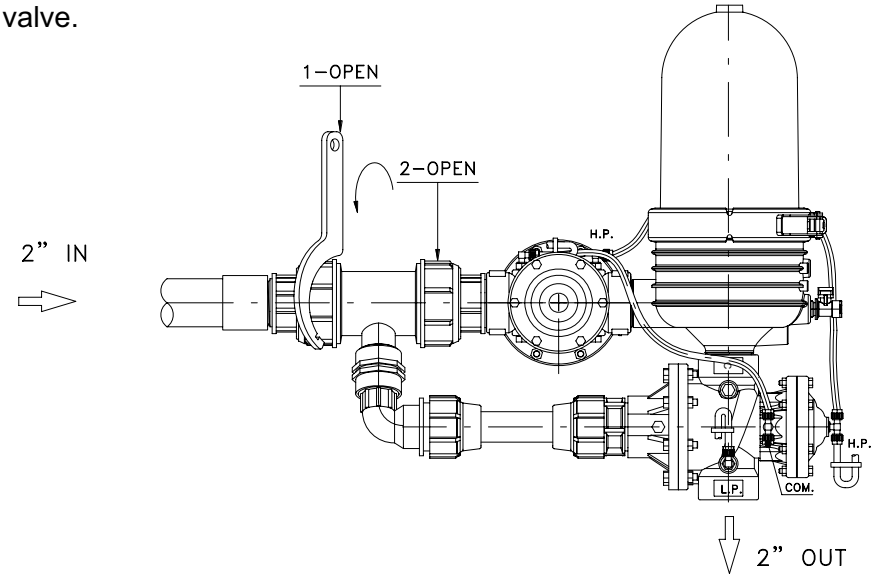
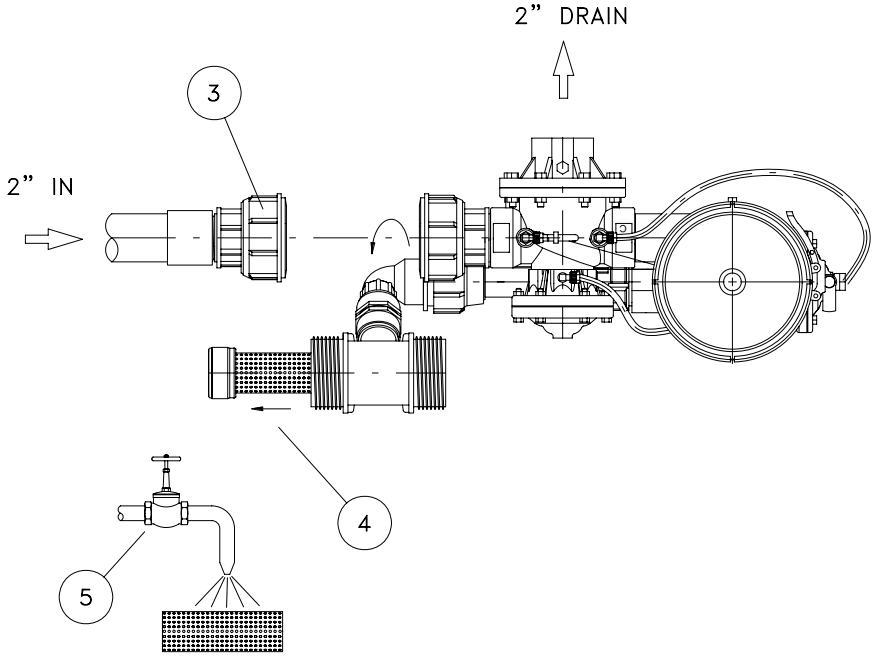


Figure 4: Bypass



Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures

If the pressure differential is above 5 m / 7 PSI activate the backwash of the Spin Klin filtration system.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold

If there is a leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance

Check that the controller timing parameters are correctly set and activate the backwash cycle. In the event of possible failure of the backwash controller, please refer to chapter 8, troubleshooting

Winterization

In order to prevent the filter battery from becoming damaged under freezing conditions - drain all the water from the filter battery and leave the drain valve open.

Seasonal Maintenance - Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

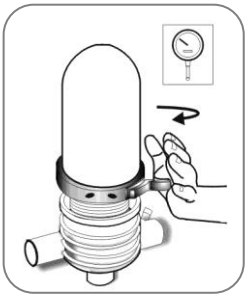


Figure 1

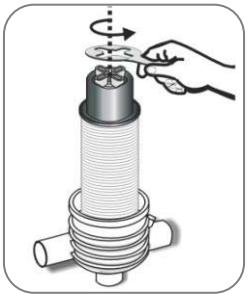


Figure 2

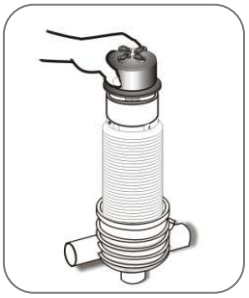


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each disc set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

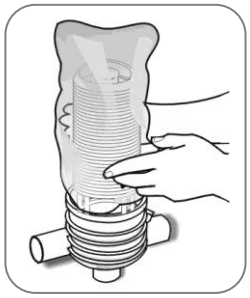


Figure 4

Figure 5

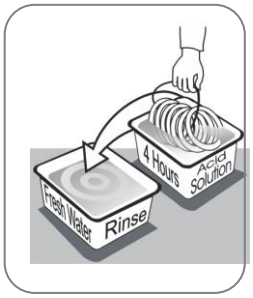


Figure 6

Check that the correct quantity of discs is assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Replace on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

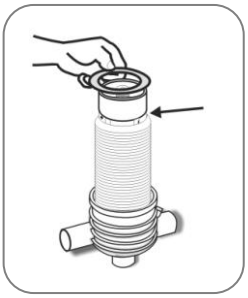


Figure 7

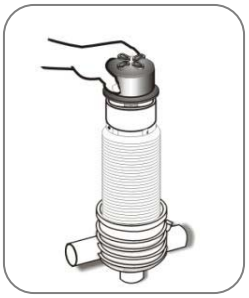


Figure 8

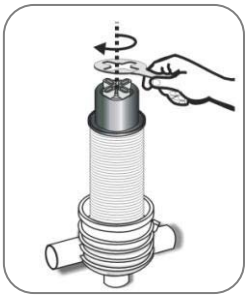


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

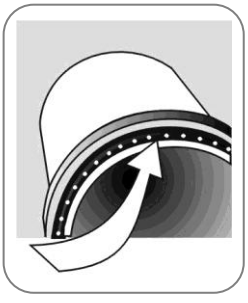


Figure 10

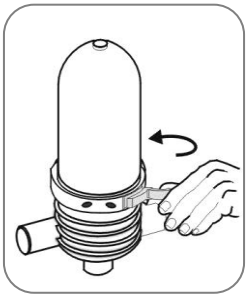


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

Warning!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing.
- Work in a well-ventilated area.
- Follow the manufacturer’s instructions.

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Warning – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of (10%) Sodium Hypochlorite into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours.
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of (30%) Hydrochloric Acid into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

Cleaning Complex Deposits

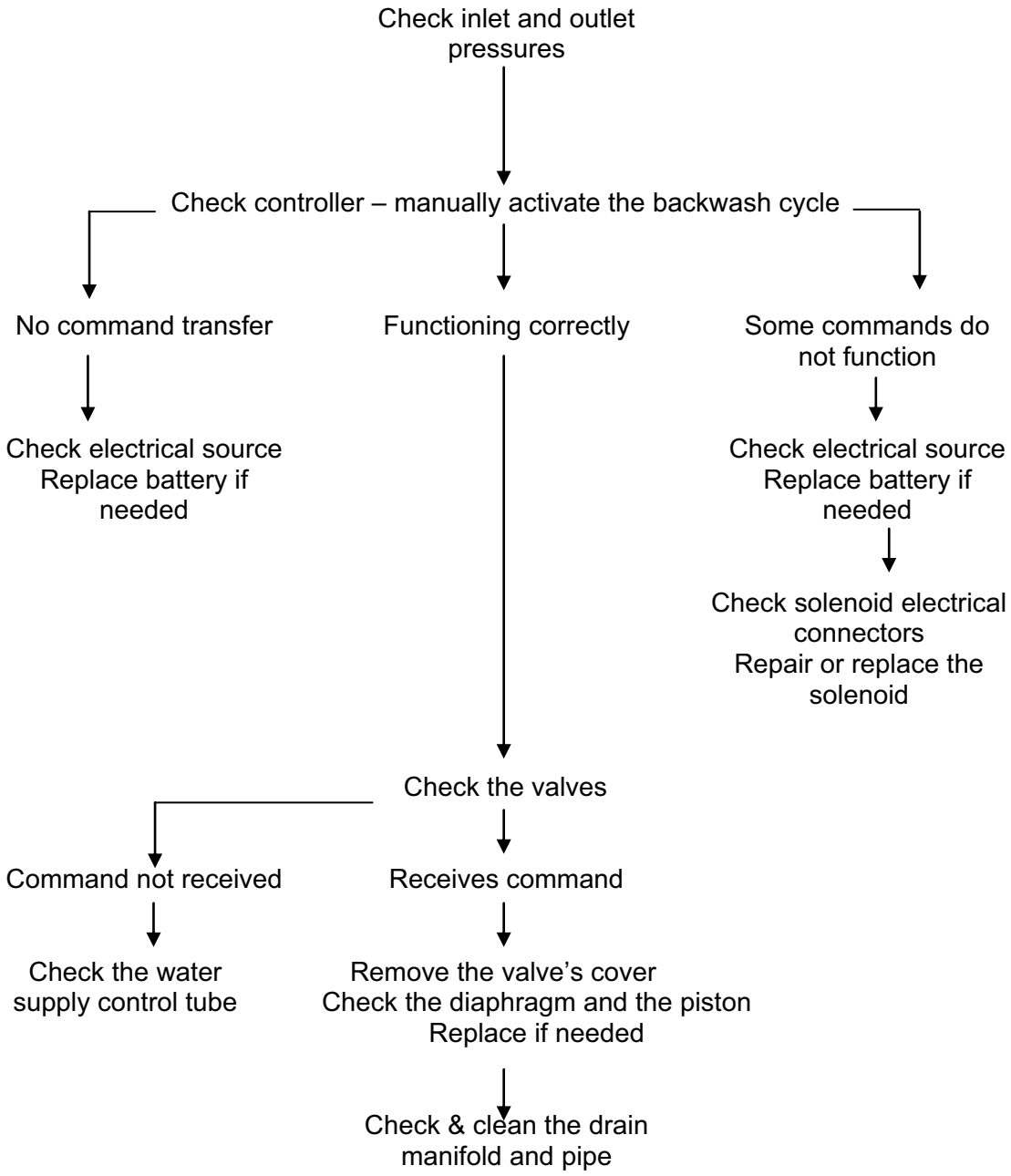
If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of (10% NaOCl) Sodium Hypochlorite.
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  If the deposits haven't been completely removed, send a set of untreated discs to the laboratory for further examination.

8. Troubleshooting

Identifying Malfunctions in the 2" Spin Klin System

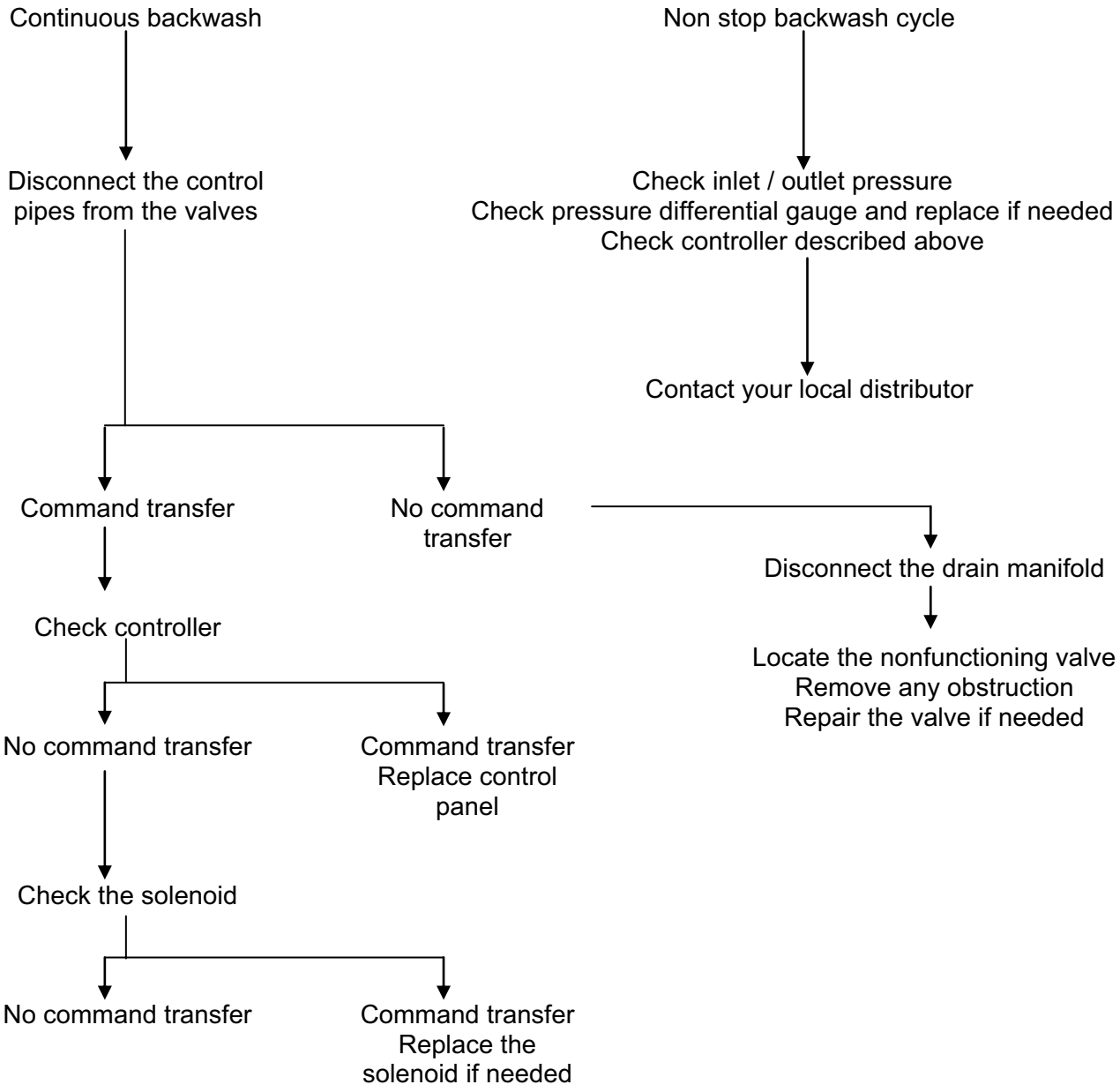
No Backwash Operation



Contact your local distributor

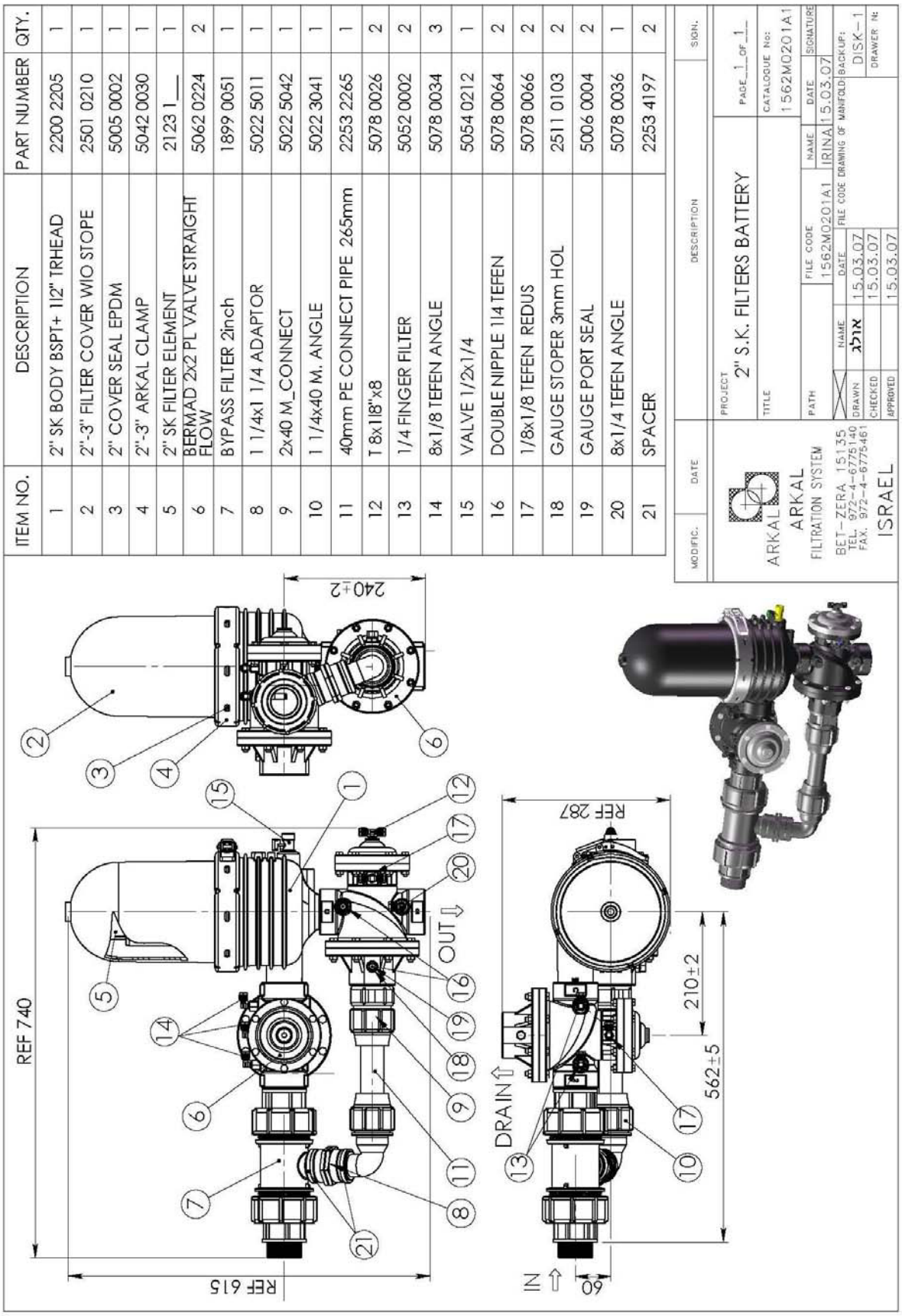
Identifying Malfunctions in the 2” Spin Klin System

Continuous or Non-stop Backwashing



Contact your local distributor

9. Spare Parts



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	2" SK BODY BSPT+ 1|2" TRHEAD	2200 2205	1
2	2"-3" FILTER COVER WIO STOPE	2501 0210	1
3	2" COVER SEAL EPDM	5005 0002	1
4	2"-3" ARKAL CLAMP	5042 0030	1
5	2" SK FILTER ELEMENT	2123 1___	1
6	BERMAD 2X2 PL VALVE STRAIGHT FLOW	5062 0224	2
7	BYPASS FILTER 2inch	1899 0051	1
8	1 1/4x1 1/4 ADAPTOR	5022 5011	1
9	2x40 M_CONNECT	5022 5042	1
10	1 1/4x40 M. ANGLE	5022 3041	1
11	40mm PE CONNECT PIPE 265mm	2253 2265	1
12	T 8x1|8"x8	5078 0026	2
13	1/4 FINGER FILTER	5052 0002	2
14	8x1/8 TEFEN ANGLE	5078 0034	3
15	VALVE 1/2x1/4	5054 0212	1
16	DOUBLE NIPPLE 1|4 TEFEN	5078 0064	2
17	1/8x1/8 TEFEN REDUS	5078 0066	2
18	GAUGE STOPER 3mm HOL	2511 0103	2
19	GAUGE PORT SEAL	5006 0004	2
20	8x1/4 TEFEN ANGLE	5078 0036	1
21	SPACER	2253 4197	2

MODIFIC. | DATE | DESCRIPTION | SIGN.

ARKAL FILTRATION SYSTEM

BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2" S.K. FILTERS BATTERY
TITLE:
PATH:
FILE CODE: 1562M0201A1
FILE CODE DRAWING OF MANIFOLD

	NAME	DATE
DRAWN	אורלי	15.03.07
CHECKED		15.03.07
APPROVED		15.03.07

PAGE 1 OF 1
CATALOGUE No: 1562M0201A1
NAME: IRINA | DATE: 15.03.07 | SIGNATURE
BACKUP: DISK-1
DRAWER №:

ARKAL 2" S.K. FILTER

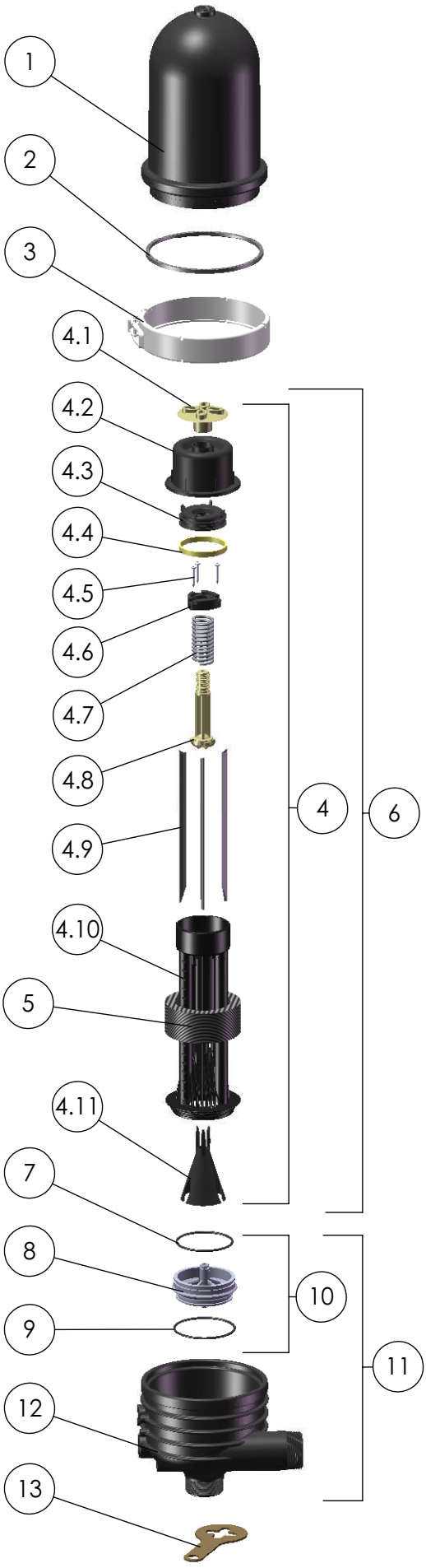
Cat. no.: 1225 0___ THREADED CONNECTION

PARTS LIST

No:	DESCRIPTION	Cat. No.:	MATERIAL
1	FILTER COVER TRASPARENT COVER	2501 0220 2501 9220	R.P.A. P.C.
2	HYDRAULIC SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	S.K. MODEL 2.7 SPINE	2199 1002	
4.1	S.K. BUTTRFLY NUT	2506 0224	R.P.A.
4.2	S.K. TIGHTENING CYLINDER	2506 0226	R.P.A.
4.3	S.K. SPINE PISTON	2530 0216	R.P.A.
4.4	SLIDING WASHER	2253 1225	P.E.
4.5	FASTENING BOLTS 10*11/4	5040 1009	S.S.
4.6	S.K. SPINE CLAMPING DISC	2507 0206	R.P.A.
4.7	SPRING	5044 0028	S.S.
4.8	S.K. SPINE SCREW	2530 0213	R.P.A.
4.9	ANTI FRICTION ELEMENT	5076 0009	S.S.
4.10	S.K. SPINE BODY MOD. 2.7	2502 0227	R.P.A.
4.11	CONE MEMBRANE	5006 0008	N.R.
5	DISCS SET	2022 1___	P.P.
6	FILTER ELEMENT	2123 ___	
7	"O" RING 2*234	5003 2234	EPDM
8	SPINE ADAPTER	2503 0324	R.P.P.
9	"O" RING 2*237	5003 2237	EPDM
10	COMPLETE ADAPTER	2234 0324	
11	BODY COMPLEX	2224 0252	
12	2" S.K. BODY THREADED OUT	2500 0252	R.P.A.
13	"BUTTERFLY" NUT WRENCH	5076 0028	G.S.

MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) G.S. - GALVANIZED STEEL
4) S.S. - STAINLESS STEEL
5) N.R. - NATURALE RUBBER



Limited Warranty

ARKAL FILTRATION SYSTEMS ("ARKAL FILTRATION SYSTEMS") warrants to the original end user ("CUSTOMER") who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

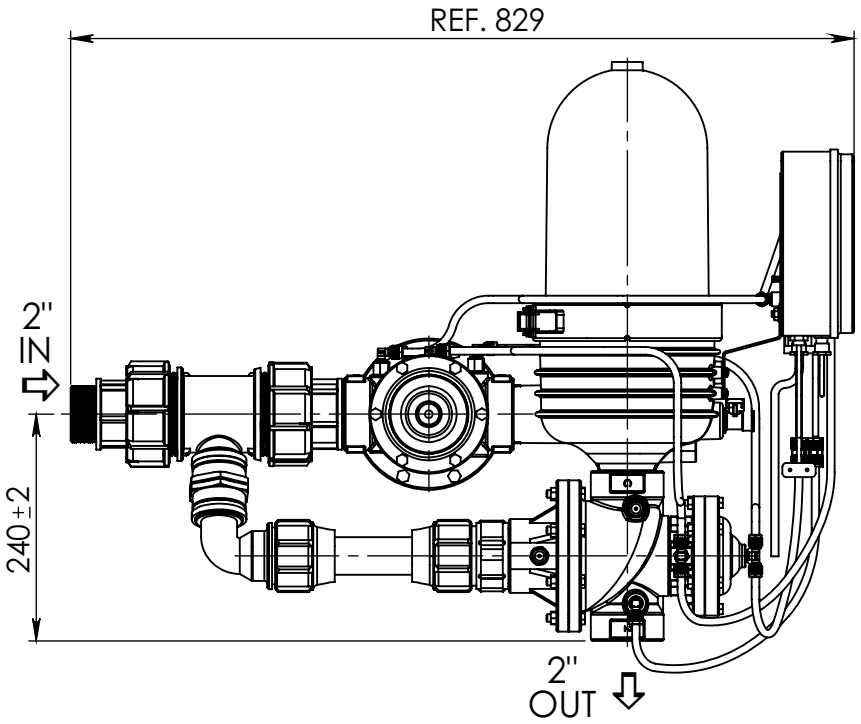
No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

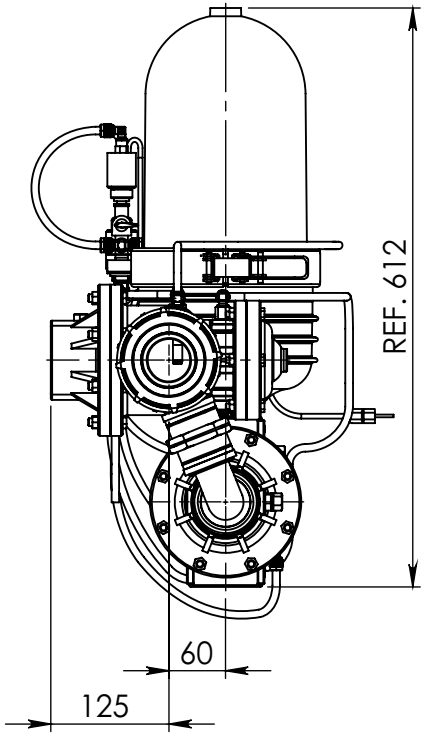
THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

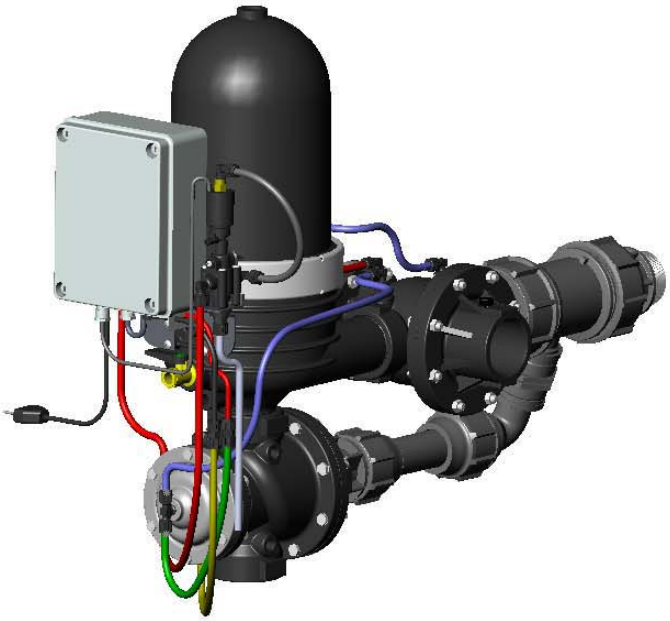
Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

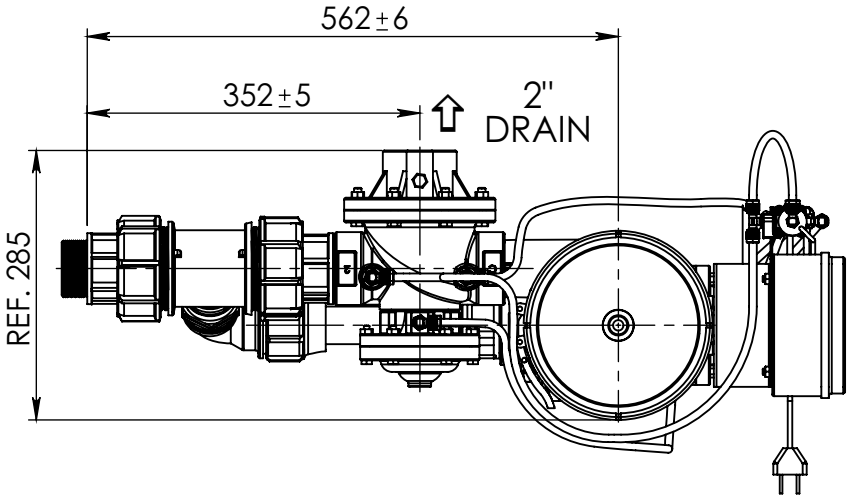
Drawings

Spin Klin 2" Compact









MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
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FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2" S.K. COMPACT WITH CONTROL SYSTEM — PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1562M0201C1___

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
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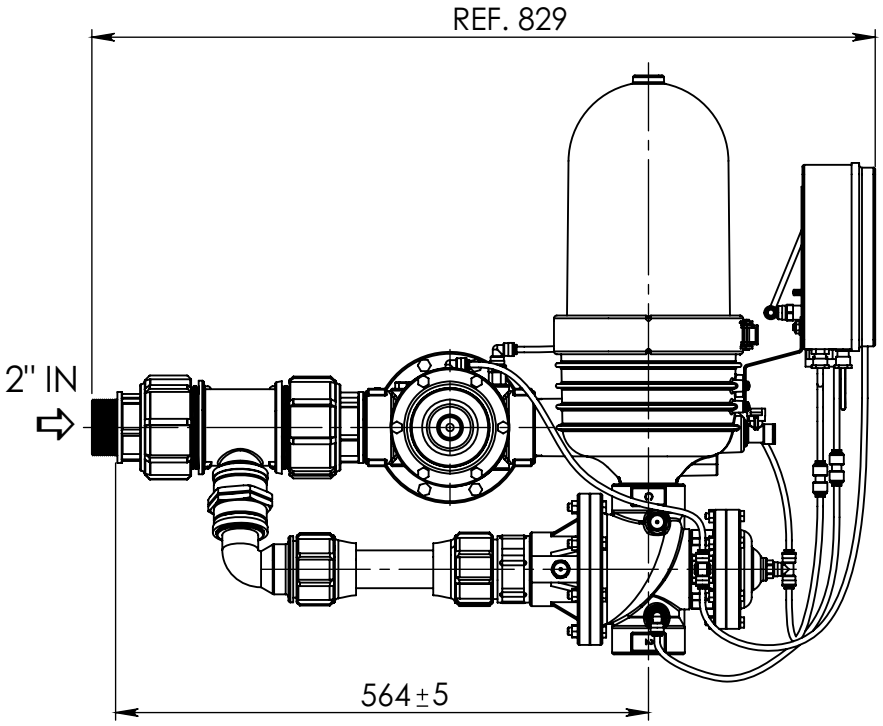
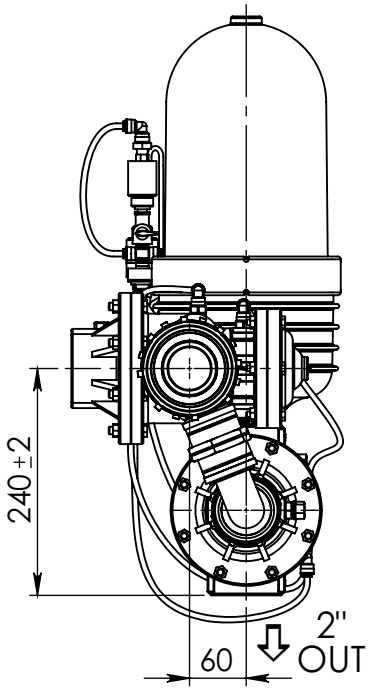
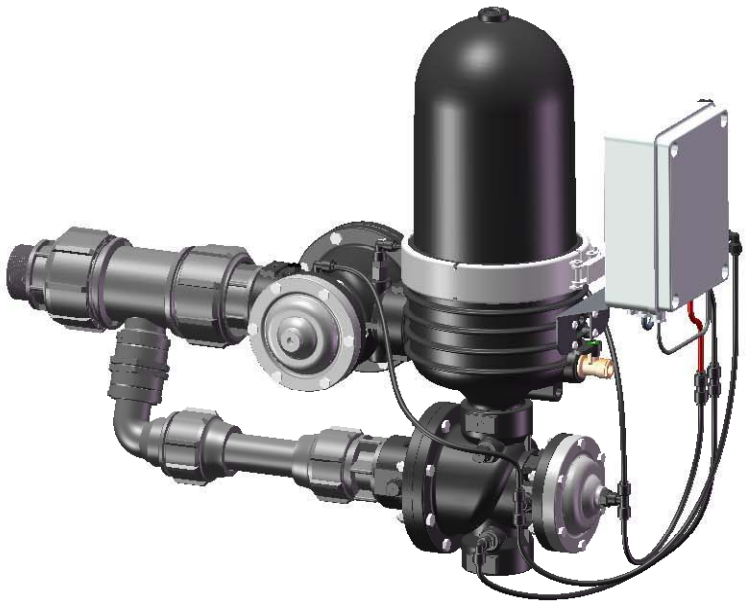
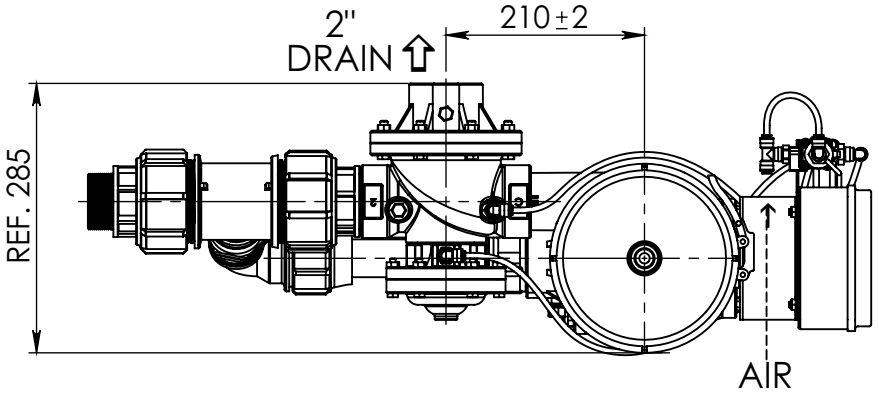
CHECKED	OMRY	18/09/2007		DRAWER N:
APPROVED	OMRY	18/09/2007		









MODIFIC.	DATE	DESCRIPTION	SING

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FILTRATION SYSTEM
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PROJECT: 2" S.K. COMPACT WITH FT-DC-DP-1 CONTROL SYSTEM				PAGE 1 OF 1
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1562M0201B2
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	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	OLEG	15.10.08	PALLET-XXX (5200 XXXX)	DISK-2S
CHECKED	OMRY	15.10.08	TRIWALL-XXX (5201 XXXX)	
APPROVED	OMRY	15.10.08	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	15.10.08		

PATH- \\Arkal-fs\drawings\MASTERS – SOLID\FILTERS COMPLETE\2 INCH FILTERS\COMPACT\

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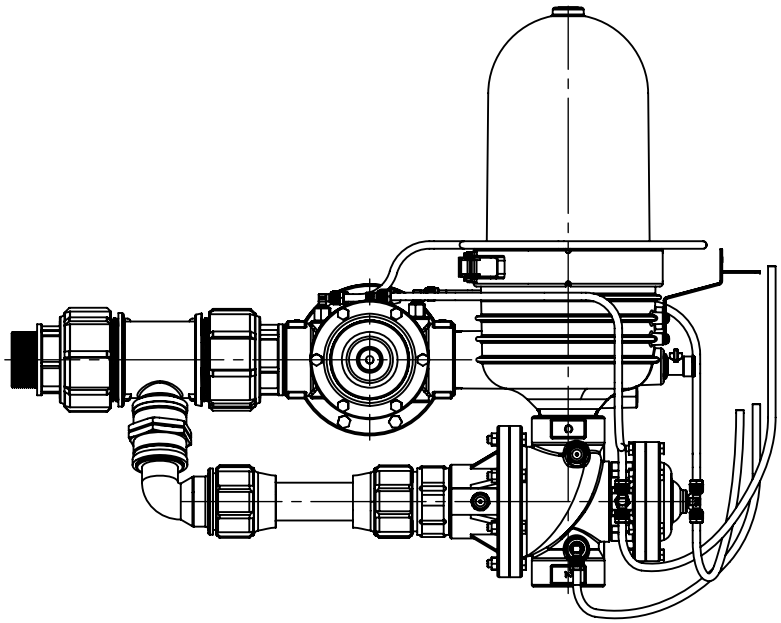

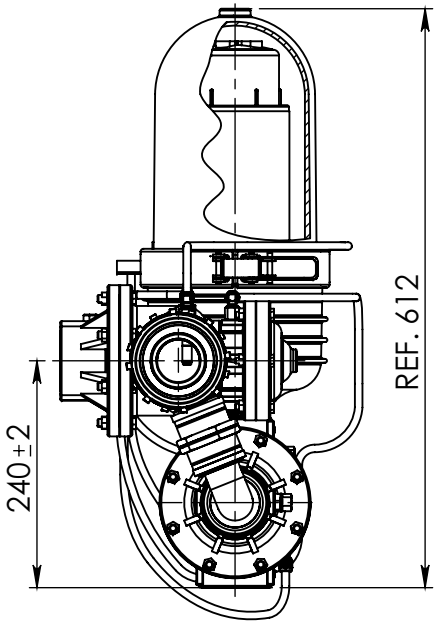

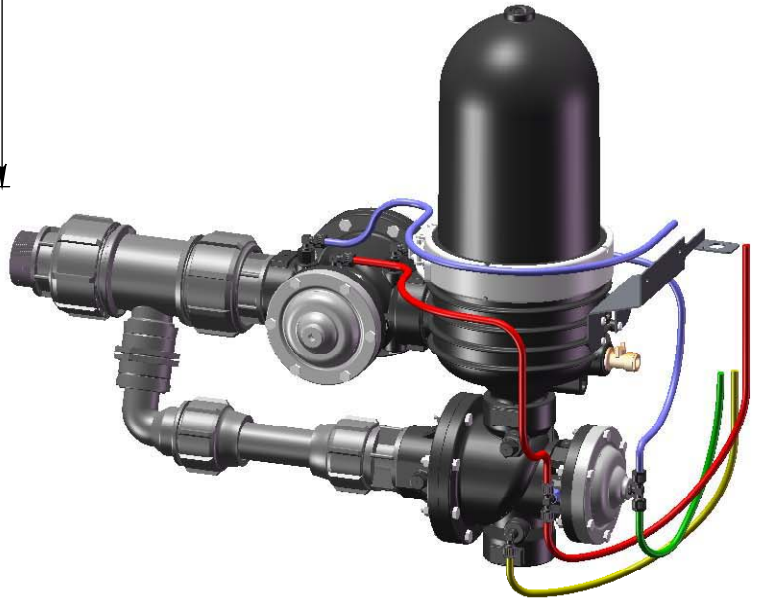

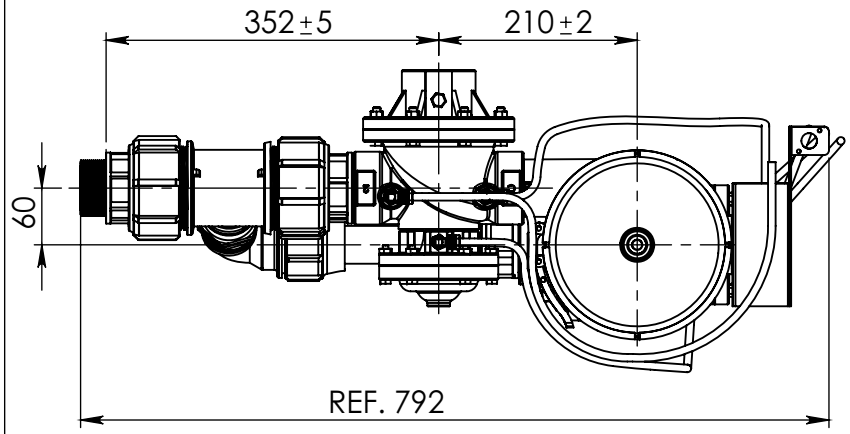

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: 2" S.K. COMPACT — PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1562M0201A1P

PATH	FILE CODE	NAME	DATE	SIGNATURE
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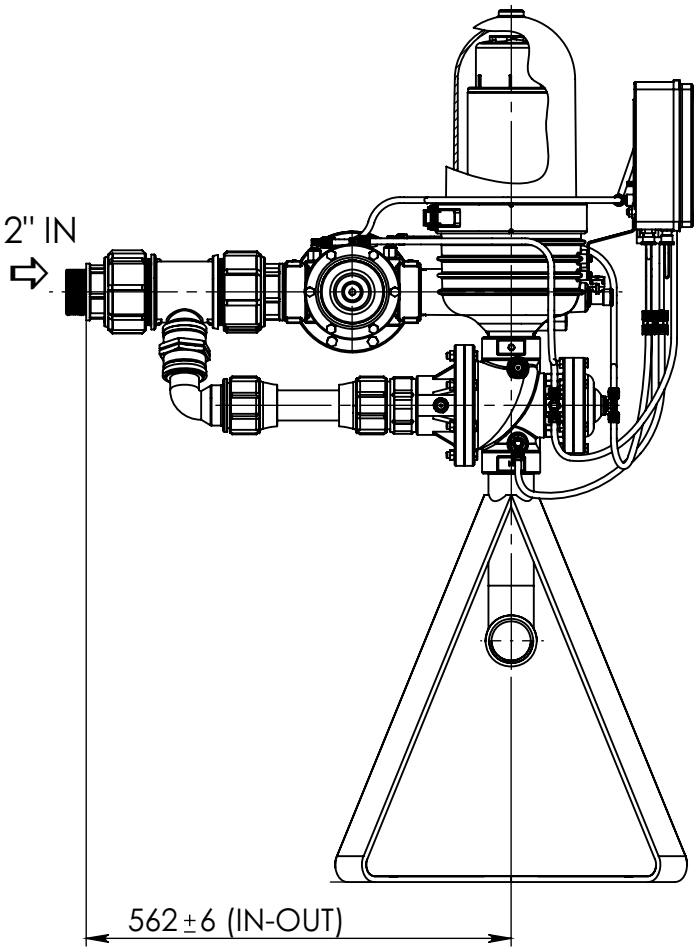
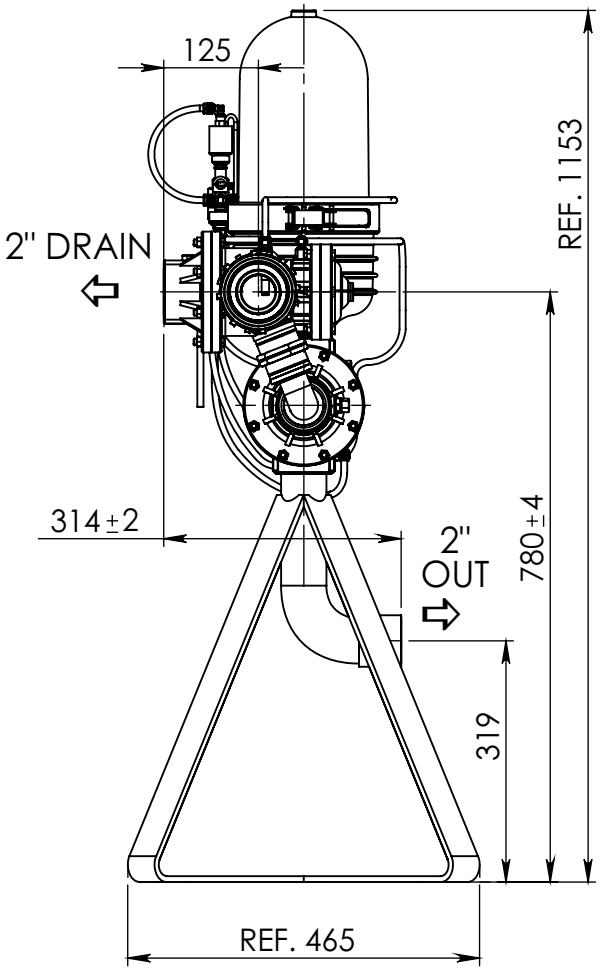
	NAME	DATE
DRAWN	OLEG	16/10/2008
CHECKED	OMRY	16/10/2008
APPROVED	OMRY	16/10/2008

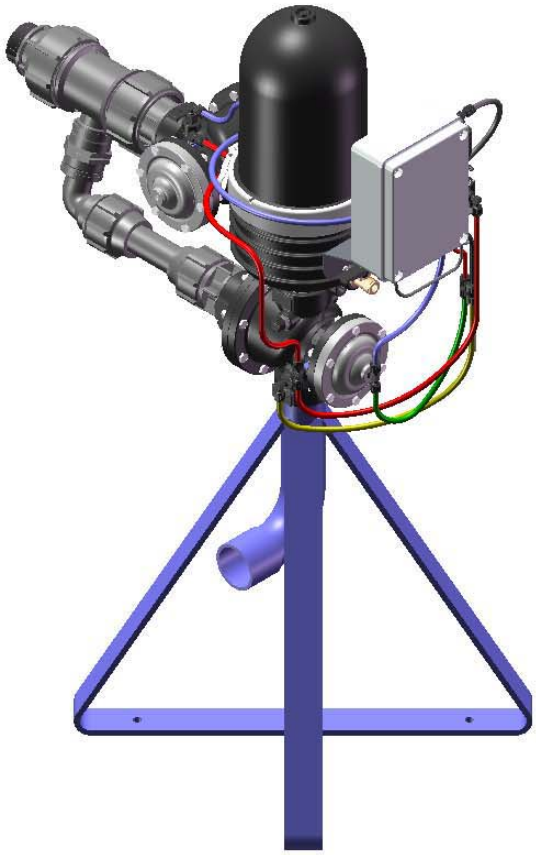
FILE CODE DRAWING OF MANIFOLD:

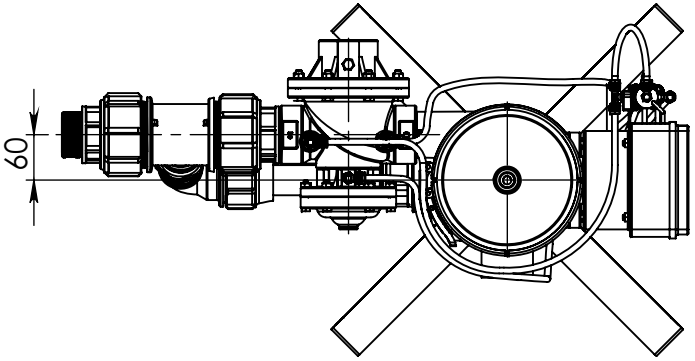
BACKUP: DISK–2S

DRAWER N:









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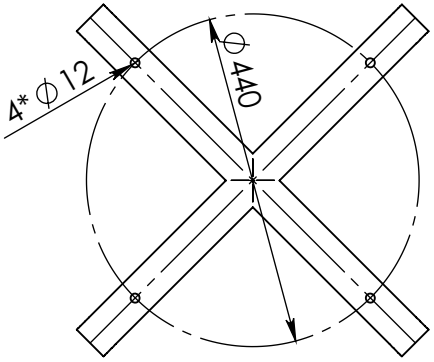

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
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FAX. 972–4–6775461
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PROJECT: 2" S.K. COMPACT

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1562M0201B1 5999 230042BL

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	OLEG	04/02/2008
CHECKED	OMRY	04/02/2008
APPROVED		04/02/2008

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N:

NEW ARKAL

2" Compact Spin Klin L.C.E

Low Cost Energy

Automatic Disc Filter
Filter that can flush at 1.5 bar (22 psi)

Product Advantages:

- Proven depth filtration technology
- Will flush at low pressure (1.5 bar - 22 psi)
- Flushing at low pressure uses less energy and will save money
- Will increase profitability

Applications:

- Surface water with algae and organic debris
- Well water
- For low pressure systems where higher pressures are not available or are too costly

Technical Data:

Max. operating pressure	6 bar	87 psi
Min. operating pressure	1 bar	14 psi
Min. backwash pressure (downstream backwash pressure)	1.5 bar	22 psi
Backwash flow rate per unit	10 m^3/h	44 gpm
Max. temperature	60° C	140° F
pH	4-11	4-11

Max. flow rate 400-130 µ	15m^3/h	66gpm
Max. flow rate 100 µ	12m^3/h	53gpm
Filtration surface area	880cm^2	136.4$inch^2$
Filtration volume	1148cm^3	70$inch^3$

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

2"compactSK LCE 9603 0007EN 03/10

L.C.E.

2” Spin Klin Compact - Stand Alone Filter
Automatic Backwash Filtration Systems
Operation, Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 2” Spin Klin Compact Filter. All Arkal Filtration Systems are easy to install, use and service and do not require special skills to operate them.

For proper operation and maintenance of the filtration system please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, please read the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service and / or maintenance.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water contact with the electronic control unit.
4. Confirm that filter weight, when full, does not exceed support construction limitations.
6. Prior to installation confirm that line pressure match's filter’s operational pressure.
7. Please note, that during normal operation the filter enters into backwash mode automatically, without prior warning.
8. Use only original parts when servicing the filter.
9. Arkal cannot accept responsibility for any changes or modifications to the equipment.

Special Note

Before opening the filter clamp, make sure that there is no system pressure in the filter.

3. Description and Operation

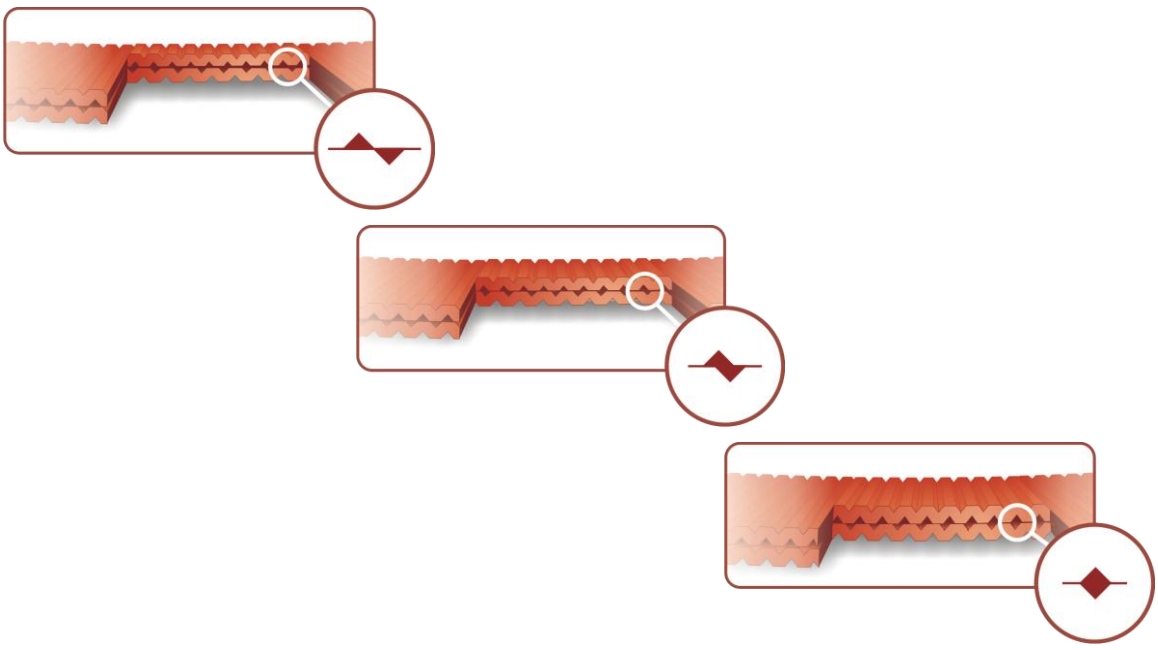
3.1 Disc Filtration Technology

Arkal Filtration Systems uses a specially designed disc filtration technology. Thin, color-coded polypropylene discs are diagonally grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of ridges and valleys, which trap the solids. The stack is enclosed in a corrosion proof and pressure resistant housing.

During the filtration process, the filtration discs are tightly compressed together by the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolates from the outer diameter to the inner diameter of the element. Depending on the micron rating, there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration.

Table of Disc Filtration Grades and Color Code

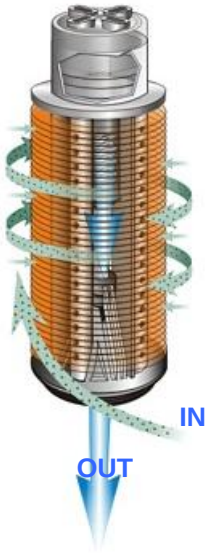
Disc Color	Blue	Yellow	Red	Black
Mesh	40	80	120	140
Micron	400	200	130	100



3.2 Spin Klin Technology – Spin Klin Spine

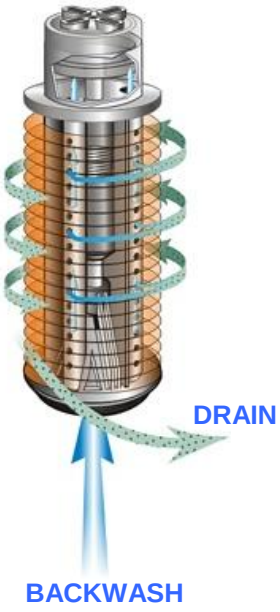
Spin Klin Spine – The Core of the Spin Klin Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

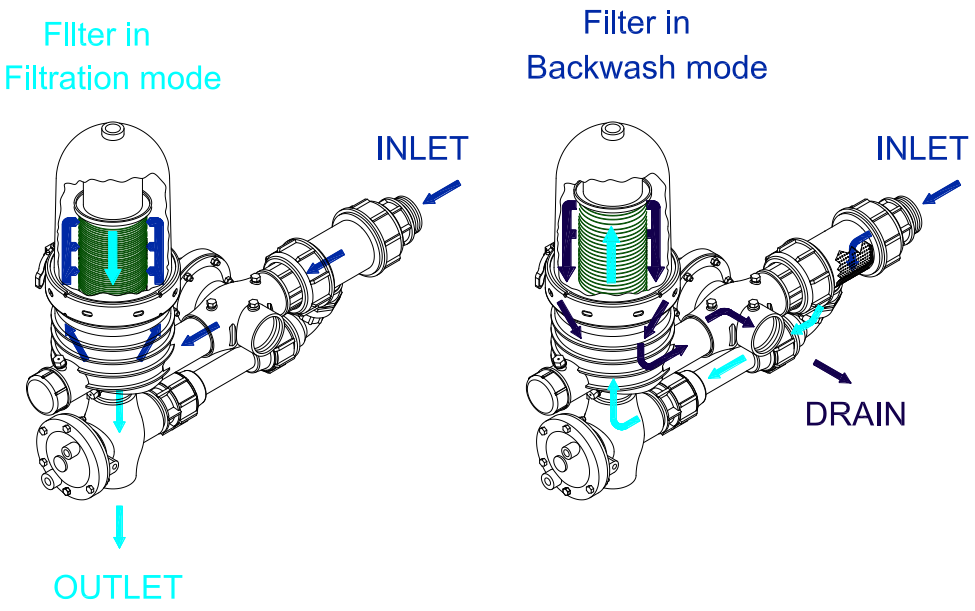


Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) each successive unit of the Spin Klin® system goes into the backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of filtered water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of Operation



The Filtration Process

Water flows through the inlet valve via the bypass filter pipe and into the 2” SPIN KLIN filter where it is filtered. The filtered water then flows through the outlet valve, for downstream use.

The Backwash Process

Command based on pressure differential or time settings is sent from the controller to (two) separate components in the filter:

1. Inlet valve Enters backwash mode (entrance closed, drain opens).

2. Outlet valve Enters backwash mode (downstream closed, filter bypass opens).

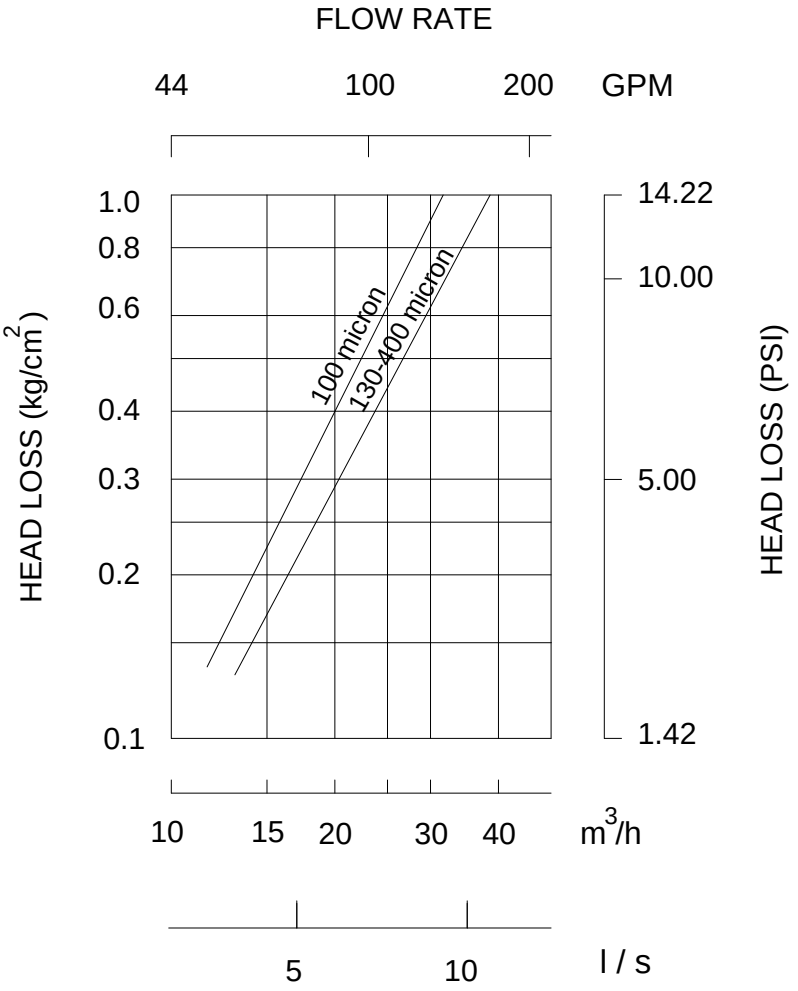
Water flows via the bypass filter screen, through the bypass into the outlet valve. It enters the main filter (which is open), where jets of water flush the grooves in the discs as the discs spin. The water carries away impurities toward the inlet valve.

At the end of the backwashing process (20 seconds) the backwash command is withdrawn, the discs are compressed and the SPIN KLIN returns to the filtration mode. The inlet and outlet valves return to the filtration mode. Water flows once again into the filter, carrying with it the impurities that are collected on the bypass filter screen during backwash.

4. Technical Data

Parameters	METRIC	US
Maximum pressure	6 bar	87 psi
Maximum flow rate	15 m^3/h	66 gpm
Minimum flow rate	10 m^3/h	44 gpm
Minimum backwash pressure	1.5 bar	22 psi
Filtration surface area	880 cm^2	136.4 in^2
Filtration volume	1,148 cm^3	70 in^3
Backwash water volume	33 liters	8.7 gal

5. Headloss Chart



6. Initial Installation & Operation Instructions

A. Installation

1. Remove from package, check contents.
2. Ensure correct orientation of INLET & OUTLET.
3. Connect the BACKWASH pipe to the Drain port.
4. Check that the filter cover is closed correctly.

B. Controller

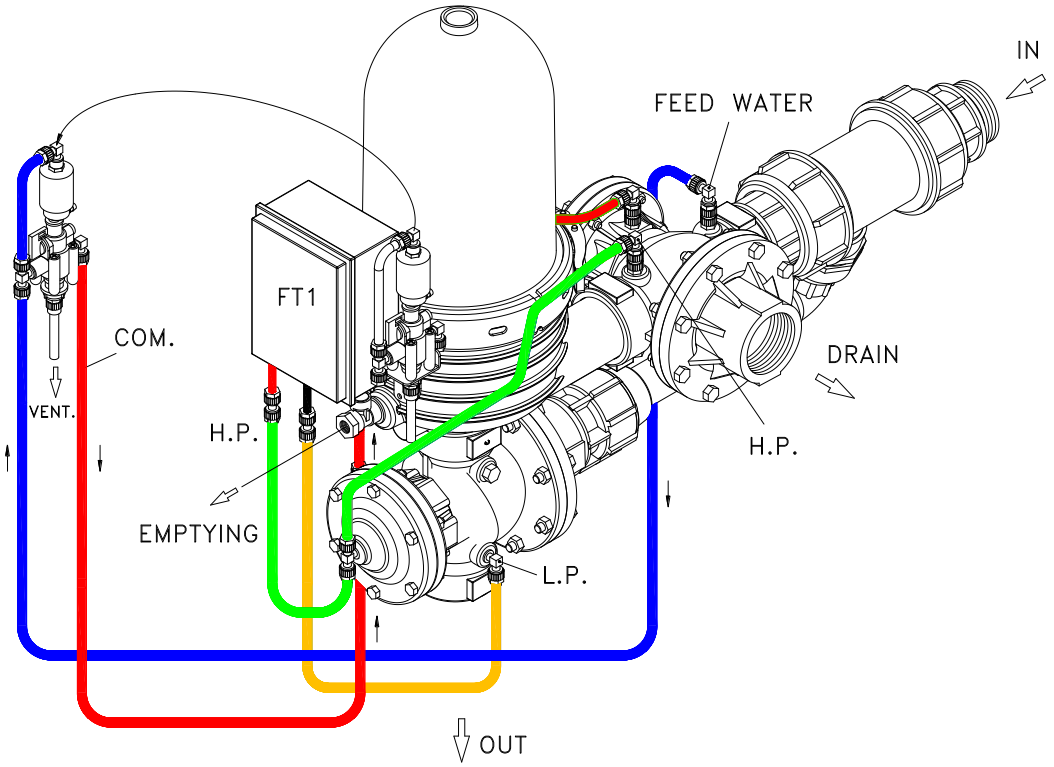
1. Refer to manufacturer's handbook before installing controller.
2. Check that the power is suitable for the solenoids & controller.
3. Make sure the solenoid manual switch is set to automatic.
4. Check that the pressure differential gauge is connected to the appropriate outlets – the high pressure & low pressure pipes (High pressure is to the center of differential pressure meter).
5. **Set the starting point on the P.D. GAUGE to 5m (7 psi) above the filtration level.** The DP set point recommended here (to activate the backwash) is a general guideline; it may need to be adjusted for conditions of low pressure and/or poor water quality.
6. Set the controller to a flush time of 20-25 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

C. Start Up Operation

1. Start backwash cycle. Check that the system is functioning correctly (to achieve maximum flushing effectiveness, use a minimum pressure of 1.5 bar (22 psi).
2. The bypass filter can be cleaned manually.

Initial Operation

1. Gradually open the inlet valve (make sure that the outlet valve, if installed, is open). **<u>WARNING</u> Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning**.
2. Check the filter assembly and its connections for leaks.
3. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as backwash starts.
4. Verify that the hydraulic backwash valve closes after the preset backwash time.
5. Verify that the backpressure during backwash is at least 1.5 bar (22 psi).
6. Set the controller to a backwash time of 7 seconds, valve delay 1 seconds and a dwell time 15-20 seconds. These settings may require adjustment to conform to local water conditions.
7. Check that the differential pressure indicator is set to 5m (7 psi)
8. Perform an additional backwash cycle manually by rotating the operation handle (turn clockwise 90°) located on the solenoid valve



7. Maintenance & Periodical Checks

1.5V Battery Replacement

The 1.5V battery enables the electronic control unit's operation. The battery can last for 3000 flushing cycles, but should be replaced every six months. Use **ONLY ALKALINE** type battery.

1. Remove the front cover of the electronic control unit
2. Disconnect and remove the used batteries.
3. Connect new batteries according to the correct polarity.
4. Secure the electronic control unit-cover with the plastic cover.
   WARNING Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning.
5. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as flushing starts.
6. Verify that the hydraulic backwash valve closes after 20 seconds.
7. Perform an additional backwash cycle manually, by rotating the operation handle (turn clockwise 90°) located on the solenoid.

FILTRON FT1+DP 3W (DC)

- The “FILTRON FT1+DP 3W” is a backwashing controller for a single station automatic filter.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor).
- The unit activates 3 wired 12v DC latching solenoid.
- For convenience, the controller can be powered either by 6v DC or 12v DC.
- The system will detect problems of endless looping if after 7 consecutive cycles; the DP sensor keeps demanding the start of a new cycle.

Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing duration is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			**FLUSHING DURATION**		
1 – ON 0 - OFF	**S1** **1 2 3 4**	**meaning**	1 – ON 0 - OFF	**S2** **1 2 3 4**	**meaning**
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	8 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	10 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	12 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	16 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	20 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	25 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	30 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	45 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	1 min.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	3 min.
14	1 0 1 1	24 hours	14	1 0 1 1	4 min.
15	0 1 1 1	72 hours	15	0 1 1 1	5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	6 min.

Installing the DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table. As long as the pressure difference is lower than the set point there is no flushing request signal generated, but when the pressure difference is higher, it will trigger a flushing cycle within 5 seconds.

Position No.	S3 (1-ON ; 0-OFF)	Set-point	
	1 2 3 4	Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.136	2
02	0 1 0 0	0.272	4
03	1 1 0 0	0.408	6
04	0 0 1 0	0.545	8
05	1 0 1 0	0.680	10
06	0 1 1 0	0.816	12
07	1 1 1 0	0.953	14
08	0 0 0 1	1.089	16
09	1 0 0 1	1.225	18
10	0 1 0 1	1.361	20
11	1 1 0 1	1.497	22
12	0 0 1 1	1.634	24
13	1 0 1 1	1.770	26
14	0 1 1 1	1.906	28
15	1 1 1 1	2.042	30

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP7 – For selection of the powering mode 6v or 12v.

JP8 – Enables or disables detection of “endless looping” problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 – Immediate or delayed reaction to the DP signal. When the upper pin of the jumper is free, then the reaction to the flushing request signal of the

DP will trigger the next cycle after 5 seconds, otherwise it will be immediate.

Summary of the beeping sound indications

1 beep every 15 sec- normal operation

2 beeps every 15 sec- endless looping problem detected

3 beeps every 15 sec- low battery

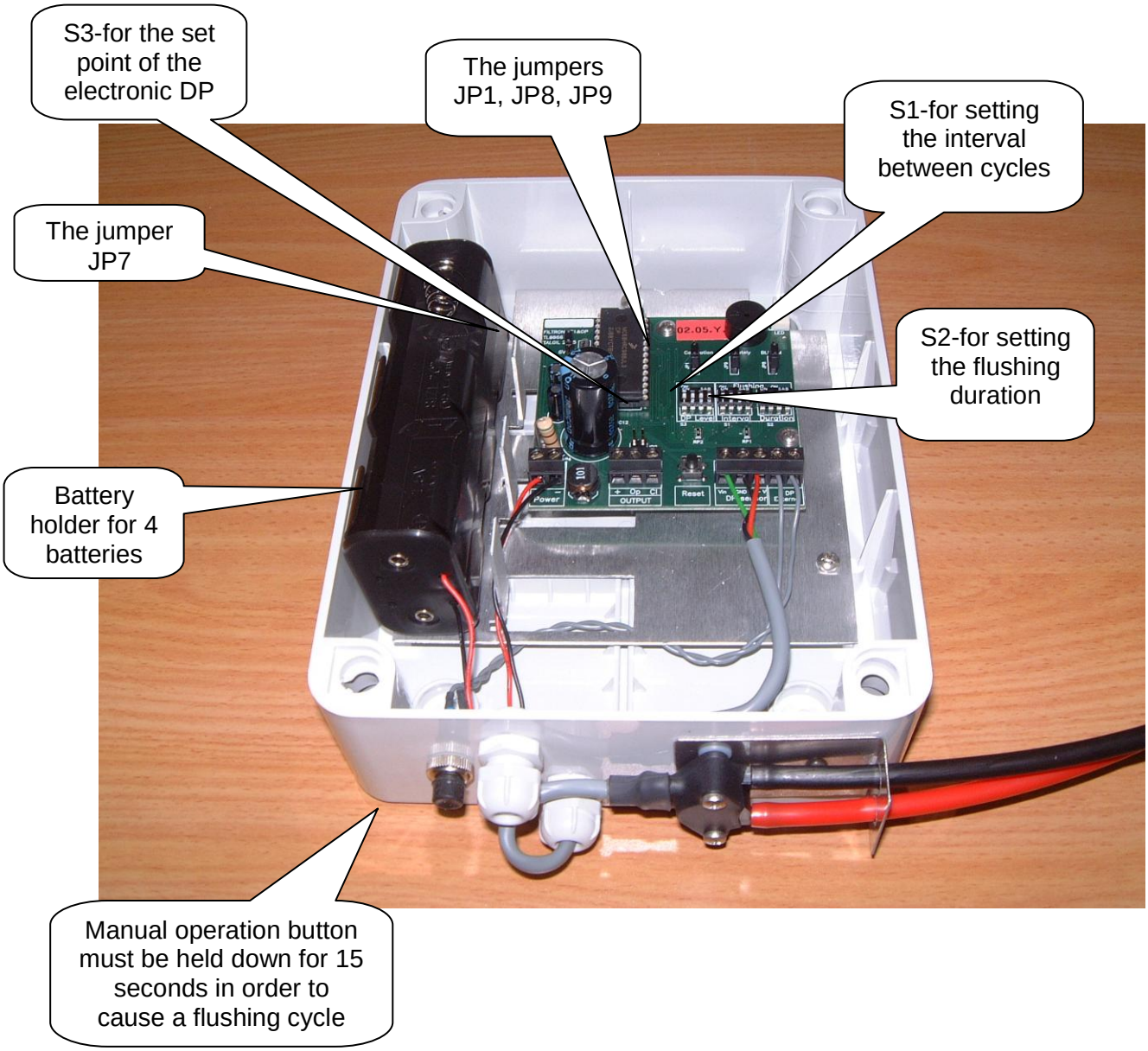
6 beeps on power up or after RESET – indicates being in calibration mode.

Calibration

Calibration is required whenever the DP sensor is replaced. Prior to entering calibration mode the pressure difference sensed by the sensor must be zero, if necessary, disconnect the red and black command tubes from the system. Change the position of JP1 so that the right side pin remains free and push the RESET button. The 6 beeps will indicate the execution of the calibration process. Change the position of JP1 back to its normal position with the left side pin free, return the command tubes and push the RESET button again.

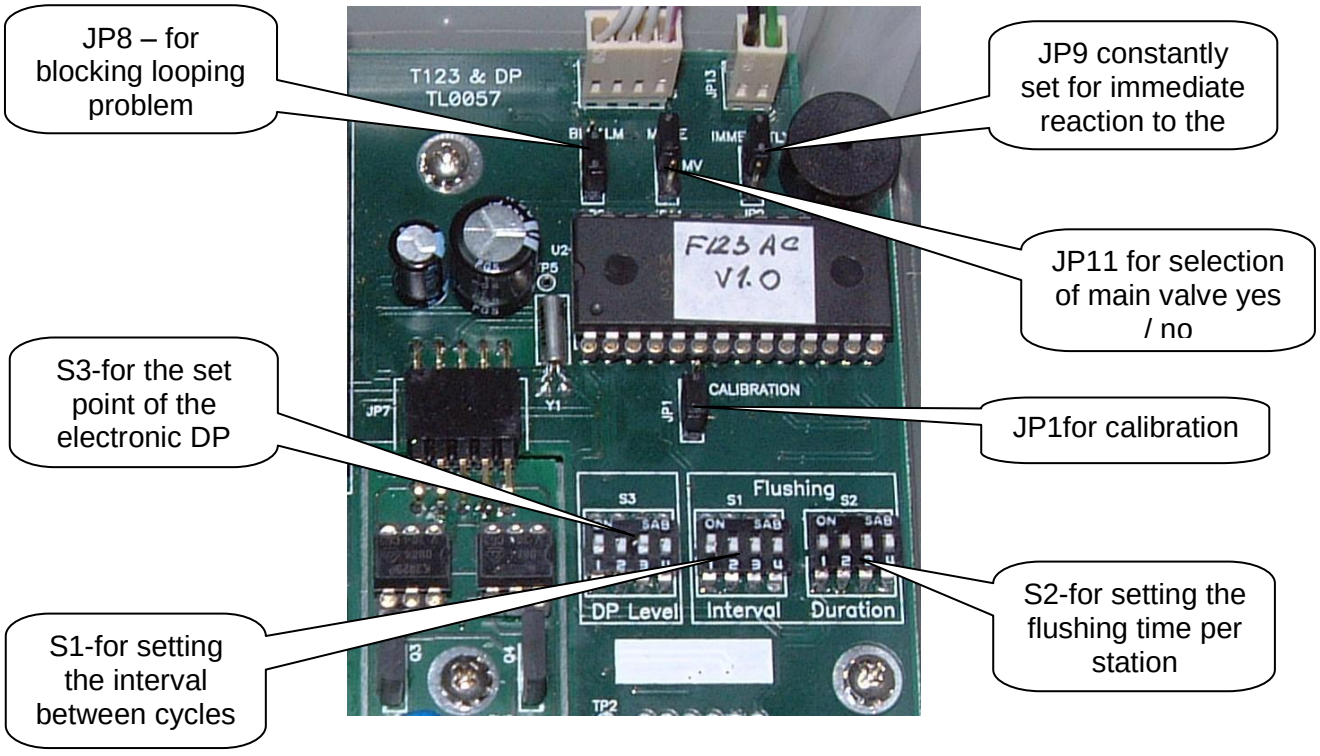
How to handle endless looping problems

The system will detect an “endless looping problem” after 7 consecutive flushing cycles. The problem can be recognized by the double beep sounded every 15 sec, and it means that the flushing request signal keeps arriving from the active DP sensor. In this case the system stops referring to the sensor and continues flushing based on the defined interval between cycles. The cause of the problem must first be detected and removed, and then push the RESET button to signal the controller that the problem was solved.


S3-for the set point of the electronic DP
The jumpers JP1, JP8, JP9
S1-for setting the interval between cycles
The jumper JP7
S2-for setting the flushing duration
Battery holder for 4 batteries
Manual operation button must be held down for 15 seconds in order to cause a flushing cycle

FILTRON 1/2/3+DP (AC)

- The “FILTRON 1/2/3+DP” is a controller for backwashing automatic filters of one, two or three stations.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor). Optionally a regular electromechanical DP can be used.
- The unit is equipped with a RESET button that when pushed generates a RESET signal and triggers a flushing cycle.
- The unit is equipped with two LED indicators, the green one indicates that the unit is energized and the red one indicates the operation statuses.
- Optionally a main valve can be controlled in place of the last station.
- Activates solenoids of 24v AC.
- Can be powered either by 110v AC or 220v AC.
- When working by DP, the system will detect problems of endless looping if after 7 consecutive cycles, the start of a new cycle is still requested by the DP sensor.



Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing time per station is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			FLUSHING TIME PER STATION		
1 – ON 0 - OFF	**S1** **1 2 3 4**	**meaning**	1 – ON 0 - OFF	**S2** **1 2 3 4**	**meaning**
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	6 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	7 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	8 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	9 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	10 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	11 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	12 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	13 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	15 sec.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	2.5 min.
14	1 0 1 1	24 hours	14	1 0 1 1	3 min.
15	0 1 1 1	72 hours	15	0 1 1 1	3.5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	4 min.

Installing the electronic DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table.

Position No.	S3 (1-ON ; 0-OFF)	Set-point	
	1 2 3 4	Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

How does an automatic backflush cycle occur ?

An automatic backflush cycle results of pressure difference between the inlet and outlet of the filter. When the pressure difference exceeds the set point for more than 15 seconds, a flushing request signal is generated. When using the electronic DP the actual reading is compared with the value selected by S3. When using an external DP the indication of excess pressure arrives in form of a closed contact at the "External DP" terminals.

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP8 – Enables or disables detection of “endless looping” problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 -The jumper is constantly set for immediate reaction to the DP flushing request signal. The lower pin is free.

JP11 - Defines whether or not a main valve has to be controlled by the system. When the upper pin of the jumper is free, no main valve is defined.

Summary of the beeping sound indications

1 beep every 15 sec - normal operation

2 beeps every 15 sec - endless looping problem detected

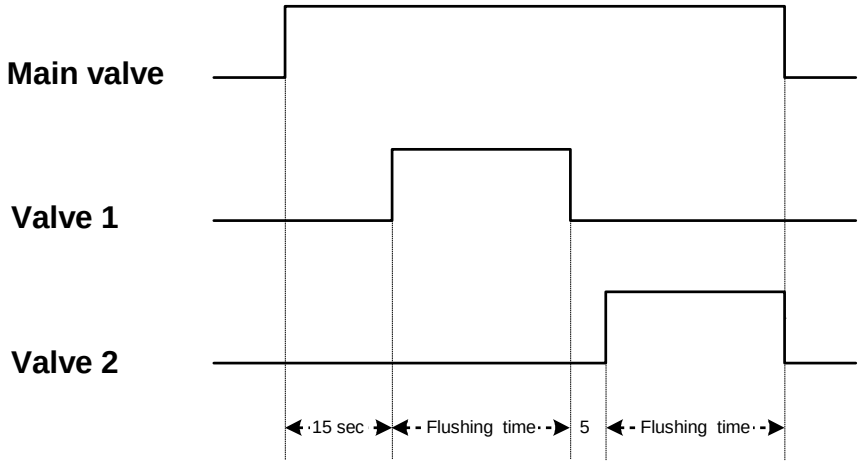
6 beeps on power up - indicates being in calibration mode. Usually this should not happen but when it does, it means that the position of JP1 has been set to calibration mode (lower pin free) the process must be completed as follows: make sure that the pressure difference sensed by the electronic DP is zero (if necessary, disconnect the red and black command tubes), and push the RESET button. Change the position of JP1 back to its normal position and push the RESET button again.

Endless looping problems

The problem of endless looping will be declared if after 7 consecutive flushing cycles the request signal for another cycle is still there. A consecutive flushing cycle happens when after termination of a previous flushing cycle (triggered by the DP) the flushing request signal still exists. However, if the flushing signal was removed, but for less than the stabilization time (T0=30 seconds) and then returned, another cycle will be triggered, which will be considered a consecutive cycle. If the stabilization time was completed without appearance of the DP signal, the counter of the consecutive cycles is cleared.

The problem is indicated by 2 beeps of the buzzer every 15 sec and by fast flushing of the red LED. When detecting “endless looping problem", the unit stops referring to the DP sensor and continues flushing by the defined interval only. The cause of the problem must first be detected and removed, and then the RESET button has to be pushed to signal the controller that the problem was solved.

Timing Diagram



THE RED LED BEHAVIOR	THE MEANING
Constantly ON	Waiting between cycles
Blinking once in a second	Flushing in progress
Blinking fast	DP problem, waiting between cycles
3 blinks per second	DP problem, flushing by time in progress
Double blink	While changing positions of the switches
LED is OFF	Problem with the controller

Bypass Filter Maintenance

Instructions

1. Close the inlet water valve and release the pressure.
2. Use a wrench to release tightening nuts.
3. Unscrew the nut completely.
4. Twist the bypass filter.
5. Remove the internal screen element.
6. Rinse the screen element properly.
7. Reassemble in reverse order of above steps (5 thru 2).
8. Open the 2” inlet valve.

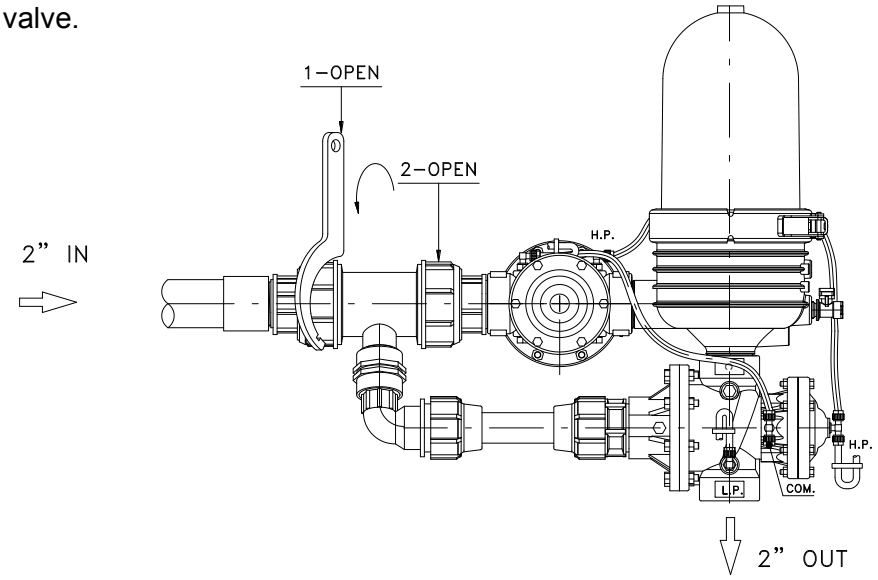
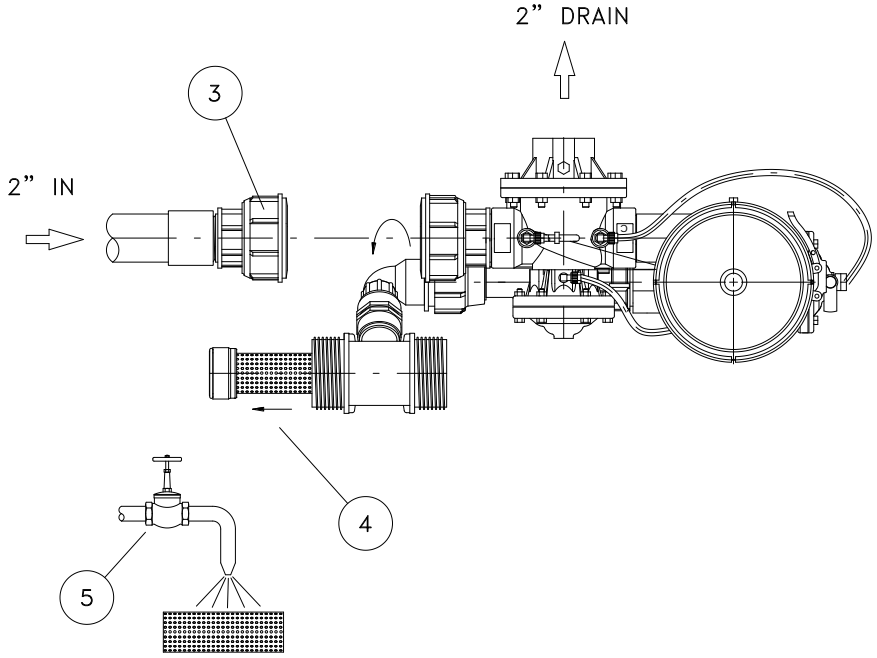


Figure 4: Bypass



Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures

If the pressure differential is above 5 m / 7 PSI activate the backwash of the Spin Klin filtration system.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold

If there is a leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance

Check that the controller timing parameters are correctly set and activate the backwash cycle. In the event of possible failure of the backwash controller, please refer to chapter 8, troubleshooting

Winterization

In order to prevent the filter battery from becoming damaged under freezing conditions - drain all the water from the filter battery and leave the drain valve open.

Seasonal Maintenance - Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

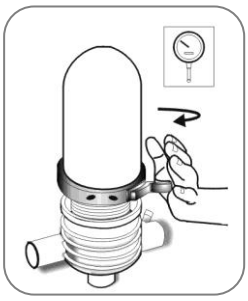


Figure 1

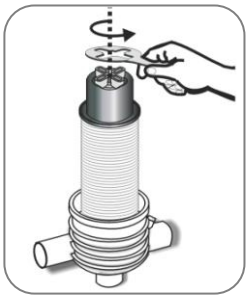


Figure 2

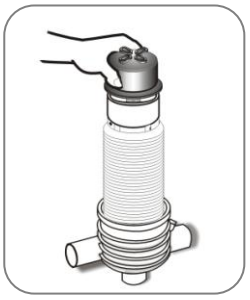


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each disc set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

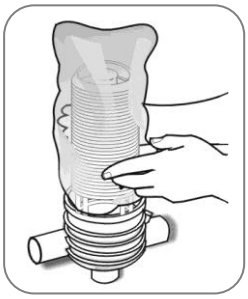


Figure 4

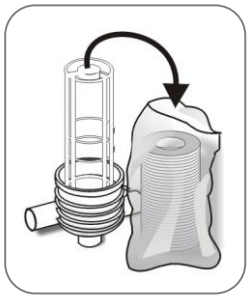


Figure 5

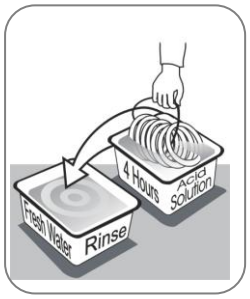


Figure 6

Check that the correct quantity of discs is assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Replace on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

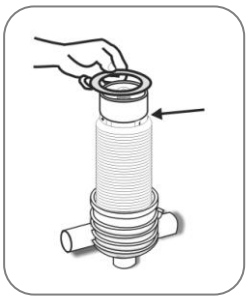


Figure 7

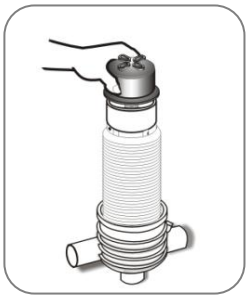


Figure 8

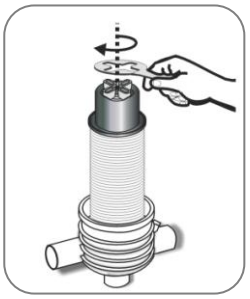


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

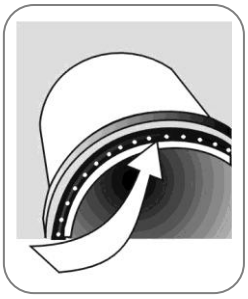


Figure 10

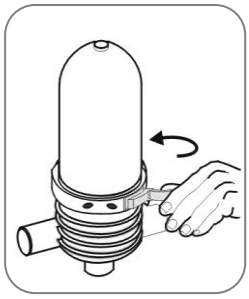


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

Warning!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing.
- Work in a well-ventilated area.
- Follow the manufacturer’s instructions.

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Warning – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of (10%) Sodium Hypochlorite into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours.
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of (30%) Hydrochloric Acid into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid
  (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

Cleaning Complex Deposits

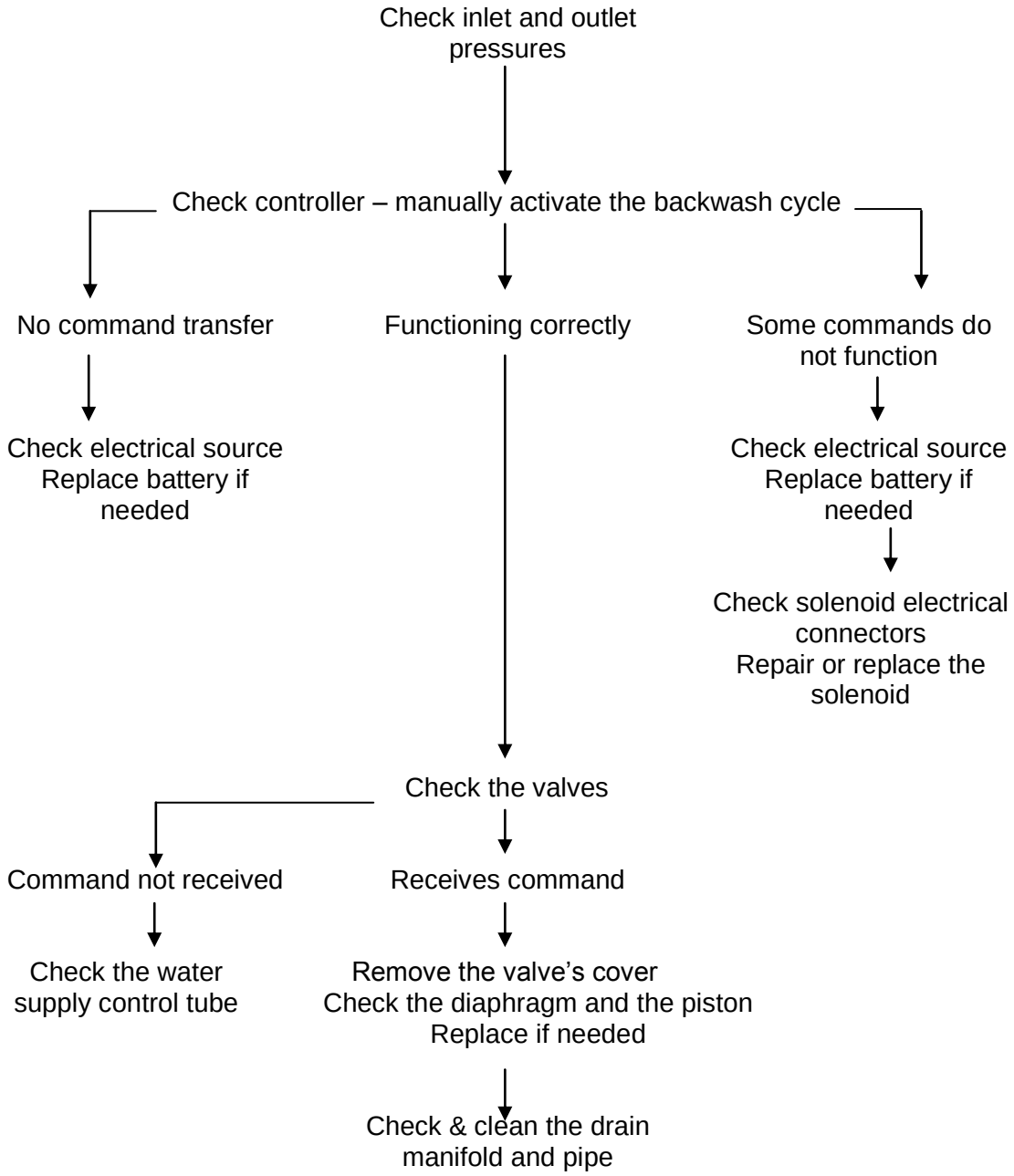
If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of (10% NaOCl) Sodium Hypochlorite.
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  If the deposits haven't been completely removed, send a set of untreated discs to the laboratory for further examination.

8. Troubleshooting

Identifying Malfunctions in the 2” Spin Klin System

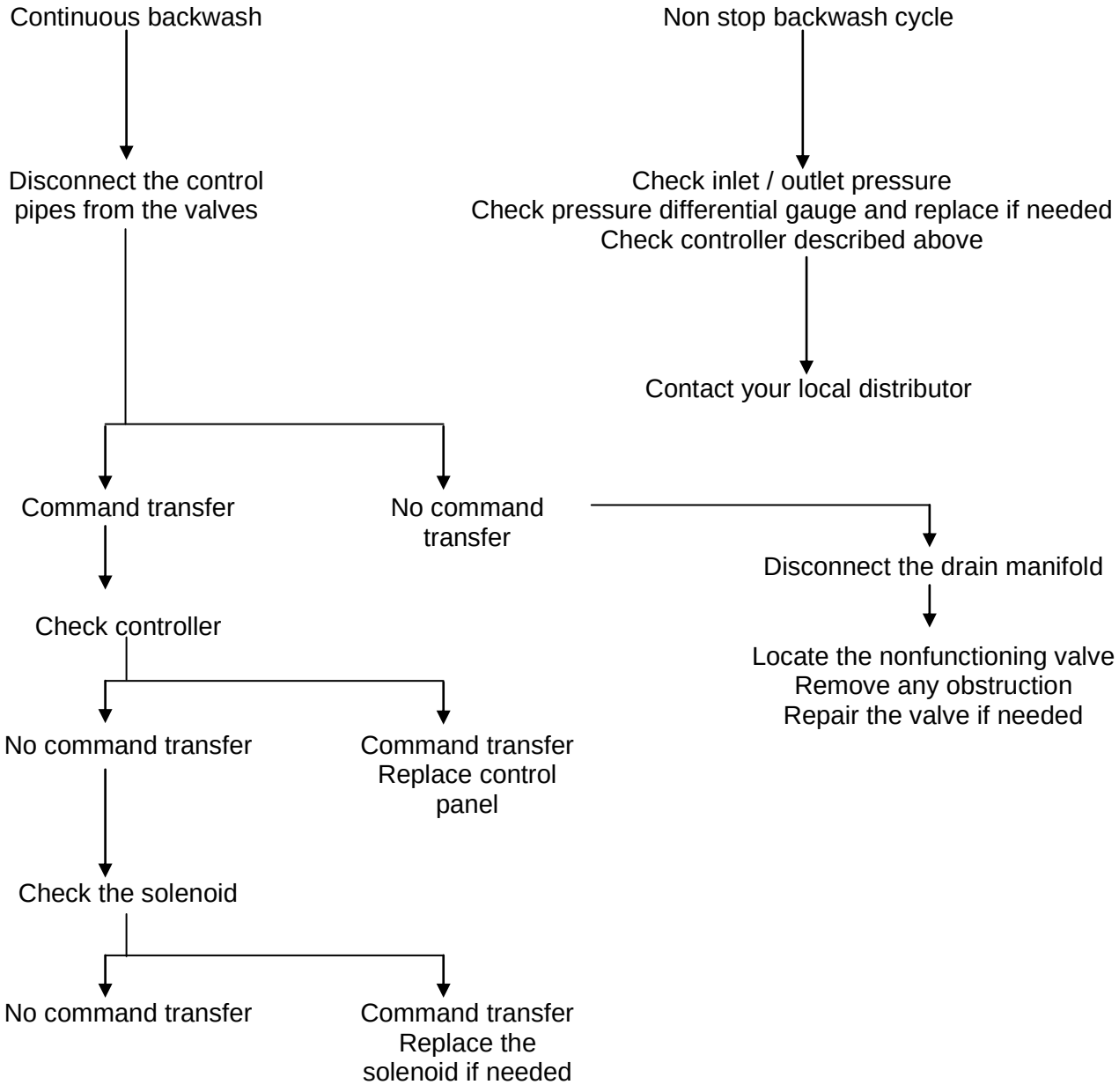
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 2” Spin Klin System

Continuous or Non-stop Backwashing



Contact your local distributor

Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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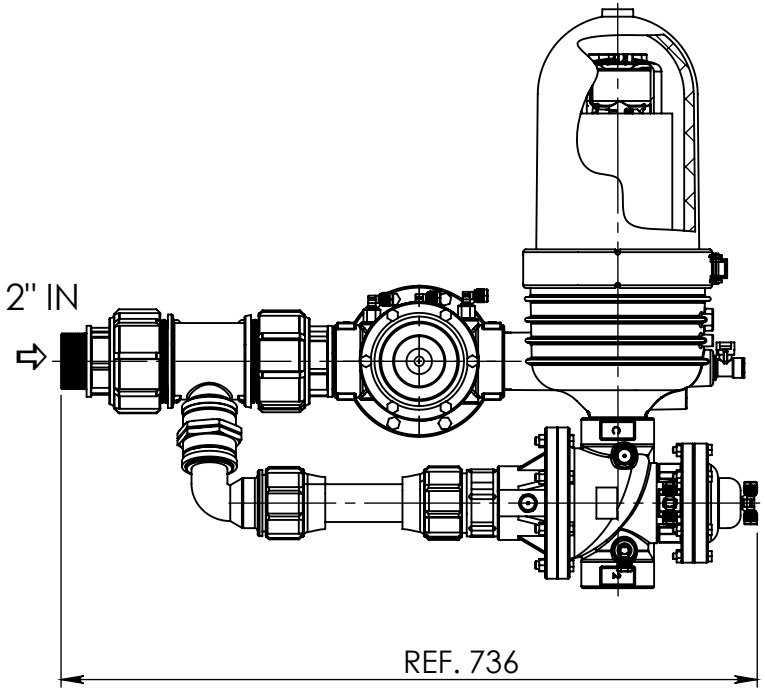

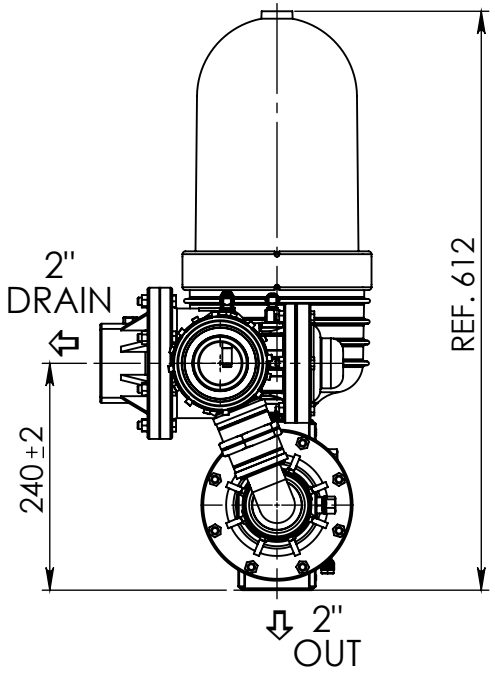

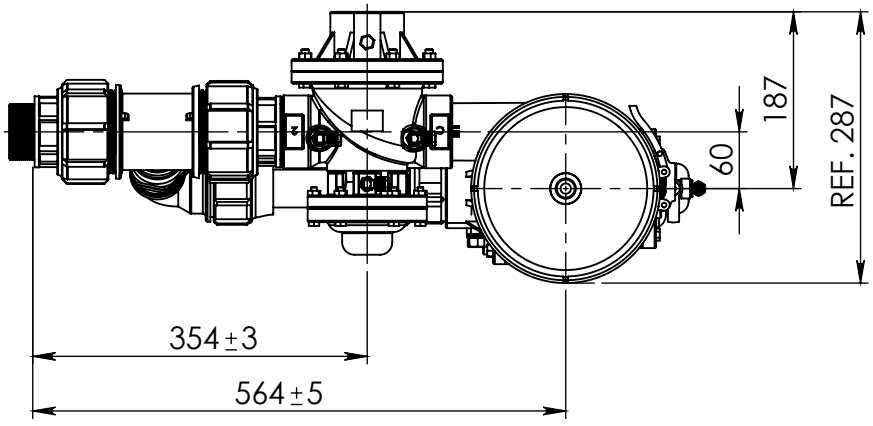

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT 2" S.K. COMPACT — PAGE___OF___

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Compact Air Aided Flushing

Filtration Unit

Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation
- Low pressure operation
- Minimum backwash water volume

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	0.8	**psi**	11.6
Filtration surface area	**cm^2**	880	**in^2**	136.4
Filtration volume	**cm^3**	1320	**in^3**	80.5
Backwash water volume	**lit**	12	**gal**	3.2

Maximum Filtration Flow Rate / Water Quality

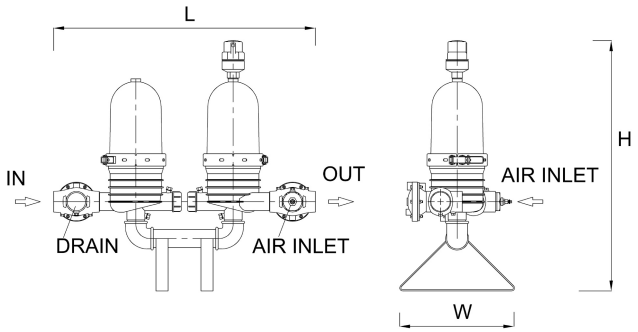
Filtration Grade	Water Quality	m^3/h	gpm
400-100 µ	Good	20	88
	Average	15	66
	Poor	10	44
	Very Poor	8	35
55 µ	Good	10	44
	Average	8	35
	Poor	6	26
	Very Poor	4	18
20 µ	Good	5	22
	Average	4	18
	Poor	3	13
	Very Poor	2	9

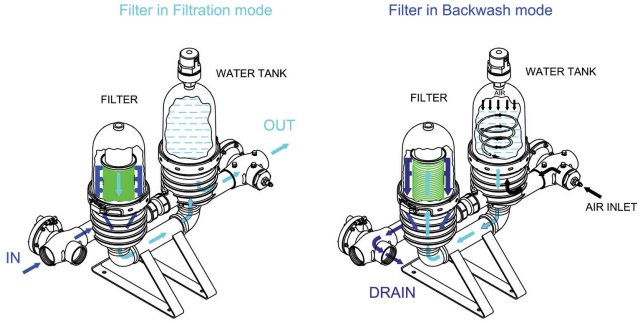
Compact
Filtration Unit

Air Aided Flushing

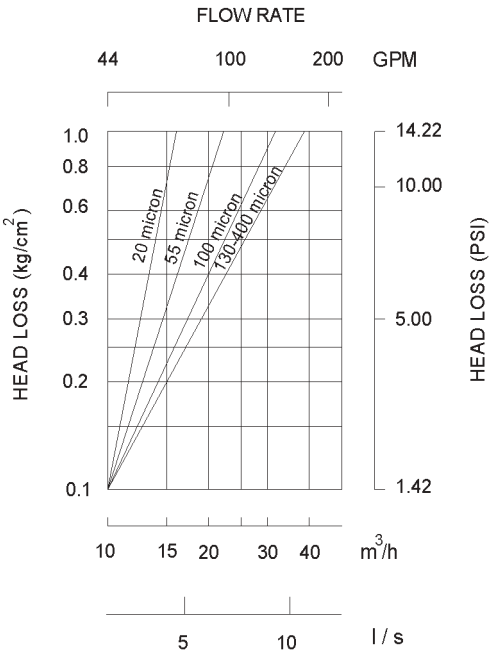
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	50	**inch**	2
L Length	**mm**	820	**inch**	32
H Height	**mm**	830	**inch**	33
W Width	**mm**	490	**inch**	19
Shipping weight (approx.)	**kg**	33.5	**lbs**	73.7





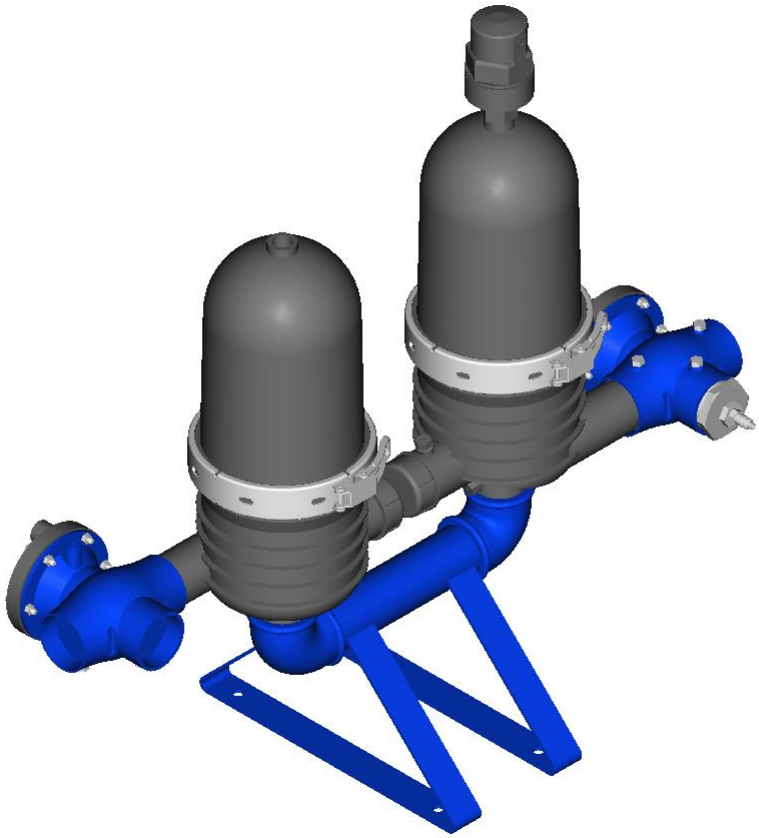
Head Loss Chart, Clean State



COMPACT filtration units are available with:
Polyester coated steel, Stainless steel manifolds or all plastic.

ARKAL SPIN KLIN
Automatic Backwash Filtration Systems
2” Compact Air Aided Flushing (A.A.F.)

Operation, Service & Maintenance Manual



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1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 2" Spin Klin Compact Filter. All Arkal Filtration Systems are easy to install, use and service and do not require special skills to operate them.

For proper operation and maintenance of the filtration system please follow the instructions in this manual.

2. Safety Instructions

1. Prior to installation or handling of the filter, please read the installation and operation instructions carefully.
2. Confirm filter draining prior to service and / or maintenance.
3. Take precautions while lifting, transporting or installing the filter.
4. Installation of the filter should be performed so as to avoid direct water contact with the electronic control unit.
5. Confirm that filter weight, when full, does not exceed support construction limitations.
6. Prior to installation confirm that line pressure does not exceed filter's operational pressure rating (10 bar).
7. During installation, use standard flanges and connections only.
8. Check that all filter flange bolts are properly secured.
9. Please note, that during normal operation the filter enters into backwash mode automatically, without prior warning.
10. Use only original parts when servicing the filter.
11. Arkal cannot accept responsibility for any changes or modifications to the equipment.

Special Note

Before opening the filter clamp, make sure that there is no system pressure in the filter.

3. Description & Operation

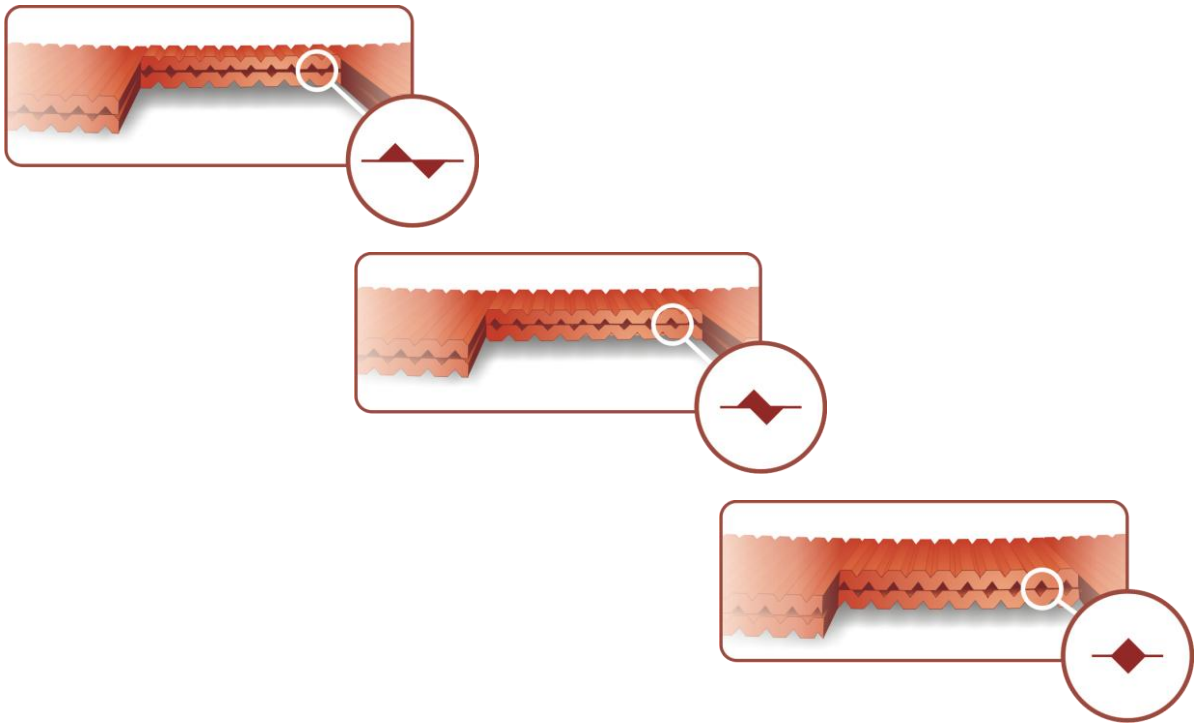
3.1 Disc Filtration Technology

Arkal Filtration Systems uses a specially designed disc filtration technology. Thin, color-coded polypropylene discs are diagonally grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of ridges and valleys, which trap the solids. The stack is enclosed in a corrosion proof and pressure resistant housing.

During the filtration process, the filtration discs are tightly compressed together by the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolates from the outer diameter to the inner diameter of the element. Depending on the micron rating, there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration.

Table of Filtration Grades of the Discs and Color Code

Color Code	Blue	Yellow	Red	Black	Brown	Green	Purple	Gray
Micron	400	200	130	100	70	55	40	20
Mesh	40	80	120	140				
PP								
Nylon								



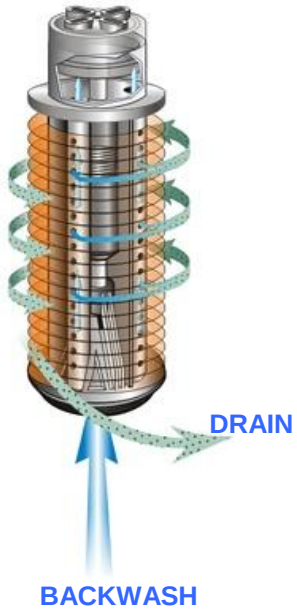
3.2 Spin Klin Technology - Spin Klin Spine

Spin Klin Spine – The Core of the Spin Klin Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

Spin Klin Automatic Backwash Operation

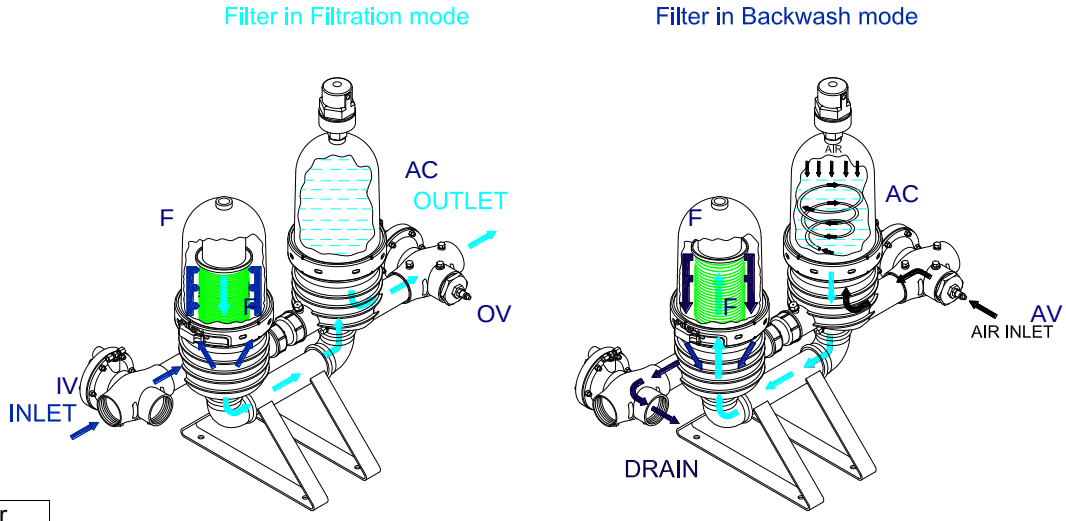
Activated by a predefined command (differential pressure or time) each successive unit of the Spin Klin® system goes into the backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of Operation

Air Aided Flushing Spin Klin® Compact - A. A. F.

Operation and Maintenance Manual



F	2” Spin Klin filter
IV	2”x2” Inlet valve
OV	2”x2” Outlet valve
AV	Air inlet
AC	Water accumulator

Filtration Process

- During the filtration mode water flows through the **INLET VALVE** (IV) to the 2” **SPIN KLIN FILTER** (F) and flows out clean through the **ACCUMULATOR** (AC) to the **OUTLET VALVE** (OV) to the customer.
- At this stage the **ACCUMULATOR** (AC) fills up with filtered water.

Backwashing Process

1. The **CONTROLLER** transmits a pulse (as per pressure differential or time, whichever is first.
2. Pneumatic command from the solenoid sends a pressure pulse to two users simultaneously.

A. To the **INLET VALVE** (IV) converting it from filtration mode to backwash mode.

B. To the **OUTLET VALVE** (OV). Opens the **AIR PORT** (AV).

- The compressed air enters the **ACCUMULATOR** (AC).
- The piston of the **SPIN KLIN FILTER** (F) rises, thus decompressing discs.
- The air is mixed with filtered water and is carried to the **FILTER** (F) which is then backwash.
- The ratio between air and water will rise until there is hardly any water at termination (air alone does not spin the discs).

4. Technical Data

Minimum water pressure: 0.8 bar (12 P. S. I.)

Maximum water pressure: 10 bar (145 P. S. I.)

pH: 4-11

Maximum temperature: 70ºC (158ºF)

Water flush volume: 12 liters (3.2 gallons)

Air pressure control: Equal or higher pressure used for backwashing

Control source should be remote from flushing source

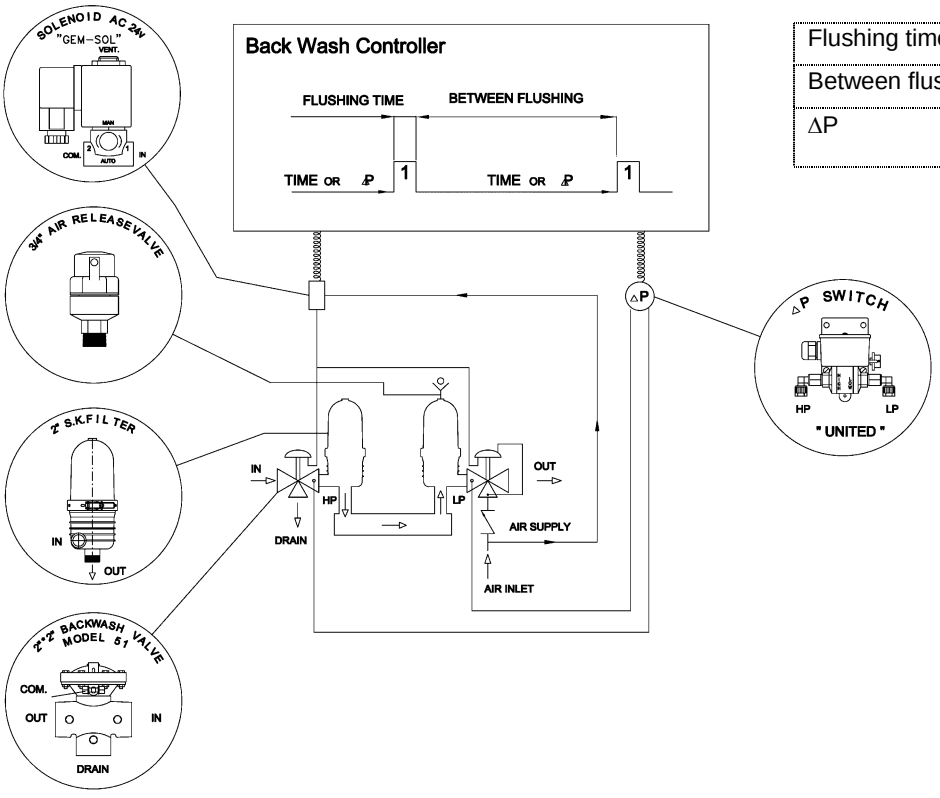
Recommended air compressor: ¾" H. P. + 80 liter (21 gallons) tank

Air Volume and Flow Rate at Different Pressures

Air Pressure…6 Bar (65 P. S. I.)						
Water Pressure		Time	Air Flow Rate		Total Volume	
Bar	P. S. I.	Seconds	Ft^3/MIN	Liter/Minute	Liter	Ft^3
6	84	7.5	9.5	269	33.6	1.18
3.5	50	7.5	9.5	269	33.7	1.18
1.5	20	7.5	10	283.2	35.4	1.25

Air Pressure…4.5 Bar (85 P. S. I.)						
Water Pressure		Time	Air Flow Rate		Total Volume	
Bar	P. S. I.	Seconds	Ft^3/MIN	Liter/Minute	Liter	Ft^3
6	84	Air Pressure Always Needs to be Higher than Water Pressure				
3.5	50	8.5	9.5	269	38.1	1.3
1.5	20	8.8	11	311.5	45.7	1.6

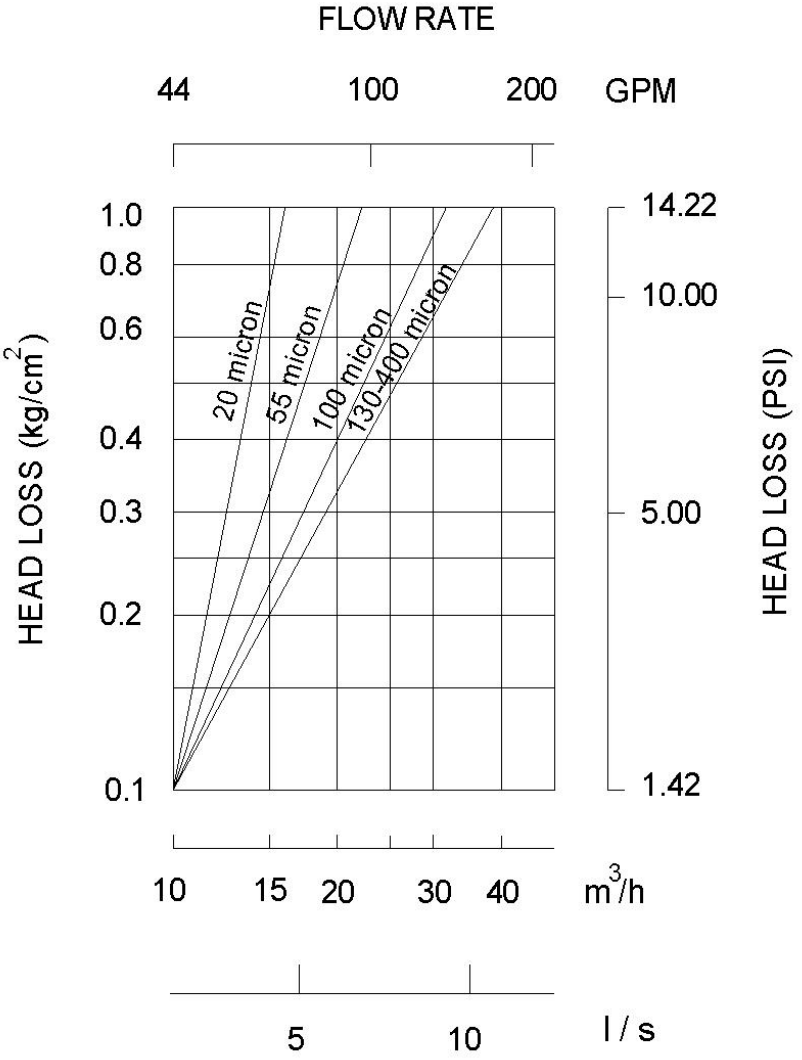
2" AAF COMPACT CONTROL SCHEME



Recommended Setup Time:

Flushing time	5 - 7 sec
Between flushing	1-2 hour
ΔP	(3-4.5)m, (4-6.5) psi

5. Headloss Chart



6. Initial Installation & Operation Instructions

A. Installation

1. Remove from package, check contents.
2. Ensure correct orientation of INLET & OUTLET.
3. Connect the BACKWASH pipe to the Drain port.
4. Check that the filter cover is closed correctly.
5. Connect air supply to the filter and the solenoid

B. Controller

1. Refer to manufacturer's handbook before installing controller.
2. Check that the power is suitable for the solenoids & controller.
3. Make sure the solenoid manual switch is set to automatic.
4. Check that the pressure differential gauge is connected to the appropriate outlets – the high pressure & low pressure pipes (High pressure is to the center of differential pressure meter).
5. Set the starting point on the P.D. GAUGE to 5m (7 psi) above the filtration level.

C. Start Up Operation

Start backwash cycle. Check that the system is functioning correctly (to achieve maximum flushing effectiveness, air pressure should be in the range of 6-9 bar (87 – 130 psi).

Initial Operation

1. Gradually open the inlet valve (make sure that the outlet valve, if installed, is open). **WARNING Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning**.
2. Check the filter assembly and its connections for leaks.
3. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as backwash starts.
4. Verify that the hydraulic backwash valve closes after 20 seconds.
5. Verify that the hydraulic piston fully extends during backwash.
6. When the filter is clean, verify that the differential pressure between inlet and outlet does not exceed 3 m (5 PSI).
7. Check that the differential pressure indicator is set to 5m (7 psi)
8. Perform an additional backwash cycle manually by rotating the operation handle (turn clockwise 90°) located on the solenoid valve.

7. Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures -

If the pressure differential is above 5 m / 7 PSI activate the backwash of the Spin Klin filtration system.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold -

If there is a leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance -

Check that the controller timing parameters are correctly set and activate the backwash cycle. In the event of possible failure of the backwash controller, please refer to chapter 8, troubleshooting

Winterization

In order to prevent the filter battery from becoming damaged under freezing conditions - drain all the water from the filter battery and leave the drain valve open.

8. Seasonal Maintenance - Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

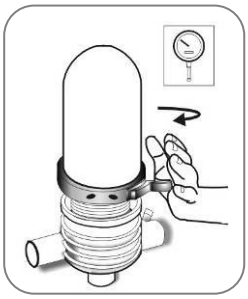


Figure 1

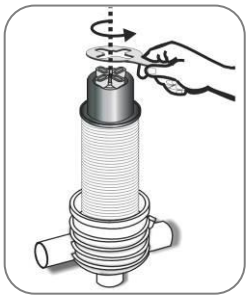


Figure 2

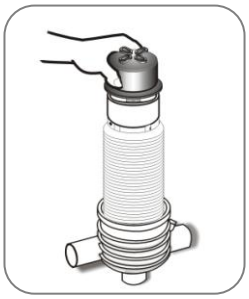


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each disc set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

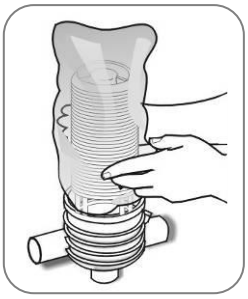


Figure 4

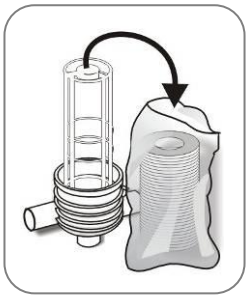


Figure 5

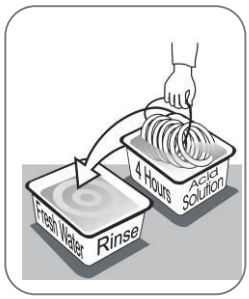


Figure 6

Check that the correct quantity of discs is assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Replace on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

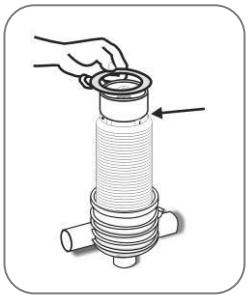


Figure 7

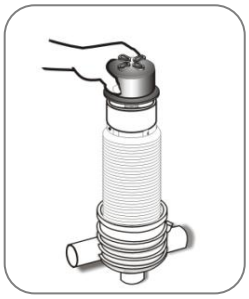


Figure 8

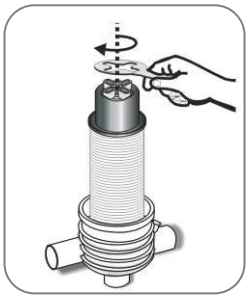


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

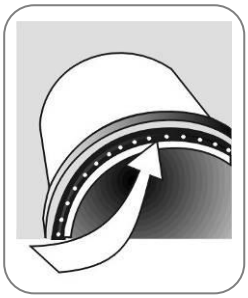


Figure 10

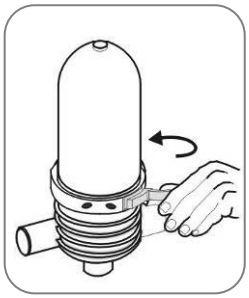


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

Warning!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing.
- Work in a well ventilated area.
- Follow the manufacturer’s instructions.

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Warning – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours.
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

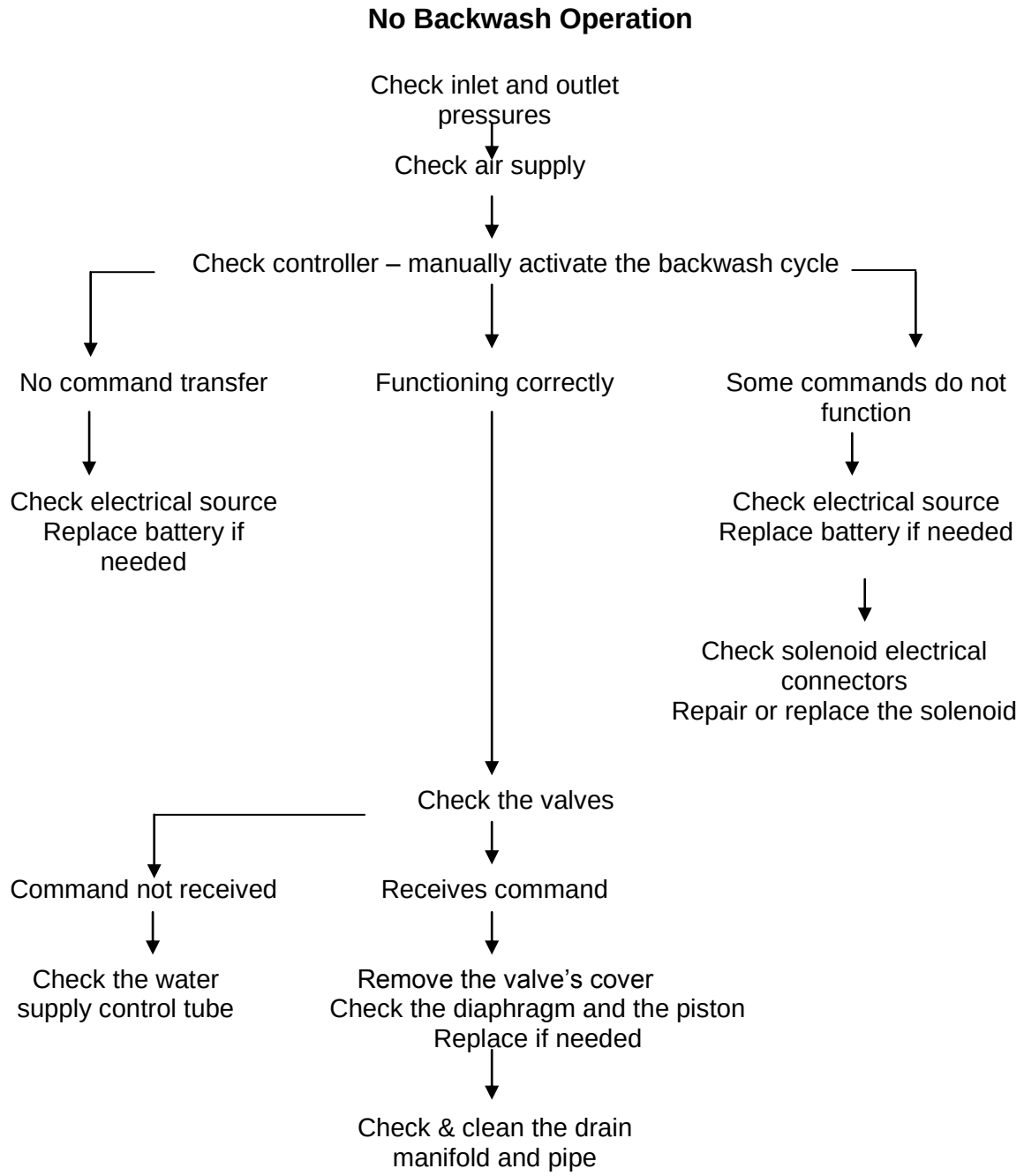
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  If the deposits haven't been completely removed, send a set of untreated discs to the laboratory for further examination.

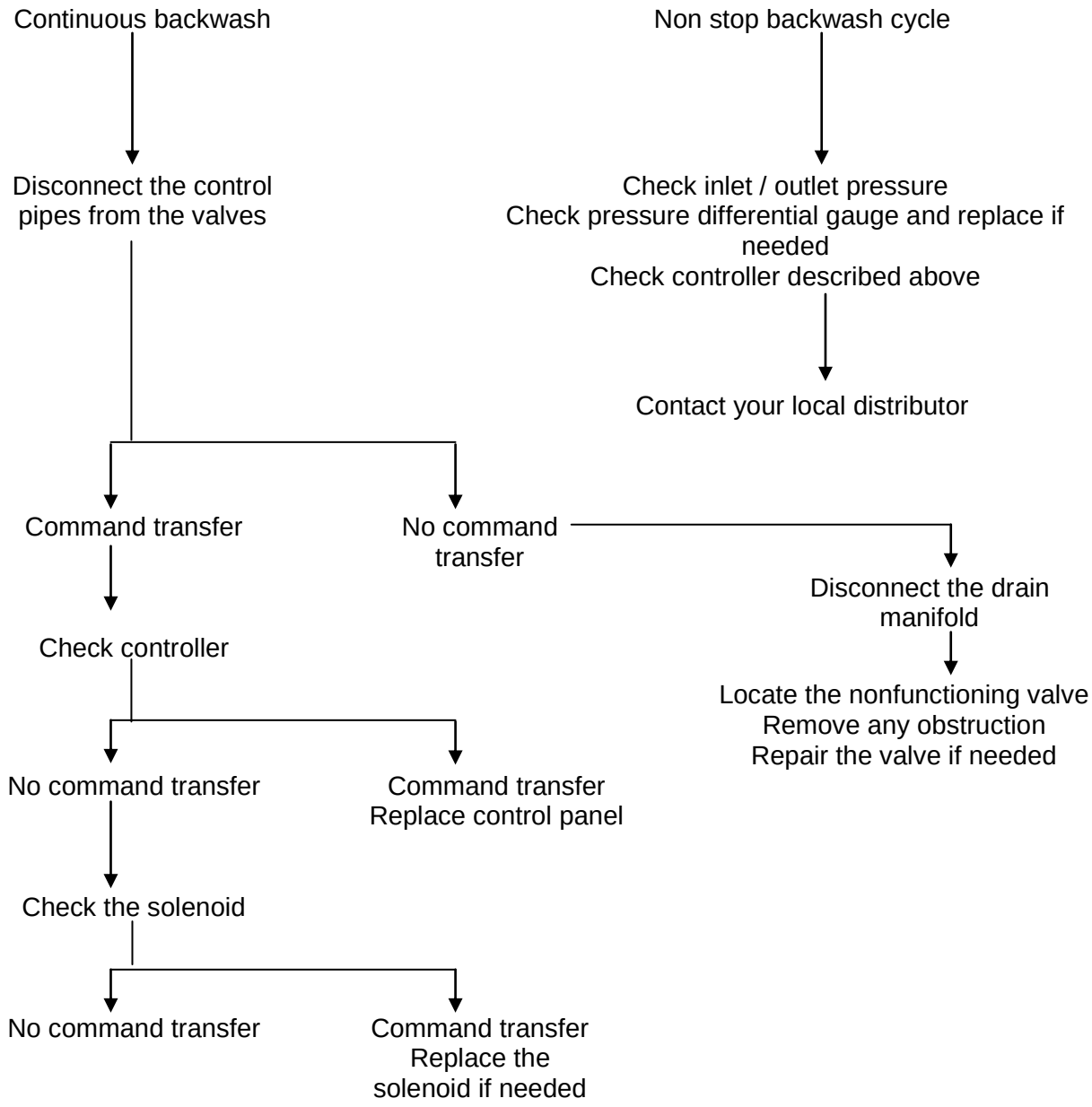
9. Troubleshooting

Identifying Malfunctions in the 2” Spin Klin System



Identifying Malfunctions in the 2” Spin Klin System

Continuous or Non-stop Backwashing



Contact your local distributor

Warranty

ARKAL FILTRATION SYSTEMS STANDARD INTERNATIONAL WARRANTY

ARKAL FILTRATION SYSTEMS (hereinafter -"ARKAL FILTRATION SYSTEMS") guarantees to the customers who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year as of the day it left ARKAL FILTRATION SYSTEMS premises, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

ARKAL FILTRATION SYSTEMS will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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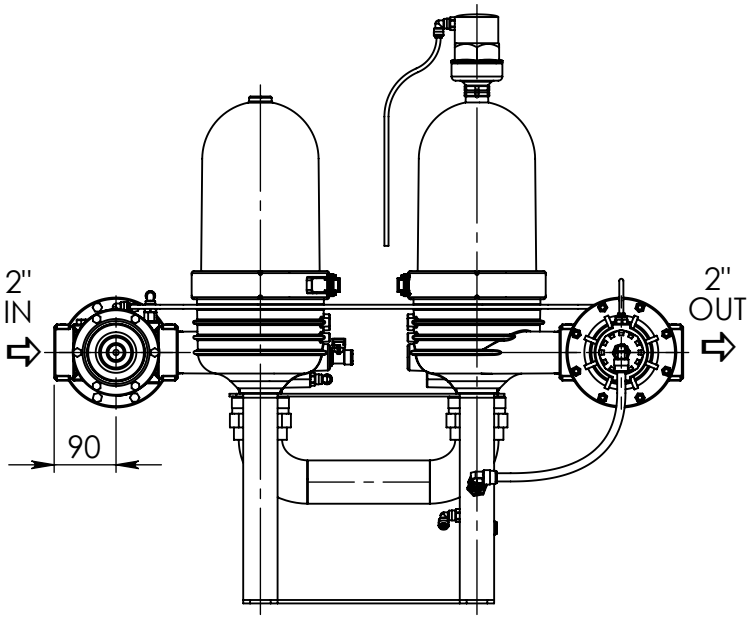
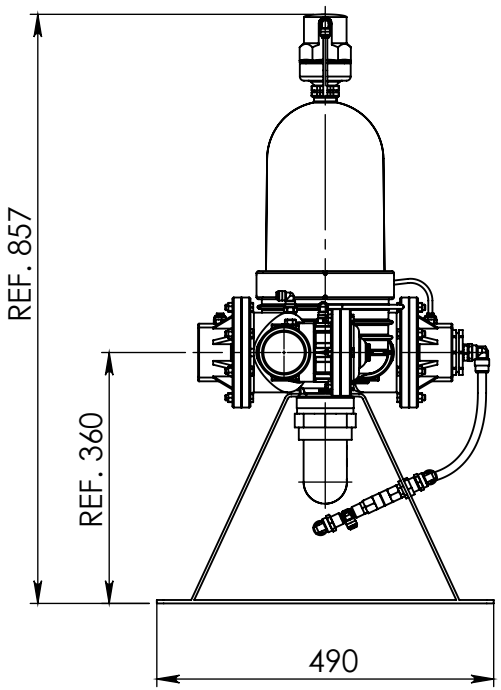
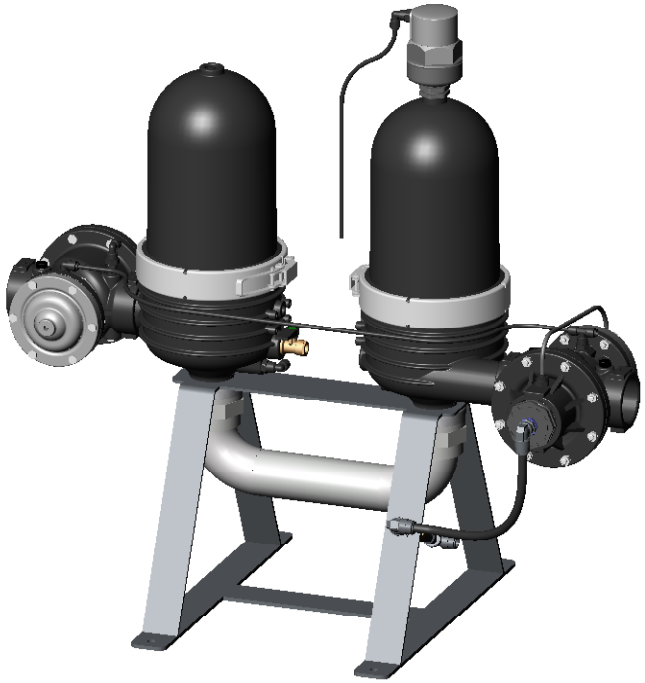
Email: filters@arkal.com Web: www.arkal-filters.com

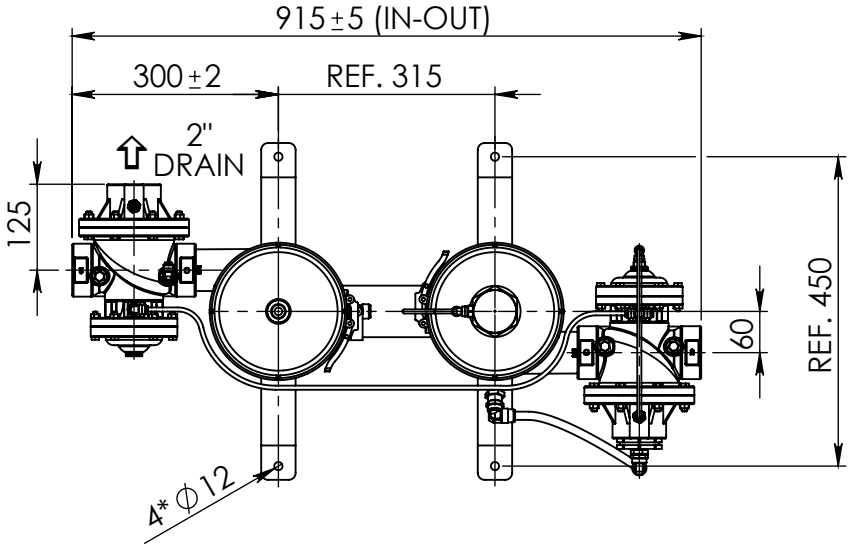
Drawings

2" Compact Air Aided Flushing









MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2" S.K. COMPAKT ALL PLASTIC AIR AIDED FLUSHING

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1566M0201A2

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	NAME	DATE
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CHECKED	OMRY	14/12/2008
APPROVED	OMRY	14/12/2008

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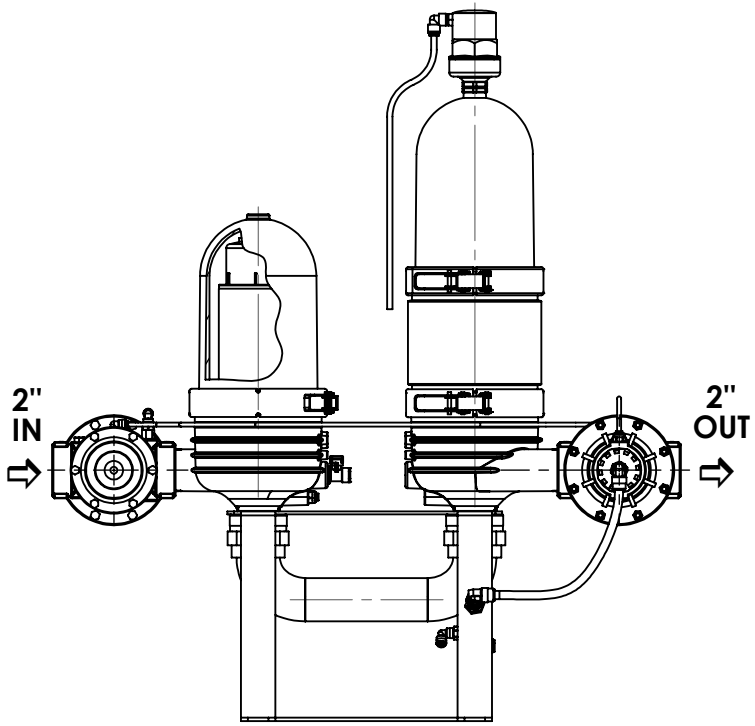
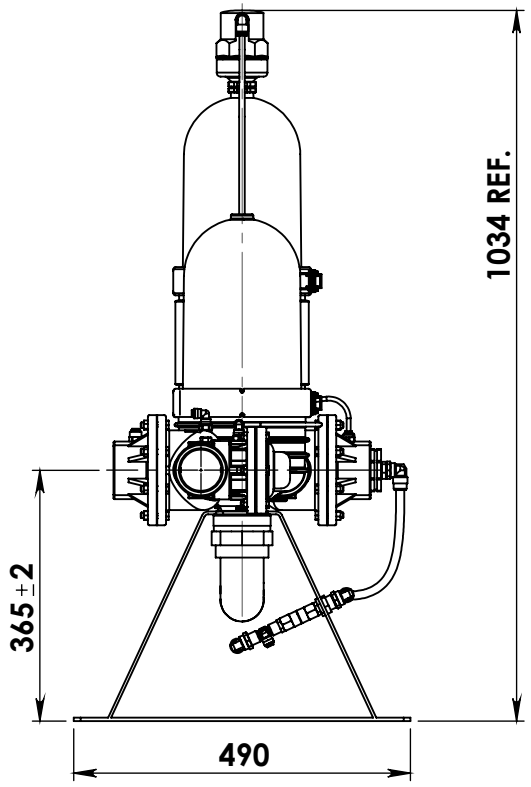
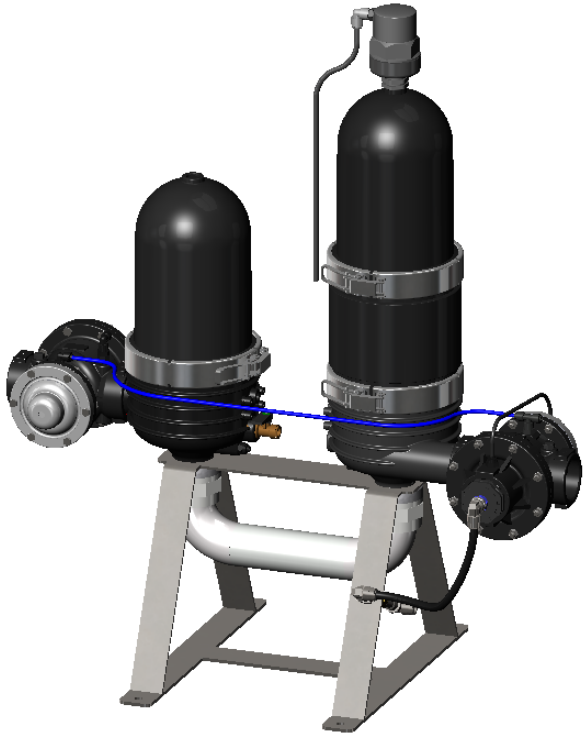
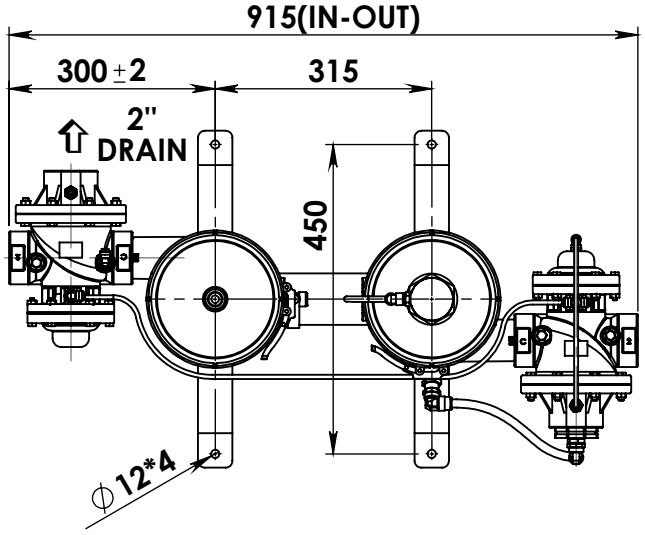
BACKUP: DISK-2S

DRAWER N:









MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT	2" S.K. COMPAKT ALL PLASTIC AIR AIDED FLUSHING			PAGE___OF___
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APPROVED			FILE CODE DRAWING OF MAN.	DRAWING:
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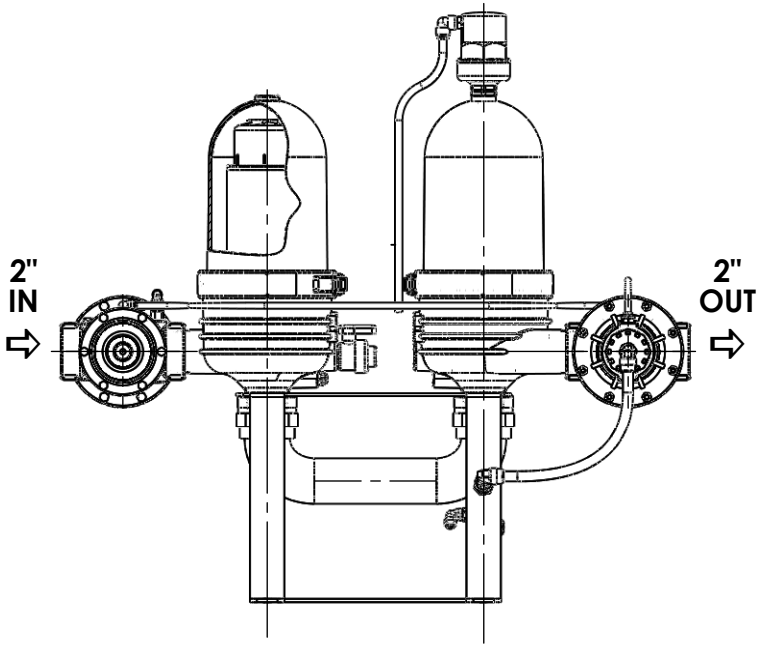
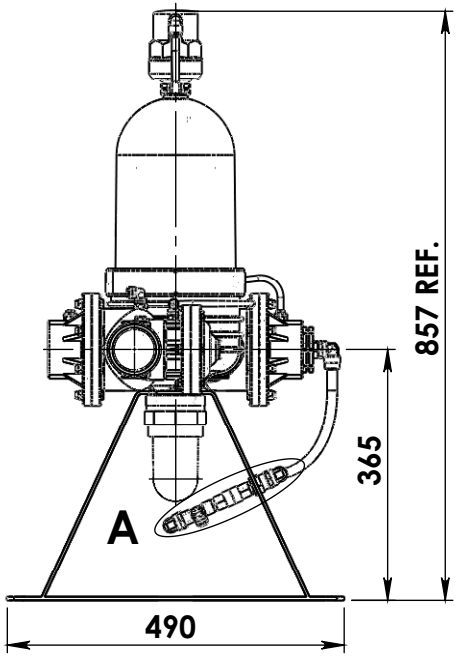
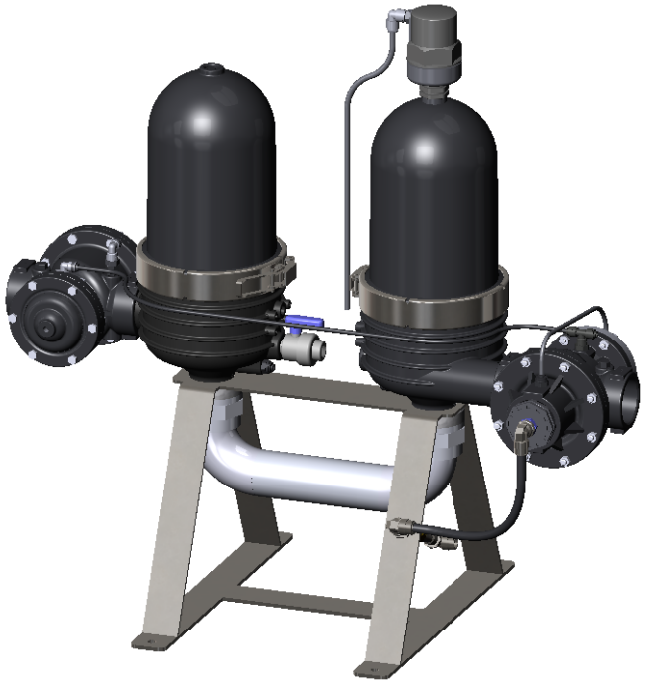
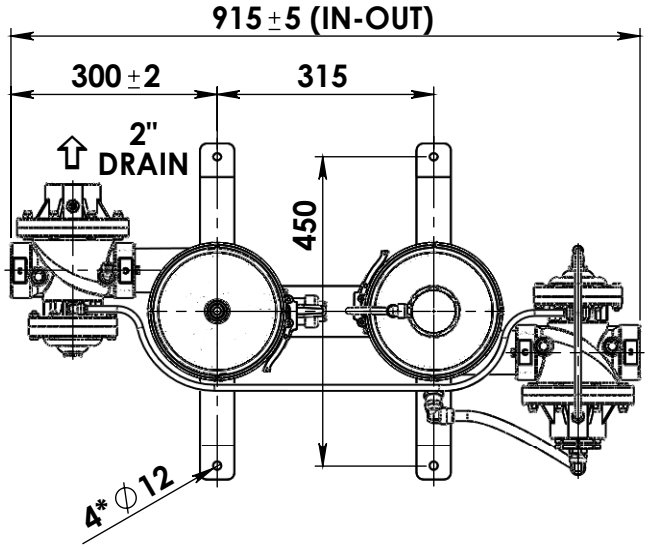
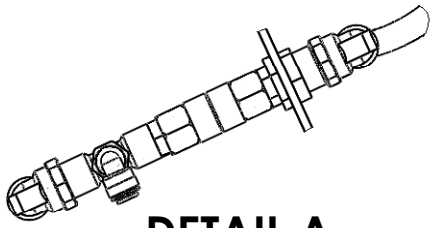
14/04/2010 0:37:19 2010 אפריל 14 יום רביעי











DETAIL A

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2" S.K. COMPAKT ALL PLASTIC AIR AIDED FLUSHING

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1566M0201A2SW

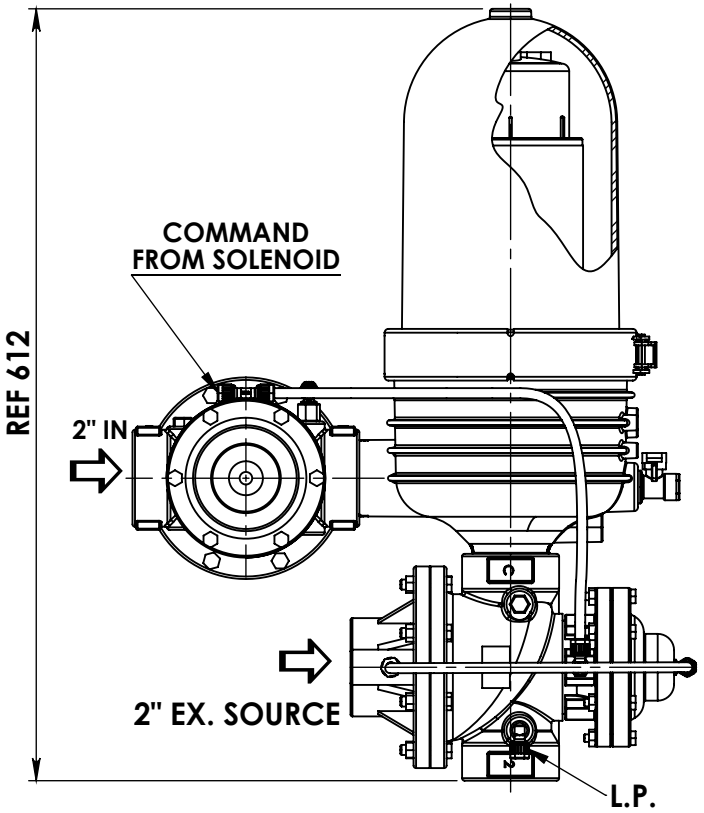
PATH	FILE CODE	NAME	DATE	SIGNATURE
MASTERS – SOLID\ FILTERS COMPLETE\ 2 INCH FILTERS\COMPACT	1566M0201A2SW S	OLEG	19/08/2009	OLEG

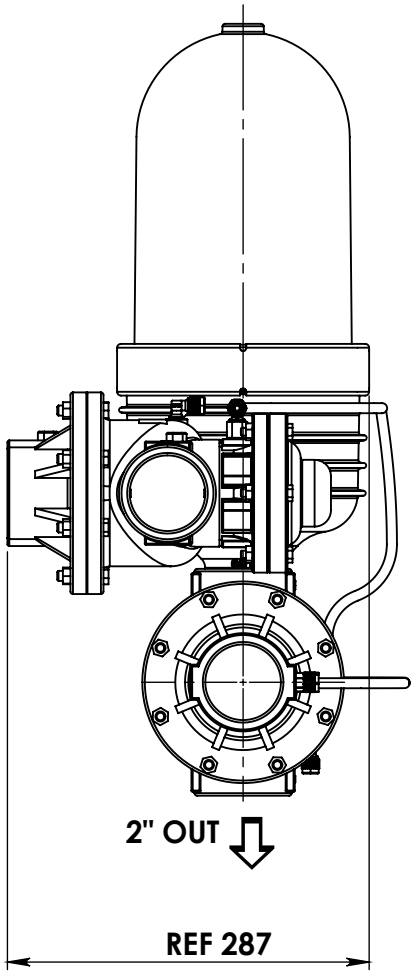
	NAME	DATE
DRAWN	HELEN	19/08/2009
CHECKED	OMRY	19/08/2009
APPROVED	OMRY	19/08/2009

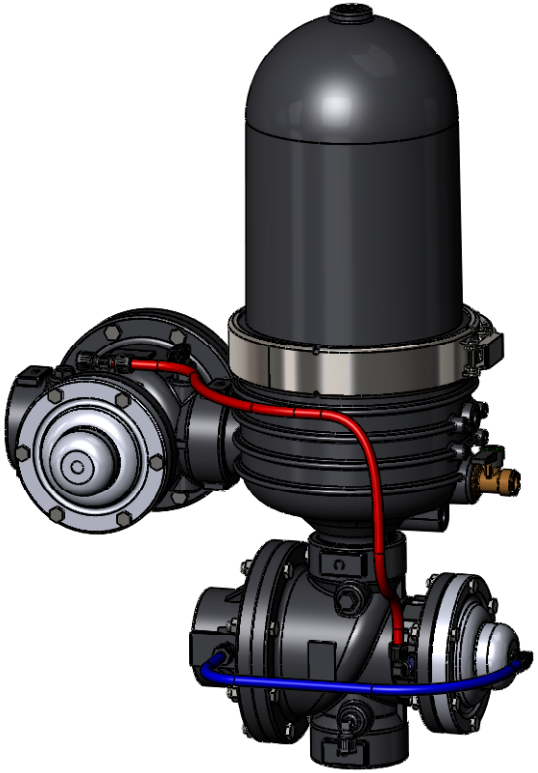
FILE CODE DRAWING OF MANIFOLD:

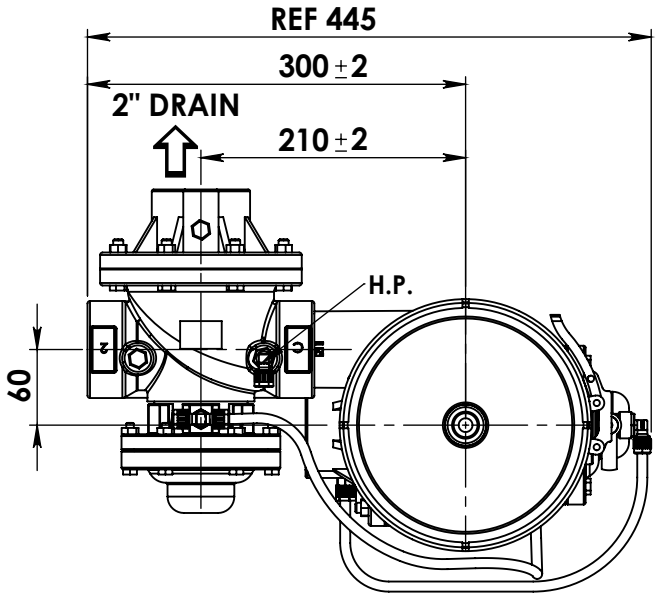
BACKUP: DISK-2S

DRAWER N:









MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: 2" S.K. COMPACT WITH EXTERNAL SOURCE FPR BACK FLUSH — PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1563M0201A1

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	OLEG	11.11.09
CHECKED	OMRY	11.11.09
APPROVED	OMRY	11.11.09

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N:

2" Poly Battery

Filtration Batteries

Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	2.8	**psi**	40.6
Filtration surface area	**cm^2**	880	**in^2**	136.4
Filtration volume	**cm^3**	1,320	**in^3**	80.5
Backwash water volume	**lit**	33	**gal**	8.7

Maximum Filtration Flow Rate / Water Quality

No. of units		2	3	4	5	6	2	3	4	5	6
Filtration Grade	**Water Quality**	**m^3/h**					**gpm**				
400-130 µ	Good	50**	75	100	125	150	220**	330	440	550	660
	Average	38**	57	76	95	115	167**	250	334	418	506
	Poor	27**	41	54	67	84	119**	180	238	294	370
	Very Poor	16**	25	33	41	49	70**	110	145	180	215
100-70 µ	Good	40**	60	80	100	120	176**	264	352	440	528
	Average	30**	45	60	75	90	132**	192	264	330	396
	Poor	20**	30	40	50	60	88**	132	176	220	264
	Very Poor	13**	20	26	33	40	57**	88	114	145	176
55-40 µ	Good	28**	42	56	70	84	123**	184	246	308	364
	Average	22**	33	44	55	66	97**	145	193	242	290
	Poor	15**	23	30	38	45	66**	101	132	167	198
	Very Poor	9*	14*	18*	24	33	39*	61*	79*	105	145
20 µ	Good	14*	21	28	35	42	61*	92	123	154	184
	Average	10*	16**	21	26	32	44*	70**	92	114	140
	Poor	7*	11**	14**	18**	21	30*	48**	61**	79**	92
	Very Poor	5*	7*	9*	11**	13**	22*	30*	39*	48**	57**

* External source for backwash is necessary

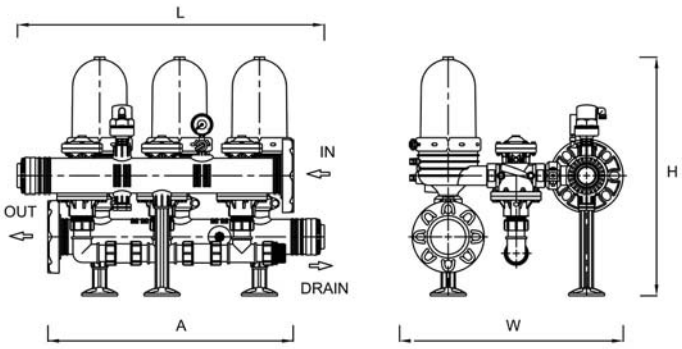
** When pressure is low, it is necessary to close downstream valve during backwash

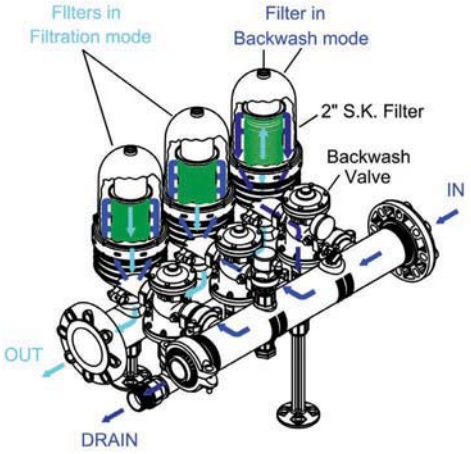
2" Poly Battery

Filtration Batteries

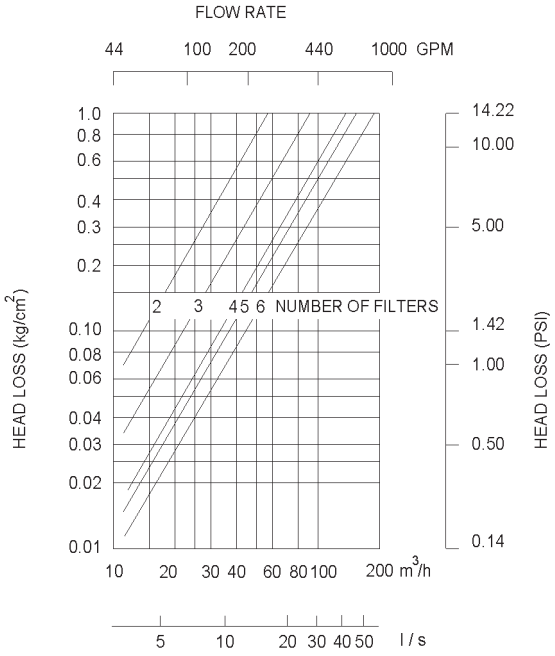
Dimensions and Weights

		2	3	4	5	6		2	3	4	5	6
D Inlet\Outlet diameter	**mm**	110	110	110	110	160	**inch**	4	4	4	4	6
L Length	**mm**	710	960	1210	1460	1915	**inch**	28	37 1/4	47 5/8	57 1/2	75 1/2
H Height	**mm**	750	750	750	750	835	**inch**	29 5/8	29 5/8	29 5/8	29 5/8	32 7/8
W Width	**mm**	670	670	670	670	752	**inch**	26 3/8	26 3/8	26 3/8	26 3/8	29 5/8
A Flange to flange distance	**mm**	515	765	1015	1265	1915	**inch**	20 5/8	30 1/8	40	49 7/8	75 1/2
Shipping weight (approx.)	**kg**	30	50	70	90	140	**lbs**	66	110	154	198	308





Head Loss Chart, Clean State



2" Poly batteries are available with:

Non Corrosive material valves

Arkal Spin Klin® 2” Battery

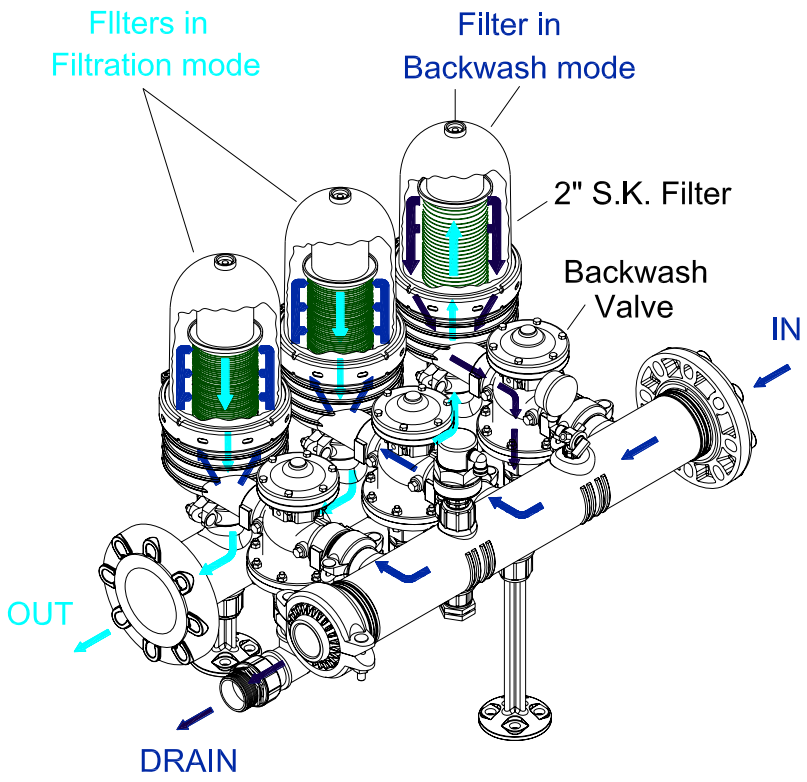
Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Operation

During the filtration stage, water flows through the inlet manifold and is distributed through the 2” x 2” backwash valves into the Spin Klin filters.

The water then passes through the filter elements to the outlet manifold for consumer use.



Description of the Backwashing Process

1. The controller transmits an electrical command to the first solenoid according to either differential pressure or time.
2. The solenoid then sends a pressure command to the backwash valve, moving it from the filtration mode to the backwash mode.
3. Filter #1 is then backwashed with water from the outlet manifold that has been filtered by the other filters in the system. Contaminated water and impurities flow out through the drain manifold.
4. On completion of the allotted backwashing time, the controller releases the backwash command, and filter #1 returns to the filtration mode.
5. Filter #2 then enters the backwash mode, and the process is repeated until all the filters in the system have been backwashed.
6. After all the filters have been backwashed the systems returns to the filtration mode, until the next backwash cycle.

Spin Klin Technology- Spin Klin Spine Model 2

General:

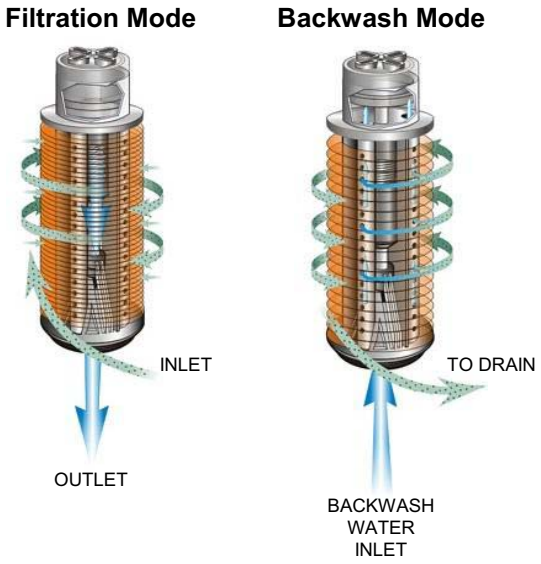
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded by micron size, and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston which are used to alternately compress and release the discs during filtration and backwash cycles.

Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs.

Backwash Mode:

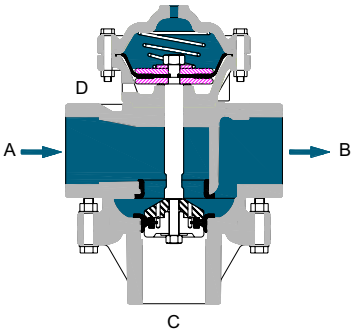
During backwash the discs are released by releasing the inlet hydraulic pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.



2" x 2" Backwash Valve

Filtration Position:

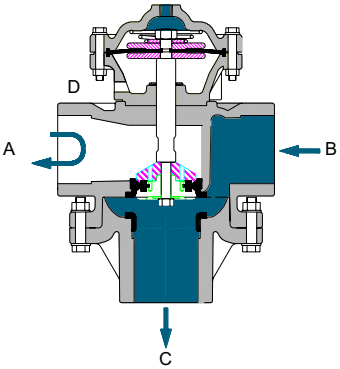
Water flows from port A (main supply) to port B (filter connection). Port C (drain water outlet) is closed by the seal.



Filtration mode

Backwash Position:

Command pressure is applied to the bottom side of the diaphragm through port D.The diaphragm moves up, pulling the sealed body by the shaft. Port A is closed by the seal, preventing flow to the filter. Port C is now open allowing flushing water to flow from port B (filter connection) to the drain.



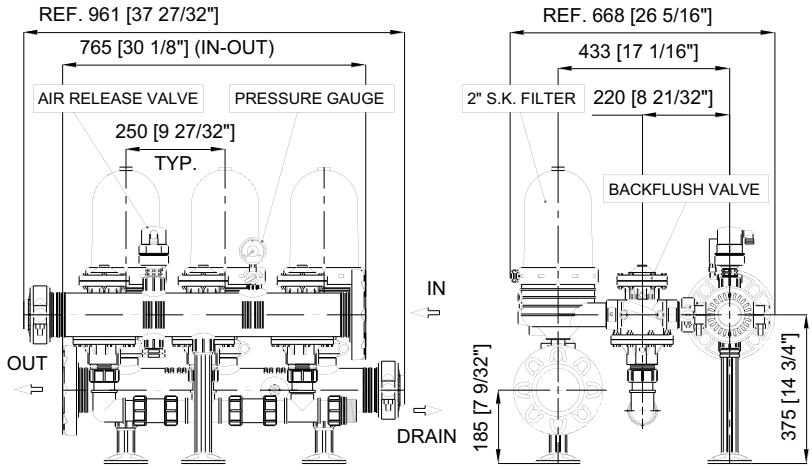
Backflush mode

System Installation and Startup

Technical Data

Maximum Pressure	10 bar	140 psi
Minimum Pressure	2.8 bar	38 psi
Backwash Flow Rate per unit	8 m^3/hr	35 gpm
Maximum Temperature	70°C	158°F
pH	4-11	4-11

2” Spin Klin Battery



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

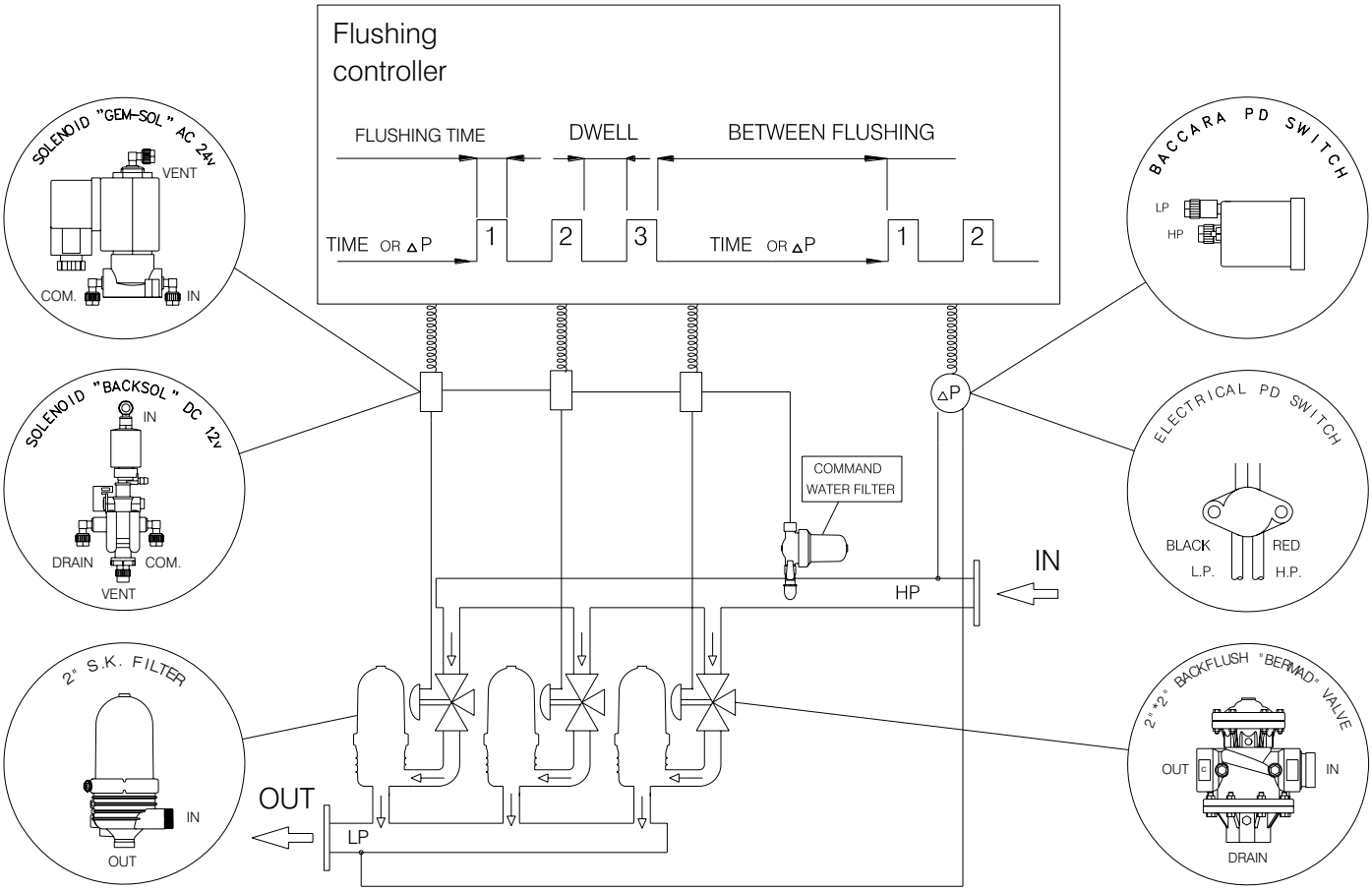
D. Cover clamps need to be properly closed.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- ❑ Close the downstream (flow control) valve (if available).
- ❑ Flush few cycles until clean.
- ❑ Slowly reopen the downstream valve.
- ❑ If the pressure difference remains high, check and see if the flow rate is too high.
  An excessive flow rate through the filter causes excessive pressure loss.



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

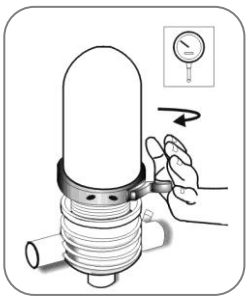


Figure 1

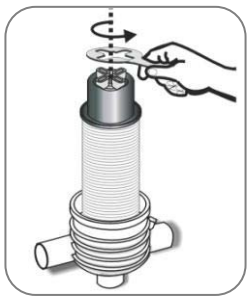


Figure 2

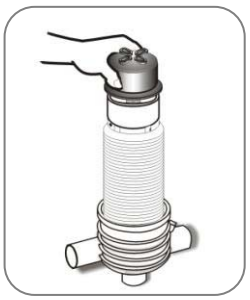


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to **"Cleaning Recommendations Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

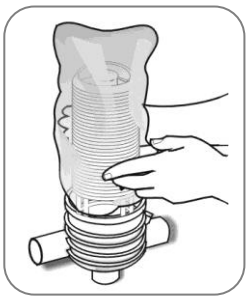


Figure 4

Figure 5

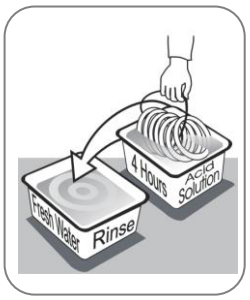


Figure 6

Check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Put on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

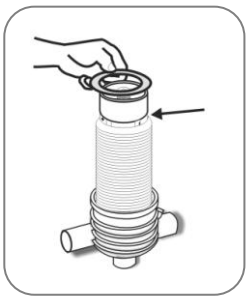


Figure 7

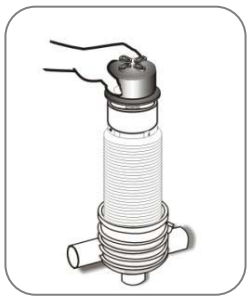


Figure 8

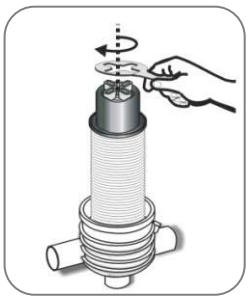


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

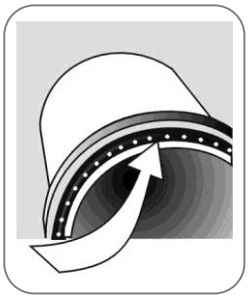


Figure 10

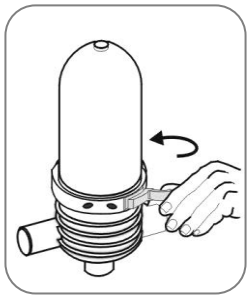


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer’s instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

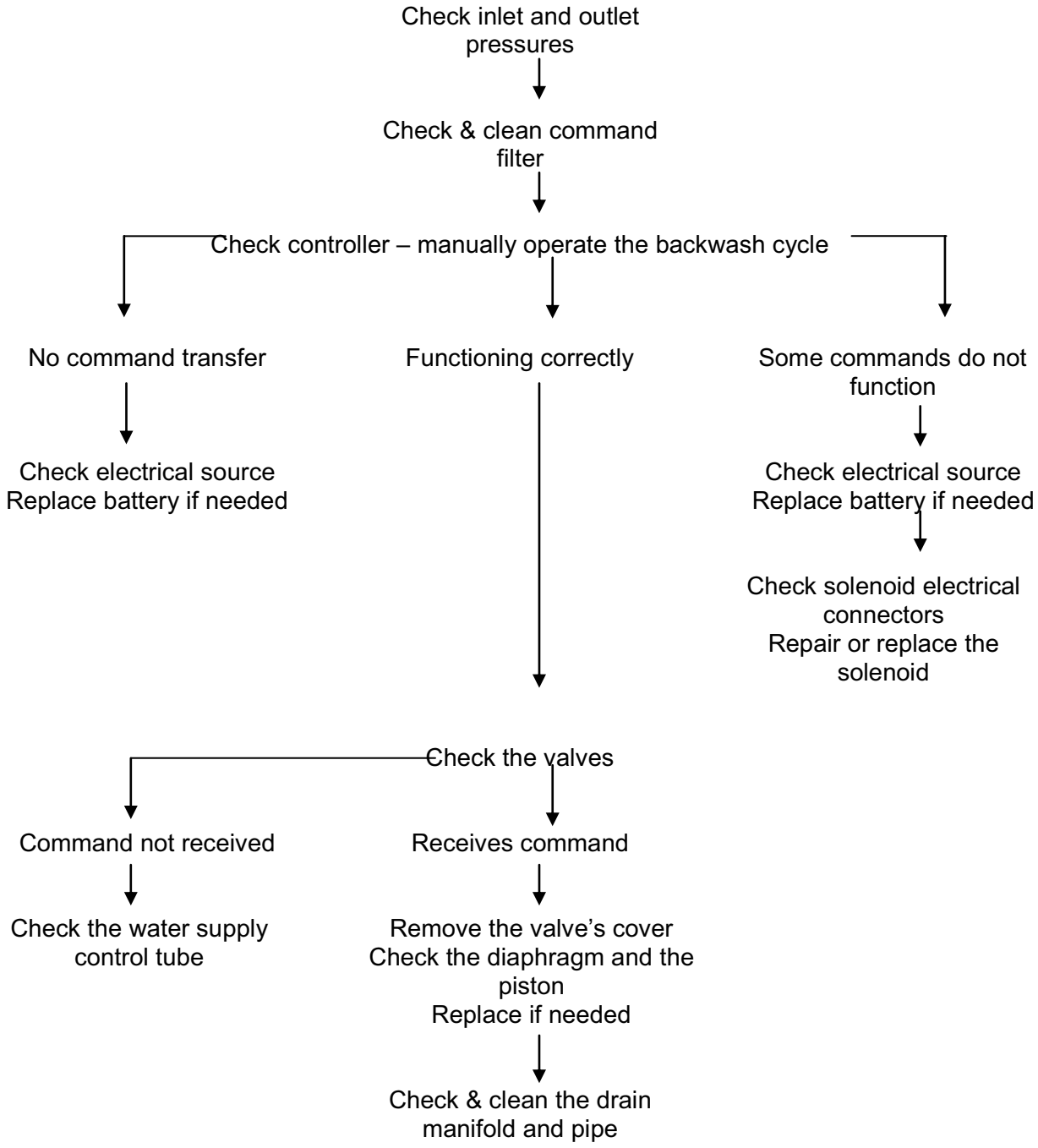
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite
  (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 2” Spin Klin system

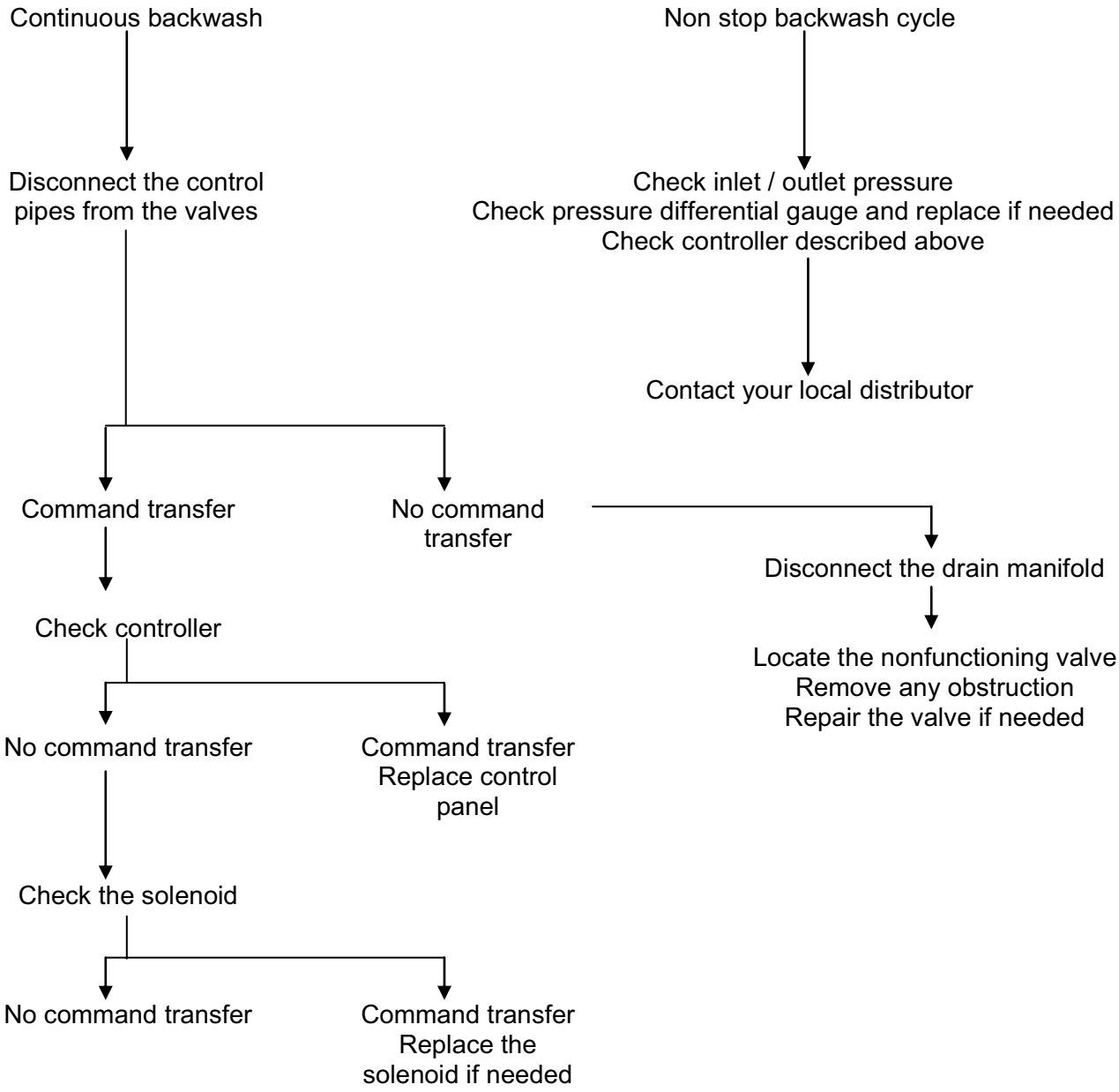
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 2” Spin Klin system

Continuous or Non-stop Backwashing



Contact your local distributor

Limited Warranty

ARKAL FILTRATION SYSTEMS ("ARKAL FILTRATION SYSTEMS") warrants to the original end user ("CUSTOMER") who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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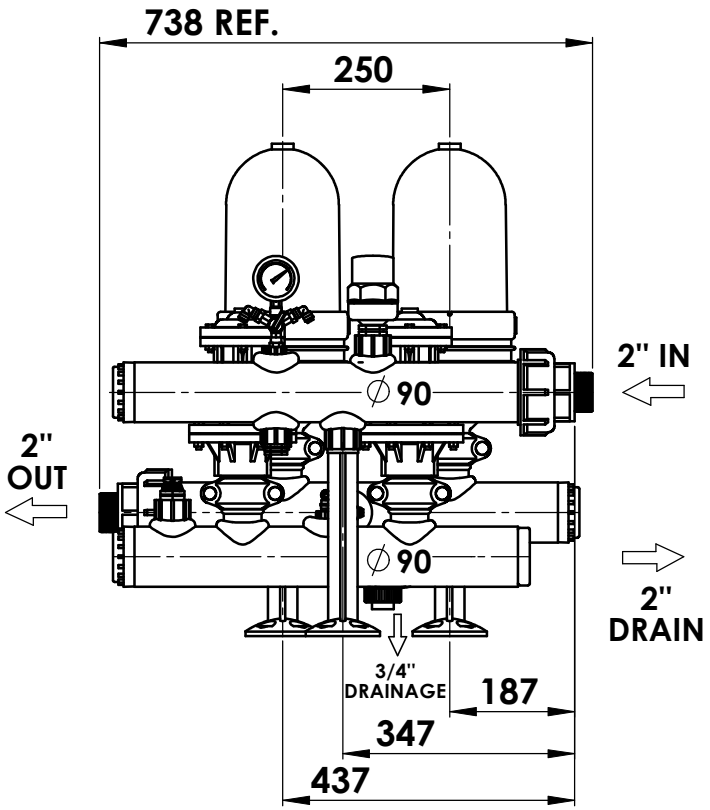
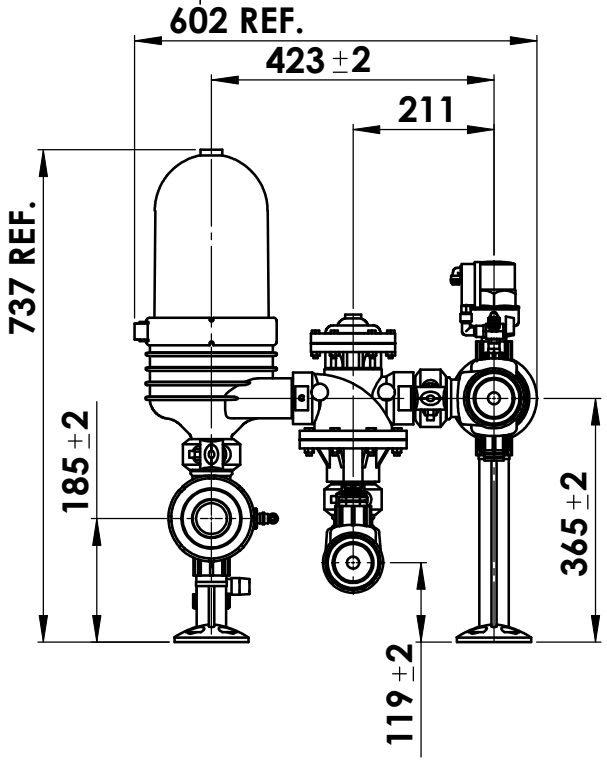
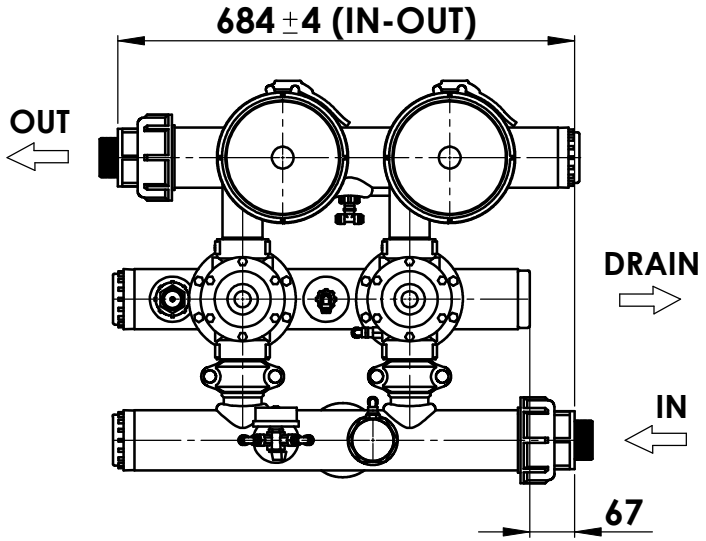
Email: filters@arkal.com Web: www.arkal-filters.com

Drawings

2" All Plastic Batteries







MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT	2*2" S.K. FILTERS PLASTIC BATTERY	PAGE 1_OF 5_
TITLE	ASSEMBLY DRAWING	CATALOGUE No: 1625P0202T3
SOLIDWORKS FILE CODE:	1625P03__3	
FILE CODE:	1625P0202T3 C	
FILE CODE OF FILTER COMPL.:	2" SK FILTER + BERMAD 2261M3007__	

	NAME	DATE
DRAWN	ELENA	18/05/2009
CHECKED	NIKOLAY	18/05/2009
APPROVED	OMRY	25/05/2009
B.O.M.	OLEG	25/05/2009

FILE CODE DRAWINGS: **PALLET- 26 (5201 5403) TRIWALL-13(5200 5300)**

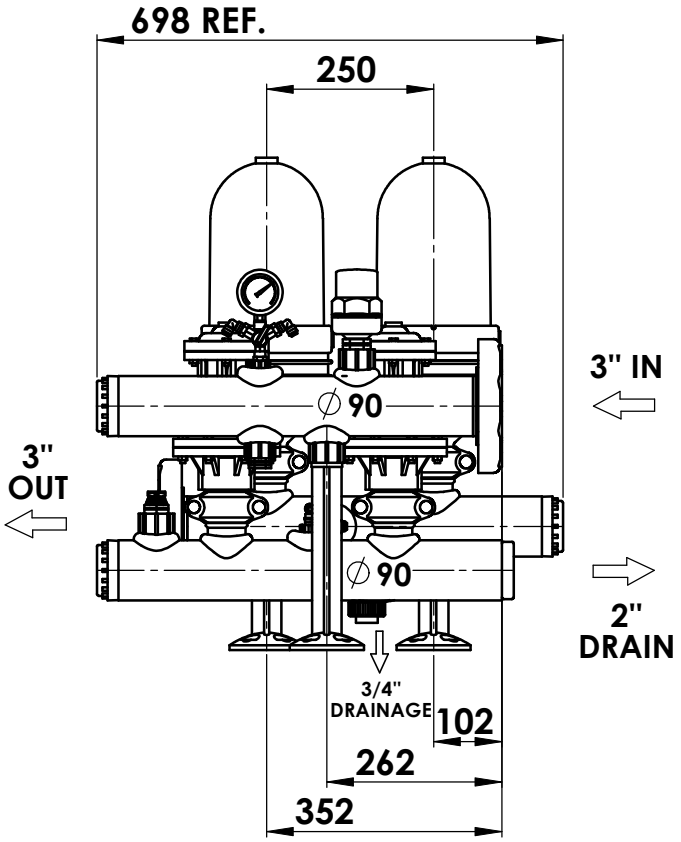
FILE CODE OF MANIFOLDS: 6626 0202TC2

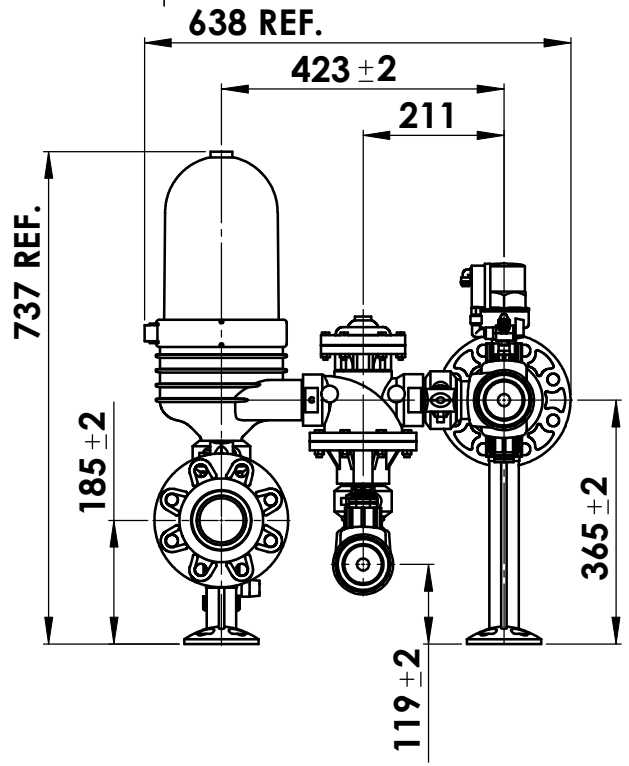
BACKUP: DISK-2S

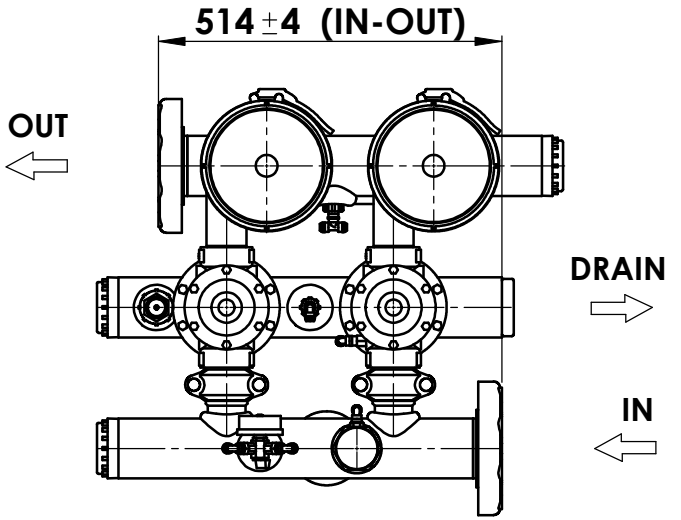
DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Wednesday, June 03, 2009 1:28:15 PM







MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 2*2'' S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0302U3

SOLIDWORKS FILE CODE: 1625P03__3 — FILE CODE: 1625P0302U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	20/05/2009
CHECKED	NIKOLAY	20/05/2009
APPROVED	OMRY	25/05/2009
B.O.M.	OLEG	25/05/2009

FILE CODE DRAWINGS: **PALLET- 26 (5201 5403) TRIWALL-13(5200 5300)**

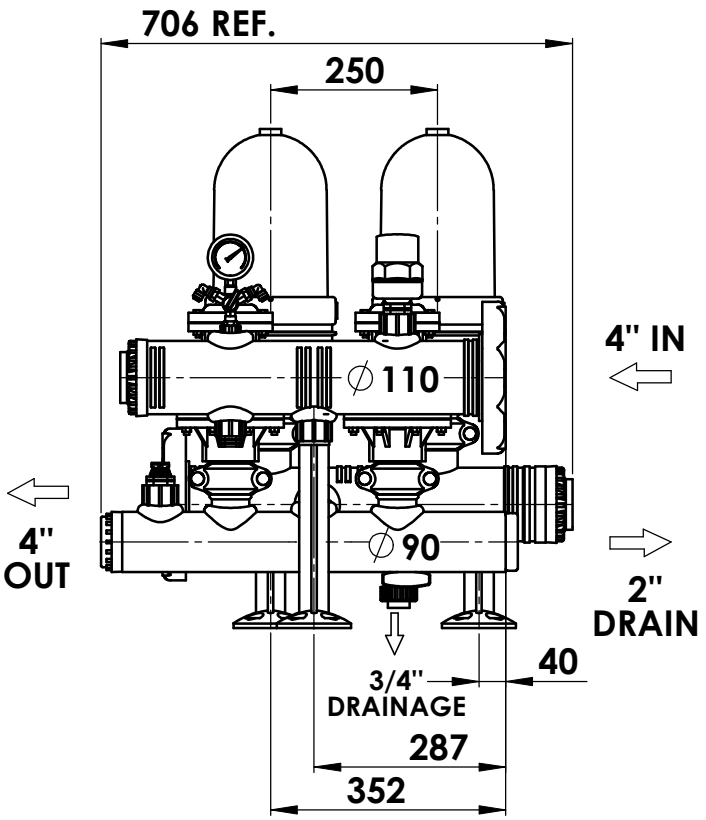
FILE CODE OF MANIFOLDS: 6626 0302VC2

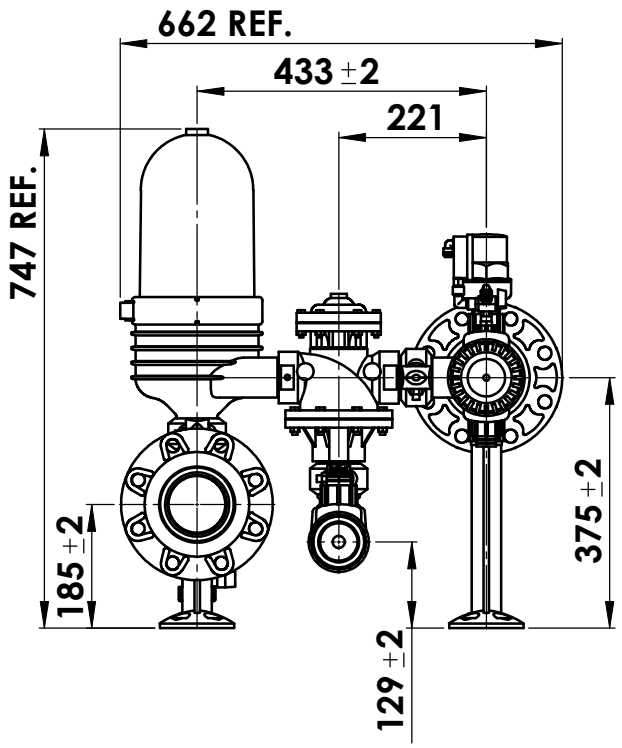
BACKUP: DISK-2S

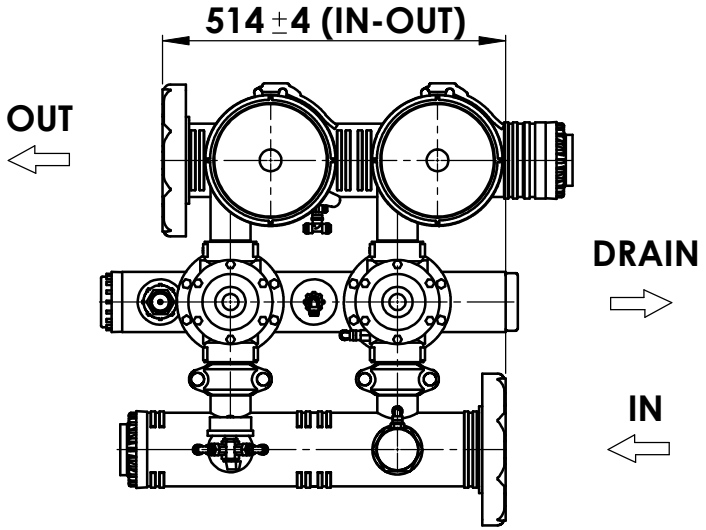
DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Tuesday, June 02, 2009 7:43:10 AM







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PROJECT: 2*2" S.K. FILTERS PLASTIC BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1625P0402U3
SOLIDWORKS FILE CODE: 1625P04__3		FILE CODE: 1625P0402U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
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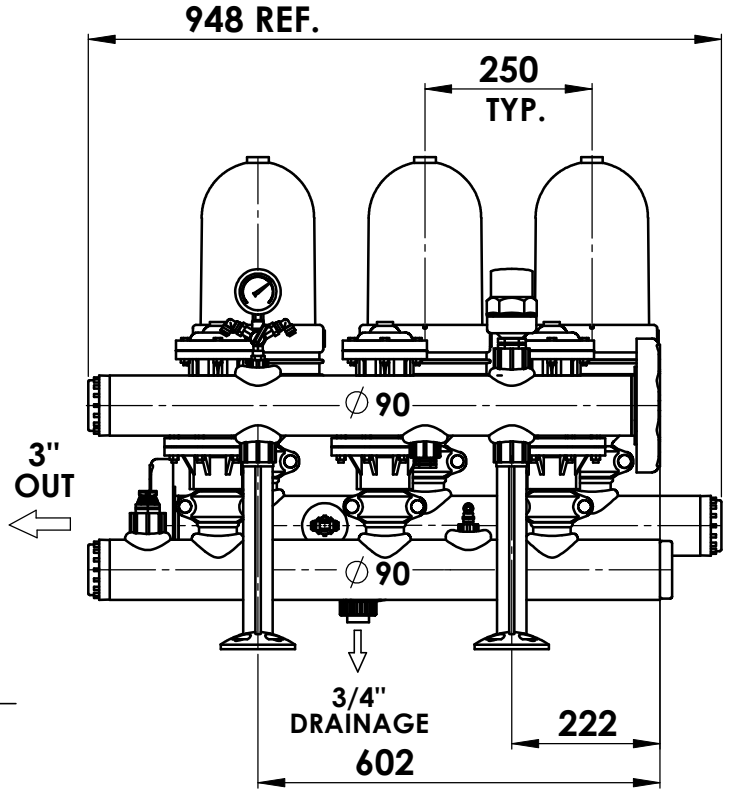
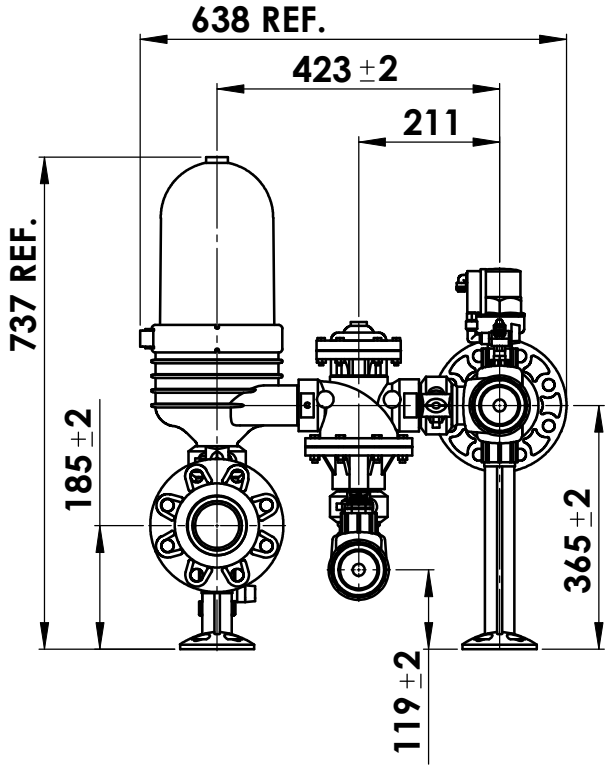
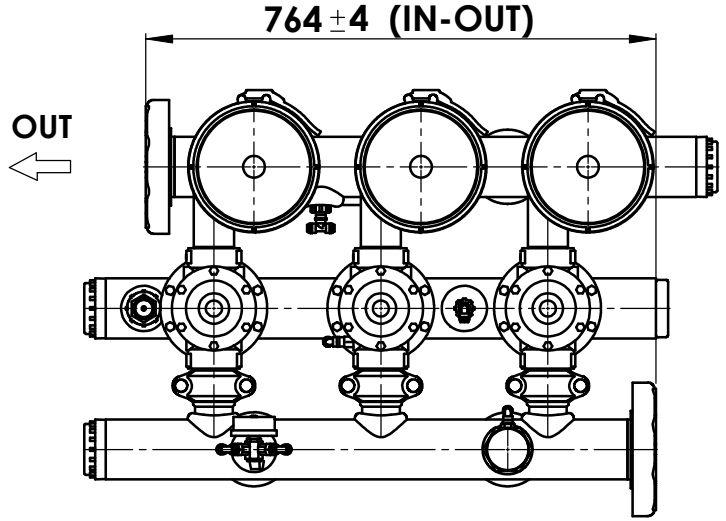
CHECKED	NIKOLAY	30/04/2009		
APPROVED	OMRY	17/05/2009	FILE CODE OF MANIFOLDS: 5625 0402VC2	DRAWING: 2130
B.O.M.	OLEG	17/05/2009		

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Sunday, May 24, 2009 3:03:20 PM







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PROJECT: 3*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0303U3

SOLIDWORKS FILE CODE: 1625P03__3 — FILE CODE: 1625P0303U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	20/05/2009
CHECKED	NIKOLAY	20/05/2009
APPROVED	OMRY	25/05/2009
B.O.M.	OLEG	25/05/2009

FILE CODE DRAWINGS: **PALLET- 26 (5201 5403) TRIWALL-13(5200 5300)**

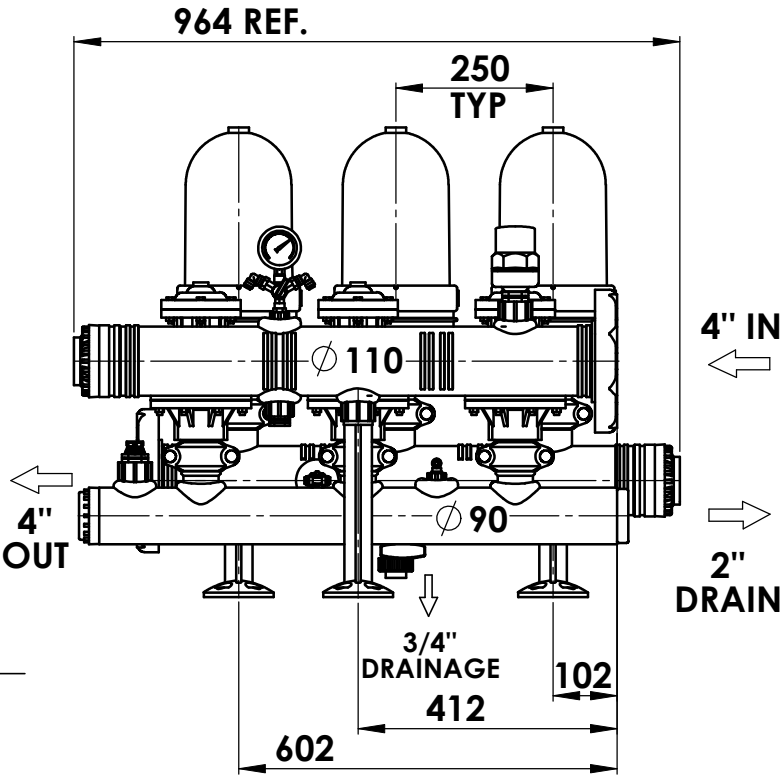
FILE CODE OF MANIFOLDS: 6626 0303VC2

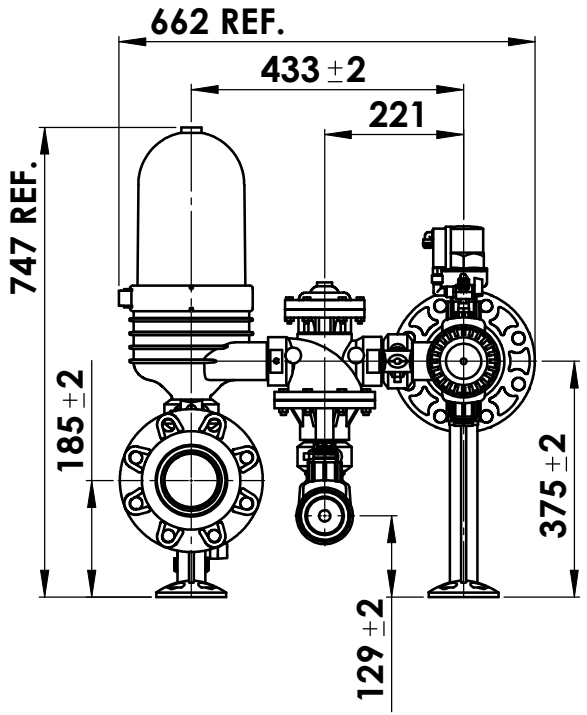
BACKUP: DISK-2S

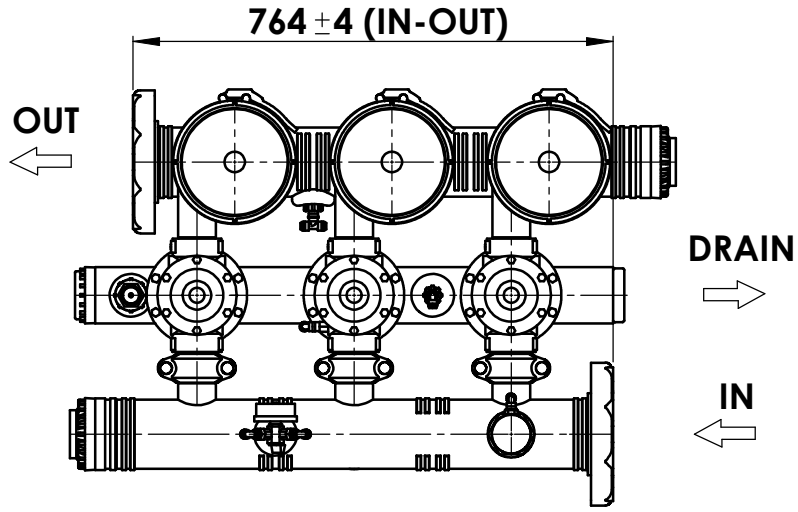
DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Tuesday, June 02, 2009 7:46:38 AM







MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 3*2'' S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0403U3

SOLIDWORKS FILE CODE: 1625P04__3 — FILE CODE: 1625P0403U3 C — FILE CODE OF FILTER COMPL.: 2'' SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	30/04/2009
CHECKED	NIKOLAY	30/04/2009
APPROVED	OMRY	17/05/2009
B.O.M.	OLEG	17/05/2009

FILE CODE OF DRAWINGS: **PALLET- 26 (5201 5403)** **TRIWALL-13(5200 5300)**

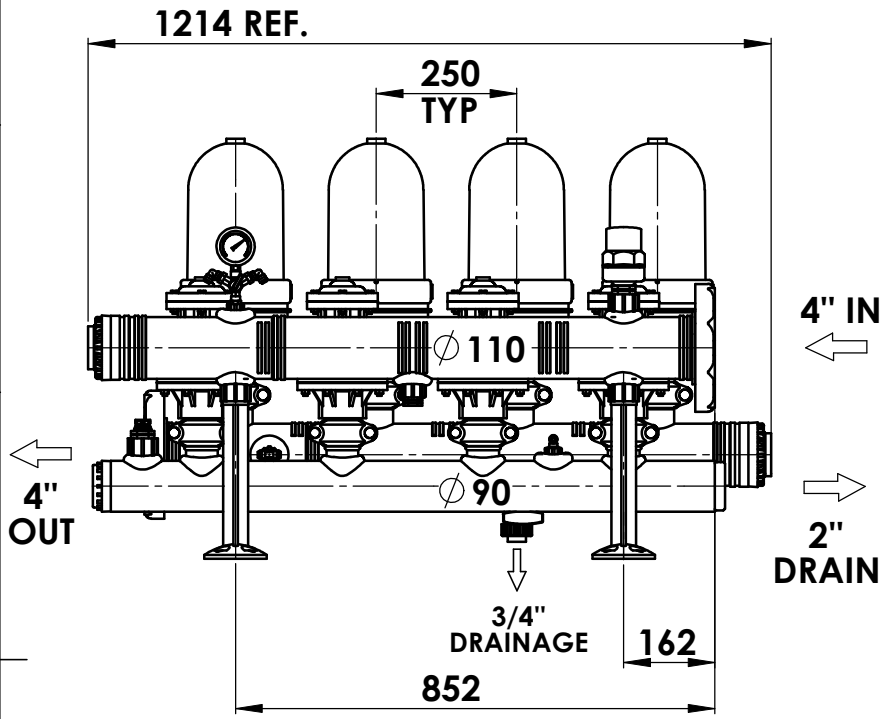
FILE CODE OF MANIFOLDS: 5625 0403VC2

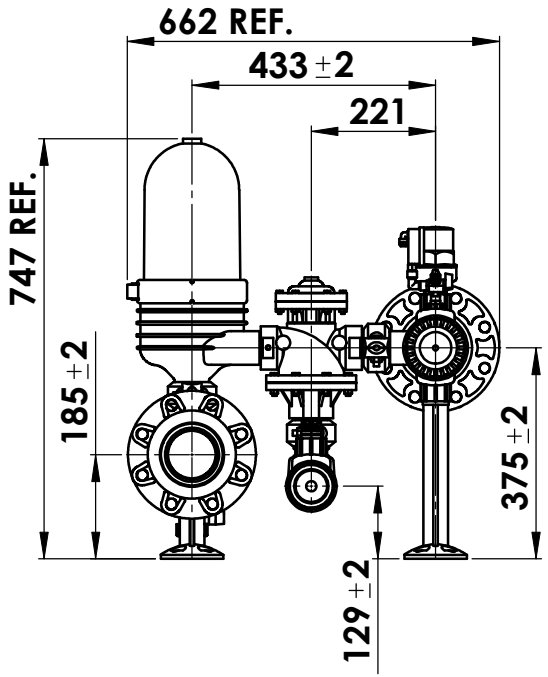
BACKUP: DISK-2S

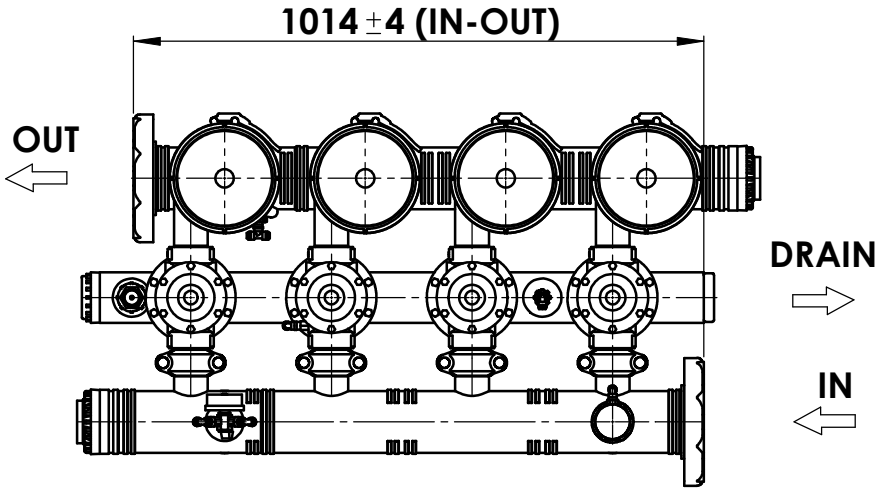
DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Sunday, May 24, 2009 3:09:41 PM







MODIFIC.	DATE	DESCRIPTION	SING

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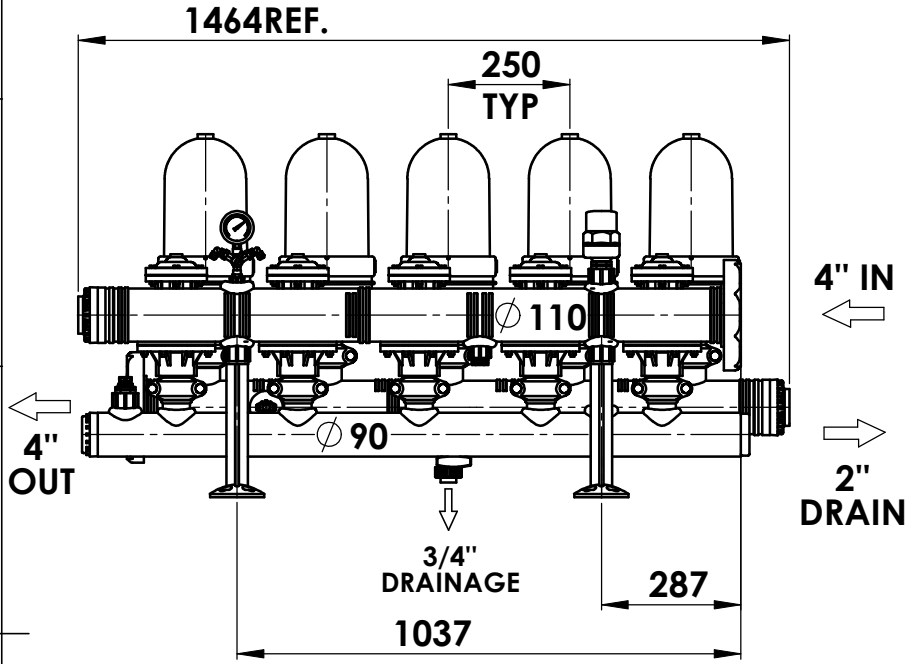
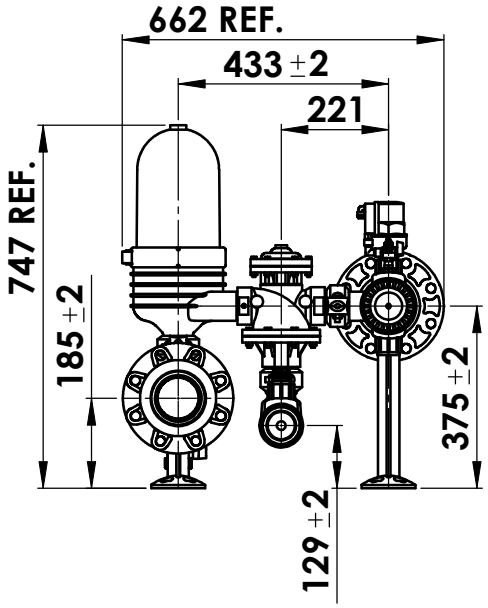
PROJECT: 4*2" S.K. FILTERS PLASTIC BATTERY		PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING		CATALOGUE No: 1625P0404U3
SOLIDWORKS FILE CODE: 1625P04__3	FILE CODE: 1625P0404U3 C	FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

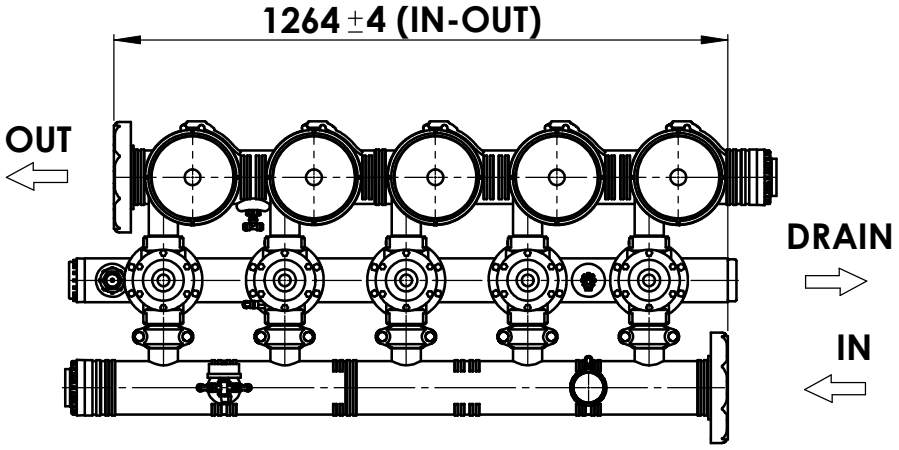
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	30/04/2009	PALLET- 25 (5201 5405) TRIWALL-111(5200 5320)	DISK-2S
CHECKED	NIKOLAY	30/04/2009		
APPROVED	OMRY	17/05/2009	FILE CODE OF MANIFOLDS: 5625 0404VC2	DRAWING: 2130
B.O.M.	OLEG	17/05/2009		

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Thursday, June 11, 2009 1:34:35 PM







MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 5*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0405U3

SOLIDWORKS FILE CODE: 1625P04__3 — FILE CODE: 1625P0405U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	30/04/2009
CHECKED	NIKOLAY	30/04/2009
APPROVED	OMRY	17/05/2009
B.O.M.	OLEG	17/05/2009

FILE CODE DRAWINGS: PALLET - 27 (5201 5404) TRIWALL-116(5200 5303)

BACKUP: DISK-2S

FILE CODE OF MANIFOLDS: 5625 0405VC2

DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

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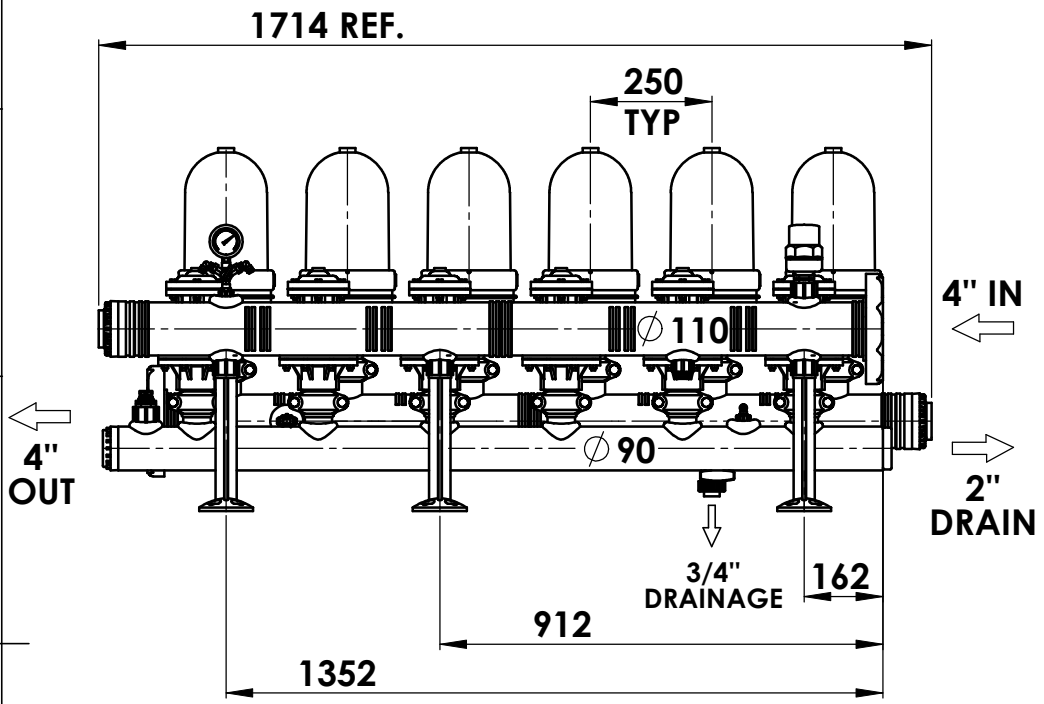

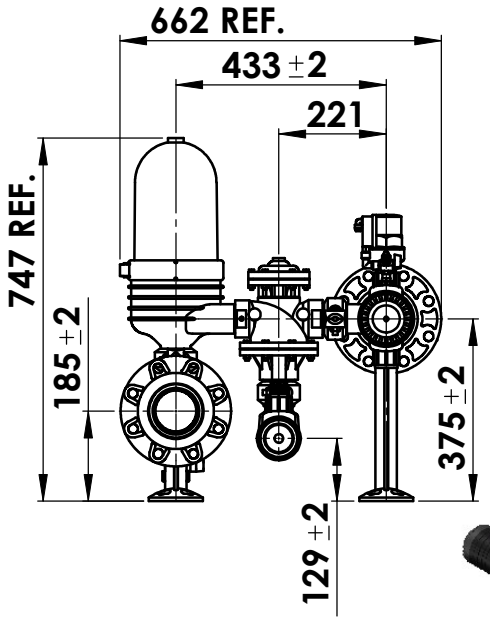

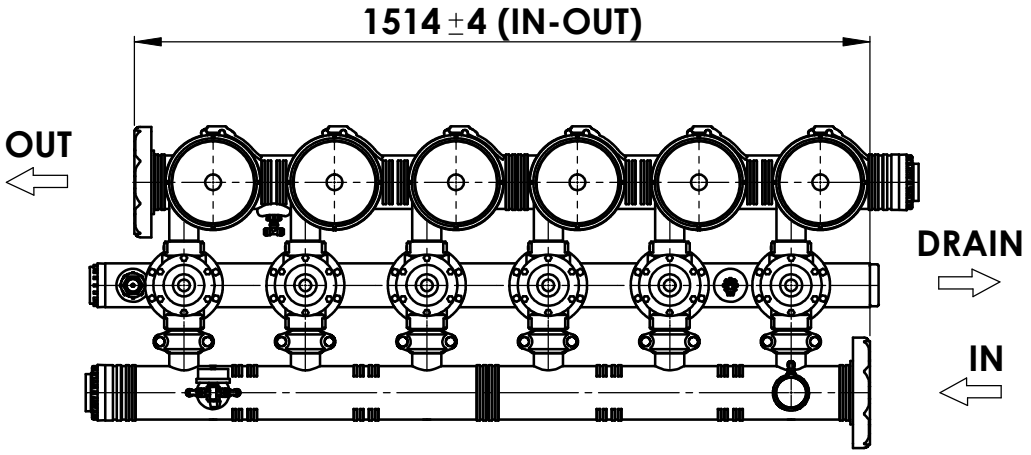

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 6*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0406U3

SOLIDWORKS FILE CODE: 1625P04__3 — FILE CODE: 1625P0406U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	30/04/2009
CHECKED	NIKOLAY	30/04/2009
APPROVED	OMRY	17/05/2009
B.O.M.	OLEG	17/05/2009

FILE CODE DRAWINGS: PALLET - 27 (5201 5404) TRIWALL-116(5200 5303)

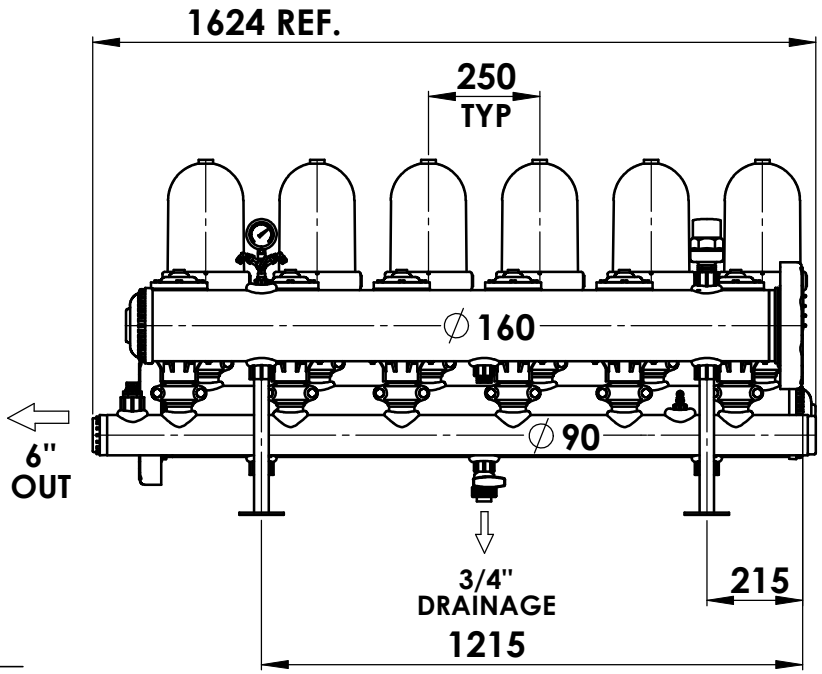
FILE CODE OF MANIFOLDS: 5625 0406VC2

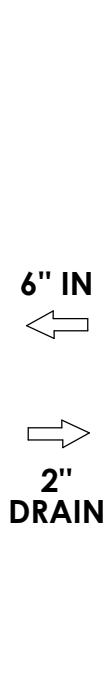
BACKUP: DISK-2S

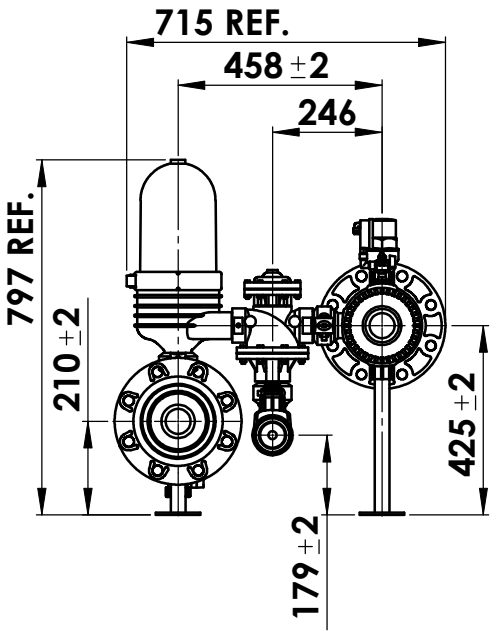
DRAWING: 2130

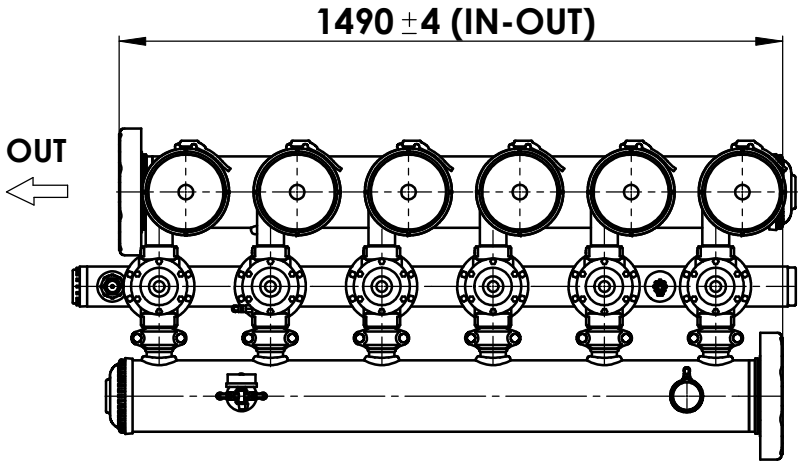
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

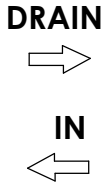
Sunday, May 24, 2009 3:31:20 PM











MODIFIC.	DATE	DESCRIPTION	SING

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BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 6*2'' S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625P0606U3

SOLIDWORKS FILE CODE: 1625P06__3 — FILE CODE: 1625P0606U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	14/05/2009
CHECKED	NIKOLAY	14/05/2009
APPROVED	YOEL	19/05/2009
B.O.M.	OLEG	19/05/2009

FILE CODE DRAWINGS: **PALLET - 27 (5201 5404) TRIWALL-116(5200 5303)**

FILE CODE OF MANIFOLDS: 6626 0606VC2

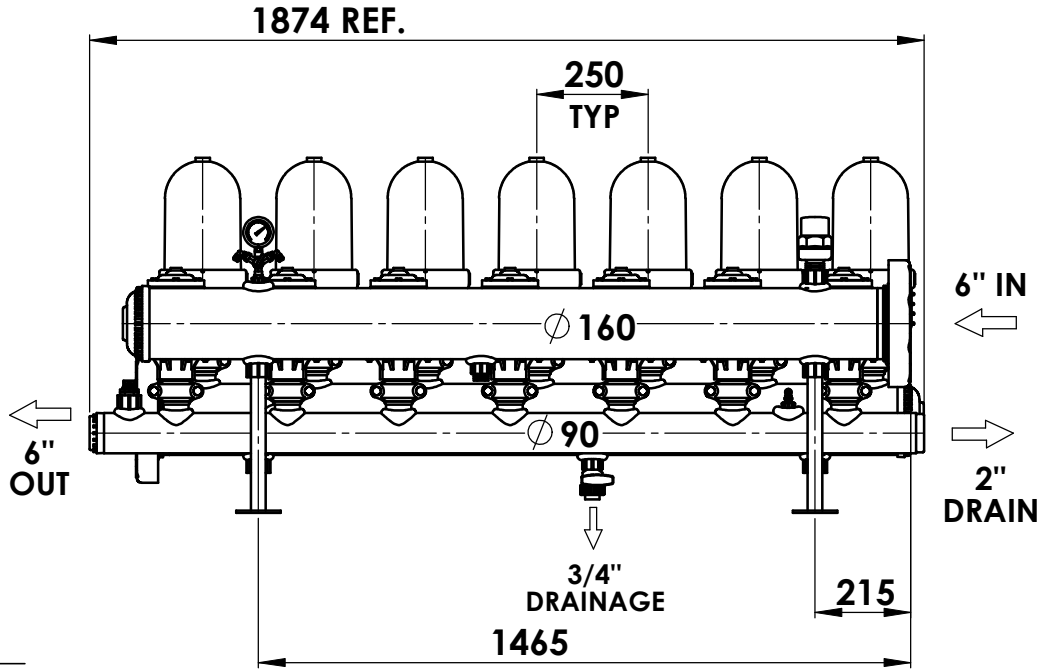
BACKUP: DISK-2S

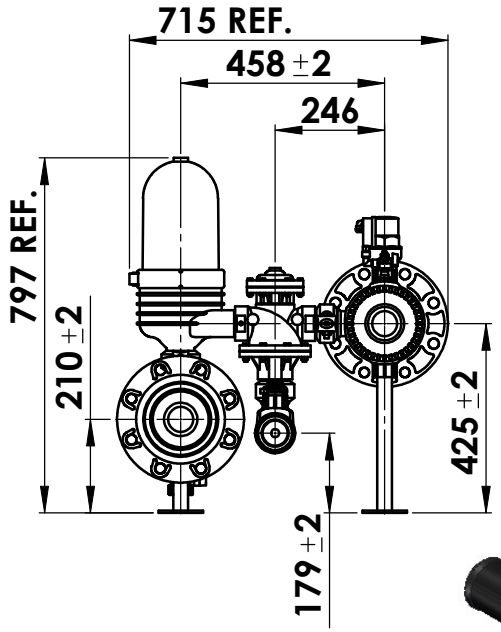
DRAWING: 2130

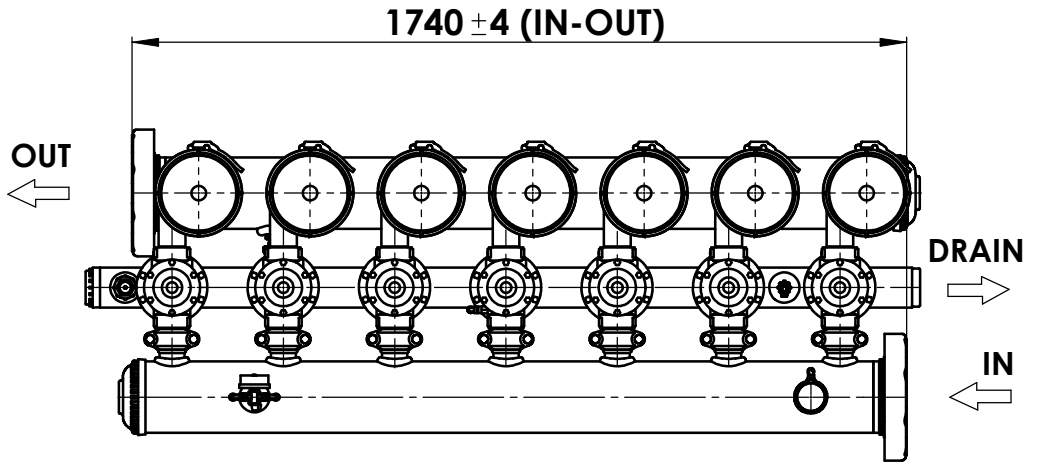
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

SHEET 1 OF 1

Wednesday, May 27, 2009 1:56:07 PM







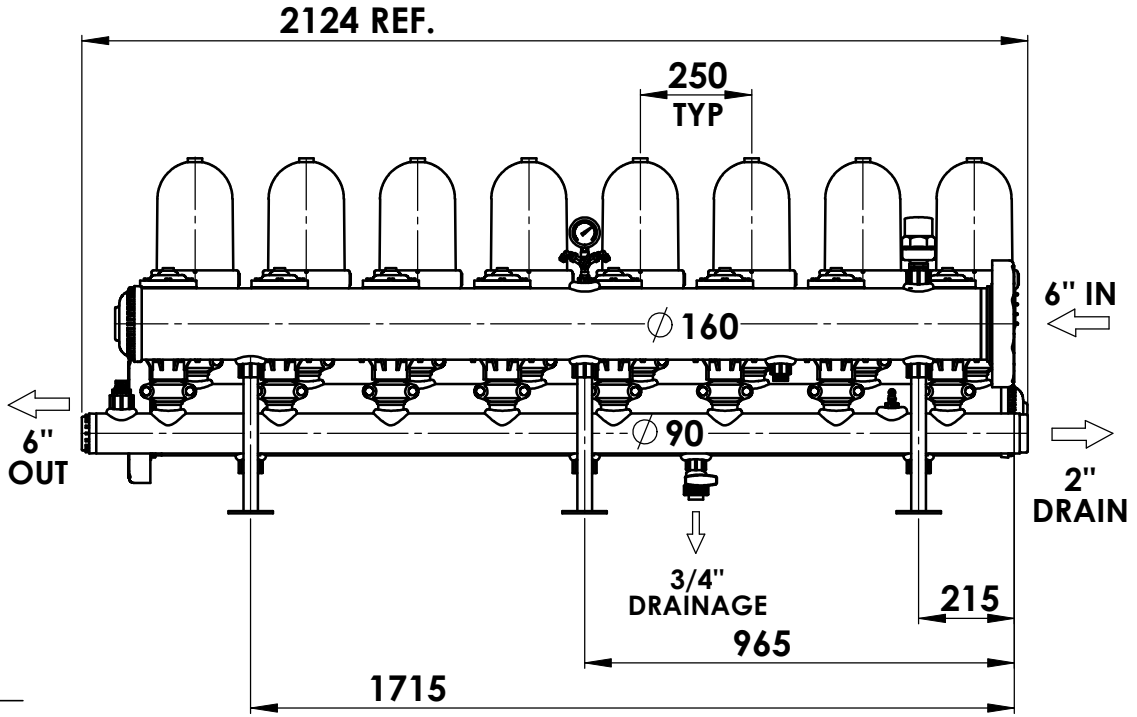
MODIFIC.	DATE	DESCRIPTION	SING

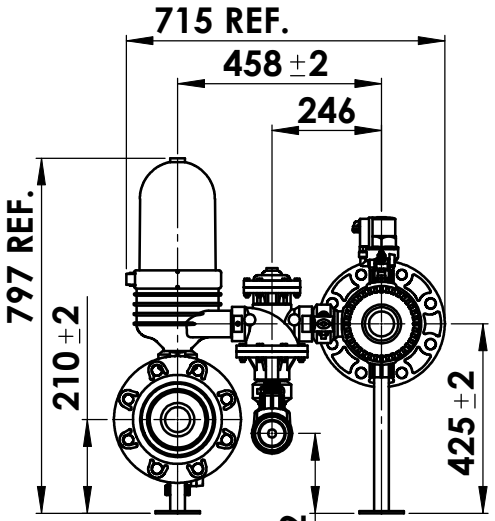
ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

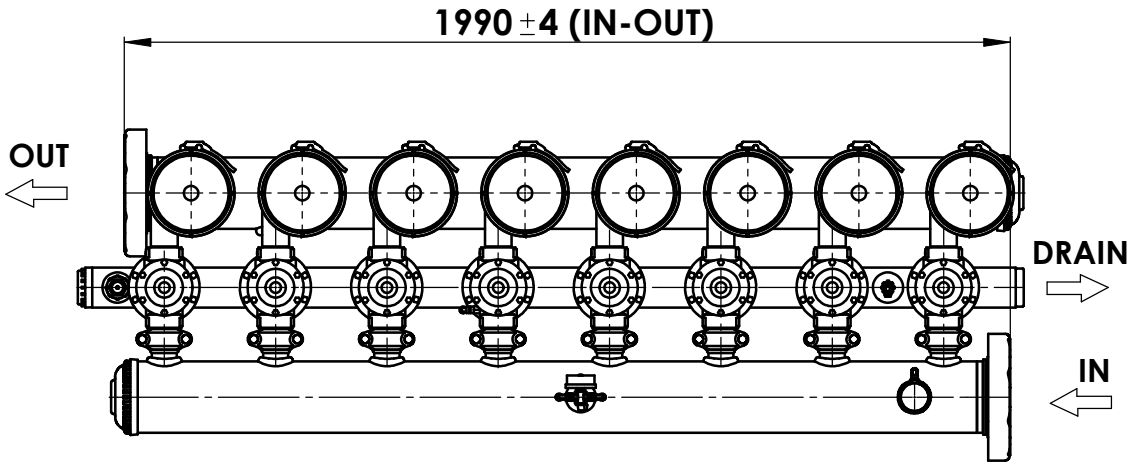
PROJECT: 7*2" S.K. FILTERS PLASTIC BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1625P0607U3
SOLIDWORKS FILE CODE: 1625P06__3		FILE CODE: 1625P0607U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M3007__
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	14/05/2009	PALLET - 331 (5201 5831)	DISK-2S
CHECKED	NIKOLAY	14/05/2009	TRIWALL-226(5200 5675)	
APPROVED	YOEL	19/05/2009	FILE CODE OF MANIFOLDS: 6626 0607VC2	DRAWING: 2130
B.O.M.	OLEG	19/05/2009		

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

Wednesday, May 27, 2009 2:02:40 PM







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT	8*2" S.K. FILTERS PLASTIC BATTERY
PAGE	1_OF 5_
TITLE	ASSEMBLY DRAWING
CATALOGUE No:	1625P0608U3
SOLIDWORKS FILE CODE:	1625P06__3
FILE CODE:	1625P0608U3 C
FILE CODE OF FILTER COMPL.:	2" SK FILTER + BERMAD 2261M3007__

	NAME	DATE
DRAWN	ELENA	14/05/2009
CHECKED	NIKOLAY	14/05/2009
APPROVED	YOEL	19/05/2009
B.O.M.	OLEG	19/05/2009

FILE CODE DRAWINGS: **PALLET - 244 (5201 5758)** **TRIWALL-205(5200 5655)**

FILE CODE OF MANIFOLDS: 6626 0608VC2

BACKUP: DISK-2S

DRAWING: 2130

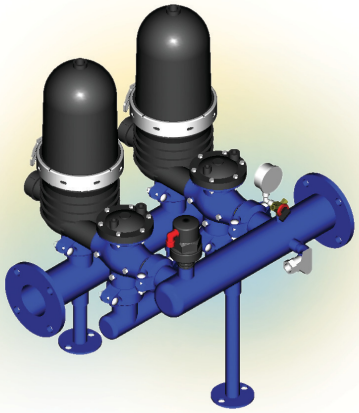
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\

SHEET 1 OF 1

Wednesday, May 27, 2009 2:07:46 PM

Opal

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm^2**	880	**in^2**	136.4
Filtration volume per unit	**cm^3**	1320	**in^3**	80.5
Backwash water volume per unit	**lit**	33	**gal**	8.7

Maximum Filtration Flow Rate / Water Quality

No. of units		2	3	4	5	6	2	3	4	5	6
Filtration Grade	**Water Quality**	**m^3/h**					**gpm**				
400-130 µ	Good	50**	75	100	125	150	220**	330	440	550	660
	Average	38**	57	76	95	115	167**	250	334	418	506
	Poor	27**	41	54	67	84	119**	180	238	294	370
	Very Poor	16**	25	33	41	49	70**	110	145	180	215
100 µ	Good	40**	60	80	100	120	176**	264	352	440	528
	Average	30**	45	60	75	90	132**	192	264	330	396
	Poor	20**	30	40	50	60	88**	132	176	220	264
	Very Poor	13**	20	26	33	40	57**	88	114	145	176
55 µ	Good	28**	42	56	70	84	123**	184	246	308	364
	Average	22**	33	44	55	66	97**	145	193	242	290
	Poor	15**	23	30	38	45	66**	101	132	167	198
	Very Poor	9*	14*	18*	24	33	39*	61*	79*	105	145
20 µ	Good	14*	21	28	35	42	61*	92	123	154	184
	Average	10*	16**	21	26	32	44*	70**	92	114	140
	Poor	7*	11**	14**	18**	21	30*	48**	61**	79**	92
	Very Poor	5*	7*	9*	11**	13**	22*	30*	39*	48**	57**

* External source for backwash is necessary

** When pressure is low, it is necessary to close downstream valve during backwash

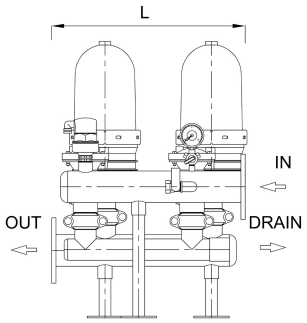
Opal

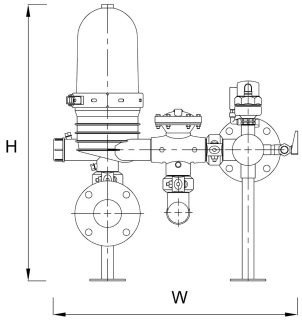
Filtration Batteries

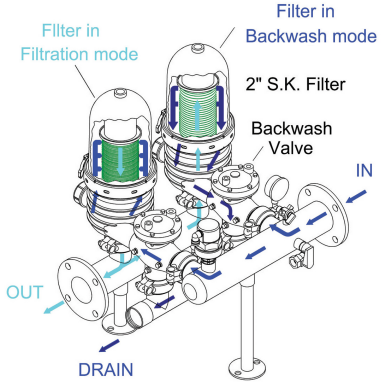
Dimensions and Weights

No. of units		2	3	4	5	6		2	3	4	5	6
D Inlet\Outlet diameter	**mm**	90	90	110	110	160	**inch**	3	3	4	4	6
L Length	**mm**	545	800	1145	1445	1745	**inch**	21	32	45	57	69
H Height	**mm**	788	788	817	817	844	**inch**	31	31	32	32	33
W Width	**mm**	643	643	674	674	731	**inch**	25	25	27	27	29
Shipping weight (approx.)	**kg**	80	100	120	140	160	**lbs**	176	220	264	308	352

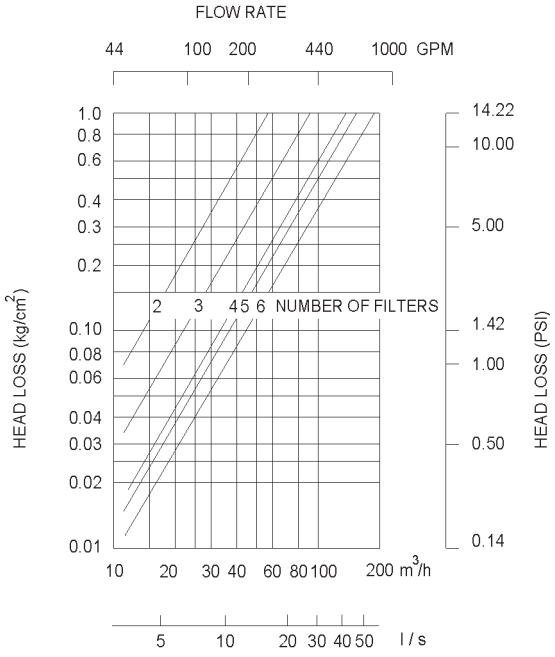
NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.







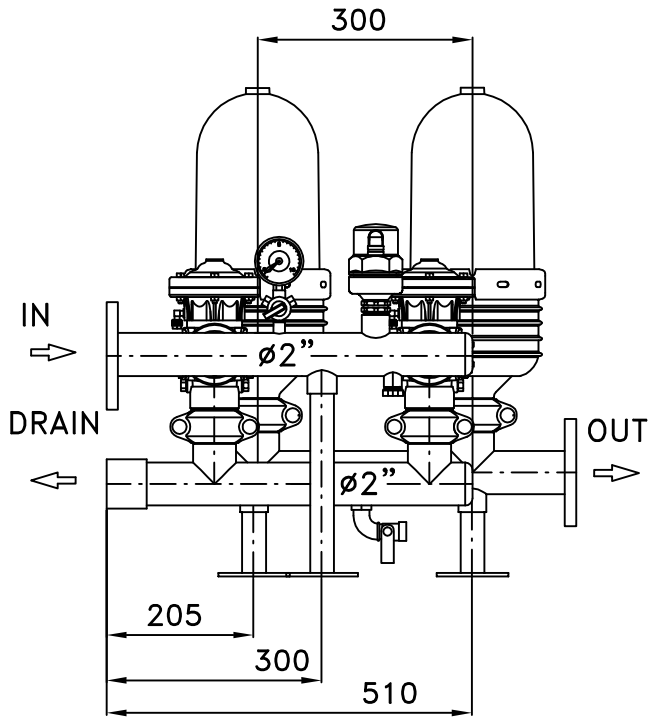
Head Loss Chart - for 130-400µ, Clean State

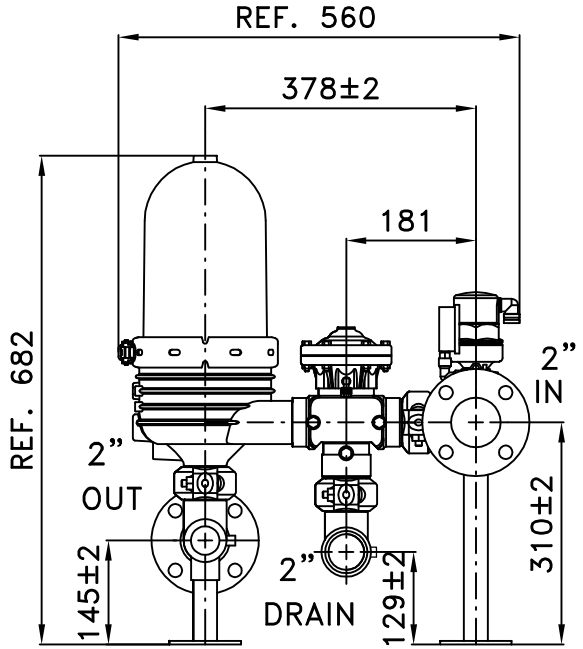


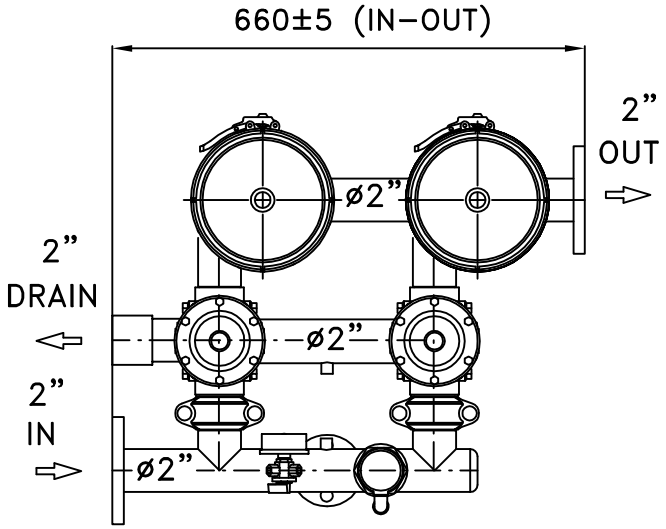
OPAL filtration batteries are available with:
Polyester coated steel,
Stainless steel or
Polypropelene manifolds.

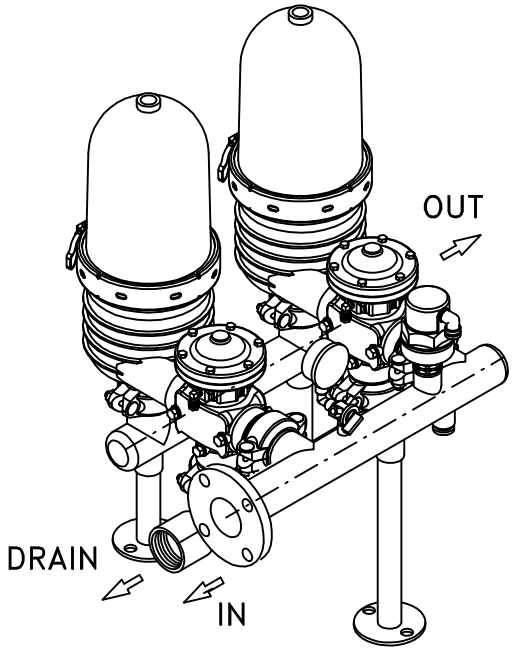
Drawings

2" Batteries









MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

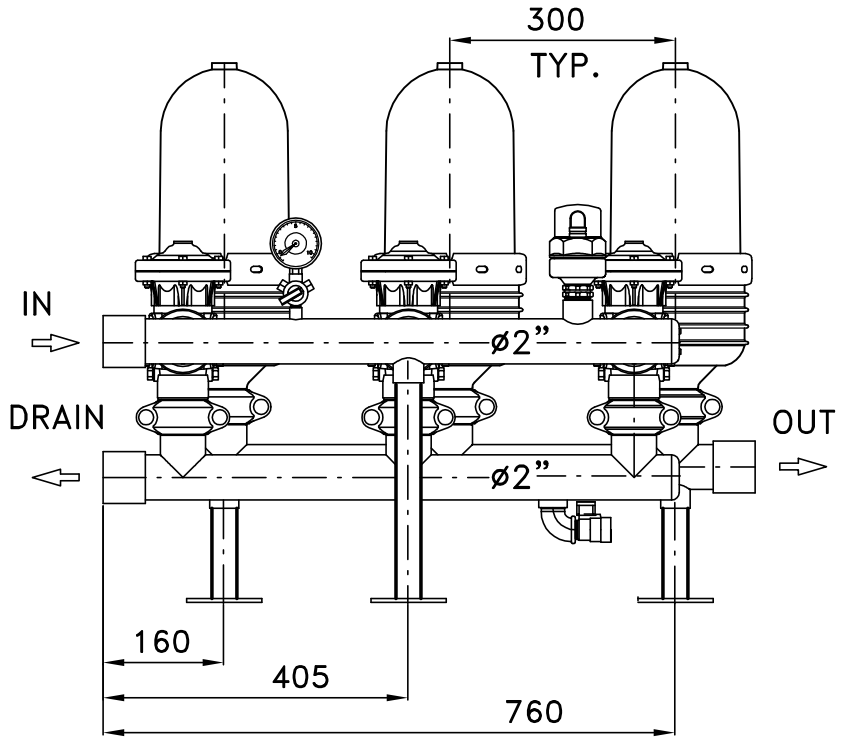
PROJECT: 2*2" S.K. FILTERS "AMETHIST" BATTERY
PAGE 1 OF 2

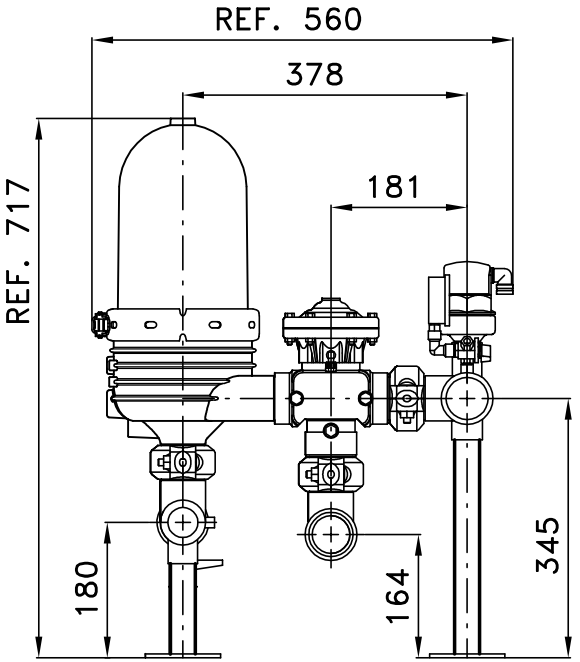
TITLE: ASSEMBLY DRAWING
CATALOGUE No: 1721P0202_5

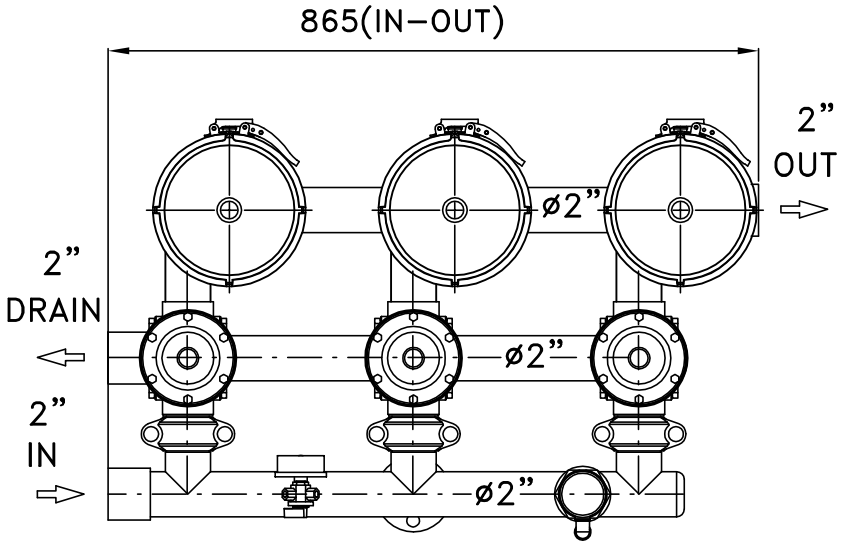
PATH BATERIES\2INCH\DRAIN-MT\AMETHIST
FILE CODE: 1721P0202_5
FILE CODE DRAWING OF MANIFOLD: 5725 0202__
BACKUP: DISK-33
DRAWER N: 2035

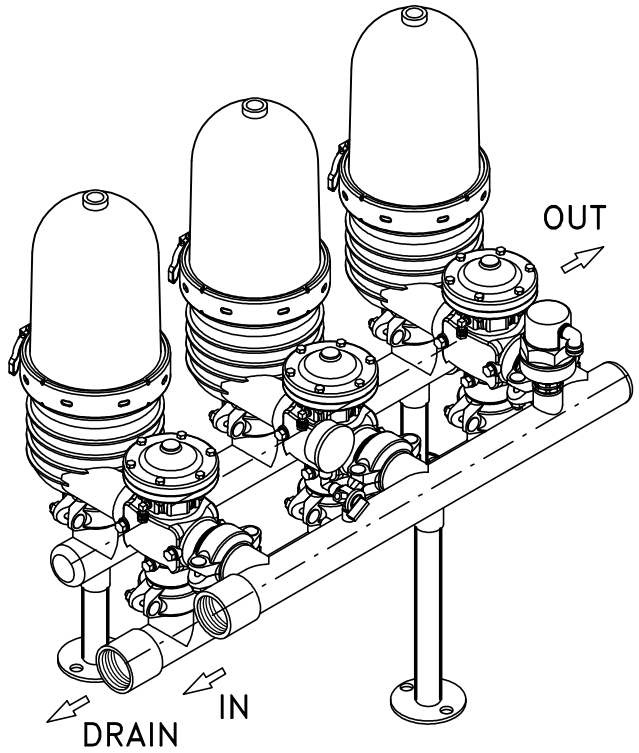
	NAME	DATE	SIGNATURE
DRAWN	MAYA	09.01.08	
CHECKED	NIKOLAY	09.01.08	
APPROVED	YOEL	09.01.08	

NAME: IRINA
DATE: 09.01.08
SIGNATURE: IRINA









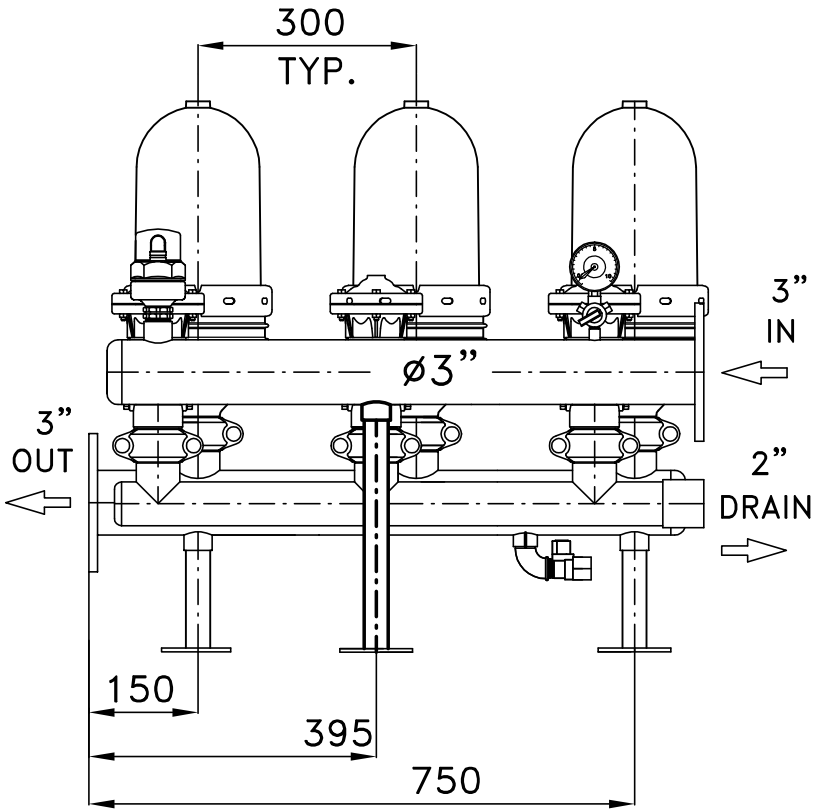
MODIFIC.	DATE	DESCRIPTION	SIGN.

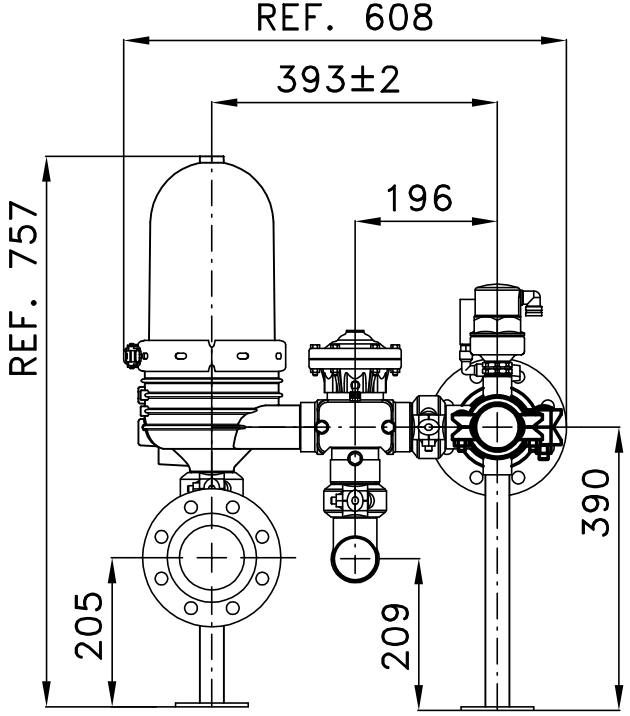
ARKAL
ARKAL
FILTRATION SYSTEM
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

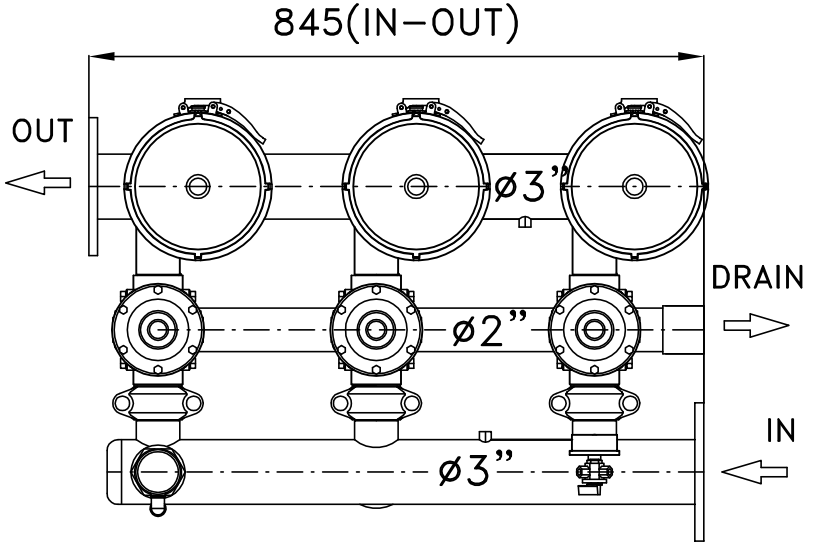
PROJECT 3*2” S.K. FILTERS ”AMETHIST” BATTERY
PAGE 1 OF 2
TITLE ASSEMBLY DRAWING
CATALOGUE No: 1721M0203T5000X

	NAME	DATE	SIGNATURE
PATH BATERIES\2INCH\DRAIN–MT\AMETHIST			
DRAWN	Nikolay	21.07.06	
CHECKED	OMRY	21.07.06	
APPROVED			

FILE CODE 1721M0203T5000X
FILE CODE DRAWING OF MANIFOLD: 5725 0203T5000X
NAME IRINA
DATE 21.07.06
BACKUP: DISK–31
DRAWER N: 2035







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

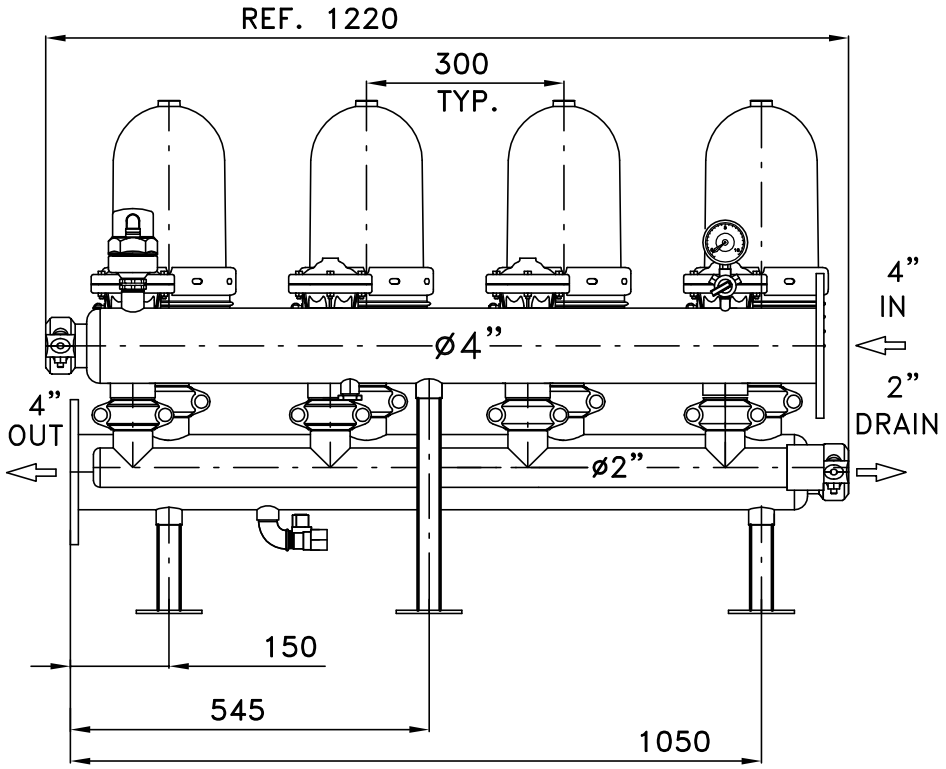
PROJECT: 3*2" S.K. FILTERS "AMETHIST" BATTERY
PAGE 1 OF 3
TITLE: ASSEMBLY DRAWING
CATALOGUE No: 1721M0303_5

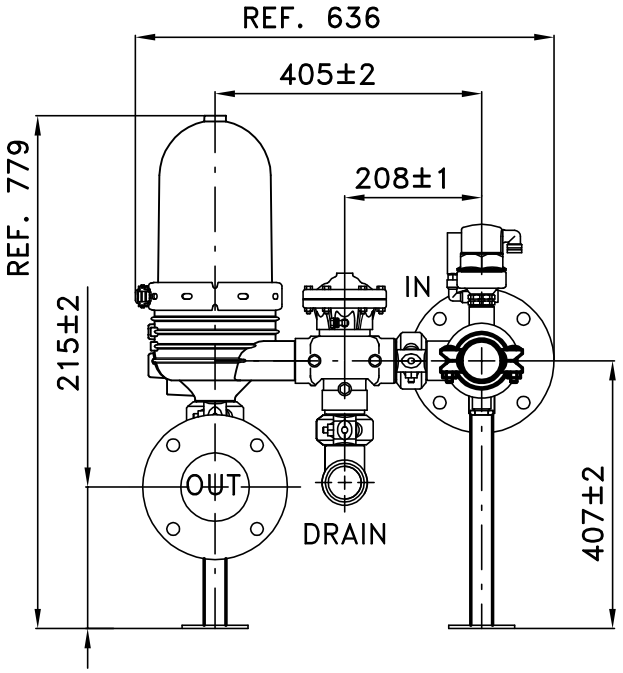
	NAME	DATE
DRAWN	PABLO	20.12.06
CHECKED	ROTEM	20.12.06
APPROVED		

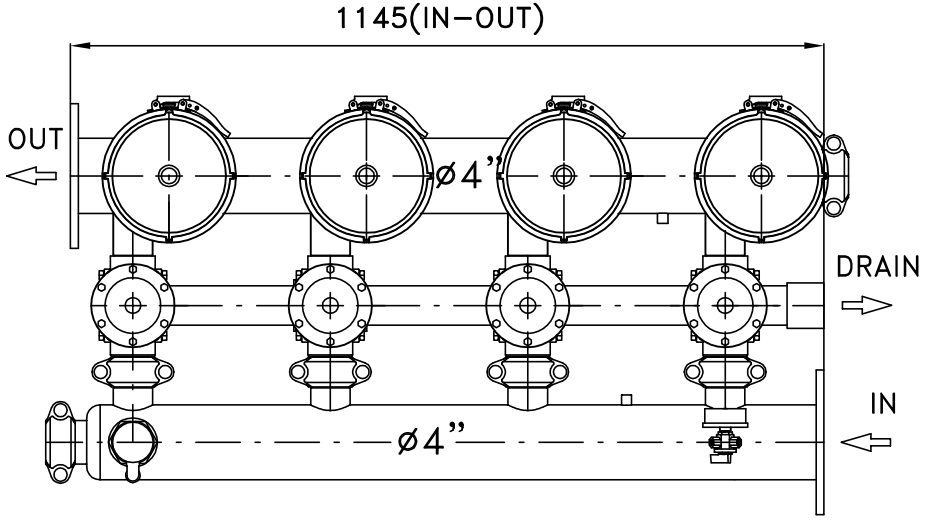
PATH BATERIES\2INCH\DRAIN-MT\AMETHIST\
FILE CODE 1721M0303_5
FILE CODE DRAWING OF MANIFOLD: 5725 0303_5(1-2)
VIEWS: FRONT,TOP & SIDE

	NAME	DATE	SIGNATURE
	IRINA	20.12.06	IRINA

BACKUP: DISK-32
DRAWER N: 2035







MODIFIC.	DATE	DESCRIPTION	SIGN.
		THIS DRAWING CANCEL DRAWING FROM 11.08.04	

ARKAL
FILTRATION SYSTEM
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: 4*2" S.K. FILTERS "AMETHYST" BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 2

CATALOGUE No: 1721P0404_5

PATH BATERIES\2INCH\DRAIN-MT \AMETHYST\

FILE CODE: 1721P0404_5

	NAME	DATE
DRAWN	NIKOLAY	08.02.07
CHECKED	NIKOLAY	08.02.07
APPROVED	ROTEM	08.02.07

FILE CODE DRAWING OF MANIFOLD:
5725 0404_5,
PALET-25 (5201 5405)
TRIWAL-111 (5200 5320)

	NAME	DATE	SIGNATURE
	IRINA	08.02.07	*Orly*

BACKUP: DISK–32

DRAWER N: 2035

NEW ARKAL
2" Spin Klin L.C.E

Low Cost Energy
Automatic Disc Filter
Filter that can flush at 1.5 bar (22 psi)

Product Advantages:

- Proven depth filtration technology
- Will flush at low pressure (1.5 bar - 22 psi)
- Flushing at low pressure uses less energy and will save money
- Will increase profitability

Applications:

- Surface water with algae and organic debris
- Well water
- For low pressure systems where higher pressures are not available or are too costly

Technical Data:

Max. operating pressure	6 bar	87 psi
Min. operating pressure	1 bar	14 psi
Min. backwash pressure (downstream backwash pressure)	1.5 bar	22 psi
Backwash flow rate per unit	10 m^3/h	44 gpm
Max. temperature	60° C	140° F
pH	4-11	4-11

	3 units	4 units	5 units	6 units	3 units	4 units	5 units	6 units
Max. flow rate 400-130 µ	45m^3/h	60m^3/h	75m^3/h	90m^3/h	198gpm	264gpm	330gpm	396gpm
Max. flow rate 100 µ	36m^3/h	48m^3/h	60m^3/h	72m^3/h	158gpm	211gpm	264gpm	317gpm
Filtration surface area	2640cm^2	3520cm^2	4400cm^2	5280cm^2	409$inch^2$	545$inch^2$	682$inch^2$	818$inch^2$
Filtration volume	3444cm^3	4592cm^3	5740cm^3	6888cm^3	210$inch^3$	280$inch^3$	350$inch^3$	420$inch^3$

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

2"SK LCE 9603 0002EN 03/10

L.C.E.

Arkal Spin Klin® 2” Battery

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 2" Spin Klin filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
4. Confirm that filter weight, when full, meets the support construction requirements.
5. Prior to installation confirm that line pressure match's filter's operational pressure.
6. During installation, use standard flanges and connections only.
7. Check that all filter flange bolts are properly secured.
8. Please note, the filter enters a flushing mode automatically, without prior warning.
9. Use original parts only when servicing the filter.
10. Arkal cannot accept responsibility for any changes or modifications to the equipment.

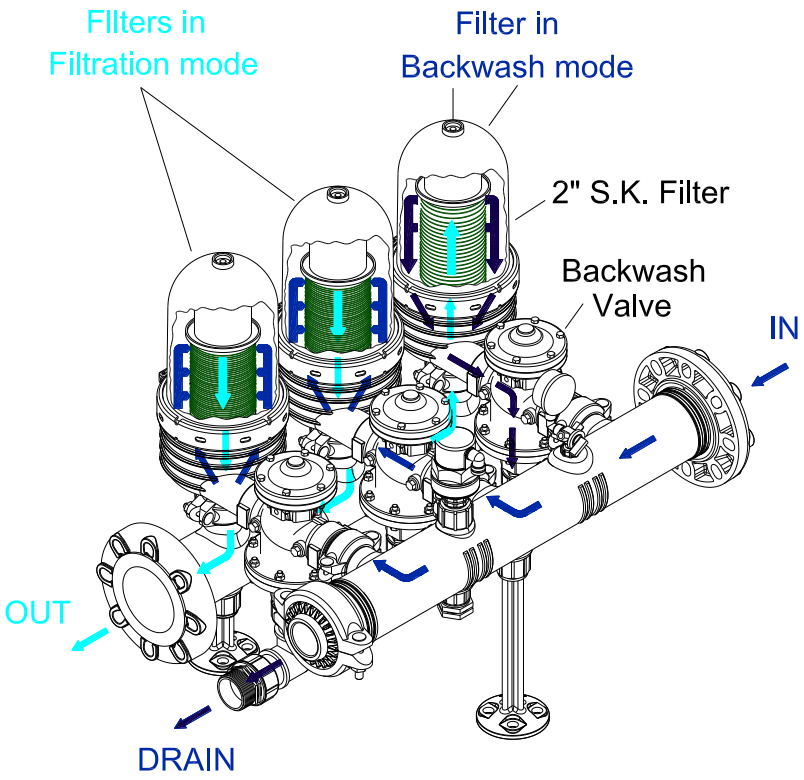
Special Note

Before opening the filter clamp, check that there is no pressure in the filter.

Operation

During the filtration stage, water flows through the inlet manifold and is distributed through the 2” x 2” backwash valves into the Spin Klin filters.

The water then passes through the filter elements to the outlet manifold for consumer use.



Description of the Backwashing Process

1. The controller transmits an electrical command to the first solenoid according to either differential pressure or time.
2. The solenoid then sends a pressure command to the backwash valve, moving it from the filtration mode to the backwash mode.
3. Filter #1 is then backwashed with water from the outlet manifold that has been filtered by the other filters in the system. Contaminated water and impurities flow out through the drain manifold.
4. On completion of the allotted backwashing time, the controller releases the backwash command, and filter #1 returns to the filtration mode.
5. Filter #2 then enters the backwash mode, and the process is repeated until all the filters in the system have been backwashed.
6. After all the filters have been backwashed the systems returns to the filtration mode, until the next backwash cycle.

Spin Klin Technology- Spin Klin Spine

General:

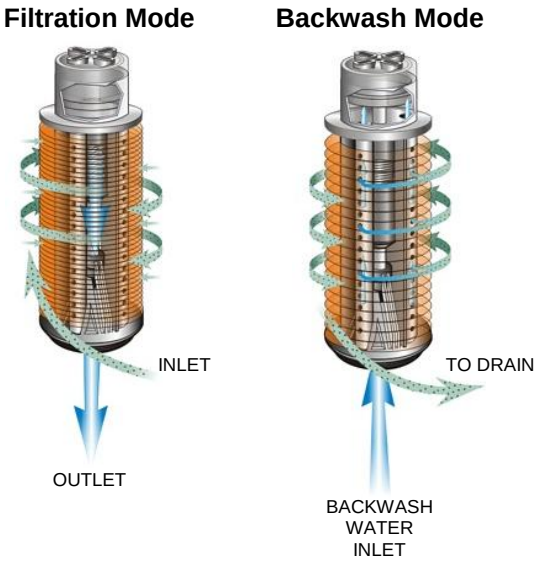
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded by micron size**,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston which are used to alternately compress and release the discs during filtration and backwash cycles.

Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs**.**

Backwash Mode:

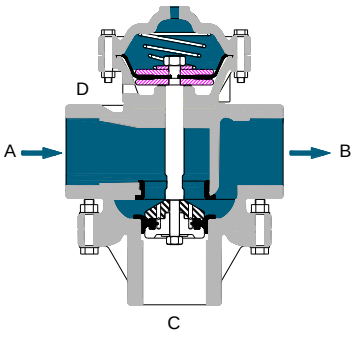
During backwash the discs are released by releasing the inlet hydraulic pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.



2” x 2” Backwash Valve

Filtration Position:

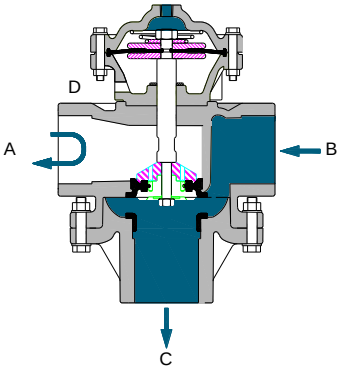
Water flows from port A (main supply) to port B (filter connection). Port C (drain water outlet) is closed by the seal.



Filtration mode

Backwash Position:

Command pressure is applied to the bottom side of the diaphragm through port D.The diaphragm moves up, pulling the sealed body by the shaft. Port A is closed by the seal, preventing flow to the filter. Port C is now open allowing flushing water to flow from port B (filter connection) to the drain.



Backflush mode

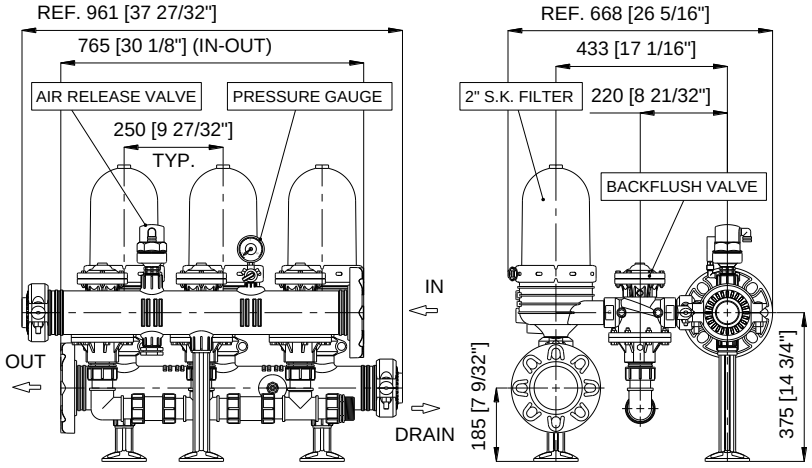
System Installation and Startup

Technical Data

Maximum pressure	6 bar	87 psi
Minimum backwash pressure down stream	1.5 bar	22 psi
Backwash flow rate per unit	10 m^3/hr	44 gpm
Maximum temperature	60°C	140°F
pH	4-11	4-11

	3 units	4 units	5 units	6 units
Filtration surface area - cm^2	2640	3520	4400	5280
Filtration surface area - $inch^2$	409	545	682	818
Filtration volume - cm^3	3444	4592	5740	6888
Filtration volume - $inch^3$	210	280	350	420

2” Spin Klin Battery



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

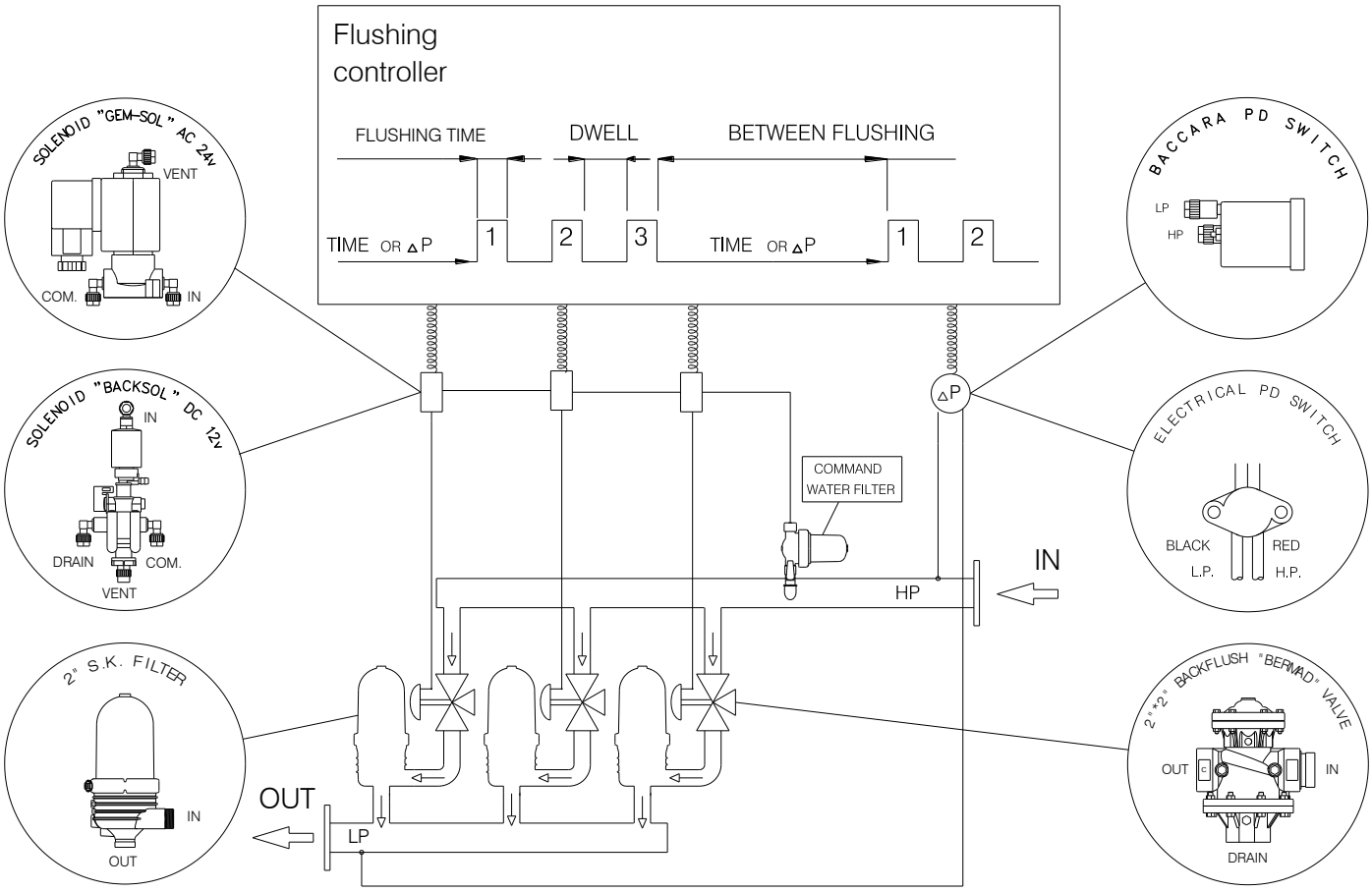
D. Cover clamps need to be properly closed.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- Close the downstream (flow control) valve (if available).
- Flush few cycles until clean.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high.
  An excessive flow rate through the filter causes excessive pressure loss.



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 4-6 meters (5-9psi).
- The DP set point recommended here (to activate the backwash) is a general guideline; it may need to be adjusted for conditions of low pressure and/or poor water quality.
- Set the controller to a flush time of 20-25 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

NOTE:

Due to low operating pressure, and depending on water qualities, manual cleaning of the discs may be seasonally required.

This is done as follows:

1. Close the downstream (flow control) valve (if available)
2. Perform a few flush cycles until clean
3. Slowly reopen the downstream valve
4. If the pressure differential remains high, check and see if the flow rate is too high (an excessively high flow rate through the filter will cause a high pressure loss).

Winterization:

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

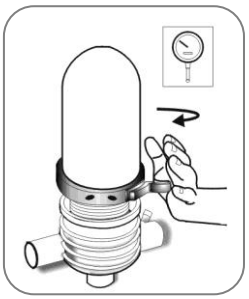


Figure 1

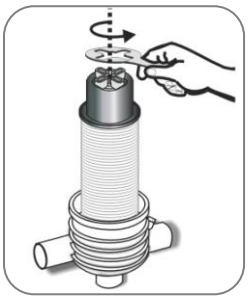


Figure 2

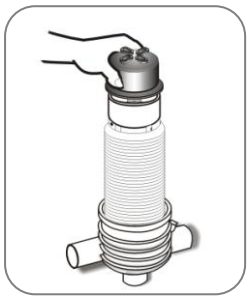
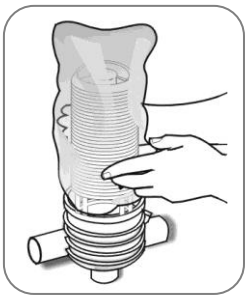


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to **"Cleaning Recommendations Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)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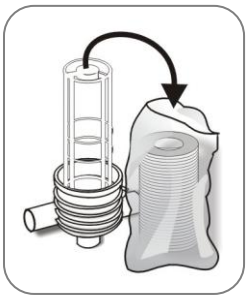
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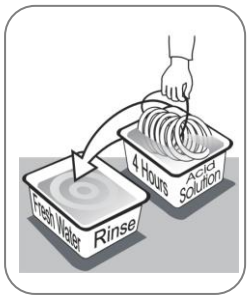
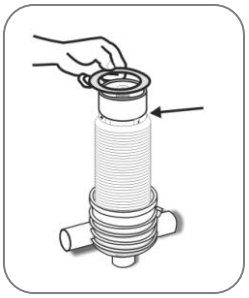


Figure 6

Check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Put on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)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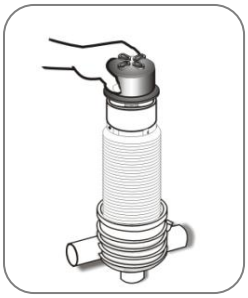


Figure 8

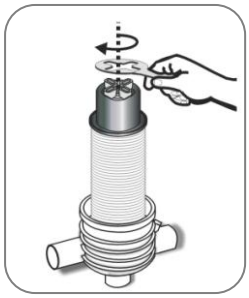


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

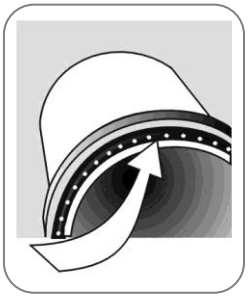


Figure 10

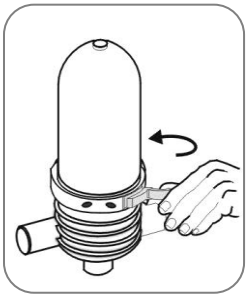


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer’s instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

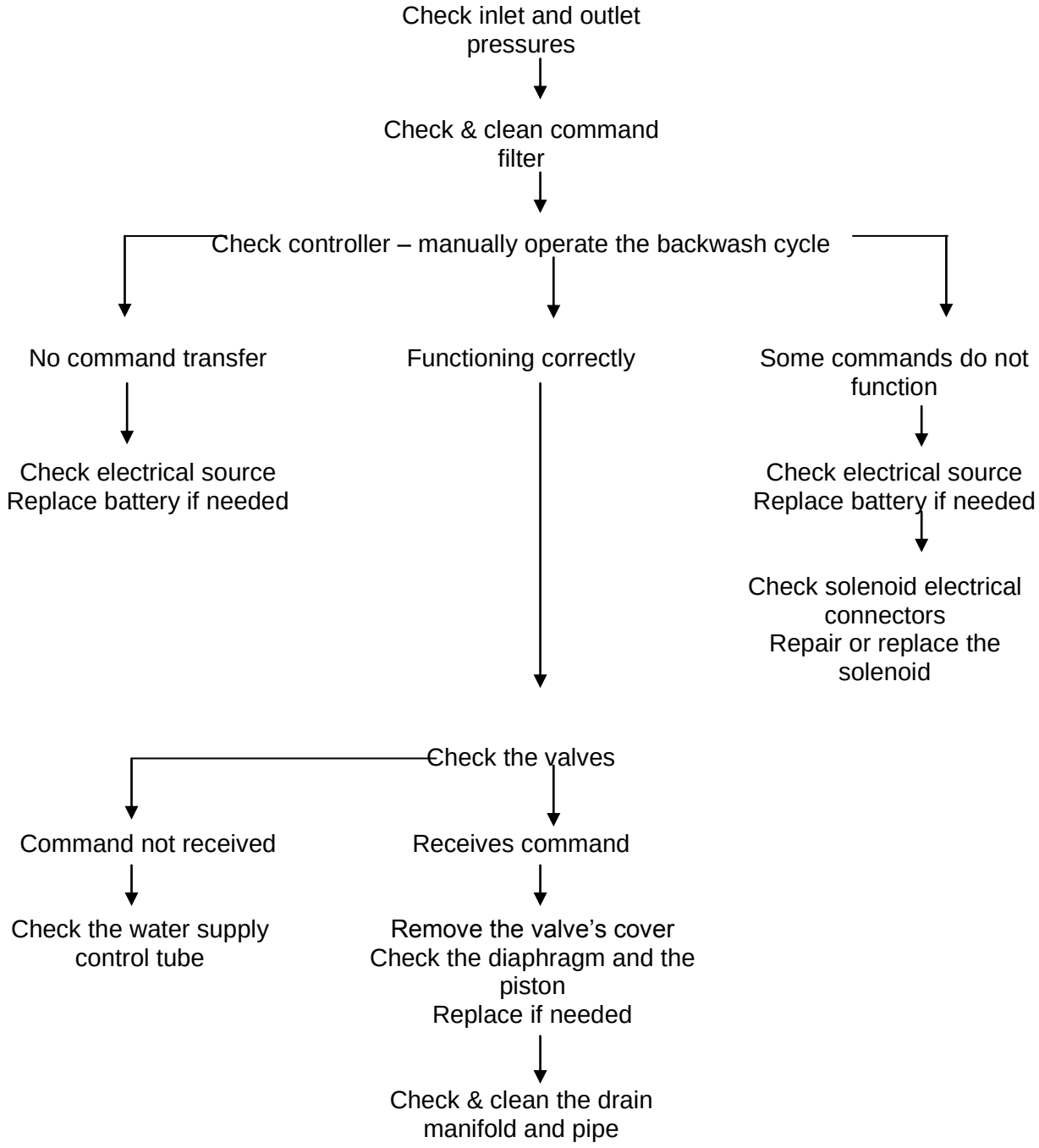
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite
  (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 2” Spin Klin system

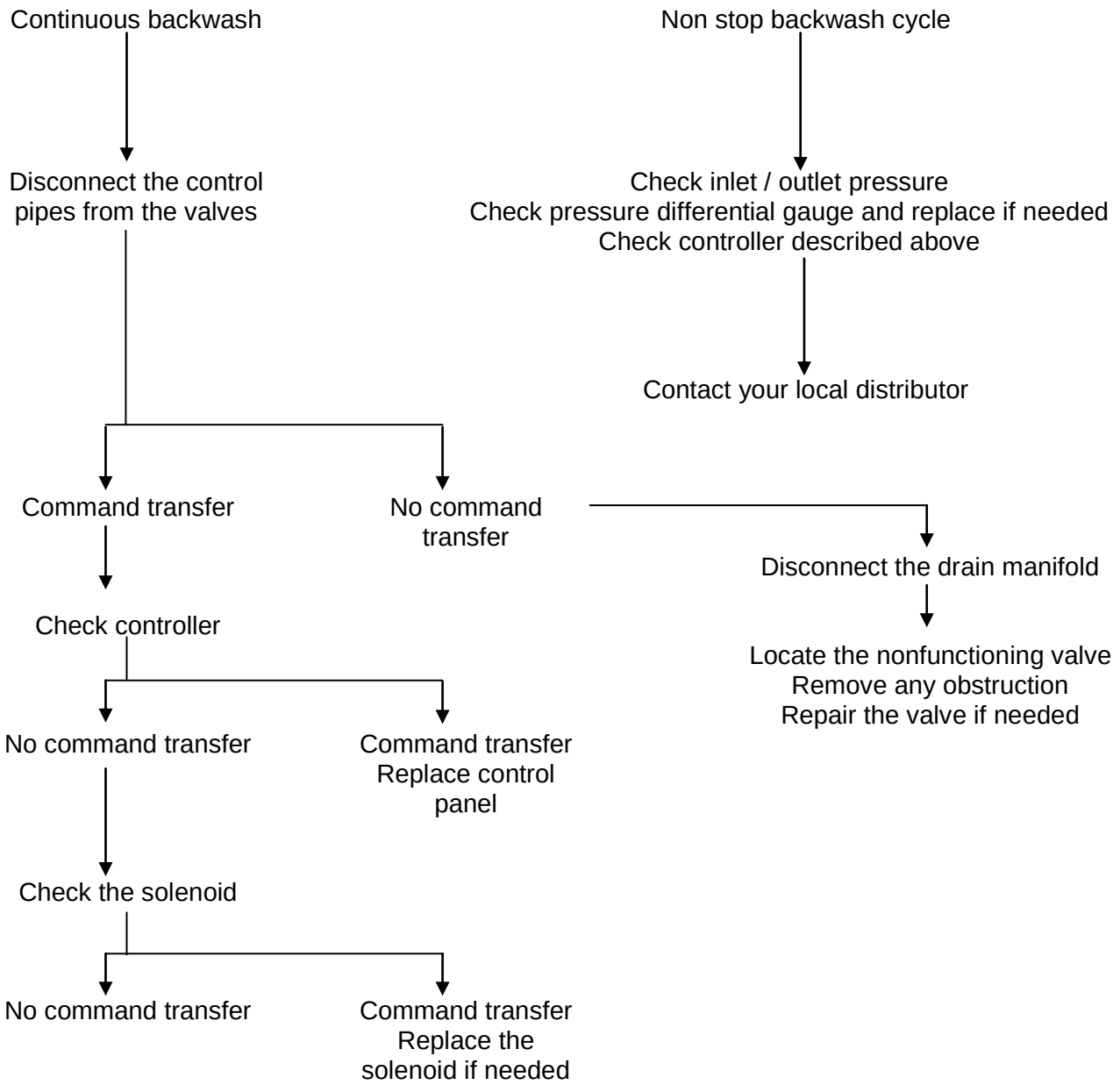
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 2” Spin Klin system

Continuous or Non-stop Backwashing



Contact your local distributor

Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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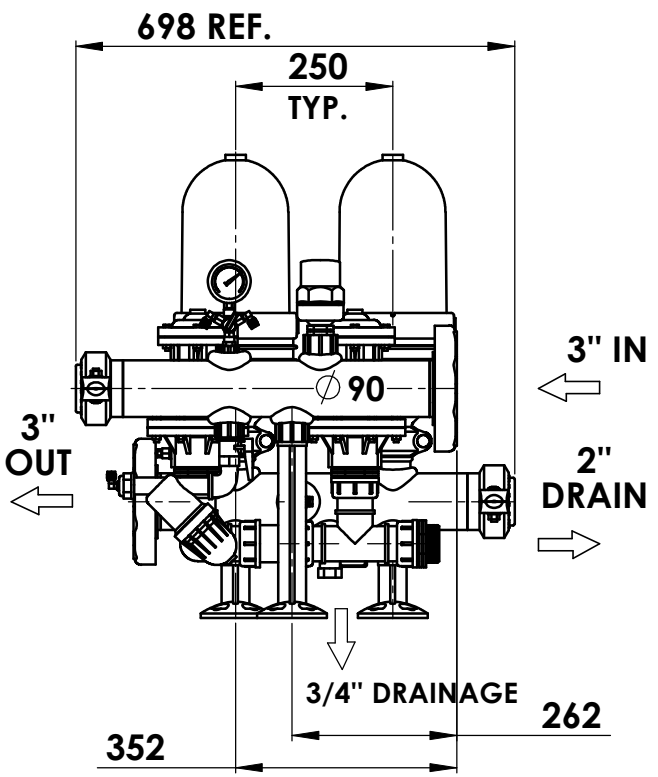
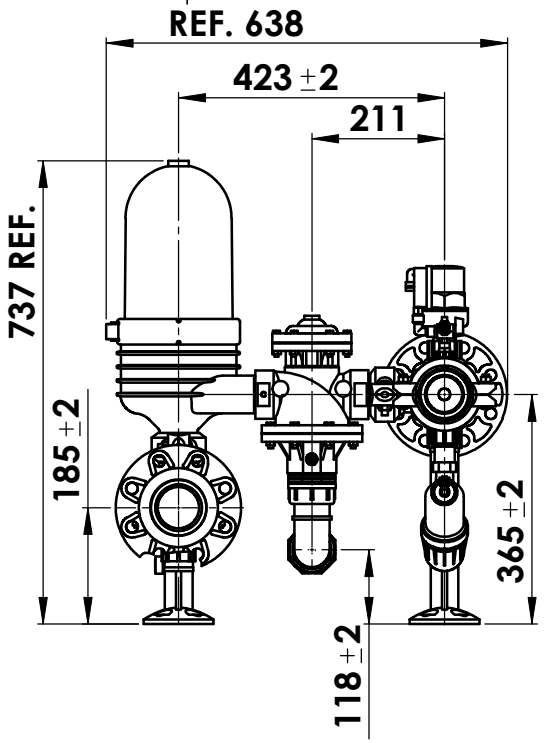
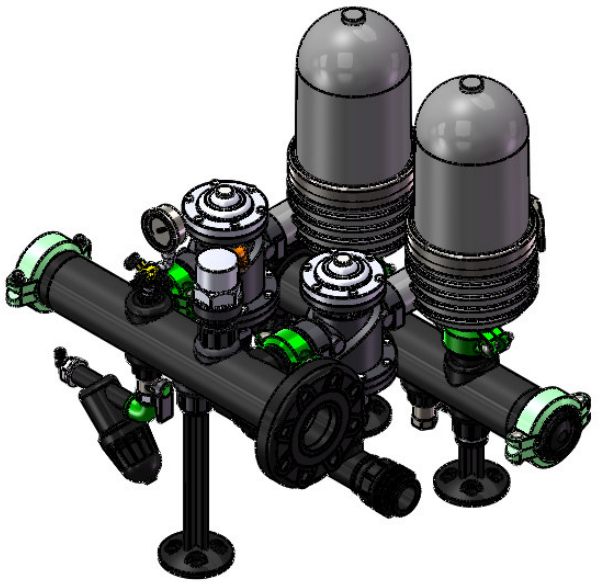
Email: filters@arkal.com Web: www.arkal-filters.com

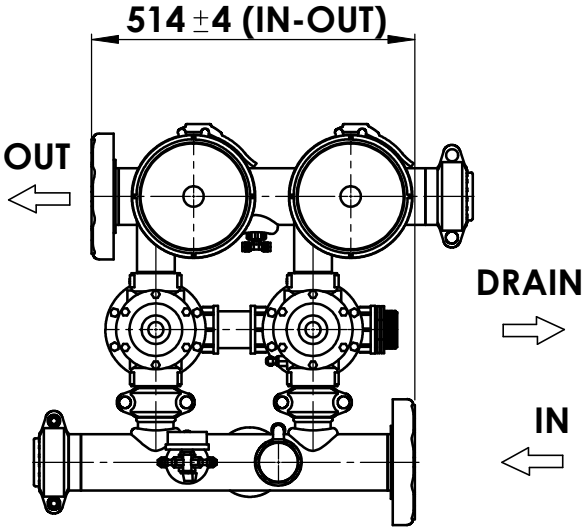
Drawings

2" All Plastic L.C.E Batteries









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MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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FAX. 972-4-6775461
ISRAEL

PROJECT	2*2" S.K. FILTERS PLASTIC BATTERY
PAGE	1A_OF 4_
TITLE	ASSEMBLY DRAWING
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SOLIDWORKS FILE CODE:	1625_03__9
FILE CODE:	1625M0302VU9LC C
FILE CODE OF FILTER COMPL.:	2261M1004___LC

	NAME	DATE
DRAWN	NIKOLAY	15.09.09
CHECKED	NIKOLAY	15.09.09
APPROVED	EYAL	15.09.09
B.O.M.	OLEG	15.09.09

FILE CODE DRAWINGS: PALLET-26 (5201 5403) TRIWALL-13 (5200 5300)

BACKUP: DISK-2S

SOLIDWORKS FILE CODE OF MAN.: 6626 0302V0

DRAWING: 2130

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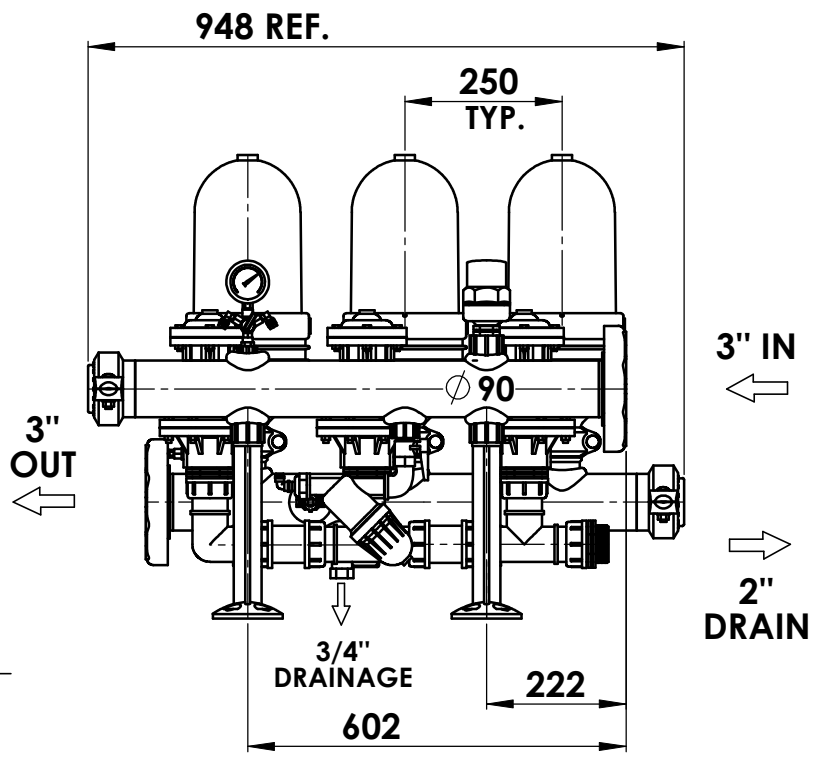
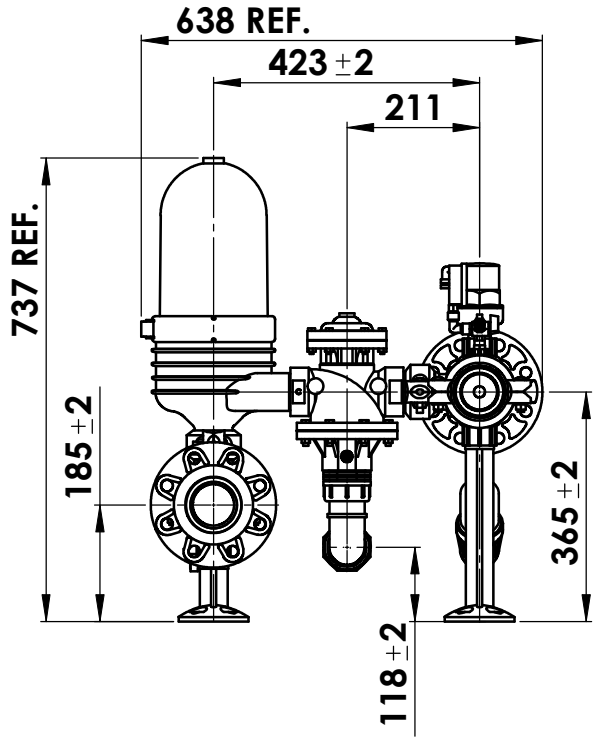
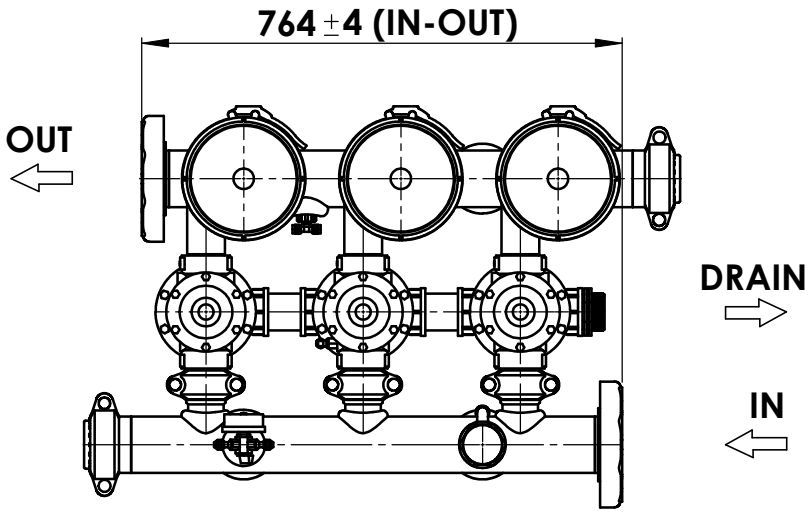
Tuesday, September 15, 2009 2:57:49 PM







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PROJECT: 3*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625M0303VU9LC

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CHECKED	NIKOLAY	26.01.09
APPROVED	EYAL	26.01.09
B.O.M.	IRINA	04.02.09

FILE CODE DRAWINGS: PALLET-26 (5201 5403) TRIWALL-13 (5200 5300)

SOLIDWORKS FILE CODE OF MAN.: 6626 0303V0

BACKUP: DISK-2S

DRAWING: 2130

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SHEET 1 OF 1

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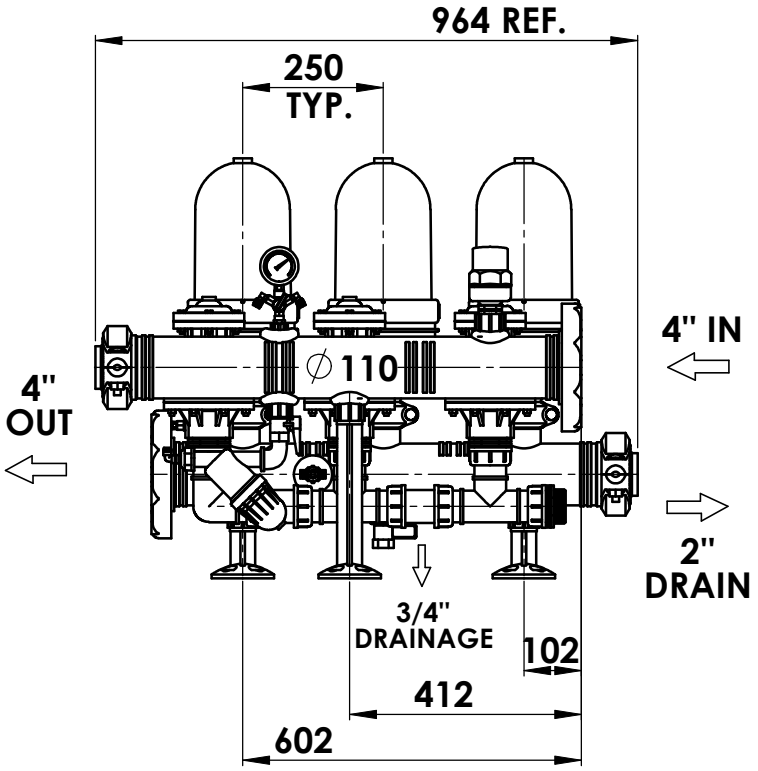

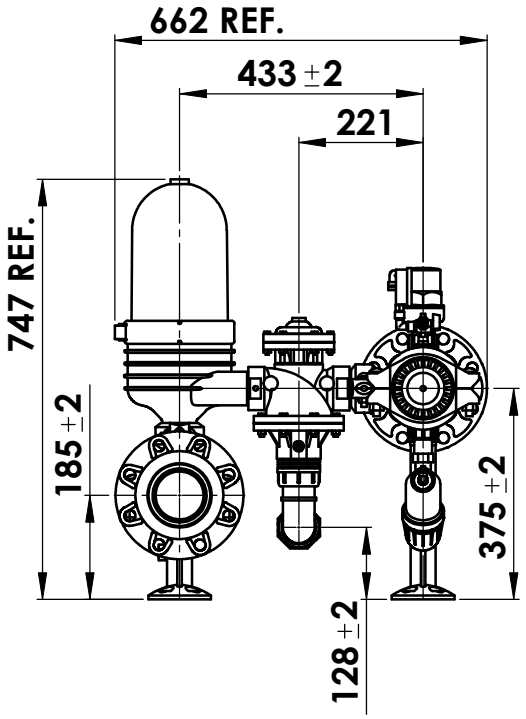

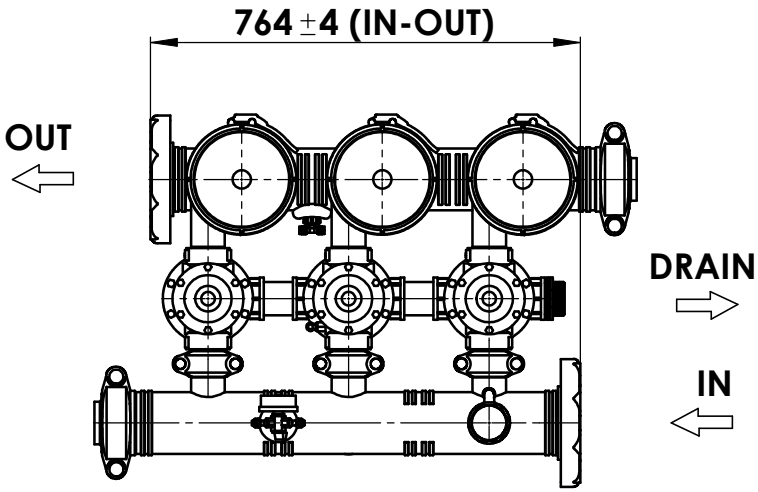

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MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 3*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625M0403VU9LC

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	NAME	DATE
DRAWN	ELENA	09.03.09
CHECKED	NIKOLAY	09.03.09
APPROVED	EYAL	09.03.09
B.O.M.	OLEG	09.03.09

FILE CODE DRAWINGS: PALLET-26 (5201 5403) TRIWALL-13 (5200 5300)

SOLIDWORKS FILE CODE OF MAN.: 5625 0403V0

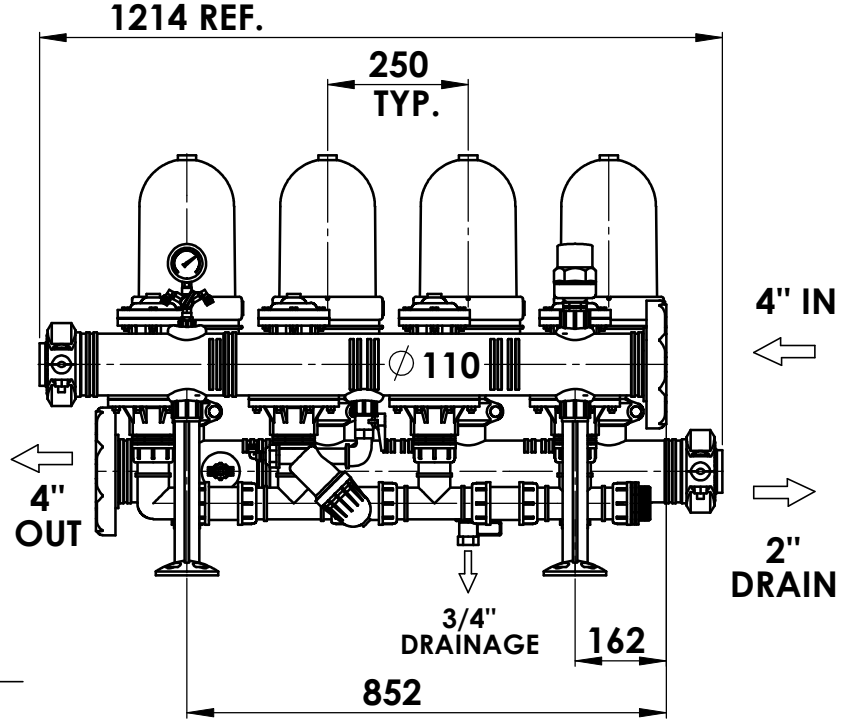
BACKUP: DISK-2S

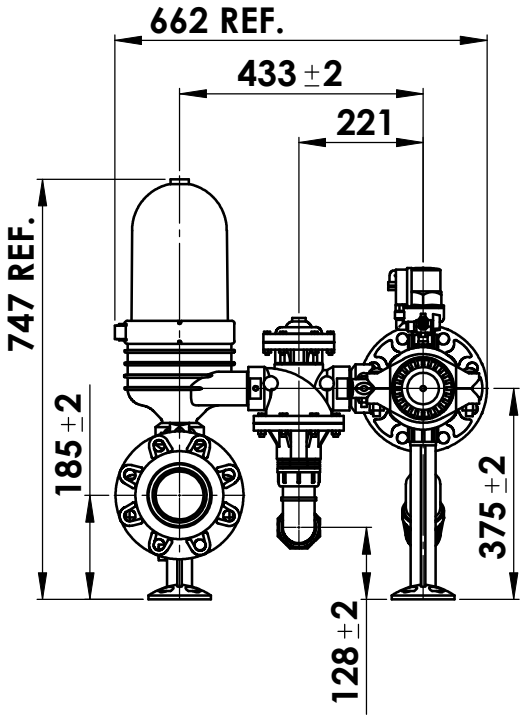
DRAWING: 2130

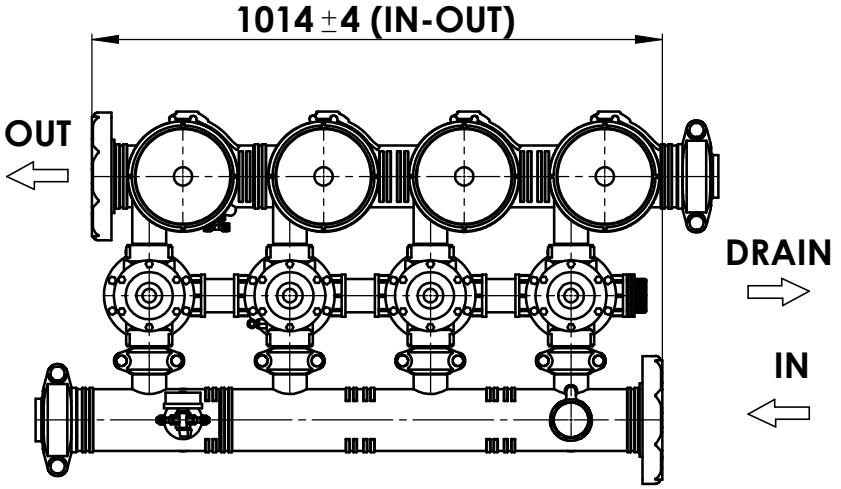
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\AGRICULTURE\

SHEET 1 OF 1

Sunday, May 17, 2009 3:08:36 PM







		LCE	
MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625M0404VU9LC

SOLIDWORKS FILE CODE: 1625_04__9 — FILE CODE: 1625M0404VU9LC C — FILE CODE OF FILTER COMPL.: 2261M1004___LC

	NAME	DATE
DRAWN	PABLO	26.01.09
CHECKED	NIKOLAY	26.01.09
APPROVED	EYAL	26.01.09
B.O.M.	IRINA	04.02.09

FILE CODE DRAWINGS: PALLET-25 (5201 5405) TRIWALL-13 (5200 5320)

SOLIDWORKS FILE CODE OF MAN.: 5625 0404V0

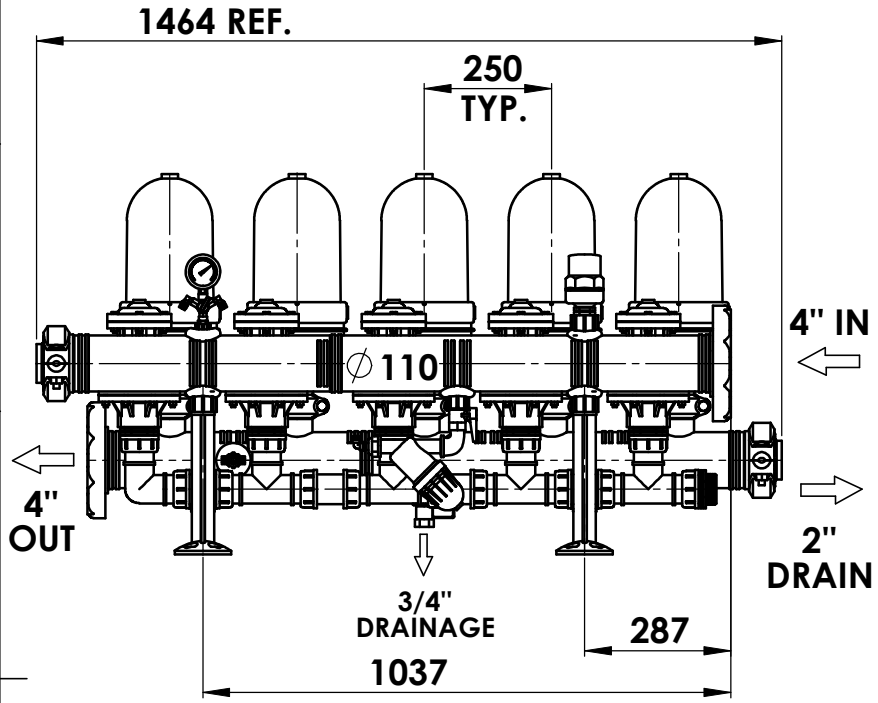
BACKUP: DISK-2S

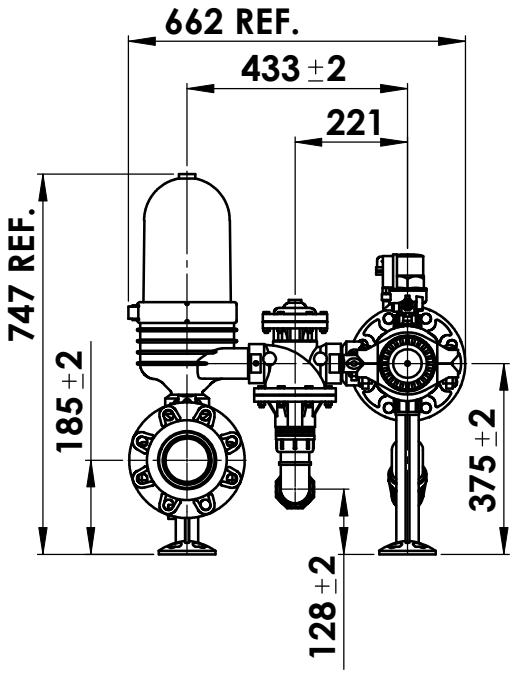
DRAWING: 2130

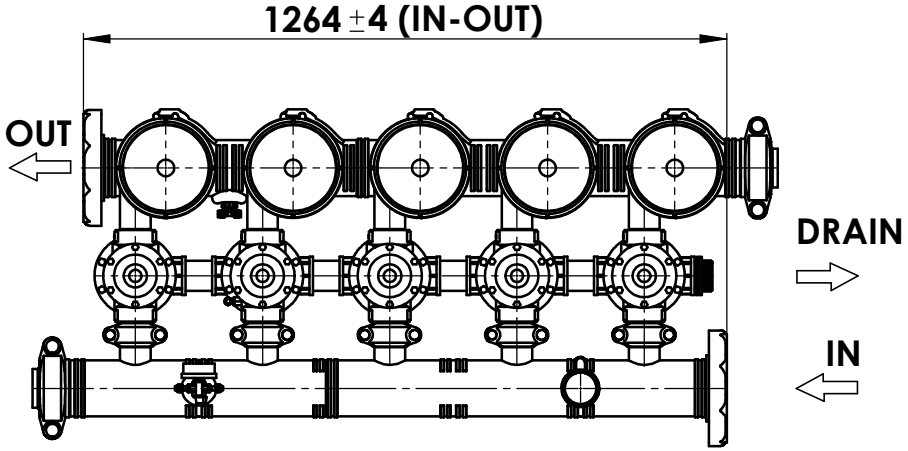
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\AGRICULTURE\

Sunday, May 17, 2009 3:16:49 PM

SHEET 1 OF 1







		LCE	
MODIFIC.	DATE	DESCRIPTION	SING

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FILTRATION SYSTEM
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FAX. 972-4-6775461
ISRAEL

PROJECT: 5*2" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1625M0405VU9LC

SOLIDWORKS FILE CODE: 1625_04__9 — FILE CODE: 1625M0405VU9LC C — FILE CODE OF FILTER COMPL.: 2261M1004___LC

	NAME	DATE
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CHECKED	NIKOLAY	26.01.09
APPROVED	EYAL	26.01.09
B.O.M.	IRINA	04.02.09

FILE CODE DRAWINGS: PALLET- 27 (5201 5404) TRIWALL-116 (5200 5303)

SOLIDWORKS FILE CODE OF MAN.: 5625 0405V0

BACKUP: DISK-2S

DRAWING: 2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\AGRICULTURE\

SHEET 1 OF 1

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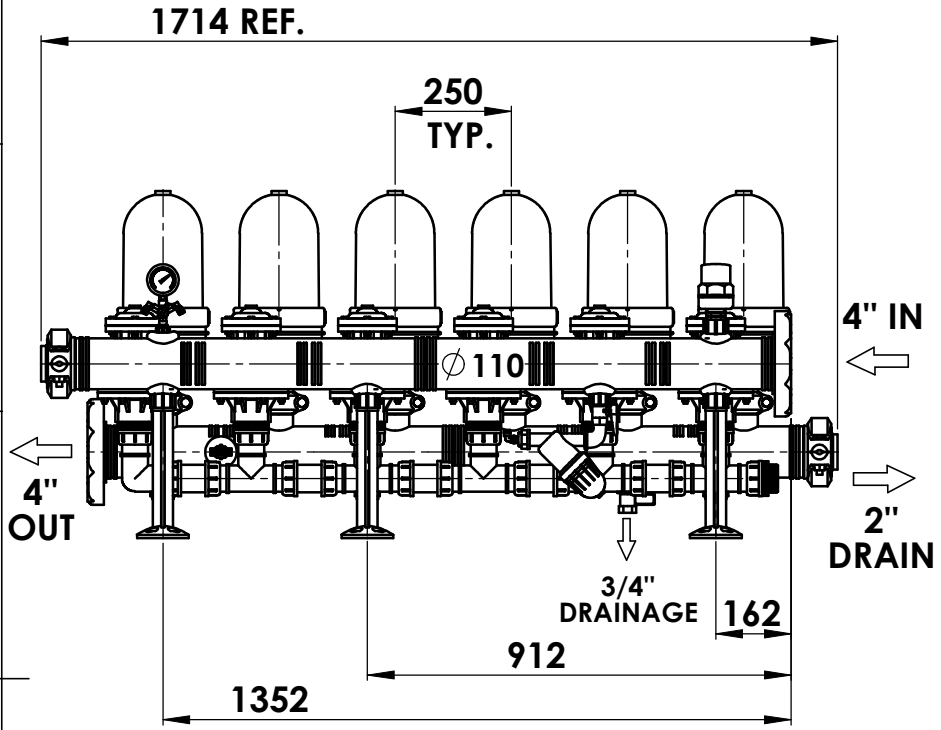

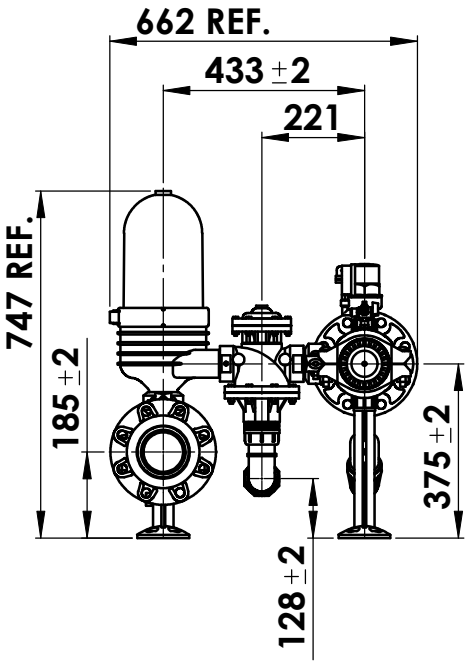

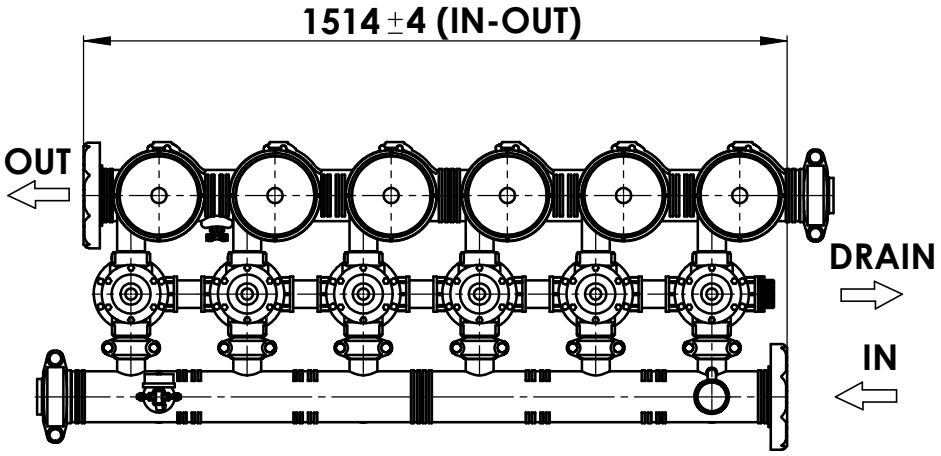

		LCE	
MODIFIC.	DATE	DESCRIPTION	SING

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FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
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PROJECT: 6*2" S.K. FILTERS PLASTIC BATTERY				PAGE 1_OF 4_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1625M0406VU9LC
SOLIDWORKS FILE CODE: 1625_04__9		FILE CODE: 1625M0406VU9LC C		FILE CODE OF FILTER COMPL.: 2261M1004___LC
	NAME	DATE	FILE CODE DRAWINGS: PALLET- 27 (5201 5404) TRIWALL-116 (5200 5303)	BACKUP: DISK-2S
DRAWN	PABLO	26.01.09		
CHECKED	NIKOLAY	26.01.09		
APPROVED	EYAL	26.01.09	SOLIDWORKS FILE CODE OF MAN. 5625 0406V0	DRAWING: 2130
B.O.M.	IRINA	04.02.09		

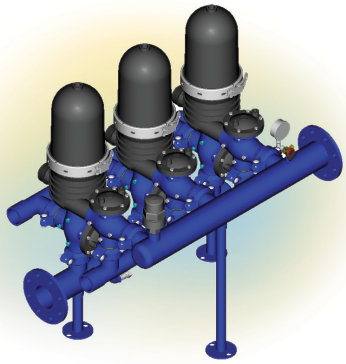
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\AGRICULTURE\

SHEET 1 OF 1

Sunday, May 17, 2009 3:28:47 PM

Opal External Source Flushing

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation
- Low-pressure operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	0.8	**psi**	10
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm^2**	880	**in^2**	136.4
Filtration volume per unit	**cm^3**	1320	**in^3**	80.5
Backwash water volume per unit	**lit**	33	**gal**	8.7

Maximum Filtration Flow Rate / Water Quality

No. of units		2	3	4	5	6	2	3	4	5	6
Filtration Grade	**Water Quality**	**m^3/h**					**gpm**				
400-130 µ	Good	50	75	100	125	150	220	330	440	550	660
	Average	38	57	76	95	115	167	250	334	418	506
	Poor	27	41	54	67	84	119	180	238	294	370
	Very Poor	16	25	33	41	49	70	110	145	180	215
100 µ	Good	40	60	80	100	120	176	264	352	440	528
	Average	30	45	60	75	90	132	192	264	330	396
	Poor	20	30	40	50	60	88	132	176	220	264
	Very Poor	13	20	26	33	40	57	88	114	145	176
55 µ	Good	28	42	56	70	84	123	184	246	308	364
	Average	22	33	44	55	66	97	145	193	242	290
	Poor	15	23	30	38	45	66	101	132	167	198
	Very Poor	9	14	18	24	33	39	61	79	105	145
20 µ	Good	14	21	28	35	42	61	92	123	154	184
	Average	10	16	21	26	32	44	70	92	114	140
	Poor	7	11	14	18	21	30	48	61	79	92
	Very Poor	5	7	9	11	13	22	30	39	48	57

Opal

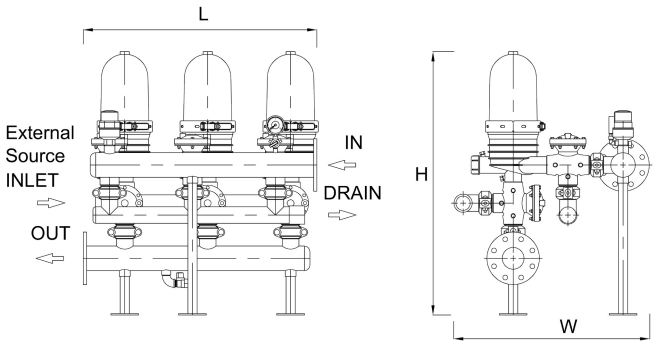
Filtration Batteries

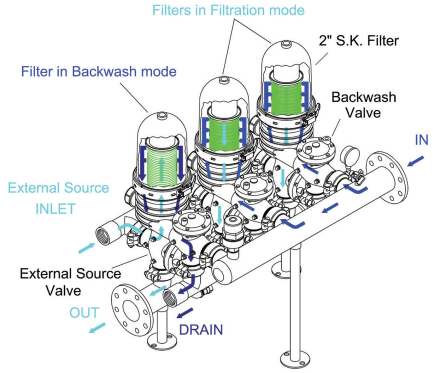
External Source Flushing

Dimensions and Weights

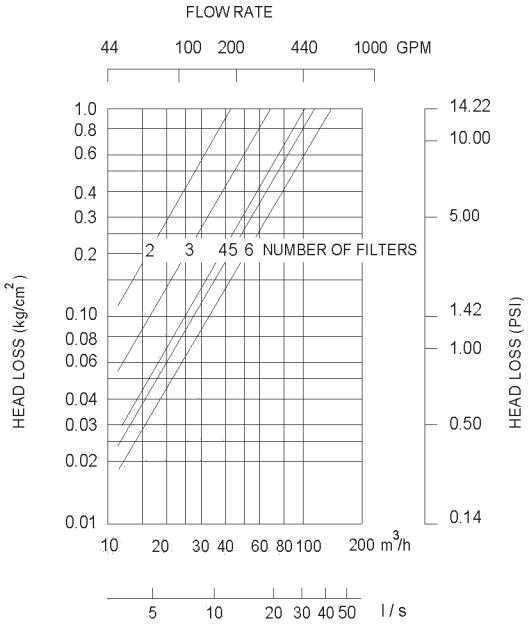
No. of units		2	3	4	5	6		2	3	4	5	6
D Inlet\Outlet diameter	mm	90	90	110	110	160	inch	3	3	4	4	6
L Length	mm	545	800	1145	1445	1745	inch	21	32	45	57	69
H Height	mm	953	953	982	982	1009	inch	38	38	39	39	40
W Width	mm	643	643	674	674	731	inch	25	25	27	27	29
Shipping weight (approx.)	kg	92	116	154	186	232	lbs	203	256	340	410	511

NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.





Head Loss Chart - for 130-400µ, Clean State



OPAL filtration batteries are available with:
Polyester coated steel,
Stainless steel or
Polypropelene manifolds.

2" Spin Klin® Battery External Source Automatic Backwash

Operation, Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 2” Spin Klin Battery with External Source. All Arkal’s filters are easy to install, use and service and don’t require special skills to operate them.
For operation and maintenance of the filter please follow the instructions in this manual.

2. Safety Instructions

1. Prior to installation or handling of the filter, read carefully the installation and operation instructions carefully.
2. Confirm filter draining prior to service.
3. Take precautions while lifting, transporting or installing the filter.
4. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
5. Confirm that filter weight, when full, meets the support construction requirements.
6. Prior to installation confirm that line pressure matches filter’s operational pressure.
7. During installation, use standard flanges and connections only.
8. Check that all filter flange bolts are properly secured.
9. Please note, the filter enters a flushing mode automatically, without prior warning.
10. Use original parts only when servicing the filter.
11. Arkal cannot accept responsibility for any changes or modifications to the equipment.

SPECIAL NOTE

Before opening the filter lock, check that there is no pressure in the filter.

3. Description & Operation

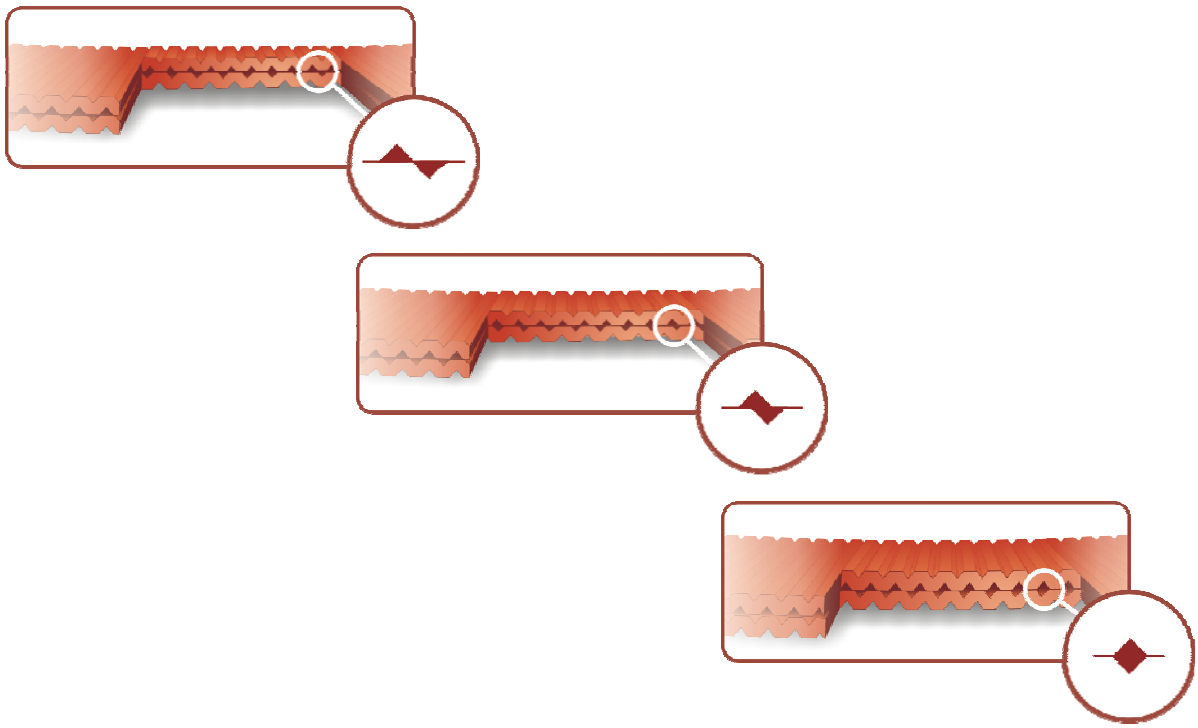
3.1 Disc Filtration Technology

Arkal Filtration Systems uses a specially designed disc filtration technology. Thin, color-coded polypropylene discs are diagonally grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of valleys and traps for solids. The stack is enclosed in a corrosion and pressure resistant housing.

During the filtration process, the filtration discs are tightly compressed together by the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolation from the outer diameter to the inner diameter of the element. Depending on the micron rating, there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration.

Table of Filtration Grades of the Discs and Color Code

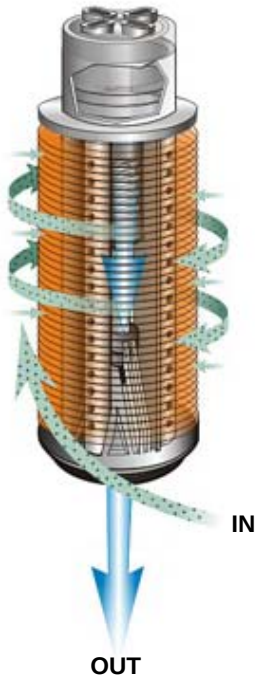
Color Code	Blue	Yellow	Red	Black	Brown	Green	Purple	Gray
Micron	400	200	130	100	70	55	40	20
Mesh	40	80	120	140				
PP								
Nylon								



3.2 Spin Klin Technology

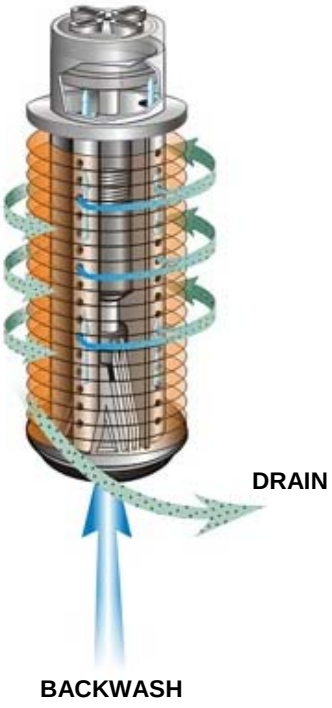
Spin Klin Spine - The Core of the Spin Klin Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the micron housing. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

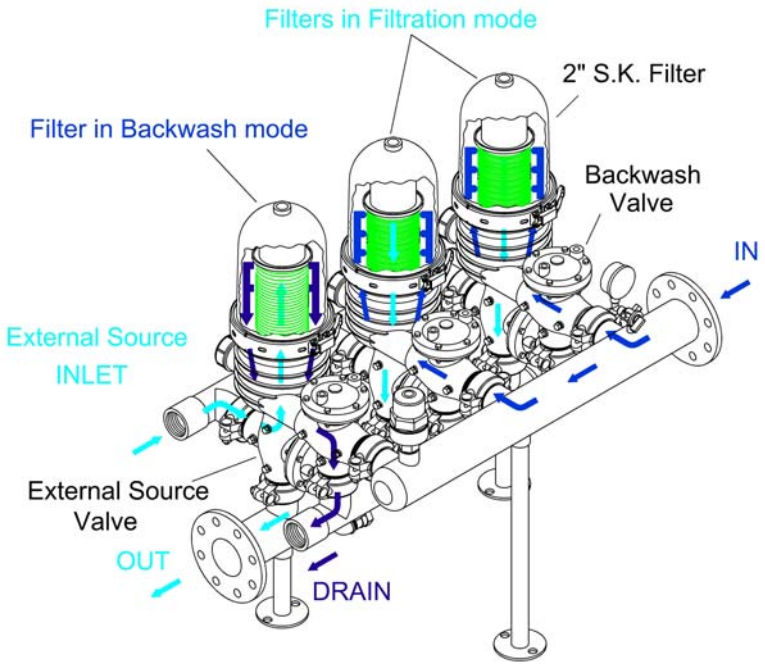


Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of operation



Filtration Process

- During the filtration stage water flows through the **INLET MANIFOLD** distributing through the **INLET VALVES** to the 2" **SPIN KLIN FILTERS**
- The water passes through the **FILTER** and flows out clean through the **OUTLET VALVE** and **OUTLET MANIFOLD** to the customer.

Backwashing Process

The **CONTROLLER** transmits a pulse (as per pressure differential or time, whichever is first.
Pneumatic command from solenoid No. 1 sends a pressure pulse to two users simultaneously.

A. To the **INLET VALVE** converting it from filtration mode to backwash mode.
B. To the **OUTLET VALVE** converting it from filtration mode to backwash mode.

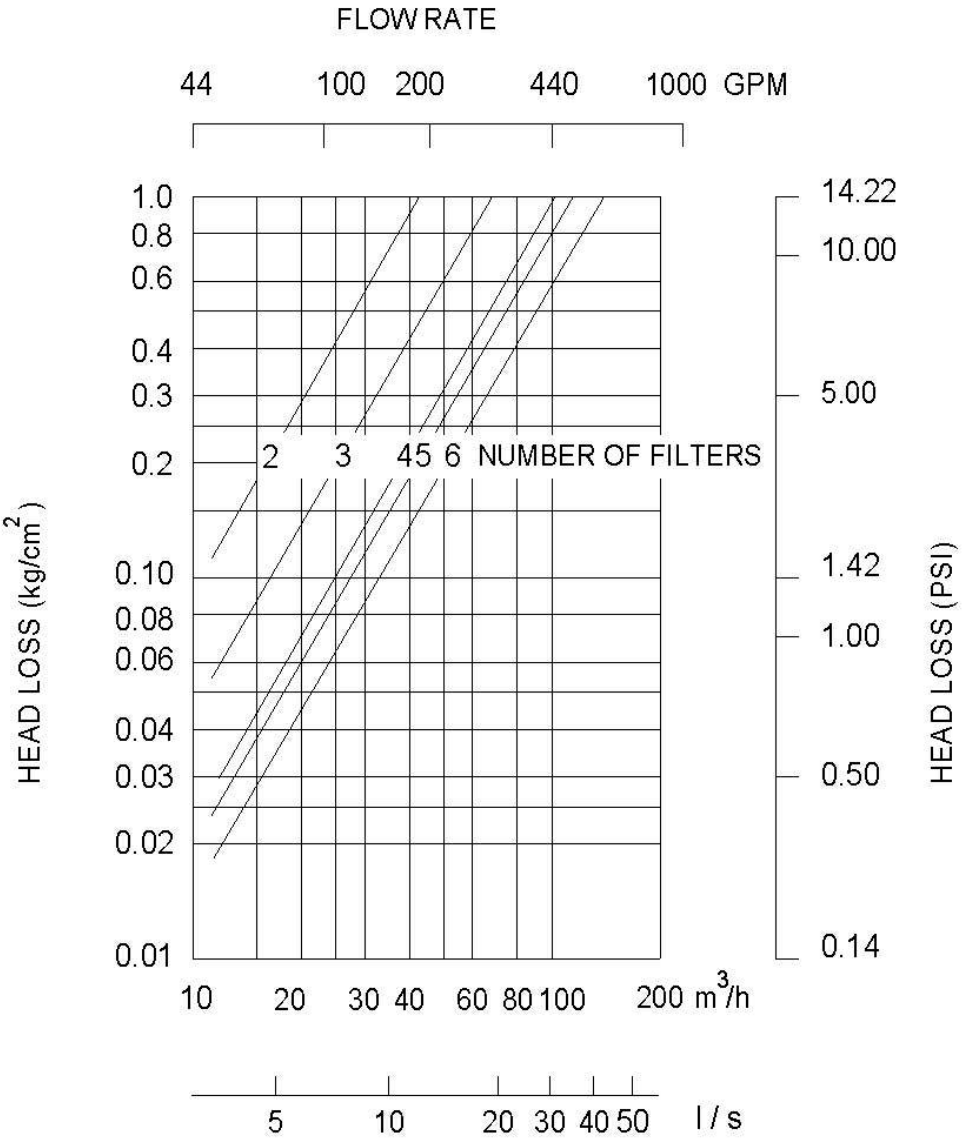
- The **EXTERNAL SOURCE WATER** flow in to **FILTER NO. 1.**
- The piston of the **SPIN KLIN FILTER** rises, thus decompressing discs.
- **FILTER NO. 1.** is then flushing for 15 seconds.

When the time elapses the control unit stops the backwash signal to the solenoid.
The solenoid releases the water pressure signal allowing the **INLET VALVE** and the discs of the spines to return to filtration mode.
Once **FILTER NO.1** is in the filtration position again the control unit sends a signal to begin the backwash process in **FILTER NO.2**.

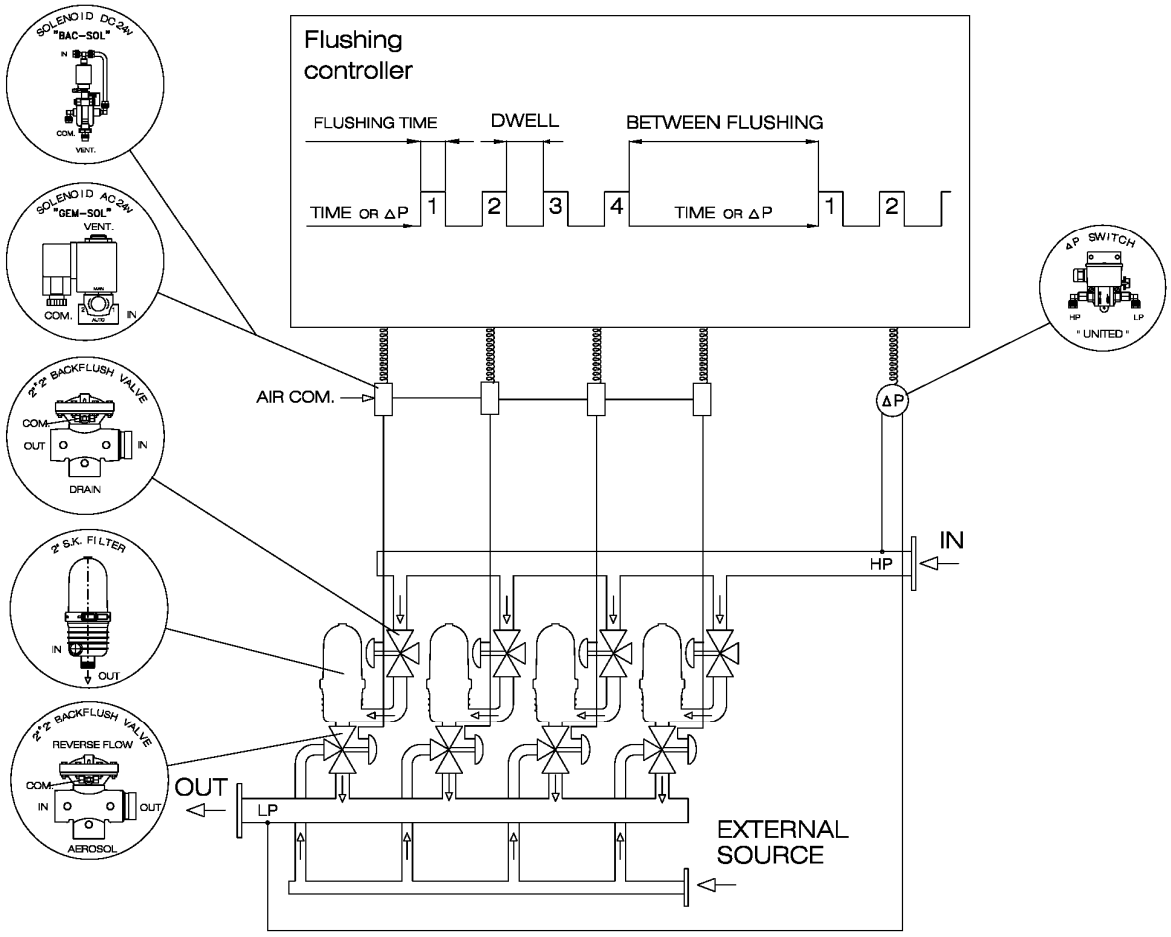
4. Technical Data

Parameters	METRIC	US
Maximum pressure	10 bar	145
Minimum pressure	0.8 bar	12 psi
Backwash flow rate per POD	10 m^3/hr	45 gpm
Maximum temperature	70 °C	158 °F

5. Headloss Chart



6. Control



- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 15 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

7. Maintenance

Monthly Maintenance

Check inlet /outlet pressures -

If the pressure differential is above 5 m / 7 PSI activate the backwash of the Spin Klin filtration system.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold -

If there is a leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance -

Check that the controller timing parameters are correctly set and activate the backwash cycle. In the event of possible failure of the backwash controller, please refer to chapter 8, troubleshooting

Winterization

In order to prevent the filter battery from becoming damaged under freezing conditions - drain all the water from the filter battery and leave the drain valve open.

Seasonal Maintenance - Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

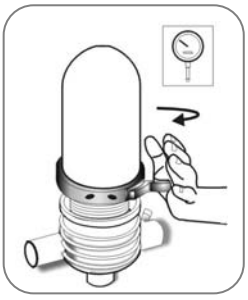


Figure 1

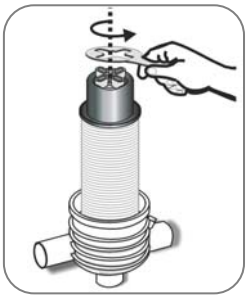


Figure 2

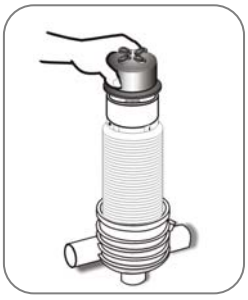


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each disc set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

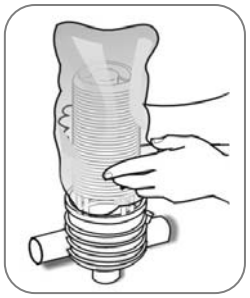


Figure 4

Figure 5

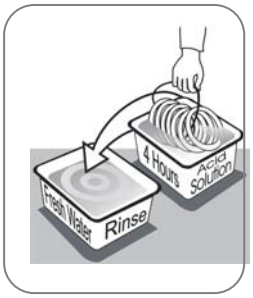


Figure 6

Check that the correct quantity of discs is assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Replace on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

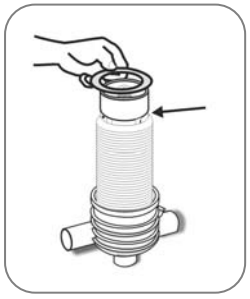


Figure 7

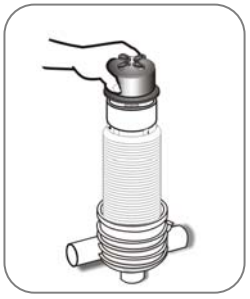


Figure 8

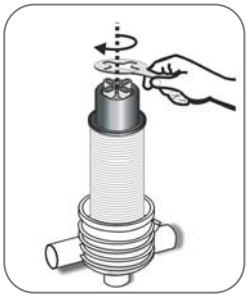


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

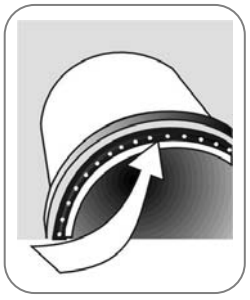


Figure 10

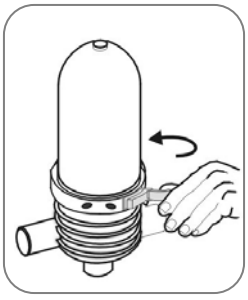


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

Warning!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing.
- Work in a well ventilated area.
- Follow the manufacturer's instructions.

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Warning – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours.
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

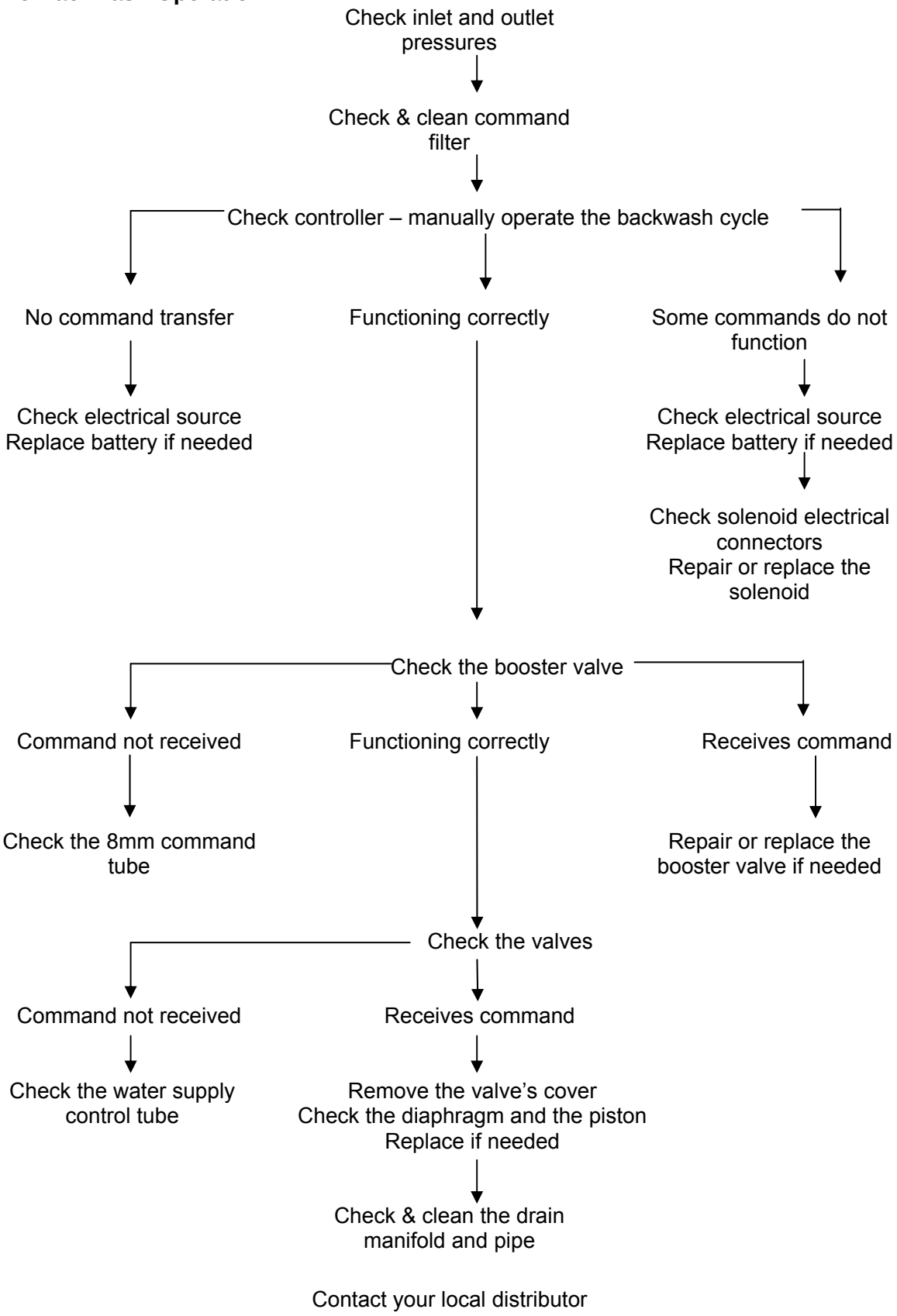
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  If the deposits haven't been completely removed, send a set of untreated discs to the laboratory for further examination.

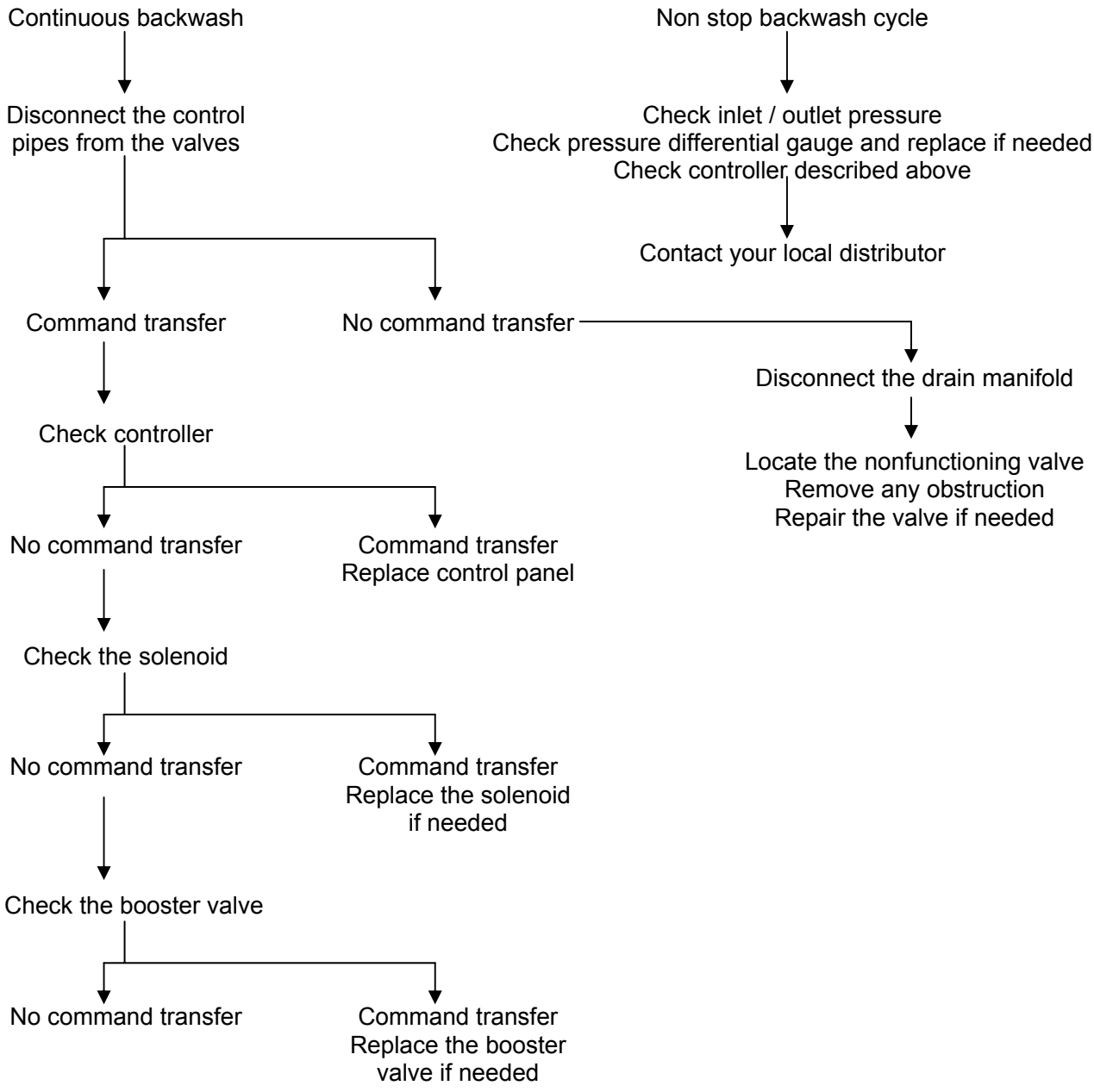
8. Troubleshooting

No Backwash Operation



Identifying Malfunctions in the 2" Spin Klin system

Continuous or Non-stop Backwashing



Warranty

ARKAL FILTRATION SYSTEMS STANDARD INTERNATIONAL WARRANTY

ARKAL FILTRATION SYSTEMS (hereinafter -"ARKAL FILTRATION SYSTEMS") guarantees to the customers who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year as of the day it left ARKAL FILTRATION SYSTEMS premises, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

ARKAL FILTRATION SYSTEMS will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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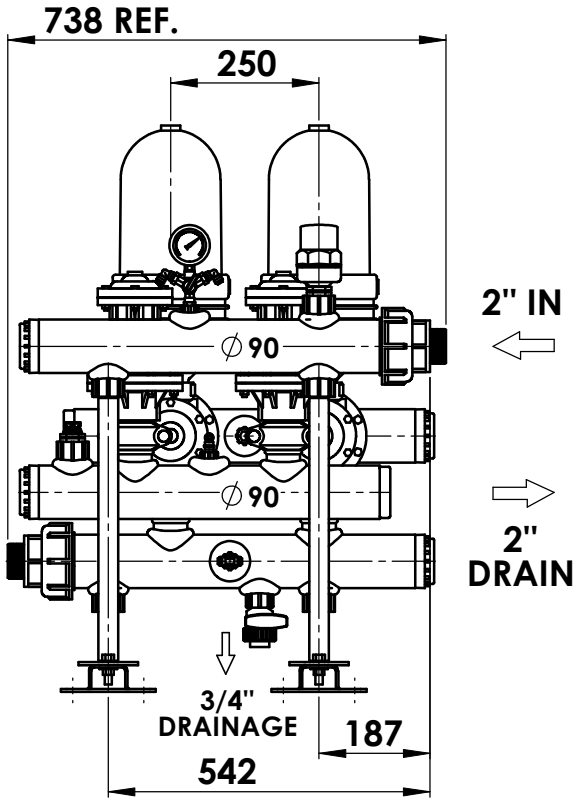
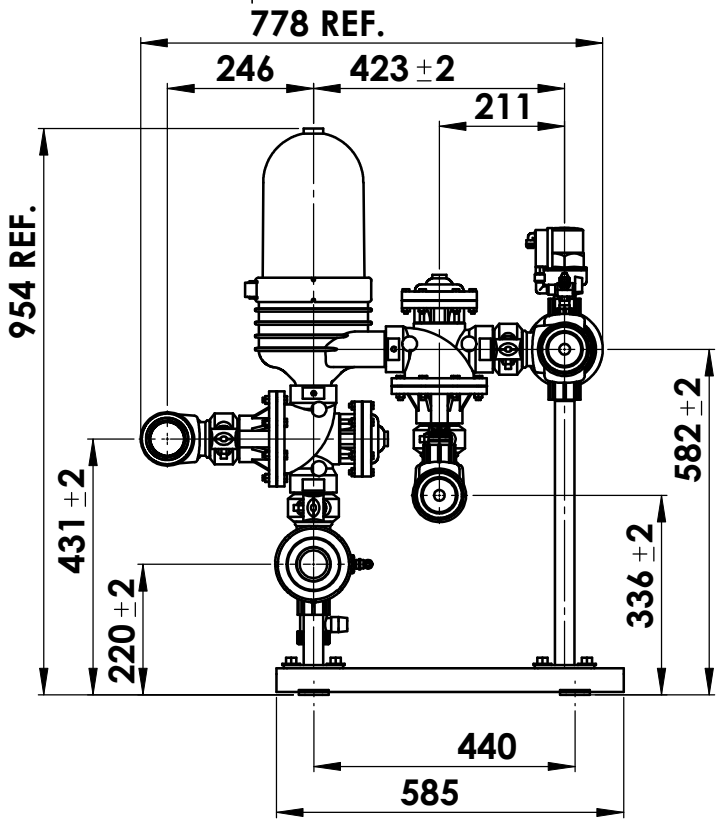
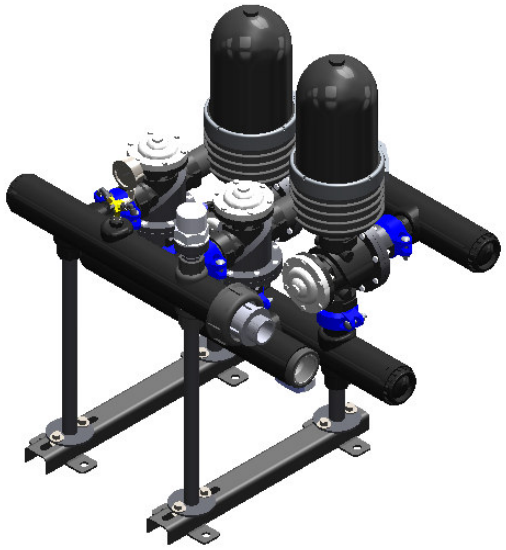
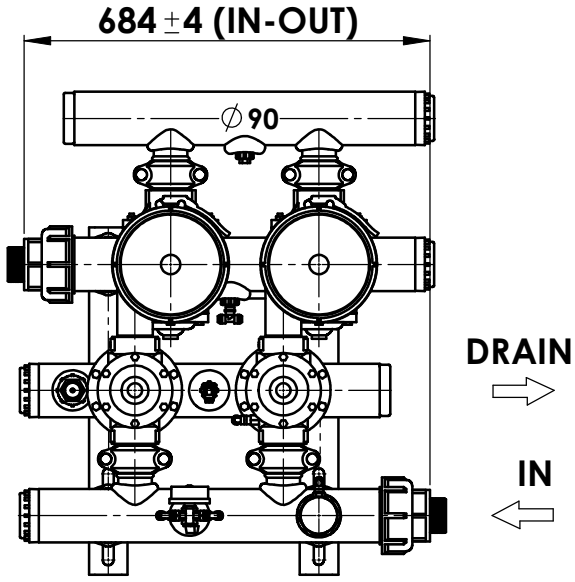
Drawings

2" Batteries External Source









MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 2*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1626M0202T3

SOLIDWORKS FILE CODE: 1626M03____3 — FILE CODE: 1626M0202T3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
DRAWN	ELENA	19/04/2009
CHECKED	NIKOLAY	19/04/2009
APPROVED	OMRY	17/05/2009
B.O.M.	OLEG	17/05/2009

FILE CODE DRAWINGS: **PALLET- 26 (5201 5403) TRIWALL-13(5200 5300)**

BACKUP: DISK-2S

FILE CODE OF MANIFOLD: 5626 0202TC2

DRAWING: 2130

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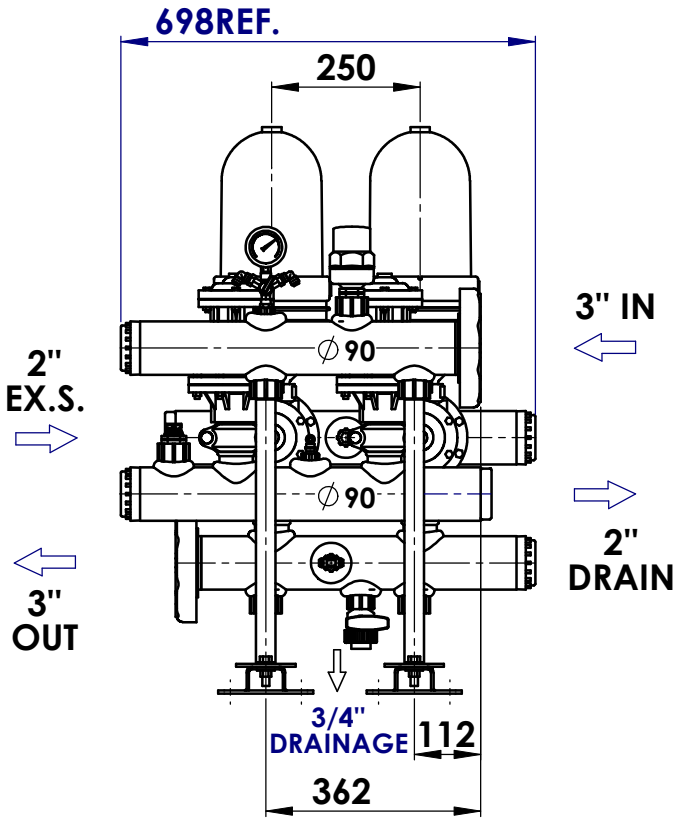

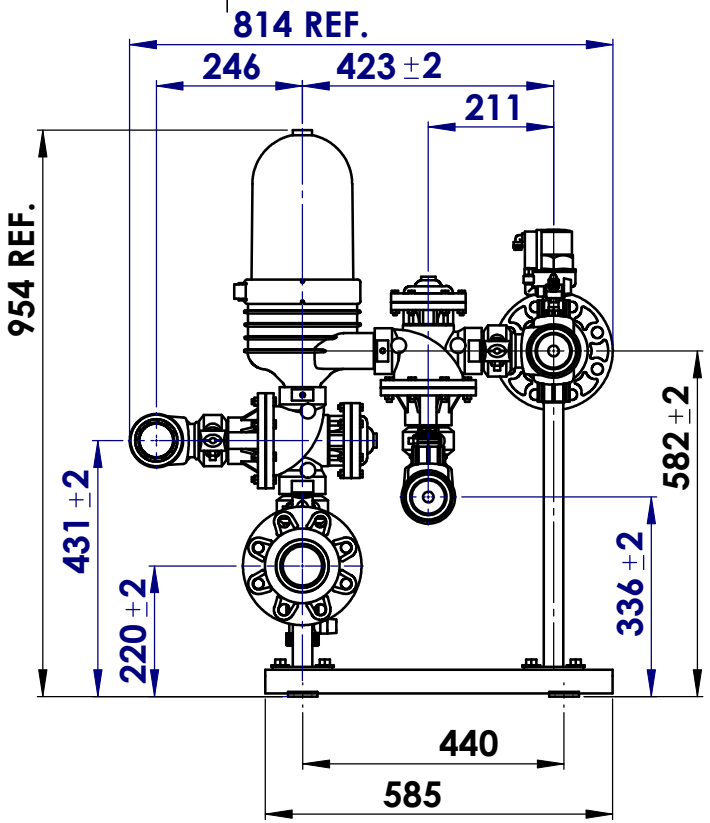

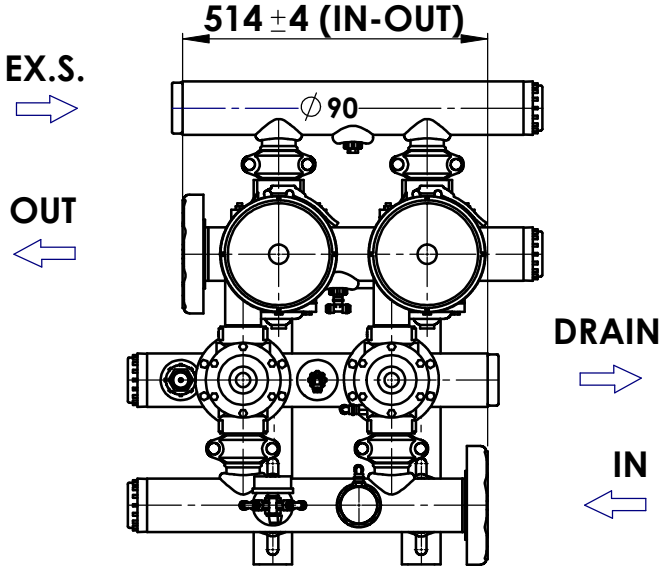

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2*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0302U3

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CHECKED	NIKOLAY	12/04/2009
APPROVED	YOEL	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS:
PALLET- 26 (5201 5403)
TRIWALL-13(5200 5300)

FILE CODE OF MANIFOLD
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BACKUP:
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DRAWING:
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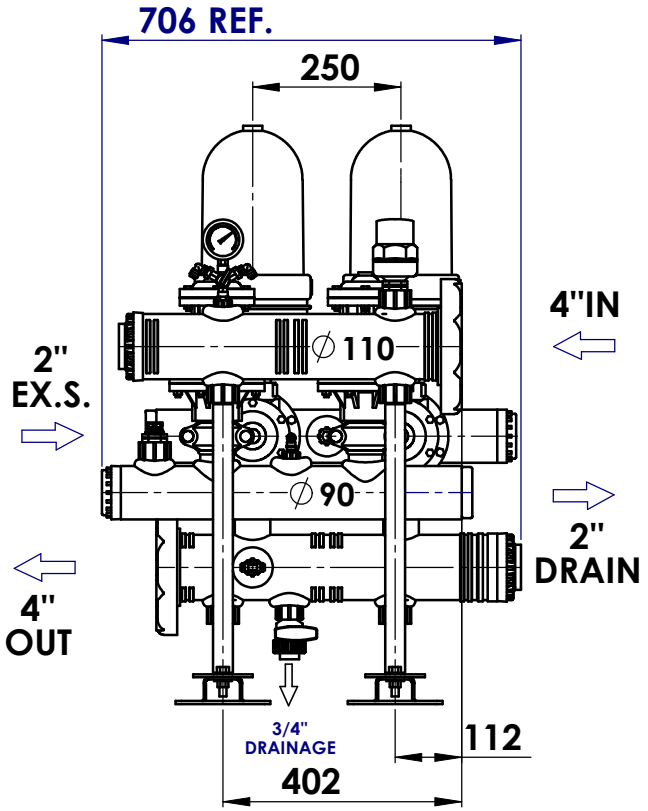

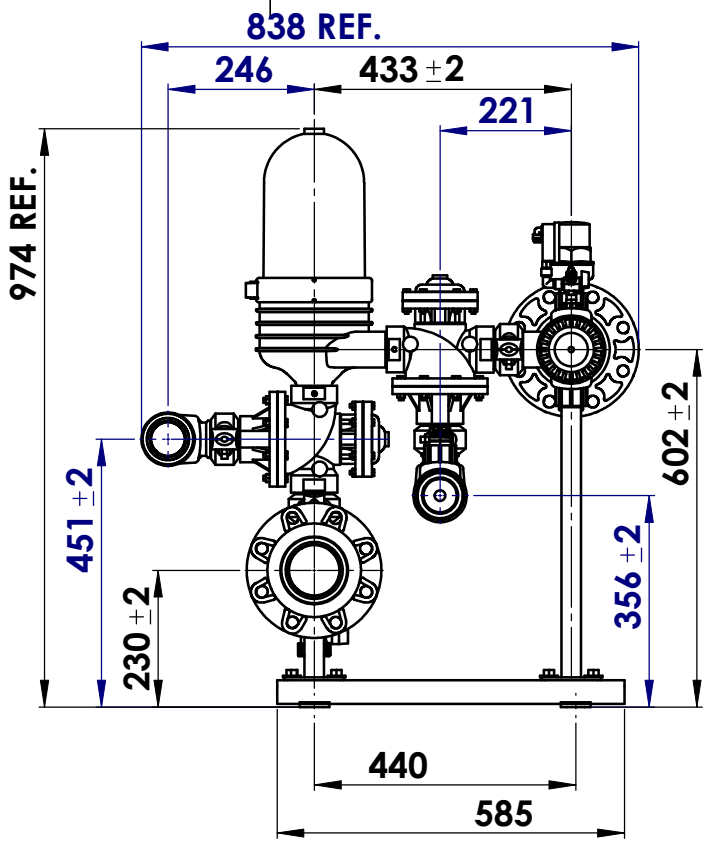

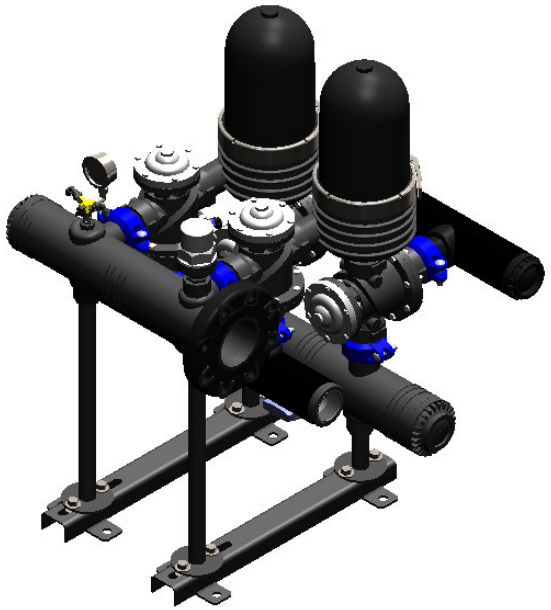

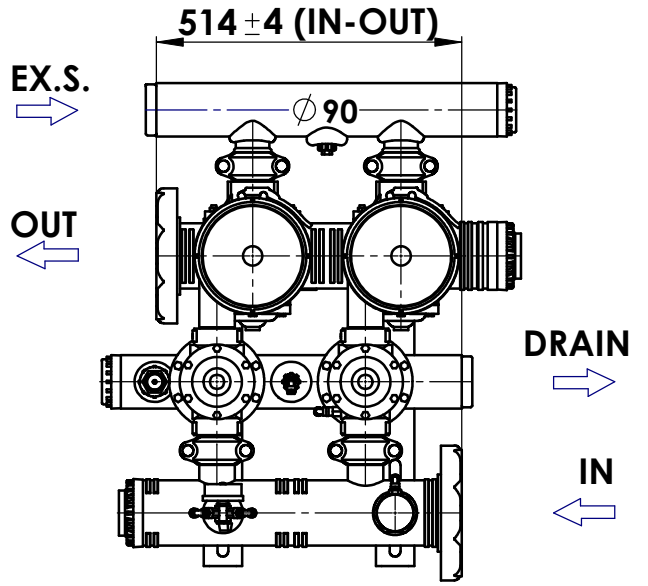

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PROJECT: 2*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1626M0402U3

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	NAME	DATE
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CHECKED	NIKOLAY	02/04/2009
APPROVED	OMRY	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS: **PALLET- 26 (5201 5403) TRIWALL-13(5200 5300)**

BACKUP: DISK-2S

FILE CODE OF MANIFOLD: 5626 0402VC2

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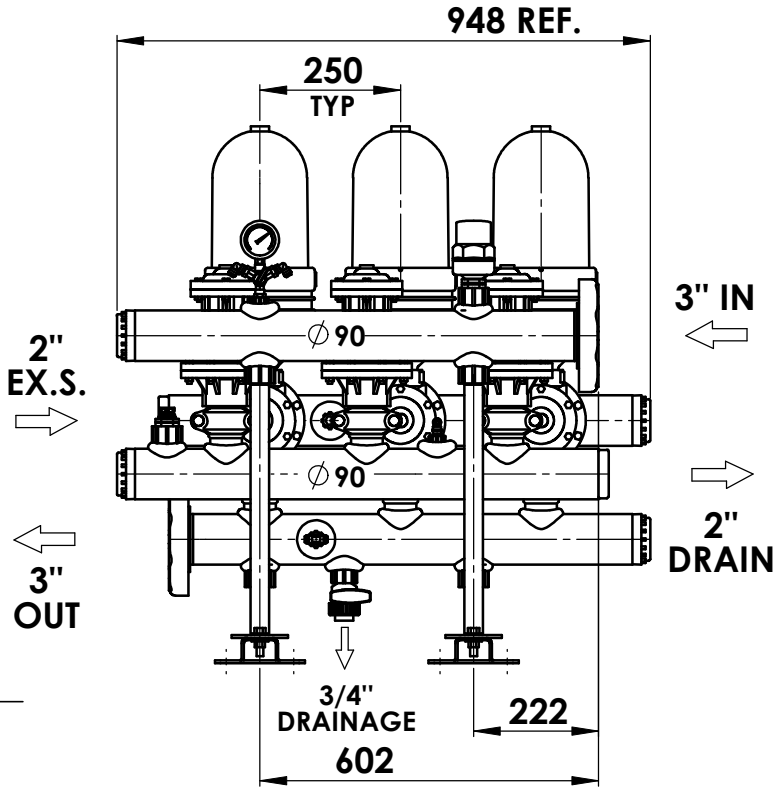

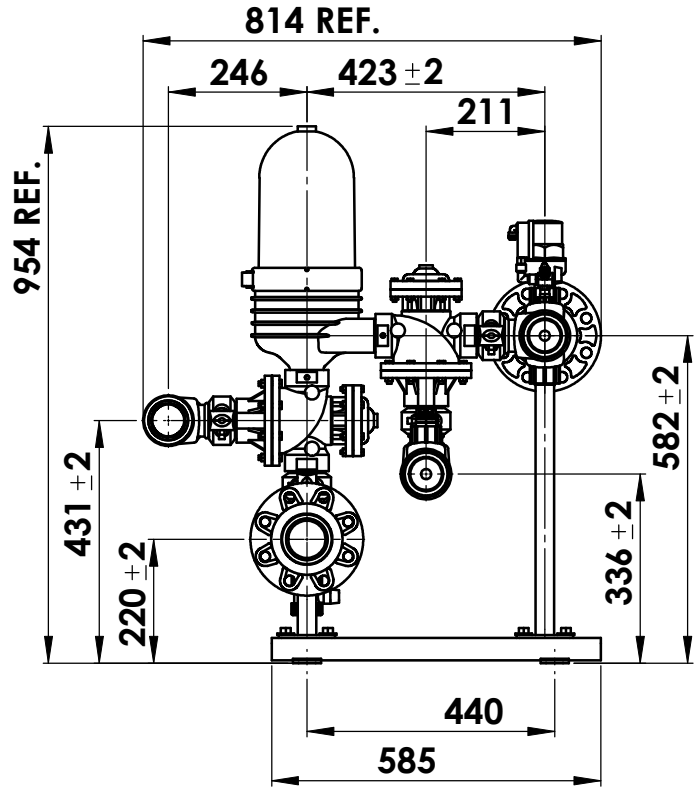

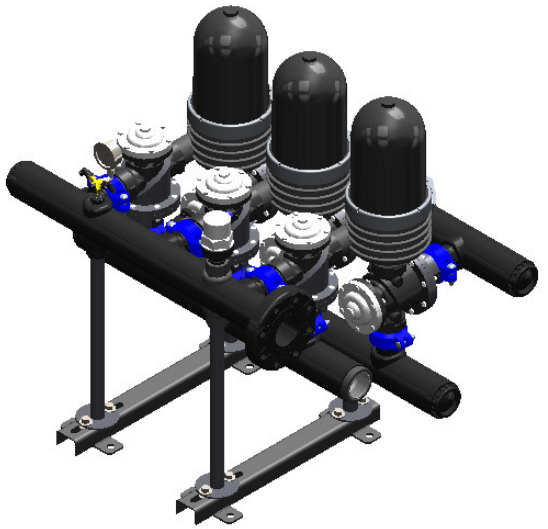

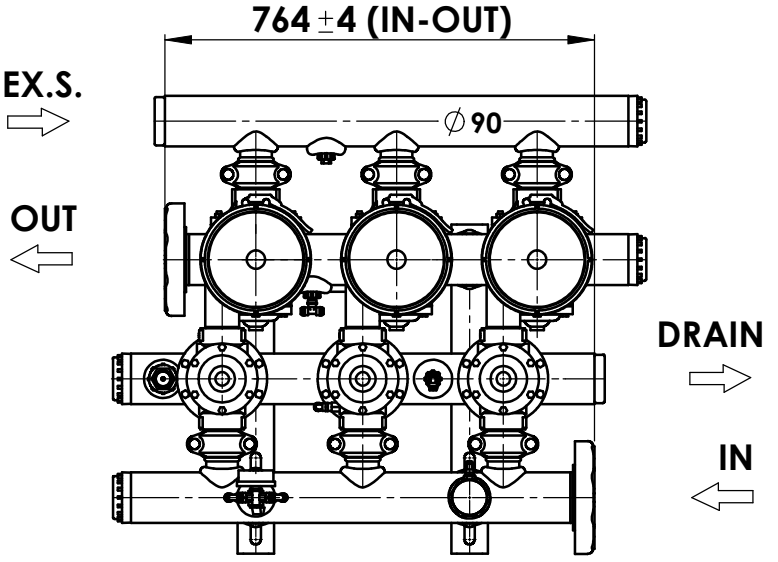

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 3*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY — PAGE 1_OF 5_

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CHECKED	NIKOLAY	20/04/2009
APPROVED	YOEL	17/05/2009
B.O.M.	OLEG	17/05/2009

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FILE CODE OF MANIFOLD: 5626 0303VC2

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DRAWING: 2130

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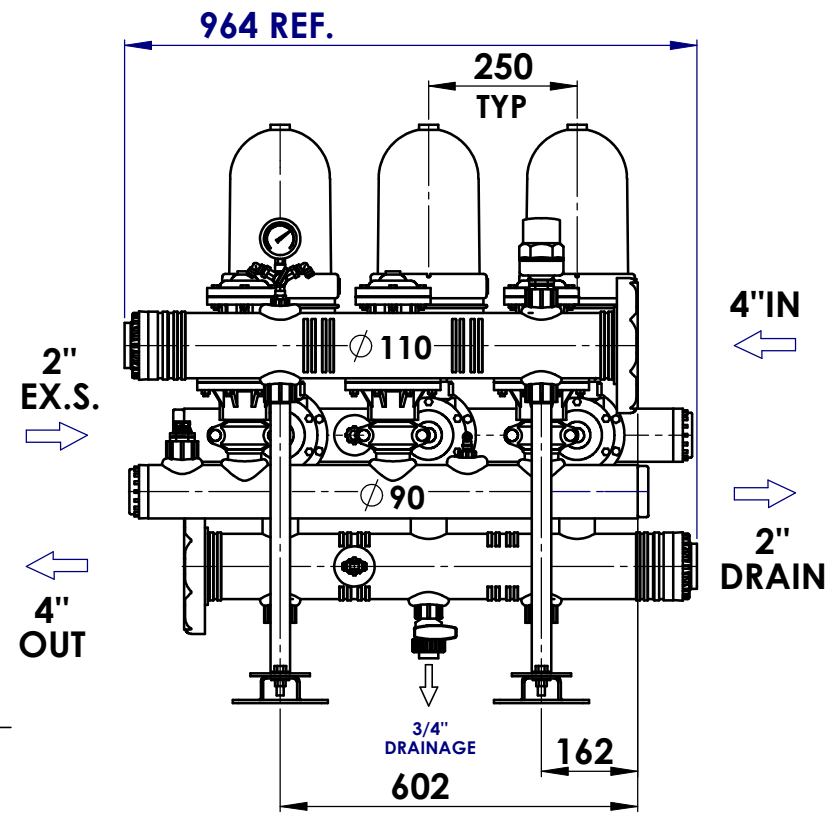

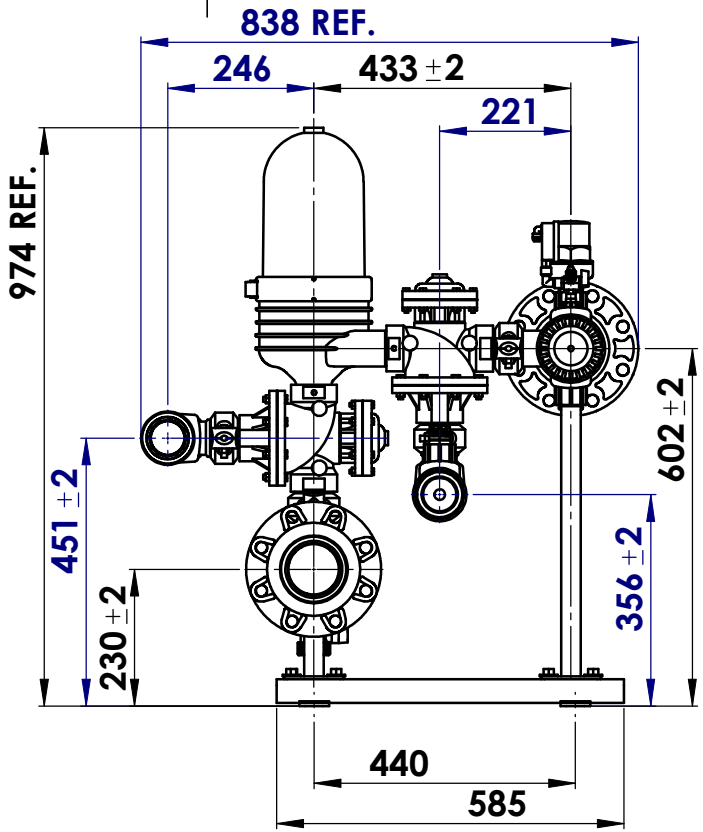

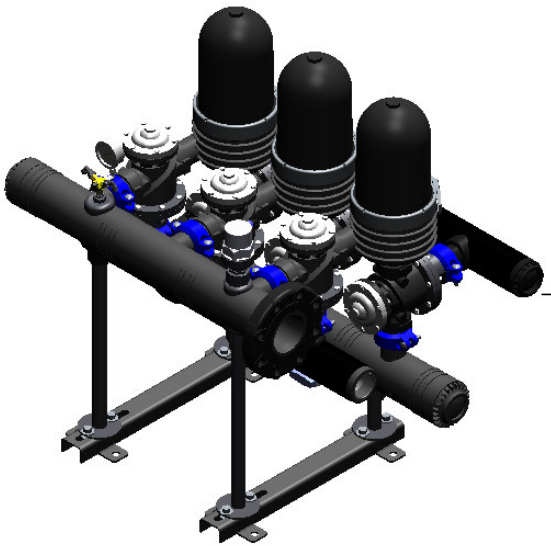

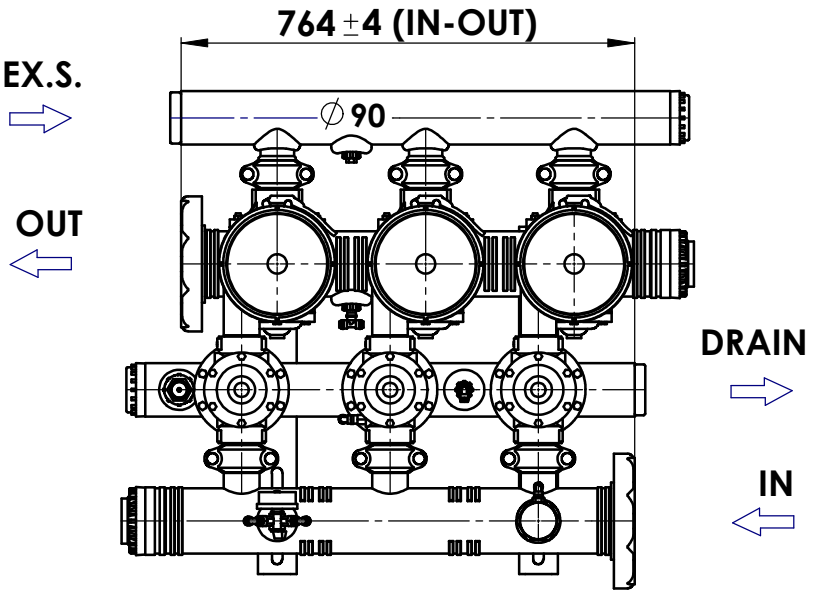

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT
3*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0403U3

SOLIDWORKS FILE CODE: 1626M04___3

FILE CODE: 1626M0403U3 C

FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
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CHECKED	NIKOLAY	05/04/2009
APPROVED	OMRY	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS:
PALLET- 422 (5201 5927)
TRIWALL-312(5200 5763)

FILE CODE OF MANIFOLD
5626 0403VC2

BACKUP: DISK-2S

DRAWING: 2130

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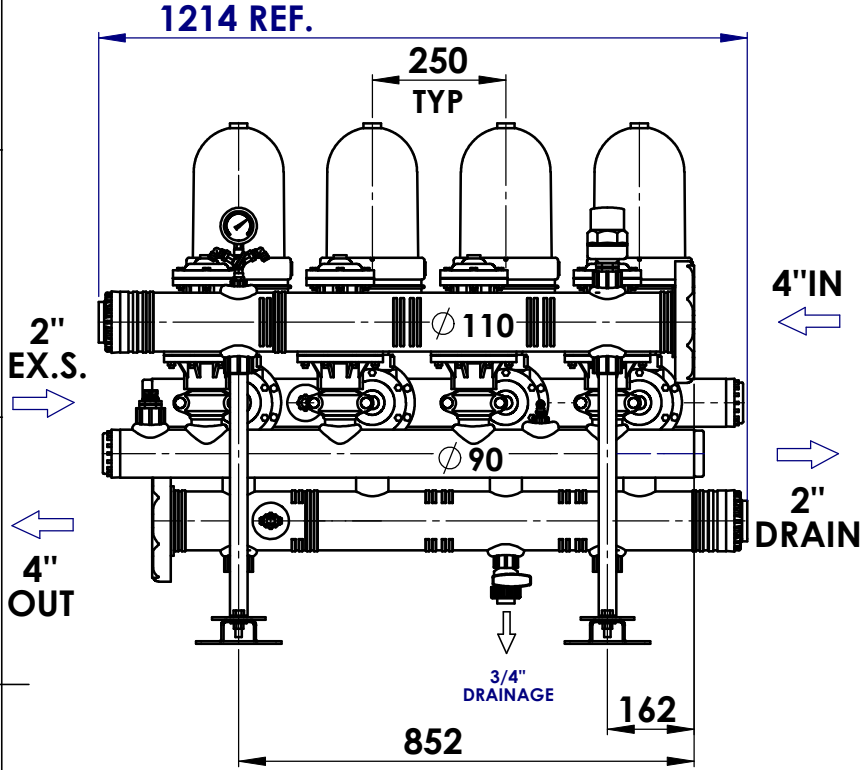

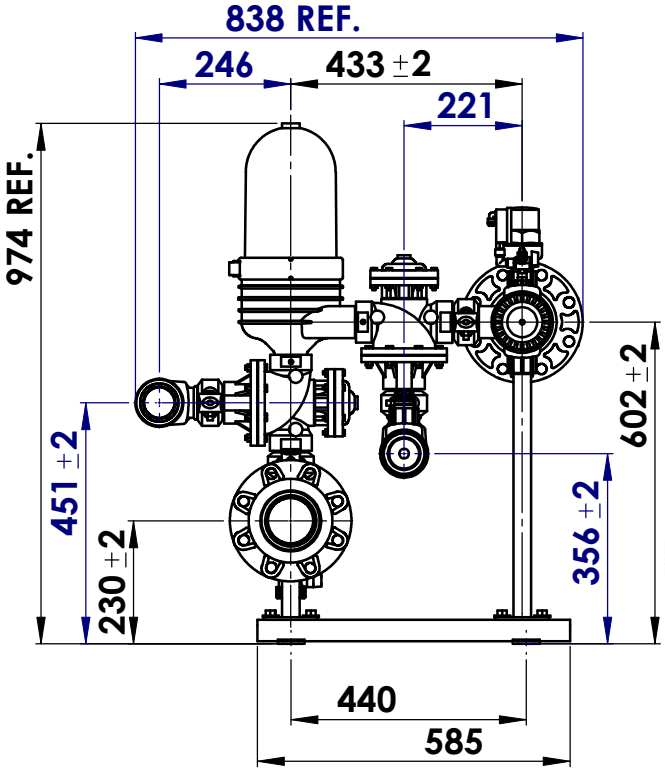

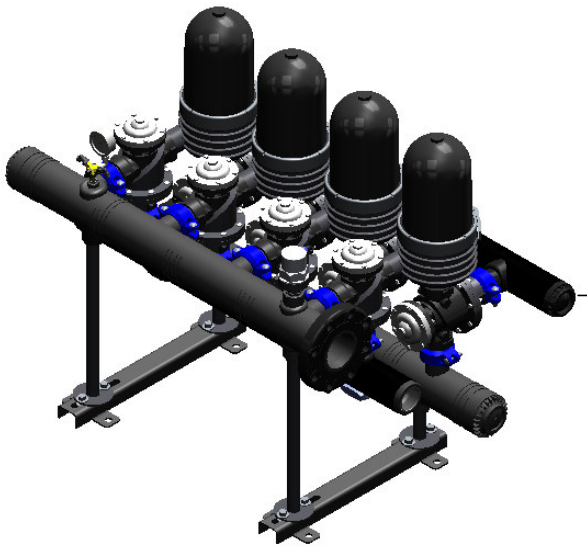

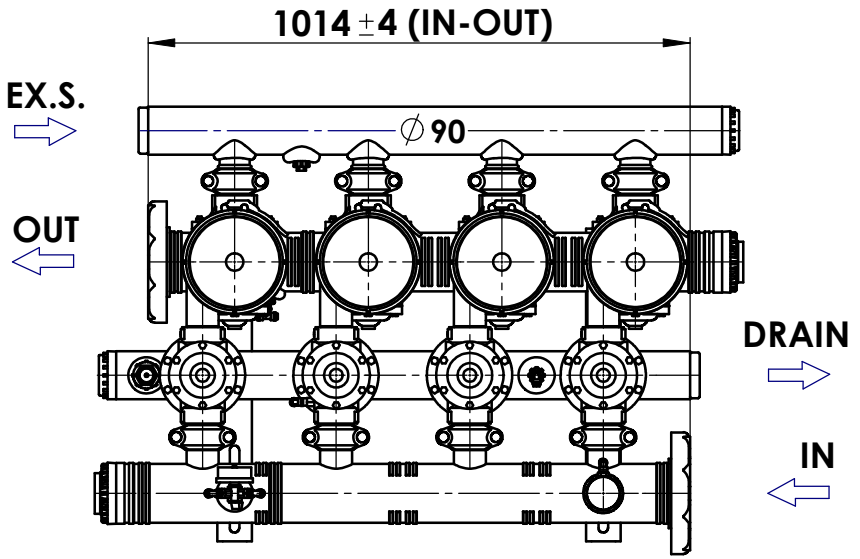

MODIFIC.	DATE	DESCRIPTION	SING

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4*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0404U3

SOLIDWORKS FILE CODE:	FILE CODE:	FILE CODE OF FILTER COMPL.:
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	NAME	DATE
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CHECKED	NIKOLAY	05/04/2009
APPROVED	OMRY	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS:
PALLET- 430 (5201 5936)
TRIWALL-313(5200 5762)

FILE CODE OF MANIFOLD
5626 0404VC2

BACKUP:
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DRAWING:
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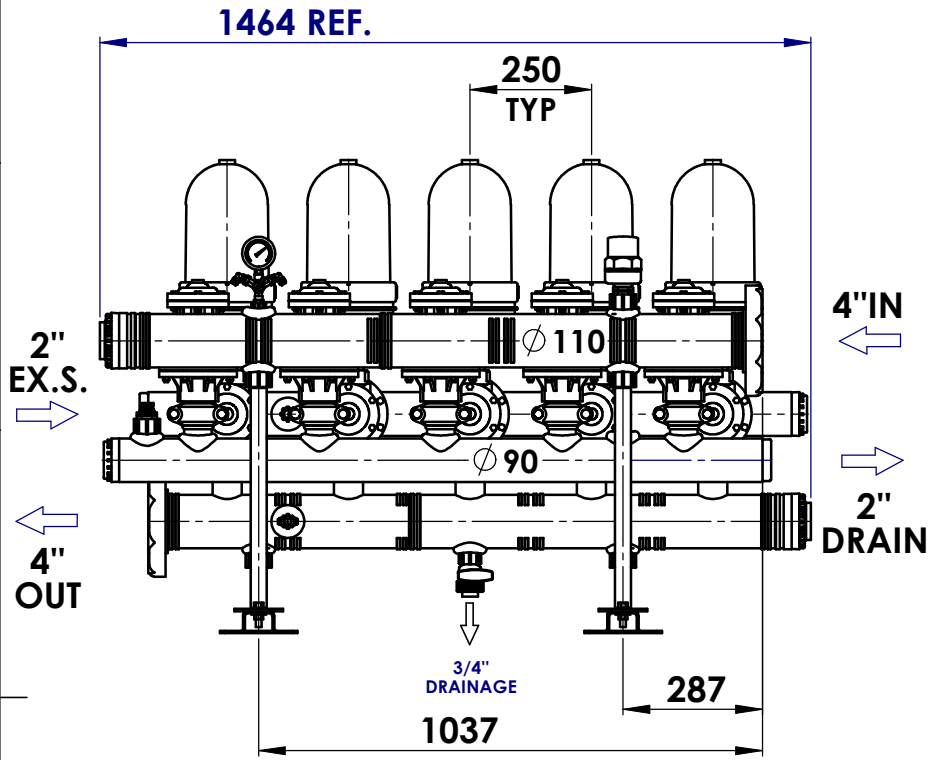
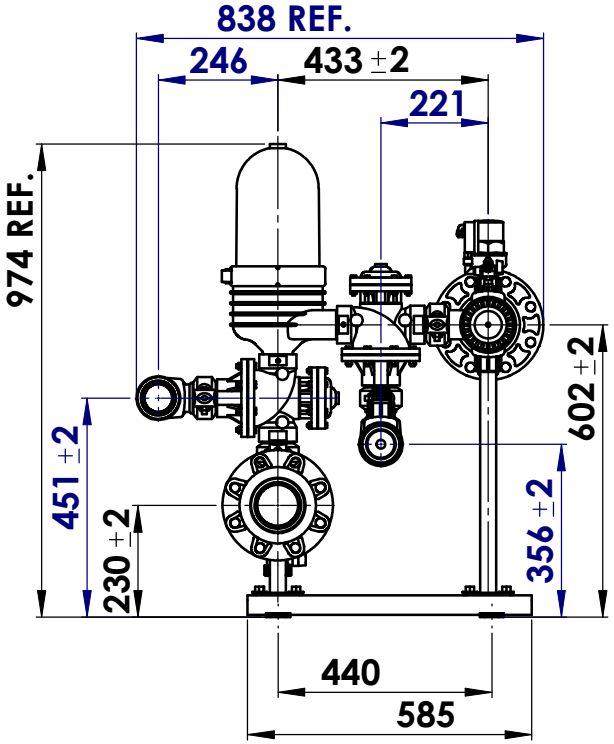
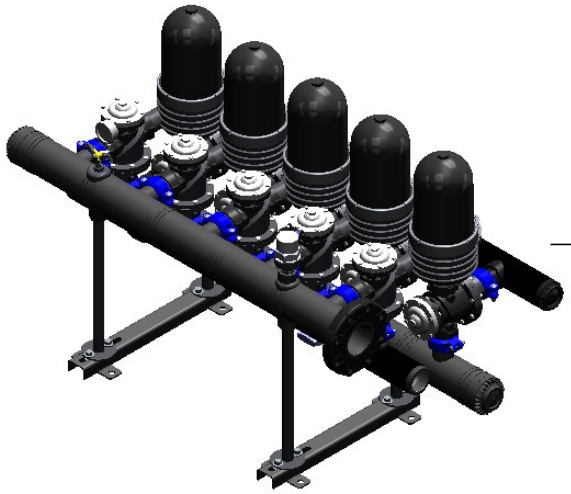
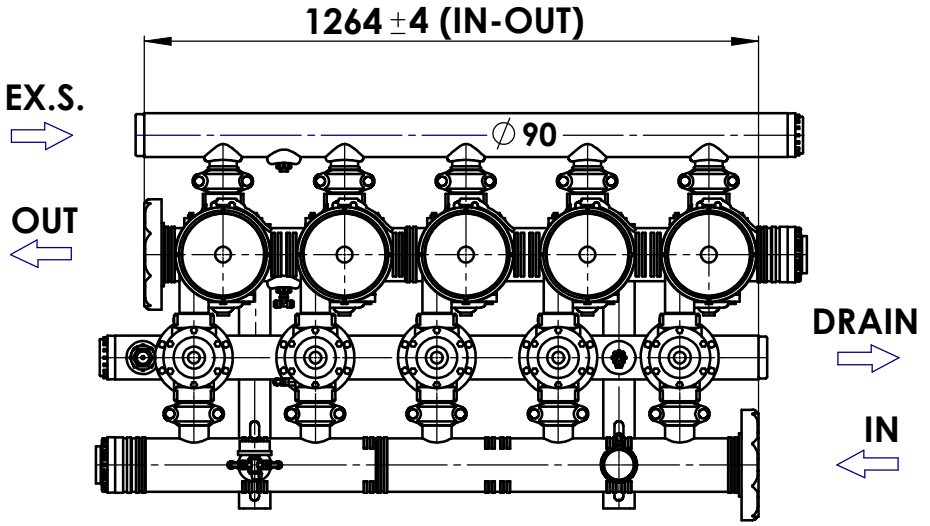








MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 5*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1626M0405U3

SOLIDWORKS FILE CODE: 1626M04___3 — FILE CODE: 1626M0405U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
DRAWN	ELENA	05/04/2009
CHECKED	NIKOLAY	05/04/2009
APPROVED	OMRY	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS: **PALLET- 277 (5201 5783)** **TRIWALL-315(5200 5760)**

BACKUP: DISK-2S

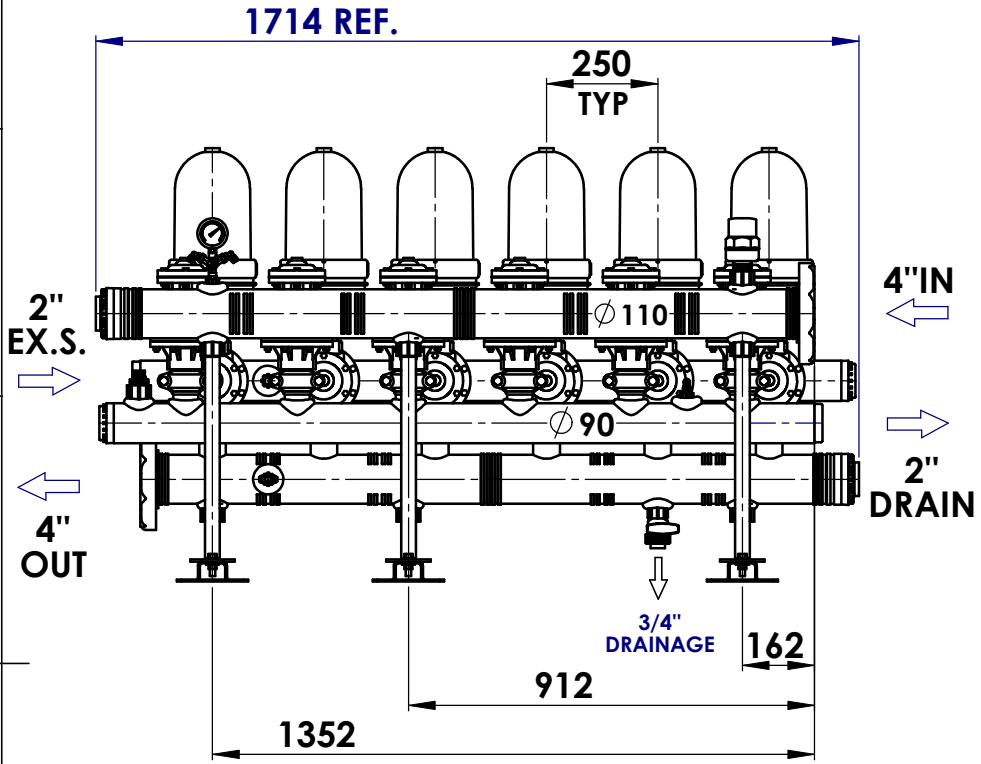
FILE CODE OF MANIFOLD: 5626 0405VC2

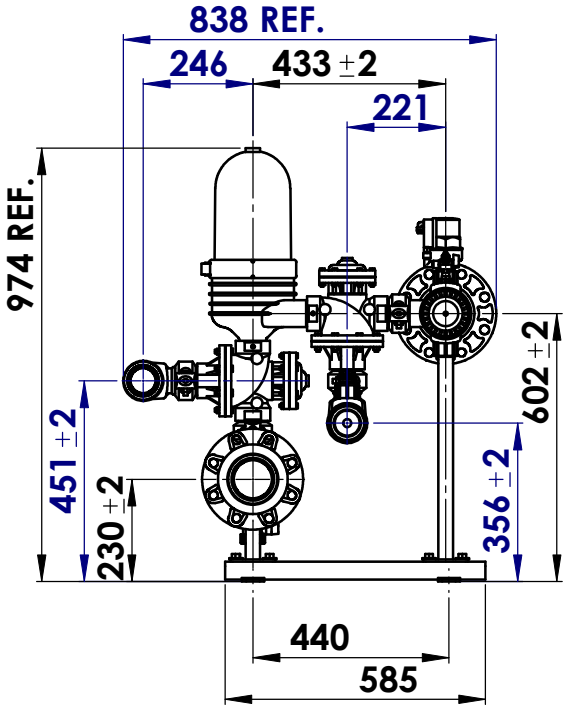
DRAWING: 2130

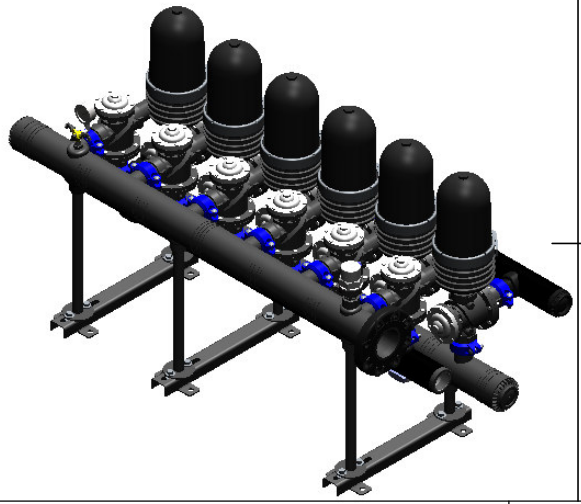
PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AFES\

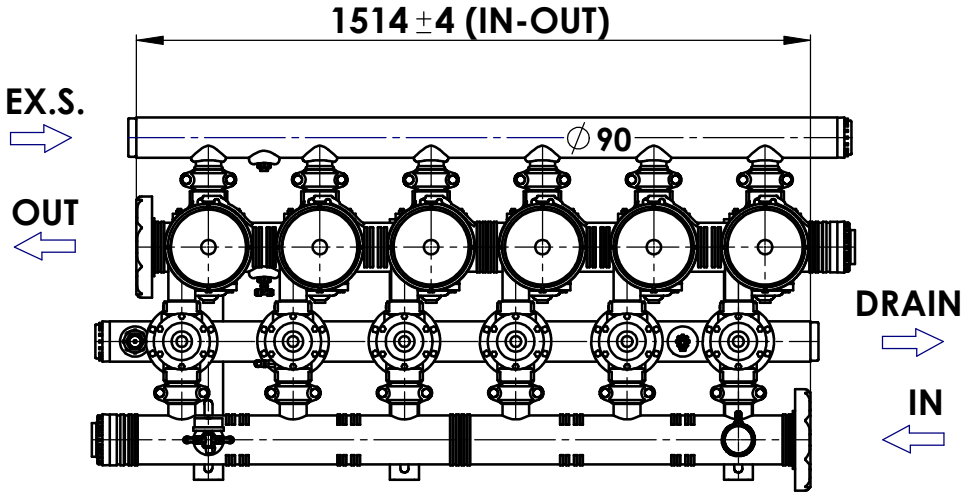
SHEET 1 OF 1

Sunday, May 10, 2009 11:16:32 AM









MODIFIC.	DATE	DESCRIPTION	SING

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FAX. 972-4-6775461
ISRAEL

PROJECT: 6*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1626M0406U3

SOLIDWORKS FILE CODE: 1626M04___3

FILE CODE: 1626M0406U3 C

FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
DRAWN	ELENA	05/04/2009
CHECKED	NIKOLAY	05/04/2009
APPROVED	OMRY	12/04/2009
B.O.M.	OLEG	12/04/2009

FILE CODE DRAWINGS: **PALLET- 375 (5201 5880)** **TRIWALL-316(5200 5761)**

FILE CODE OF MANIFOLD: 5626 0406VC2

BACKUP: DISK-2S

DRAWING: 2130

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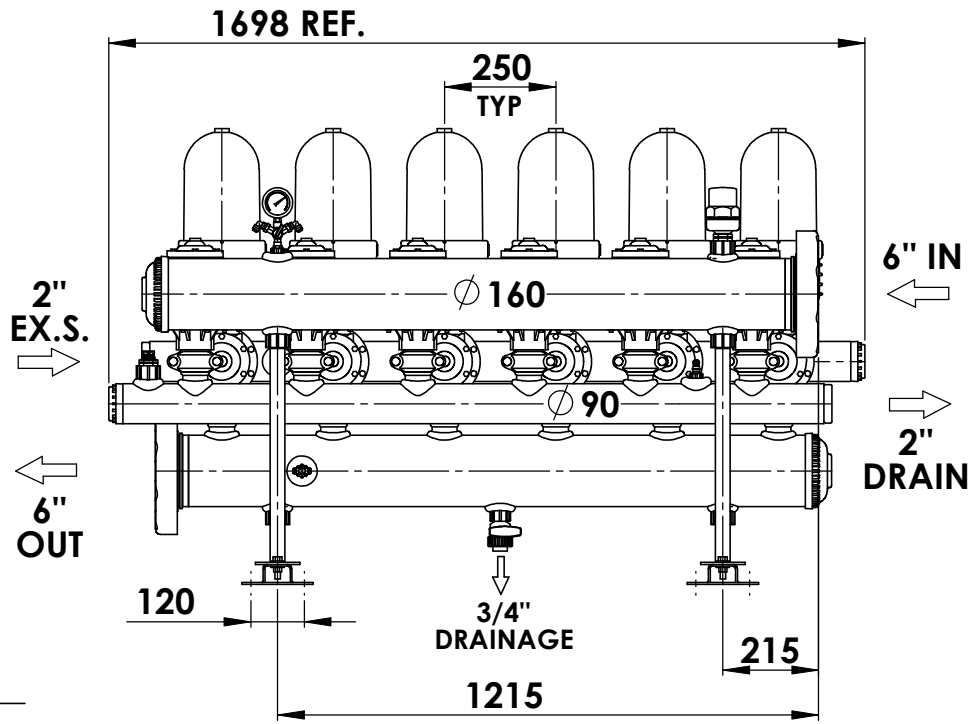

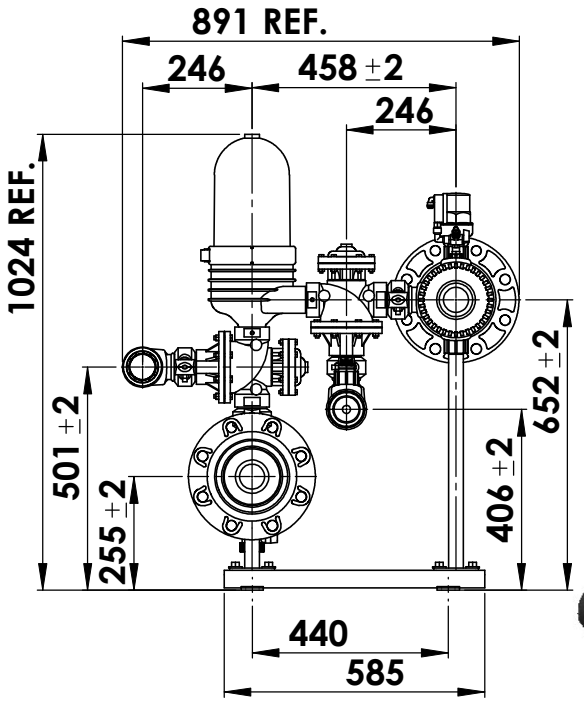

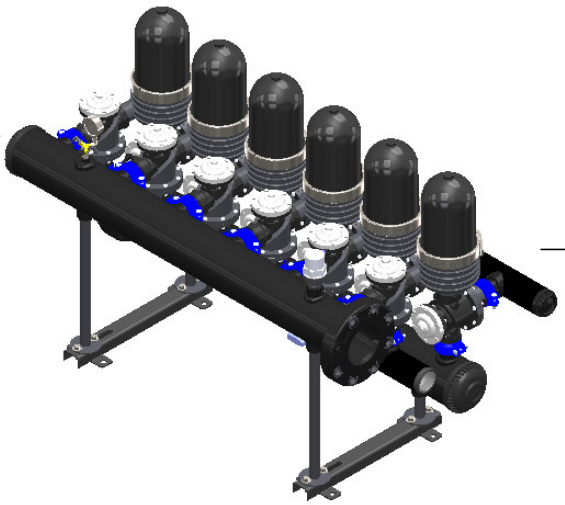

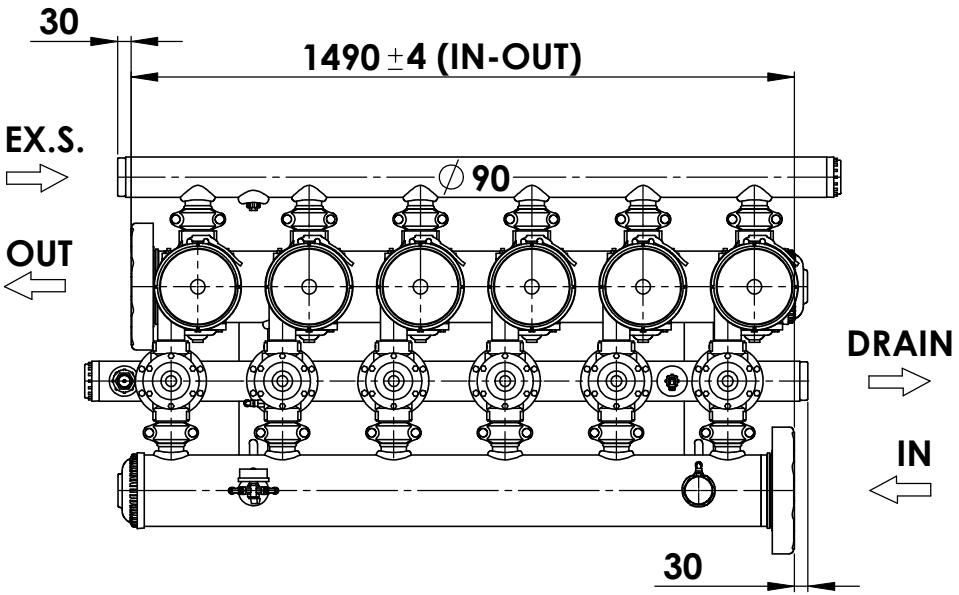

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT
6*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0606U3

SOLIDWORKS FILE CODE:	FILE CODE:	FILE CODE OF FILTER COMPL.:
1626M060___3	1626M0606U3 C	2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
DRAWN	ELENA	01/04/2009
CHECKED	NIKOLAY	01/04/2009
APPROVED	OMRY	05/04/2009
B.O.M.	OLEG	05/04/2009

FILE CODE DRAWINGS:
PALLET- 375 (5201 5880)
TRIWALL-316(5200 5761)

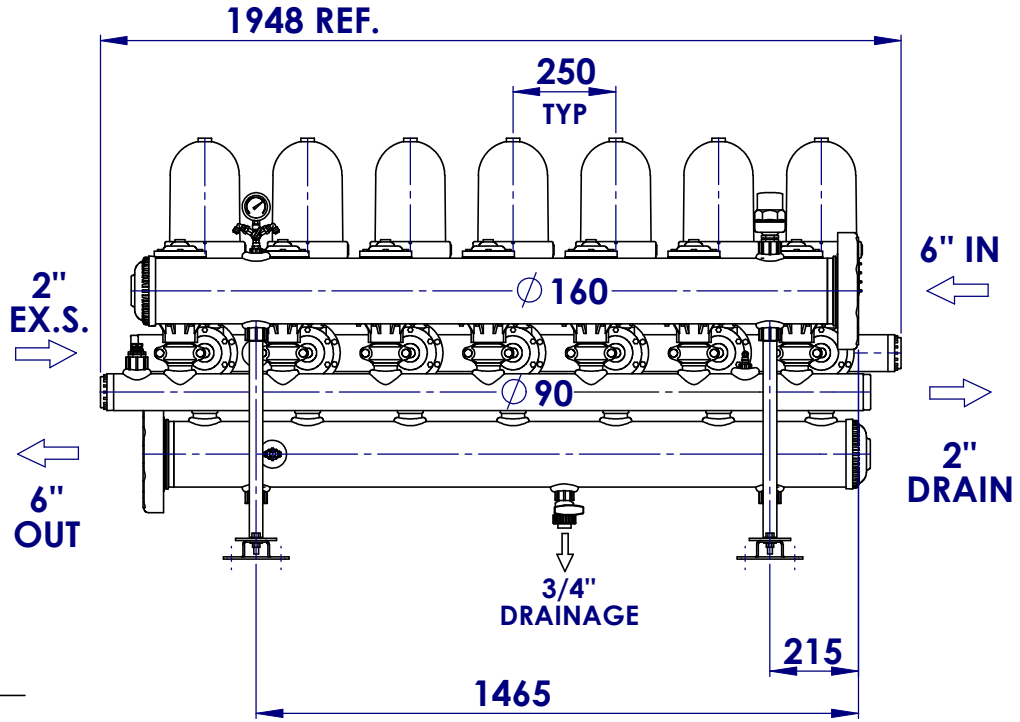
FILE CODE OF MANIFOLD
5626 0606VC2

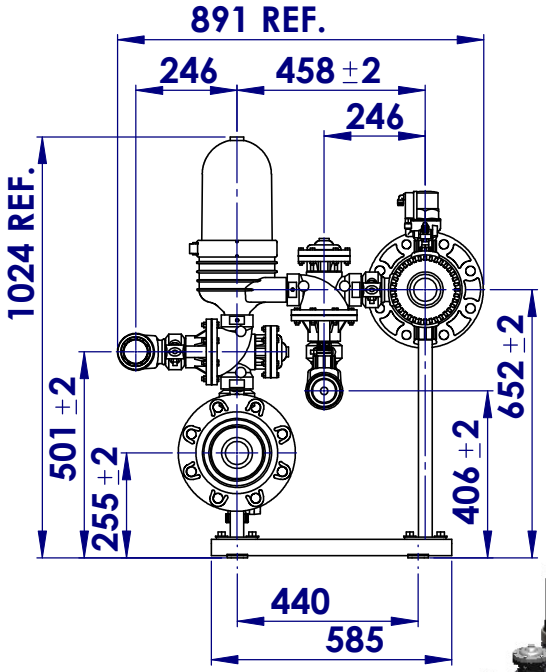
BACKUP:
DISK-2S

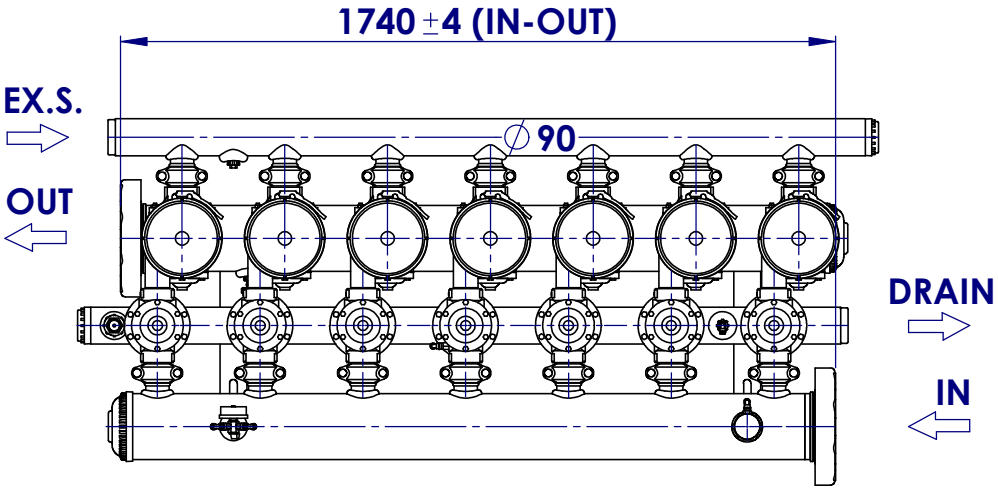
DRAWING:
2130

PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AFES\

Tuesday, May 05, 2009 8:07:18 AM







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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PROJECT
7*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0607U3

SOLIDWORKS FILE CODE:
1626M060___3

FILE CODE:
1626M0607U3 C

FILE CODE OF FILTER COMPL.:
2" SK FILTER + BERMAD
2260M1107_

	NAME	DATE
DRAWN	ELENA	01/04/2009
CHECKED	NIKOLAY	01/04/2009
APPROVED	OMRY	05/04/2009
B.O.M.	OLEG	05/04/2009

FILE CODE DRAWINGS:
PALLET- 313 (5201 5812)
TRIWALL-314(5200 5764)

FILE CODE OF MANIFOLD
5626 0607VC2

BACKUP:
DISK-2S

DRAWING:
2130

PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AFES

SHEET 1 OF 1

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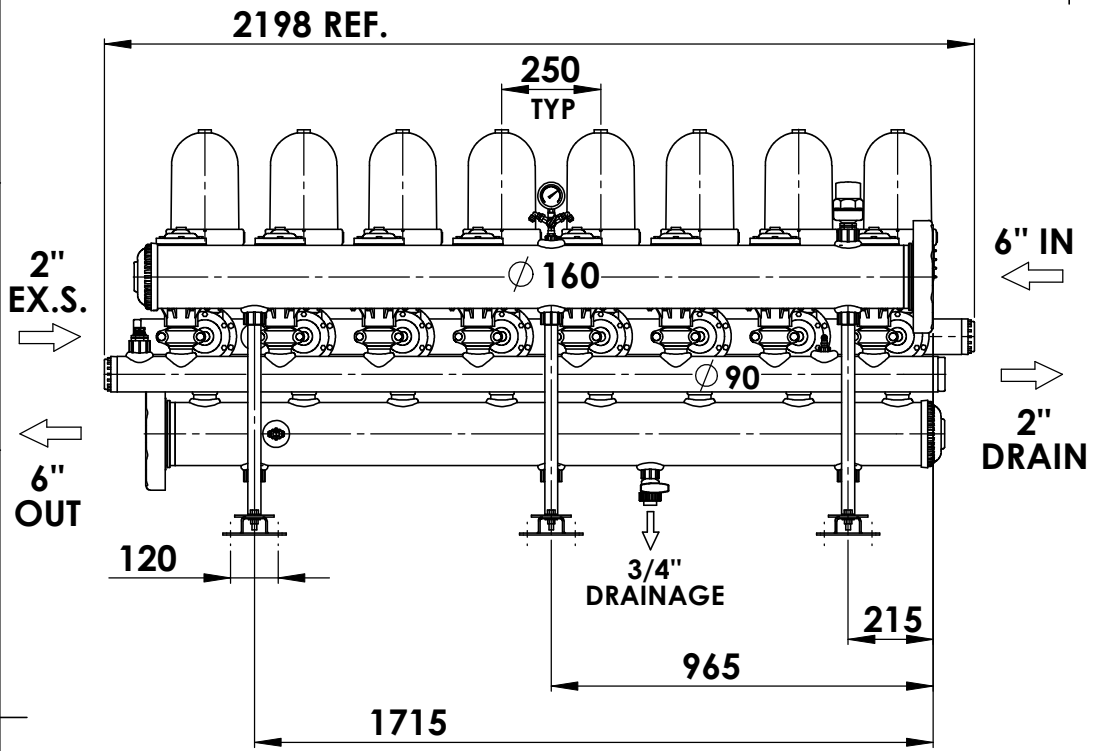

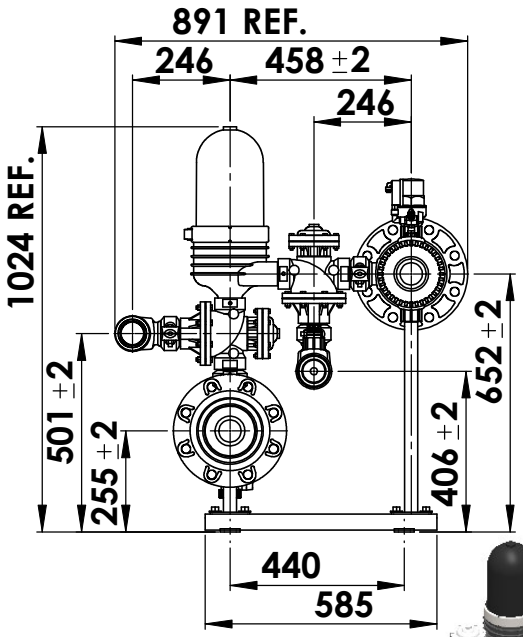

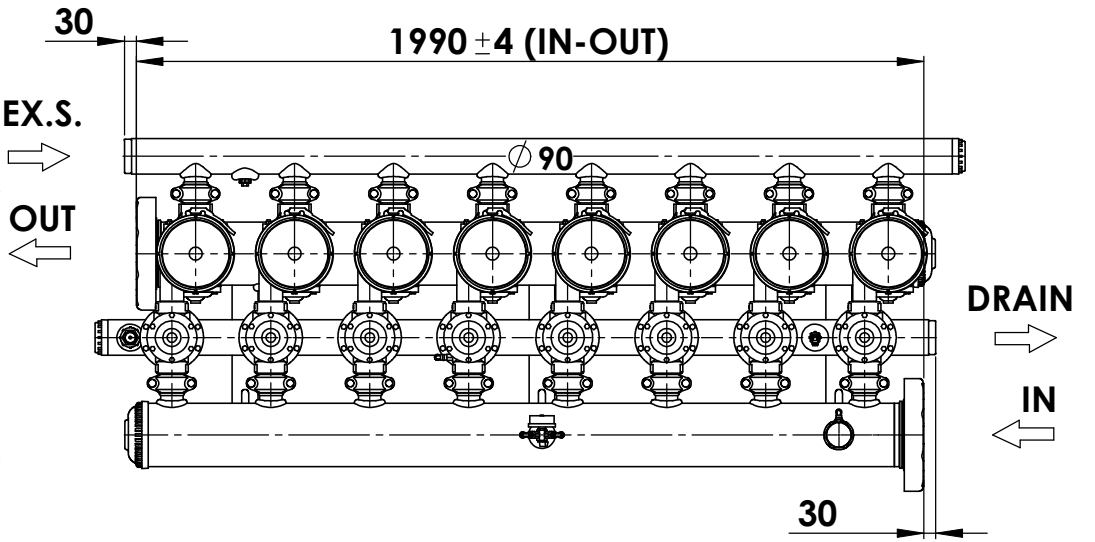

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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PROJECT
8*2" S.K. FILTERS "A.F.E.S." PLASTIC BATTERY

PAGE 1_OF 5_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1626M0608U3

SOLIDWORKS FILE CODE:
1626M060___3

FILE CODE:
1626M0608U3 C

FILE CODE OF FILTER COMPL.:
2" SK FILTER + BERMAD 2260M1107_

	NAME	DATE
DRAWN	ELENA	02/04/2009
CHECKED	NIKOLAY	02/04/2009
APPROVED	OMRY	05/04/2009
B.O.M.	OLEG	05/04/2009

FILE CODE DRAWINGS:
PALLET- 521 (5201 5026)
TRIWALL-318(5200 5765)

FILE CODE OF MANIFOLD
5626 0608VC2

BACKUP:
DISK-2S

DRAWING:
2130

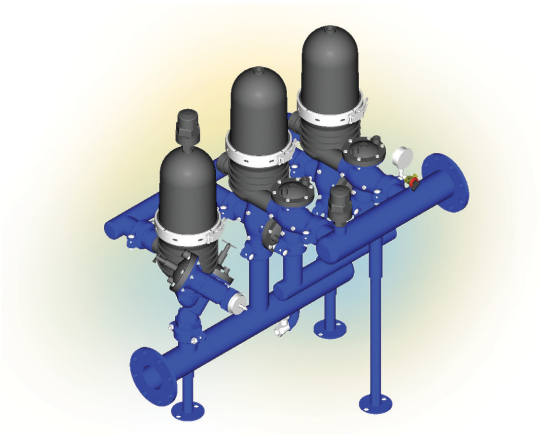
PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AFES\

SHEET 1 OF 1

Sunday, April 19, 2009 11:03:38 AM

Opal Air Aided Flushing

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for low flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation
- Low pressure operation
- Minimum backwash water volume

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	0.8	**psi**	12
Filtration surface area per unit	**cm^2**	880	**in^2**	136.4
Filtration volume per unit	**cm^3**	1320	**in^3**	80.5
Backwash water volume per unit	**lit**	12	**gal**	3.2

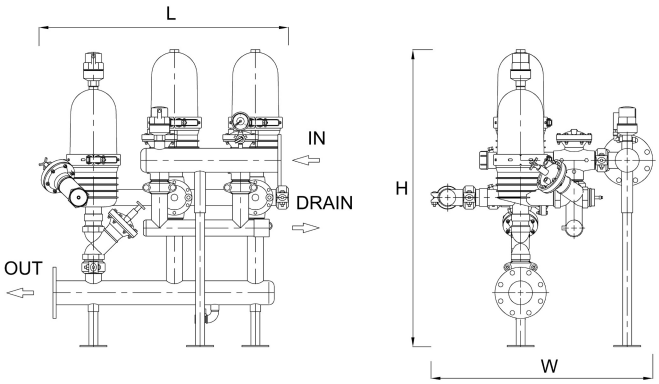
Maximum Filtration Flow Rate / Water Quality

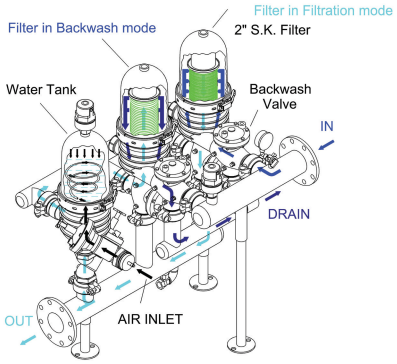
No. of units		2	3	4	5	6	2	3	4	5	6
Filtration Grade	**Water Quality**	**m^3/h**					**gpm**				
400-130 µ	Good	50	75	100	125	150	220	330	440	550	660
	Average	38	57	76	95	115	167	250	334	418	506
	Poor	27	41	54	67	84	119	180	238	294	370
	Very Poor	16	25	33	41	49	70	110	145	180	215
100 µ	Good	40	60	80	100	120	176	264	352	440	528
	Average	30	45	60	75	90	132	192	264	330	396
	Poor	20	30	40	50	60	88	132	176	220	264
	Very Poor	13	20	26	33	40	57	88	114	145	176
55 µ	Good	28	42	56	70	84	123	184	246	308	364
	Average	22	33	44	55	66	97	145	193	242	290
	Poor	15	23	30	38	45	66	101	132	167	198
	Very Poor	9	14	18	24	33	39	61	79	105	145
20 µ	Good	14	21	28	35	42	61	92	123	154	184
	Average	10	16	21	26	32	44	70	92	114	140
	Poor	7	11	14	18	21	30	48	61	79	92
	Very Poor	5	7	9	11	13	22	30	39	48	57

Dimensions and Weights

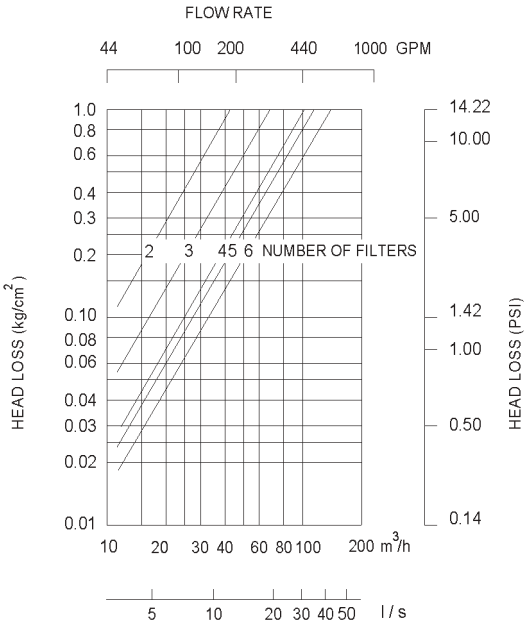
No. of units		2	3	4	5	6		2	3	4	5	6
D Inlet\Outlet diameter	**mm**	90	90	110	110	160	**inch**	3	3	4	4	6
L Length	**mm**	997	1297	1597	1897	2155	**inch**	39	51	63	75	85
H Height	**mm**	1100	1100	1129	1129	1156	**inch**	43	43	44	44	46
W Width	**mm**	805	805	823	823	864	**inch**	32	32	32	32	34
Shipping weight (approx.)	**kg**	105	118	138	158	186	**lbs**	231	260	303	347	409

NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.





Head Loss Chart - for 130-400µ, Clean State



OPAL filtration batteries are available with:
Polyester coated steel,
Stainless steel or
Polypropelene manifolds.

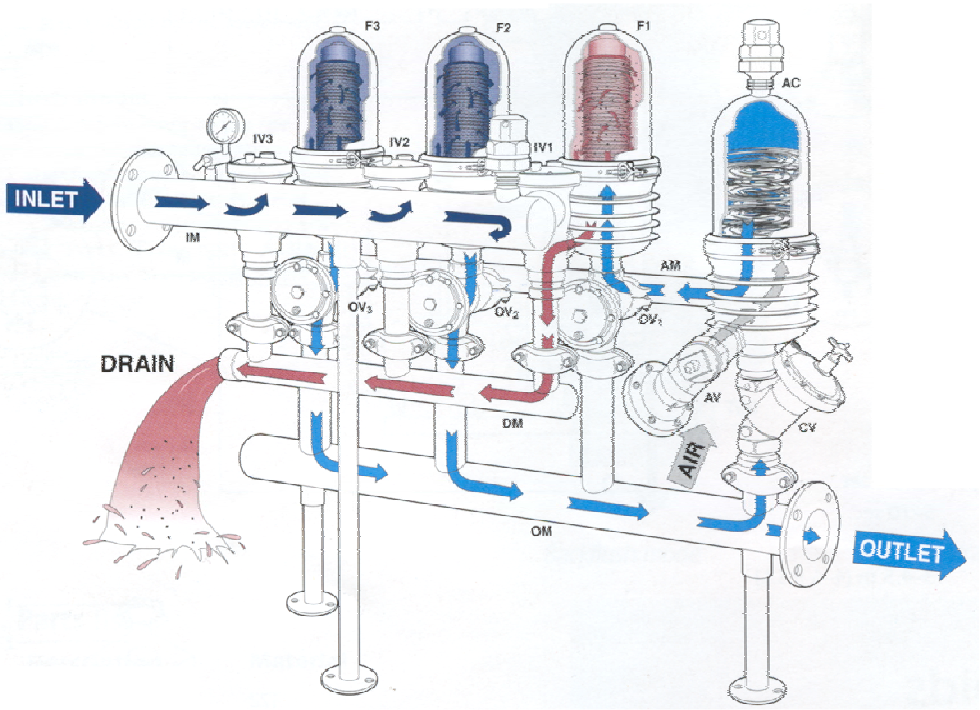
2” Spin Klin® Battery

Air Aided Flushing

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Air Aided Flushing Spin Klin® Battery – A. A. F.
Operation and Maintenance Manual



IM	Inlet Manifold
OM	Outlet Manifold
AM	Aerosol Manifold
DM	Drain Manifold
F	2” Spin Klin filter
IV	2”x2” Inlet Valve
OV	2”x2” Outlet Valve
AV	Air Inlet Valve
CV	Check Valve
AC	Accumulator

Filtration Process

- During the filtration stage water flows through the **INLET MANIFOLD** (IM), distributing through the **INLET VALVES** (IV) to the 2” **SPIN KLIN FILTERS** (F).
- The water passes through the **FILTER** (F) and flows out clean through the **OUTLET VALVE** (OV) and **OUTLET MANIFOLD** (OM) to the customer.
- At this stage the **ACCUMULATOR TANK** (AC) fills up with clean water from the **OUTLET MANIFOLD** (OM) through the **CHECK VALVE** (CV).

Backwashing Process

1. The **CONTROLLER** transmits a pulse (as per pressure differential or time, whichever is first.
2. Pneumatic command from solenoid No. 1 sends a pressure pulse to two users simultaneously.

   A. To the **INLET VALVE** (IV) converting it from filtration mode to backwash mode.

   B. To the **OUTLET VALVE** (OV1) converting it from filtration mode to backwash mode.
3. Air command from the solenoid of the **AIR VALVE** (AV):
   - Opens the **AIR VALVE** (AV).
   - The compressed air enters the **ACCUMULATOR** (AC).
   - The piston of the **SPIN KLIN FILTER** (F1) rises, thus decompressing discs.
   - The air is mixed with clean water and is carried to a **FILTER** (F1) which is then flushed.
   - The ratio between air and water will rise until there is hardly any water at termination (air alone does not spin the discs).

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Spin Klin Technology- Spin Klin Spine

General:

The Spin Klin discs are stacked on the Spin Klin spine.

The discs are color-coded by micron **size,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtration and backwash cycles.

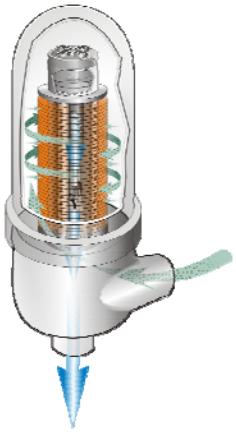
Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs**.**

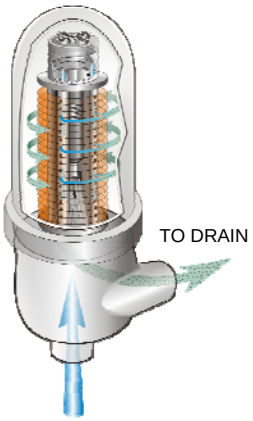
Backwash Mode:

During backwash the discs are released by releasing the inlet hydraulic pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

Filtration Mode



Backwash Mode



2" x 2" Backwash Valve

Filtration Mode:

Water flows from port A (main supply) to port B (filter connection).

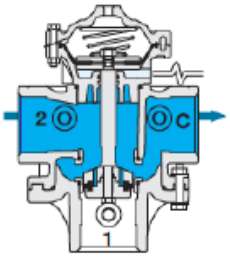
Port C (drain water outlet) is closed by the seal.

Backwash Mode:

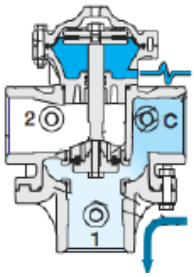
Command pressure is applied to the bottom side of the diaphragm through port D. The diaphragm moves up, pulling the sealed body by the shaft. Port A is closed by the seal, preventing flow to the filter. Port C is now open allowing flushing water to flow from port B (filter connection) to the drain.

Inlet Valve

Mode of Operation:



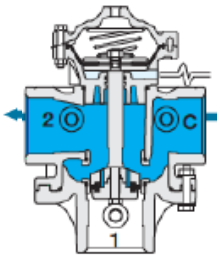
Filtration Mode



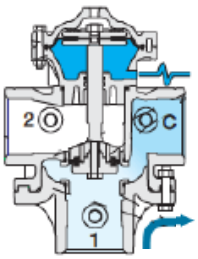
Backwash Mode

Outlet Valve

Mode of Operation:



Filtration Mode



Backwash Mode

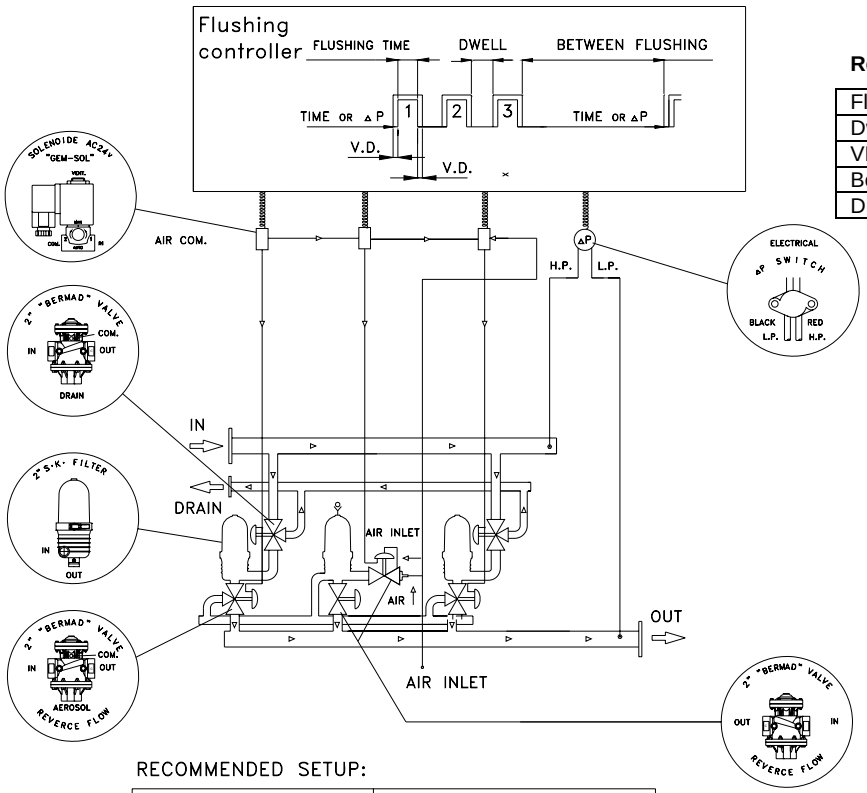
Technical Data

Minimum water pressure:	0.8 bar (12 P. S. I.)
Maximum water pressure:	8.0 bar (115 P. S. I.)
pH:	4-11
Maximum Temperature:	70ºC (158ºF)
Water Flush volume:	12 – 22 liters (3.2-5.8 gallon) per single filter unit. The variance is according to the length of aerosol manifold
Air pressure control:	Equal or higher pressure used for backwashing Control source should be remote from flushing source
Recommended air compressor:	¾" H. P. + 80 liter (21 gallon) tank

Air Volume and Flow Rate at Different Pressures

Air Pressure…6 Bar (65 P. S. I.)						
Water Pressure		Time	Air Flow Rate		Total Volume	
Bar	P. S. I.	Seconds	Ft^3/MIN	Liter/Minute	Liter	Ft^3
6	84	7.5	9.5	269	33.6	1.18
3.5	50	7.5	9.5	269	33.7	1.18
1.5	20	7.5	10	283.2	35.4	1.25

Air Pressure…4.5 Bar (85 P. S. I.)						
Water Pressure		Time	Air Flow Rate		Total Volume	
Bar	P. S. I.	Seconds	Ft^3/MIN	Liter/Minute	Liter	Ft^3
6	84	Air Pressure Always Needs to be Higher than Water Pressure				
3.5	50	8.5	9.5	269	38.1	1.3
1.5	20	8.8	11	311.5	45.7	1.6



Recommended Setup Time:

Flushing time	5 - 7 sec
Dwell	15-25 sec
VD	1 sec
Between flushing	1-2 hour
DP	(3-4.5)m, (4-6.5) psi

RECOMMENDED SETUP:

FLUSHING TIME:	7 sec.
DWELL:	40 sec.
V.D.:	1 sec.
BETWEEN FLUSHING:	1–2 hour.
ΔP :	(3–4.5)m , (4–6) p.s.i.

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller.

Cleaning of the Command Filter

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
Remove the tightening cylinder. (Figure 3)

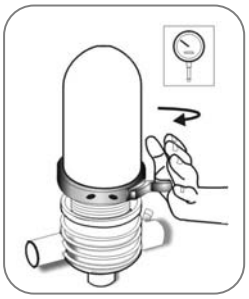
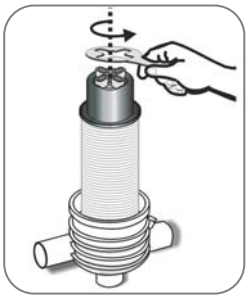


Figure 1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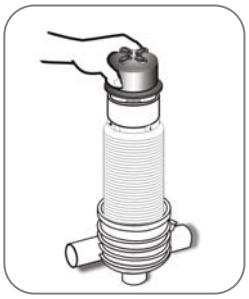


Figure 3

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to **"Cleaning Recommendations Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)

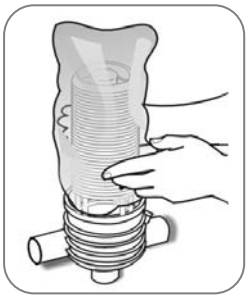


Figure 4

Figure 5

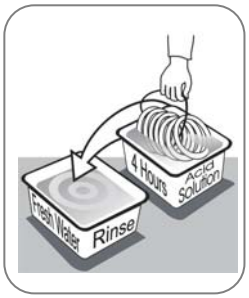
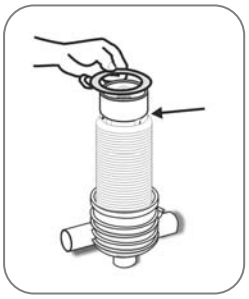


Figure 6

Check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
Put on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)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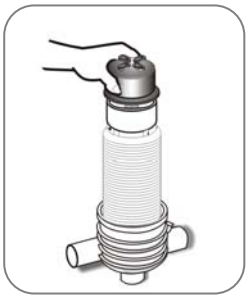
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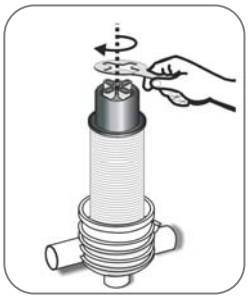


Figure 9

Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

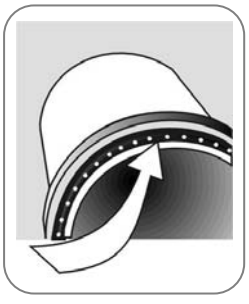


Figure 10

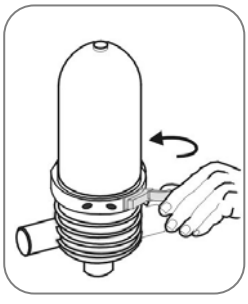


Figure 11

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer’s instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

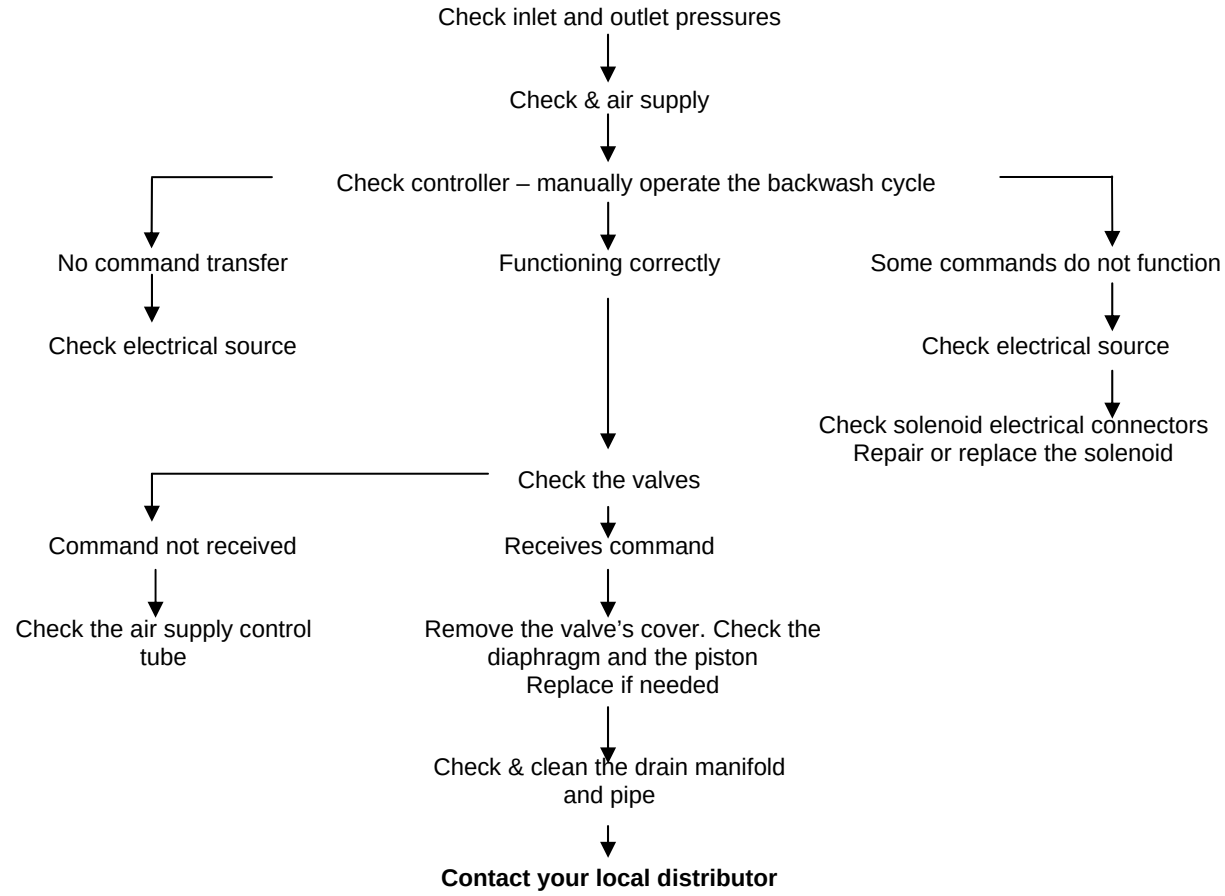
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

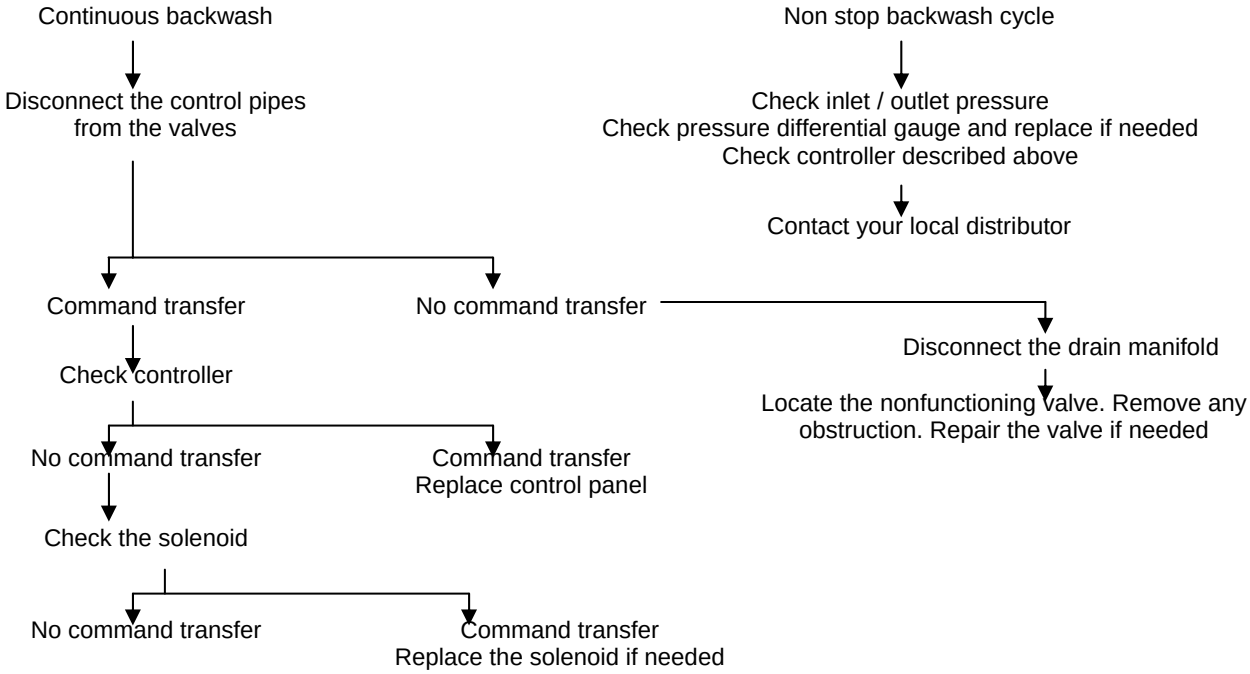
- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 2” Spin Klin system

No Backwash Operation



Continuous or Non-stop Backwashing



Contact your local distributor

Warranty

ARKAL FILTRATION SYSTEMS STANDARD INTERNATIONAL WARRANTY

ARKAL FILTRATION SYSTEMS (hereinafter -"ARKAL FILTRATION SYSTEMS") guarantees to the customers who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year as of the day it left ARKAL FILTRATION SYSTEMS premises, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

ARKAL FILTRATION SYSTEMS will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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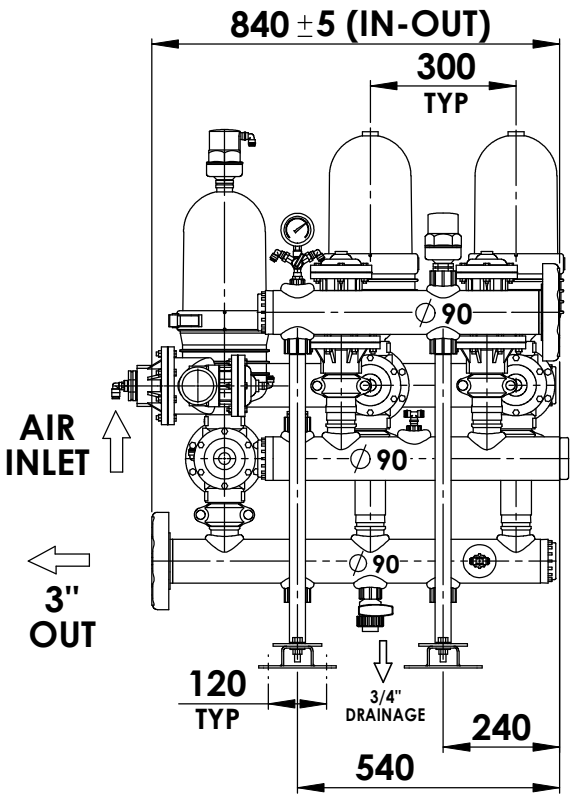
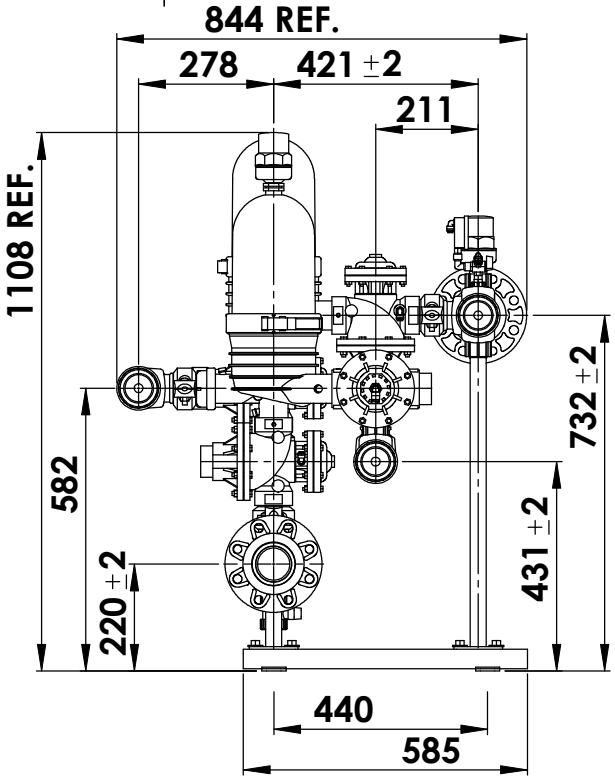
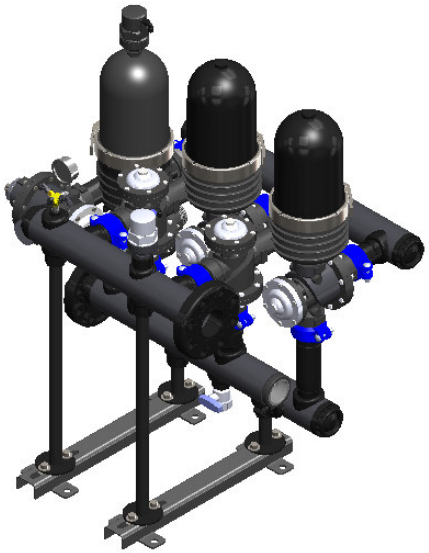
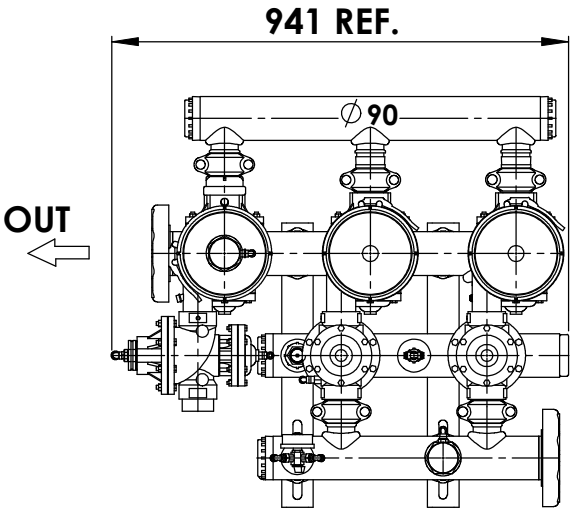
Drawings

2" Batteries External Source









MODIFIC.	DATE	DESCRIPTION	SING

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FILTRATION SYSTEM
BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT: 2*2" S.K. FILTERS PLASTIC "AAF" BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1627M0302U3
SOLIDWORKS FILE CODE: 1627M03___U3		FILE CODE: 1627M0302U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__
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CHECKED	NIKOLAY	08/12/2009	TRIWALL-268(5200 5718)	DISK-2S
APPROVED	OMRY	08/12/2009	FILE CODE OF MANIFOLD	DRAWING:
B.O.M.	OLEG	08/12/2009	5627 0302VC2	2130

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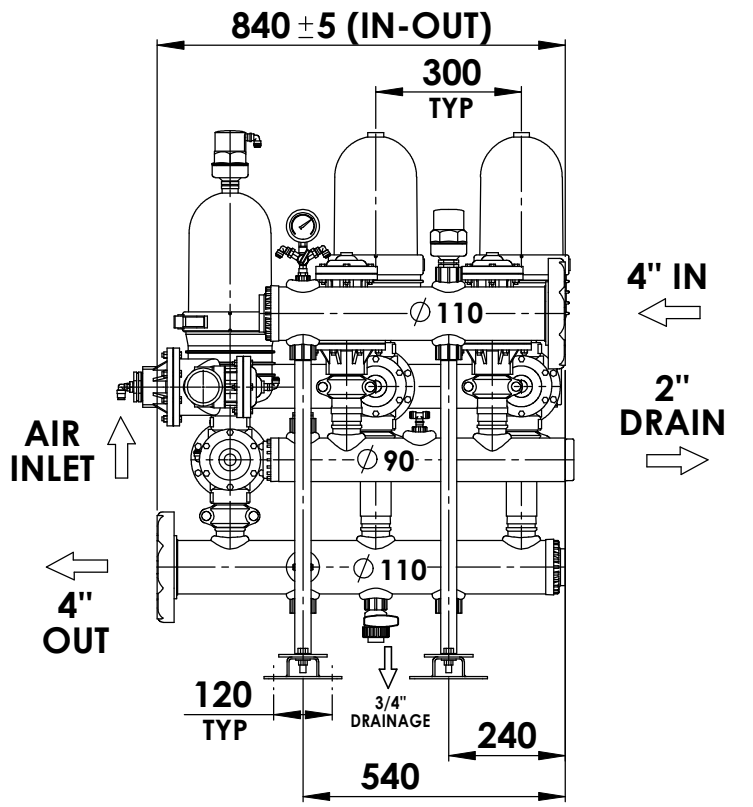

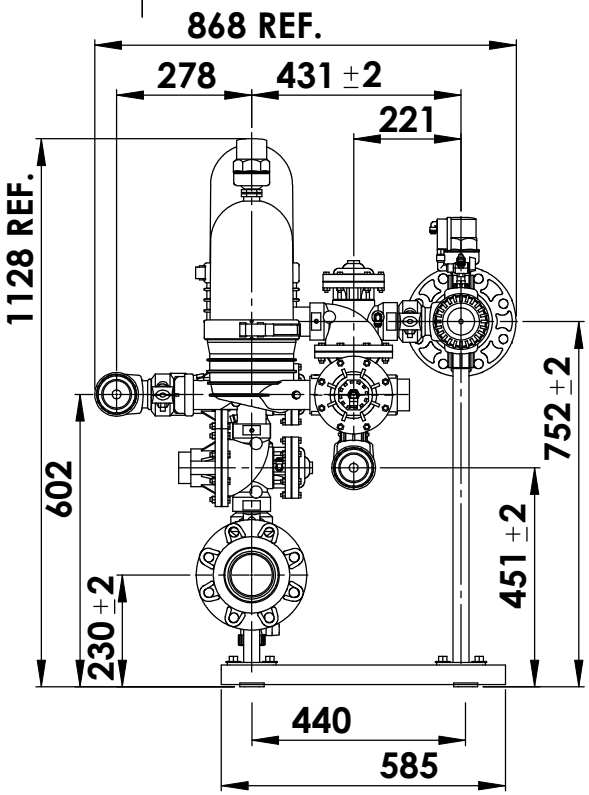

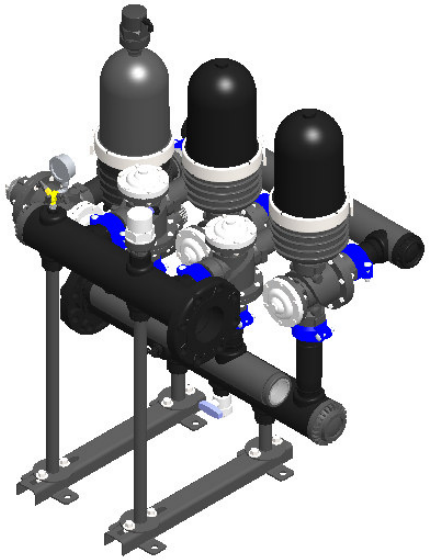

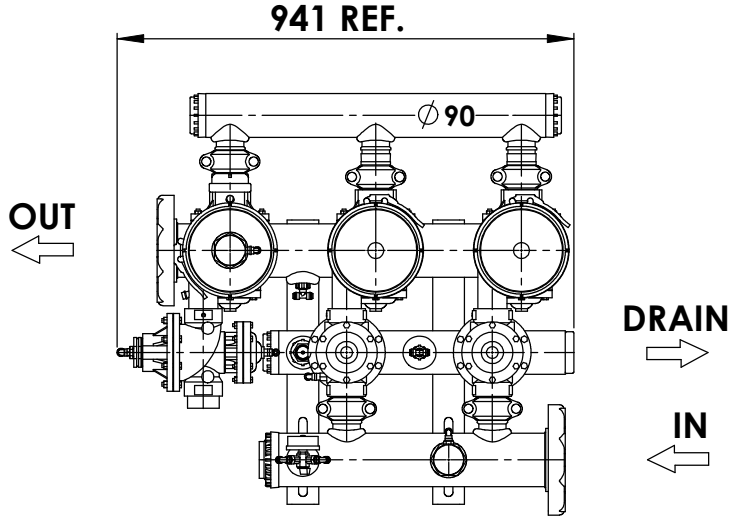

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PROJECT: 2*2" S.K. FILTERS PLASTIC "AAF" BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1627M0402U3

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	NAME	DATE
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CHECKED	NIKOLAY	07/12/2009
APPROVED	OMRY	07/12/2009
B.O.M.	OLEG	07/12/2009

FILE CODE DRAWINGS: **PALLET- 422 (5201 5927) TRIWALL-268(5200 5718)**

FILE CODE OF MANIFOLD: 5627 0402VC2

BACKUP: DISK-2S

DRAWING: 2130

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SHEET 1 OF 1

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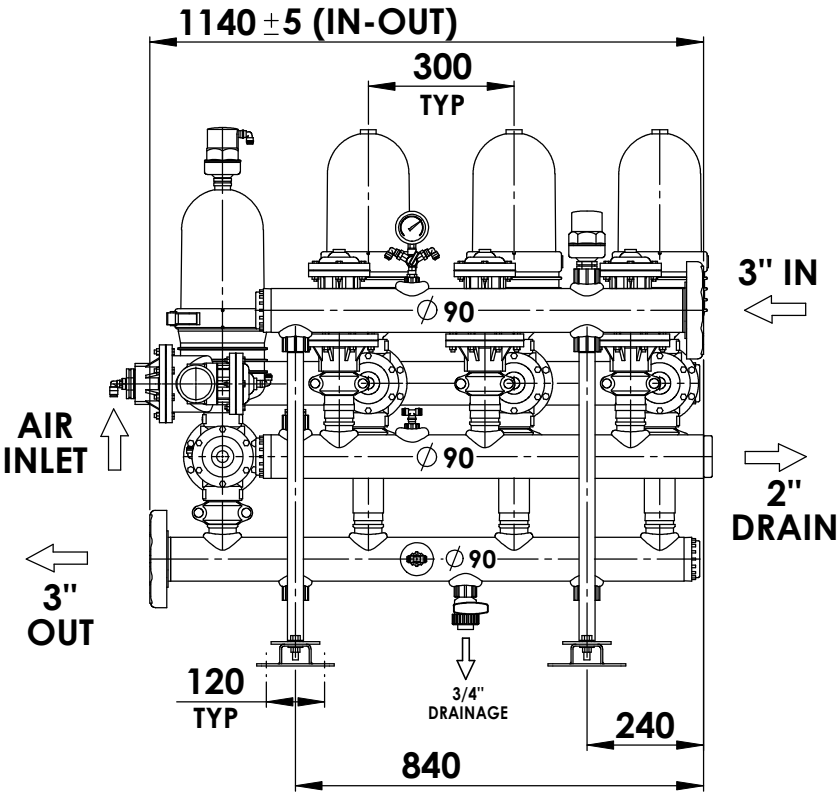

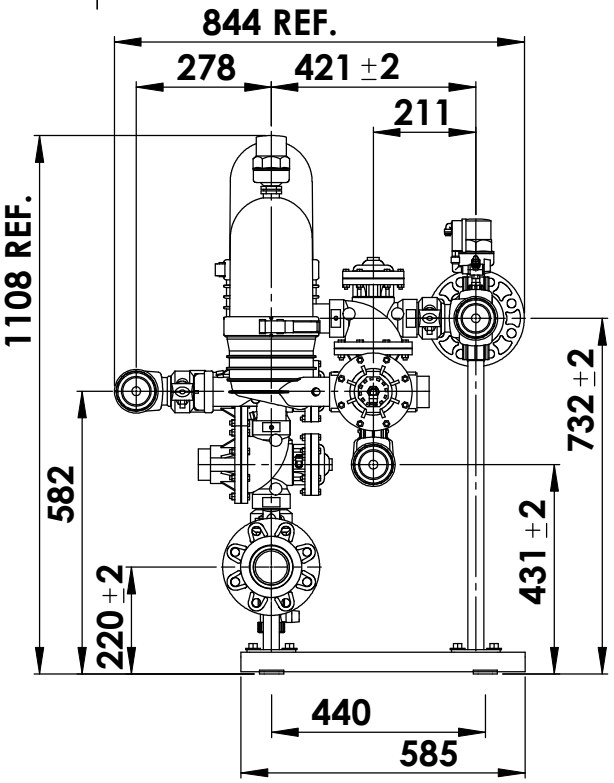

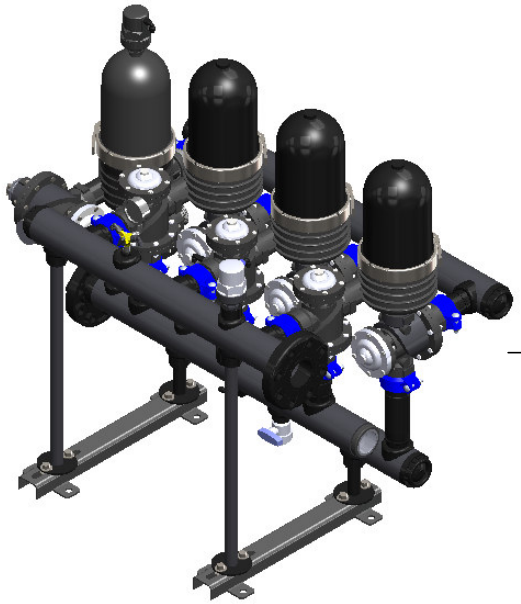

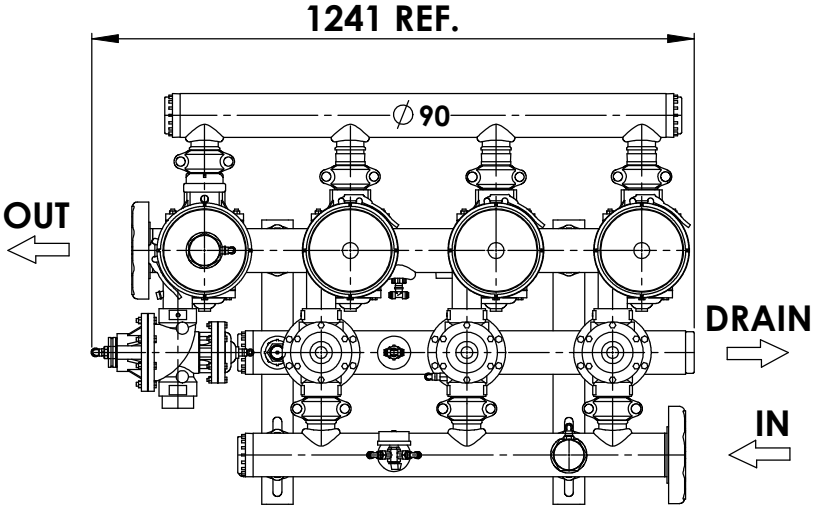

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PROJECT: 3*2" S.K. FILTERS PLASTIC "AAF" BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1627M0303U3
SOLIDWORKS FILE CODE: 1627M03___U3		FILE CODE: 1627M0303U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__
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CHECKED	NIKOLAY	08/12/2009	TRIWALL-272(5200 5722)	DISK-2S
APPROVED	OMRY	08/12/2009	FILE CODE OF MANIFOLD	DRAWING:
B.O.M.	OLEG	08/12/2009	5627 0303VC2	2130

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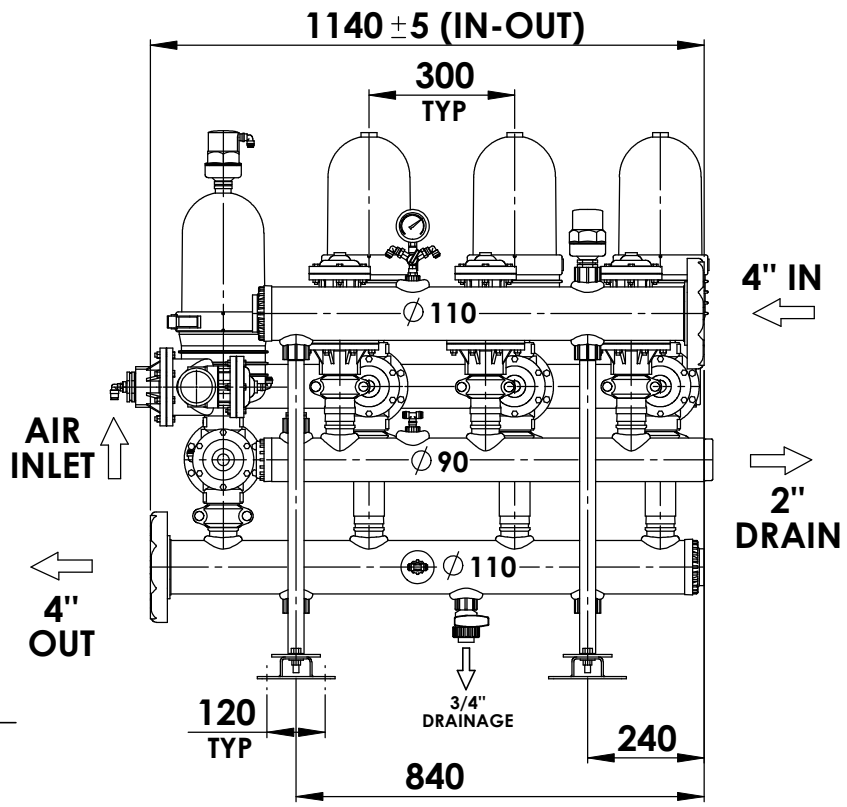

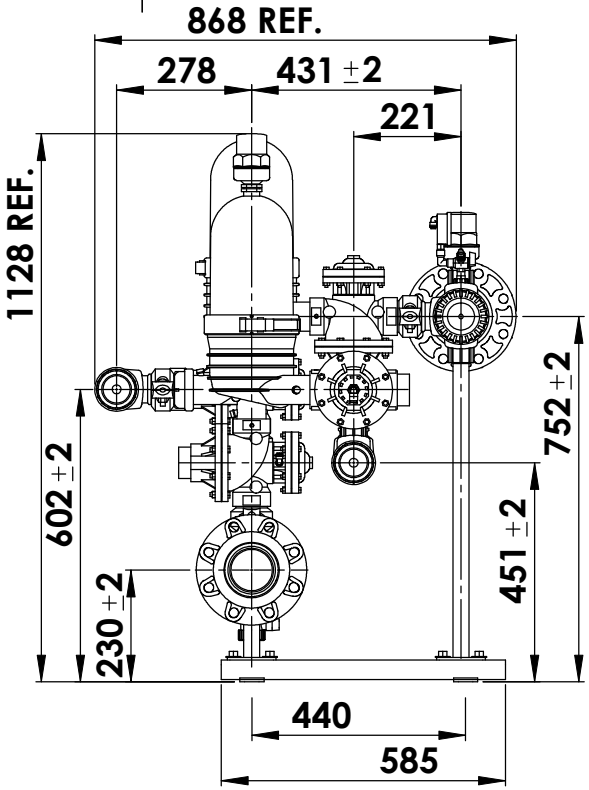

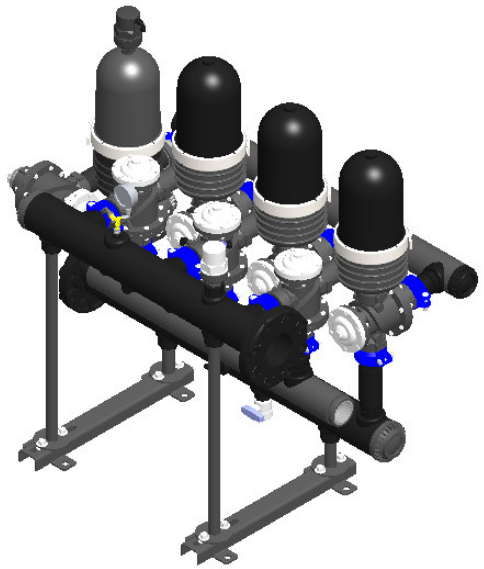

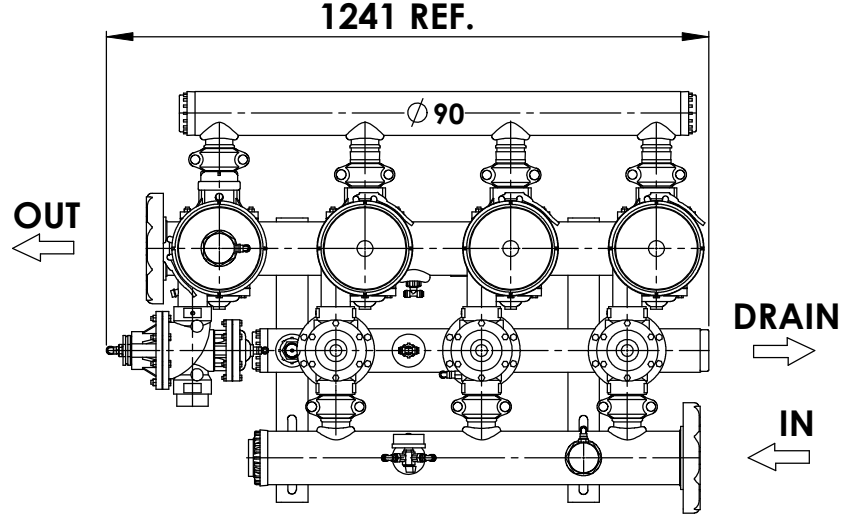

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PROJECT: 3*2" S.K. FILTERS PLASTIC "AAF" BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1627M0403U3

SOLIDWORKS FILE CODE: 1627M04___U3 — FILE CODE: 1627M0403U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__

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CHECKED	NIKOLAY	07/12/2009
APPROVED	OMRY	07/12/2009
B.O.M.	OLEG	07/12/2009

FILE CODE DRAWINGS: **PALLET- 430 (5201 5936)** **TRIWALL-272(5200 5722)**

FILE CODE OF MANIFOLD: 5627 0403VC2

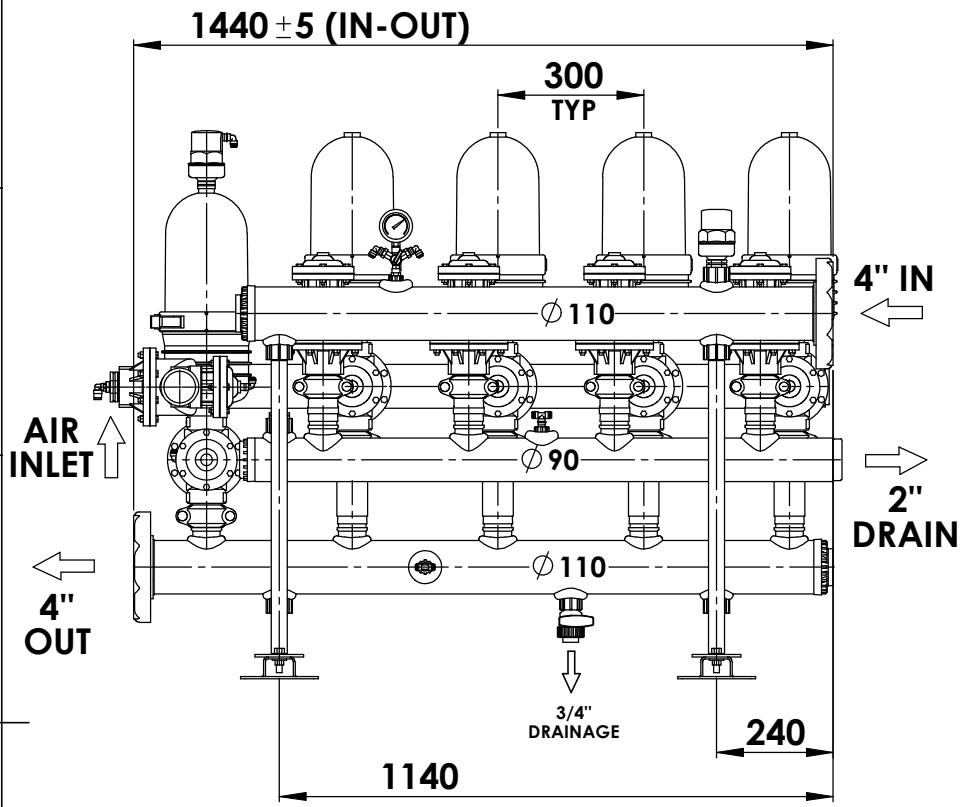
BACKUP: DISK-2S

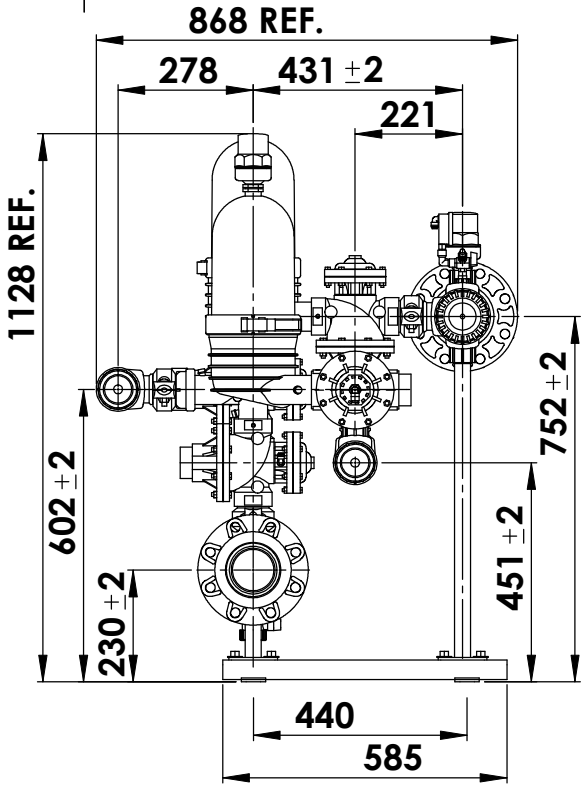
DRAWING: 2130

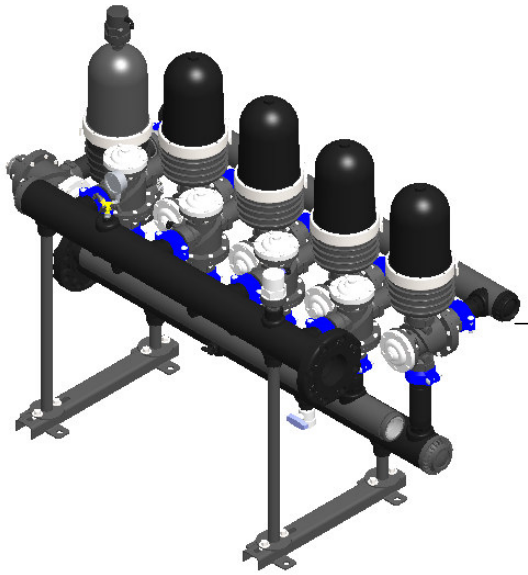
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

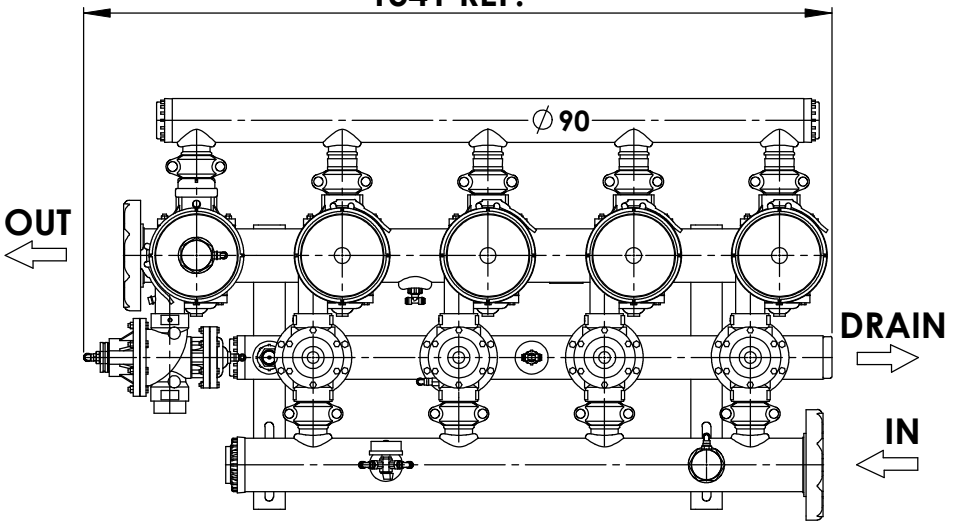
SHEET 1 OF 1

Monday, December 07, 2009 10:48:40 AM









MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4*2" S.K. FILTERS PLASTIC "AAF" BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1627M0404U3

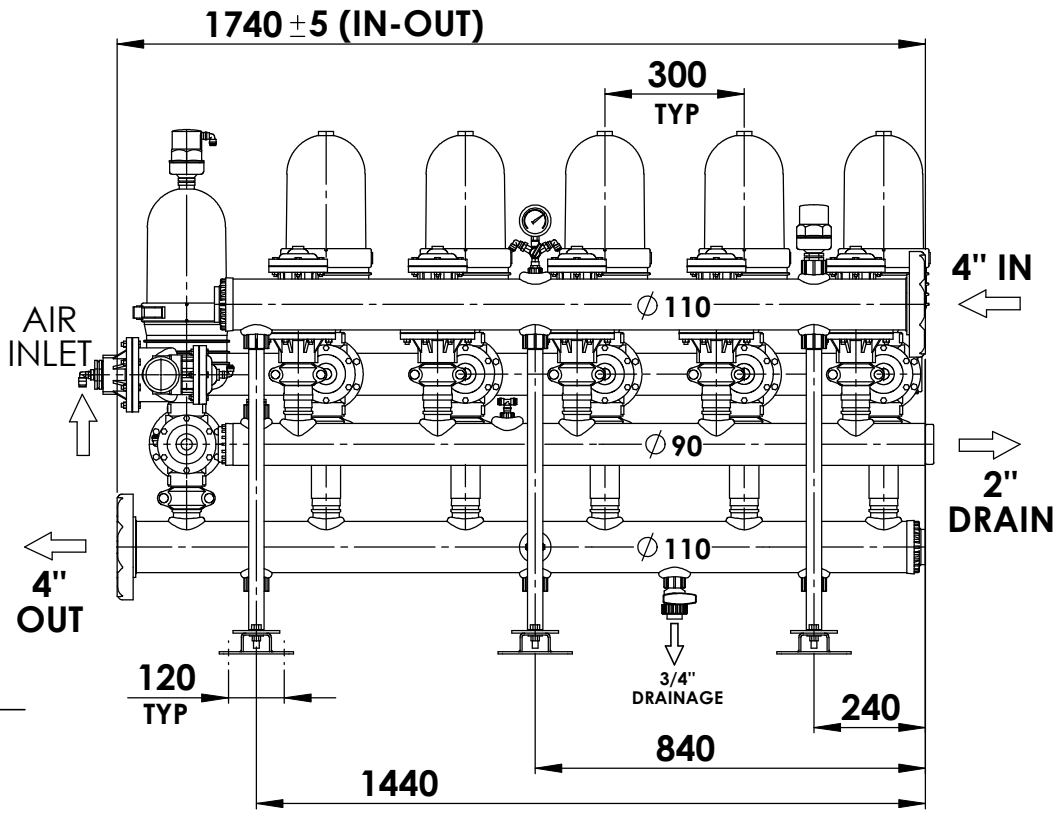
SOLIDWORKS FILE CODE: 1627M04___U3 — FILE CODE: 1627M0404U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__

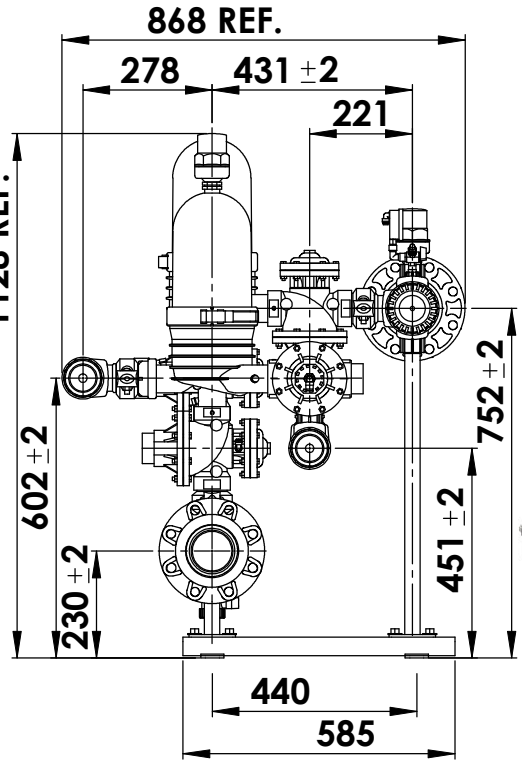
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	07/12/2009	PALLET- 277 (5201 5783) TRIWALL-181(5200 5472)	DISK-2S
CHECKED	NIKOLAY	07/12/2009		
APPROVED	ROTEM	07/12/2009	FILE CODE OF MANIFOLD: 5627 0404VC2	DRAWING: 2130
B.O.M.	OLEG	07/12/2009		

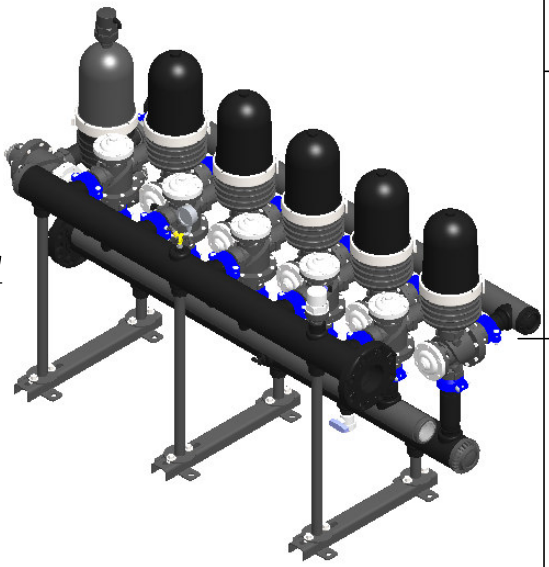
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

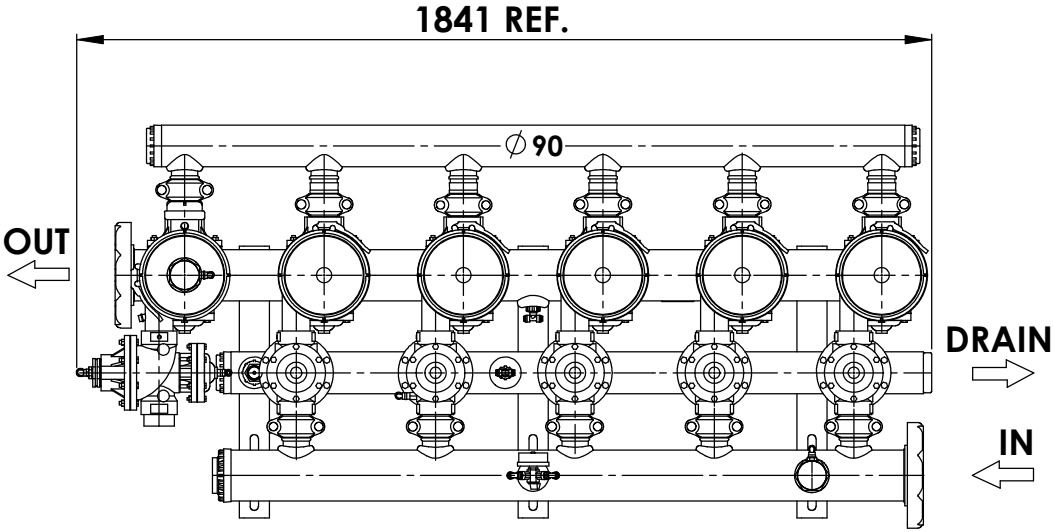
SHEET 1 OF 1

Monday, December 07, 2009 10:54:04 AM









		27.10.2009 שירטוט זה מבטל שירטוט מתאריך	
MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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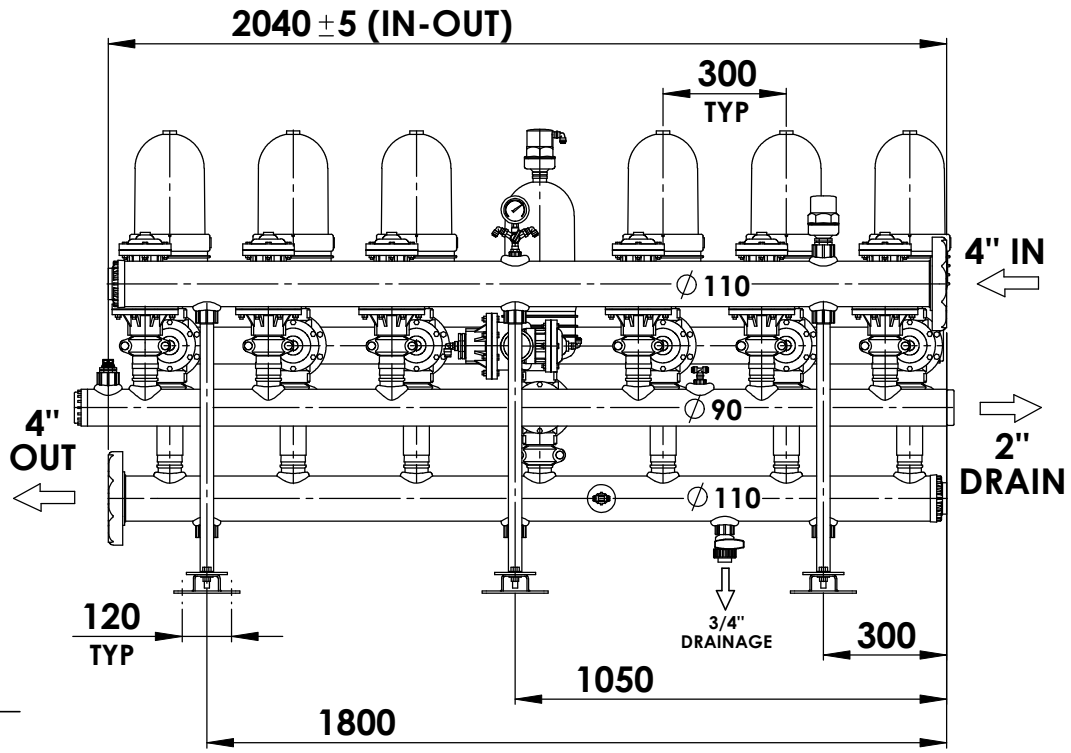
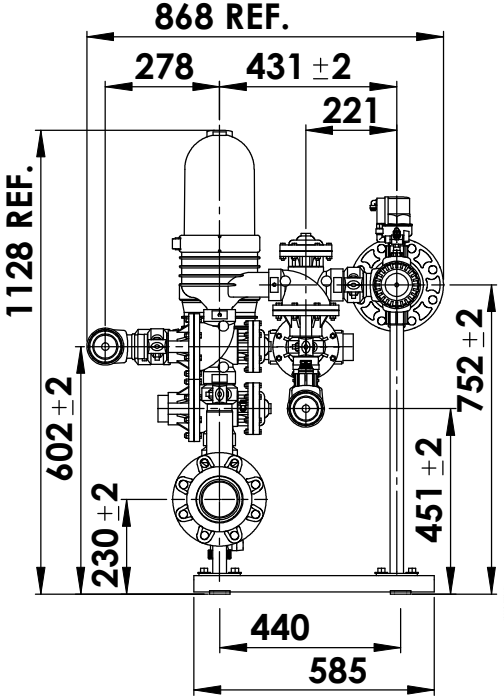
PROJECT: 5*2" S.K. FILTERS PLASTIC "AAF" BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1627M0405U3
SOLIDWORKS FILE CODE: 1627M04___U3		FILE CODE: 1627M0405U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	07/12/2009	PALLET- 375 (5201 5880) TRIWALL-254(5200 5706)	DISK-2S
CHECKED	NIKOLAY	07/12/2009		
APPROVED	OMRY	07/12/2009	FILE CODE OF MANIFOLD: 5627 0405VC2	DRAWING: 2130
B.O.M.	OLEG	07/12/2009		

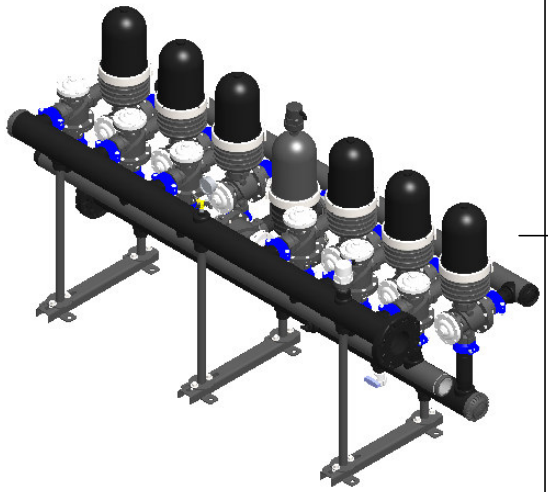
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

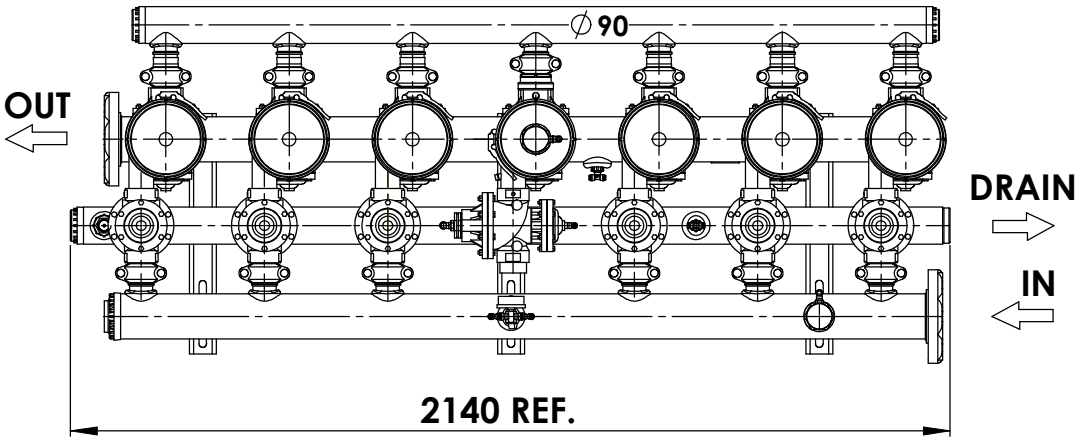
SHEET 1 OF 1

Monday, December 07, 2009 11:03:32 AM









MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 6*2" S.K. FILTERS PLASTIC "AAF" BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1627M0406U3

SOLIDWORKS FILE CODE: 1627M04___U3 — FILE CODE: 1627M0406U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__

	NAME	DATE
DRAWN	ELENA	07/12/2009
CHECKED	NIKOLAY	07/12/2009
APPROVED	OMRY	07/12/2009
B.O.M.	OLEG	07/12/2009

FILE CODE DRAWINGS: **PALLET- 251 (5201 5764)** **TRIWALL-170(5200 5624)**

FILE CODE OF MANIFOLD: 5627 0406VC2

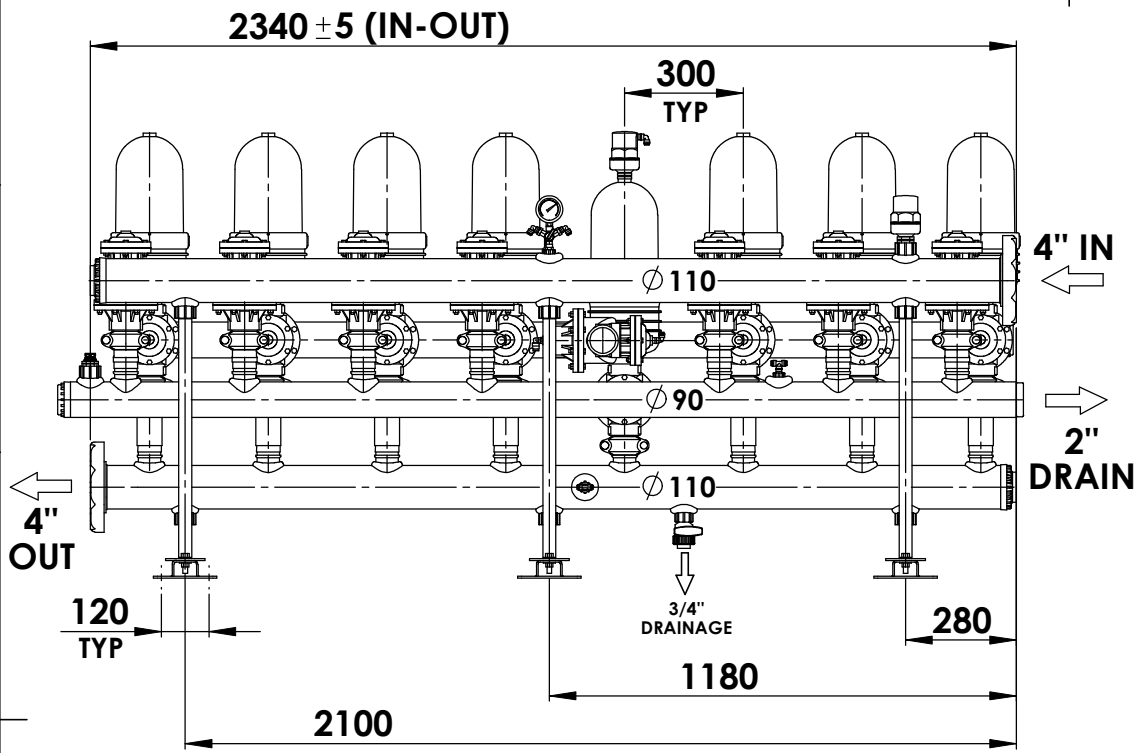
BACKUP: DISK-2S

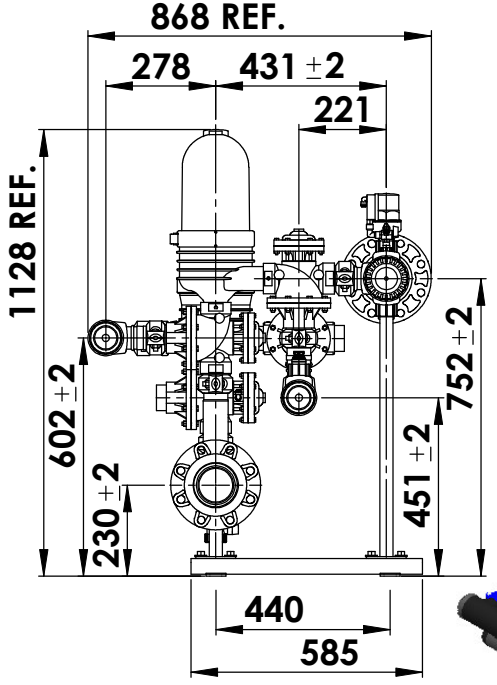
DRAWING: 2130

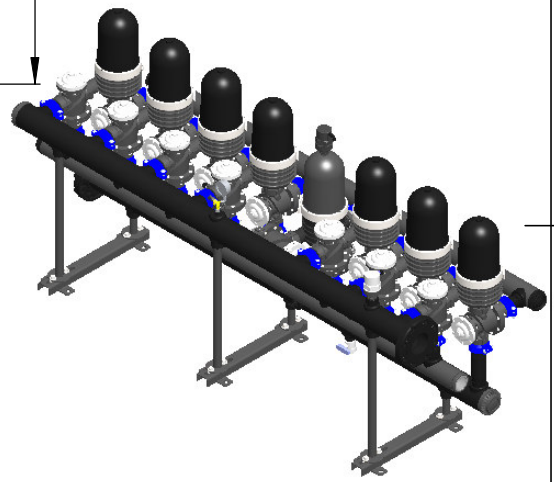
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

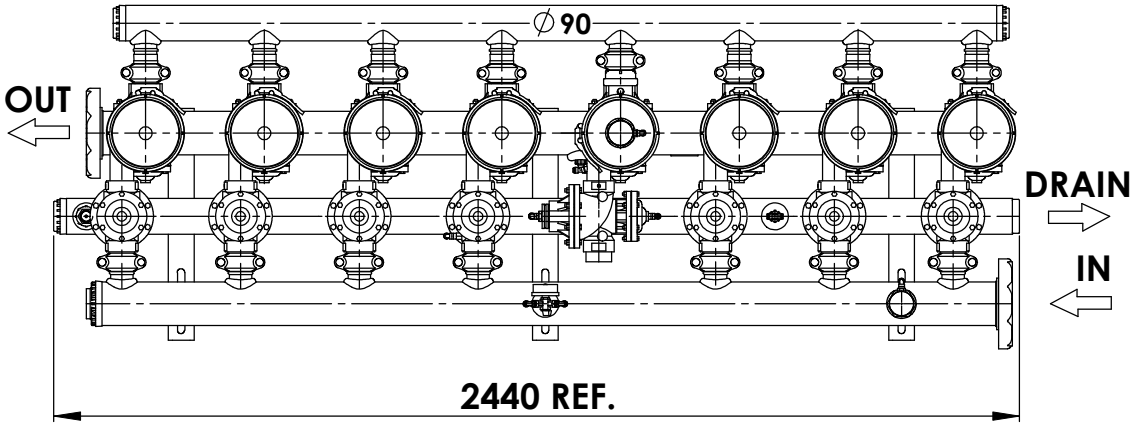
SHEET 1 OF 1

Monday, December 07, 2009 11:45:59 AM









MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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PROJECT: 7*2" S.K. FILTERS PLASTIC "AAF" BATTERY — PAGE 1_OF 5_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1627M0407U3

SOLIDWORKS FILE CODE: 1627M04___U3 — FILE CODE: 1627M0407U3 C — FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__

	NAME	DATE
DRAWN	ELENA	07/12/2009
CHECKED	NIKOLAY	07/12/2009
APPROVED	OMRY	07/12/2009
B.O.M.	OLEG	07/12/2009

FILE CODE DRAWINGS: **PALLET- 470 (5201 5976)** **TRIWALL-288(5200 5738)**

BACKUP: DISK-2S

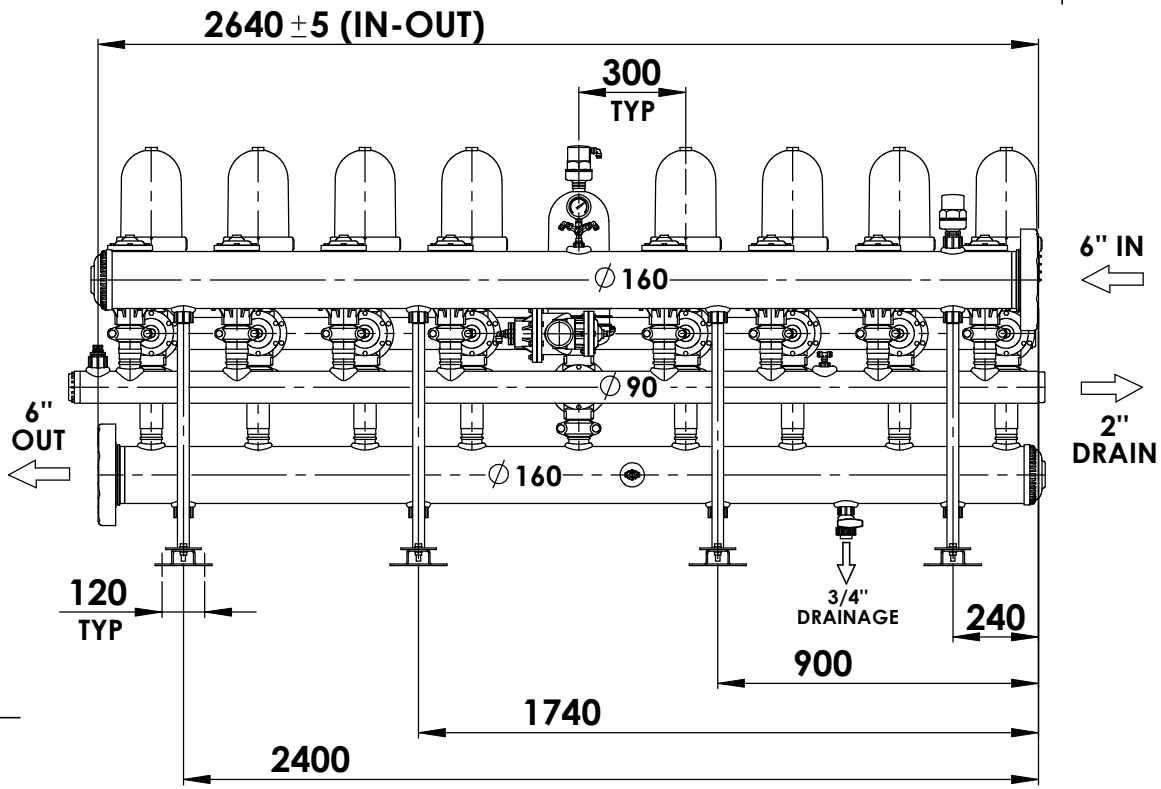
FILE CODE OF MANIFOLD: 5627 0407VC2

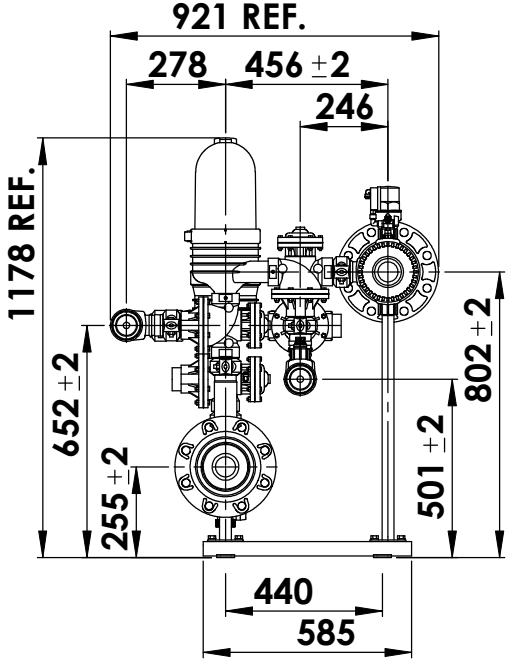
DRAWING: 2130

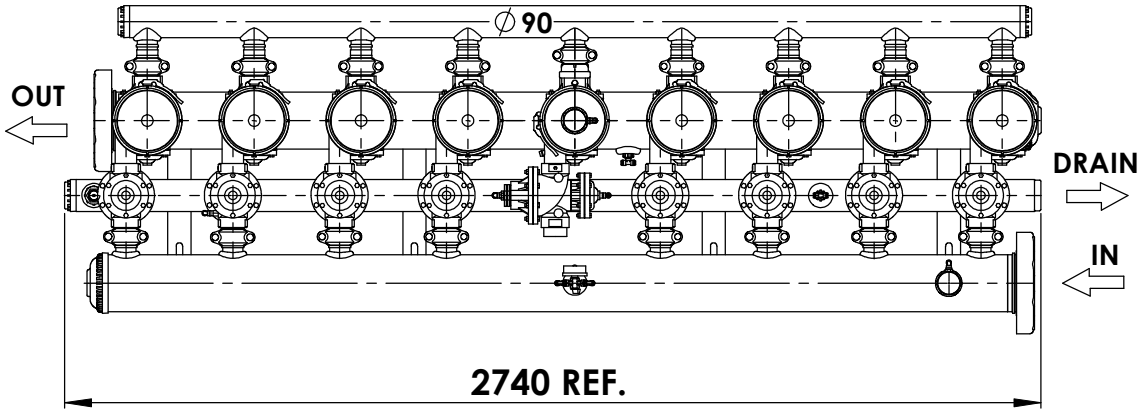
PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

SHEET 1 OF 1

Monday, December 07, 2009 11:54:01 AM







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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PROJECT: 8*2" S.K. FILTERS PLASTIC "AAF" BATTERY				PAGE 1_OF 5_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1627M0608U3
SOLIDWORKS FILE CODE: 1627M06___U3		FILE CODE: 1627M0608U3 C		FILE CODE OF FILTER COMPL.: 2" SK FILTER + BERMAD 2261M1107__
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	11/02/2010	PALLET- 531 (5201 5036)	
CHECKED	NIKOLAY	11/02/2010	TRIWALL-330(5200 5767)	DISK-2S
APPROVED	OMRY	14/02/2010	FILE CODE OF MANIFOLD	DRAWING:
B.O.M.	OLEG	14/02/2010	5627 0608VC2	2130

PATH-\\Arkal-fs\drawings\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\2 inch Filters\Plastic Manifolds\INDUSTRY\AAF\

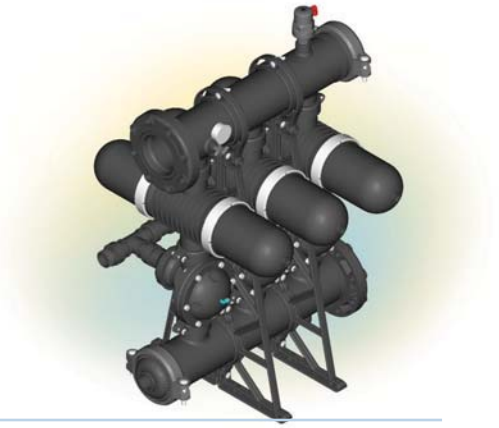
Thursday, February 11, 2010 4:09:53 PM

3" Poly Battery

Filtration Batteries

Features

- Precise filtration with Spin Klin technology
- Automatic filtration for medium flow rates
- Continuous flow during backwash
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation



Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm²**	1,760	**in²**	272.8
Filtration volume per unit	**cm³**	2,640	**in³**	161
Backwash water volume per unit	**lit**	66	**gal**	17.4

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m³/h**						**gpm**					
400-130 µ	Good	110	148	185	222	259	296	484	652	814	977	1140	1302
	Average	90	120	150	180	210	240	396	528	660	792	924	1056
	Poor	66	88	110	132	154	176	290	387	484	581	678	774
	Very Poor	45*	60	75	90	105	120	198*	264	330	396	462	528
100-70 µ	Good	90	120	150	180	210	240	396	528	660	792	924	1056
	Average	66	88	110	132	154	176	290	387	484	581	678	774
	Poor	48*	64	80	96	112	128	211*	282	352	422	493	563
	Very Poor	33*	44*	55	66	77	88	145*	194*	242	290	339	387
55-40 µ	Good	60	80	100	120	140	160	264	352	440	528	616	704
	Average	48*	64	80	96	112	128	211*	282	352	422	493	563
	Poor	36*	48*	60	72	84	96	158*	211*	264	317	370	422
	Very Poor	27***	36**	45*	54	63	72	119***	158**	198*	238	277	317
20 µ	Good	30***	40**	50	60	70	80	132***	176**	220	264	308	352
	Average	24***	32***	40**	48*	56	64	106***	141***	176**	211*	246	282
	Poor	18***	24***	30***	36***	42*	48*	79***	106***	132***	158***	185*	211*
	Very Poor	12***	16***	20***	24***	28***	32***	53***	70***	88***	106***	123***	141***

* External source for backwash is necessary

** When pressure is low, it is necessary to close downstream valve during backwash

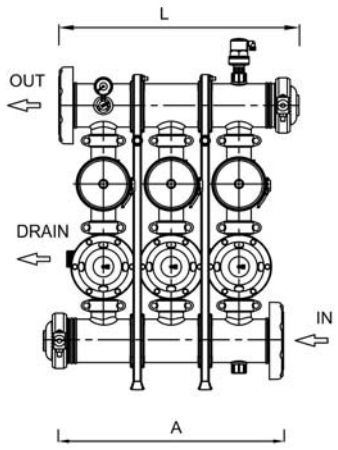
*** The 2" Spin Klin Battery is recommended

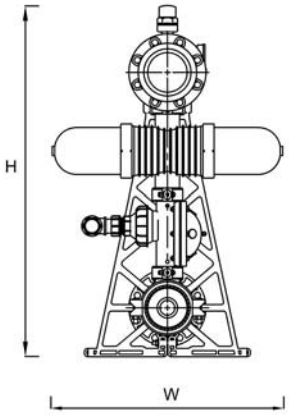
3" Poly Battery

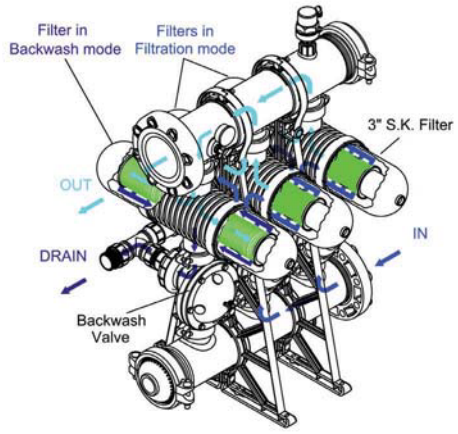
Filtration Batteries

Dimensions and Weights

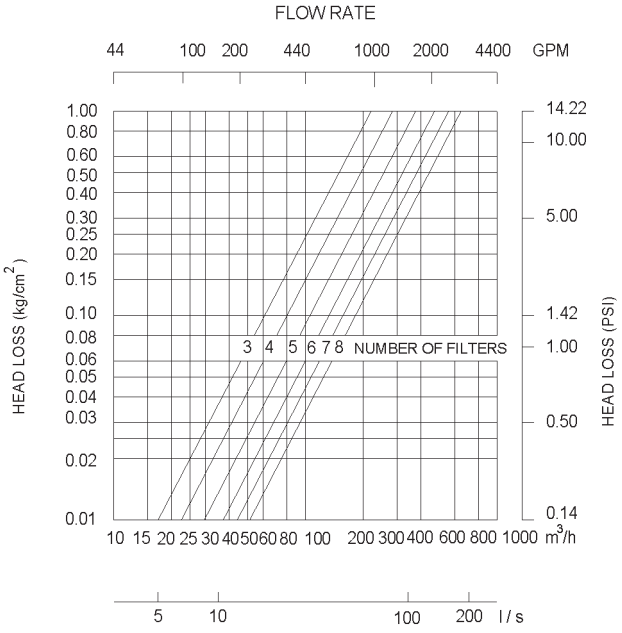
		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	**mm**	160	160	160	160	200	200	**inch**	6	6	6	6	8	8
L Length	**mm**	902	1152	1402	1652	2200	2500	**inch**	35 1/2	45 11/32	55 3/16	65 1/32	86 5/8	98 7/16
H Height	**mm**	1291	1291	1291	1291	1510	1510	**inch**	50 13/16	50 13/16	50 13/16	50 13/16	59 7/16	59 7/16
W Width	**mm**	865	865	865	865	865	865	**inch**	34 1/16	34 1/16	34 1/16	34 1/16	34 1/16	34 1/16
A Flange to flange distance	**mm**	820	1070	1320	1570	2200	2500	**inch**	32 9/32	42 1/8	51 31/32	61 13/16	86 5/8	98 7/16
Shipping weight (approx.)	**kg**	120	150	180	210	250	290	**lbs**	264	330	396	492	550	638







Head Loss Chart, Clean State

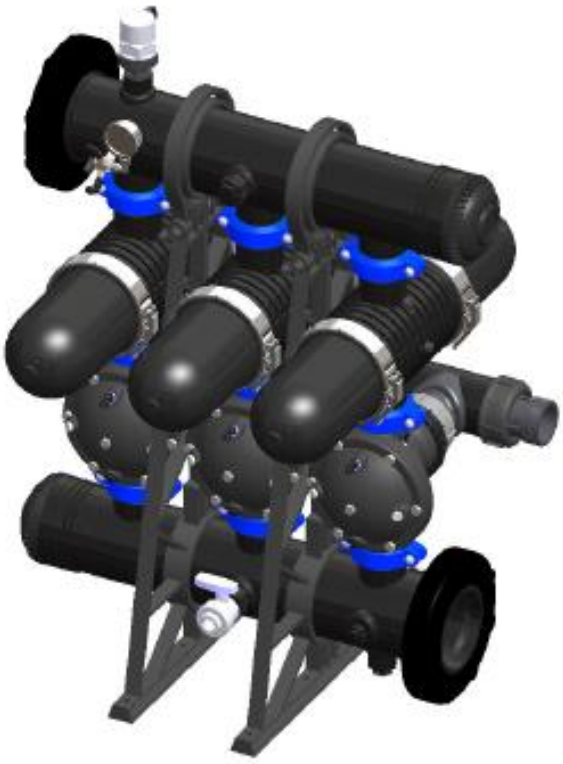


3" Spin Klin Poly batteries are available with:

Non Corrosive material valves

Arkal Spin Klin® 3” Battery

Service & Maintenance Manual

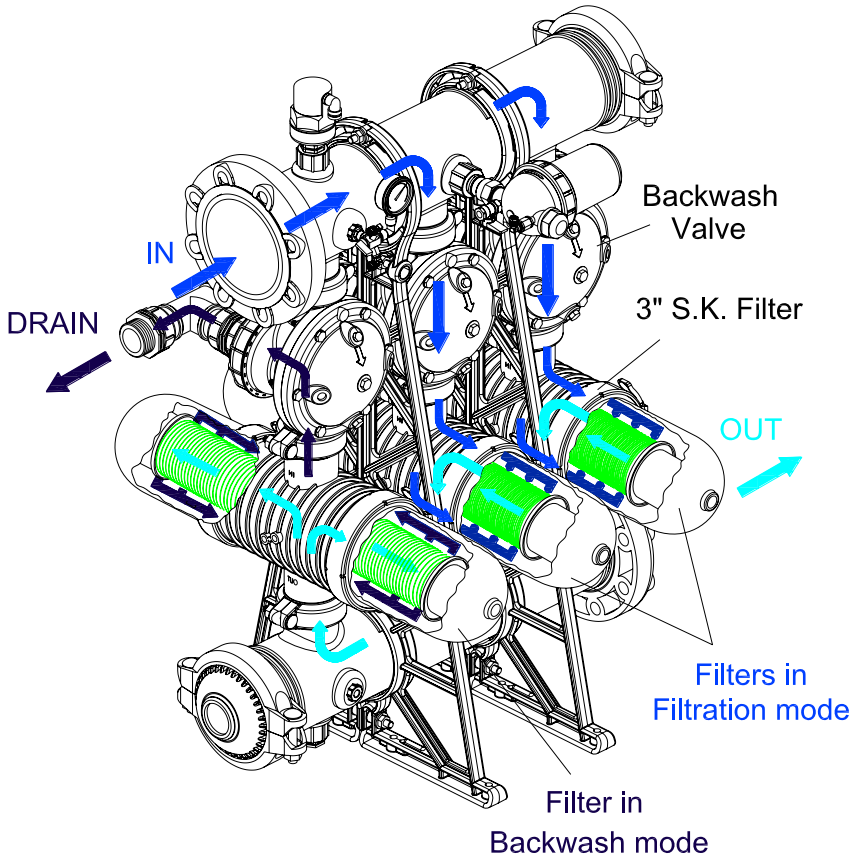


Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Operation

During the filtration stage, water flows through the INLET manifold and is distributed through the 3” x 2” backwash valves into the Spin Klin filters.

The water then passes through the filter elements to the outlet manifold for consumer use.



Description of the Backwashing Process

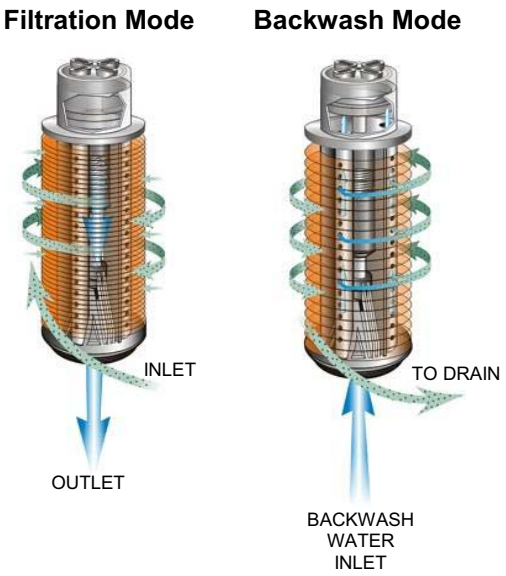
1. The controller transmits an electrical command to the first solenoid according to either differential pressure or time.
2. The solenoid then sends a pressure command to the backwash valve, moving it from the filtration mode to the backwash mode.
3. Filter #1 is then backwashed with water from the outlet manifold that has been filtered by the other filters in the system. Contaminated water and impurities flow out through the drain manifold.
4. On completion of the allotted backwashing time, the controller releases the backwash command, and filter #1 returns to the filtration mode.
5. Filter #2 then enters the backwash mode, and the process is repeated until all the filters in the system have been backwashed.
6. After all the filters have been backwashed the system returns to the filtration mode, until the next backwash cycle.

Spin Klin Technology - Spin Klin Spine

General:

The Spin Klin discs are stacked on the Spin Klin spine.

The discs are color-coded by micron size**,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston which are used to alternately compress and release the discs during filtration and backwash cycles.



Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs**.**

Backwash Mode:

During backwash the discs are released by releasing the inlet hydraulic pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

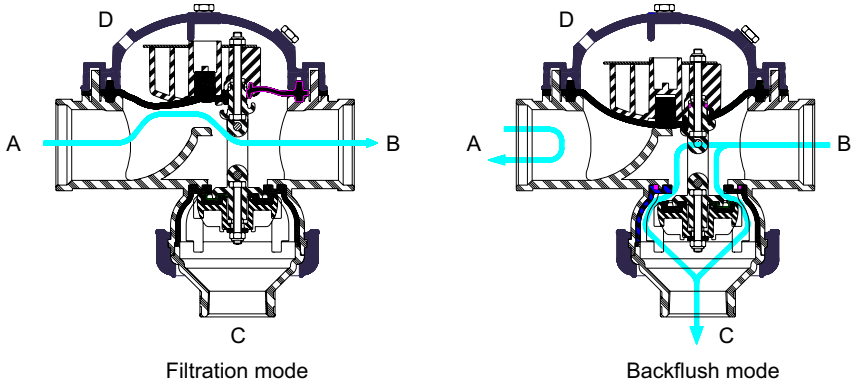
3” x 2” Backwash Valve

Filtration Position:

Water flows from port A (main supply) to port B (filter connection). Port C (drain water outlet) is closed by the seal.

Backwash Position:

Command pressure is applied to the top side of the diaphragm through port D. The diaphragm moves down, pushing the sealed body by the shaft. Port A is closed by the seal, preventing flow to the filter. Port C is now open allowing flushing water to flow from port B (filter connection) to the drain.

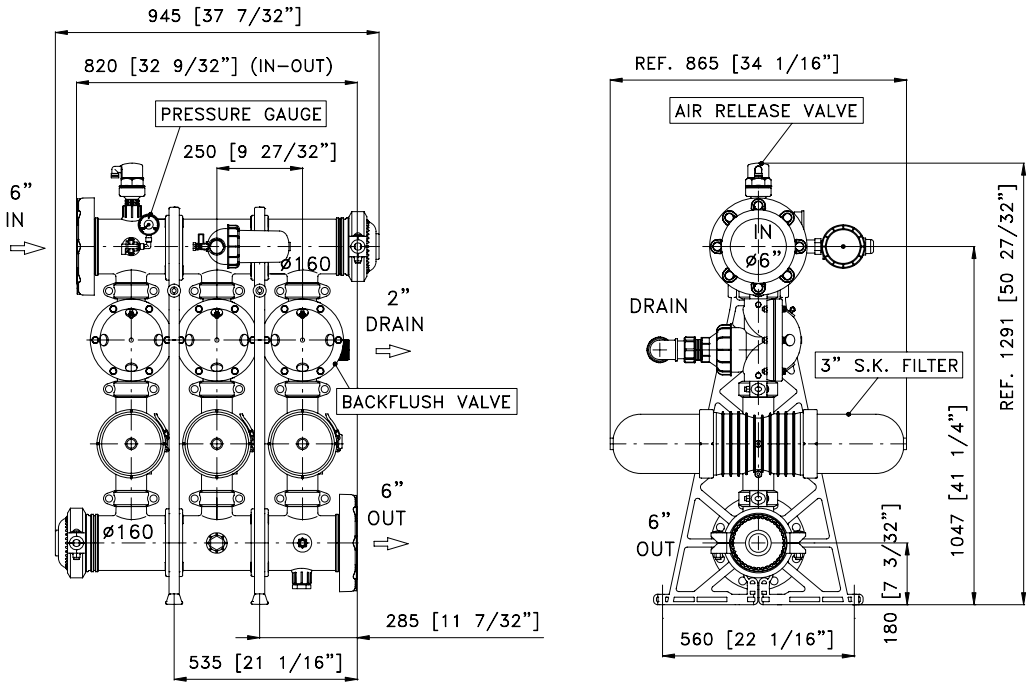


System Installation and Startup

Technical Data

Maximum Pressure	10 bar	140 psi
Minimum Pressure	2.8 bar	38 psi
Backwash Flow Rate per unit	16 m^3/hr	70 gpm
Maximum Temperature	70°C	158°F
pH	4-11	4-11

3” Spin Klin Battery with Plaslite Valves



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

D. Cover clamps need to be properly closed.

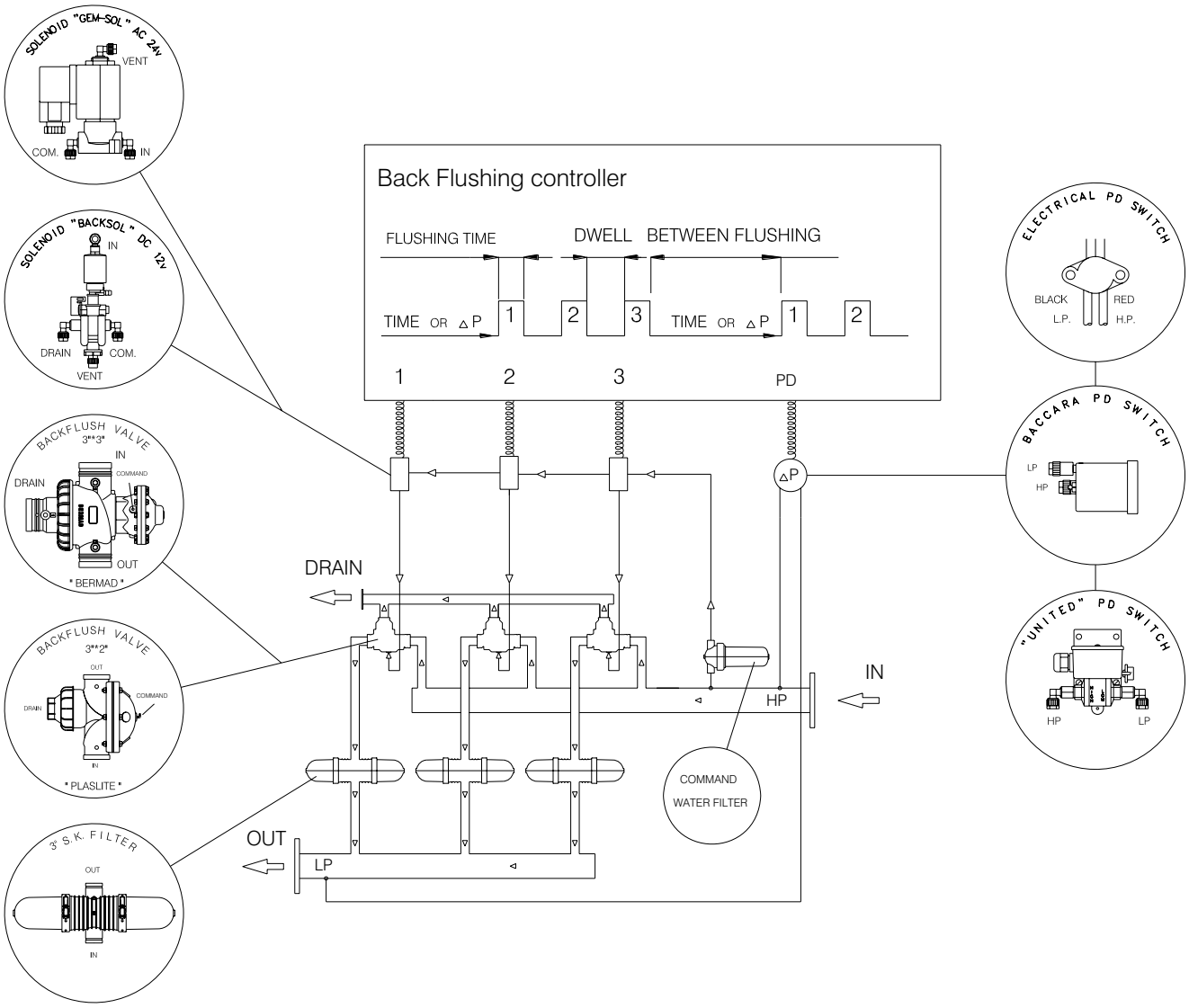
Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- Close the downstream (flow control) valve (if available).
- Flush until clean with repeated cycles.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high.

  An excessive flow rate through the filter causes excessive pressure loss.



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 30 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover (Figures 1, 2)

Unscrew the butterfly-nut on the filtration element (Figure 3)
Remove the tightening cylinder (Figure 4)

Remove the discs (for convenience we recommend using a plastic bag) (Figures 5, 6)

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to “Cleaning Recommendations Clogged Filtration Discs”.
Thoroughly wash the discs with fresh water (Figure 7)

Reassemble the discs on the spines, check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine (Figure 8)

Put on the tightening cylinder and tighten the butterfly-nut, then reassemble the filter cover and tighten the clamp (Figures 9, 10)

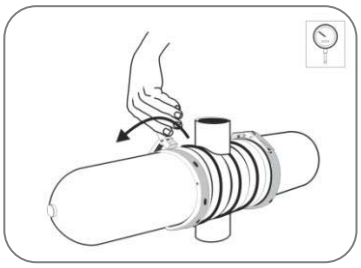


Figure 1

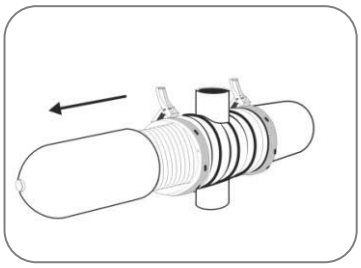


Figure 2

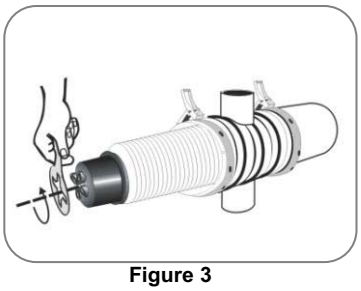
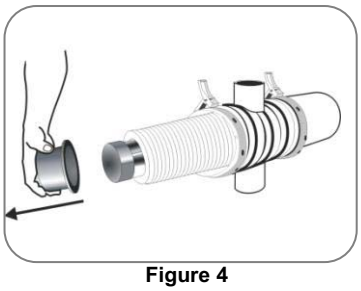


Figure 3



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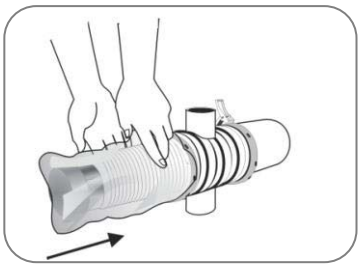

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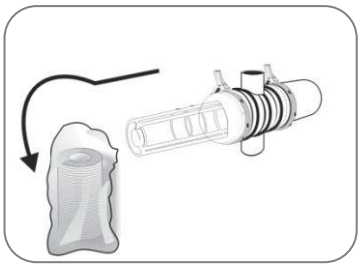

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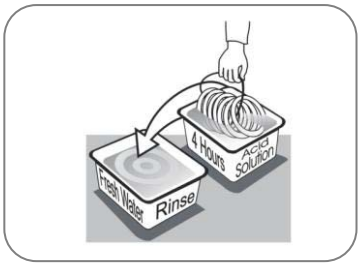

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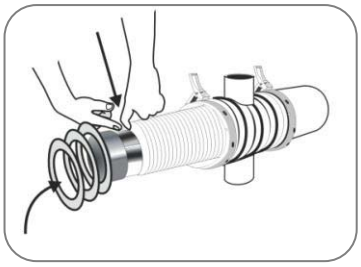


Figure 8

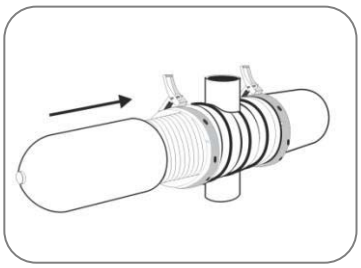


Figure 9

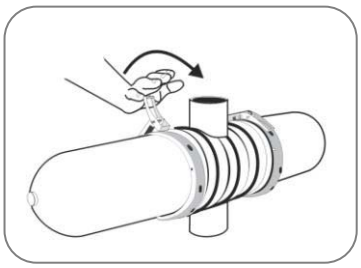


Figure 10

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer’s instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

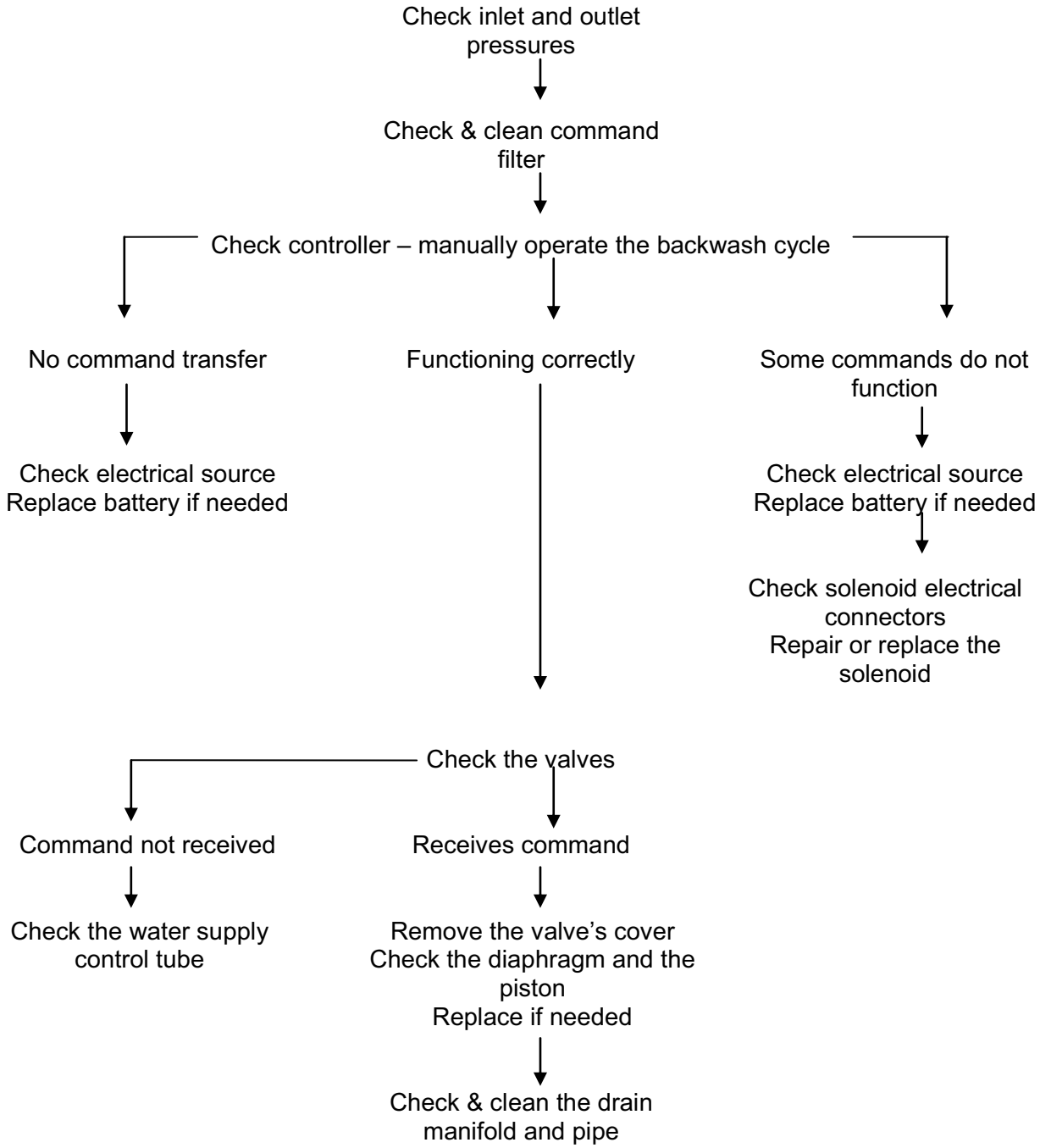
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 3” Spin Klin system

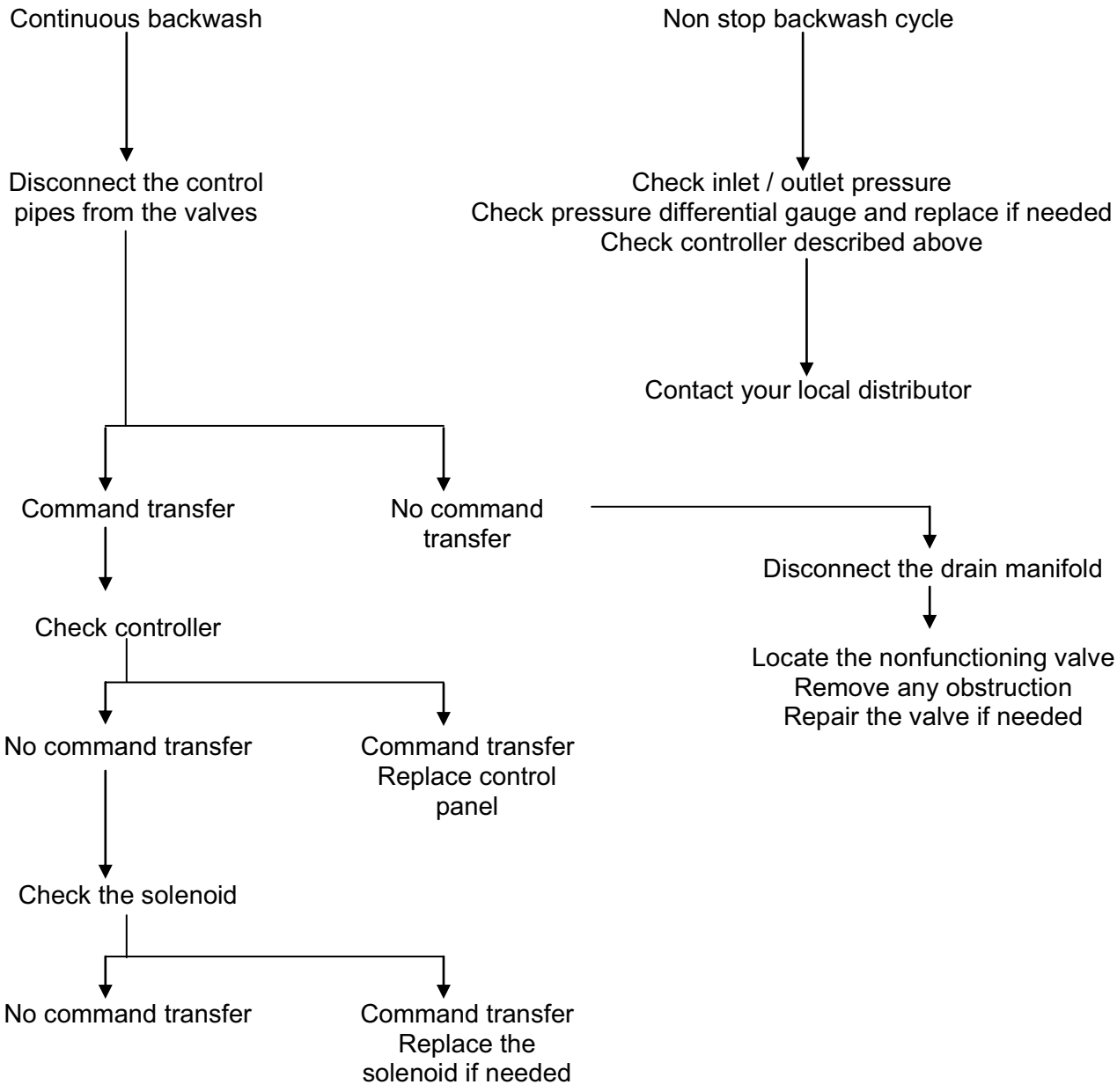
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 3” Spin Klin system

Continuous or Non-stop Backwashing



Contact your local distributor

Limited Warranty

ARKAL FILTRATION SYSTEMS ("ARKAL FILTRATION SYSTEMS") warrants to the original end user ("CUSTOMER") who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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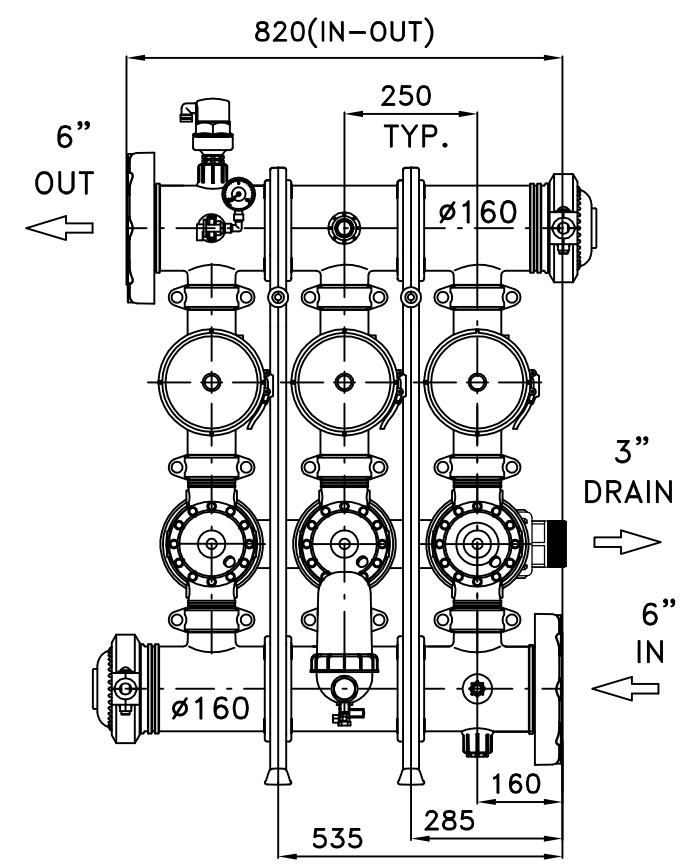
Drawings

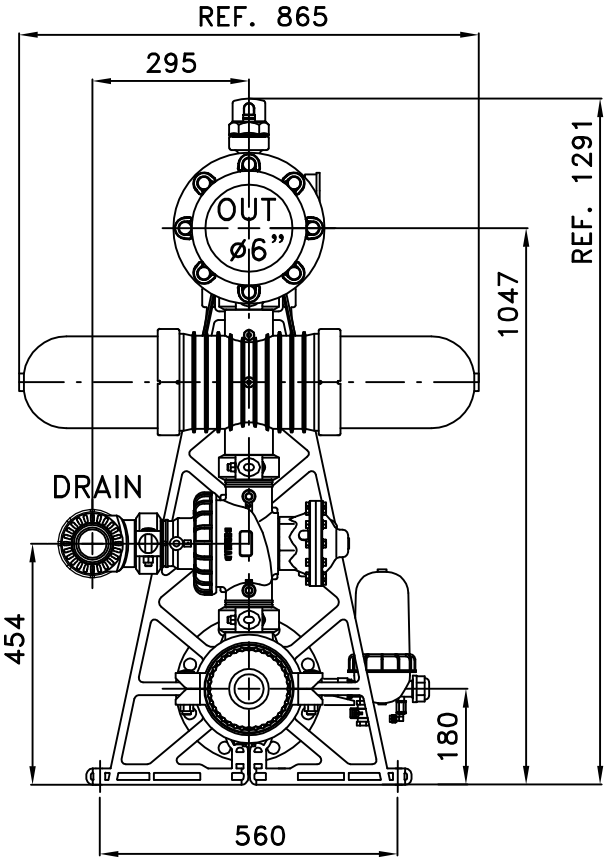
Spin Klin 3" All Plastic Batteries

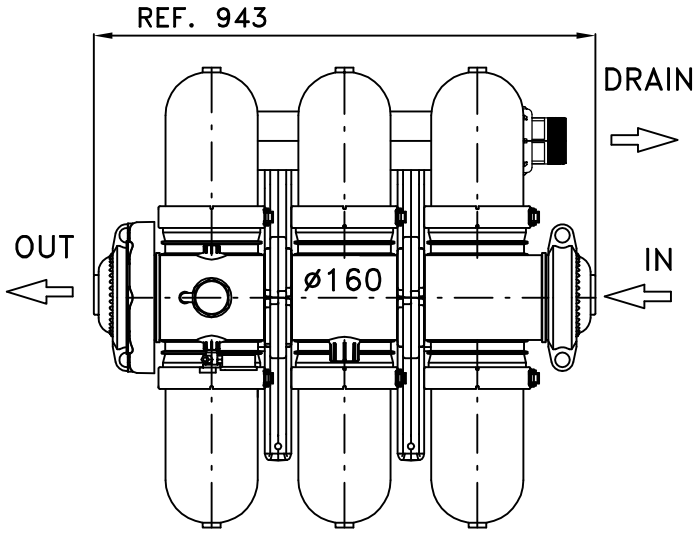
Drawings

Spin Klin 3" All Plastic Batteries

Gavish With Bermad Plastic Valves







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
FILTRATION SYSTEM

BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT: 3*3"S.K. FILTERS SYNTHETIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 3

CATALOGUE No: 1635M0603VU3

PATH BATERIES\3INCH\TWIN\ GAVISH-PL\PLASTIC\PL. VALVE

FILE CODE: 1635M0603VU3

FILE CODE DRAWING OF MANIFOLD: 6535 0603V2(1-2) 2253 0601

BACKUP: DISK-32

DRAWER N: 3130

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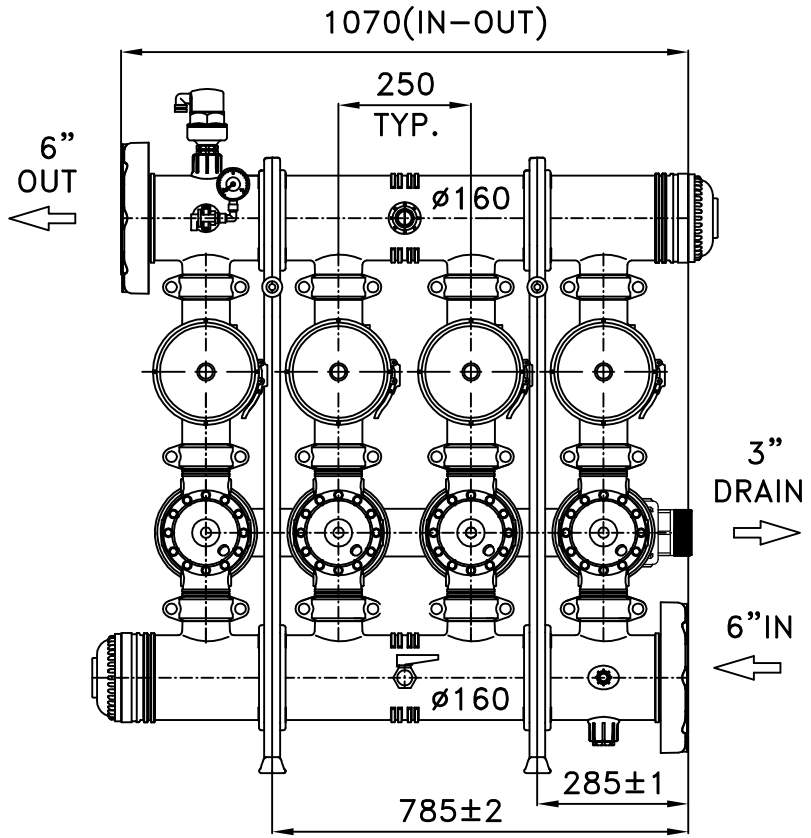
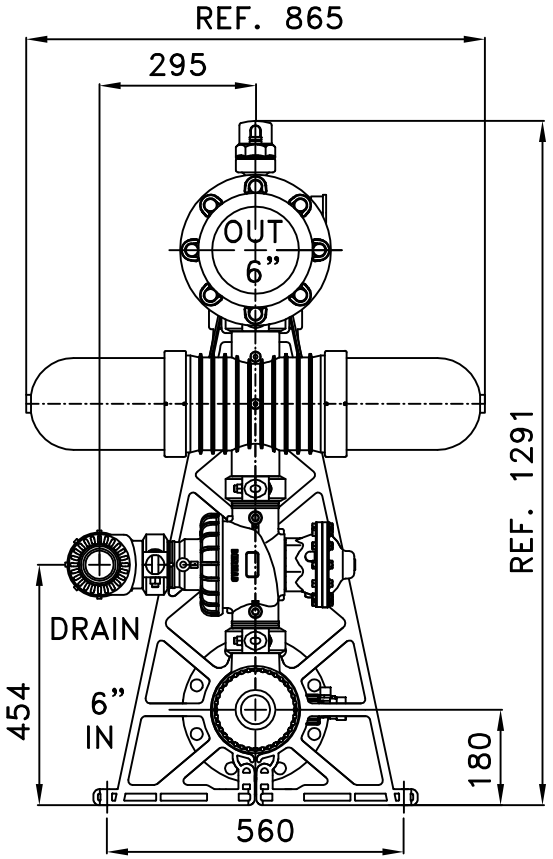
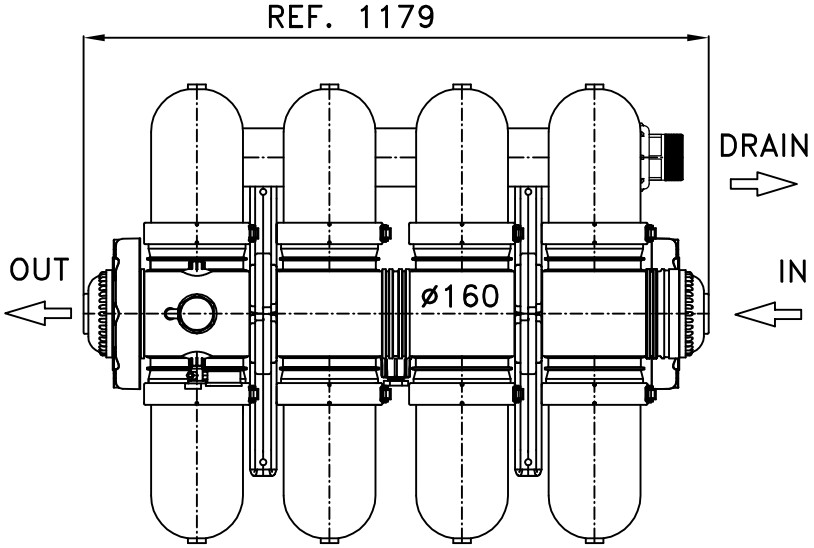
CHECKED	NIKOLAY	18.09.07	
APPROVED	TAMIR	18.09.07	
NAME	IRINA	18.09.07	







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PROJECT 4*3"S.K. FILTERS SYNTHETIC BATTERY
PAGE 1 OF 5
TITLE ASSEMBLY DRAWING
CATALOGUE No: 1635P0604U3

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FILE CODE 1635P0604U3

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CHECKED	NIKOLAY	12.03.08
APPROVED	MARINA	12.03.08

NAME	DATE	SIGNATURE
IRINA	12.03.08	IRINA

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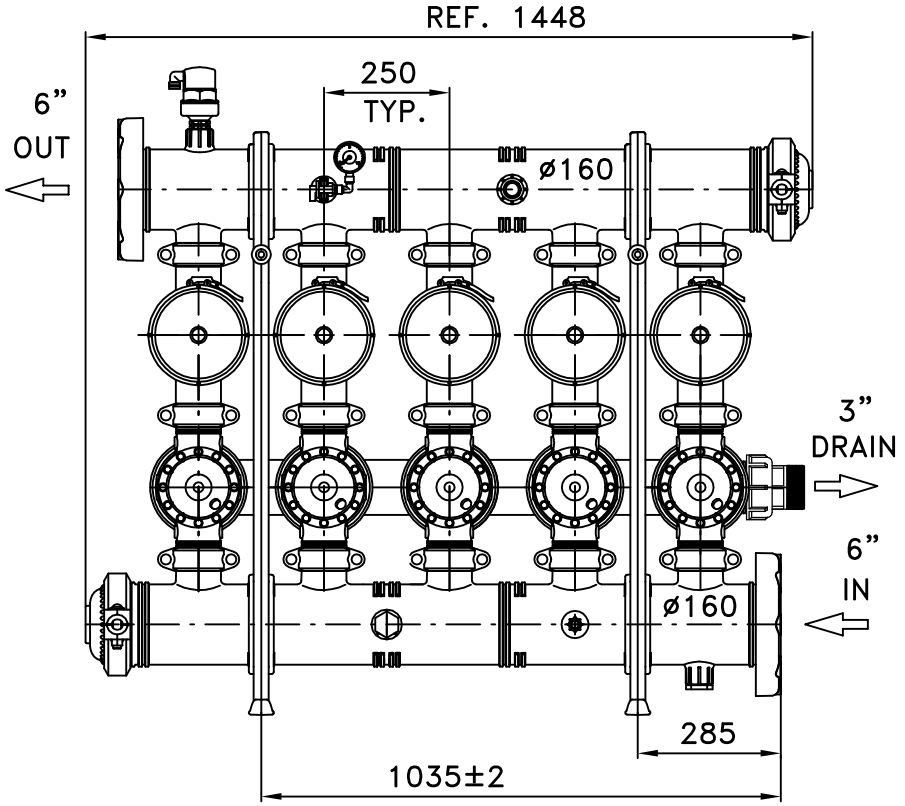

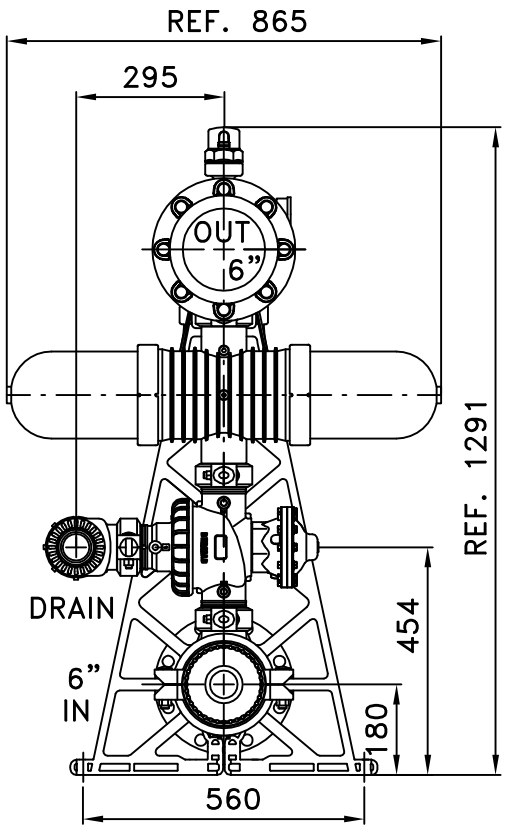

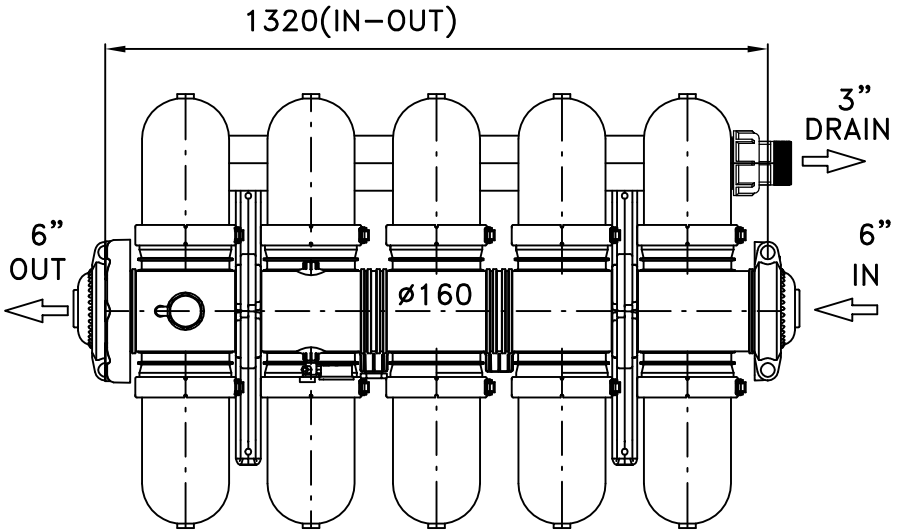

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 5*3" S.K. FILTERS SYNTHETIC BATTERY
TITLE: ASSEMBLY DRAWING
PAGE 1 OF 5
CATALOGUE No: 1635P0605VU3

PATH BATERIES\3INCH\TWIN GAVISH-PL\PLASTIC\PLASTIC VALVE
FILE CODE 1635P0605VU3

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APPROVED	ROTEM	02.10.07	PALET-25(5201 5405), TRIWAL-112(5200 5322)

	NAME	DATE	SIGNATURE
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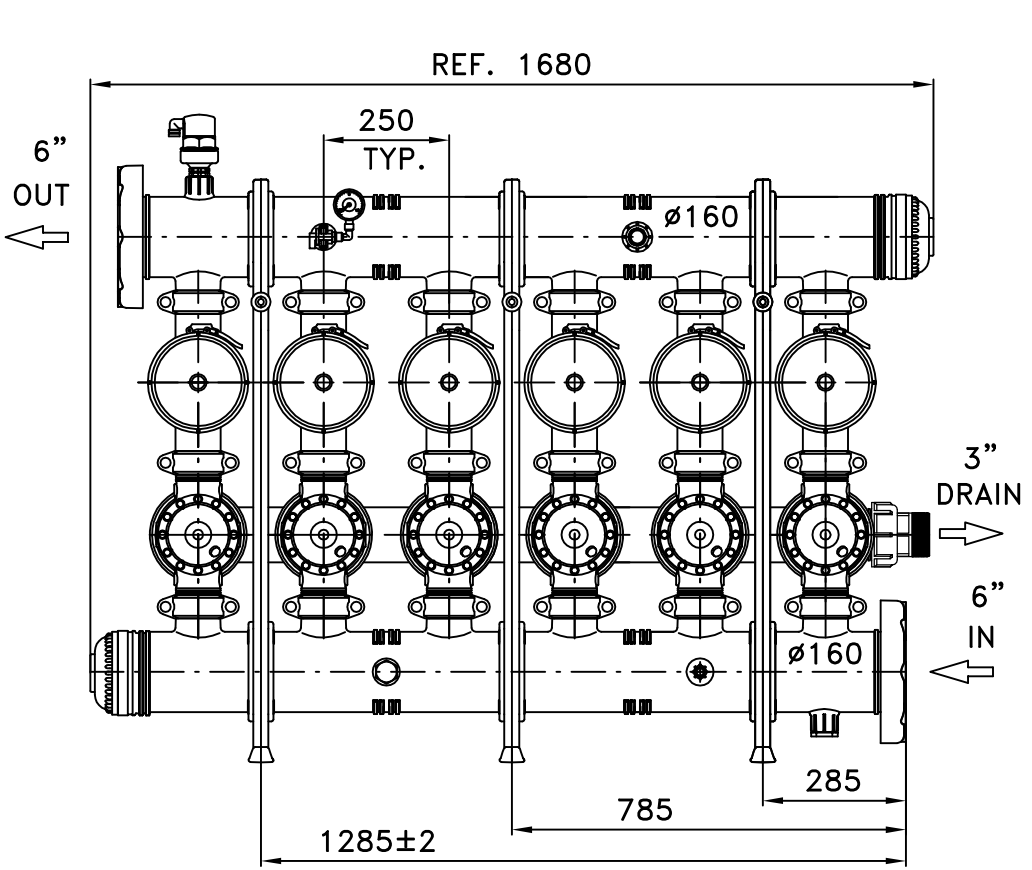
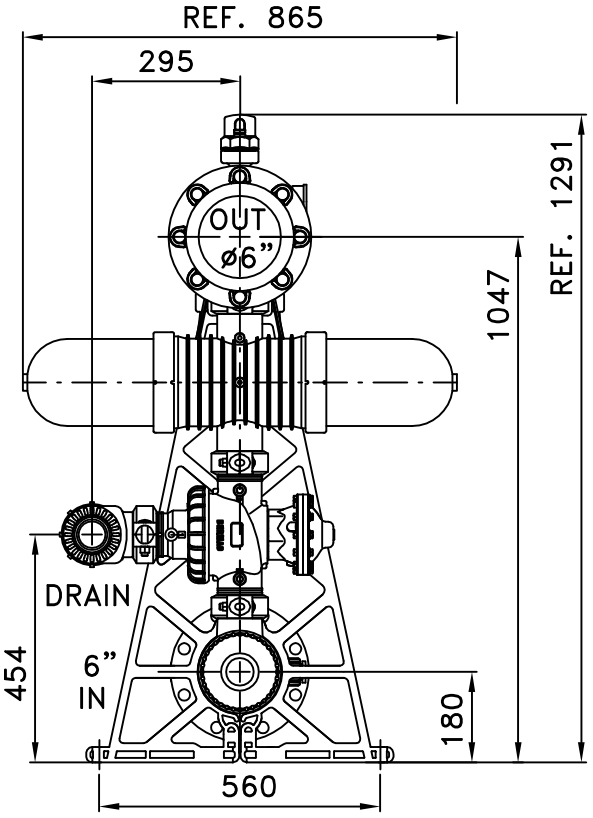
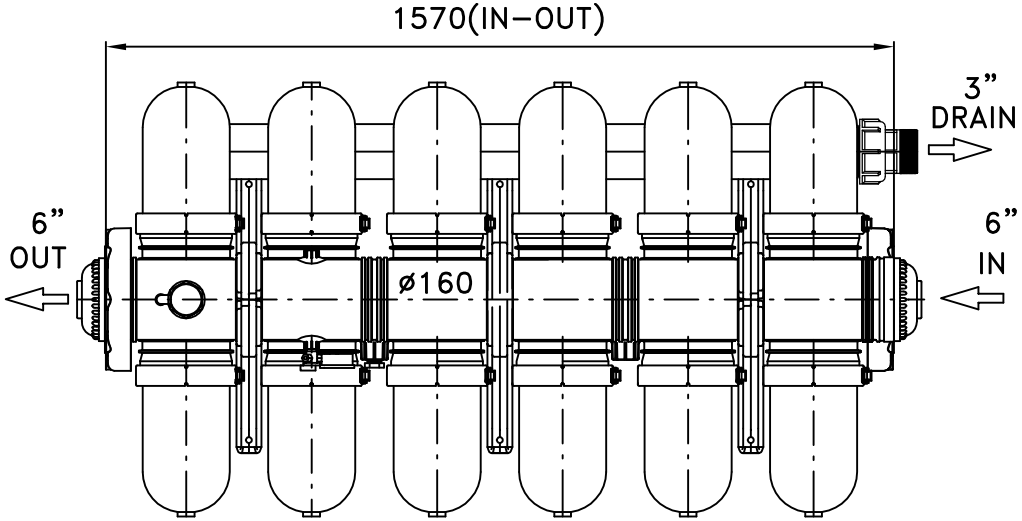
DRAWER N: 3130







MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 6*3" S.K. FILTERS SYNTHETIC BATTERY
TITLE: ASSEMBLY DRAWING
PAGE 1 OF 6
CATALOGUE No: 1635P0606U3

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CHECKED	NIKOLAY	21.04.09
APPROVED	YOEL	21.04.09

NAME: IRINA
DATE: 21.04.09
SIGNATURE: IRINA
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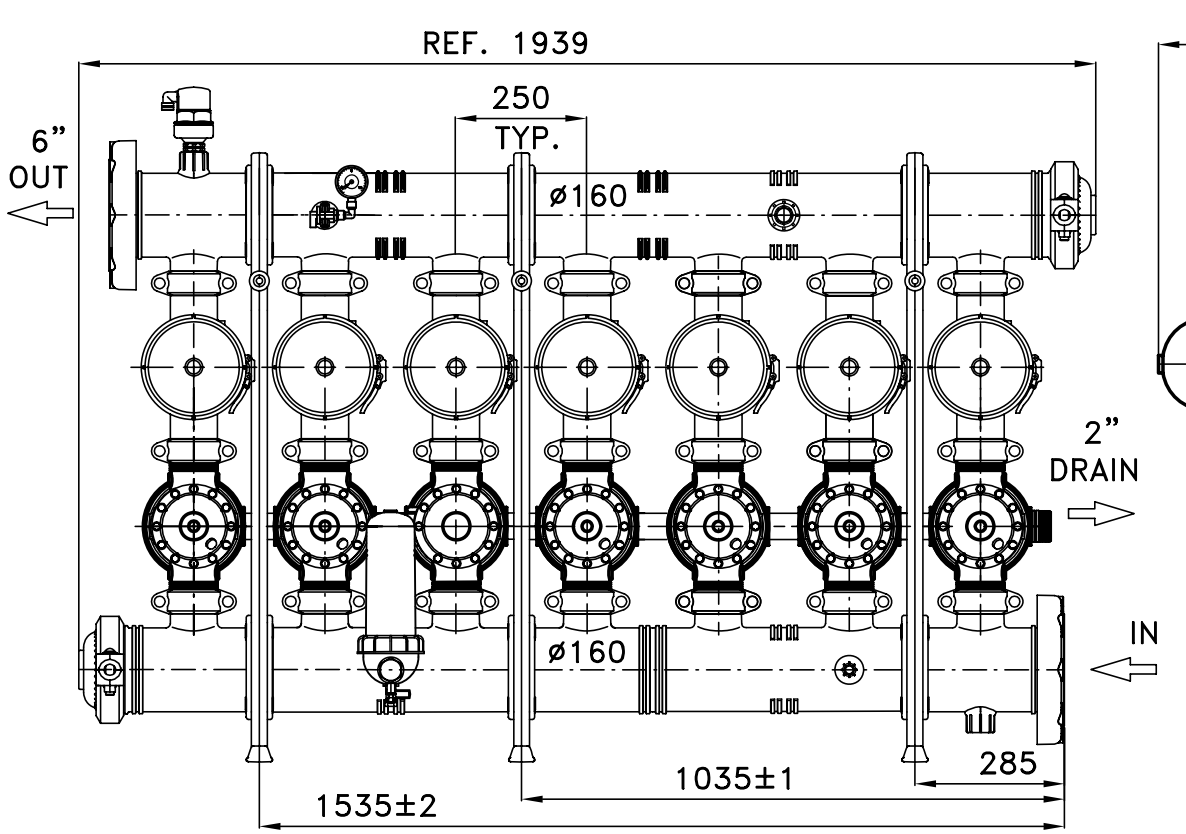
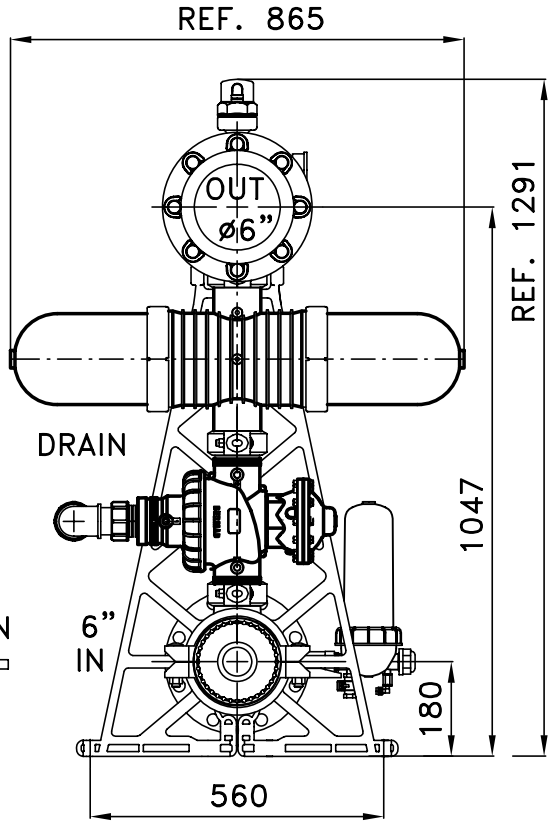
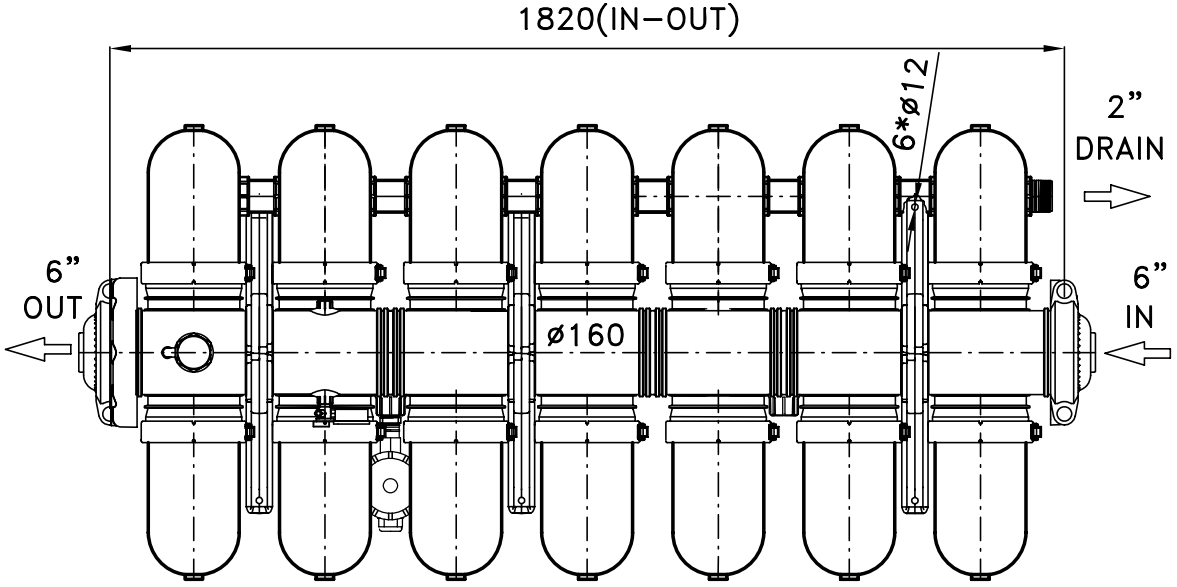
DRAWER N: 3130







SIGN.	DESCRIPTION	DATE	MODIFIC.

PROJECT 7*3" S.K. FILTERS SYNTHETIC BATTERY

TITLE ASSEMBLY DRAWING

PAGE 1 OF 5

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CHECKED	NIKOLAY	31.12.06	
APPROVED	OMRY	31.12.06	

PATH BATERIES\3INCH\TWIN\ GAVISH-PL\PLASTIC\PL-VALVE

FILE CODE 1635M0607VU9

FILE CODE DRAWING OF MANIFOLD: 6635 0607V0,2253 0601,

BACKUP: DISK-32

DRAWER N: 3040

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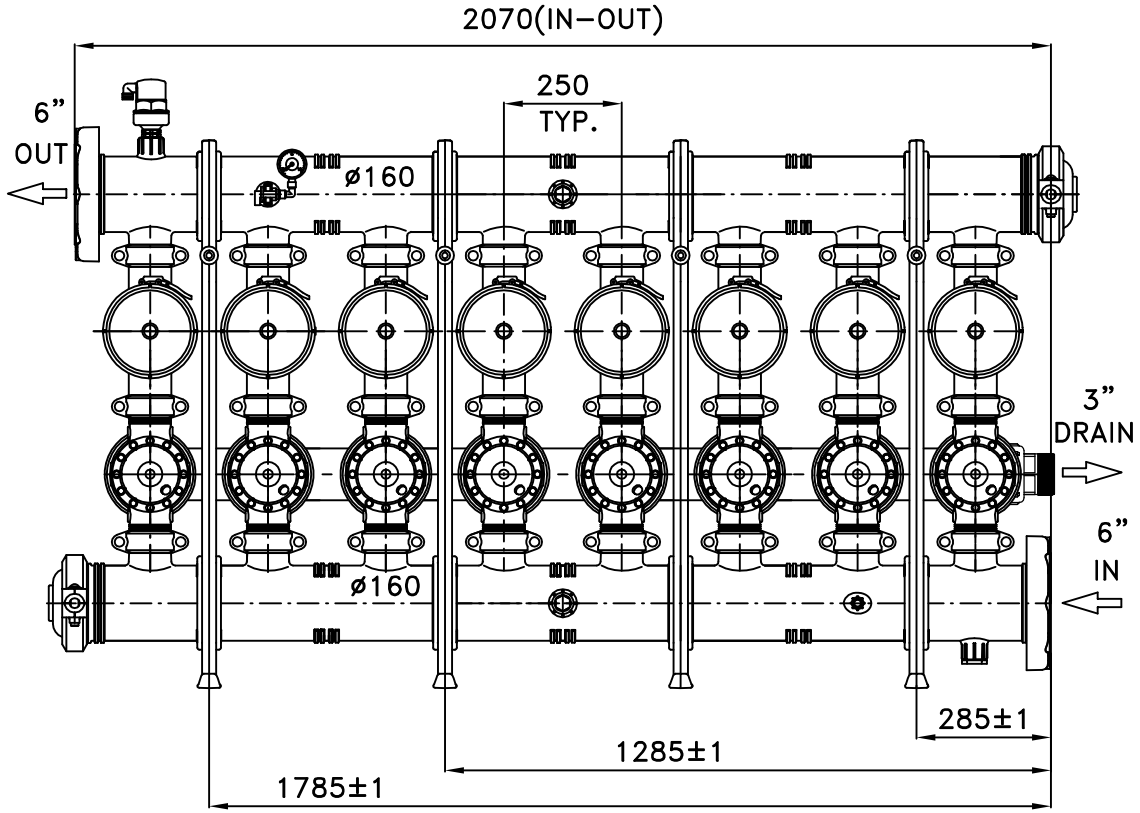
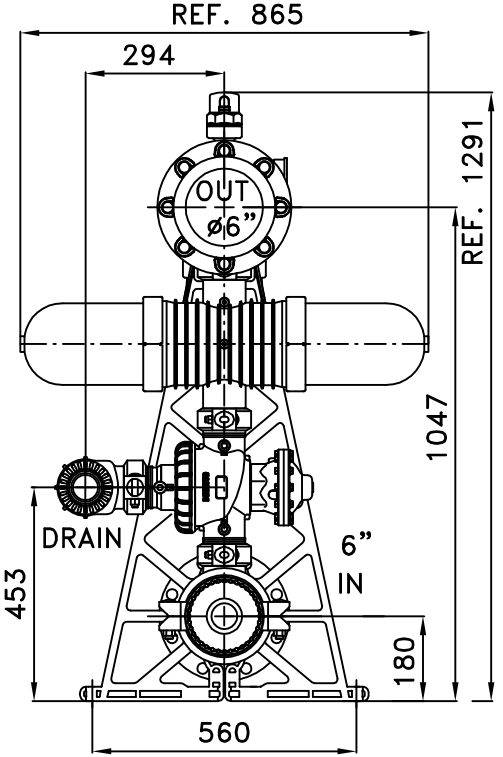
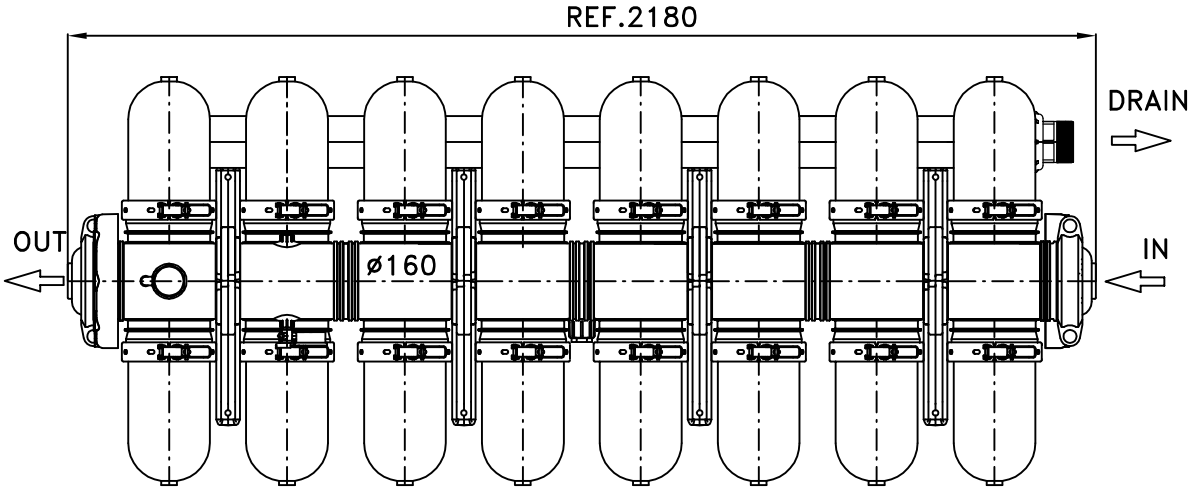
FAX. 972-4-6775461
ISRAEL







MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT: 8*3" S.K. FILTERS SYNTHETIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 1635P0608VU3

PATH: BATERIES\3INCH\TWIN GAVISH-PL\PLASTIC\PLASTIC VALVE

FILE CODE: 1635P0608VU3

FILE CODE DRAWING OF MANIFOLD: 6635 0608V2(1-2) 2253 0601

	NAME	DATE	SIGNATURE
DRAWN	PABLO	27.08.08	
CHECKED	NIKOLAY	27.08.08	
APPROVED	ROTEM	27.08.08	
	IRINA	27.01.08	IRINA

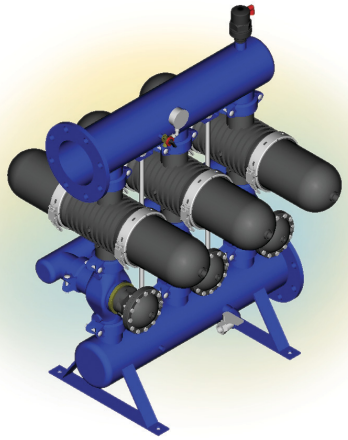
BACKUP: DISK-33

DRAWER N: 3130

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

Crystal

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for medium flow rates
- Continuous flow during backwash
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm^2**	1760	**in^2**	272.8
Filtration volume per unit	**cm^3**	2640	**in^3**	161
Backwash water volume per unit	**lit**	66	**gal**	17.4

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m^3/h**						**gpm**					
400-130 µ	Good	110	148	185	222	259	296	484	652	814	977	1140	1302
	Average	90	120	150	180	210	240	396	528	660	792	924	1056
	Poor	66	88	110	132	154	176	290	387	484	581	678	774
	Very Poor	45*	60	75	90	105	120	198*	264	330	396	462	528
100 µ	Good	90	120	150	180	210	240	396	528	660	792	924	1056
	Average	66	88	110	132	154	176	290	387	484	581	678	774
	Poor	48*	64	80	96	112	128	211*	282	352	422	493	563
	Very Poor	33*	44*	55	66	77	88	145*	194*	242	290	339	387
55 µ	Good	60	80	100	120	140	160	264	352	440	528	616	704
	Average	48*	64	80	96	112	128	211*	282	352	422	493	563
	Poor	36*	48*	60	72	84	96	158*	211*	264	317	370	422
	Very Poor	27***	36**	45*	54	63	72	119***	158**	198*	238	277	317
20 µ	Good	30***	40**	50	60	70	80	132***	176**	220	264	308	352
	Average	24***	32***	40**	48*	56	64	106***	141***	176**	211*	246	282
	Poor	18***	24***	30***	36***	42*	48*	79***	106***	132***	158***	185*	211*
	Very Poor	12***	16***	20***	24***	28***	32***	53***	70***	88***	106***	123***	141***

* External source for backwash is necessary

** When pressure is low, it is necessary to close downstream valve during backwash

*** The 2" Spin Klin Battery is recommended

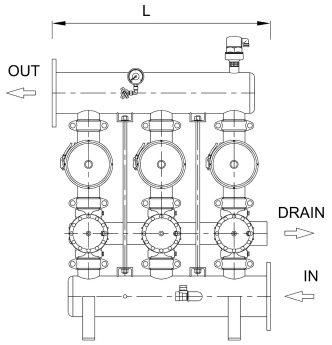
Crystal

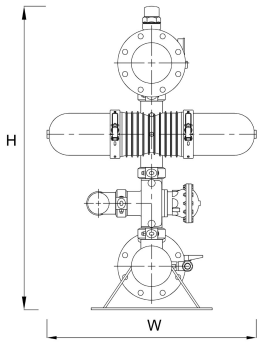
Filtration Batteries

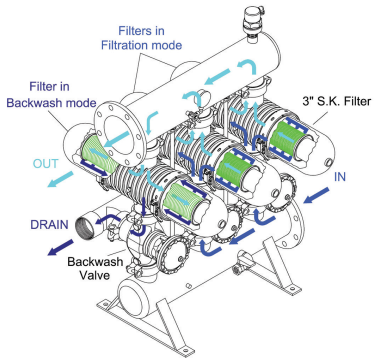
Dimensions and Weights

No. of units		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	**mm**	90	110	160	160	225	225	**inch**	3	4	6	6	8	8
L Length	**mm**	900	1200	1500	1800	2100	2400	**inch**	35	47	59	71	83	94
H Height	**mm**	1220	1220	1220	1220	1488	1488	**inch**	48	48	48	47	59	59
W Width	**mm**	900	900	900	900	900	900	**inch**	35	35	35	35	35	35
Shipping weight (approx.)	**kg**	150	170	190	210	260	300	**lbs**	331	375	419	463	573	661

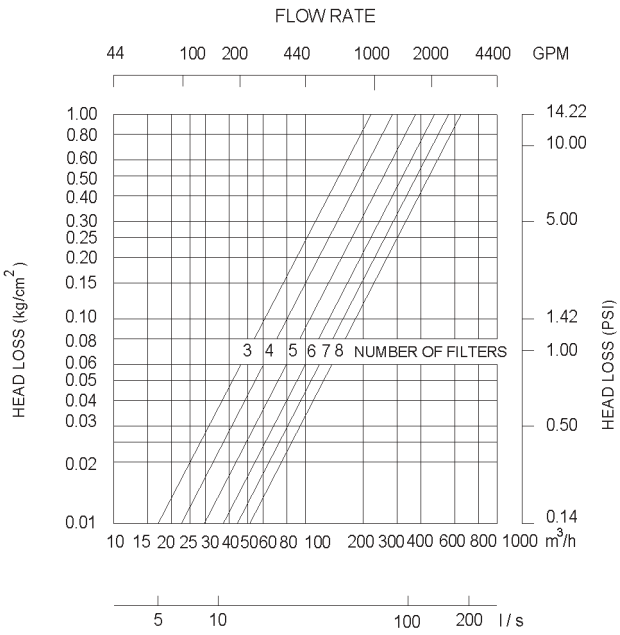
NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.







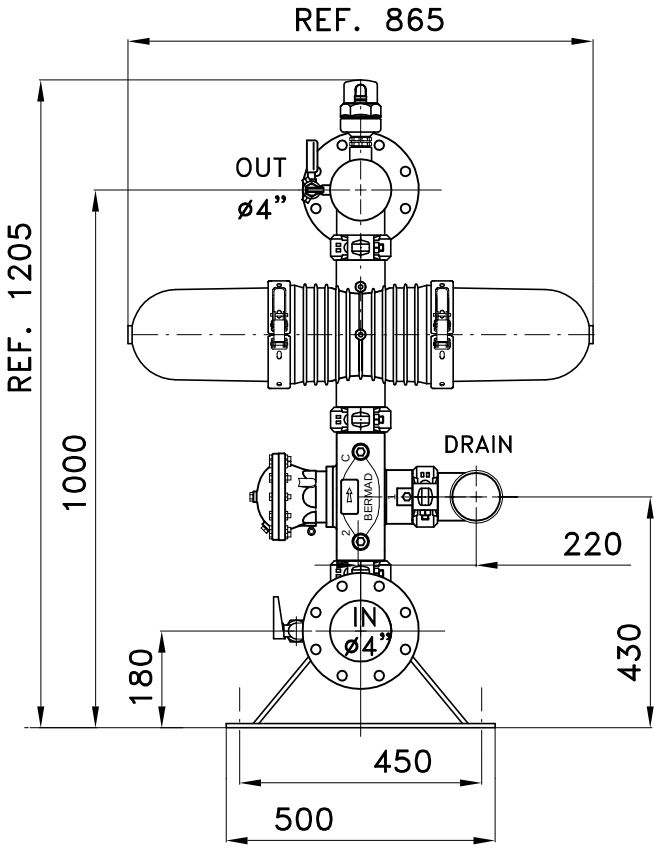
Head Loss Chart - for 130-400µ, Clean State

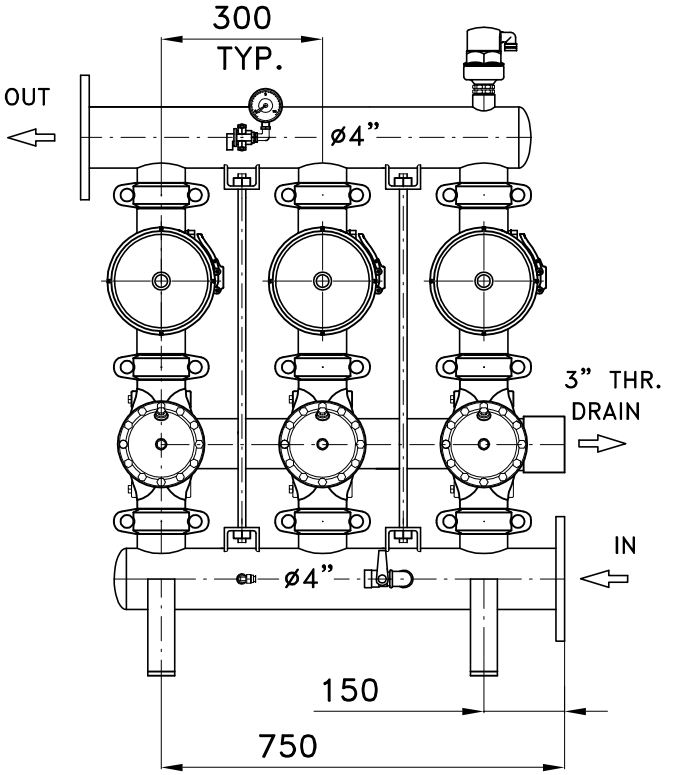


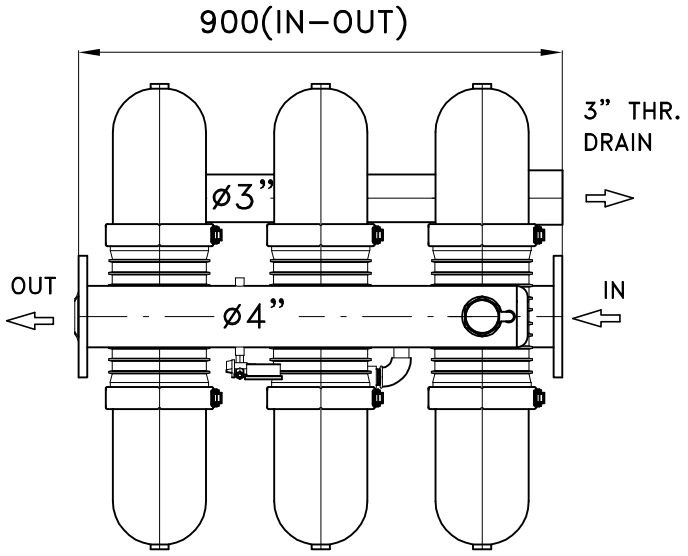
CRYSTAL filtration batteries are available with:
Polyester coated steel,
Stainless steel or
Polypropelene manifolds.

Drawings

3" Batteries







CANCEL DRAWING FROM 26.02.04

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT: 3*3" S.K. FILTER BATTERY — PAGE 1 OF 3

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1735M0403_5

PATH: BATERIES\3INCH\TWIN GAVISH-MT\STANDARD — FILE CODE: 1735M0403_5 — FILE CODE DRAWING OF MANIFOLD: 5735 0403_5 — BACKUP: DISK-24

	NAME	DATE	SIGNATURE
DRAWN	MAYA	09.12.04	
CHECKED		09.12.04	
APPROVED			

NAME: IRINA — DATE: 09.12.04

VIEW: FRONT,TOP & SIDE VIEWS — DRAWER N: 3125

ARKAL
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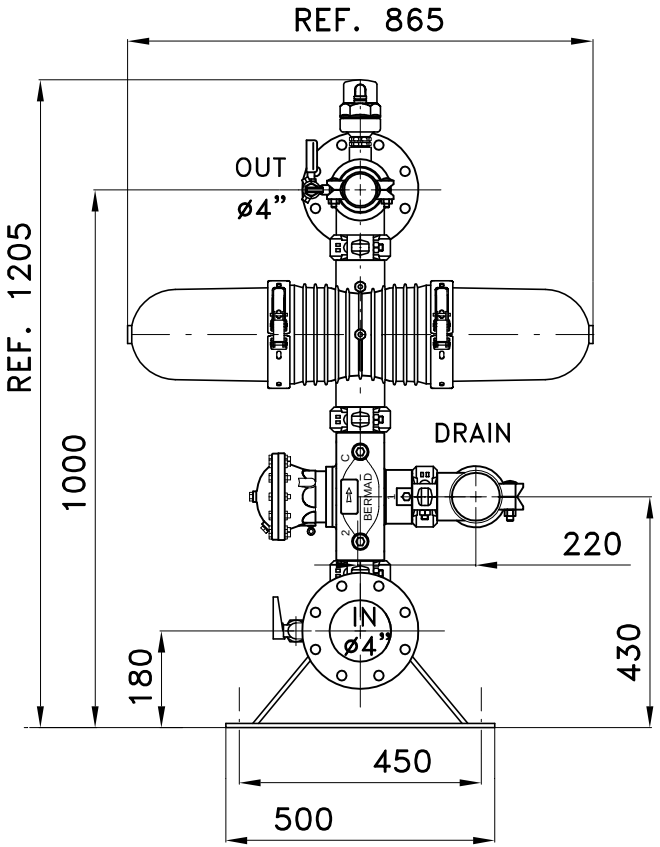
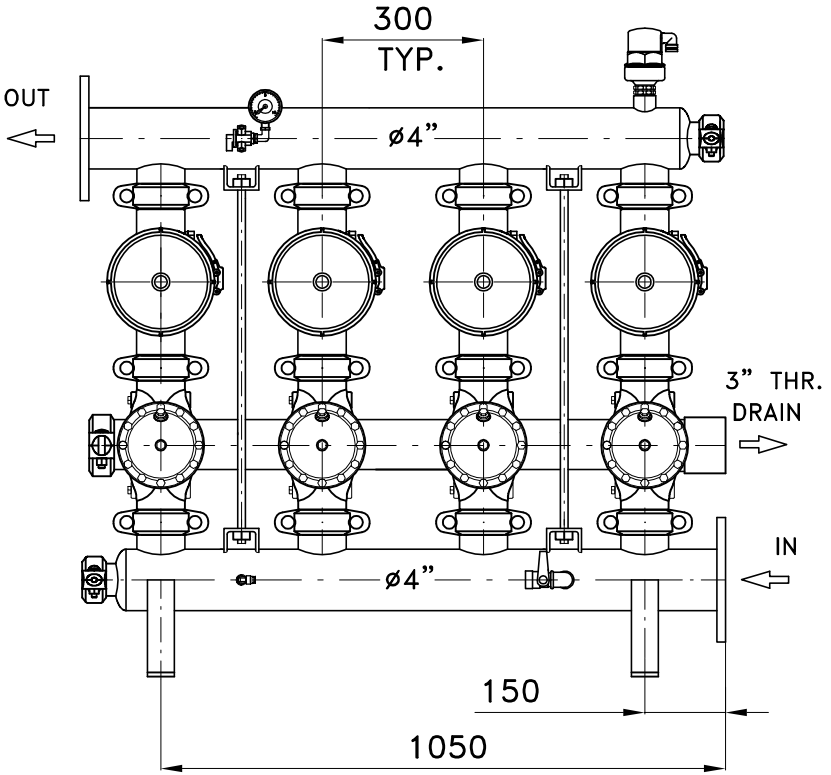
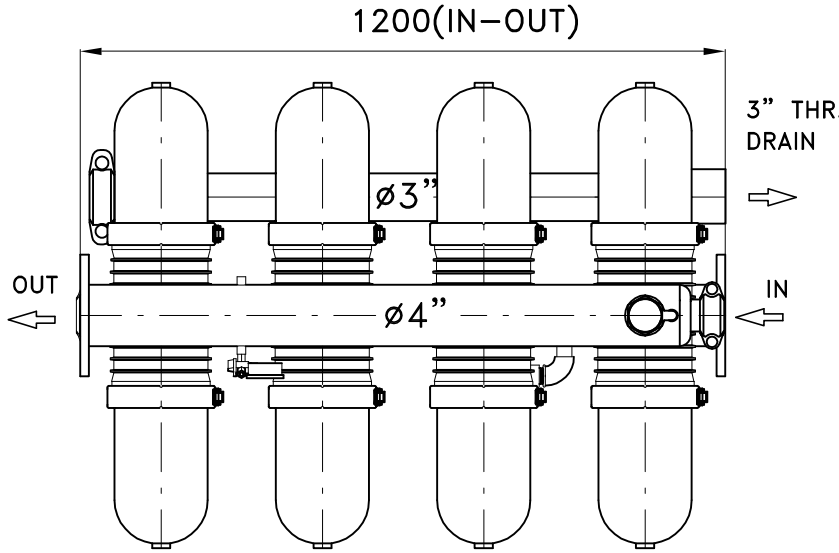
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL







CANCEL DRAWING FROM 26.02.04

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT: 4*3" S.K. FILTER BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 3

CATALOGUE No: 1735P0404_5

PATH: BATERIES\3INCH\TWIN GAVISH-MT\STANDARD

FILE CODE: 1735P0404_5

FILE CODE DRAWING OF MANIFOLD: 5735 0404_5

VIEW: FRONT,TOP & SIDE VIEWS

BACKUP: DISK-26

DRAWER N: 3125

	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	31.05.05	
CHECKED	YOEL	31.05.05	
APPROVED			
	IRINA	31.05.05	IRINA

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FAX. 972-4-6775461
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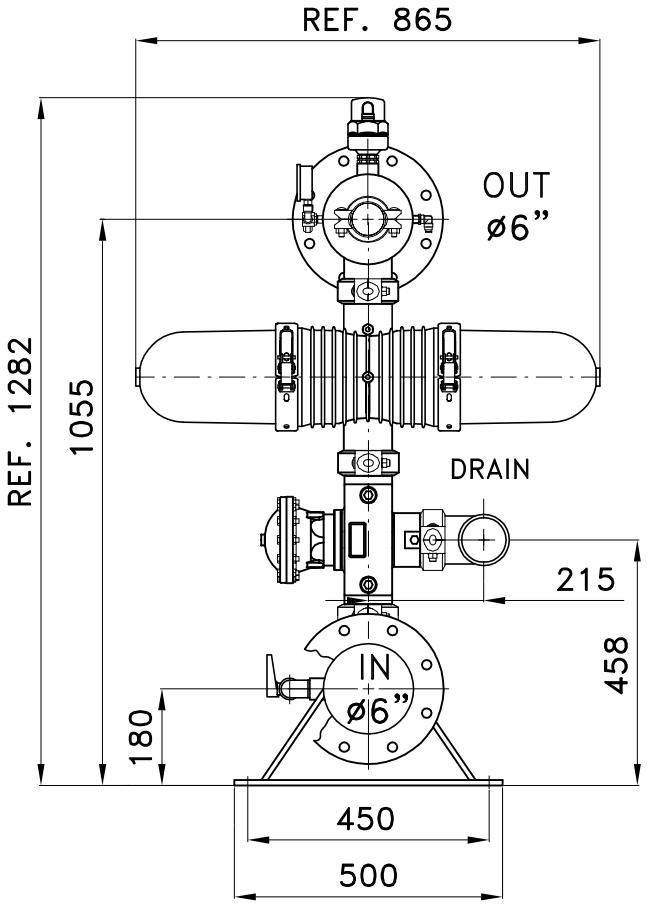

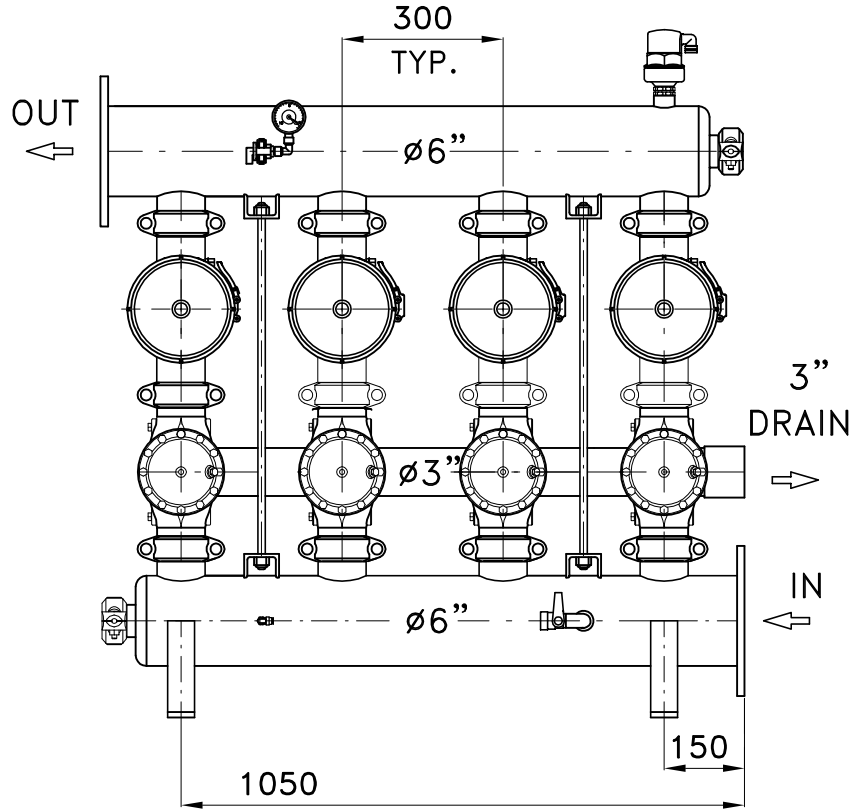

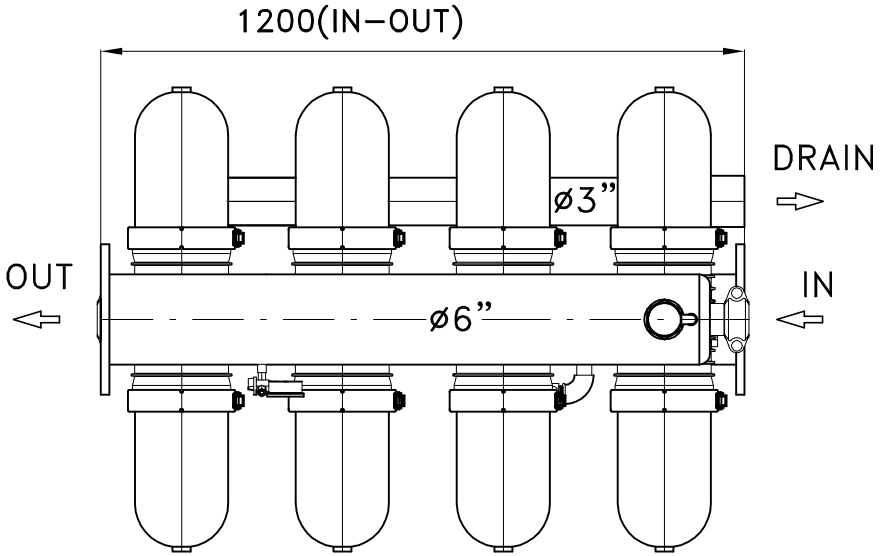

THIS DRAWING CANCEL DRAWING FROM 26.02.04

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT 4*3” S.K. FILTERS ”GAVISH” BATTERY

PAGE 1 OF 4

TITLE ASSEMBLY DRAWING

CATALOGUE No: 1735P0604_5

PATH BATERIES\3INCH\TWIN GAVISH-MT \STANDARD

FILE CODE 1735P0604_5

FILE CODE DRAWING OF MANIFOLD: 5735 0604_5

BACKUP: DISK-27

DRAWER N: 3125

	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	19.07.05	IRINA 19.07.05
CHECKED	YOEL	19.07.05	PALET-25 (5201 5405)
APPROVED			TRIWAL-112 (5250 5322)

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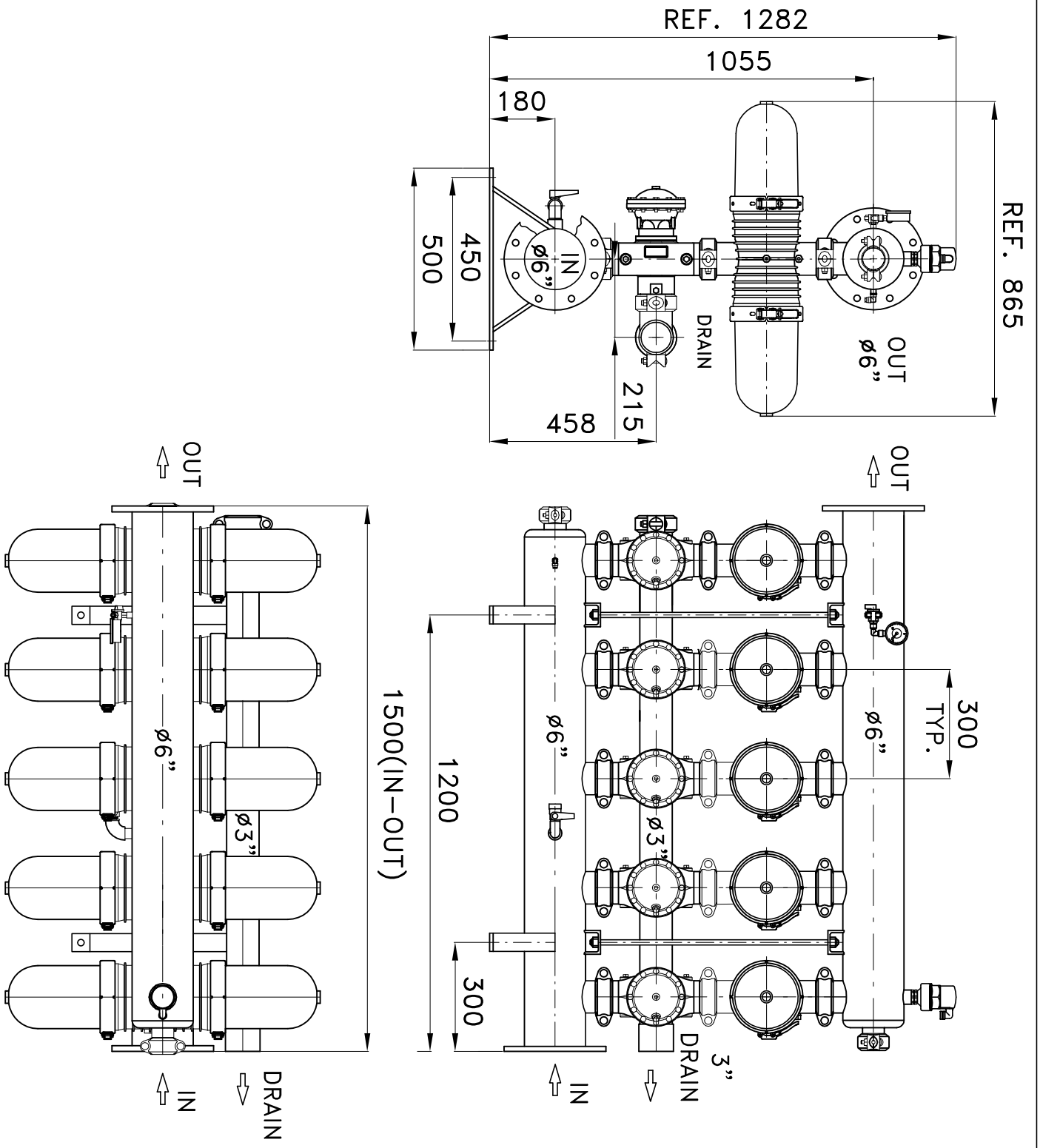

MODIFIC.	DATE	DESCRIPTION	SIGN.
		CANCEL DRAWING FROM 29.07.03	

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FAX. 972-4-6775461
ISRAEL

PROJECT: 5*3" S.K. FILTERS BATTERY — PAGE 1 OF 4

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1735P0605_5

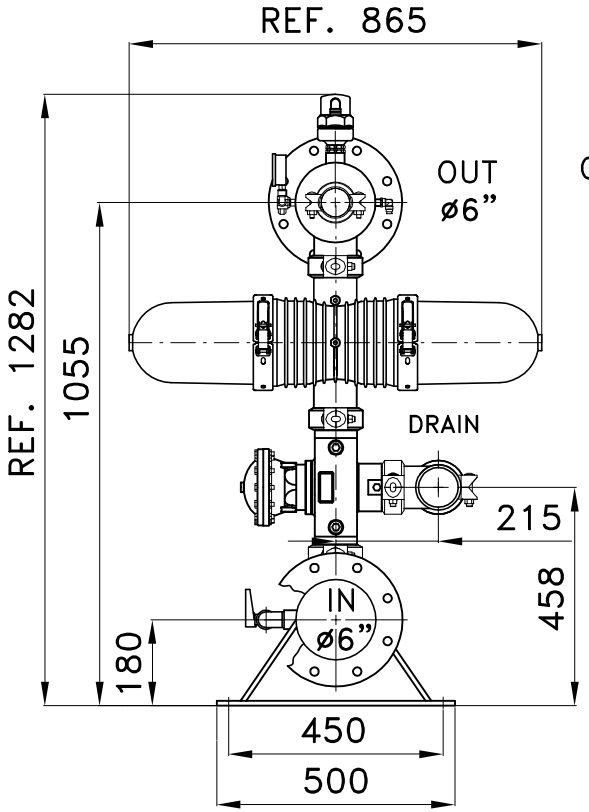
PATH: BATERIES\3INCH\TWIN GAVISH-MT \STANDARD — FILE CODE: 1735P0605_5 — NAME: IRINA — DATE: 24.05.05 — SIGNATURE: IRINA

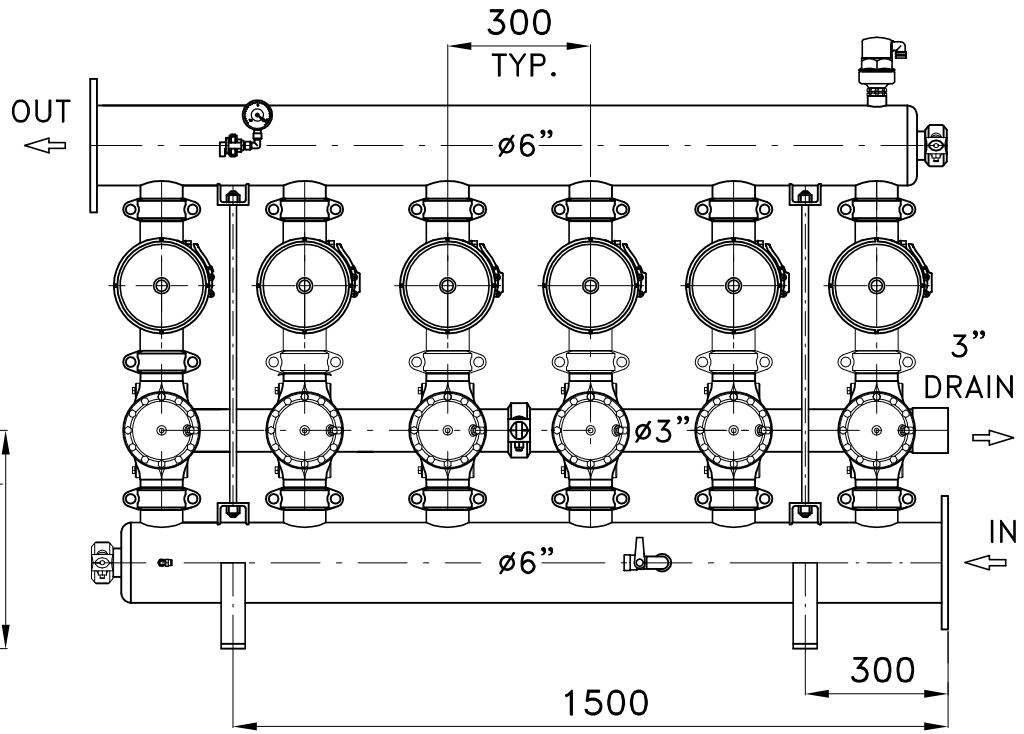
	NAME	DATE
DRAWN	LEAH	24.05.05
CHECKED	YOEL	24.05.05
APPROVED		

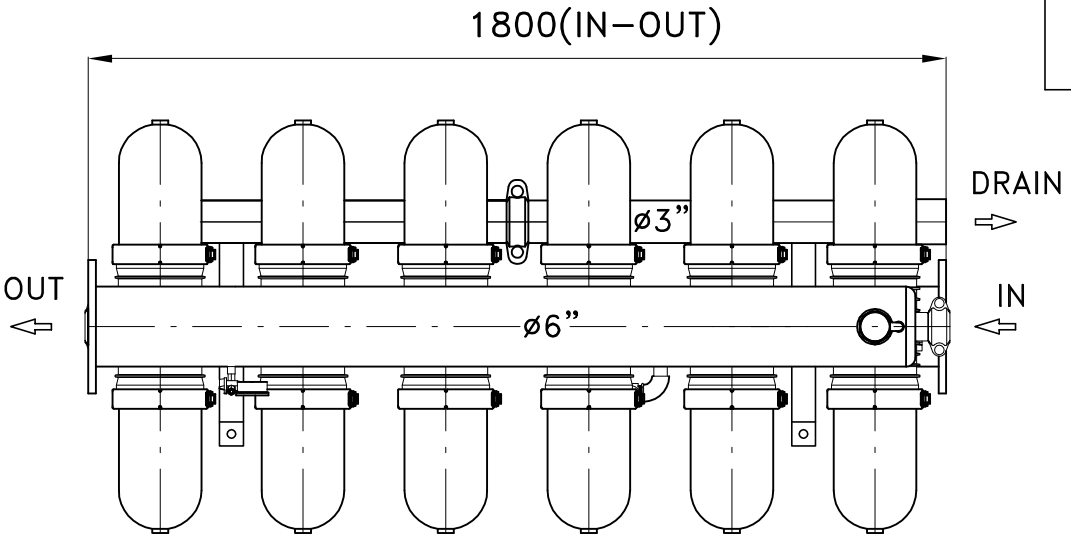
FILE CODE DRAWING OF MANIFOLD: 5735 0605_5
PALET-27 (5201 5404)
TRIWAL-115 (5250 5305)

BACKUP: DISK-26

DRAWER N: 3125







MODIFIC.	DATE	DESCRIPTION	SIGN.
		THIS DRAWING CANCEL DRAWING FROM 06.12.02	

PROJECT: 6*3" S.K. FILTERS "GAVISH" BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 4

CATALOGUE No: 1735P0606_5

PATH: BATERIES\3INCH\TWIN GAVISH-MT \STANDARD

FILE CODE: 1735P0606_5

FILE CODE DRAWING OF MANIFOLD: 5735 0606_5(1-2)

PALET-27 (5201 5404)

TRIWAL-115 (5250 5305)

BACKUP: DISK-27

DRAWER N: 3125

	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	14.06.05	
CHECKED	OMRY	14.06.05	
APPROVED			
	IRINA	14.06.05	IRINA

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FILTRATION SYSTEM
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NEW ARKAL
3" Spin Klin L.C.E

Low Cost Energy

Automatic Disc Filter
Filter that can flush at 1.5 bar (22 psi)

Product Advantages:

- Proven depth filtration technology
- Will flush at low pressure (1.5 bar - 22 psi)
- Flushing at low pressure uses less energy and will save money
- Will increase profitability

Applications:

- Surface water with algae and organic debris
- Well water
- For low pressure systems where higher pressures are not available or are too costly

Technical Data:

Max. operating pressure	6 bar	87 psi
Min. operating pressure	1 bar	14 psi
Min. backwash pressure (downstream backwash pressure)	1.5 bar	22 psi
Backwash flow rate per unit	20 m^3/h	88 gpm
Max. temperature	60° C	140° F
pH	4-11	4-11

	3 units	4 units	5 units	6 units	3 units	4 units	5 units	6 units
Max. flow rate 400-130 µ	90m^3/h	120m^3/h	150m^3/h	180m^3/h	396gpm	528gpm	660gpm	792gpm
Max. flow rate 100 µ	72m^3/h	96m^3/h	120m^3/h	144m^3/h	317gpm	422gpm	528gpm	634gpm
Filtration surface area	5280cm^2	7040cm^2	8800cm^2	10560cm^2	818$inch^2$	1091$inch^2$	1364$inch^2$	1636$inch^2$
Filtration volume	6888cm^3	9184cm^3	11480cm^3	13776cm^3	420$inch^3$	560$inch^3$	700$inch^3$	840$inch^3$

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

3"SK LCE 9603 0003EN 03/10

L.C.E.

Arkal Spin Klin® 3” Battery

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 3" Spin Klin filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
4. Confirm that filter weight, when full, meets the support construction requirements.
5. Prior to installation confirm that line pressure match's filter's operational pressure.
6. During installation, use standard flanges and connections only.
7. Check that all filter flange bolts are properly secured.
8. Please note, the filter enters a flushing mode automatically, without prior warning.
9. Use original parts only when servicing the filter.
10. Arkal cannot accept responsibility for any changes or modifications to the equipment.

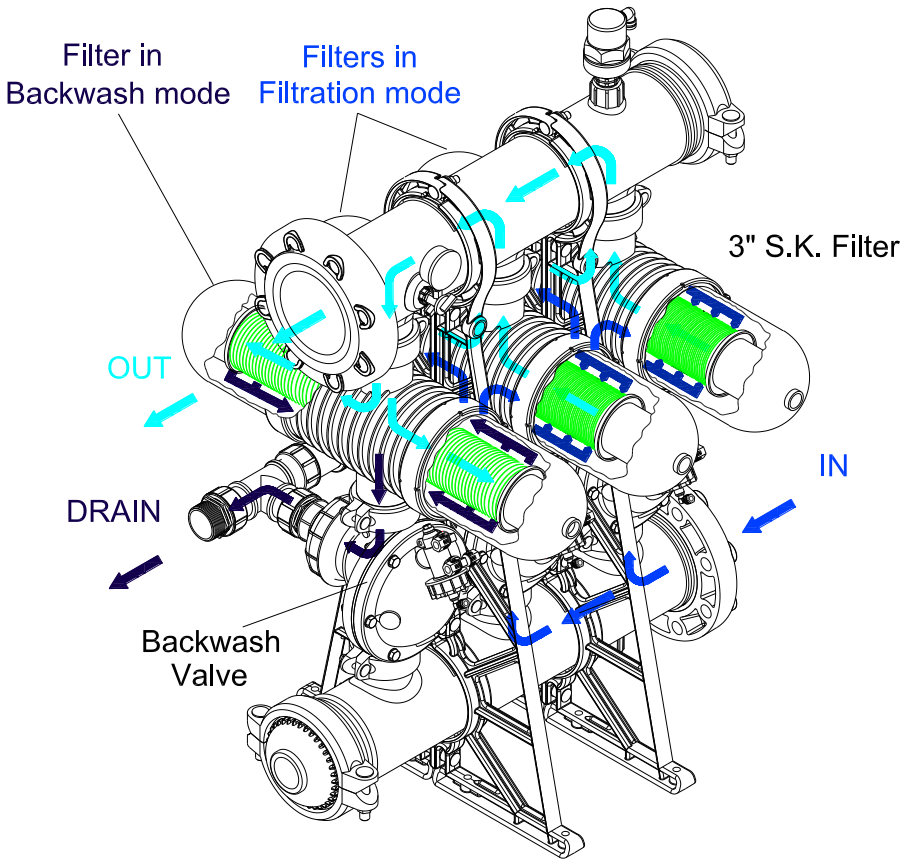
Special Note

Before opening the filter clamp, check that there is no pressure in the filter.

Operation

During the filtration stage, water flows through the INLET manifold and is distributed through the 3” x 2” backwash valves into the Spin Klin filters.

The water then passes through the filter elements to the outlet manifold for consumer use.



Description of the Backwashing Process

1. The controller transmits an electrical command to the first solenoid according to either differential pressure or time.
2. The solenoid then sends a pressure command to the backwash valve, moving it from the filtration mode to the backwash mode.
3. Filter #1 is then backwashed with water from the outlet manifold that has been filtered by the other filters in the system. Contaminated water and impurities flow out through the drain manifold.
4. On completion of the allotted backwashing time, the controller releases the backwash command, and filter #1 returns to the filtration mode.
5. Filter #2 then enters the backwash mode, and the process is repeated until all the filters in the system have been backwashed.
6. After all the filters have been backwashed the system returns to the filtration mode, until the next backwash cycle.

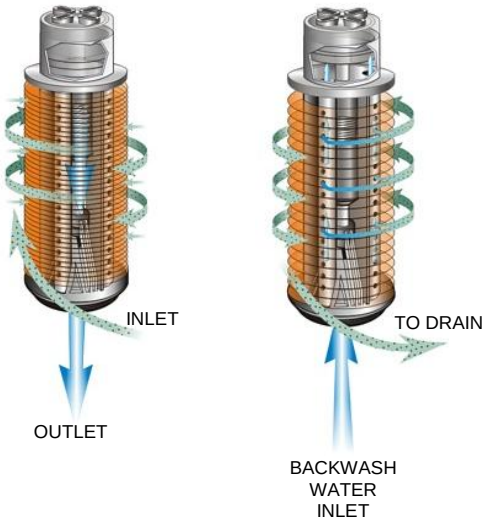
Spin Klin Technology - Spin Klin Spine

General:

The Spin Klin discs are stacked on the Spin Klin spine.

The discs are color-coded by micron size**,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston which are used to alternately compress and release the discs during filtration and backwash cycles.

Filtration Mode **Backwash Mode**



Filtration Mode:

During the filtration process the filter discs are tightly compressed together by the spring and the differential pressure, forcing the water to flow through the grooves and traps of the discs**.**

Backwash Mode:

During backwash the discs are released by releasing the inlet hydraulic pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

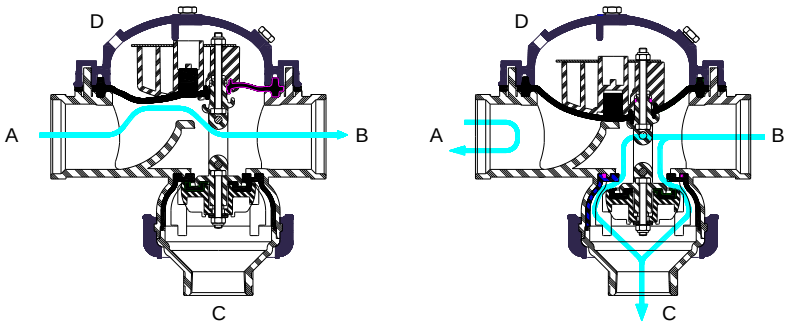
3” x 2” Backwash Valve

Filtration Position:

Water flows from port A (main supply) to port B (filter connection). Port C (drain water outlet) is closed by the seal.

Backwash Position:

Command pressure is applied to the top side of the diaphragm through port D. The diaphragm moves down, pushing the sealed body by the shaft. Port A is closed by the seal, preventing flow to the filter. Port C is now open allowing flushing water to flow from port B (filter connection) to the drain.



Filtration Mode **Backwash Mode**

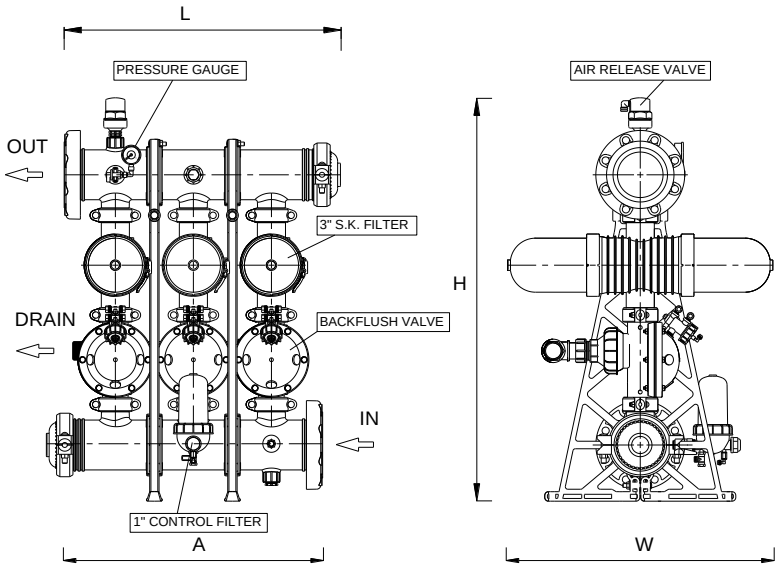
System Installation and Startup

Technical Data

Maximum pressure	6 bar	87 psi
Minimum backwash pressure down stream	1.5 bar	22 psi
Backwash flow rate per unit	20 m^3/h	88 gpm
Maximum temperature	60°C	140°F
pH	4-11	4-11

	3 units	4 units	5 units	6 units
Filtration surface area - cm^2	5280	7040	8800	10560
Filtration surface area - $inch^2$	818	1091	1364	1636
Filtration volume - cm^3	6888	9184	11480	13776
Filtration volume - $inch^3$	420	560	700	840

3” Spin Klin Battery with Plaslite Valves



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

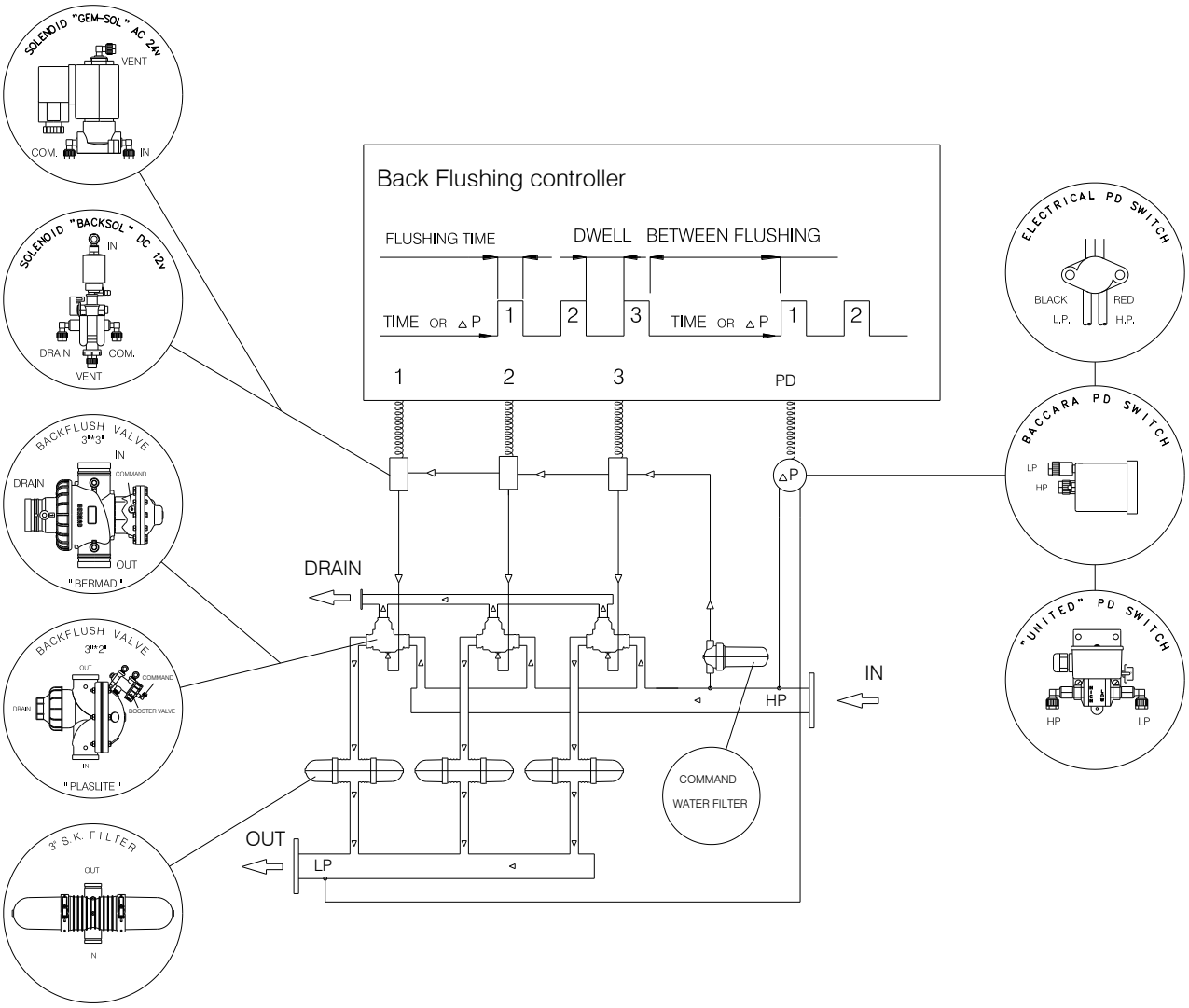
D. Cover clamps need to be properly closed.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- Close the downstream (flow control) valve (if available).
- Flush until clean with repeated cycles.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high.
  An excessive flow rate through the filter causes excessive pressure loss.



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 4-6 meters (5-9 psi).
- The DP set point recommended here (to activate the backwash) is a general guideline; it may need to be adjusted for conditions of low pressure and/or poor water quality.
- Set the controller to a flush time of 30-35 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

NOTE:

Due to low operating pressure, and depending on water qualities, manual cleaning of the discs may be seasonally required.

This is done as follows:

1. Close the downstream (flow control) valve (if available)
2. Perform a few flush cycles until clean
3. Slowly reopen the downstream valve
4. If the pressure differential remains high, check and see if the flow rate is too high (an excessively high flow rate through the filter will cause a high pressure loss).

Winterization:

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover (Figures 1, 2)

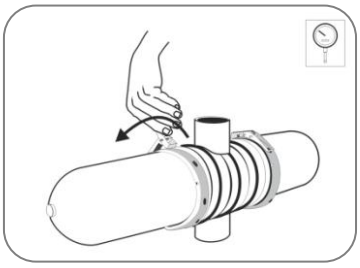
Unscrew the butterfly-nut on the filtration element (Figure 3)
Remove the tightening cylinder (Figure 4)

Remove the discs (for convenience we recommend using a plastic bag) (Figures 5, 6)

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to “Cleaning Recommendations Clogged Filtration Discs”.
Thoroughly wash the discs with fresh water (Figure 7)

Reassemble the discs on the spines, check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine (Figure 8)

Put on the tightening cylinder and tighten the butterfly-nut, then reassemble the filter cover and tighten the clamp (Figures 9, 10)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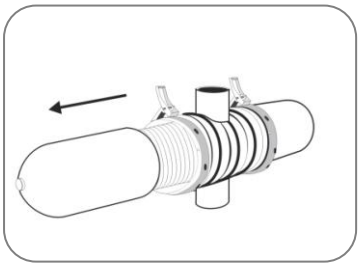
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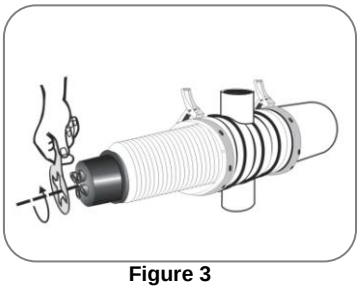
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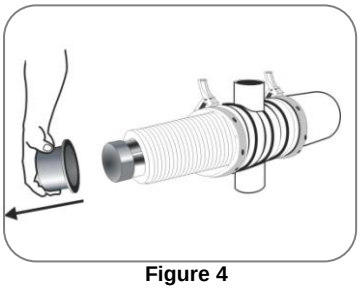
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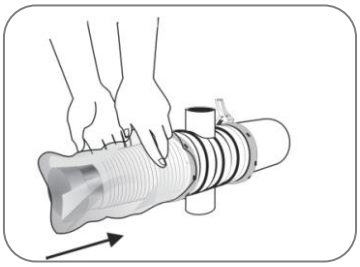
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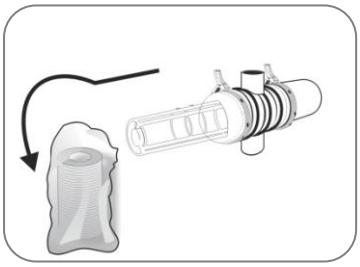
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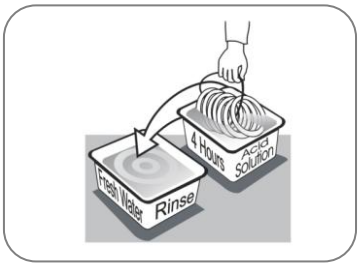
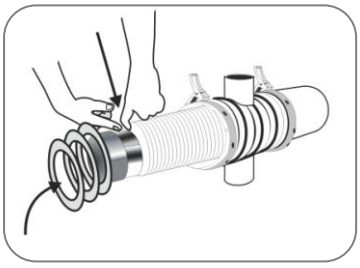


Figure 7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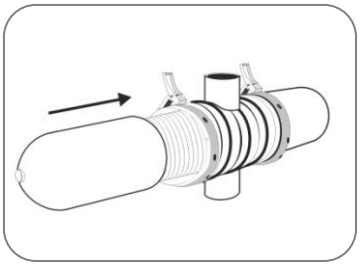


Figure 9

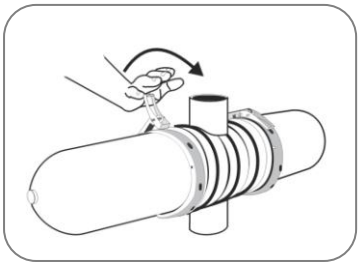


Figure 10

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer’s instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

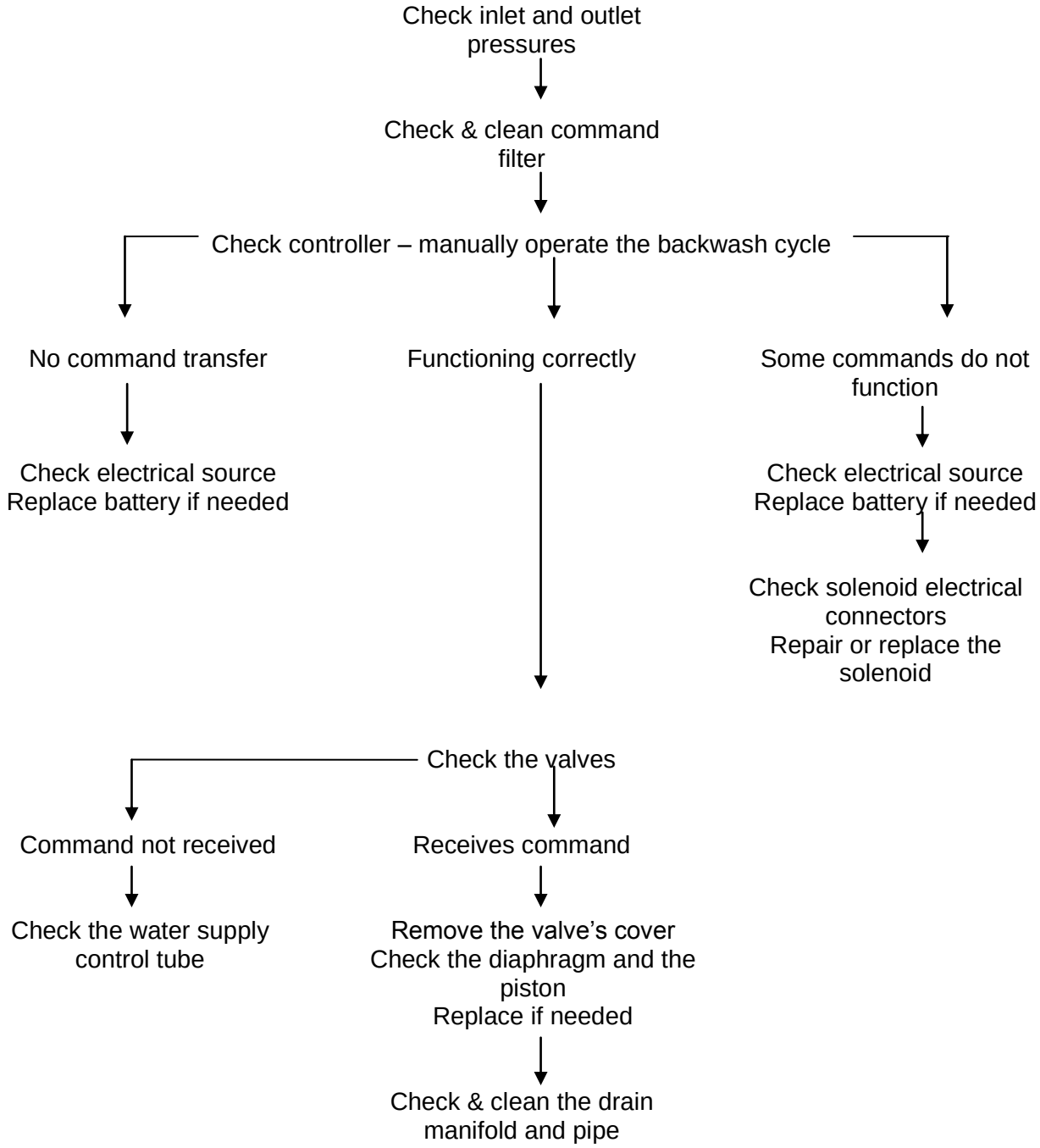
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 3” Spin Klin system

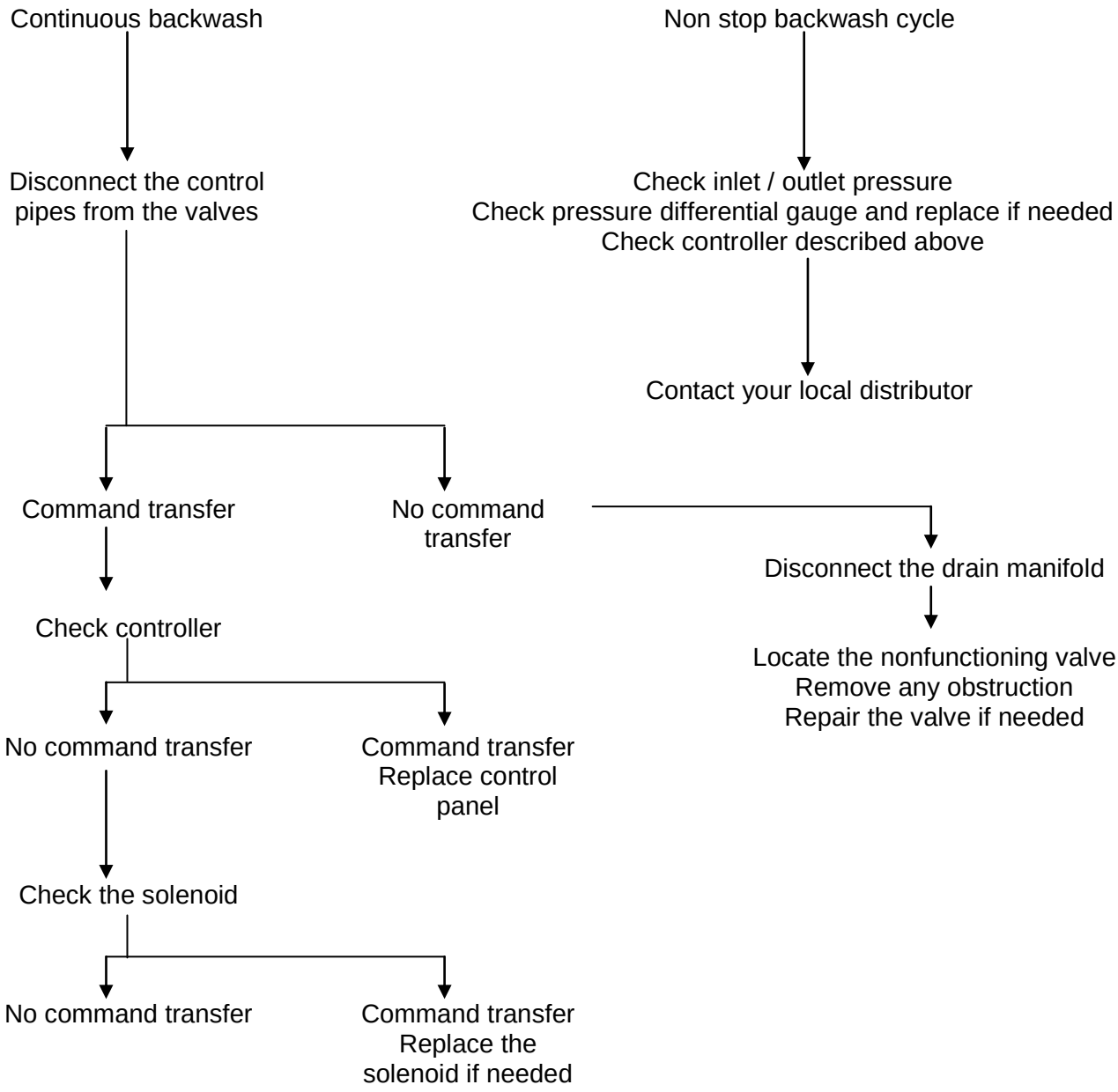
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 3” Spin Klin system

Continuous or Non-stop Backwashing



Contact your local distributor

Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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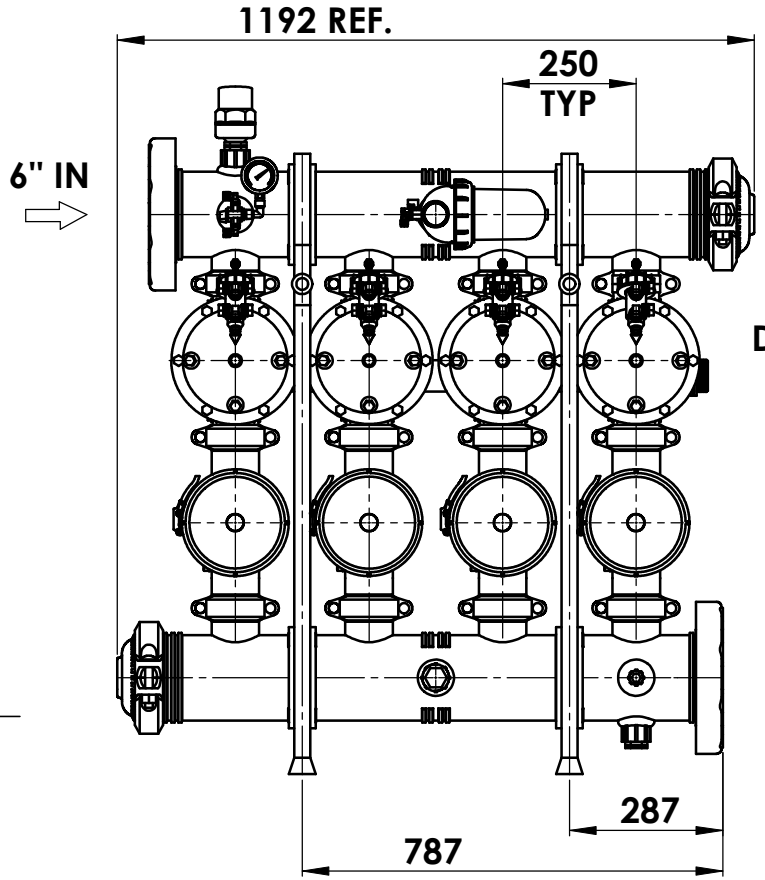
Email: filters@arkal.com Web: www.arkal-filters.com

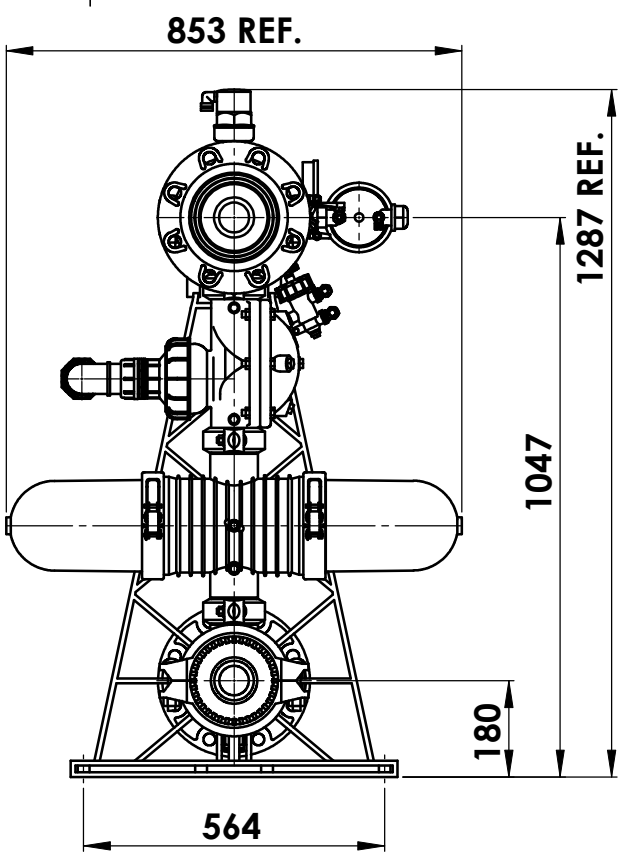
Drawings

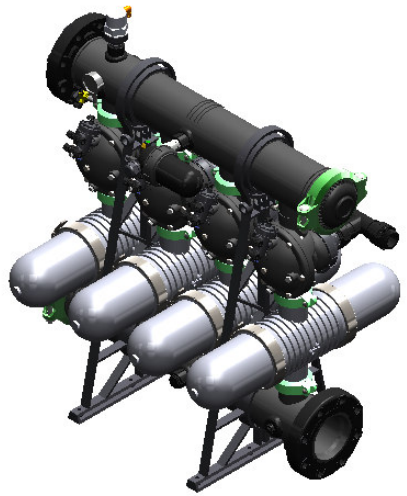
Spin Klin

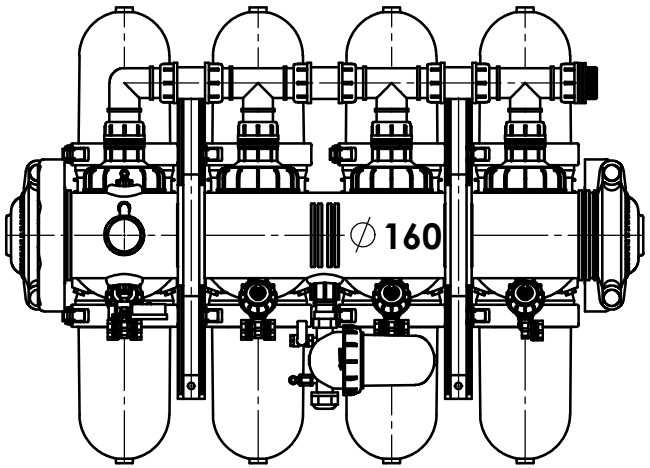
L.C.E

3" All Plastic Batteries









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MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4*3" S.K. FILTERS PLASTIC BATTERY				PAGE 1_OF 4_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 4636H0604VU9LC
SOLIDWORKS FILE CODE: 4636H06___9LC		FILE CODE: 4636H0604VU9LC C		FILE CODE OF FILTER COMPL.: F+PLASLITE SAPPHIRE-LCD
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
DRAWN	ELENA	07/06/2009	PALLET- 25 (5201 5405)	DISK-2S
CHECKED	NIKOLAY	07/06/2009	TRIWALL-112(5200 5322)	
APPROVED	OMRY	07/06/2009	FILE CODE OF MANIFOLDS: 6635 0604V0	DRAWING: 2130
B.O.M.	OLEG	07/06/2009		

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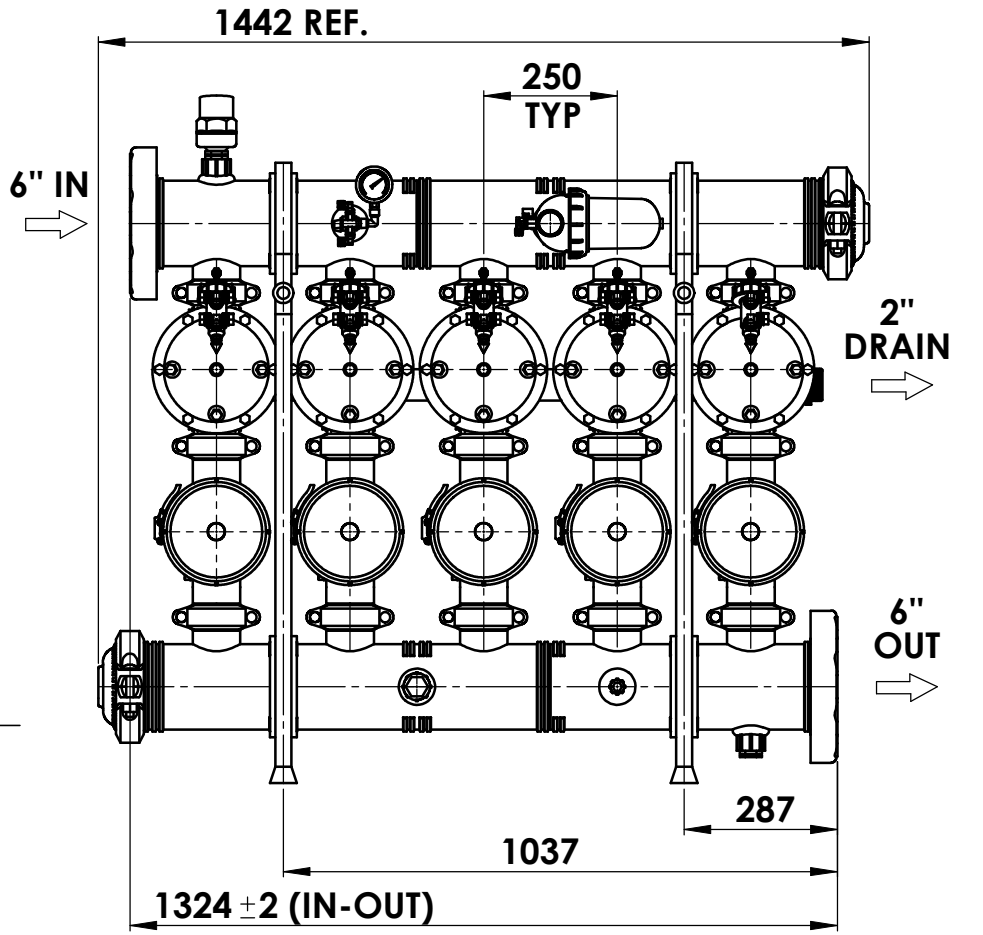

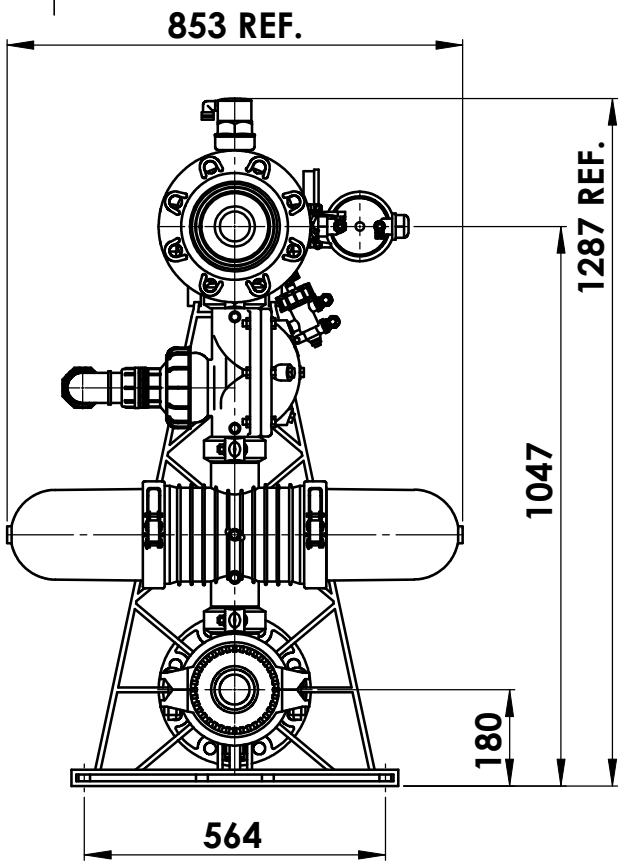

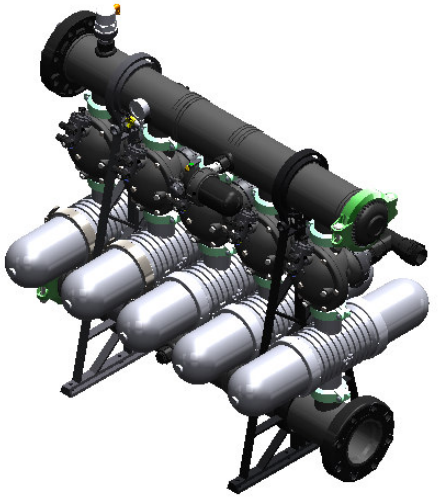

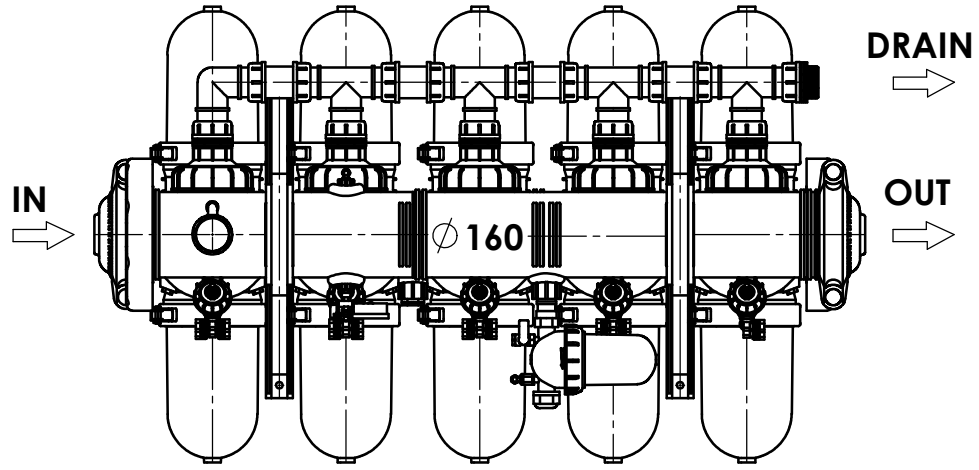

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MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 5*3" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4636H0605VU9LC

SOLIDWORKS FILE CODE: 4636H06___9LC — FILE CODE: 4636H0605VU9LC C — FILE CODE OF FILTER COMPL.: F+PLASLITE SAPPHIRE-LCD

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CHECKED	NIKOLAY	07/06/2009
APPROVED	OMRY	07/06/2009
B.O.M.	OLEG	07/06/2009

FILE CODE DRAWINGS: PALLET- 25 (5201 5405) TRIWALL-112(5200 5322)

FILE CODE OF MANIFOLDS: 6635 0605V0

BACKUP: DISK-2S

DRAWING: 2130

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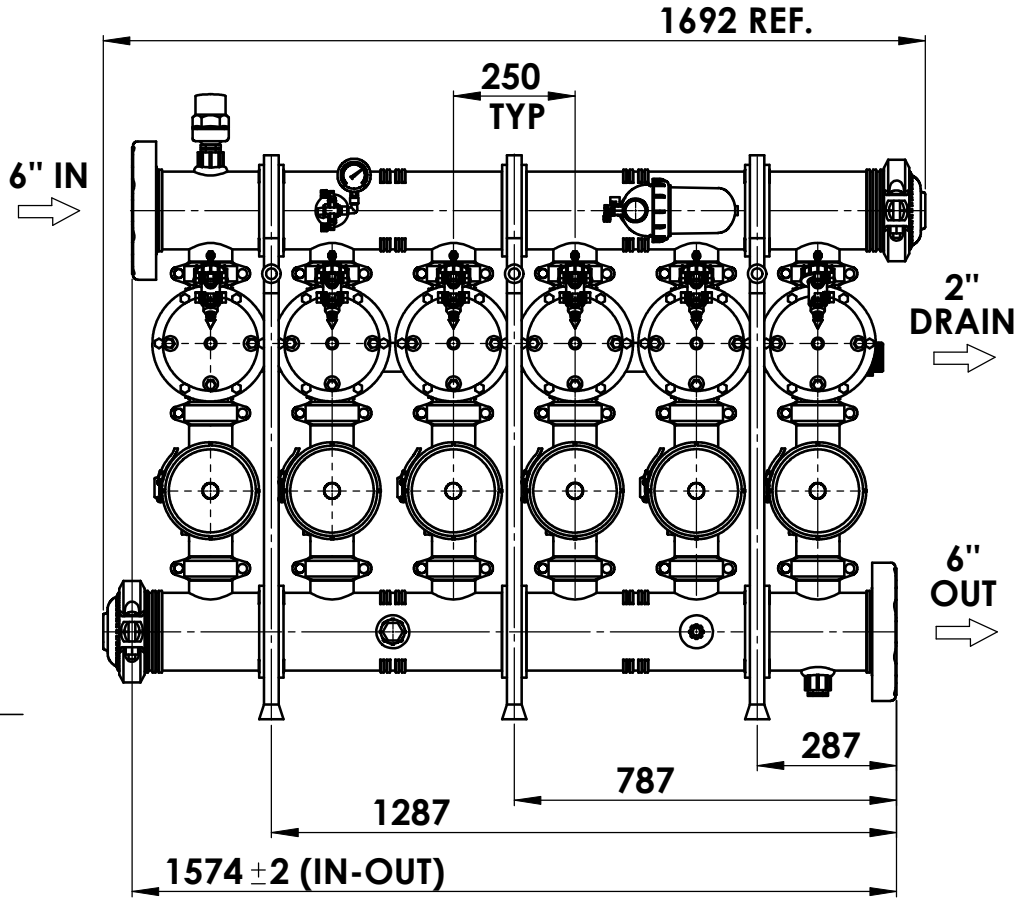
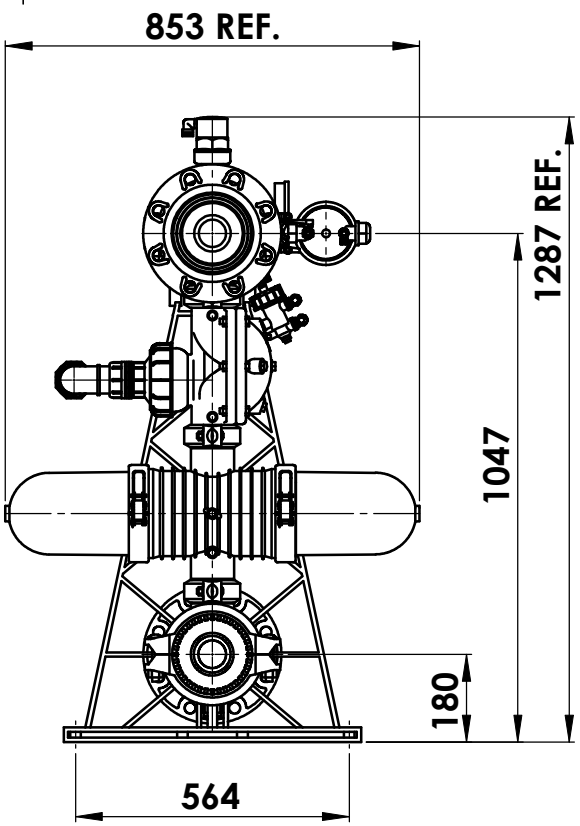
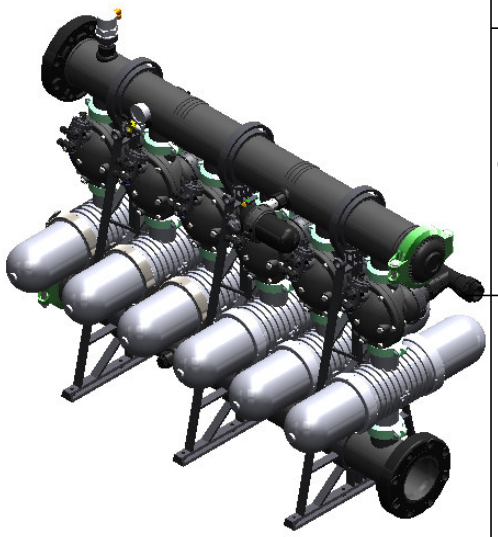
OLEG

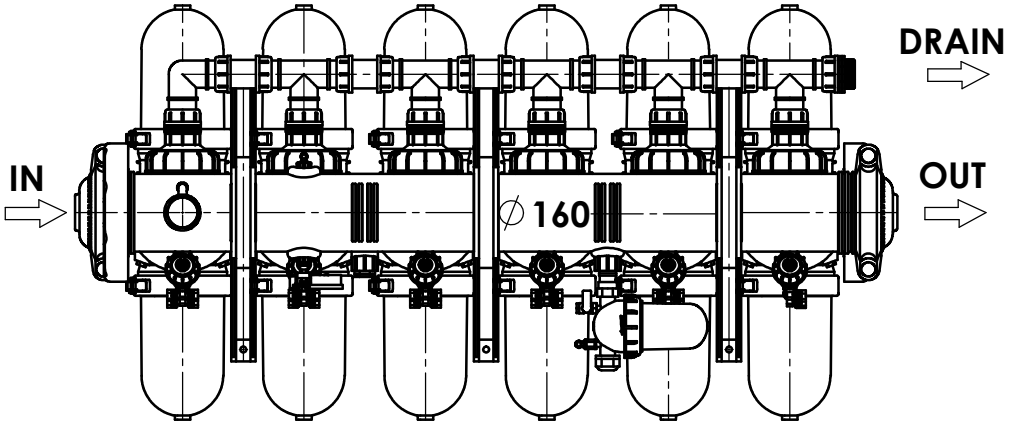
SHEET 1 OF 1

Thursday, June 18, 2009 7:53:05 AM









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MODIFIC.	DATE	DESCRIPTION	SING

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FAX. 972-4-6775461
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PROJECT: 6*3" S.K. FILTERS PLASTIC BATTERY — PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4636H0606VU9LC

SOLIDWORKS FILE CODE: 4636H06___9LC — FILE CODE: 4636H0606VU9LC C — FILE CODE OF FILTER COMPL.: F+PLASLITE SAPPHIRE-LCD

	NAME	DATE
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CHECKED	NIKOLAY	07/06/2009
APPROVED	OMRY	07/06/2009
B.O.M.	OLEG	07/06/2009

FILE CODE DRAWINGS: **PALLET- 27 (5201 5404)** **TRIWALL-115(5200 5305)**

FILE CODE OF MANIFOLDS: 6635 0606V0

BACKUP: DISK-2S

DRAWING: 2130

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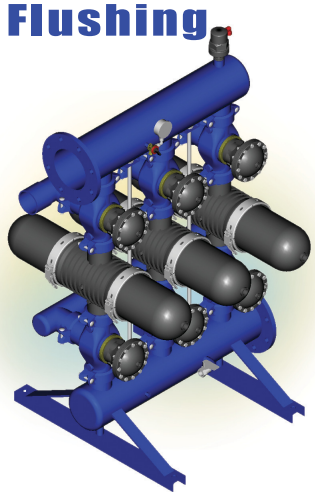
Crystal External Source Flushing

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for medium flow rates
- Continuous flow during backwash
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation
- Low pressure operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. filtration pressure	**bar**	0.8	**psi**	10
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm²**	1760	**in²**	272.8
Filtration volume per unit	**cm³**	2640	**in³**	161
Backwash water volume per unit	**lit**	66	**gal**	17.4

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m³/h**						**gpm**					
400-130 µ	Good	110	148	185	222	259	296	484	652	814	977	1140	1302
	Average	90	120	150	180	210	240	396	528	660	792	924	1056
	Poor	66	88	110	132	154	176	290	387	484	581	678	774
	Very Poor	45	60	75	90	105	120	198	264	330	396	462	528
100 µ	Good	90	120	150	180	210	240	396	528	660	792	924	1056
	Average	66	88	110	132	154	176	290	387	484	581	678	774
	Poor	48	64	80	96	112	128	211	282	352	422	493	563
	Very Poor	33	44	55	66	77	88	145	194	242	290	339	387
55 µ	Good	60	80	100	120	140	160	264	352	440	528	616	704
	Average	48	64	80	96	112	128	211	282	352	422	493	563
	Poor	36	48	60	72	84	96	158	211	264	317	370	422
	Very Poor	27	36	45	54	63	72	119	158	198	238	277	317
20 µ	Good	30	40	50	60	70	80	132	176	220	264	308	352
	Average	24	32	40	48	56	64	106	141	176	211	246	282
	Poor	18	24	30	36	42	48	79	106	132	158	185	211
	Very Poor	12	16	20	24	28	32	53	70	88	106	123	141

Crystal

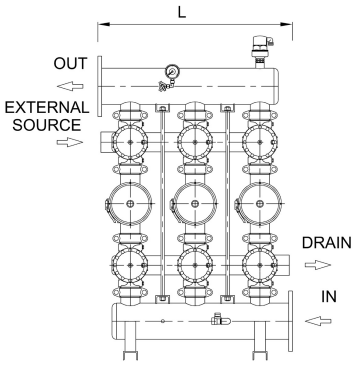
Filtration Batteries

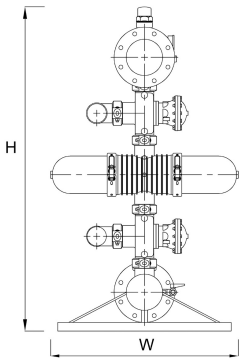
External Source Flushing

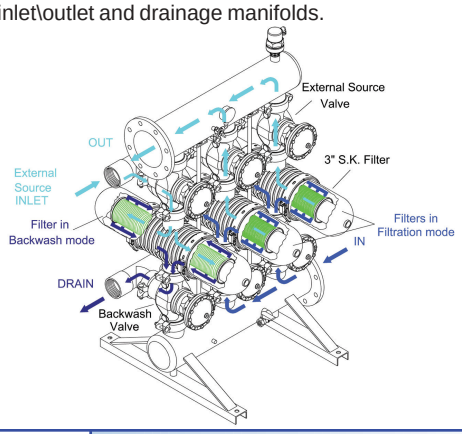
Dimensions and Weights

No. of units		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	**mm**	90	110	160	160	225	225	**inch**	3	4	6	6	8	8
L Length	**mm**	900	1200	1500	1800	2100	2400	**inch**	35	47	59	71	83	94
H Height	**mm**	1542	1542	1542	1542	1705	1705	**inch**	61	61	61	61	67	67
W Width	**mm**	900	900	900	900	900	900	**inch**	35	35	35	35	35	35
Shipping weight (approx.)	**kg**	170	190	210	230	280	320	**lbs**	375	419	462	506	616	704

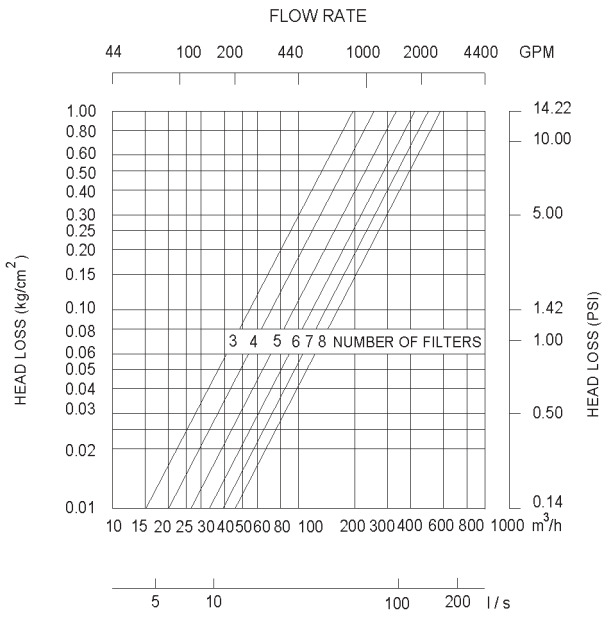
NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.







Head Loss Chart - for 130-400µ, Clean State



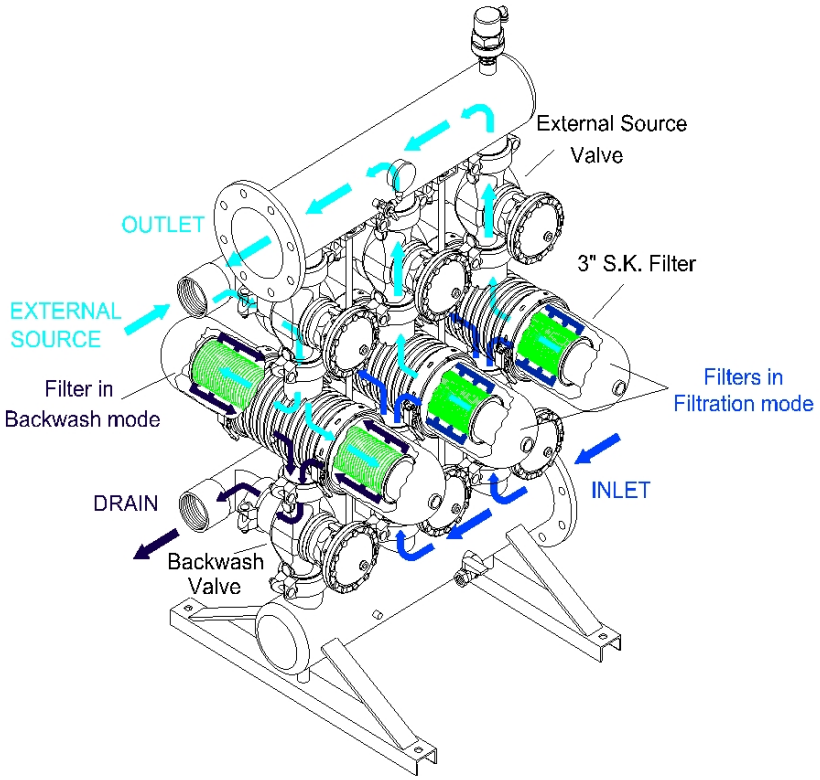
CRYSTAL filtration batteries are available with:
Polyester coated steel,
Stainless steel or
Polypropelene manifolds.

3″ Spin Klin® Battery
External Source Automatic Backwash

Operation and Maintenance Manual

Filtration Process

During filtration, water flows from inlet manifold, through the 3”x3” / 3”x2” inlet valve into the filters, and through the 3”x3” / 3”x2” outlet valve. Filtered water gathers in the outlet manifold and flows into the user system.



Backwash Process

The backwash process is initiated by the control unit according to differential pressure between the inlet and outlet or time.

The first solenoid transmits a command to two valves:

1. In the Inlet valve the inlet port closes and the drain port opens.
2. In the outlet valve the outlet port closes and the external source port opens.

Filter No. 1 is now in backwash mode.

The 2 Spin Klin spines in filter No. 1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied by an external source through the external source manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is 15-20 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

The solenoid releases the command allowing the inlet / outlet valve and the discs of the 2 spines to return to filtration mode.

Once filter No. 1 is in the filtration position again the control unit sends a command to begin the backwash process in filter No. 2.

Spin Klin Technology- Spin Klin Spine

General:

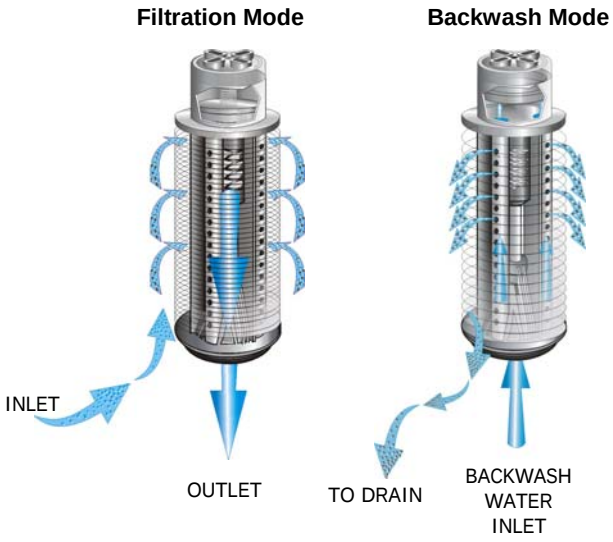
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded by micron **size,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtration and backwashing cycles.

Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs**.**

Backwash Mode:

During backwash the discs are released hydraulically. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.



Backwash valve

The Bermad backwash valves have two built-in chambers.

The Plaslite backwash valves have one built-in chambers.

Each port has its own valve seat, but they share a common shaft and diaphragm.

The valve chambers are mutually integrated units. When one port is open, the other is closed, permitting the backwash valve to perform two modes of operation:

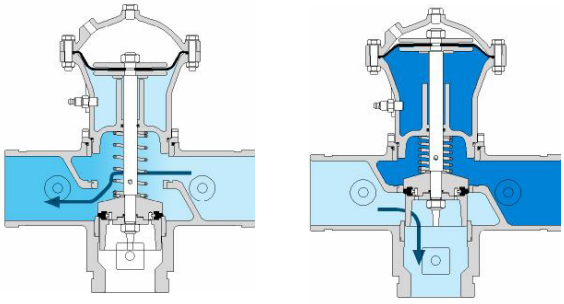
Filtration mode: The valve permits flow from the inlet manifold through the filter, into the system.

Flushing mode: The valve closes the inlet port and opens the drain port, causing reverse flow through the filter, ejecting impurities via the drain port.

Operation is initiated by an electric solenoid.

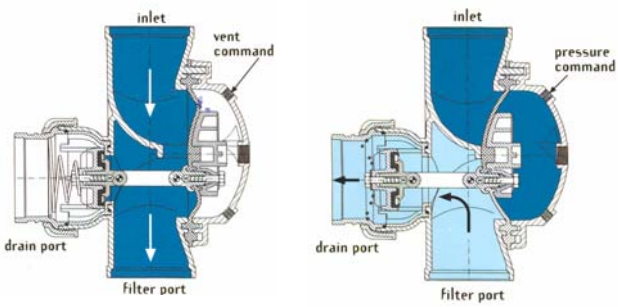
The backwash valve is either controlled by water pressure, or a pneumatic source.

Bermad backwash valve



Filtration Mode **Backwash Mode**

Plaslite backwash valve (single chember velve)*



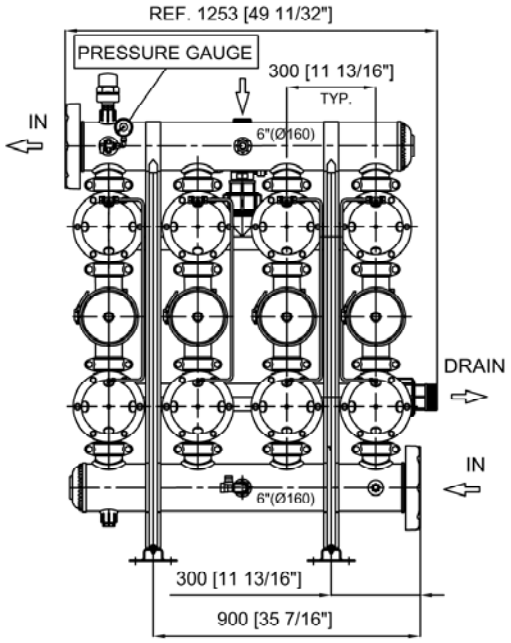
Filtration Mode **Backwash Mode**

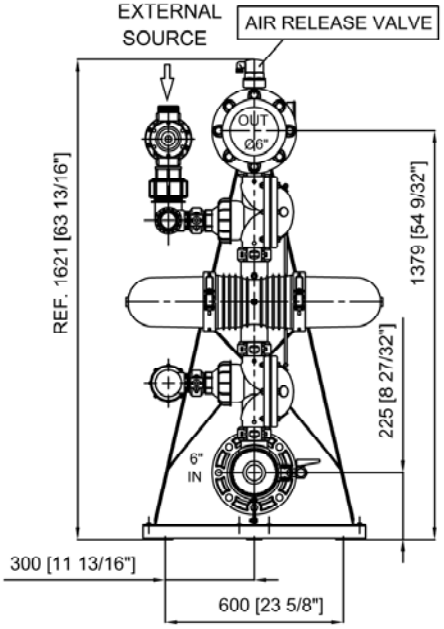
* Require valve delay

Technical Data

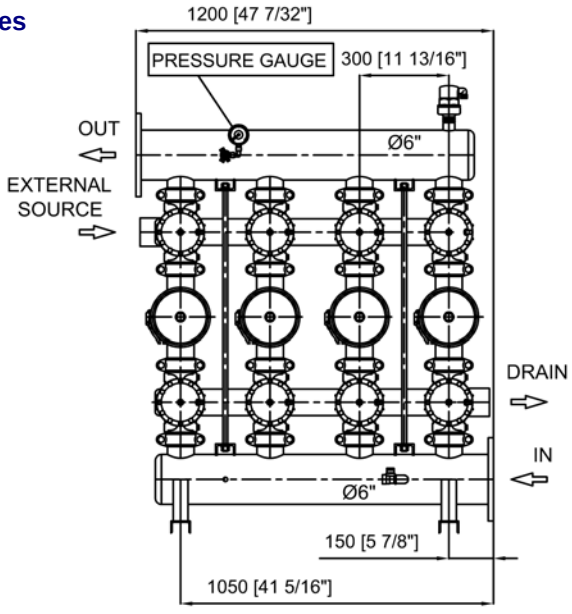
Maximum pressure	10 bar	145 psi
Minimum pressure	0.8 bar	12 psi
Minimum backwash pressure	2.8 bar	40.6 psi
Backwash flow rate per unit	20 m^3/hr	88 gpm
Water volume per backwash	80 liter	21 gallons
Maximum temperature	70°C	158°F

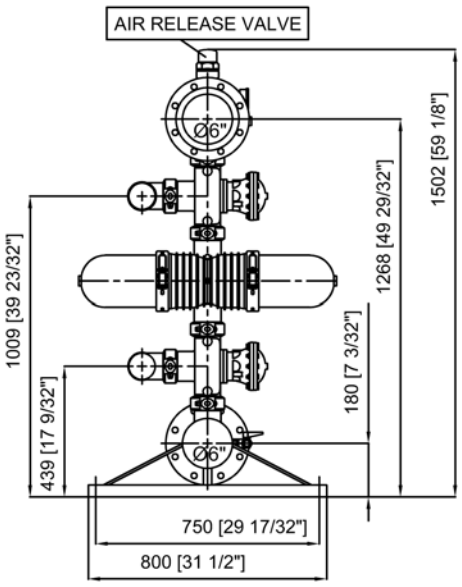
3” Spin Klin System
Fully Plastic
with Plaslite Valves





3” Spin Klin System
with Bermad Valves





Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter and manifolds).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

D. Cover clamps need to be properly secured.

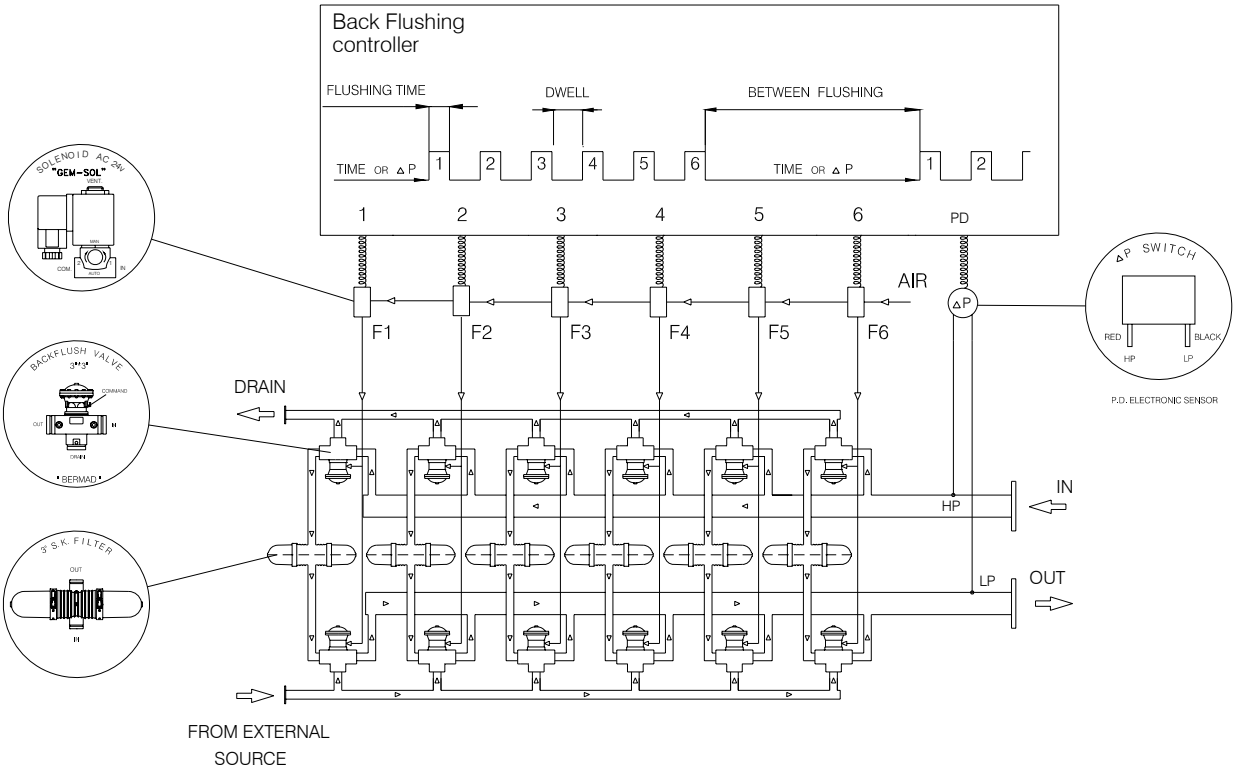
Start-up Operation

Start the backwash cycle, checking that all system components function correctly.

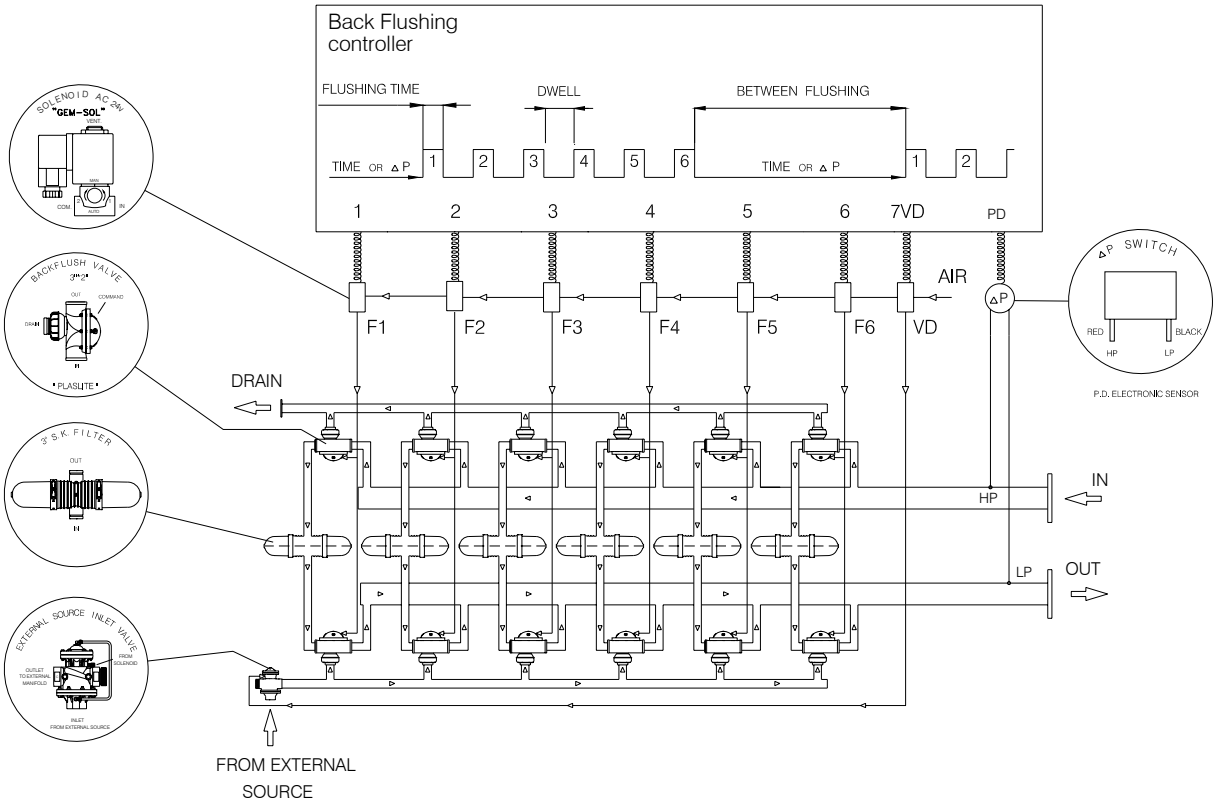
Filter Blockage during Start-up

- Close the downstream (flow control) valve (if available).
- Operate backflush in consecutive cycles until clean.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

Control Scheme of Battery with Bermad Valves



Control Scheme of Battery with Plaslite Valves



- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case of pressure differential above 5 m / 7 PSI activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing - drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover (Figures 1, 2)

Unscrew the butterfly-nut on the filtration element (Figure 3)
Remove the tightening cylinder (Figure 4)

Remove the discs (for convenience we recommend using a plastic bag) (Figures 5, 6)

Tie each set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water (Figure 7)

Reassemble the discs on the spines, check that the correct quantities of discs are assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine (Figure 8)

Put on the tightening cylinder and tighten the butterfly-nut, then reassemble the filter cover and tighten the clamp (Figures 9, 10)

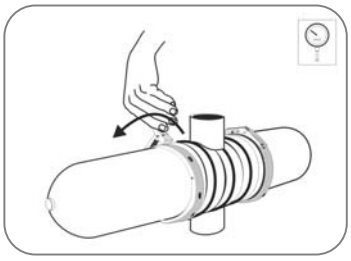


Figure 1

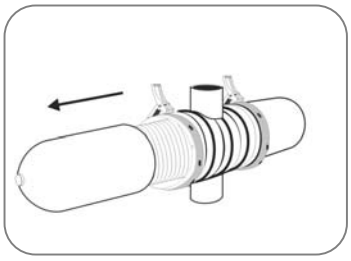


Figure 2

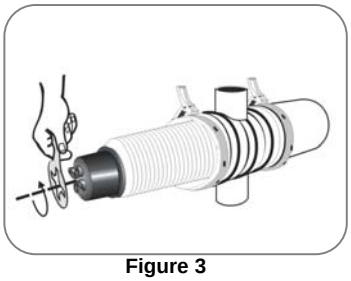


Figure 3

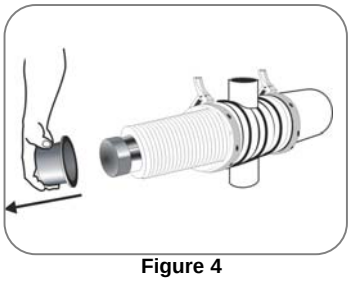


Figure 4

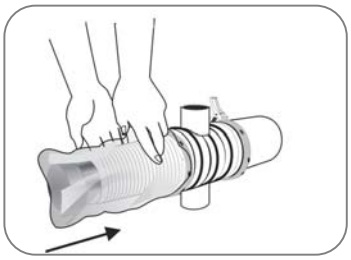


Figure 5

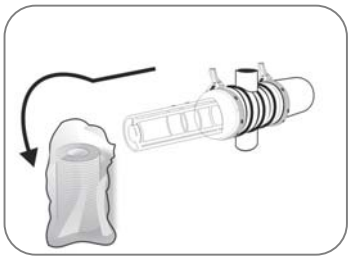


Figure 6

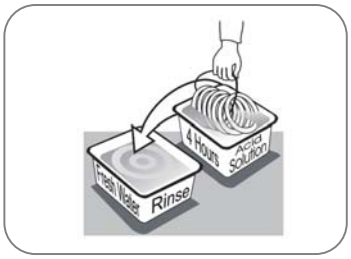


Figure 7

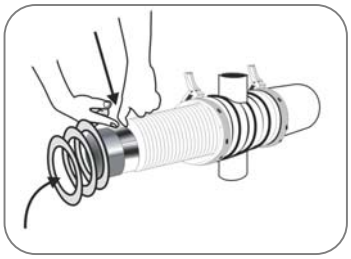


Figure 8

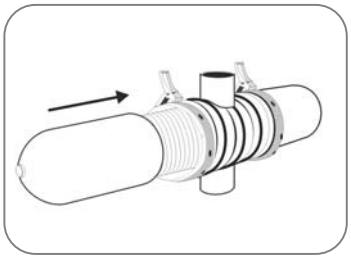


Figure 9

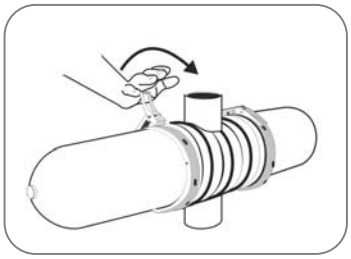


Figure 10

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions such as temperature, pH, exposure to light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly slimey or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably from polypropylene.
- Plastic rope to tie the discs.
- Sodium Hypochloride NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochloride solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochloride (10%) into the water.
- Soak the discs in the solution so that both sides are immersed. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

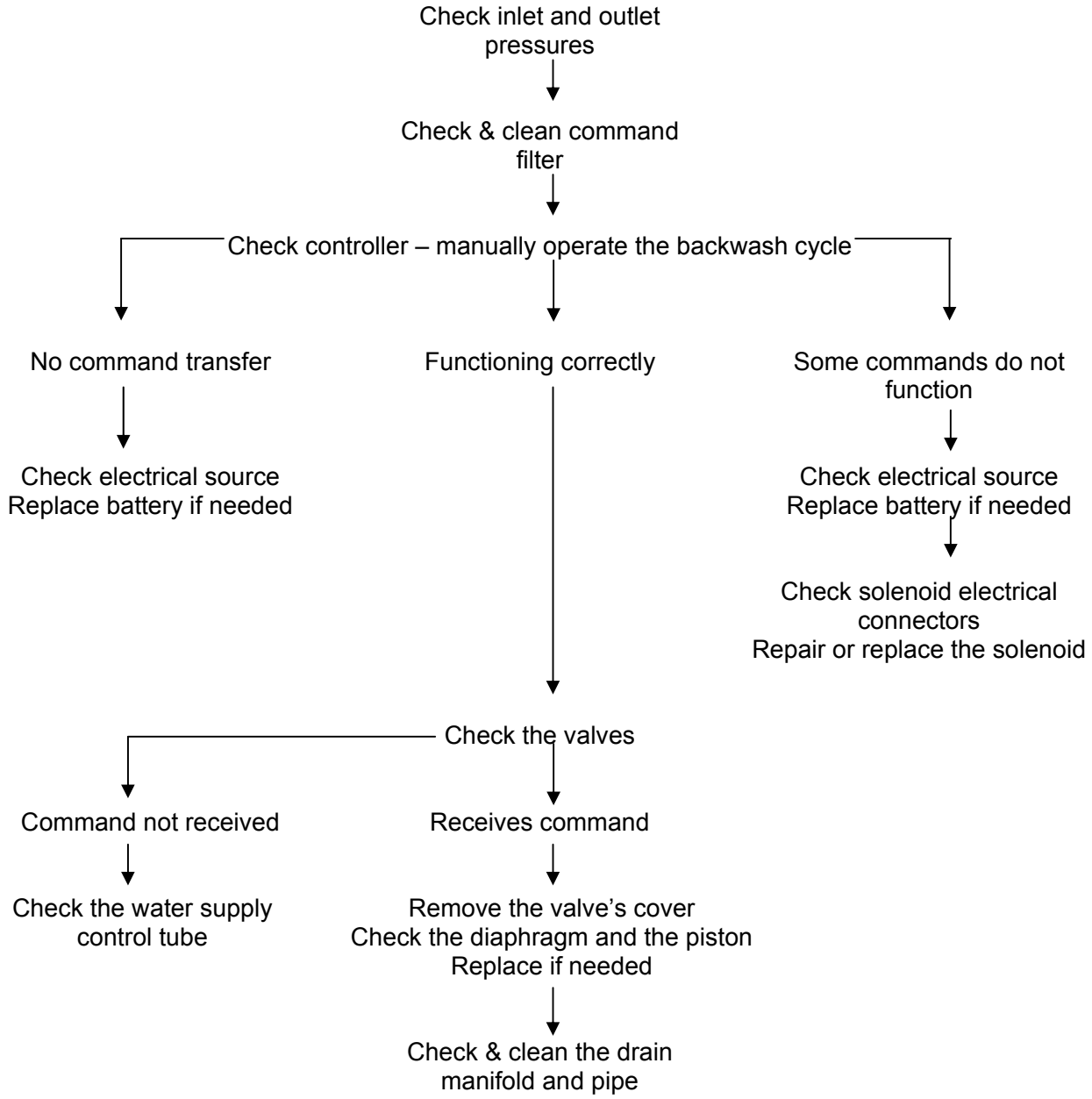
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochloride Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochloride (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochloride Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.
  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

Identifying Malfunctions in the 3” Spin Klin system

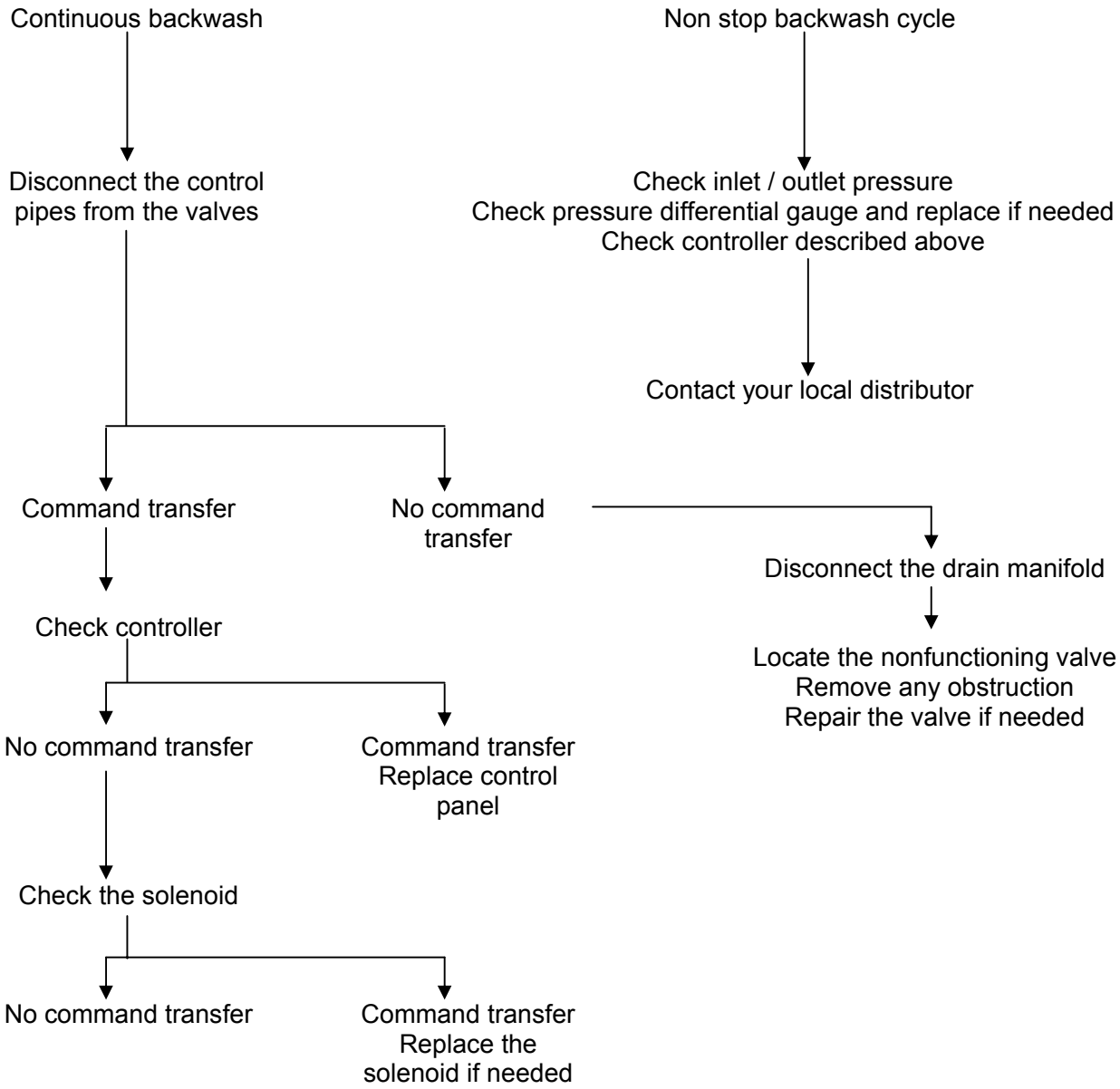
No Backwash Operation



Contact your local distributor

Identifying Malfunctions in the 3” Spin Klin system

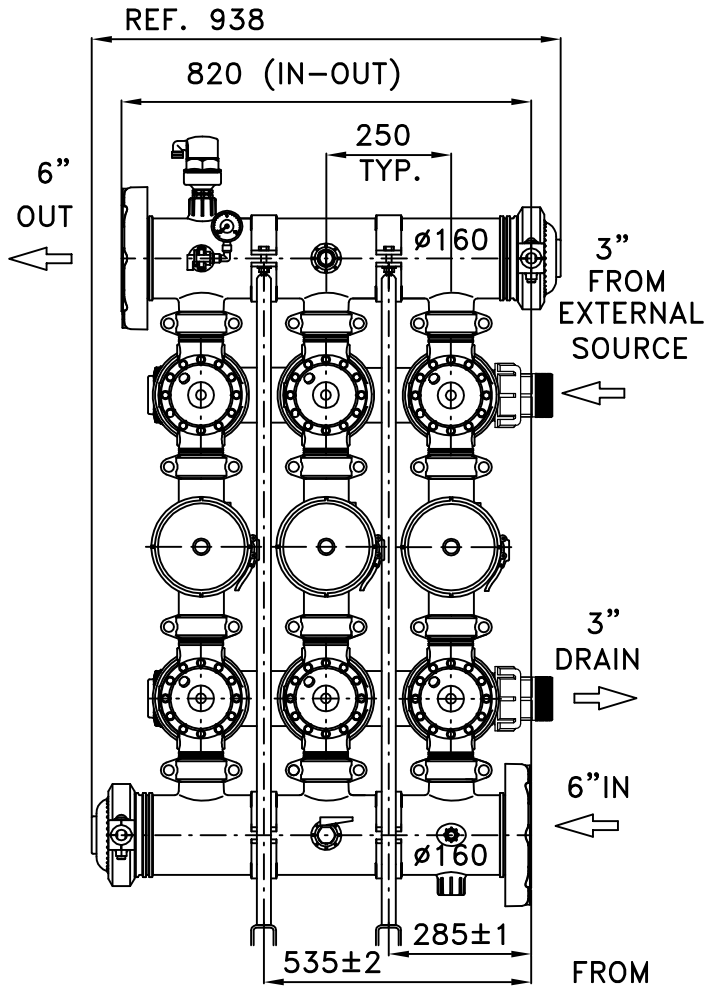
Continuous or Non-stop Backwashing

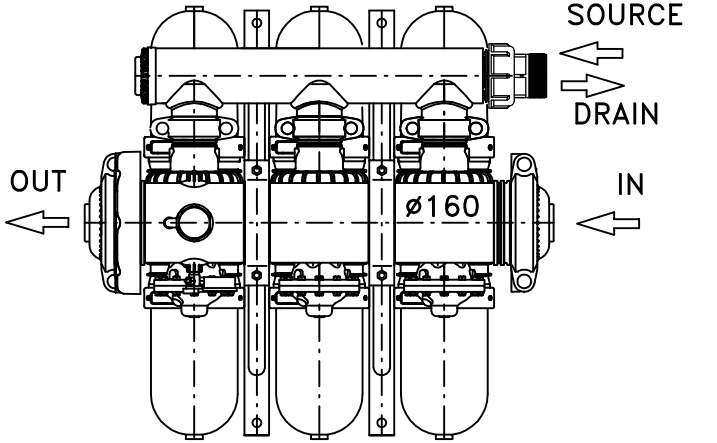


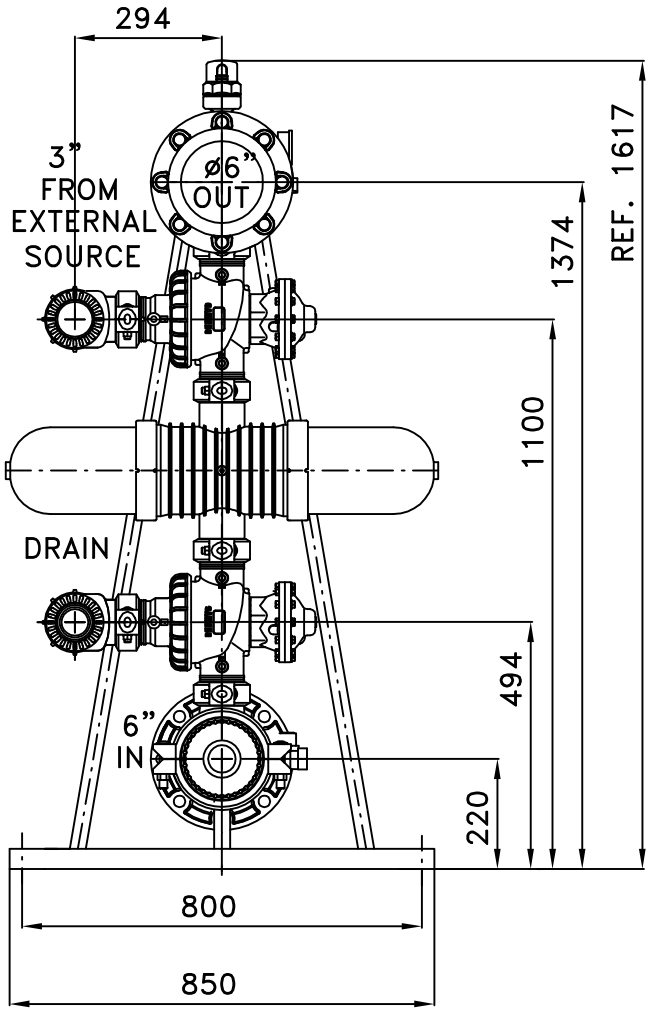
Contact your local distributor

Drawings

3" Batteries External Source







ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT 3*3" S.K. FILTERS SYNTHETIC BATTERY WITH EXTERNAL SOURCE FPR BACK FLUSH

TITLE ASSEMBLY DRAWING

PAGE 1 OF 6

CATALOGUE No: 1638M0603VU3

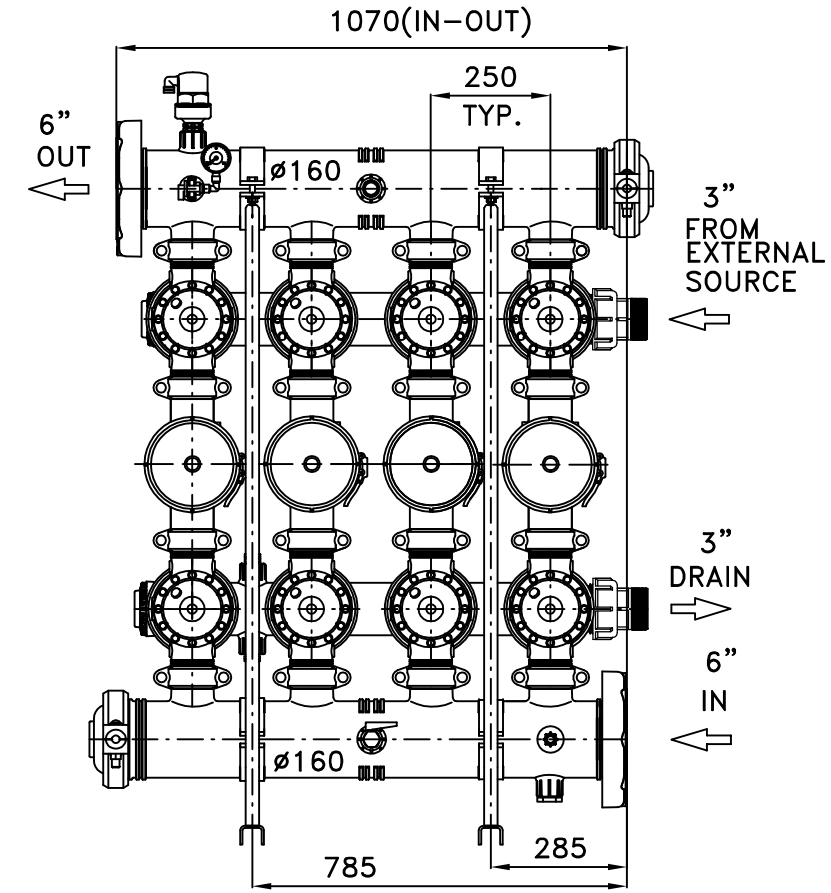
	NAME	DATE
PATH BATERIES\3INCH\TWIN\GAVISH-PL PLASTIC\EXT. SOURCE\PL. VALVE		
DRAWN	NIKOLAY	06.12.07
CHECKED	NIKOLAY	06.12.07
APPROVED	JACKY	06.12.07

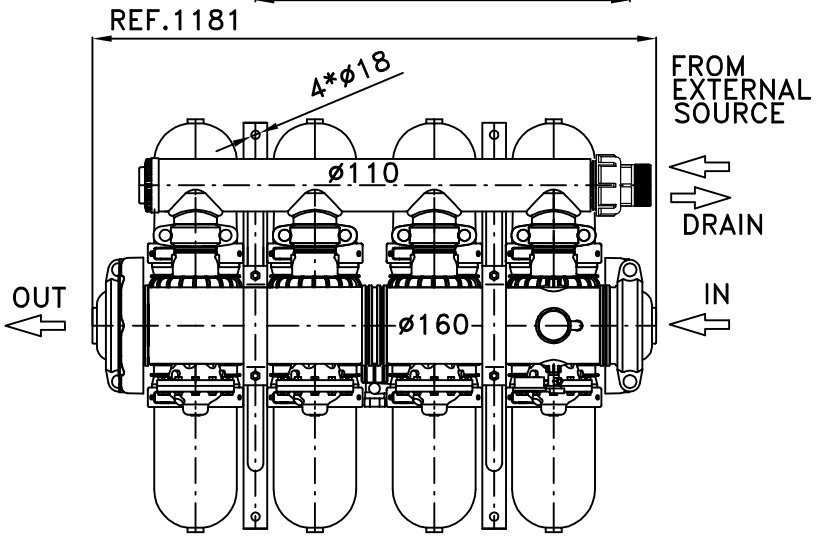
FILE CODE	NAME	DATE	SIGNATURE
1638M0603VU3	IRINA	06.12.07	ORLY

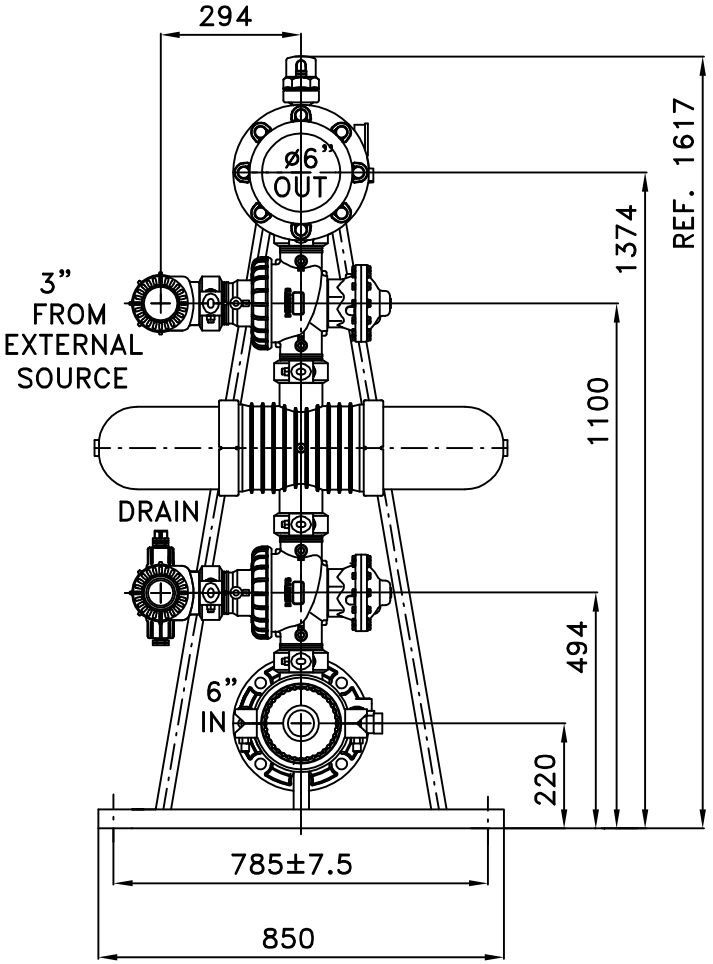
FILE CODE DRAWING OF MANIFOLD:
5638 0603V2 (1,2),
6132 0261
PALET-26 (5201 5403)
TRIWALL-15 (5200 5301)

BACKUP: DISK-33

DRAWER N: 3200







PROJECT 4*3" S.K. FILTERS SYNTHETIC BATTERY WITH EXTERNAL SOURCE FPR BACK FLUSH

PAGE 1 OF 6

TITLE ASSEMBLY DRAWING

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CHECKED	NIKOLAY	01.12.09	
APPROVED	TAMIR	01.12.09	

PATH BATTERIES\3INCH\TWIN\GAVISH-PL\PLASTIC\EXT. SOURCE\PL..VALVE

FILE CODE 1638M0604VU3

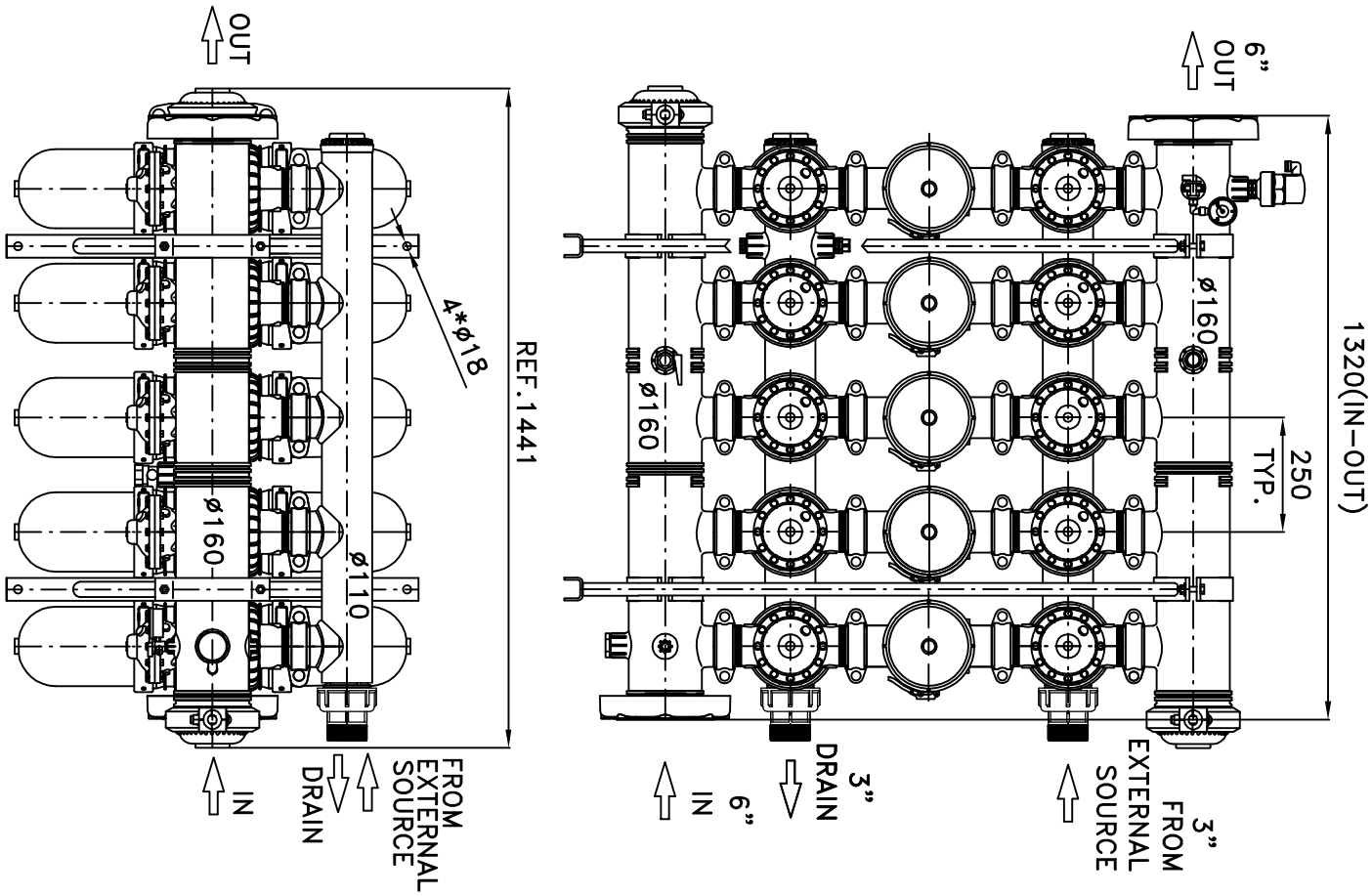
NAME IRINA DATE 01.12.09 SIGNATURE

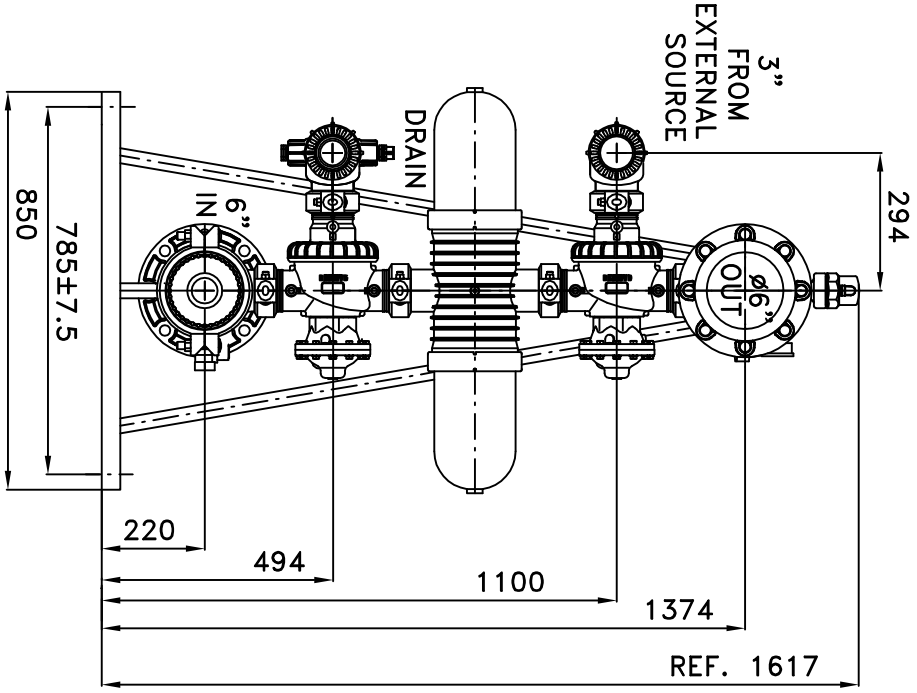
FILE CODE DRAWING OF MANIFOLD:
5638 0604V2 (1-2),
6134 0261,
PALET-169(5201 5683)
TRIWALL-277(5200 5727)

BACKUP: DISK-34

DRAWER N: 3200

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL





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MODIFIC.	DATE	DESCRIPTION	

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FAX. 972-4-6775461
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PROJECT
5*3" S.K. FILTERS SYNTHETIC BATTERY WITH EXTERNAL SOURCE FPR BACK FLUSH

PAGE 1 OF 6

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1638M0605VU3

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BATERIES\3INCH\TWIN\GAVISH-PL PLASTIC\EXT. SOURCE\PL. VALVE	1638M0605VU3	IRINA	01.12.09	IRINA

	NAME	DATE
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CHECKED	NIKOLAY	01.12.09
APPROVED	ZALI	01.12.09

FILE CODE DRAWING OF MANIFOLD:
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PALET-421(5201 5928),
TRIWAL-267(5200 5719)

BACKUP:
DISK-34

DRAWER N:
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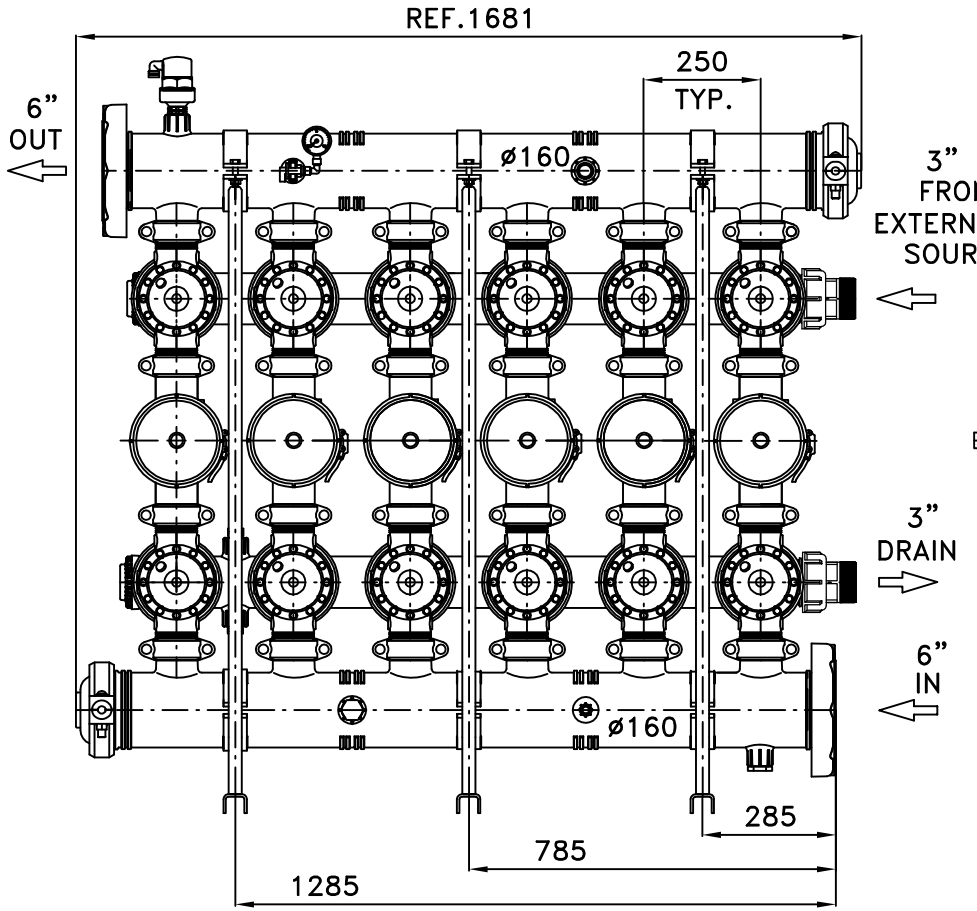

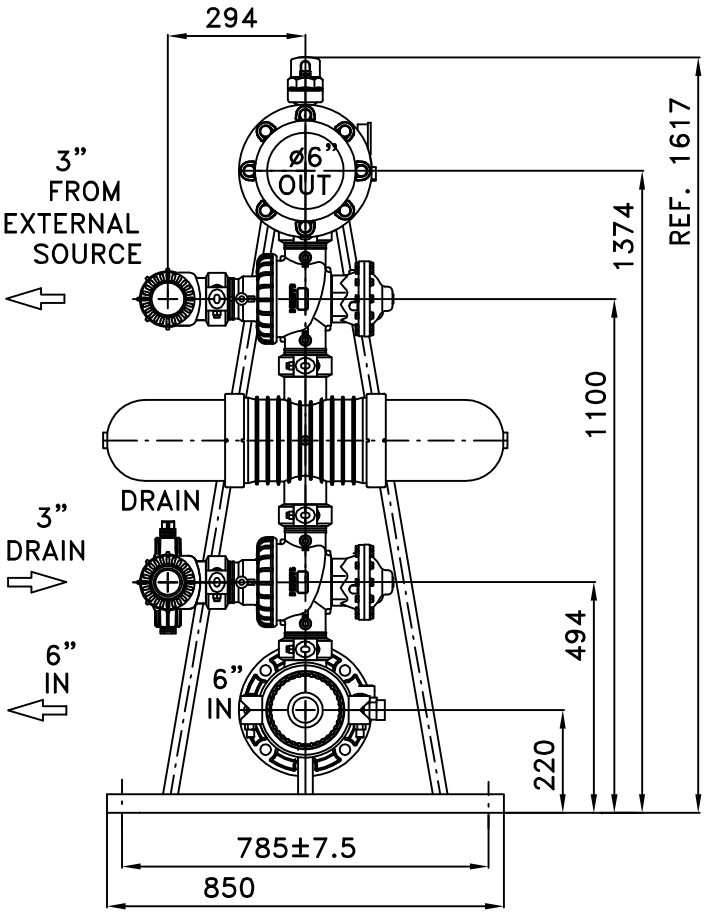

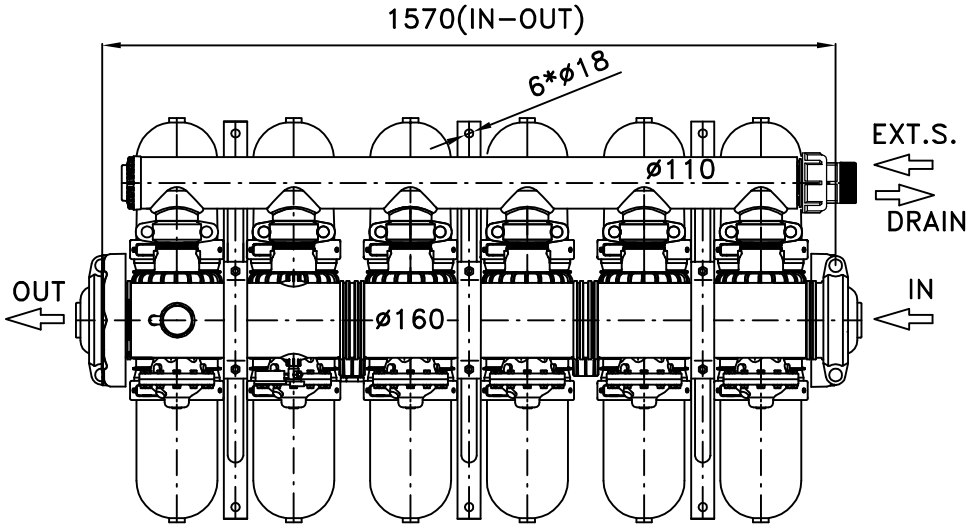

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MODIFIC.	DATE	DESCRIPTION

PROJECT 6*3" S.K. FILTERS SYNTHETIC BATTERY WITH EXTERNAL SOURCE FPR BACK FLUSH

PAGE 1 OF 6

TITLE ASSEMBLY DRAWING

CATALOGUE No: 1638M0606VU3

PATH BATERIES\3INCH\TWIN\GAVISH-PL PLASTIC\EXT. SOURCE\PL.VALVE

FILE CODE 1638M0606VU3

FILE CODE DRAWING OF MANIFOLD:

	NAME	DATE	SIGNATURE
DRAWN	MAYA	01.12.09	
CHECKED	NIKOLAY	01.12.09	
APPROVED	EYAL	01.12.09	

NAME: IRINA DATE: 01.12.09 SIGNATURE: IRINA

BACKUP: DISK-34

DRAWER N: 3200

5638 0606V2 (1-2), 6134 0261, PALET-413 (5201 5920), TRIWALL-114 (5200 5304)

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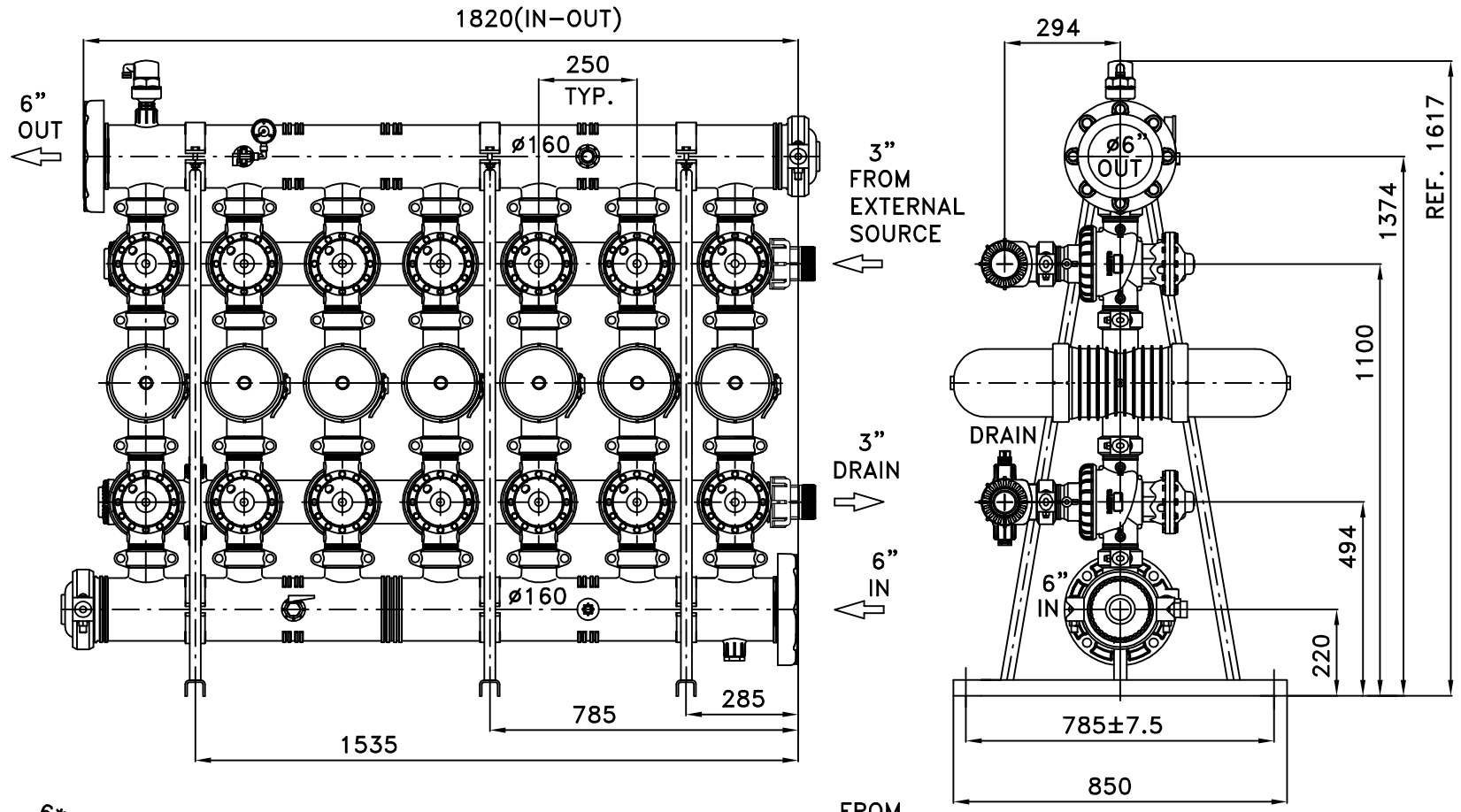

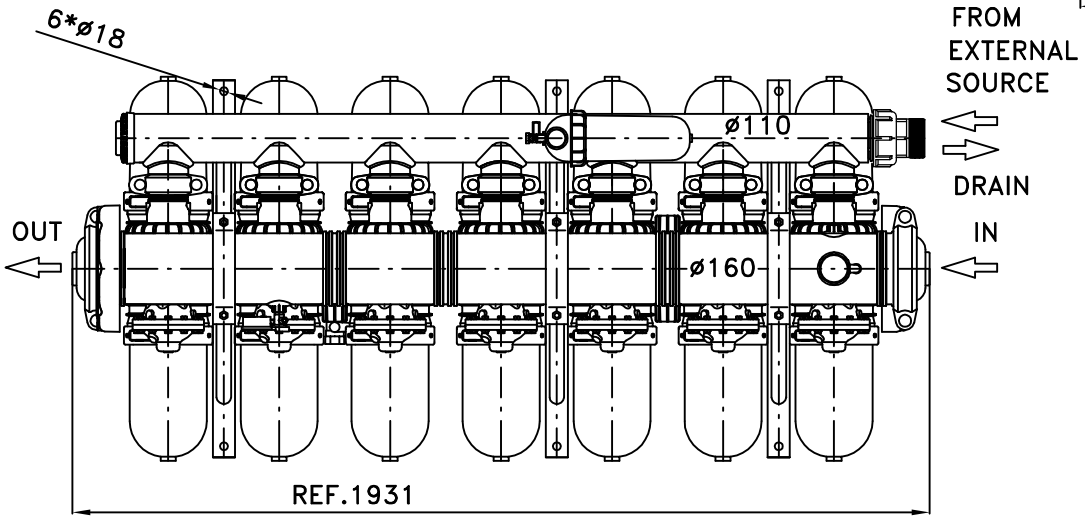

MODIFIC.	DATE	DESCRIPTION

PROJECT 7*3" S.K. FILTERS SYNTHETIC BATTERY WITH EXTERNAL SOURCE FPR BACK FLUSH

PAGE 1 OF 6

TITLE ASSEMBLY DRAWING

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CHECKED	NIKOLAY	01.12.09	
APPROVED	OMRY	01.12.09	

PATH BATERIES\3INCH\TWIN\GAVISH-PL PLASTIC\EXT. SOURCE\PL.VALVE

FILE CODE 1638M0607VU3

NAME IRINA

DATE 01.12.09

SIGNATURE IRINA

FILE CODE DRAWING OF MANIFOLD: 5638 0607V2 (1-2), 6134 0261,

BACKUP: DISK-34

DRAWER N: 3200

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FILTRATION SYSTEM
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TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

Spin Klin 3"-4" Apollo Angle

3"-4" Spin Klin® Angle Apollo Battery

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

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1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the Spin Klin Apollo filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
4. Confirm that filter weight, when full, meets the support construction requirements.
5. Prior to installation confirm that line pressure matches filter's operational pressure.
6. During installation, use standard flanges and connections only.
7. Check that all filter flange bolts are properly secured.
8. Please note, the filter enters a flushing mode automatically, without prior warning.
9. Use original parts only when servicing the filter.
10. Arkal cannot accept responsibility for any changes or modifications to the equipment.

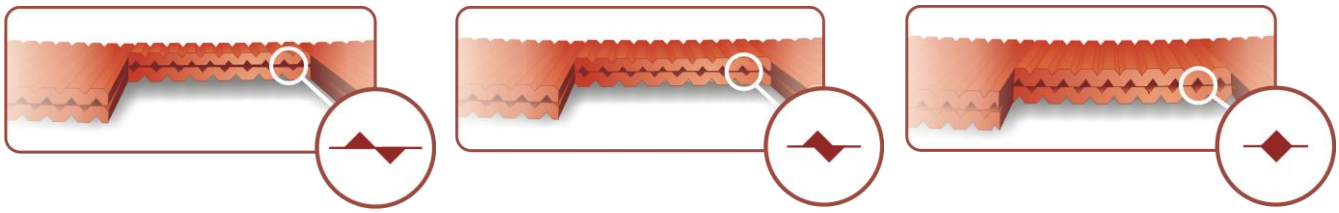
Special Note

Before opening the filter lock, check that there is no pressure in the filter.

3. Description and Operation

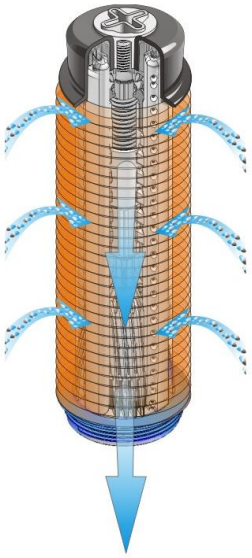
Table of Filtration Grades of the Discs and Color Code

Color Code	Blue	Yellow	Red	Black
Mesh	40	80	120	140
Micron	400	200	130	100



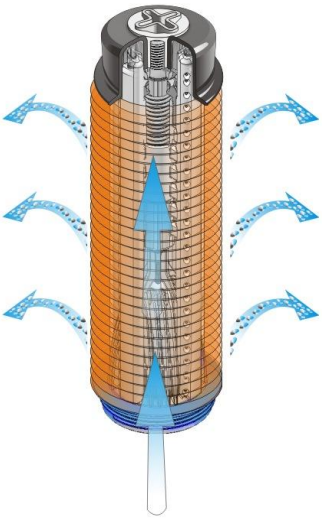
Spin Klin Spine - The Core of the Spin Klin Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the micron housing. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

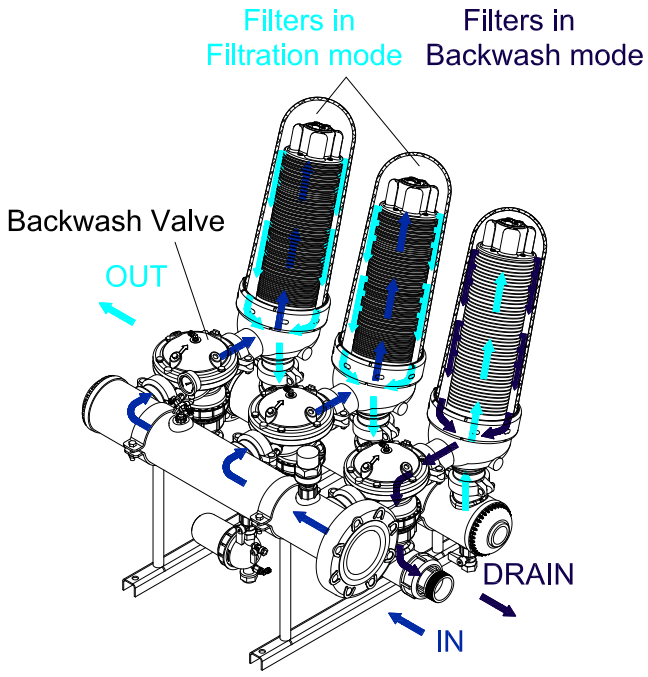


Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of Operation



Filtration Process

During the filtration process the water flows through the inlet manifold, reaching the filters through the backwash valves. The filtered water flow through the outlet manifold into the system.

Backwash Process

The backwash process begins with a signal from the control unit activated by the pressure difference between the inlet and outlet or by time.

This signal is transported to the booster valve (assembled on 4”x 3”inlet valve No.1).

The booster valve opens, causing the No.1 valve to close the 4” inlet to the filter and open the 3” drain port.

Filter No.1 is now in a backwash mode.

The Spin Klin spine in filter No.1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied from the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is between 20 -25 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

The solenoid releases the water pressure signal allowing the inlet valve and the discs of the spine to return to filtration mode.

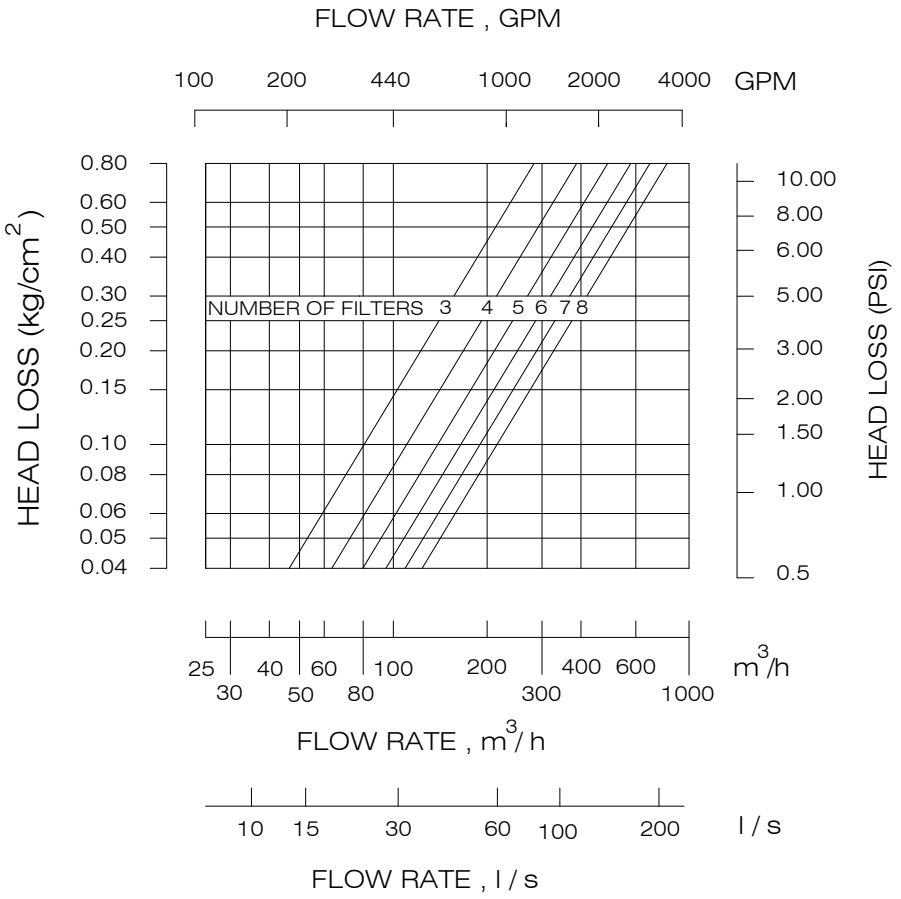
Once filter No.1 is in the filtration position again the control unit sends a signal to begin the backwash process in filter No.2.

4. Technical Data - 3"-4" Spin Klin Angle Apollo

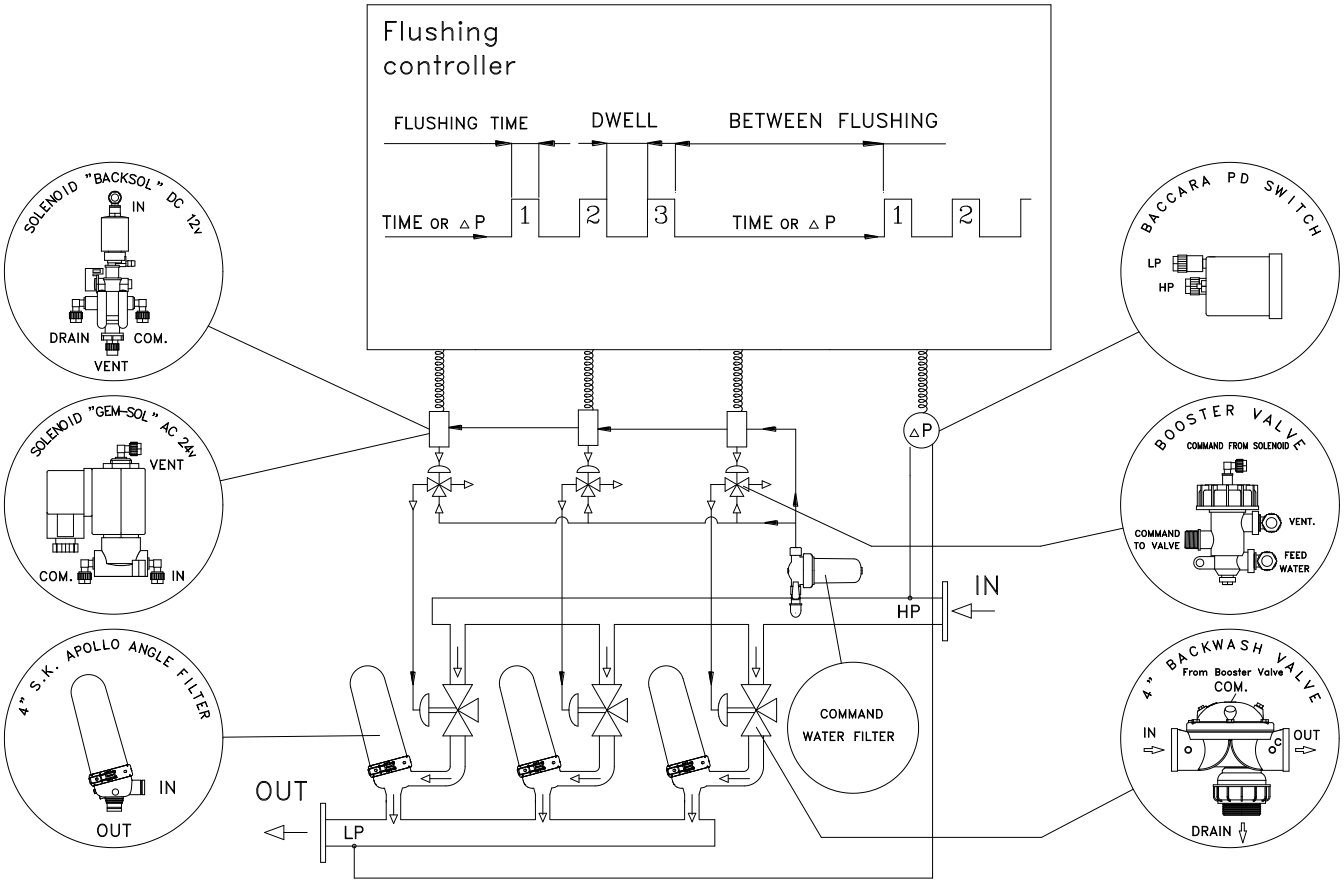
		Units	3 filter battery	4 filter battery	5 filter battery	6 filter battery	7 filter battery	8 filter battery
Max. pressure		bar/psi	10/145	10/145	10/145	10/145	10/145	10/145
Min. backwash pressure *		bar/psi	2/29	2/29	2/29	2/29	2/29	2.0/29
Max. recommended flow rate	**400-130µ**	m^3/h/gpm	120/530	160/705	200/880	240/1,055	280/1,235	320/1,420
	100µ	m^3/h/gpm	110/485	145/639	180/793	215/947	250/1,100	290/1,277
Filtration surface area		cm^2/in^2	7,860/1,220	10,480/1,625	13,100/2,030	15,720/2,435	18,340/2,840	20,960/3,245
Filtration volume		cm^3/in^3	9,426/575	12,568/767	15,710/959	18,852/1,150	21,994/1,342	25,136/1,534
Backwash flow per unit		m^3/h/gpm	24/105	24/105	24/105	24/105	24/105	24/105
Backwash volume		m^3/gallon	0.4/105	0.5/130	0.7/185	0.8/210	0.9/235	1/265
System length - L		mm/inch	1,160/46	1,520/60	1,920/76	2,280/90	2,660/105	3,040/120
System width - W		mm/inch	1,048/41	1,048/41	1,118/44	1,118/44	1,160/46	1,160/46
System height - H		mm/inch	1,201/47	1,201/47	1,285/51	1,285/51	1,307/51	1,307/51
Standard diameter		mm/inch	160/6	160/6	200/8	200/8	280/10	280/10

* depended on the water quality

5. Batteries Headloss Chart - 130 micron, 4" Spin Klin Angle Apollo



6. P & ID



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8 psi).
- Set the controller to a flush time of 20-25 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

7. Apollo Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve. Release the static pressure by opening the drain valve. Remove the cover. Thoroughly clean the filter element and then reassembly the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing – drain all the water from the filter battery, the command filter and the backwash valves.

SEASONAL MAINTENANCE - DISCS

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. Make sure that there is no pressure in the system, pull out the safety pin, open the clamp and remove the cover. (**Figure 1**)

Unscrew the butterfly nuts on the filtration elements. (**Figure 2**)

Remove the tightening cylinders. (**Figure 3**)

Remove the disc sets (for convenience we recommend using a plastic bag). (**Figure 4-5**)

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to “Cleaning Recommendations Clogged Filtration Discs”. (**Figure 6**)

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (**Figure 7**)

Tighten the butterfly nut until the stopping point. (**Figure 8)**

Place the filter cover on the filter body and secure it with a slight clockwise rotation. Reposition clamp onto the cover and close using the lever. (**Figure 9-10**)

Tighten the clamp. Insert the safety pin. (**Figure 11**)

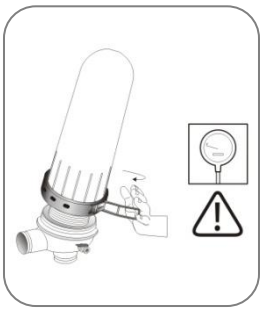


Figure 1

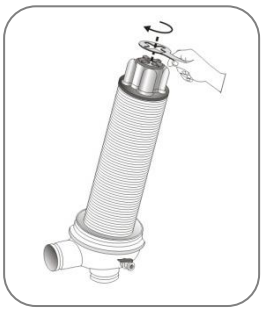


Figure 2

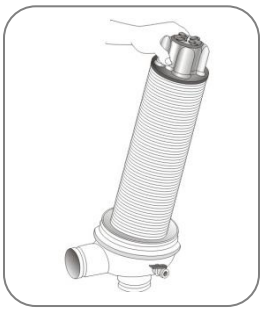


Figure 3

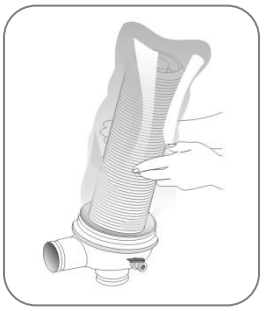


Figure 4

Figure 5

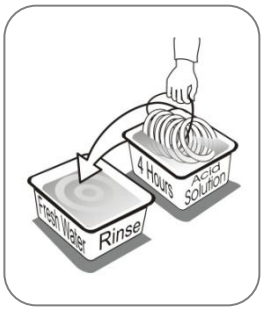


Figure 6

Figure 7

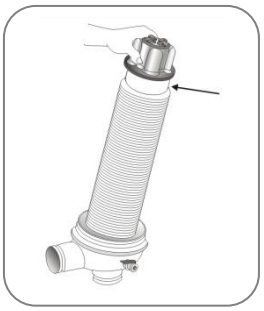


Figure 8

Figure 9

Figure 9

Figure 10

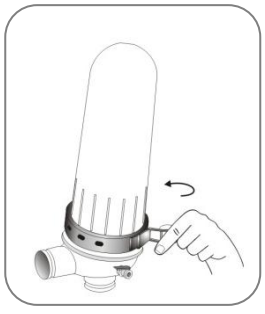
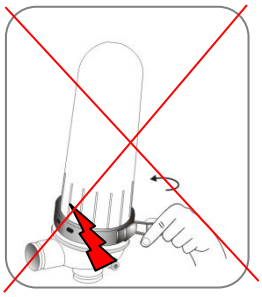


Figure 11

Attention:

When carrying out any of the following seasonal maintenance, service, or cleaning the discs – After backwashing the system and after closing the water inlet, **make sure that there is no pressure in the system!**

Please Note:



- Before removing the cover you may experience the vacuum phenomenon – which will make the removing of the cover very difficult or almost impossible.
- **Do Not** - insert any sharp tools (objects) in between the cover and the body! You may damage the hydraulic seal and the cover!
- In order to remove the cover easily – **you should drain the water from the filter**!
- You may drain the filter through the drain valve located on the filter body, once the filter is empty the cover can then be removed safely and easily.

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

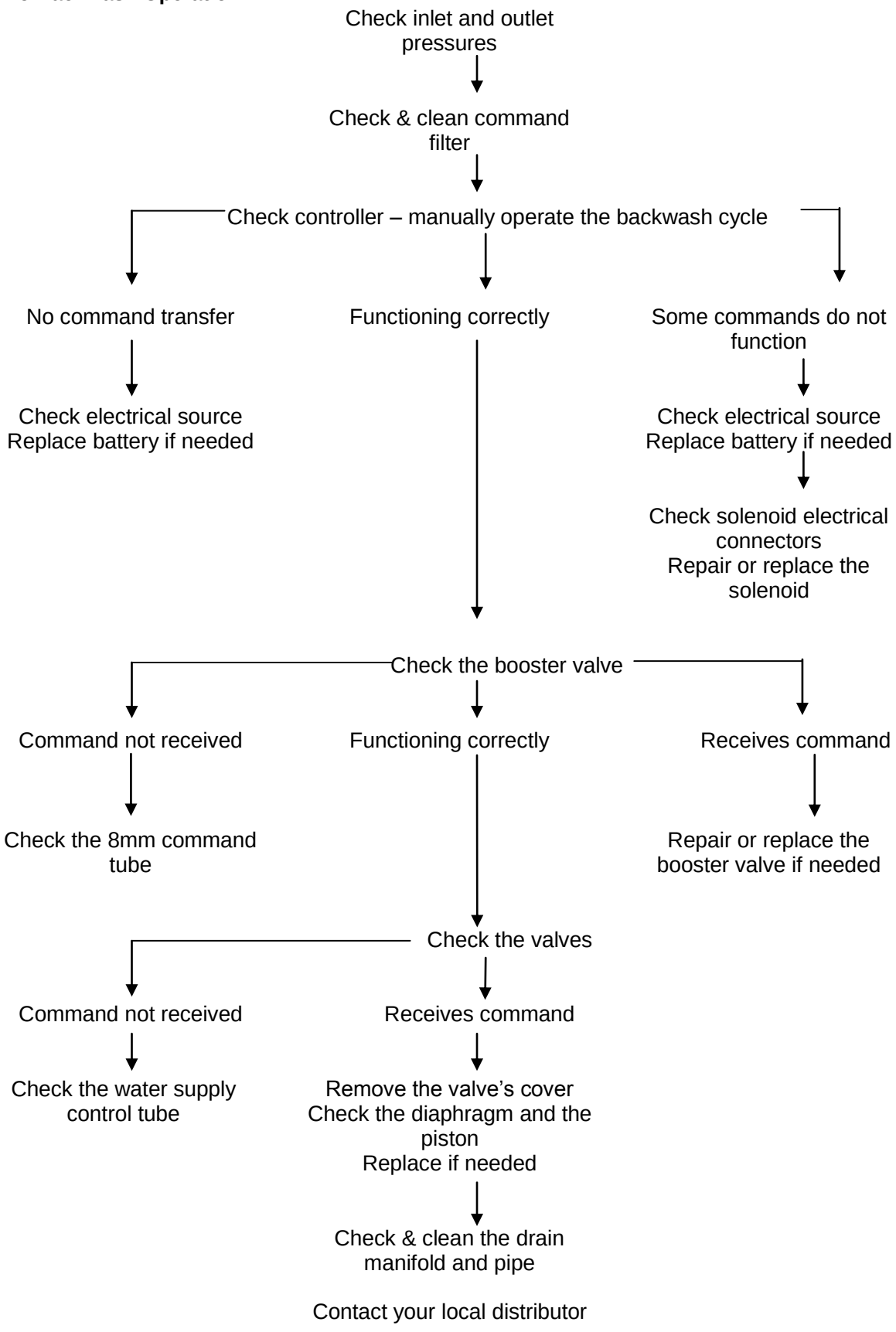
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes. If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

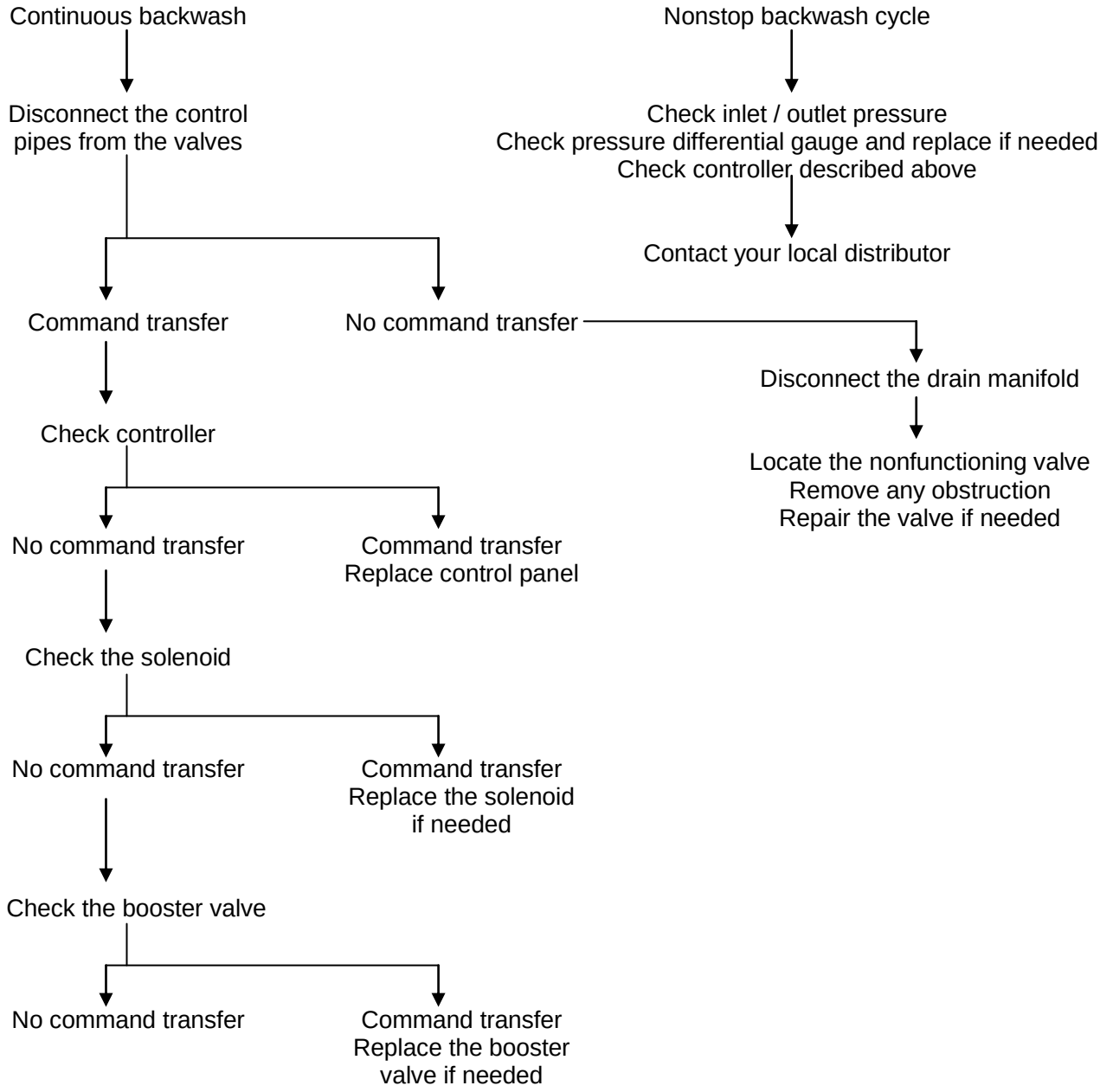
8. Troubleshooting

No Backwash Operation



Identifying Malfunctions in the Apollo system

Continuous or Non-stop Backwashing



Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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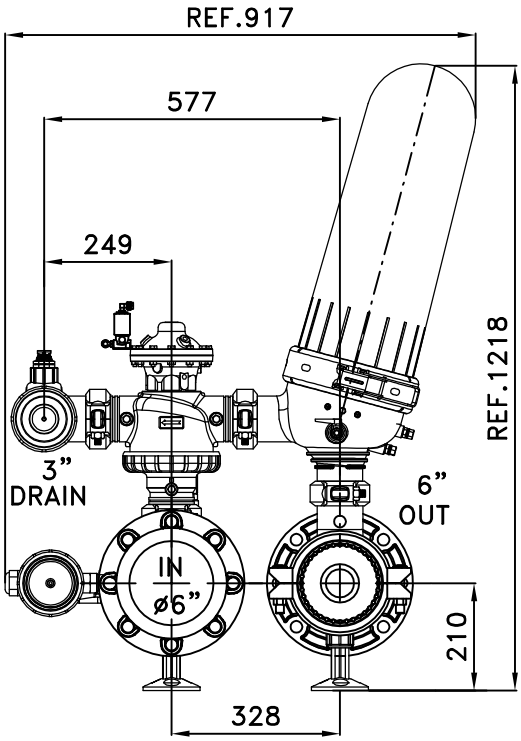
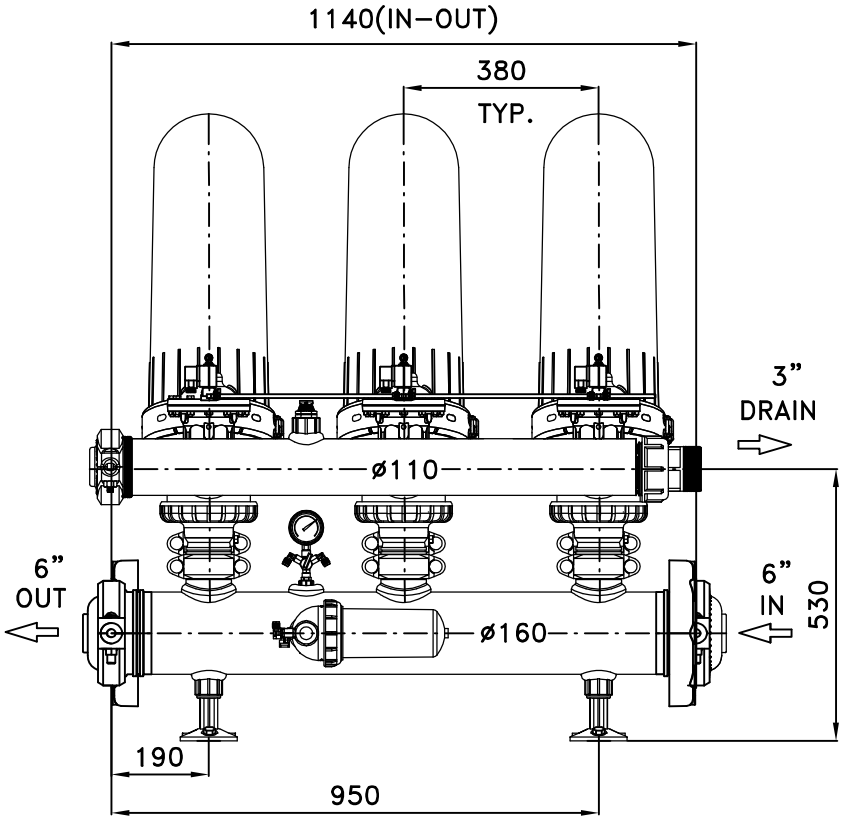
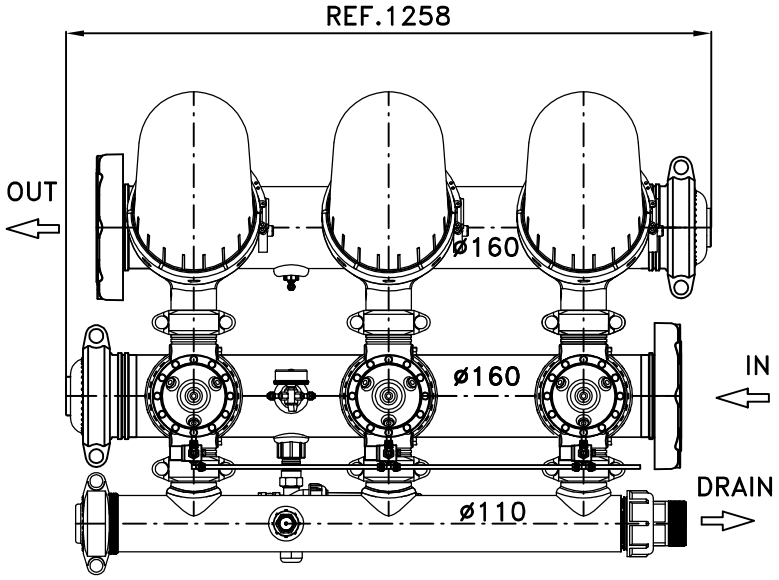
Spin Klin 3" Apollo Angle

Drawings

3" Apollo Angle Batteries







MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 3*3" S.K. APPOLO FILTERS PLASTIC BATTERY — PAGE 1 OF 6

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CHECKED	NIKOLAY	02.05.08
APPROVED	DEKEL	02.05.08

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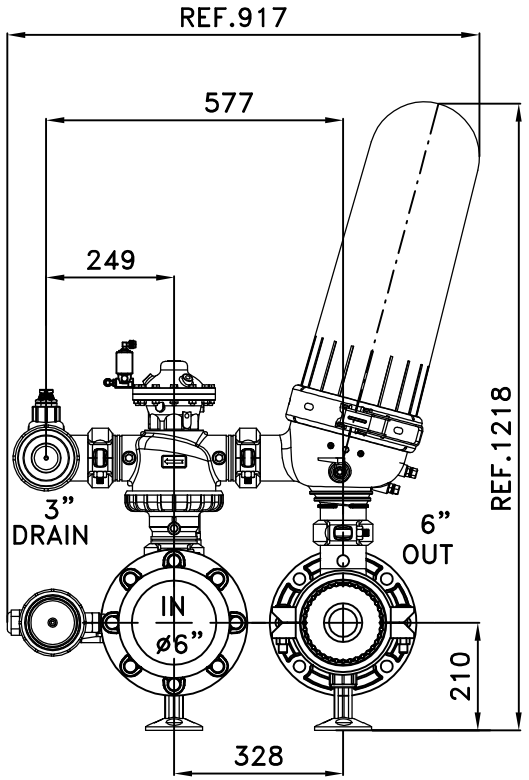
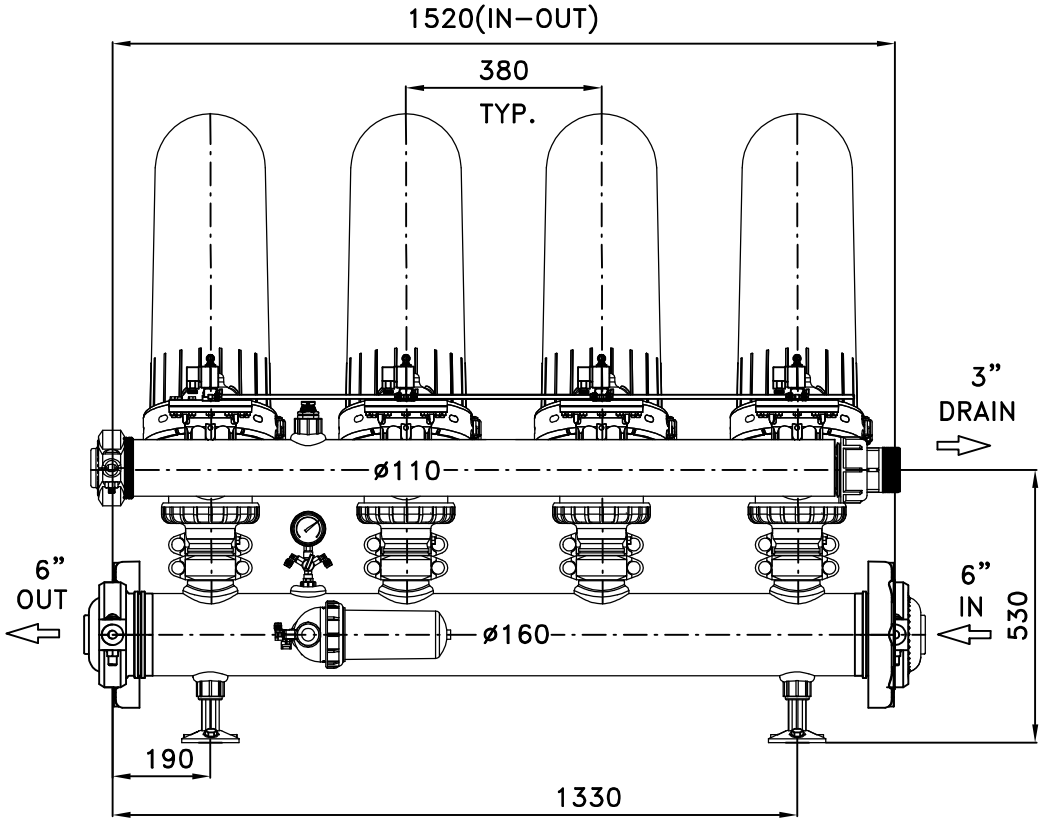
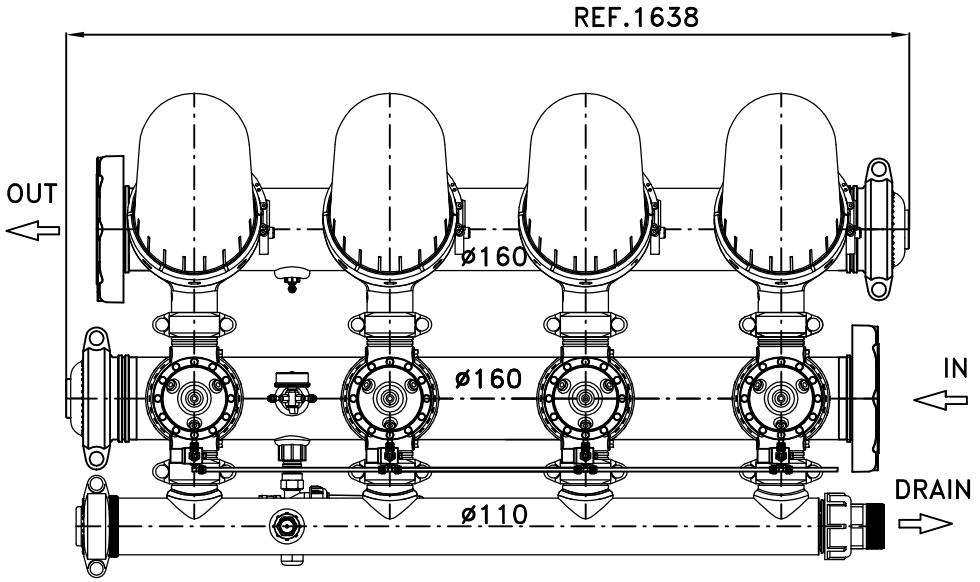
BACKUP: DISK-33

DRAWER N: 3220







MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
4*3" S.K. APPOLO FILTERS PLASTIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 6

CATALOGUE No:
1639E0604VU_007

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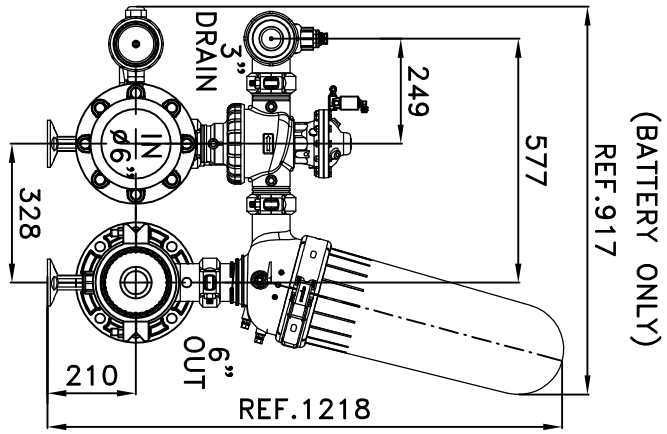

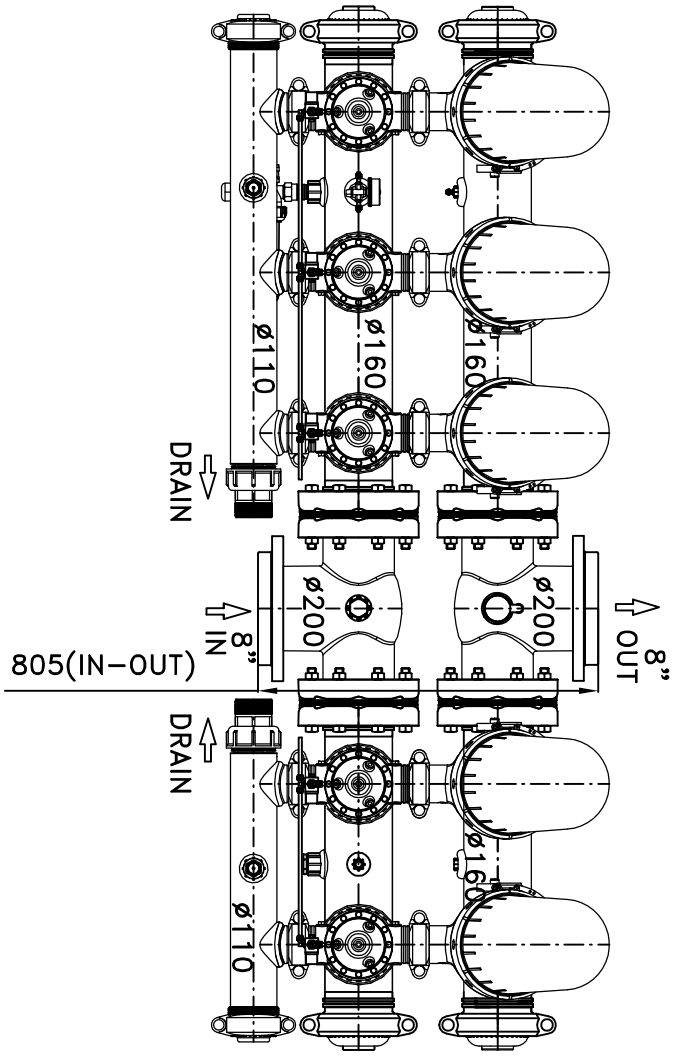

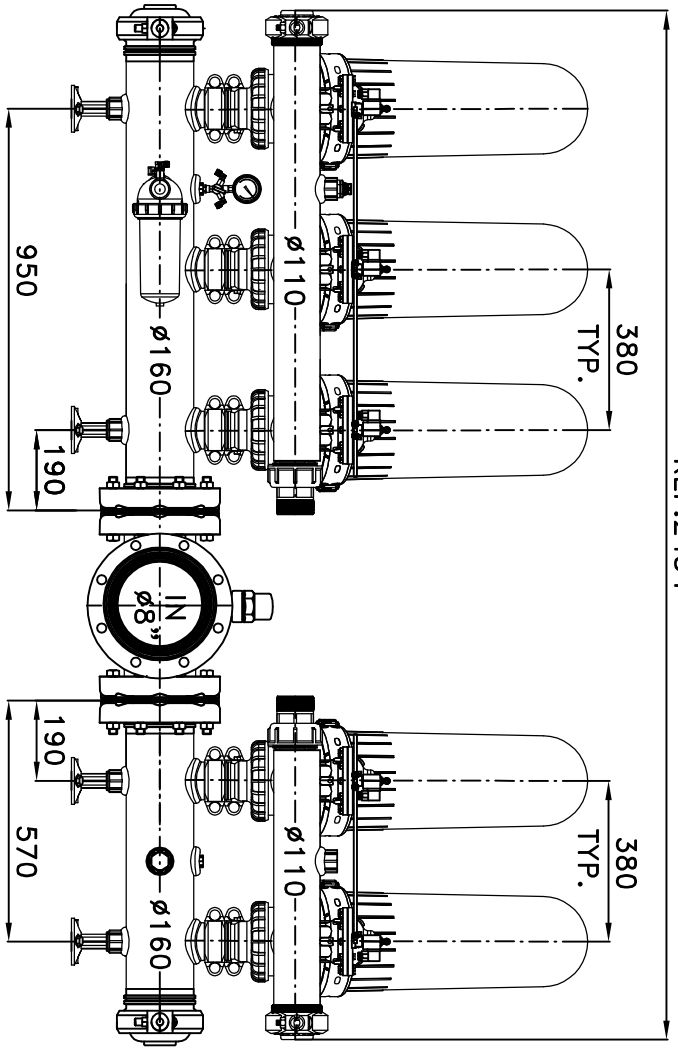

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 5*3" S.K. APPOLO FILTERS PLASTIC BATTERY — PAGE 1 OF 6

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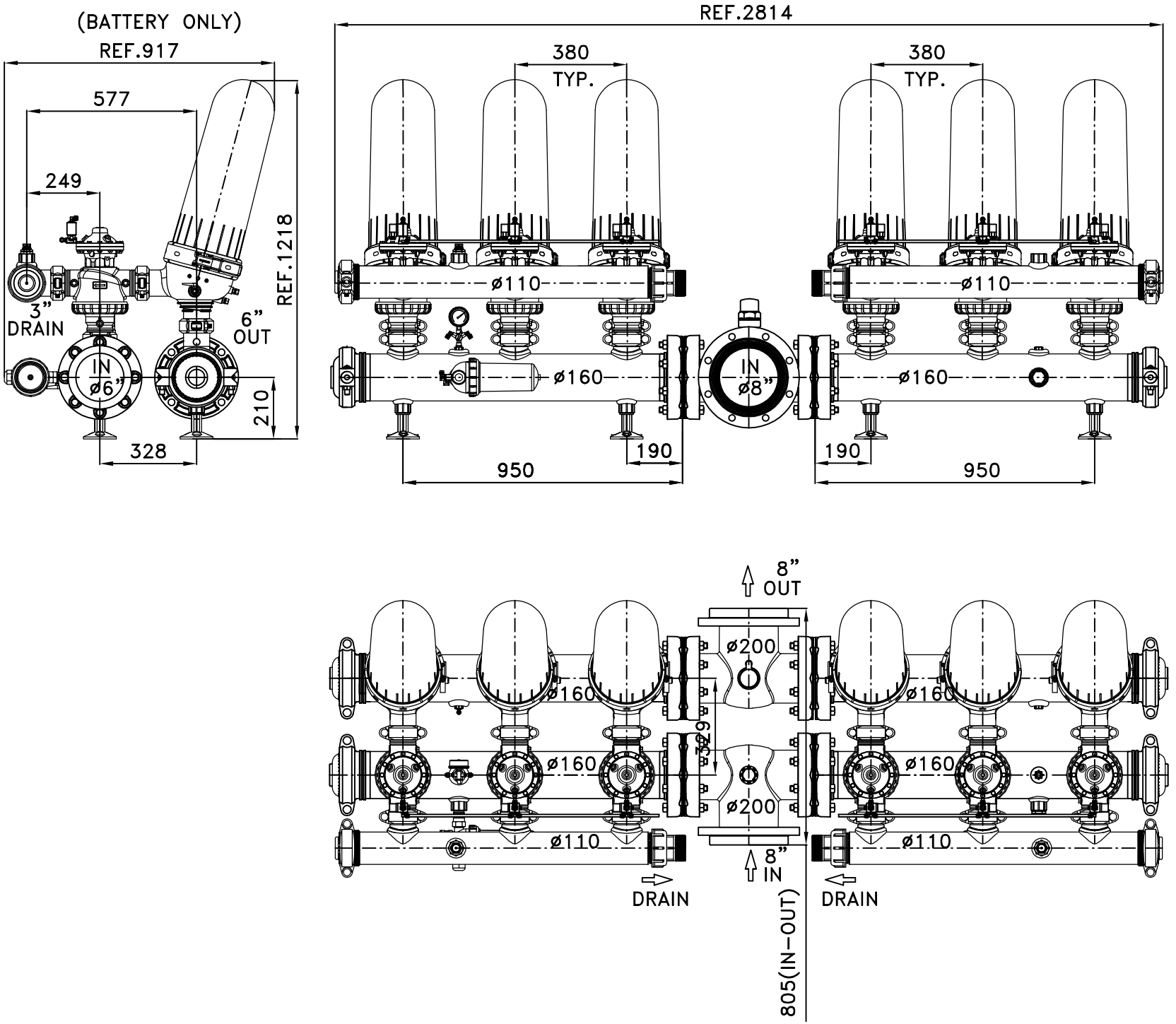

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 6*3" S.K. APPOLO FILTERS PLASTIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 6

CATALOGUE No: 1639E0806_0007

PATH BATERIES\3INCH\APPOLO\PLASTIC\BER.PL.

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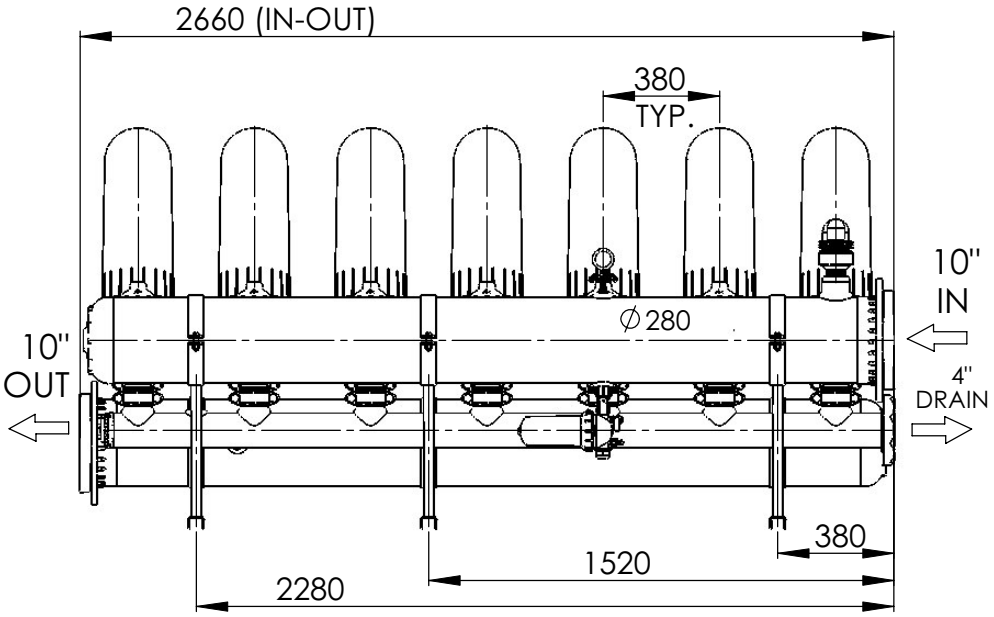

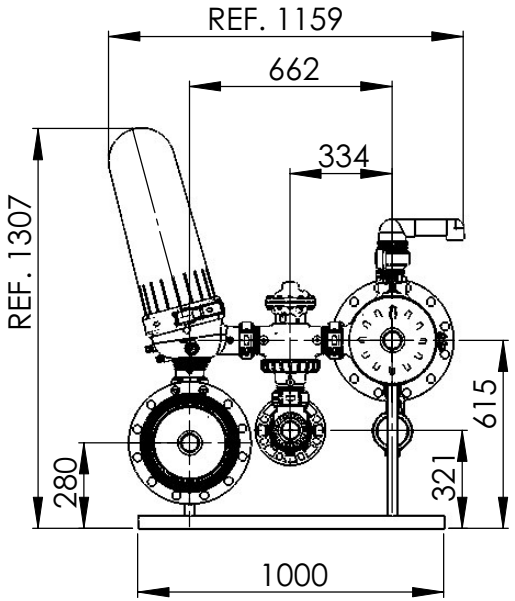

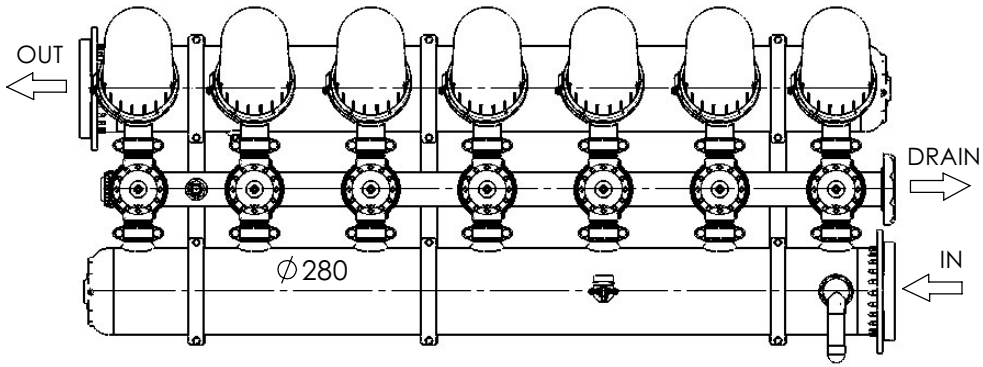

MODIFIC.	DATE	DESCRIPTION	SIGN.

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7*3" S.K. APPOLO FILTERS PLASTIC BATTERY

PAGE_1_of _5_

TITLE
ASSEMBLY DRAWING

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1633M1007_2

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APPR.	DOTAN	8/13/2007	PAL. XXX (5201 XXXX)

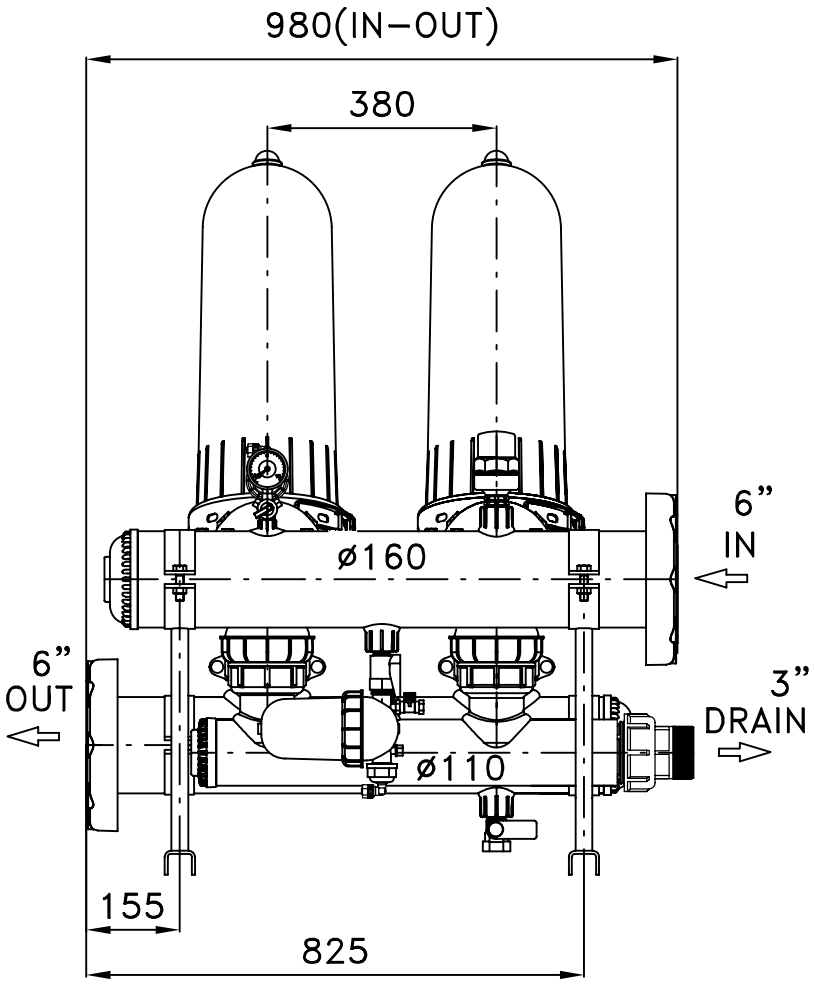
BACKUP:
DISK-1S

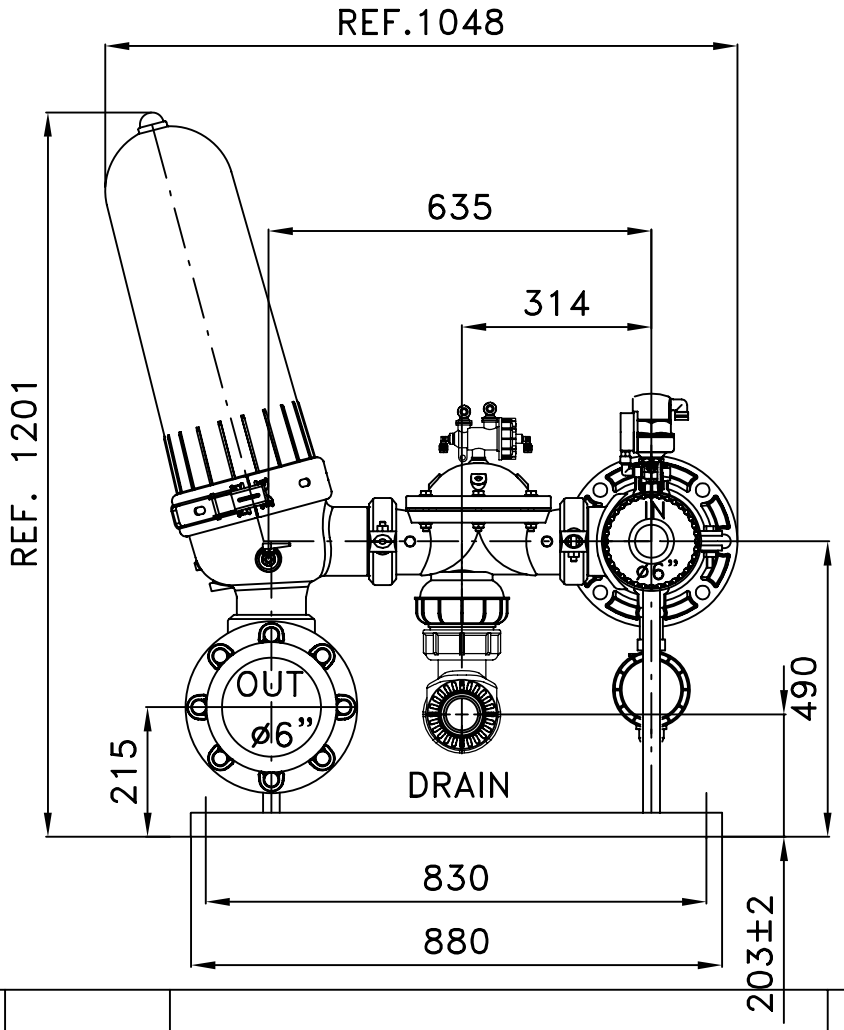
DRAWER No:
3220

Spin Klin 4" Apollo Angle

Drawings

4" Apollo Angle Batteries





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PROJECT: 2*4” APOLLO ANGLE FILTERS SYNTHETIC BATTERY — PAGE 1 OF 5

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CHECKED	NIKOLAY	03.11.08
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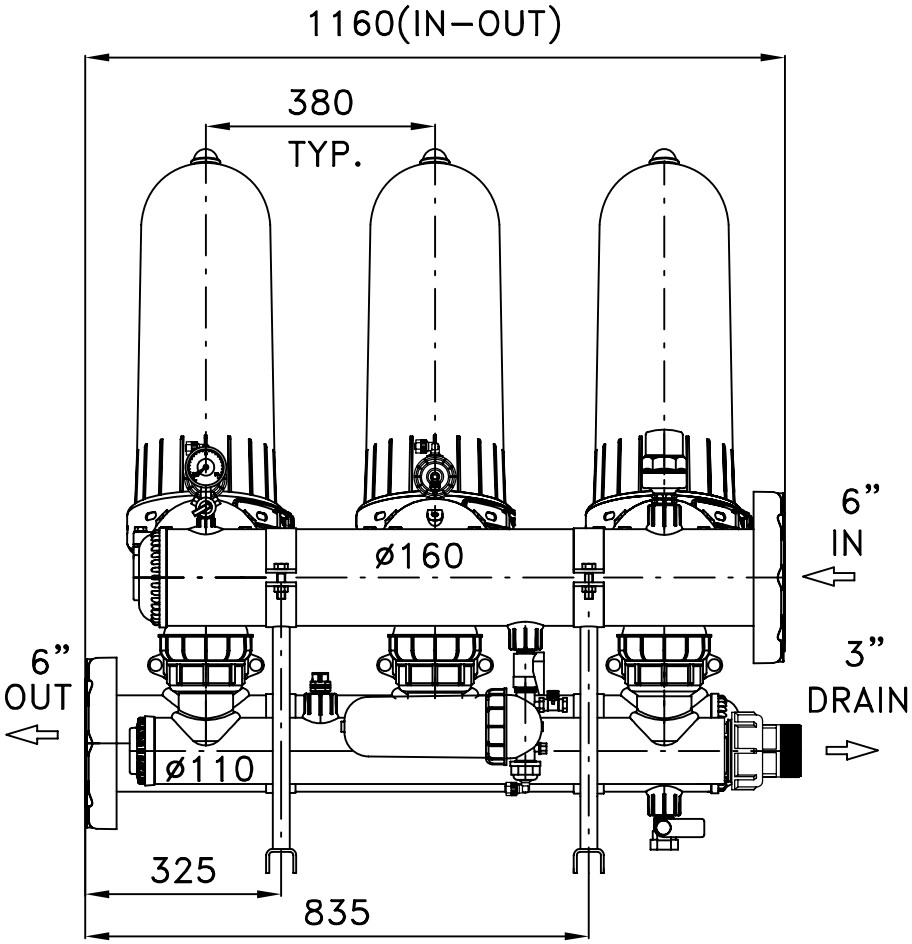

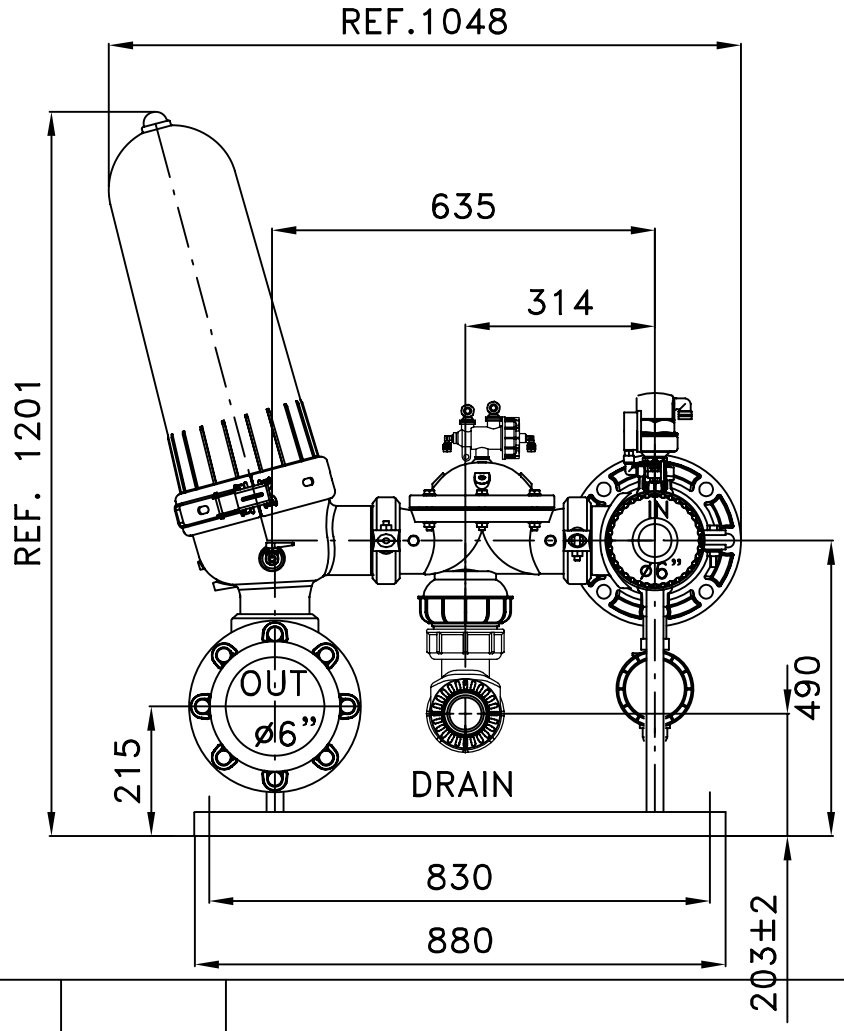

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 3*4" APOLLO ANGLE FILTERS SYNTHETIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1642M0603U2

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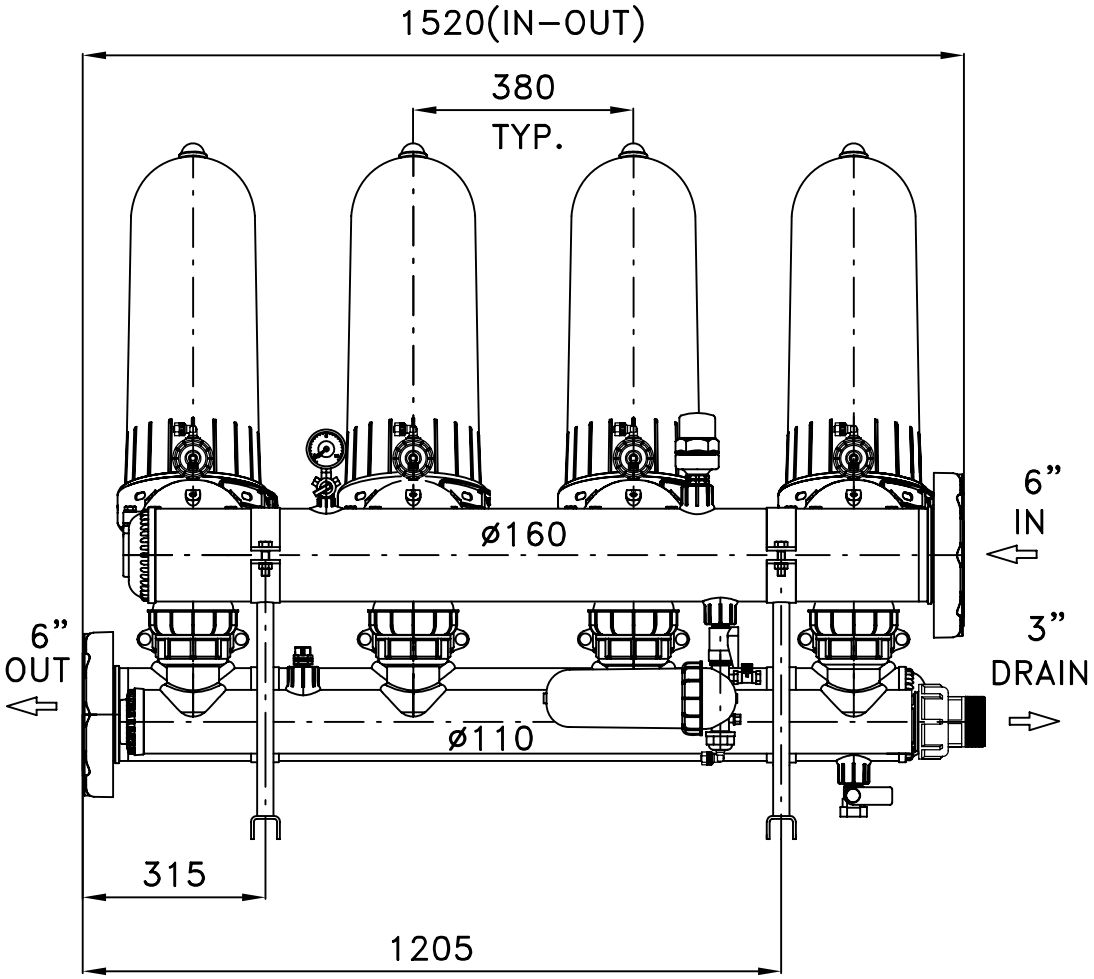

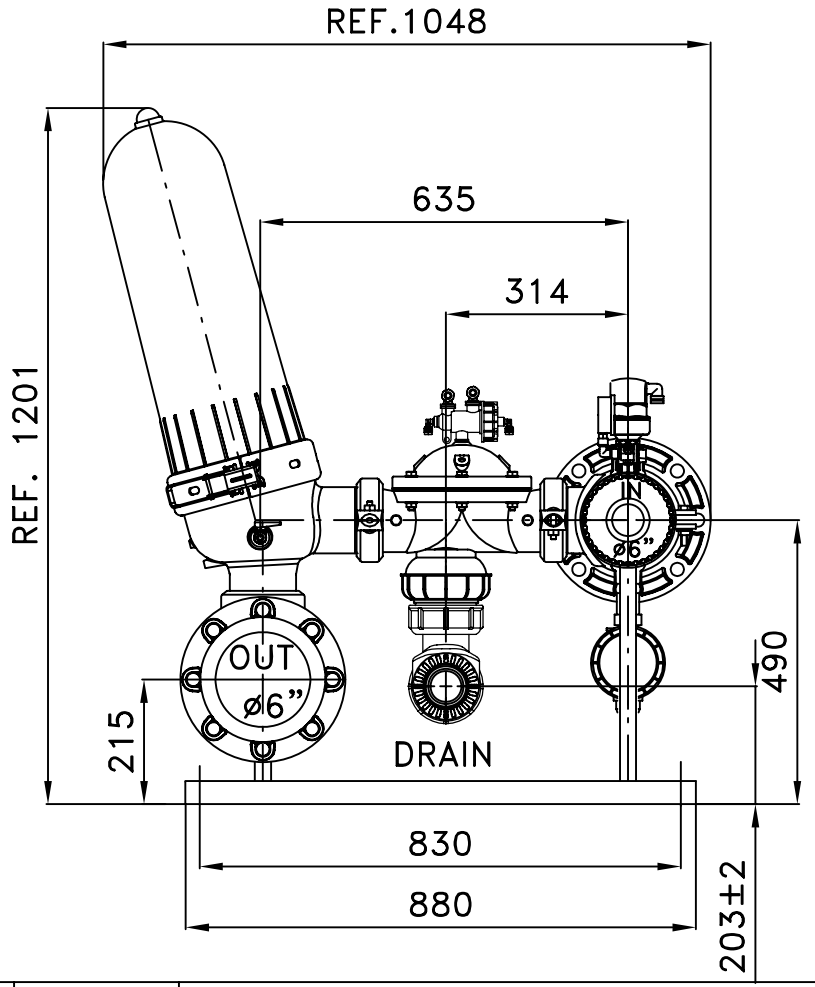

		THIS DRAWING CANCEL DRAWING FROM 03.11.08	
MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 4*4" APOLLO ANGLE FILTERS SYNTHETIC BATTERY — PAGE 1 OF 5

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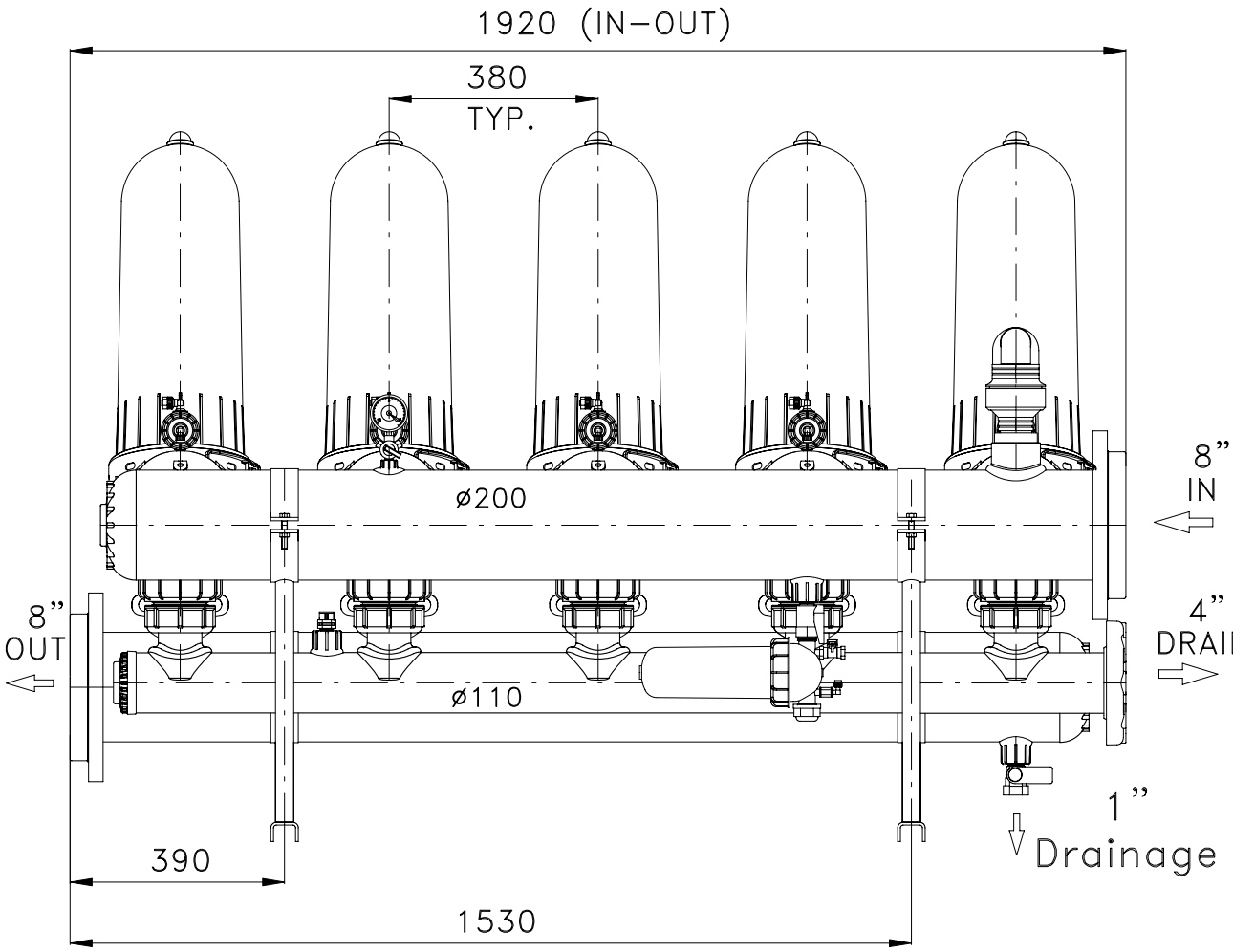

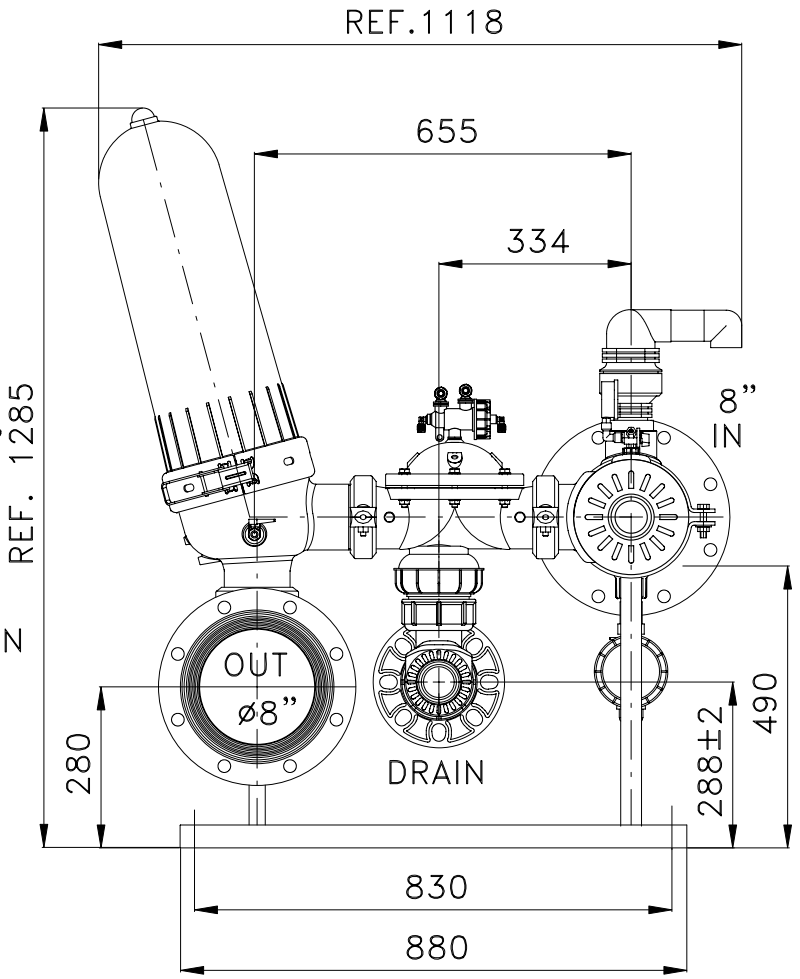

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 5*4" APOLLO ANGLE FILTERS SYNTHETIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1642M0805_20002

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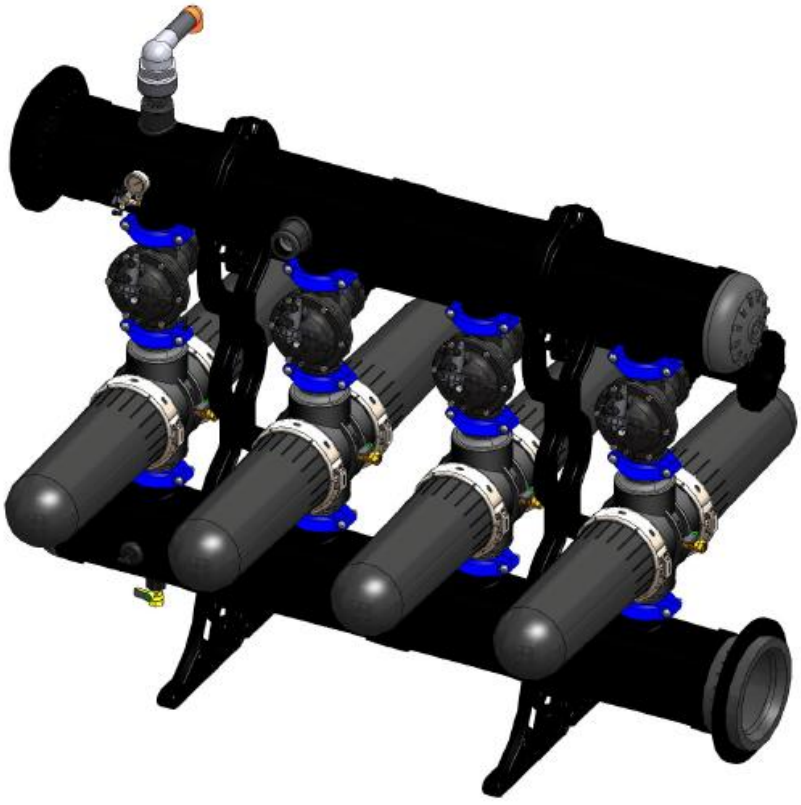
Spin Klin 4" Apollo Twin

4" Spin Klin Twin Apollo Battery

Service & Maintenance Manual



Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

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1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the Spin Klin Apollo filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
4. Confirm that filter weight, when full, meets the support construction requirements.
5. Prior to installation confirm that line pressure matches filter's operational pressure.
6. During installation, use standard flanges and connections only.
7. Check that all filter flange bolts are properly secured.
8. Please note, the filter enters a flushing mode automatically, without prior warning.
9. Use original parts only when servicing the filter.
10. Arkal cannot accept responsibility for any changes or modifications to the equipment.

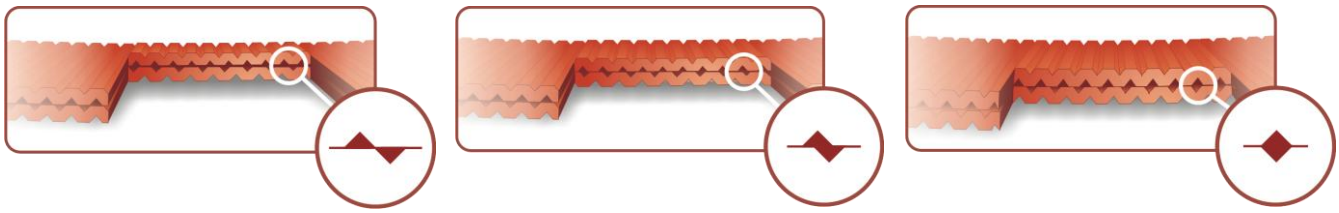
Special Note

Before opening the filter lock, check that there is no pressure in the filter.

3. Description and Operation

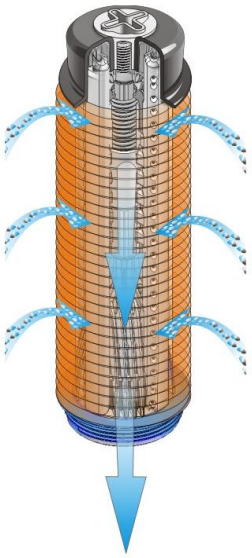
Table of Filtration Grades of the Discs and Color Code

Color Code	Blue	Yellow	Red	Black
Mesh	40	80	120	140
Micron	400	200	130	100



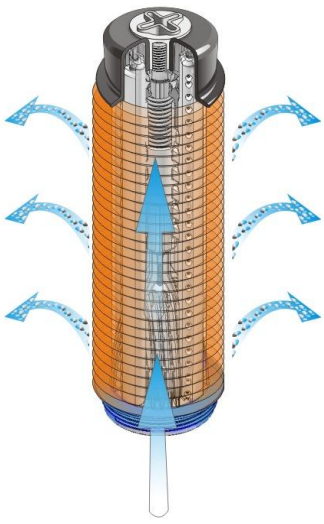
Spin Klin Spine - The Core of the Spin Klin Filtration System

The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the micron housing. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

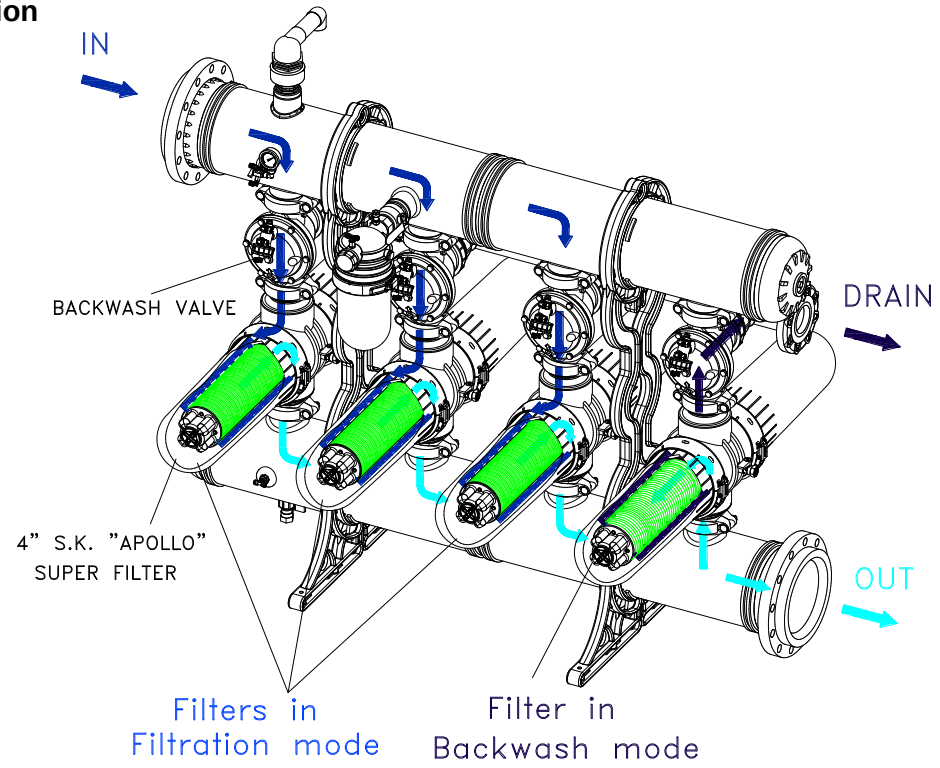


Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.



3.3 Mode of Operation



Filtration Process

During the filtration process the water flows through the inlet manifold, reaching the filters through the backwash valves. The filtered water flow through the outlet manifold into the system.

Backwash Process

The backwash process begins with a signal from the control unit activated by the pressure difference between the inlet and outlet or by time.

This signal is transported to the booster valve (assembled on 4"x 3"inlet valve No.1).

The booster valve opens, causing the No.1 valve to close the 4" inlet to the filter and open the 3" drain port.

Filter No.1 is now in a backwash mode.

The Spin Klin spine in filter No.1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied from the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is between 20 -25 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

The solenoid releases the water pressure signal allowing the inlet valve and the discs of the spine to return to filtration mode.

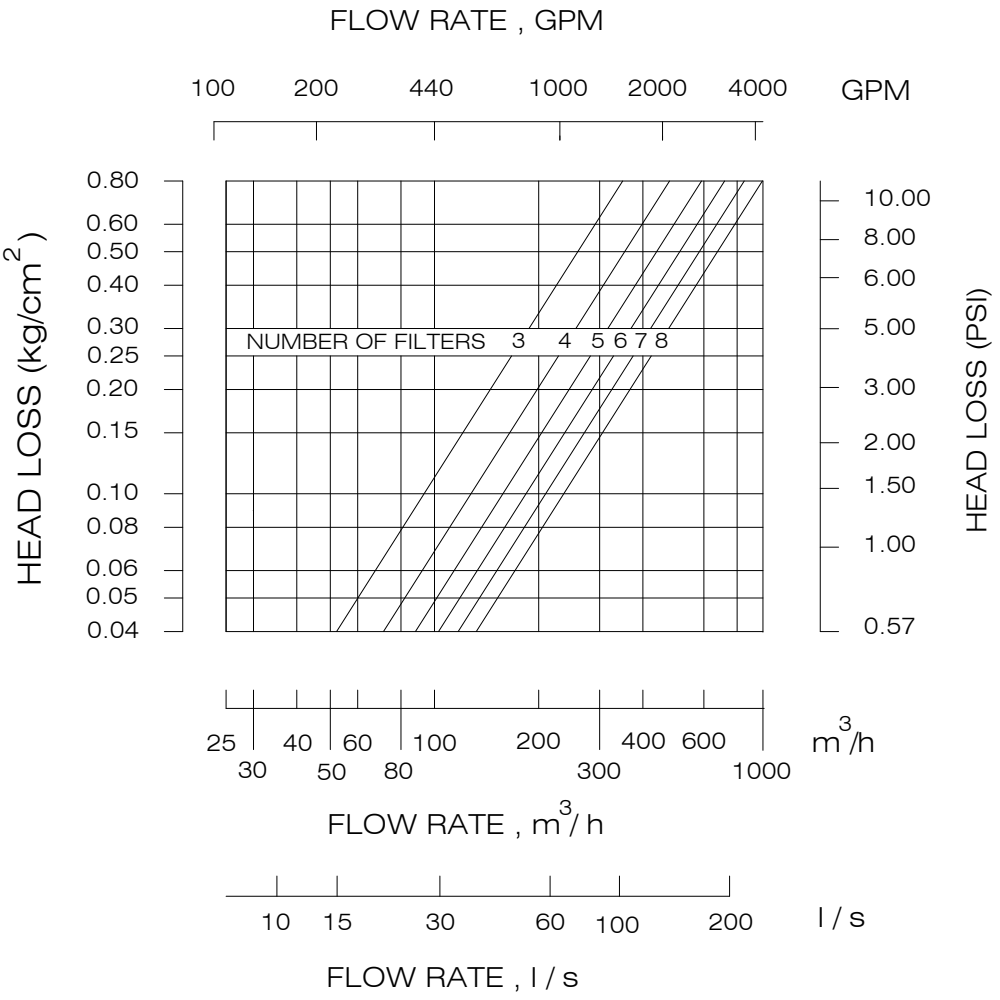
Once filter No.1 is in the filtration position again the control unit sends a signal to begin the backwash process in filter No.2.

4. Technical Data - 4" Spin Klin Twin Apollo

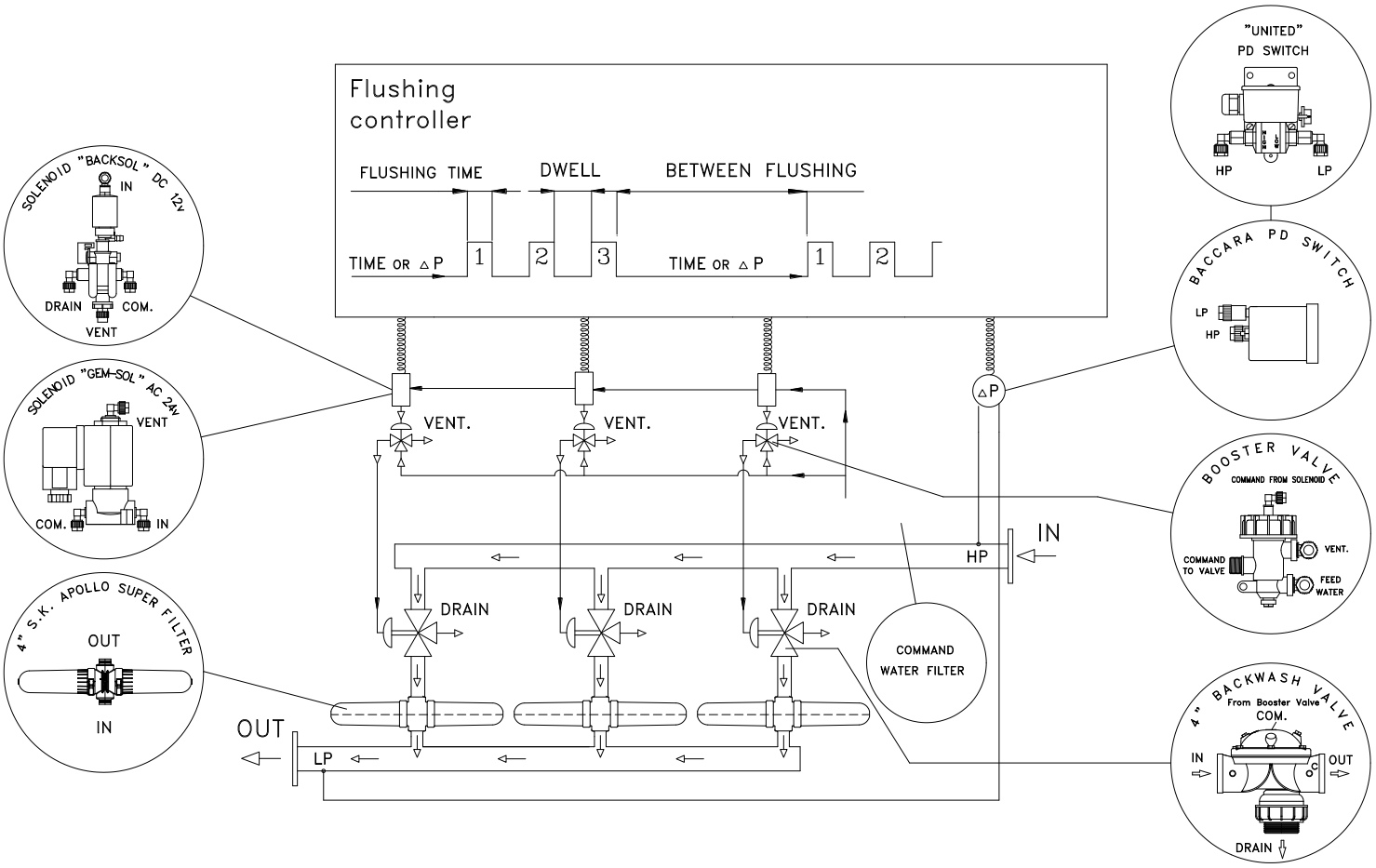
			3 Units	4 Units	5 Units	6 Units	7 Units	8 Units
Max. pressure		bar/psi	10/145	10/145	10/145	10/145	10/145	10/145
Min. backwash pressure *		bar/psi	2/29	2/29	2/29	2/29	2/29	2.0/29
Max. recommended flow rate	**400-130µ**	m^3/h/gpm	225/990	300/1,320	375/1,650	450/1,980	525/2,300	600/2,640
	100µ	m^3/h/gpm	215/947	290/1,277	360/1,585	430/1,894	505/2,224	580/2,554
Filtration surface area		cm^2/in^2	15,720/2,435	20,960/3,245	26,200/4,055	31,440/4,865	36,680/5,675	41,920/6,485
Filtration volume		cm^3/in^3	18,852/1,150	25,136/1,534	31,420/1,917	37,704/2,301	43,988/2,684	50,272/3,068
Backwash flow per filter		m^3/h/gpm	48/210	48/210	48/210	48/210	48/210	48/210
Backwash volume		m^3/gallon	0.8/210	1/265	1.3/340	1.6/420	1.9/500	2.1/550
System length - L		mm/inch	1,450/57	2,240/88	2,740/108	3,240/128	3,740/147	4,240/167
System width - W		mm/inch	1,533/60	1,533/60	1,533/60	1,533/60	1,533/60	1,533/60
System height - H		mm/inch	1,699/67	1,833/72	1,833/72	1,833/72	1,930/76	1,930/76
Standard diameter		mm/inch	200/8	280/10	280/10	280/10	315/12	315/12

* depended on the water quality

5. Batteries Headloss Chart - 130 micron, 4" Spin Klin Twin Apollo



6. P & ID



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8 psi).
- Set the controller to a flush time of 20-25 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

7. Apollo Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve. Release the static pressure by opening the drain valve. Remove the cover. Thoroughly clean the filter element and then reassembly the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing – drain all the water from the filter battery, the command filter and the backwash valves.

SEASONAL MAINTENANCE - DISCS

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. Make sure that there is no pressure in the system, pull out the safety pin, open the clamp and remove the cover. (**Figure 1, 2**)

Unscrew the butterfly nuts on the filtration elements.

Remove the tightening cylinders. (**Figure 3, 4**)

Remove the disc sets (for convenience we recommend using a plastic bag). (**Figure 5, 6**)

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to “Cleaning Recommendations Clogged Filtration Discs”. (**Figure 7**)

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (**Figure 8**)

Tighten the butterfly nut until the stopping point. (**Figure 9**)

Place the filter cover on the filter body and secure it with a slight clockwise rotation. Reposition clamp onto the cover and close using the lever. (**Figure 10**)

Tighten the clamp. Insert the safety pin. (**Figure 11**)

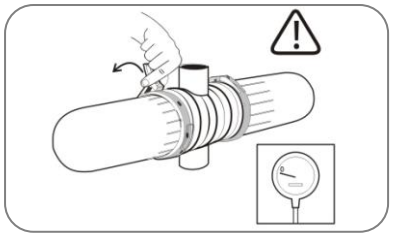


Figure 1

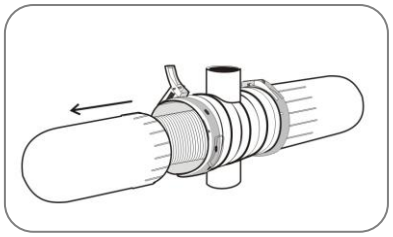


Figure 2

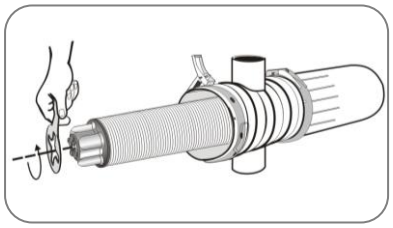


Figure 3

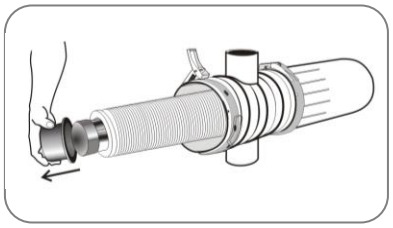


Figure 4

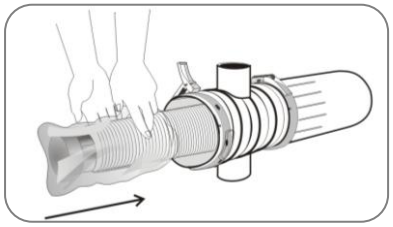
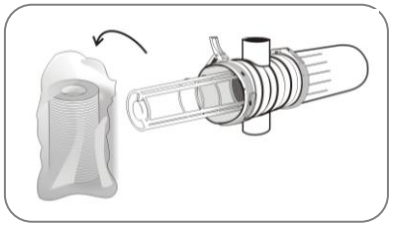


Figure 5



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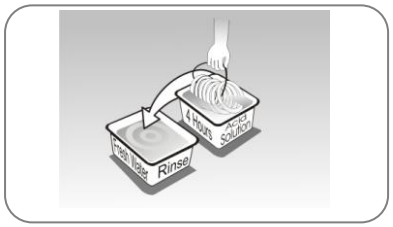


Figure 7

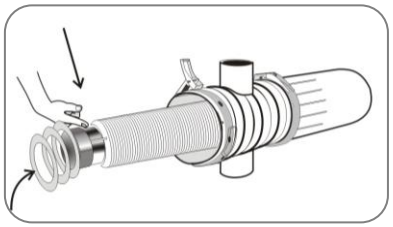


Figure 8

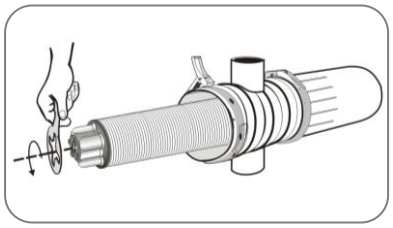


Figure 9

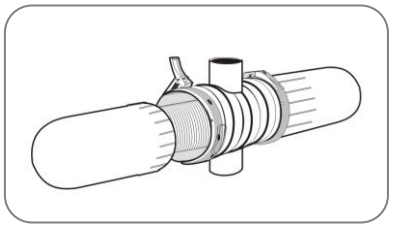


Figure 10

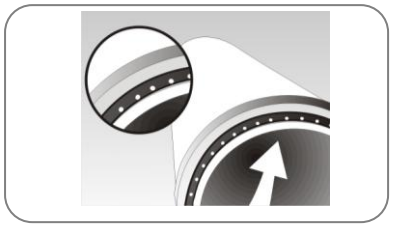


Figure 11

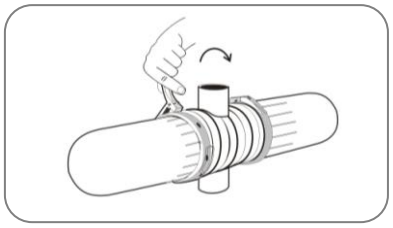
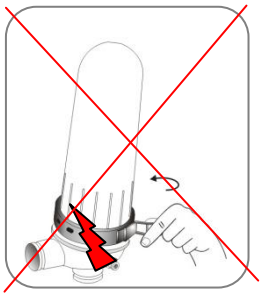


Figure 12

Attention:

When carrying out any of the following seasonal maintenance, service, or cleaning the discs – After backwashing the system and after closing the water inlet, **make sure that there is no pressure in the system!**

Please Note:



- Before removing the cover you may experience the vacuum phenomenon – which will make the removing of the cover very difficult or almost impossible.
- **Do Not** - insert any sharp tools (objects) in between the cover and the body! You may damage the hydraulic seal and the cover!
- In order to remove the cover easily – **you should drain the water from the filter**!
- You may drain the filter through the drain valve located on the filter body, once the filter is empty the cover can then be removed safely and easily.

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

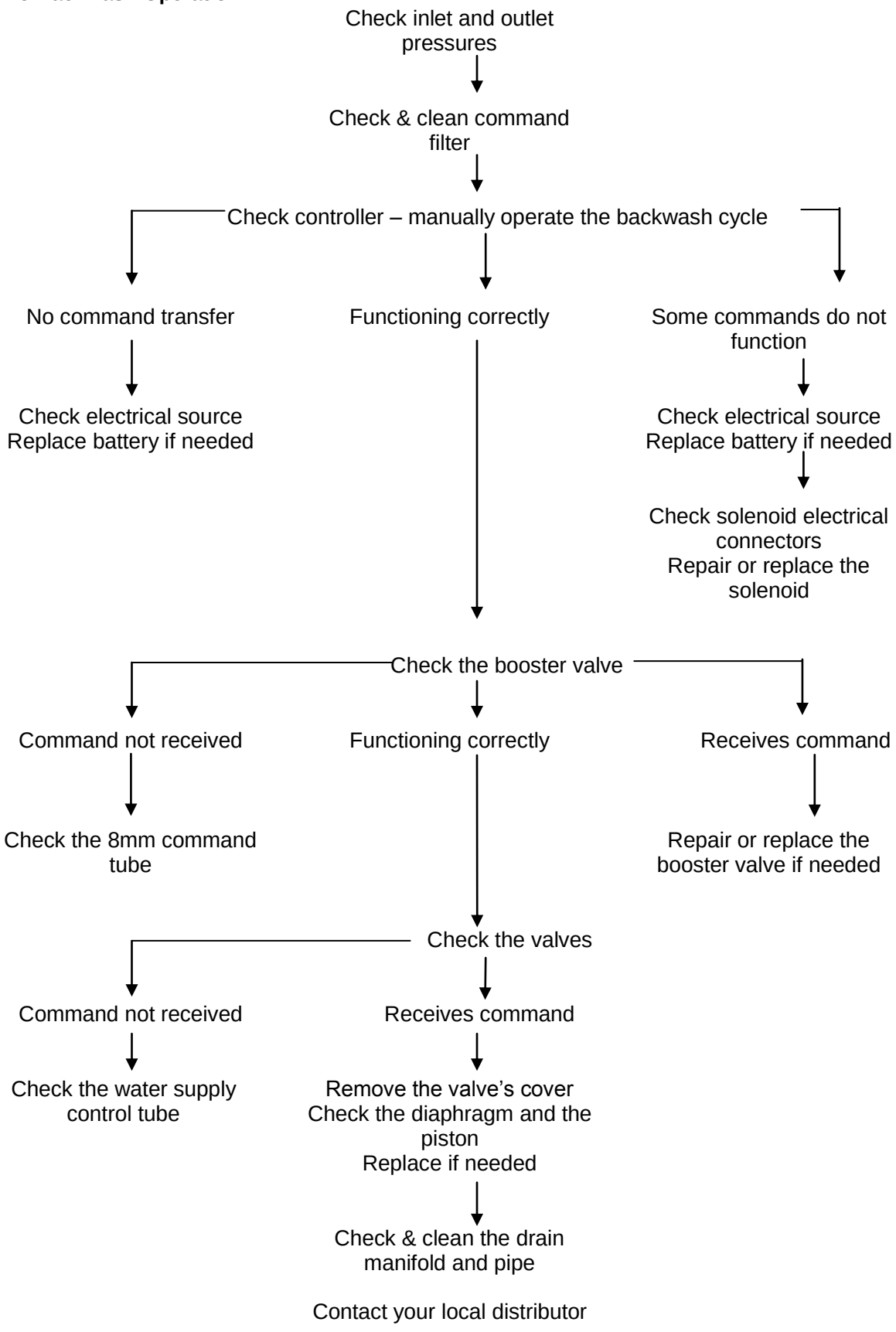
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes. If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

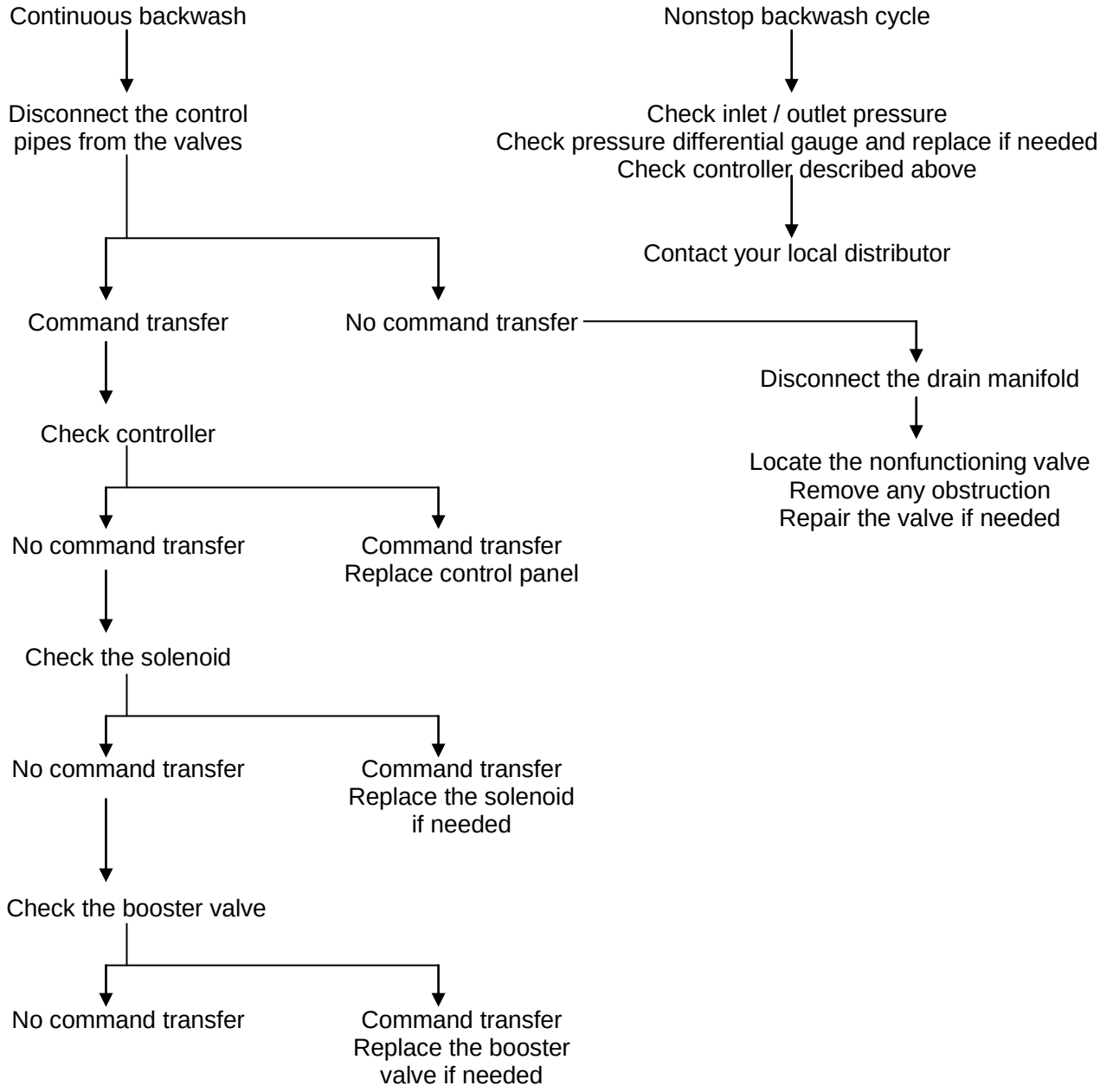
8. Troubleshooting

No Backwash Operation



Identifying Malfunctions in the Apollo system

Continuous or Non-stop Backwashing



Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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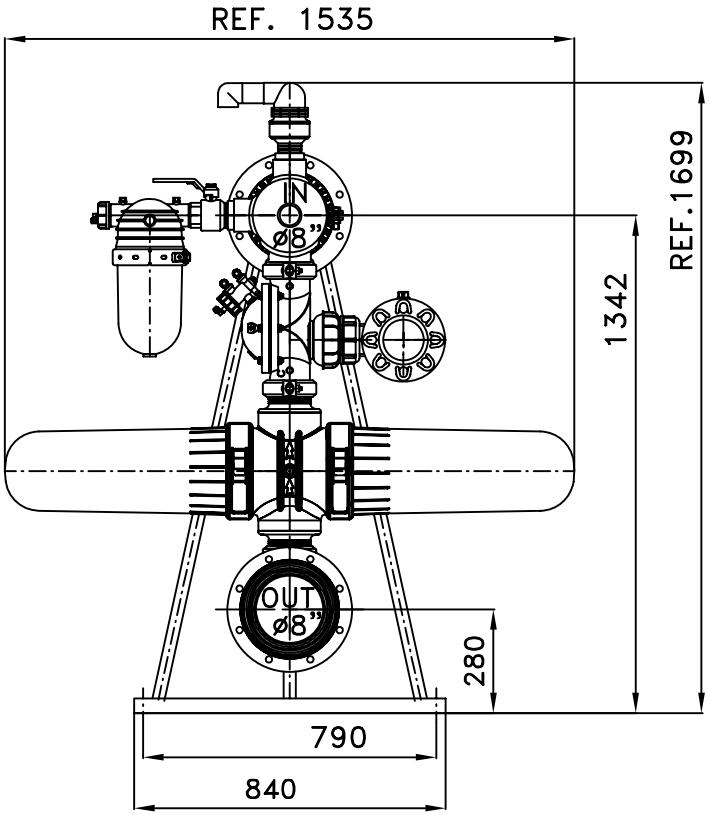
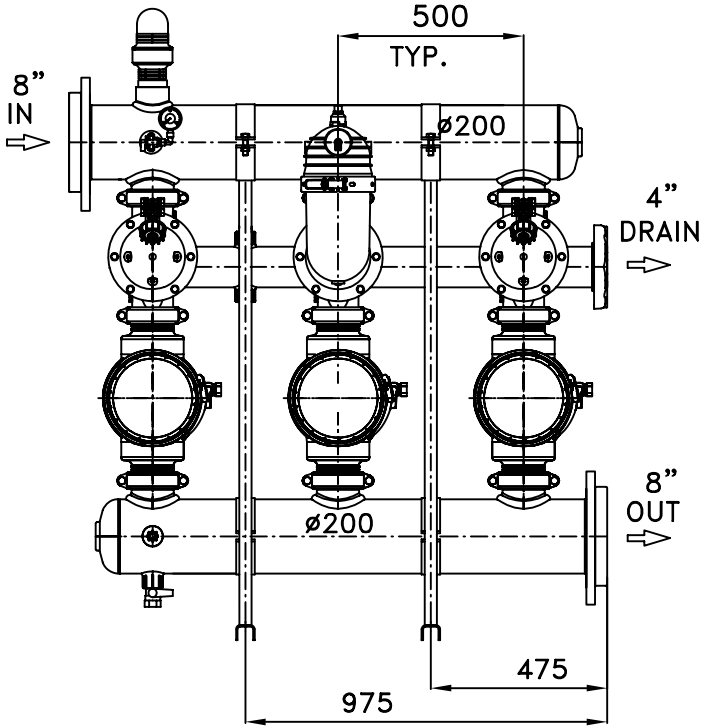
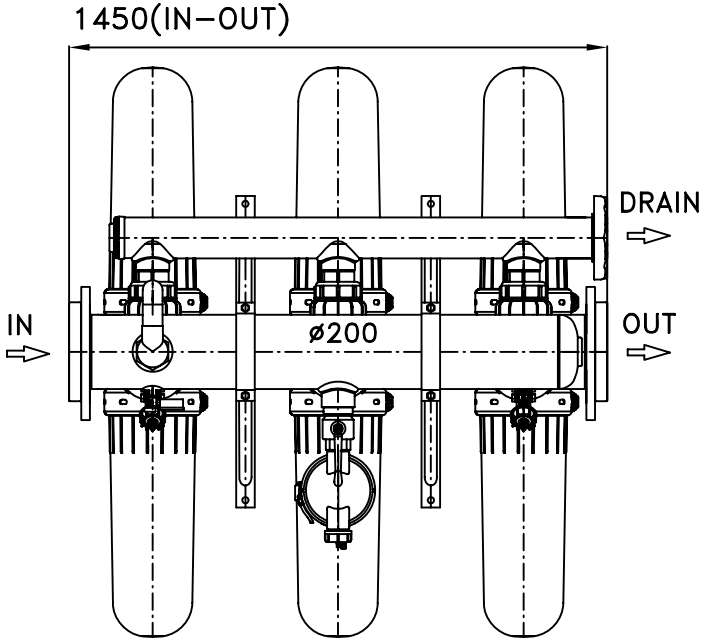
Email: filters@arkal.com Web: www.arkal-filters.com

Drawings

4" Apollo Twin Batteries







MODIFIC.	DATE	DESCRIPTION	SIGN.

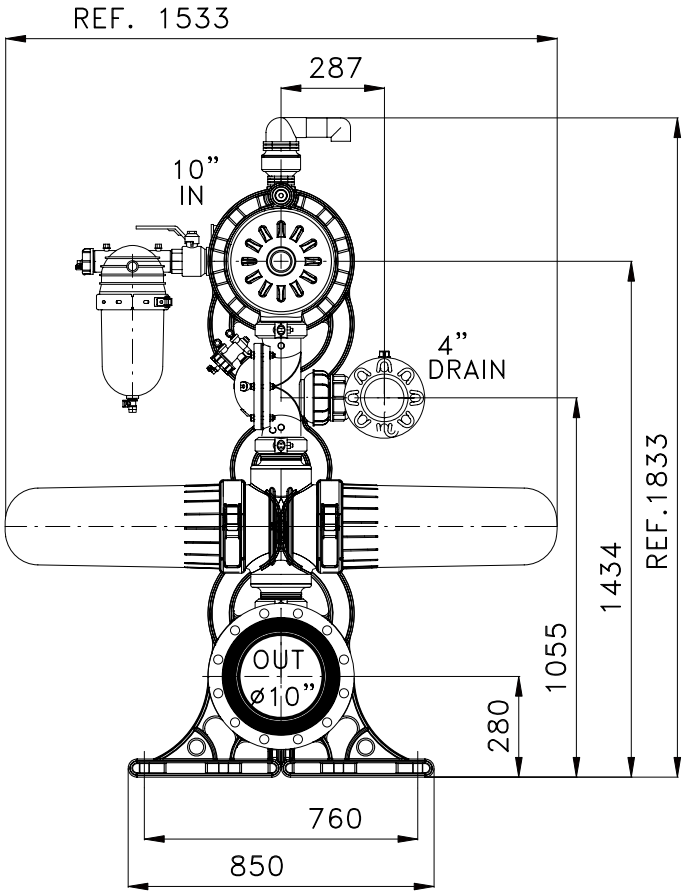
ARKAL
FILTRATION SYSTEM

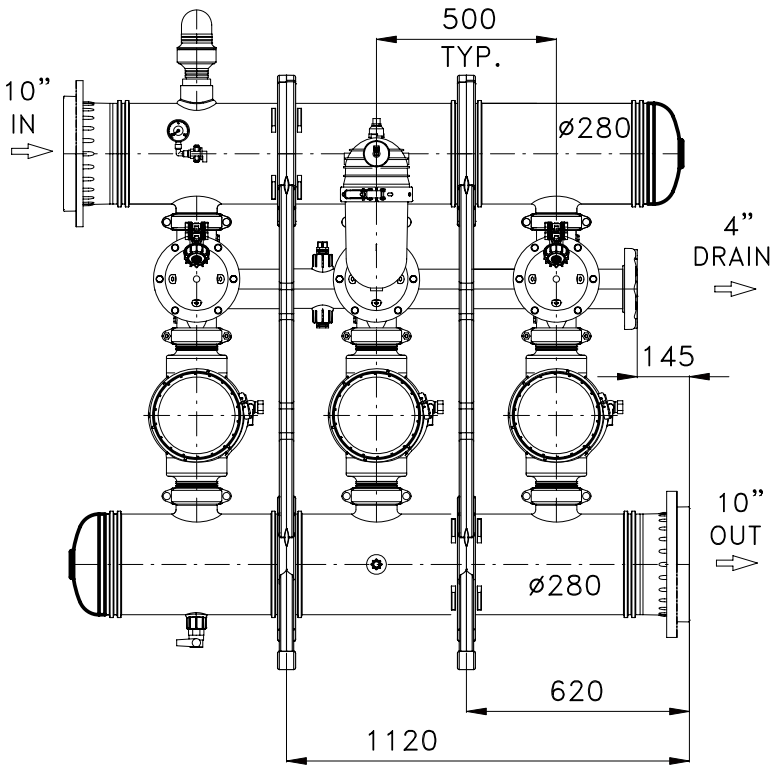
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

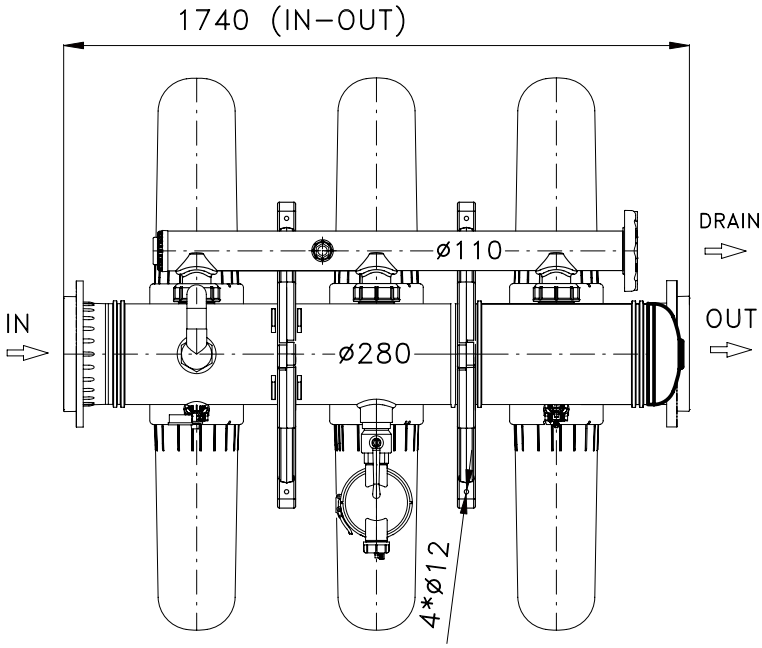
PROJECT: 3*4" S.K. FILTERS PLASTIC BATTERY
PAGE 1 OF 5
TITLE: ASSEMBLY DRAWING
CATALOGUE No: 4544H0803_2

	NAME	DATE
DRAWN	NIKOLAY	28.01.07
CHECKED	NIKOLAY	28.01.07
APPROVED	ZALI	28.01.07

PATH BATERIES\4INCH\APOLO\PLASLITE\PLASTIC
FILE CODE 4544H0803_2
FILE CODE DRAWING OF MANIFOLD: 6544 0803_2(1-2) 6120 0371 PALET-429(5201 5934)
NAME IRINA
DATE 28.01.07
SIGNATURE
BACKUP: DISK-32
DRAWER N: 5070







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL

ARKAL
FILTRATION SYSTEM

BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT
3*4" S.K. FILTERS PLASTIC BATTERY

PAGE 1 OF 5

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
4544H1003_2

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	NAME	DATE
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CHECKED	NIKOLAY	06.03.09
APPROVED	ZALI	06.03.09

FILE CODE DRAWING OF MANIFOLD:
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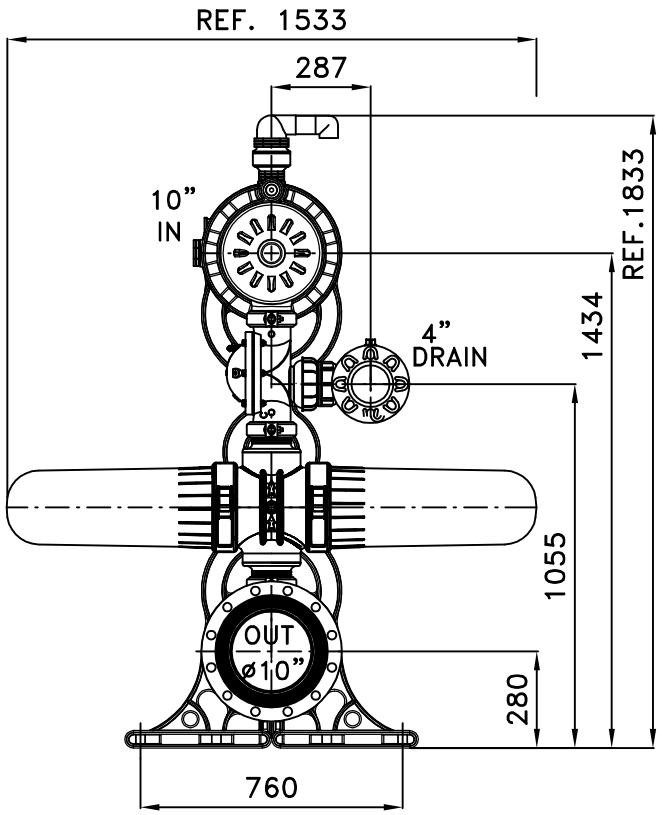
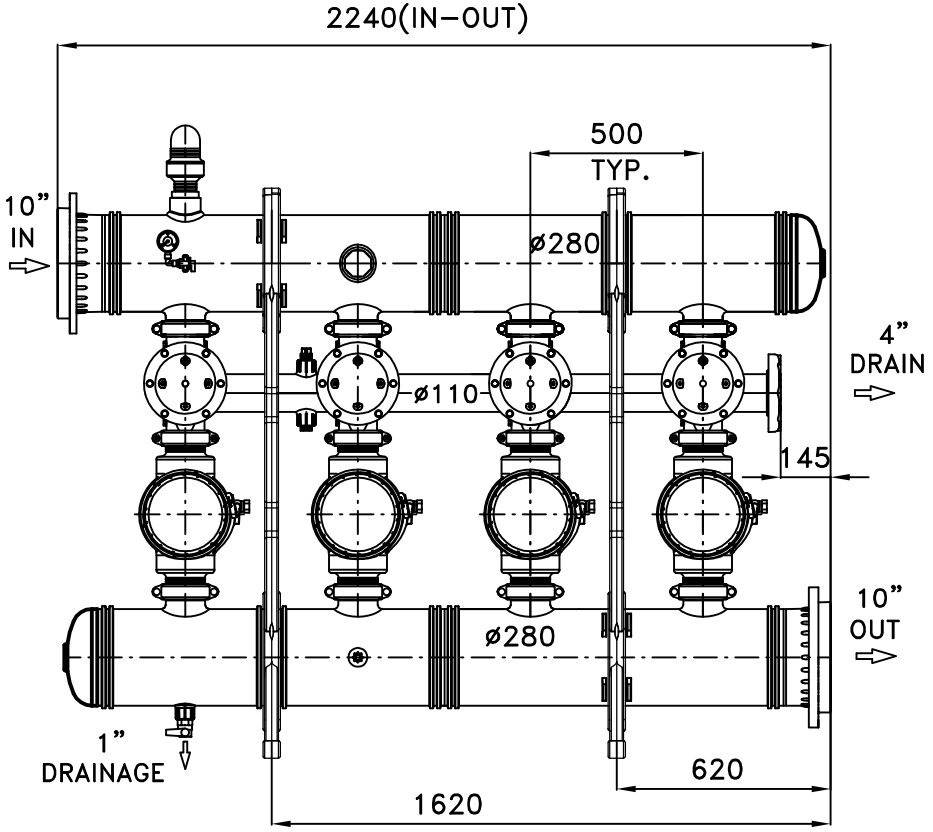
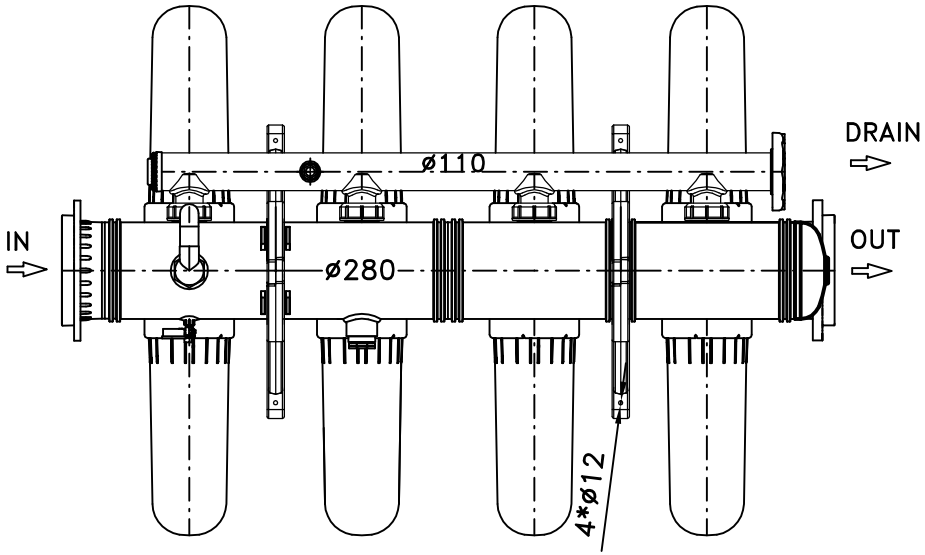
2253 1001,
PALET-XXX (5201 5XXX)

BACKUP:
DISK-34

DRAWER N:
5070







MODIFIC.	DATE	DESCRIPTION	SIGN.
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BET-ZERA 15135
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ISRAEL

PROJECT: 4*4" S.K. FILTERS PLASTIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544P1004_3

PATH BATERIES\4INCH\APOLO\PLASLITE\PLASTIC

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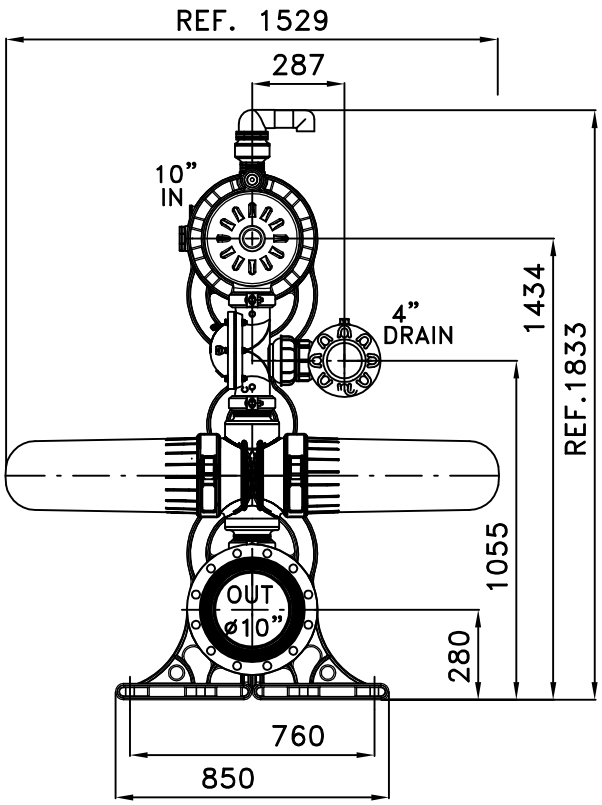
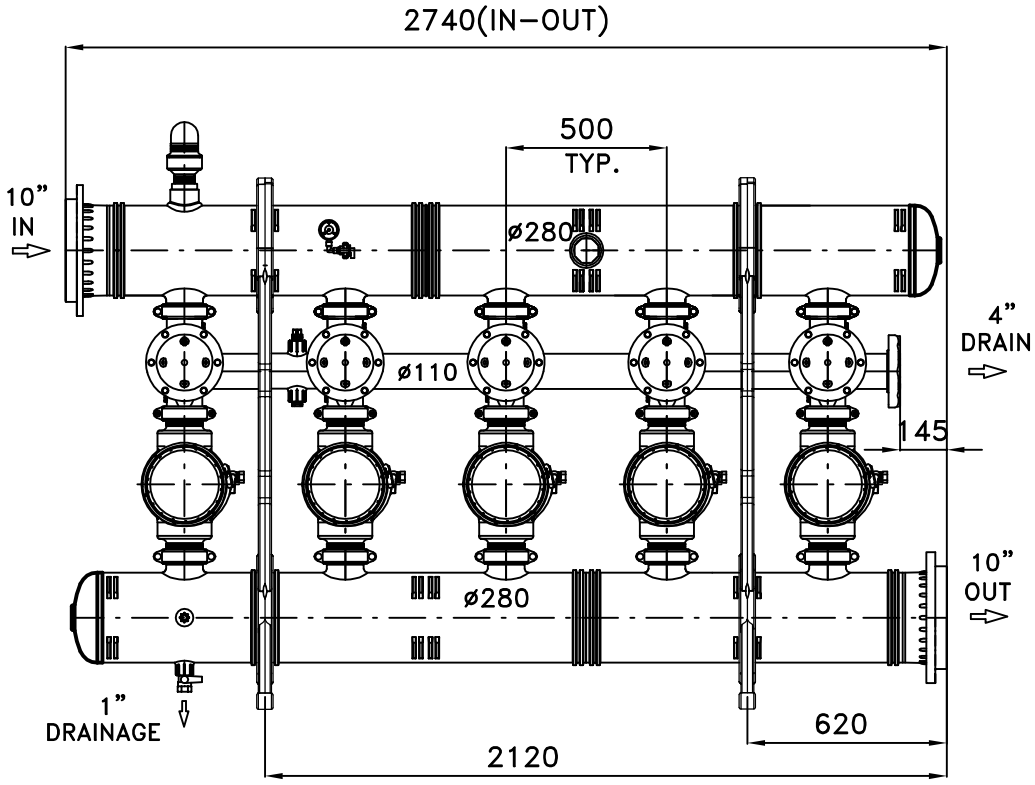
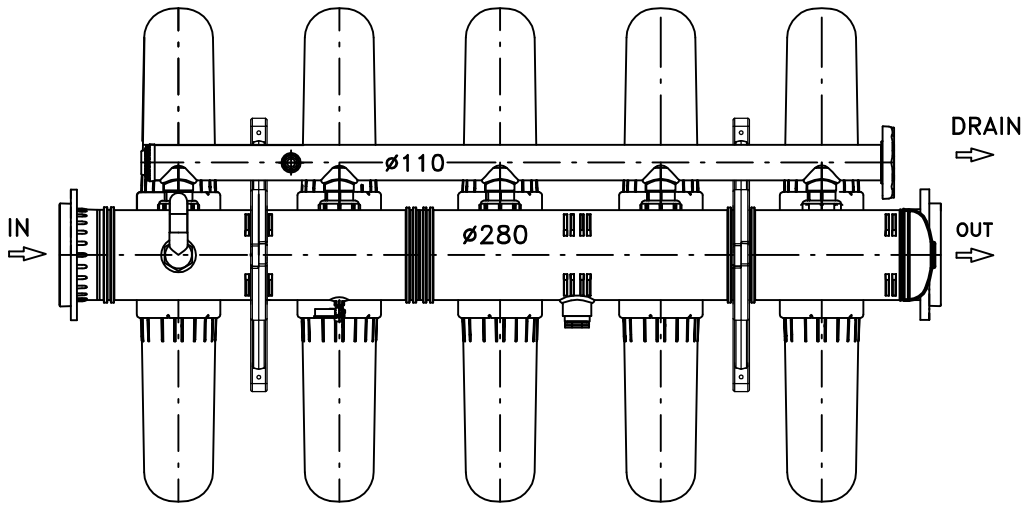
CHECKED	NIKOLAY	12.11.09	2253 1001,			
APPROVED	YOEL	12.11.09	PALET-517(5201 5021)			

BACKUP: DISK-34

DRAWER N: 5070







MODIFIC.	DATE	DESCRIPTION	SIGN.

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FILTRATION SYSTEM
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ISRAEL

PROJECT: 5*4" S.K. FILTERS PLASTIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544P1005_3

PATH BATERIES\4INCH\APOLO PLASLITE\PLASTIC

FILE CODE: 4544P1005_3

FILE CODE DRAWING OF MANIFOLD: 6544 1005_2(1-2), 2253 1001, PALET-404 (5201 5911)

BACKUP: DISK-34

DRAWER N: 5070

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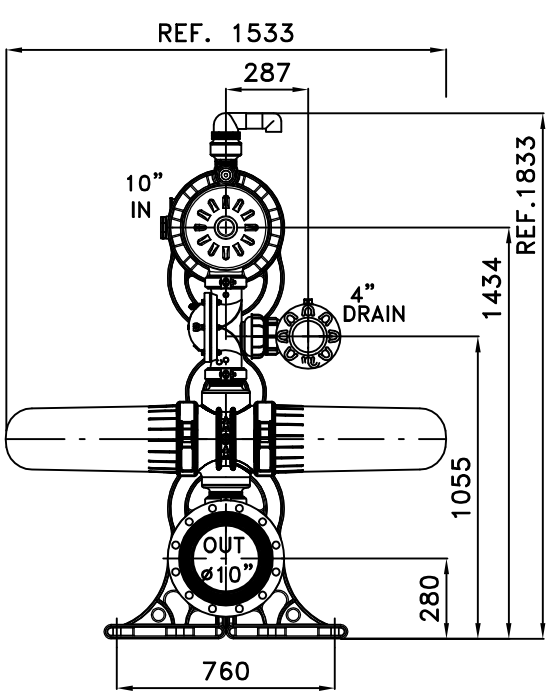
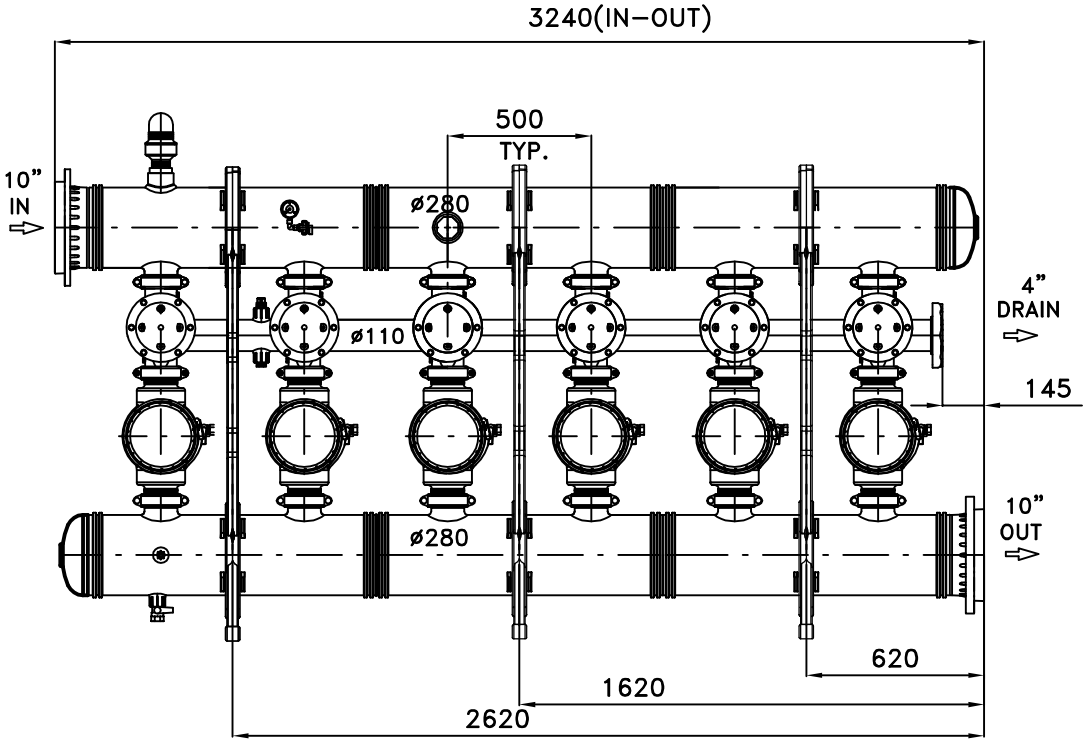
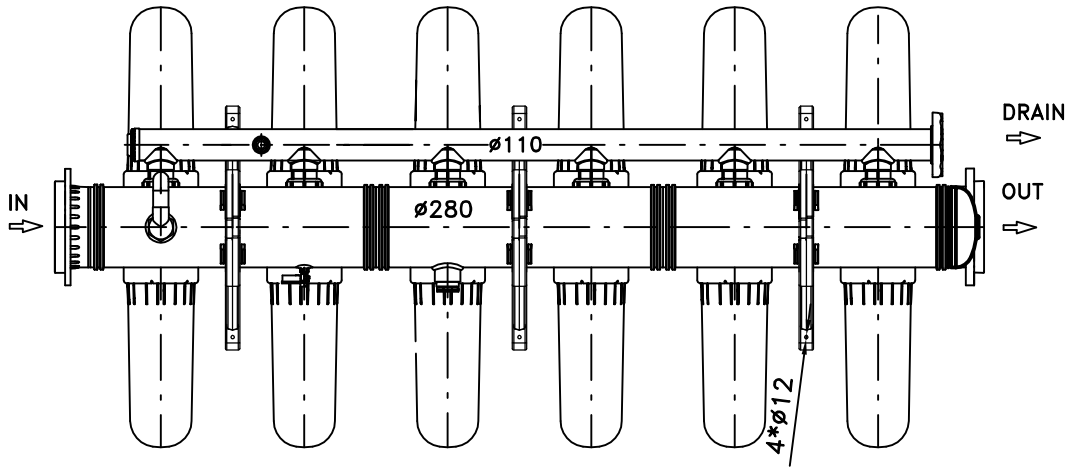
APPROVED	YOEL	16.09.09	
	IRINA	16.09.09	







MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT: 6*4" S.K. FILTERS PLASTIC BATTERY

TITLE: ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544P1006_3

PATH BATERIES\4INCH\APOLO PLASLITE\PLASTIC

FILE CODE: 4544P1006_3

FILE CODE DRAWING OF MANIFOLD: 6544 1006_2(1-2), 2253 1001,

BACKUP: DISK-34

DRAWER N: 5070

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DRAWN	PABLO	25.10.09	
CHECKED	NIKOLAY	25.10.09	
APPROVED	YOEL	25.10.09	
	IRINA	25.10.09	

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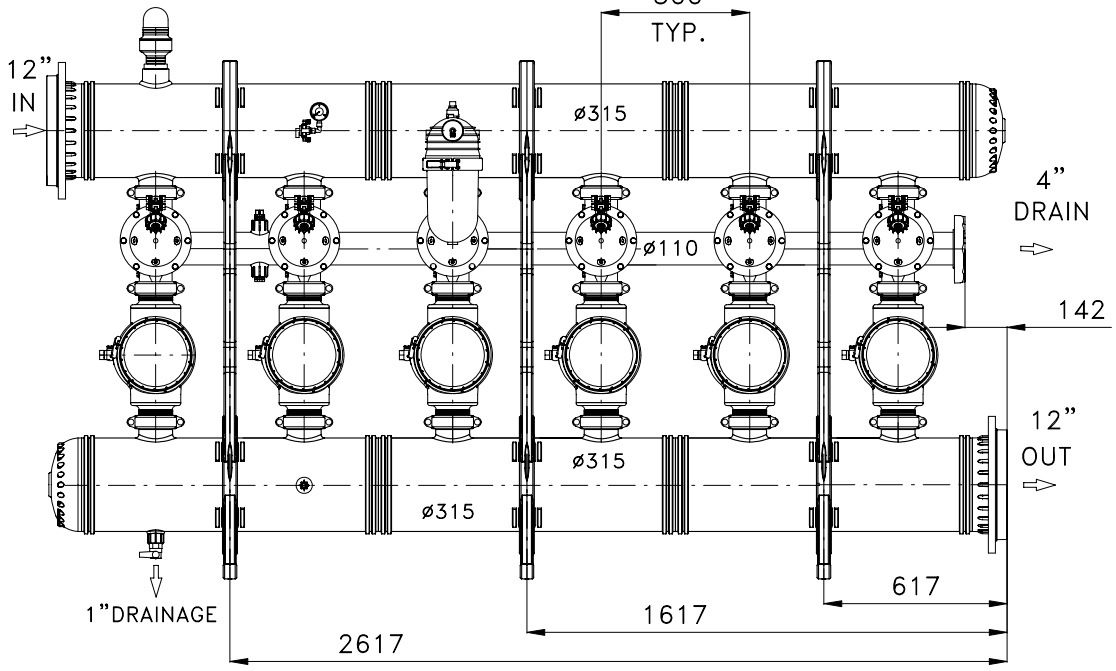

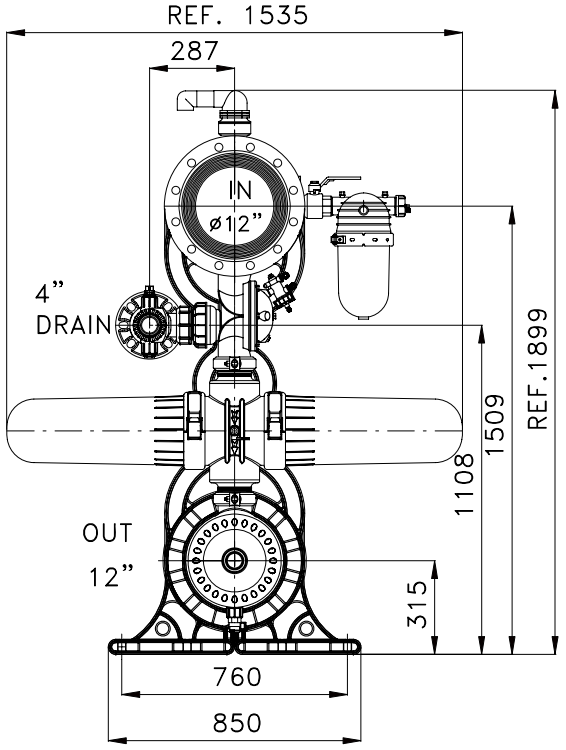

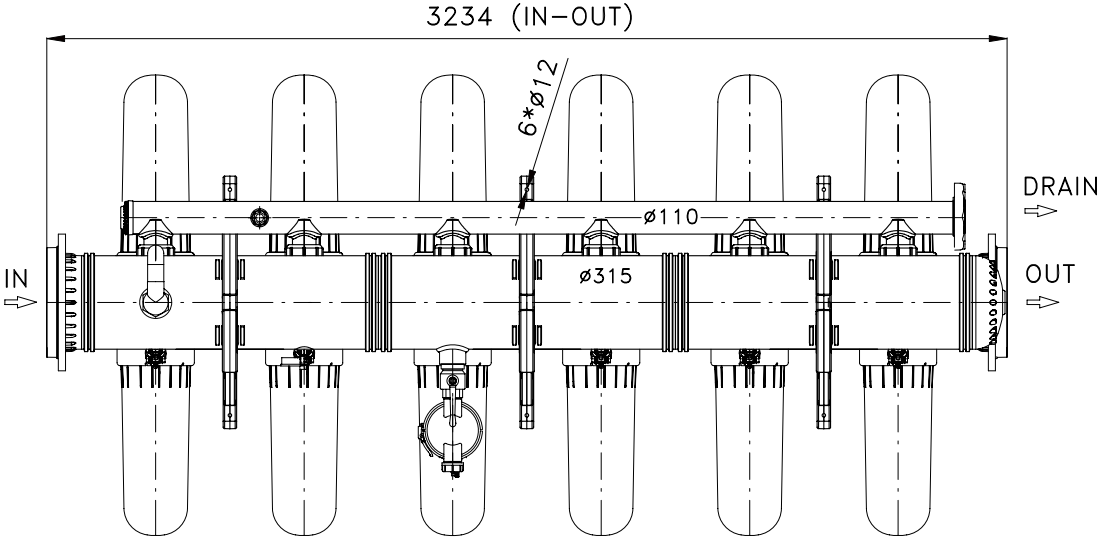

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MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT 6*4" S.K. FILTERS PLASTIC BATTERY

TITLE ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544H1206_2

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DRAWN	PABLO	04.02.10	6544 1206_2
CHECKED	NIKOLAY	04.02.10	PALET-518(5201 5022)
APPROVED	ZALI	04.02.10	

FILE CODE DRAWING OF MANIFOLD:

NAME	DATE	SIGNATURE
IRINA	04.02.10	IRINA

BACKUP: DISK-34

DRAWER N: 5070

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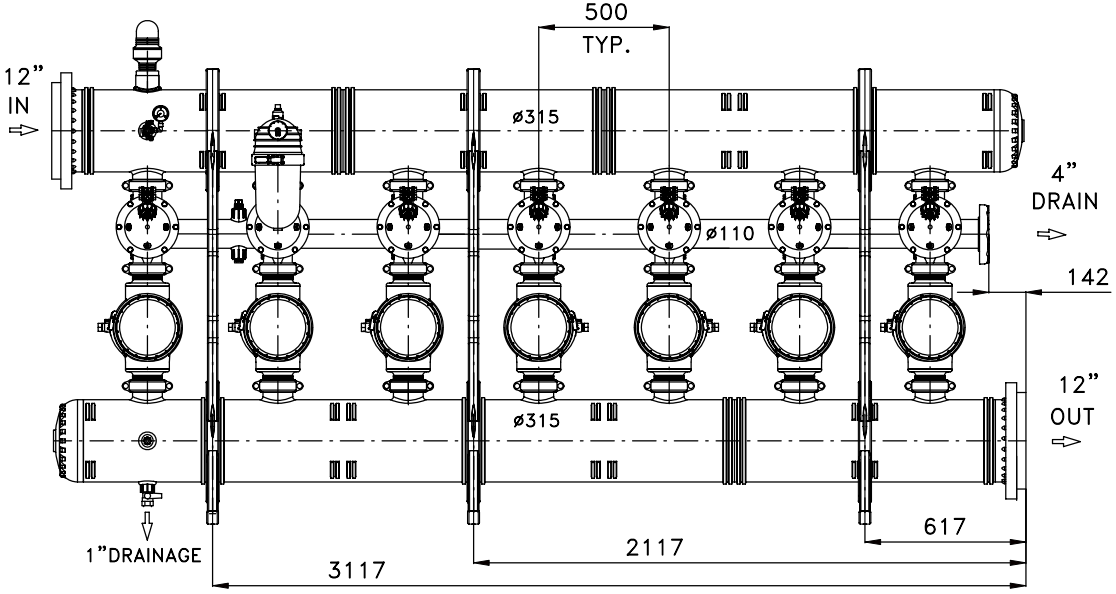
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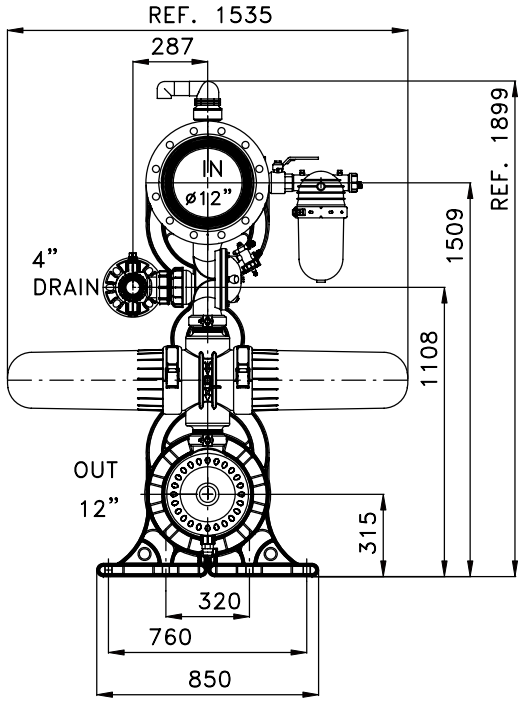
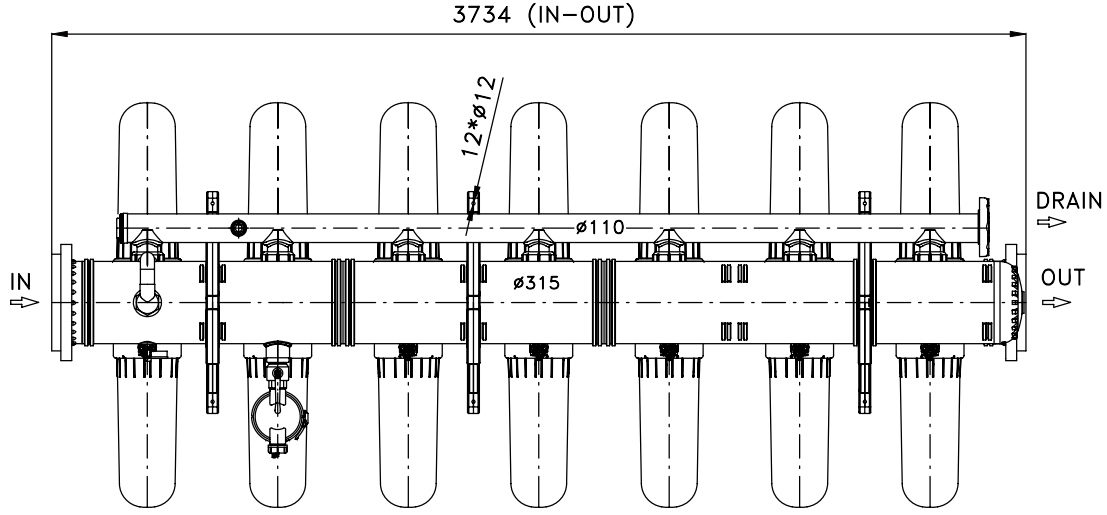
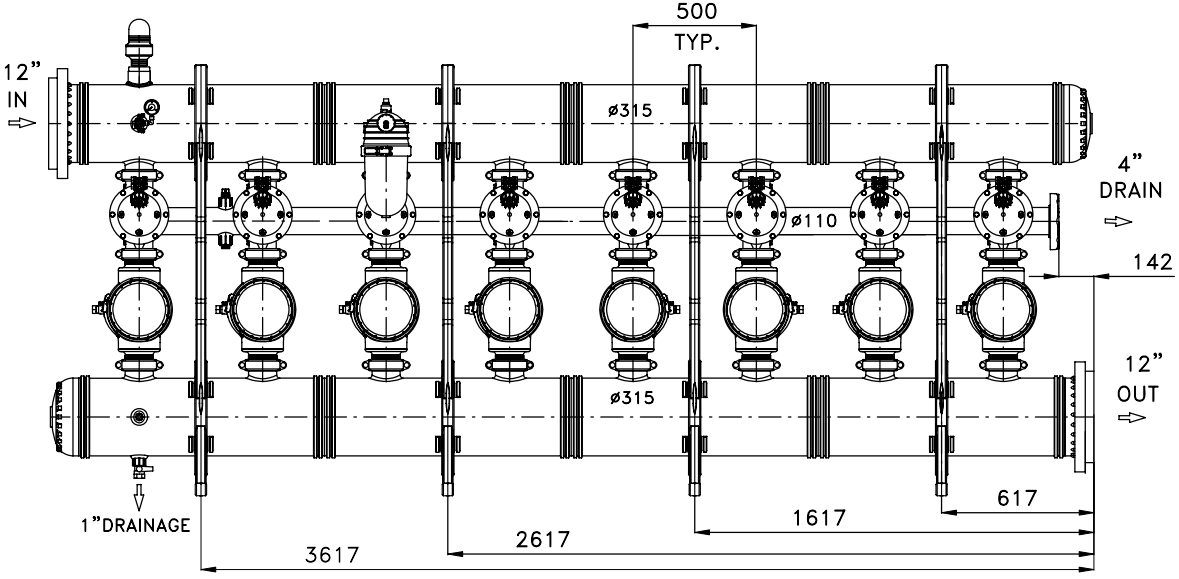
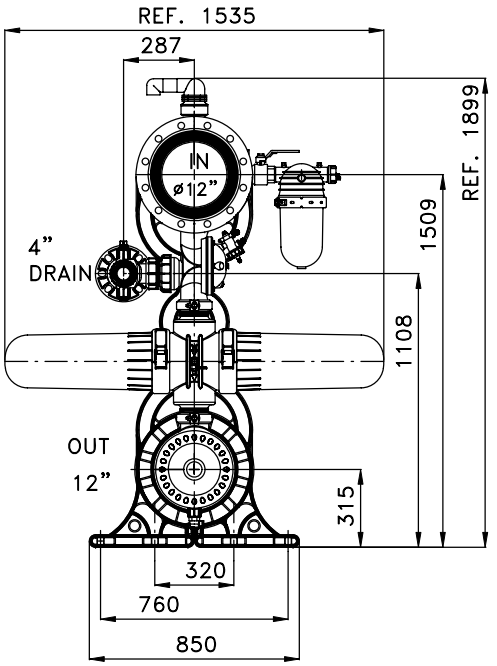
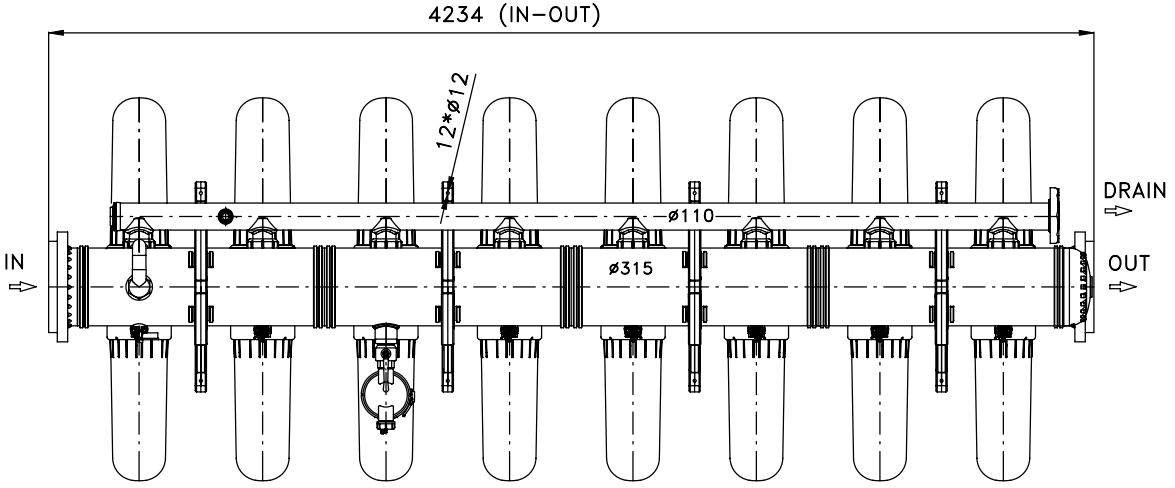
TYP.
12"
IN
ø315
ø110
4"
DRAIN
142
12"
OUT
ø315
1"DRAINAGE
617
2117
3117


REF. 1535
287
IN
ø12"
4"
DRAIN
REF. 1899
1509
1108
OUT
12"
315
320
760
850


3734 (IN-OUT)
12*ø12
ø110
DRAIN
IN
ø315
OUT







MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT 8*4" S.K. FILTERS PLASTIC BATTERY

TITLE ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544H1208_2

PATH BATERIES\4INCH\APOLO\PLASLITE\PLASTIC

FILE CODE 4544H1208_2

FILE CODE DRAWING OF MANIFOLD: 6544 1208_2, 2253 1210, PALET-519(5201 5023)

	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	01.03.10	
CHECKED	NIKOLAY	01.03.10	
APPROVED	EYAL	01.03.10	
	IRINA	01.03.10	IRINA

BACKUP: DISK-34

DRAWER N: 5070

NEW ARKAL
4" Spin Klin Apollo L.C.E

Low Cost Energy
Automatic Disc Filter
Filter that can flush at 1.5 bar (22 psi)

Product Advantages:

- Proven depth filtration technology
- Will flush at low pressure (1.5 bar - 22 psi)
- Flushing at low pressure uses less energy and will save money
- Will increase profitability

Applications:

- Surface water with algae and organic debris
- Well water
- For low pressure systems where higher pressures are not available or are too costly

Technical Data:

Max. operating pressure	6 bar	87 psi
Min. operating pressure	1 bar	14 psi
Min. backwash pressure (downstream backwash pressure)	1.5 bar	22 psi
Backwash flow rate per unit	40 m^3/h	175 gpm
Max. temperature	60° C	140° F
pH	4-11	4-11

	3 units	4 units	5 units	6 units	3 units	4 units	5 units	6 units
Max. flow rate 400-130 µ	225m^3/h	300m^3/h	375m^3/h	450m^3/h	990gpm	1320gpm	1650gpm	1980gpm
Max. flow rate 100 µ	215m^3/h	290m^3/h	360m^3/h	430m^3/h	947gpm	1227gpm	1585gpm	1894gpm
Filtration surface area	15720cm^2	20960cm^2	26200cm^2	31440cm^2	2435$inch^2$	3245$inch^2$	4055$inch^2$	4865$inch^2$
Filtration volume	18852cm^3	25136cm^3	31420cm^3	37704cm^3	1150$inch^3$	1534$inch^3$	1917$inch^3$	2301$inch^3$

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

4"SK APOLLO LCE 9604 0001EN 03/10

L.C.E.

4" Spin Klin Twin Apollo Battery

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

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1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the Spin Klin Apollo filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

1. Confirm filter draining prior to service.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
4. Confirm that filter weight, when full, meets the support construction requirements.
5. Prior to installation confirm that line pressure matches filter's operational pressure.
6. During installation, use standard flanges and connections only.
7. Check that all filter flange bolts are properly secured.
8. Please note, the filter enters a flushing mode automatically, without prior warning.
9. Use original parts only when servicing the filter.
10. Arkal cannot accept responsibility for any changes or modifications to the equipment.

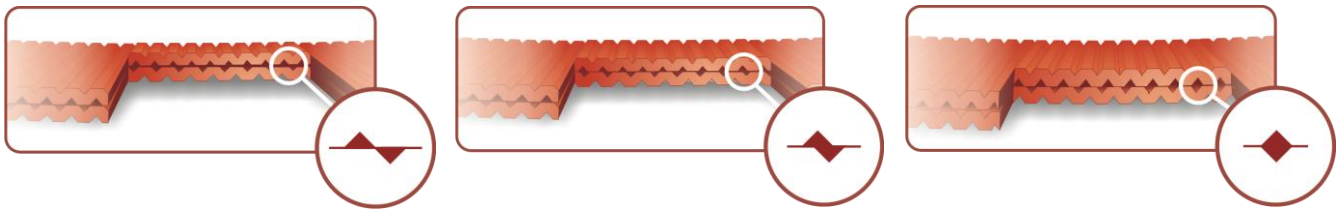
Special Note

Before opening the filter clamp, check that there is no pressure in the filter.

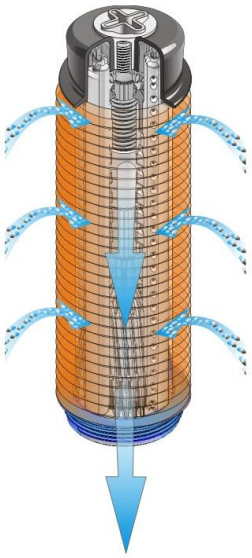
3. Description and Operation

Table of Filtration Grades of the Discs and Color Code

Color Code	Blue	Yellow	Red	Black
Mesh	40	80	120	140
Micron	400	200	130	100

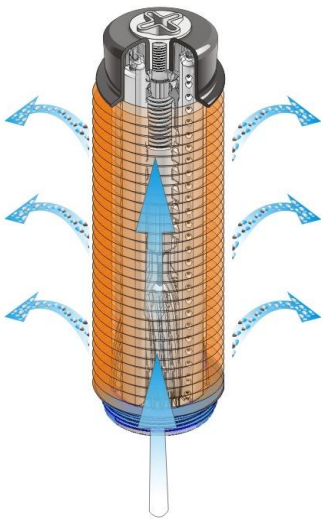


Spin Klin Spine - The Core of the Spin Klin Filtration System



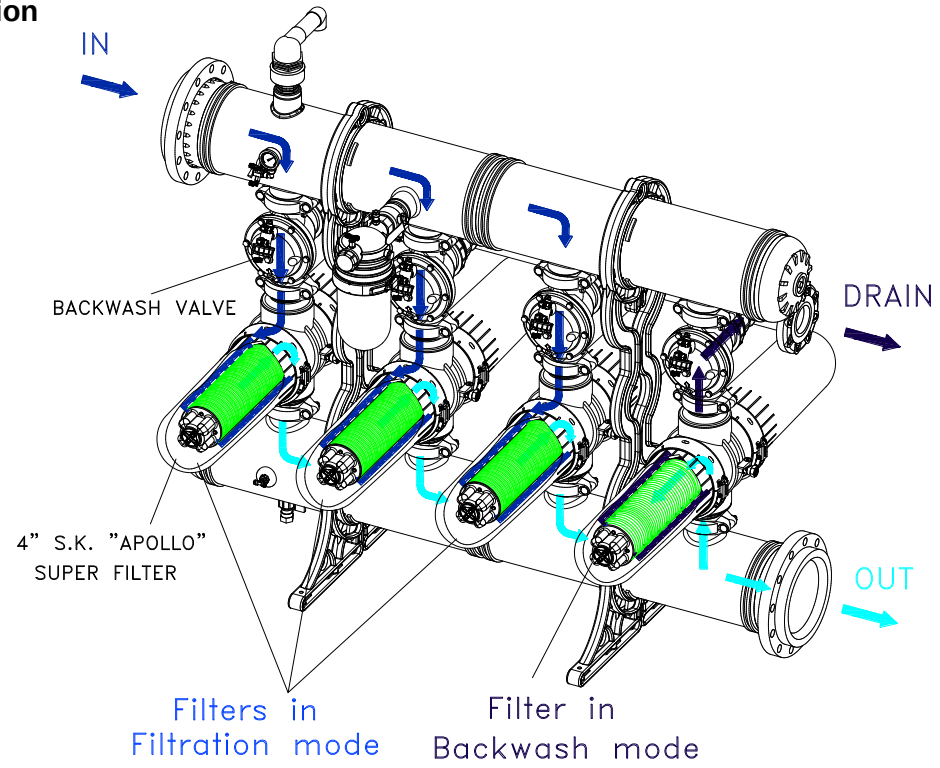
The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the micron housing. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.

Spin Klin Automatic Backwash Operation



Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.

3.3 Mode of Operation



Filtration Process

During the filtration process the water flows through the inlet manifold, reaching the filters through the backwash valves. The filtered water flow through the outlet manifold into the system.

Backwash Process

The backwash process begins with a signal from the control unit activated by the pressure difference between the inlet and outlet or by time.

This signal is transported to the booster valve (assembled on 4"x 3"inlet valve No.1).

The booster valve opens, causing the No.1 valve to close the 4" inlet to the filter and open the 3" drain port.

Filter No.1 is now in a backwash mode.

The Spin Klin spine in filter No.1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied from the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is between 20 -25 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

The solenoid releases the water pressure signal allowing the inlet valve and the discs of the spine to return to filtration mode.

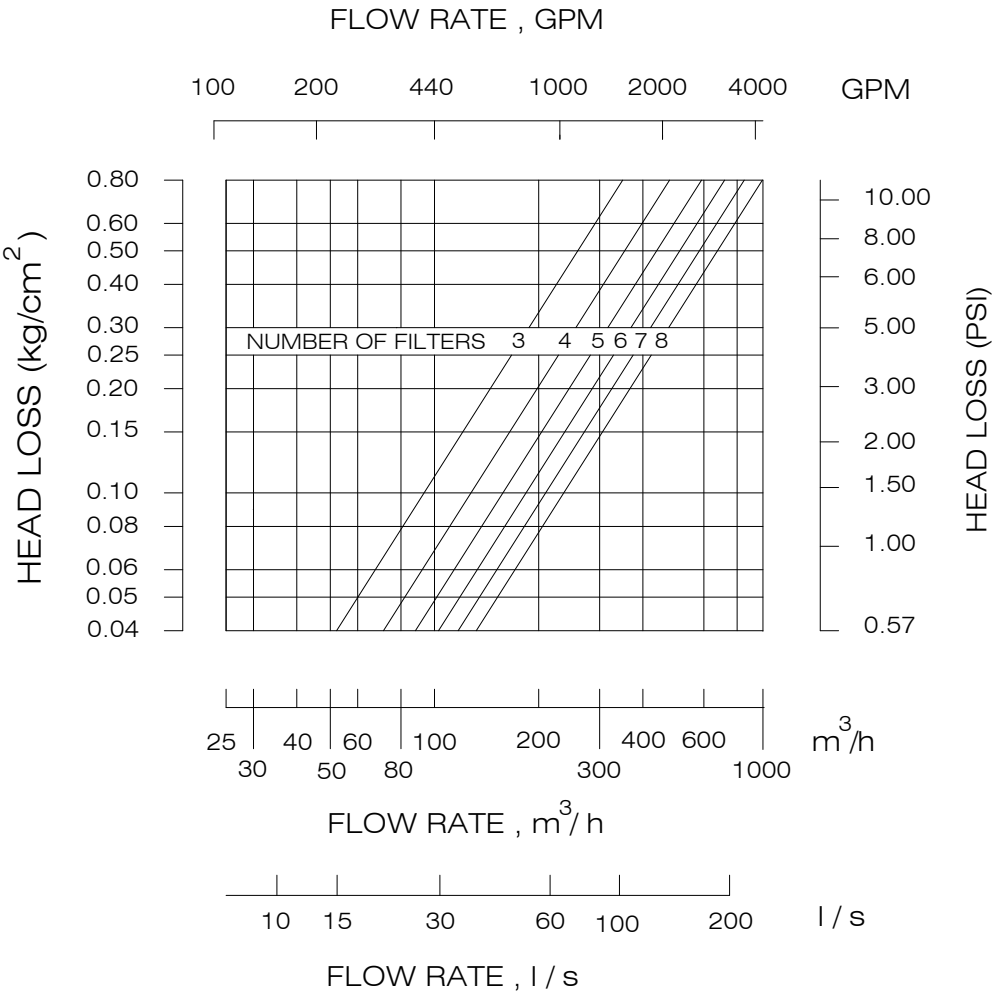
Once filter No.1 is in the filtration position again the control unit sends a signal to begin the backwash process in filter No.2.

4. Technical Data

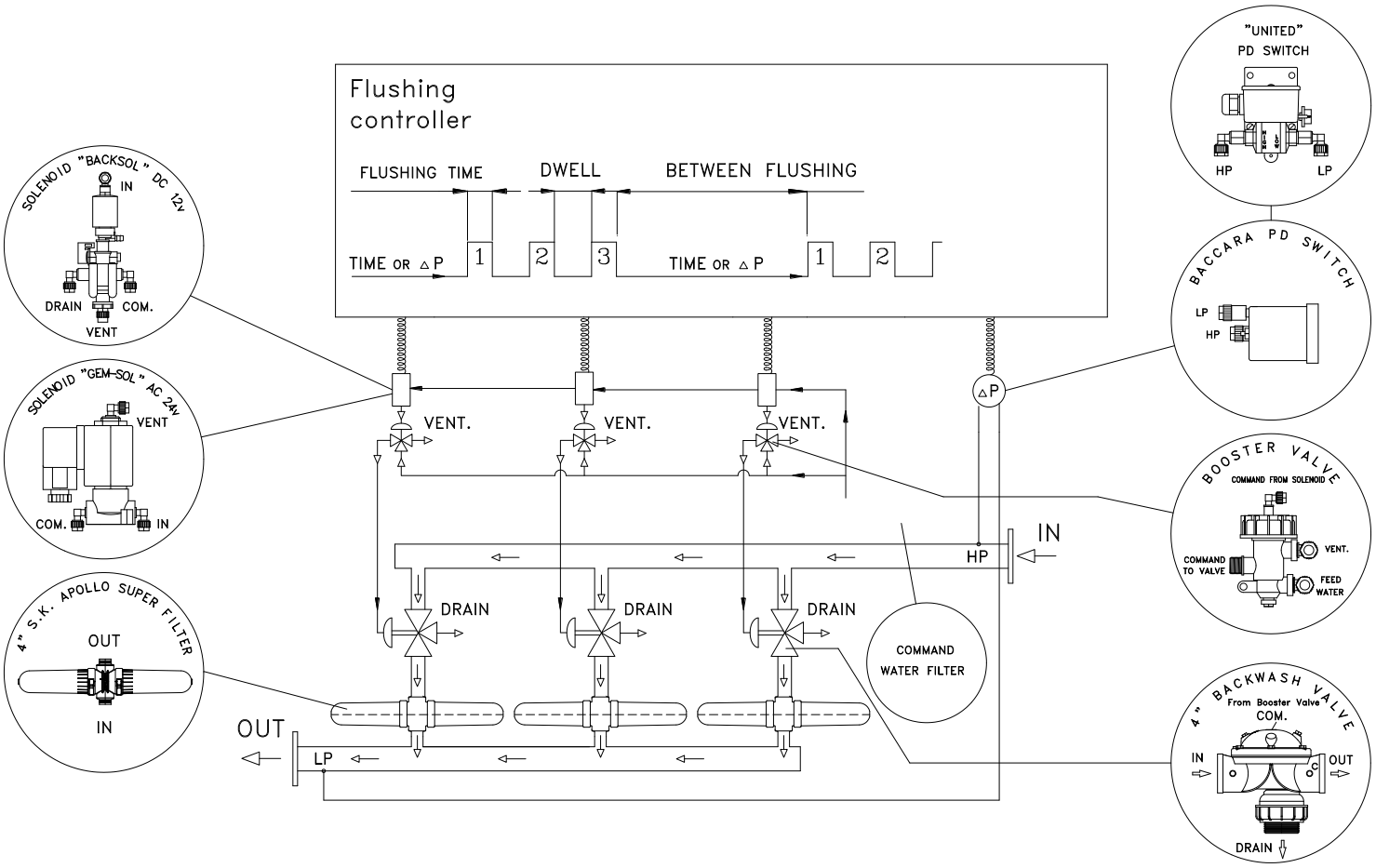
			3 Units	4 Units	5 Units	6 Units	7 Units	8 Units
Max. pressure		bar/psi	6/87	6/87	6/87	6/87	6/87	6/87
Min. backwash pressure down streem*		bar/psi	1.5/22	1.5/22	1.5/22	1.5/22	1.5/22	1.5/22
Max. recommended flow rate *	**400-130µ**	m^3/h/gpm	225/990	300/1,320	375/1,650	450/1,980	525/2,300	600/2,640
	100µ	m^3/h/gpm	215/947	290/1,277	360/1,585	430/1,894	505/2,224	580/2,554
Filtration surface area		cm^2/in^2	15,720/2,435	20,960/3,245	26,200/4,055	31,440/4,865	36,680/5,675	41,920/6,485
Filtration volume		cm^3/in^3	18,852/1,150	25,136/1,534	31,420/1,917	37,704/2,301	43,988/2,684	50,272/3,068
Backwash flow per filter		m^3/h/gpm	40/175	40/175	40/175	40/175	40/175	40/175
Backwash volume		m^3/gallon	0.8/210	1/265	1.3/340	1.6/420	1.9/500	2.1/550
System length - L		mm/inch	1,450/57	2,240/88	2,740/108	3,240/128	3,740/147	4,240/167
System width - W		mm/inch	1,533/60	1,533/60	1,533/60	1,533/60	1,533/60	1,533/60
System height - H		mm/inch	1,699/67	1,833/72	1,833/72	1,833/72	1,930/76	1,930/76
Standard diameter		mm/inch	200/8	280/10	280/10	280/10	315/12	315/12

* depended on the water quality

5. Batteries Headloss Chart - 130 micron



6. P & ID



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 4-6 meters (5-9 psi). 5 meter / 7 psi is recommended. The DP set point recommended here (to activate the backwash) is a general guideline; it may need to be adjusted for conditions of low pressure and/or poor water quality.
- Set the controller to a flush time of 20-25 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

7. Apollo Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve. Release the static pressure by opening the drain valve. Remove the cover. Thoroughly clean the filter element and then reassembly the command filter element and cover, then open the inlet valve.

NOTE:

Due to low operating pressure, and depending on water qualities, manual cleaning of the discs may be seasonally required.

This is done as follows:

1. Close the downstream (flow control) valve (if available)
2. Perform a few flush cycles until clean
3. Slowly reopen the downstream valve
4. If the pressure differential remains high, check and see if the flow rate is too high (an excessively high flow rate through the filter will cause a high pressure loss).

Winterization:

In order to prevent the filter battery becoming damaged during water freezing – drain all the water from the filter battery, the command filter and the backwash valves.

SEASONAL MAINTENANCE - DISCS

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. Make sure that there is no pressure in the system, pull out the safety pin, open the clamp and remove the cover. (**Figure 1, 2**)

Unscrew the butterfly nuts on the filtration elements.

Remove the tightening cylinders. (**Figure 3, 4**)

Remove the disc sets (for convenience we recommend using a plastic bag). (**Figure 5, 6**)

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to “Cleaning Recommendations Clogged Filtration Discs”. (**Figure 7**)

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (**Figure 8**)

Tighten the butterfly nut until the stopping point. (**Figure 9**)

Place the filter cover on the filter body and secure it with a slight clockwise rotation. Reposition clamp onto the cover and close using the lever. (**Figure 10**)

Tighten the clamp. Insert the safety pin. (**Figure 11**)

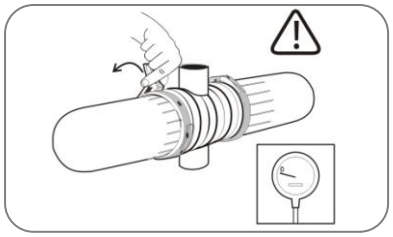
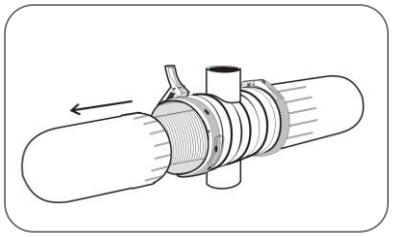


Figure 1



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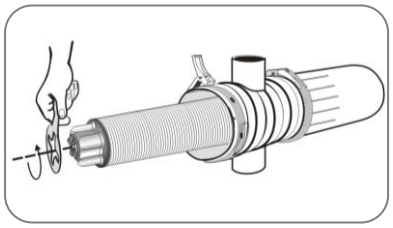

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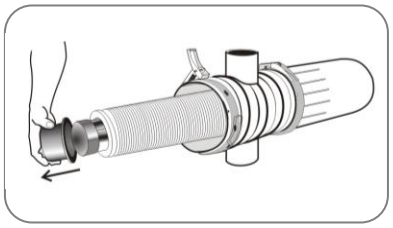

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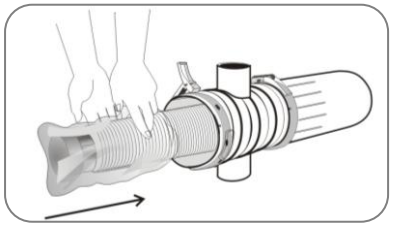

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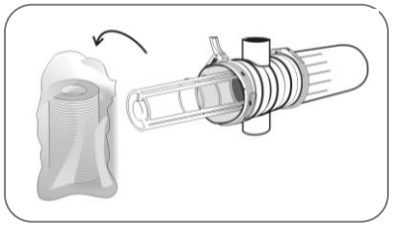

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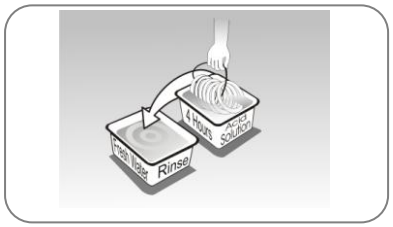

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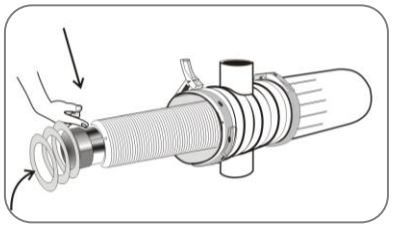

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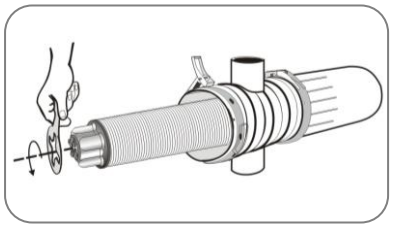

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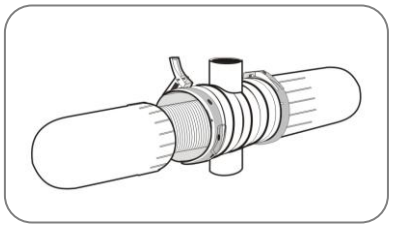

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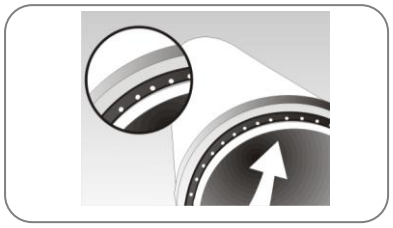


Figure 11

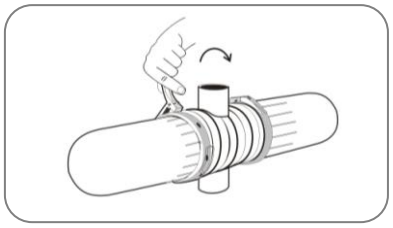
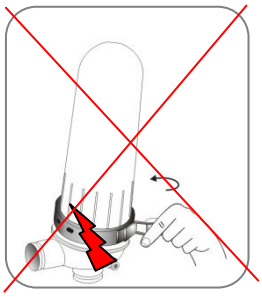


Figure 12

Attention:

When carrying out any of the following seasonal maintenance, service, or cleaning the discs – After backwashing the system and after closing the water inlet, **make sure that there is no pressure in the system!**

Please Note:



- Before removing the cover you may experience the vacuum phenomenon – which will make the removing of the cover very difficult or almost impossible.
- **Do Not** - insert any sharp tools (objects) in between the cover and the body! You may damage the hydraulic seal and the cover!
- In order to remove the cover easily – **you should drain the water from the filter**!
- You may drain the filter through the drain valve located on the filter body, once the filter is empty the cover can then be removed safely and easily.

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

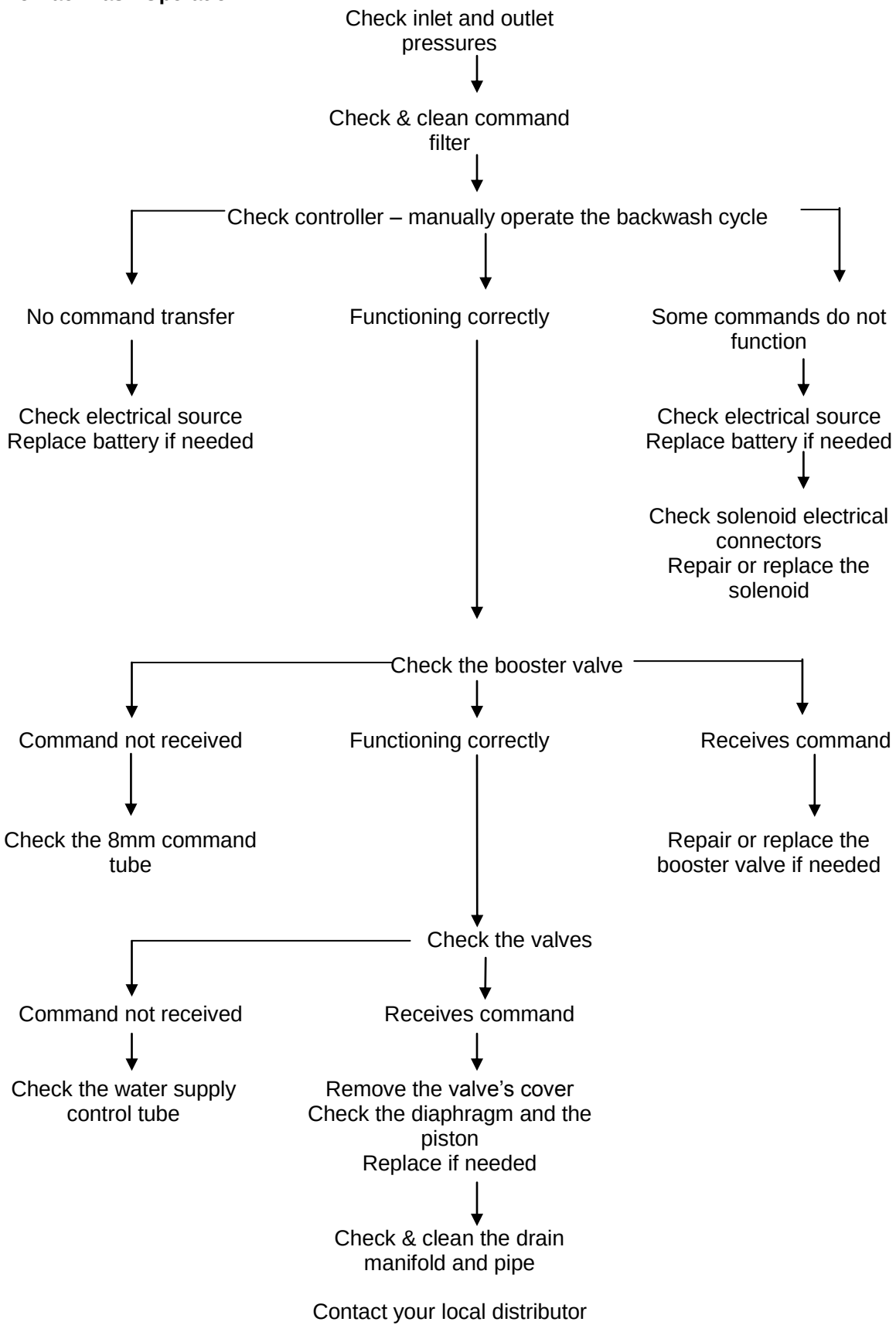
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes. If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

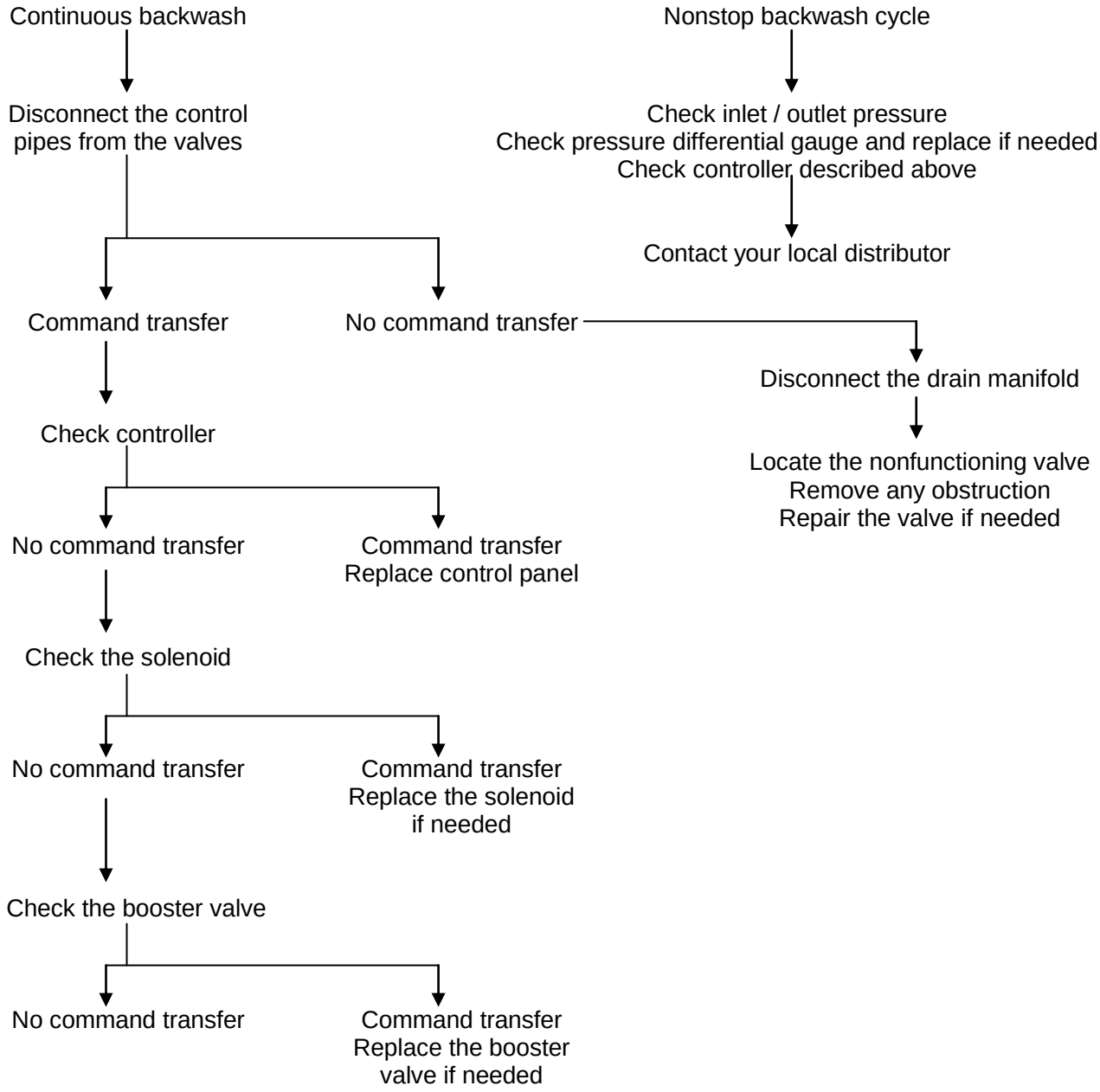
8. Troubleshooting

No Backwash Operation



Identifying Malfunctions in the Apollo system

Continuous or Non-stop Backwashing



Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

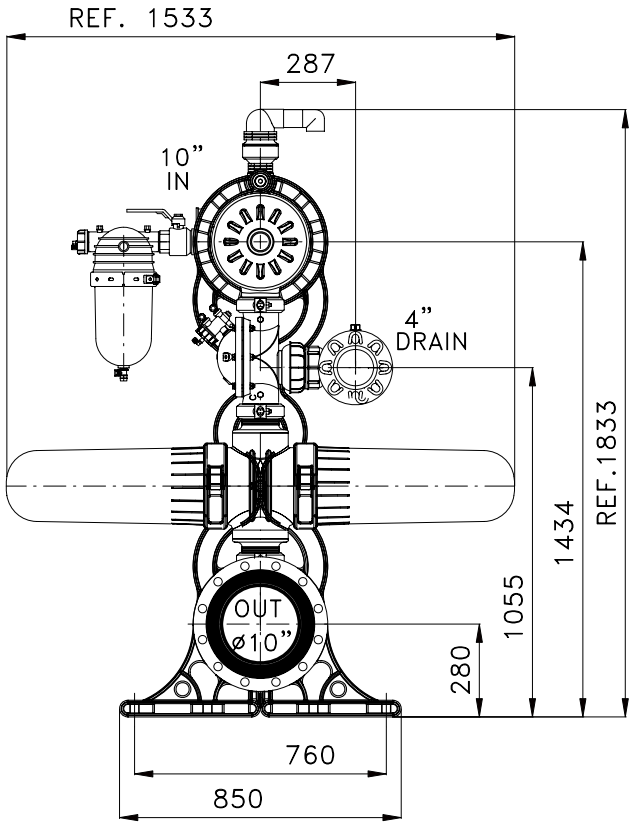
No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

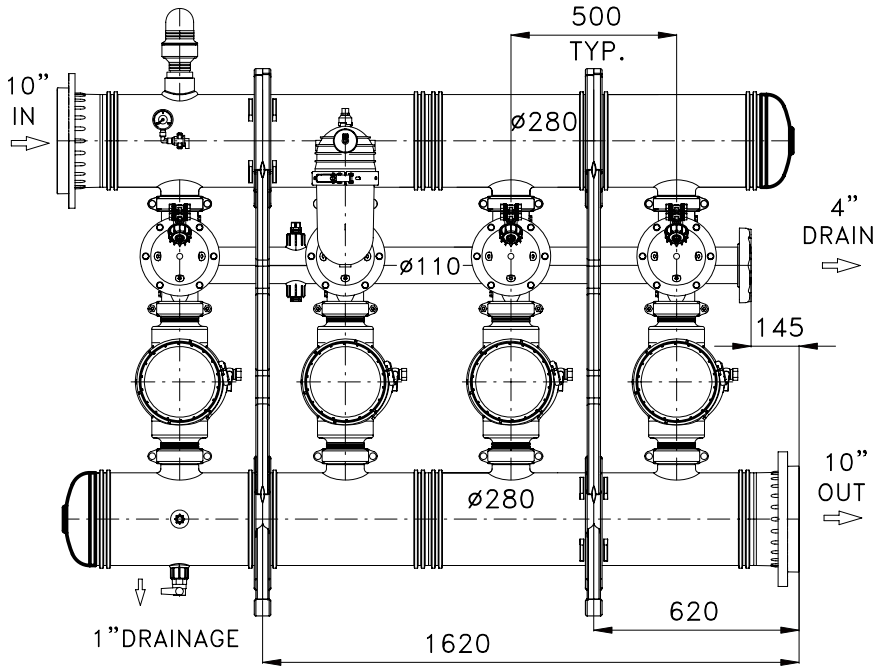
THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

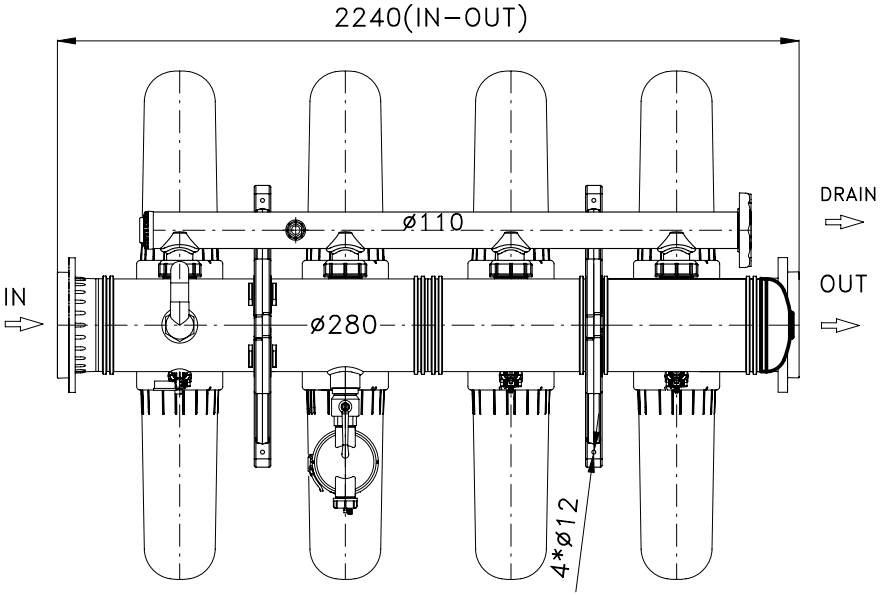
Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Drawings

4" Apollo Twin L.C.E Batteries







MODIFIC.	DATE	DESCRIPTION	SIGN.
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PROJECT
4*4" S.K. FILTERS PLASTIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No:
4544H1004_2LC

PATH BATERIES\4INCH\APOLO
PLASLITE\PLASTIC

FILE CODE
4544H1004_2LC

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CHECKED	NIKOLAY	04.02.10
APPROVED	ZALI	04.02.10

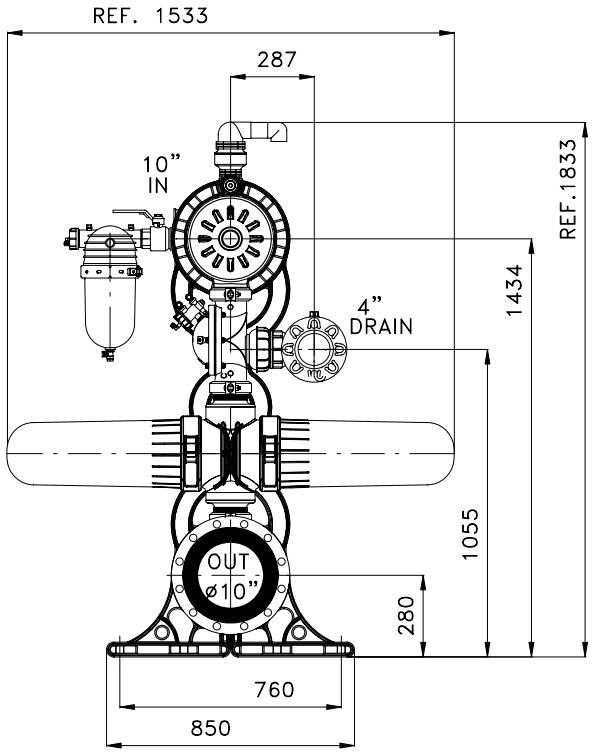
NAME: IRINA
DATE: 04.02.10
SIGNATURE: IRINA

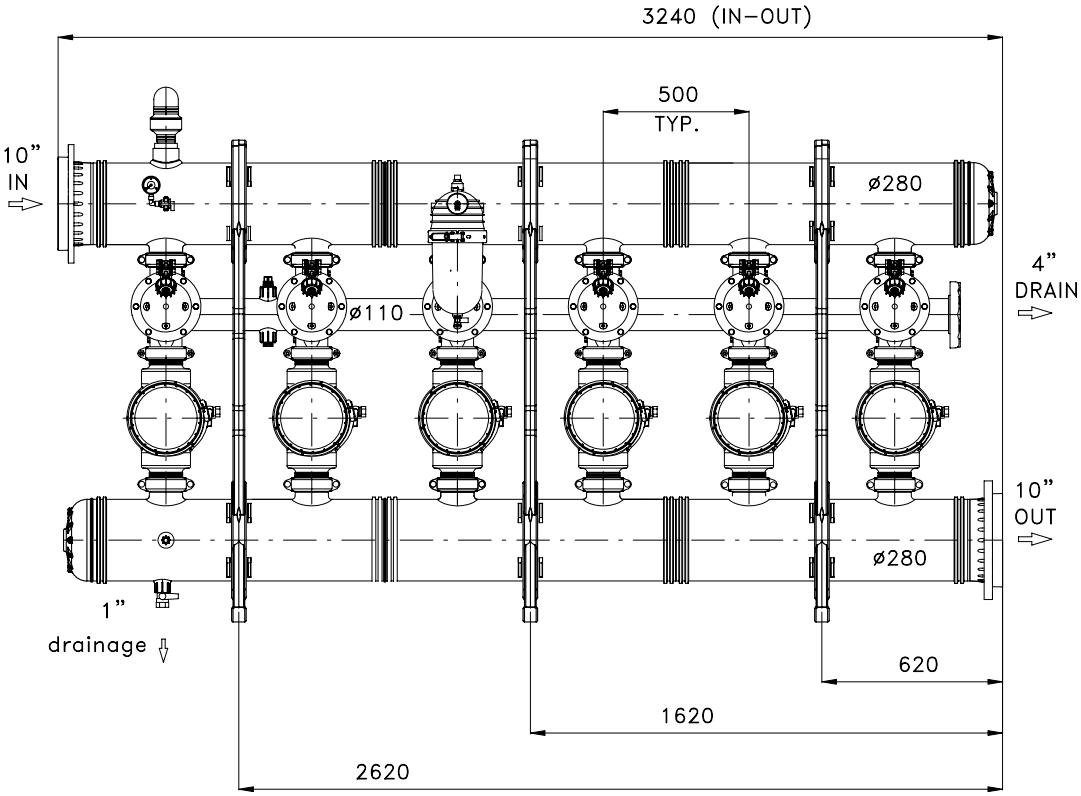
FILE CODE DRAWING OF MANIFOLD:
6544 1004_2
2253 1001,
PALET-517 (5201 5021)

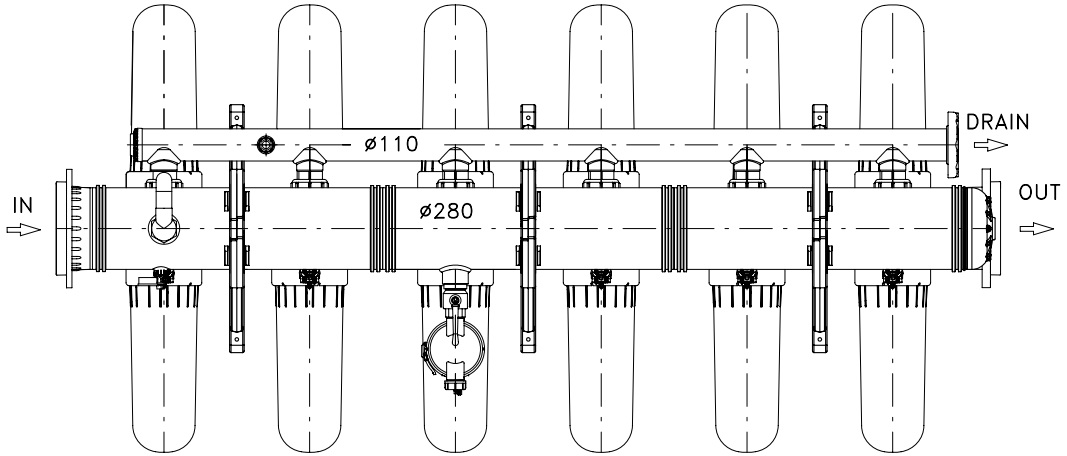
BACKUP:
DISK-34

DRAWER N:
5070

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL







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PROJECT: 6*4" S.K. FILTERS PLASTIC BATTERY

PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 4544H1006_2LC

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DRAWN	MAYA	04.02.10	IRINA
CHECKED	NIKOLAY	04.02.10	
APPROVED	ZALI	04.02.10	

PATH BATERIES\4INCH\APOLO PLASLITE\PLASTIC

FILE CODE: 4544H1006_2LC

FILE CODE DRAWING OF MANIFOLD: 6544 1006_2(1-2), 2253 1001, PALET-518 (5201 5022)

BACKUP: DISK-34

DRAWER N: 5070

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
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FAX. 972-4-6775461
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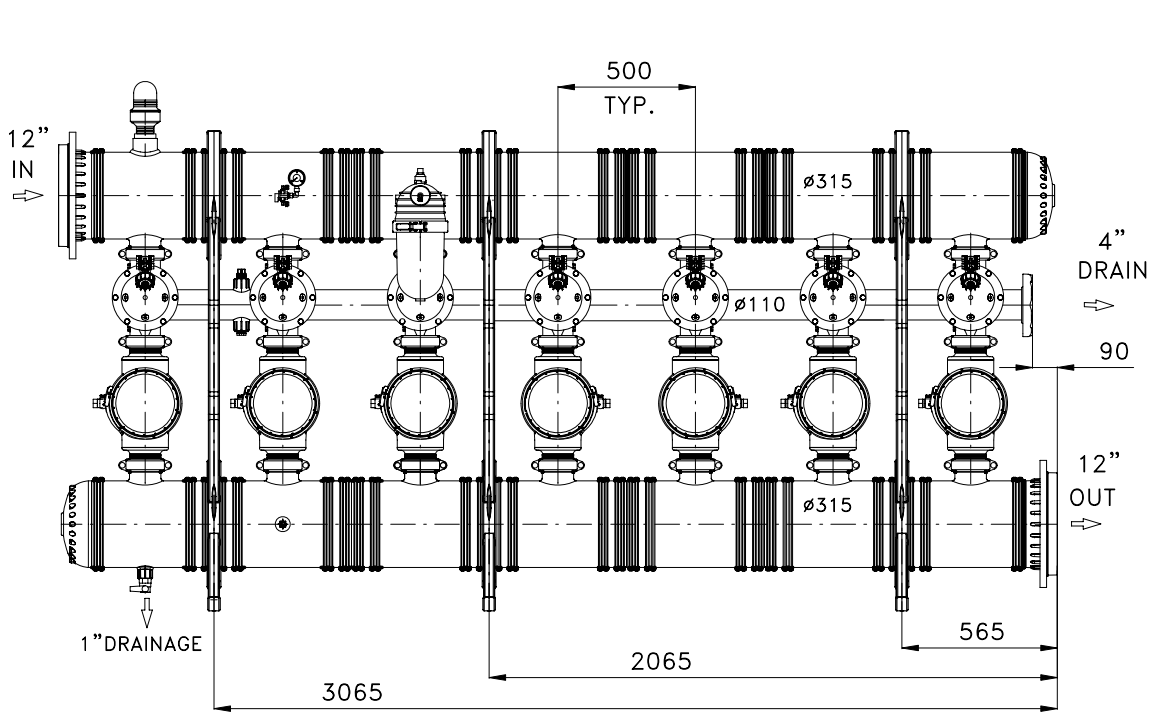

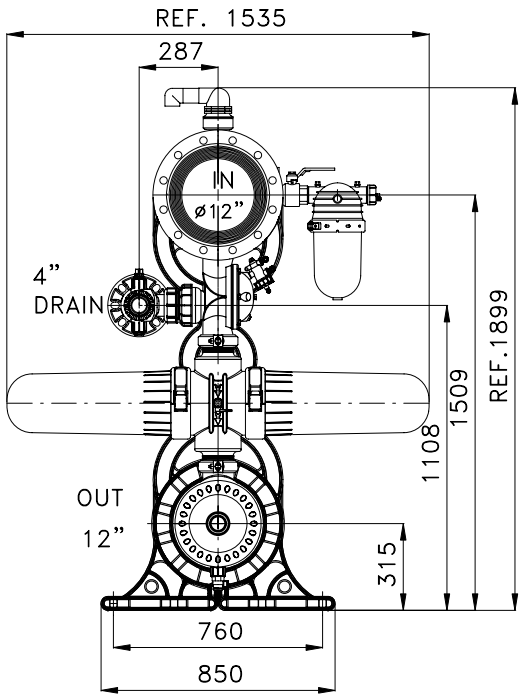

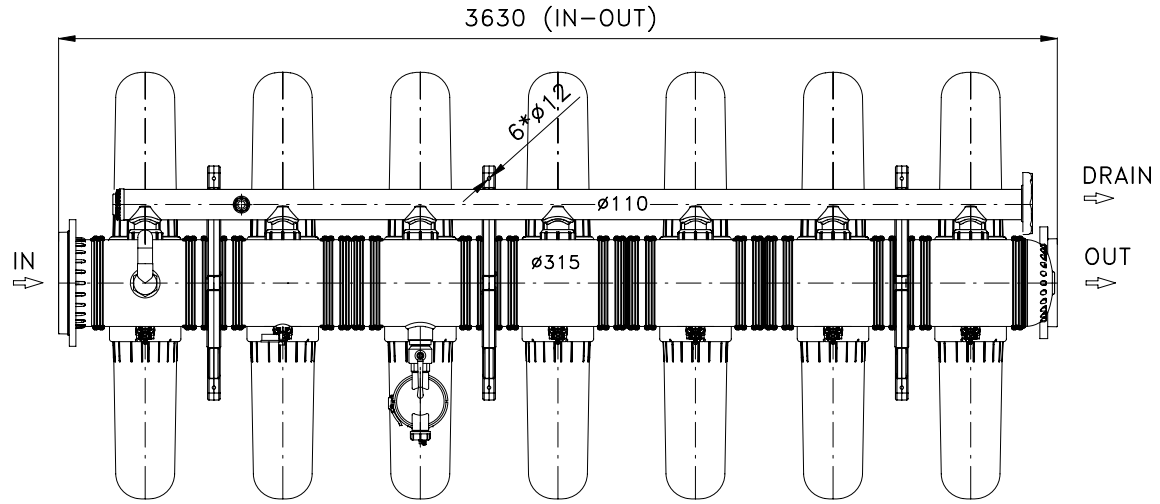

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PROJECT 7*4" S.K. FILTERS PLASTIC BATTERY

TITLE ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No: 4544H1207_2LC

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CHECKED		01.03.10
APPROVED		01.03.10

PATH BATERIES\4INCH\APOLO\PLASLITE\PLASTIC

FILE CODE 4544H1207_2LC

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	NAME	DATE	SIGNATURE
	IRINA	01.03.10	

BACKUP: DISK-34

DRAWER N: 5070

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FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
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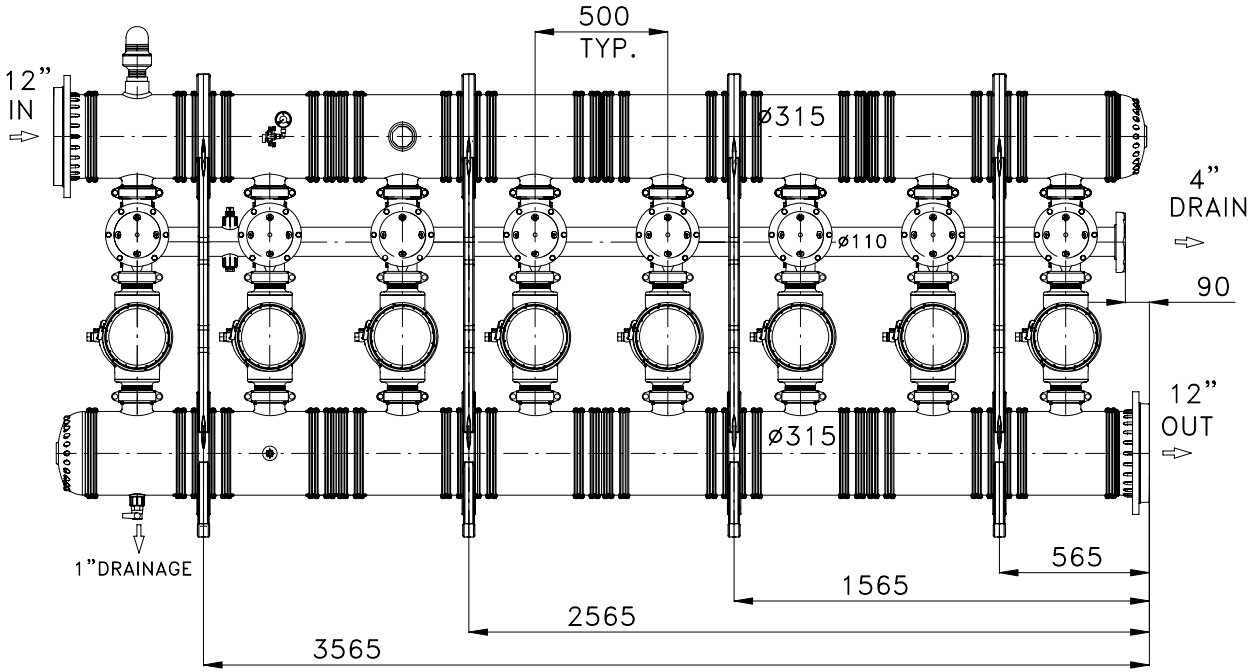

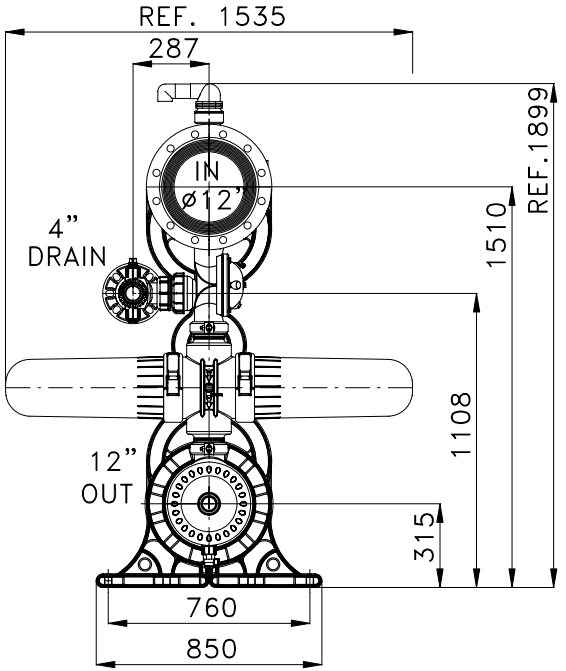

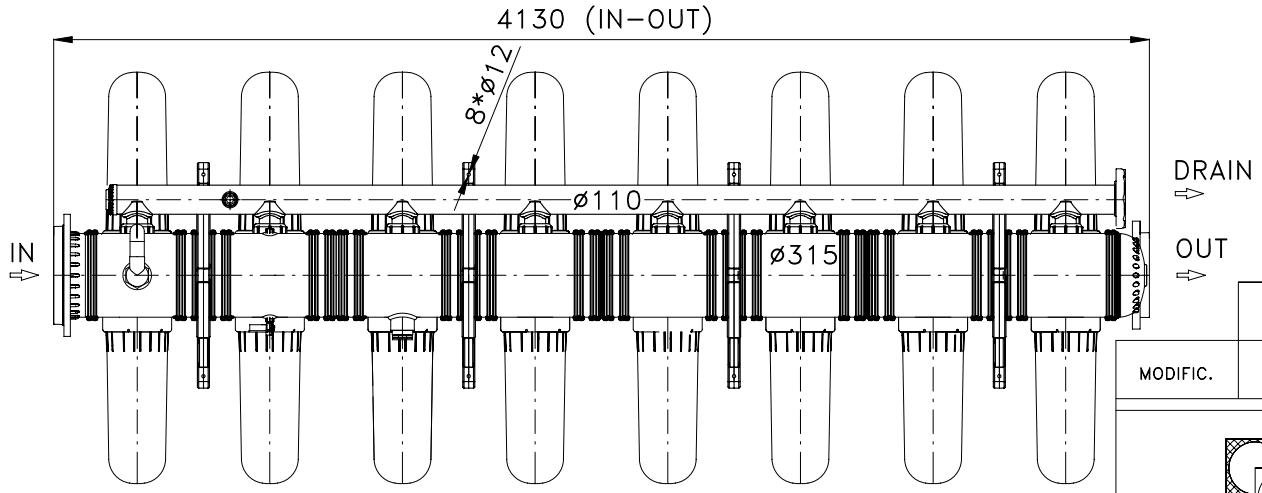

MODIFIC.	DATE	DESCRIPTION	SIGN.
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ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 8*4" S.K. FILTERS PLASTIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4544P1208_2LC

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	NAME	DATE
DRAWN	PABLO	29.12.09
CHECKED	NIKOLAY	29.12.09
APPROVED	CHEN	29.12.09

FILE CODE DRAWING OF MANIFOLD: 6544 1208_2

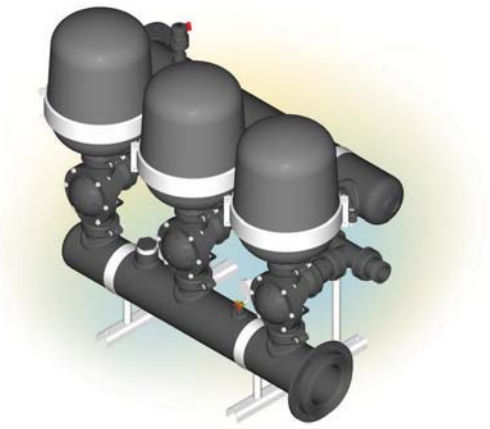
PALET-447(5201 5953)

BACKUP: DISK-34

DRAWER N: 5070

Galaxy Polymer

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for high flow rates
- Continuous flow during backwash
- Plastic parts - corrosion free
- Highly durable filter element
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm^2**	4,400	**in^2**	680
Filtration volume per unit	**cm^3**	6,600	**in^3**	410
Backwash water volume per unit	**lit**	165	**gal**	44

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m^3/h**						**gpm**					
400-130 µ	Good	300	400	500	600	700	800	1320	1760	2200	2640	3080	3520
	Average	225	300	375	450	525	600	990	1320	1650	1980	2310	2640
	Poor	150	200	250	300	350	400	660	880	1100	1320	1540	1760
	Very Poor	100*	130	160	200	230	260	435*	580	725	870	1015	1160
100-70 µ	Good	270	360	450	540	630	720	1190	1585	1980	2375	2770	3165
	Average	205	270	340	410	480	550	900	1200	1500	1800	2100	2400
	Poor	135*	180	225	270	315	360	600*	800	1000	1200	1400	1600
	Very Poor	90**	120	150	180	210	240	400**	530	660	790	920	1050
55-40 µ	Good	170	225	280	335	390	445	750	990	1235	1480	1725	1970
	Average	125*	165	210	255	300	345	555*	740	925	1110	1295	1480
	Poor	85**	110*	140	170	200	230	370**	490*	615	740	865	990
	Very Poor	60**	80**	100*	120*	140	160	260**	340**	430*	520*	610	700
20 µ	Good	N/A***	N/A***	140	170	200	230	N/A***	N/A***	630	745	870	995
	Average	N/A***	N/A***	105*	125*	150	175	N/A***	N/A***	475*	565*	660	755
	Poor	N/A***	N/A***	70**	85**	100*	115*	N/A***	N/A***	310**	370**	435*	500*
	Very Poor	N/A***	N/A***	50**	60**	70**	80**	N/A***	N/A***	220**	260**	315*	350*

Higher flow rates available with additional unit design

* External source for backwash is necessary

** When pressure is low, it is necessary to close downstream valve during backwash

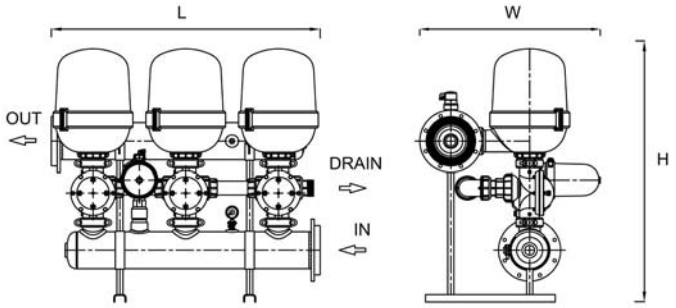
*** The 3" Spin Klin Battery is recommended

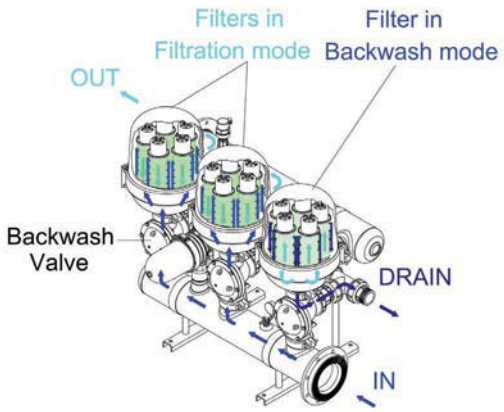
Galaxy Polymer

Filtration Batteries

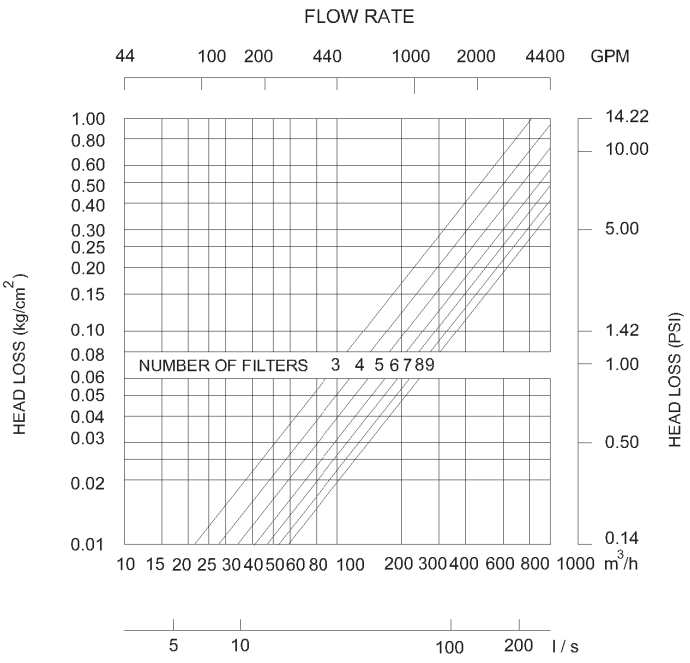
Dimensions and Weights

		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	**mm**	225	280	280	315	315	355	**inch**	8	10	10	12	12	14
L Length	**mm**	1450	1950	2450	1450	1950	1950	**inch**	57	77	96	57	77	77
H Height	**mm**	1405	1405	1405	1405	1405	1405	**inch**	55	55	55	55	55	55
W Width	**mm**	830	900	970	1450	1450	1510	**inch**	33	35	38	57	57	59
Shipping weight (approx.)	**kg**	290	370	485	610	720	912	**lbs**	638	814	1067	1342	1584	2006





Head Loss Chart, Clean State

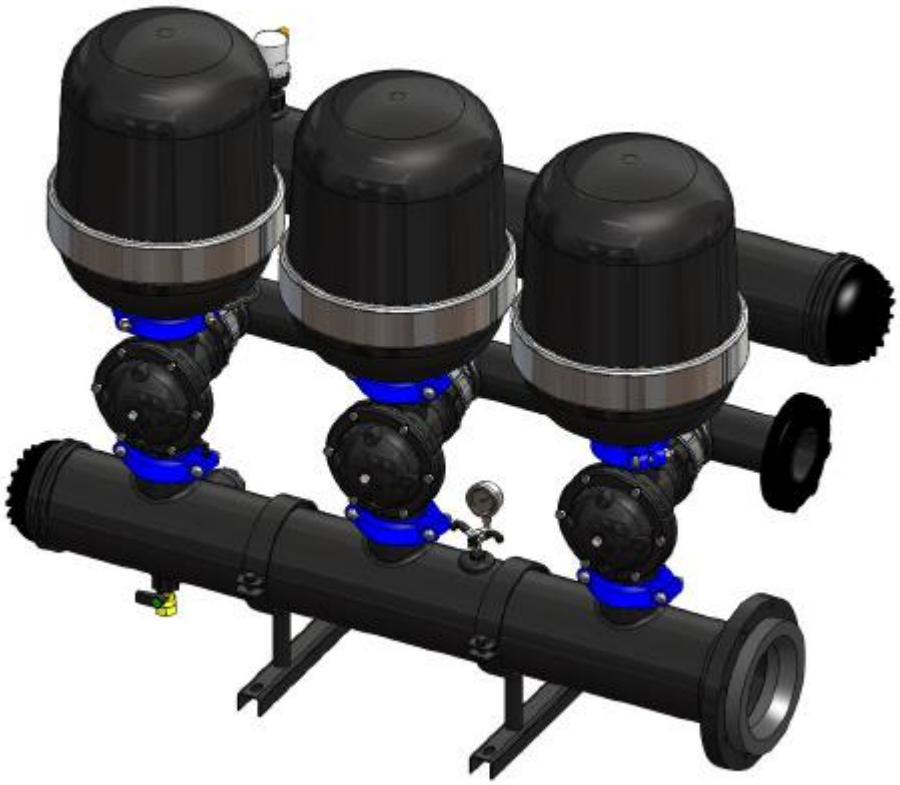


GALAXY Polymer batteries are available with:

Non Corrosive material valves

Arkal Spin Klin® 4” Battery

Service & Maintenance Manual



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1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the Spin Klin Galaxy filter. All Arkal's filters are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual.

2. Safety Instructions

Prior to installation or handling of the filter, read carefully the Installation and Operation Instructions carefully.

2. Confirm filter draining prior to service.
3. Take precautions while lifting, transporting or installing the filter.
4. Installation of the filter should be performed so as to avoid direct water splashing on any of the filter parts and especially on the electronic control unit.
5. Confirm that filter weight, when full, meets the support construction requirements.
6. Prior to installation confirm that line pressure matches filter's operational pressure.
7. During installation, use standard flanges and connections only.
8. Check that all filter flange bolts are properly secured.
9. Please note, the filter enters a flushing mode automatically, without prior warning.
10. Use original parts only when servicing the filter.
11. Arkal cannot accept responsibility for any changes or modifications to the equipment.

Special Note

Before opening the filter lock, check that there is no pressure in the filter.

3. Description & Operation

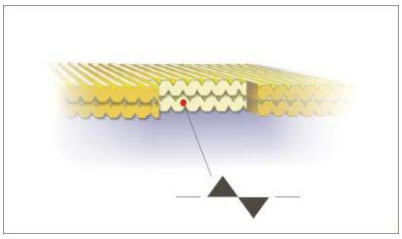
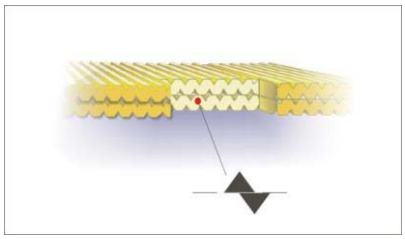
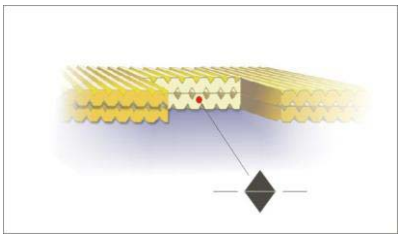
3.1 Disc Filtration Technology

Arkal Filtration Systems uses a specially designed disc filtration technology. Thin, color-coded polypropylene discs are diagonally grooved on both sides to a specific micron size. A series of these discs are then stacked and compressed on a specially designed spine. When stacked, the groove on top runs opposite to the groove below, creating a filtration element with a statistically significant series of valleys and traps for solids. The stack is enclosed in corrosion and pressure resistant housing.

During the filtration process, the filtration discs are tightly compressed together by the spring's power and the differential pressure, thus providing high filtration efficiency. Filtration occurs while water is percolation from the outer diameter to the inner diameter of the element. Depending on the micron rating, there are from 18 (in 400 micron discs) to 32 (in 20 micron discs) stopping points in each track, thus creating the unique in-depth filtration.

Table of Filtration Grades of the Discs and Color Code

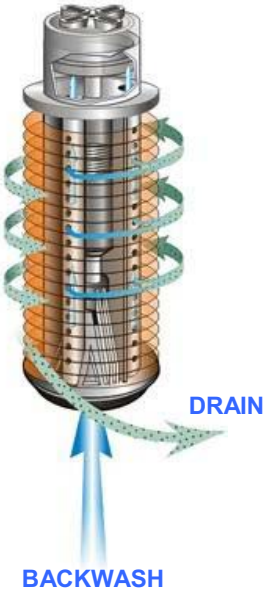
Color Code	Blue	Yellow	Red	Black	Brown	Green	Purple	Gray
Micron	400	200	130	100	70	55	40	20
Mesh	40	80	120	140				
PP								
Nylon								

3.2 Spin Klin Technology – Spin Klin Spine Model II

Spin Klin Spine - The Core of the Spin Klin Filtration System

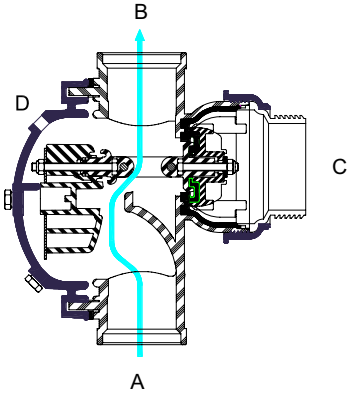
The Spin Klin® discs are stacked on the Spin Klin® spine. The discs are color-coded according to micron size, and are assembled to suit your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which operate during alternate filtration or backwash modes. The spine assembly is specially designed to compress the micron housing. Inside the housing a spring and the pressure difference compress the discs tightly during the filtration process, forcing the water to flow between the grooves and trap the solids.



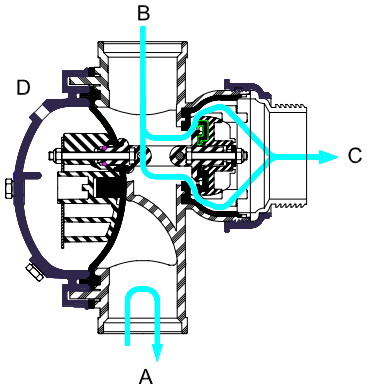
Spin Klin Automatic Backwash Operation

Activated by a predefined command (differential pressure or time) alternate units of the Spin Klin® system go into backwash mode. The inlet valve is shut as the drain is automatically opened. During the backwash process, the compression spring is released and the pressure difference is eliminated. The spine piston rises up, releasing the pressure on the discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.

Plaslite Backwash Valve

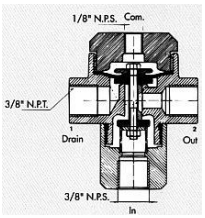


Filtration Mode

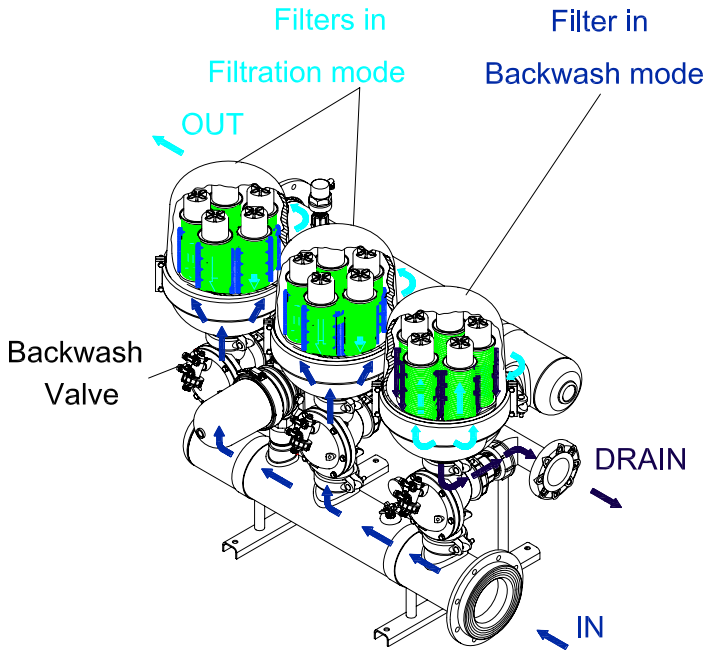


Backwash Mode

½" Booster Valve



3.3 Mode of Operation



Filtration Process

During the filtration process the water flows through the inlet manifold, reaching the 4” filters through the 4”x3” inlet valves. The filtered water gathers in the outlet manifold into the system.

Backwash Process

The backwash process begins with a signal from the control unit activated by the pressure difference between the inlet and outlet or by time.

This signal is transported to the booster valve (assembled on 4”x 3”inlet valve No.1).

The booster valve opens, causing the No.1 valve to close the 4” inlet to the filter and open the 3” drain port.

Filter No.1 is now in a backwash mode.

The 5 Spin Klin spines in filter No.1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied from the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is between 20 -25 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

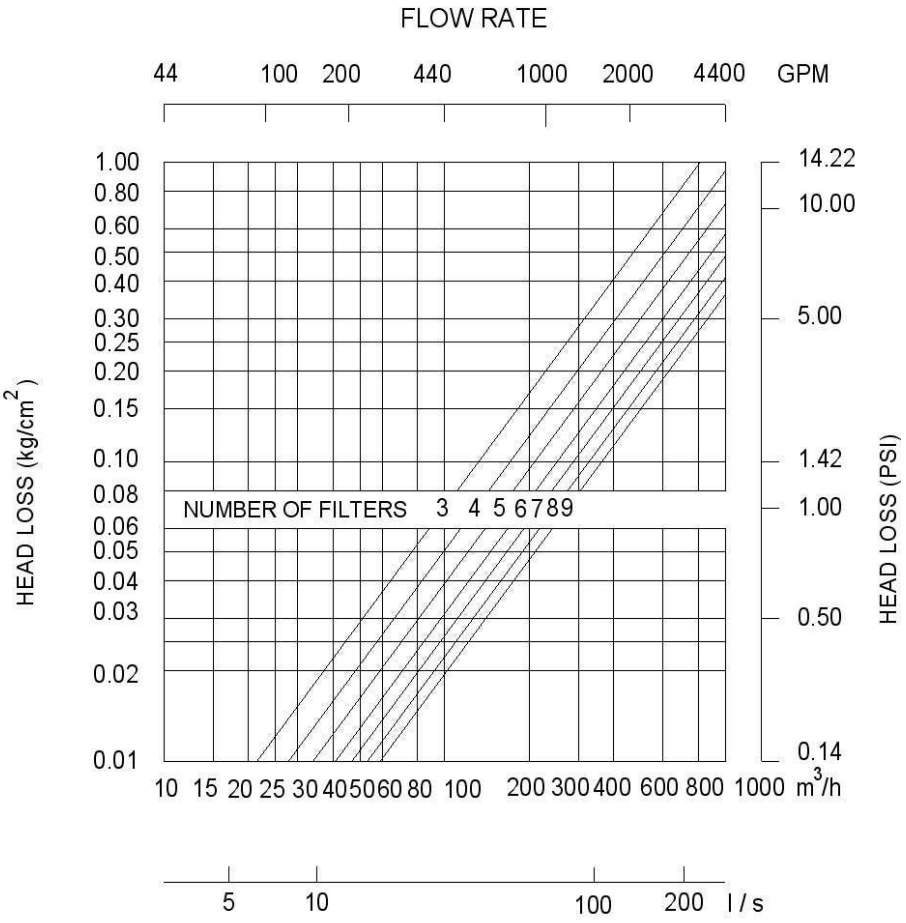
The solenoid releases the water pressure signal allowing the inlet valve and the discs of the 5 spines to return to filtration mode.

Once filter No.1 is in the filtration position again the control unit sends a signal to begin the backwash process in filter No.2.

4. Technical Data

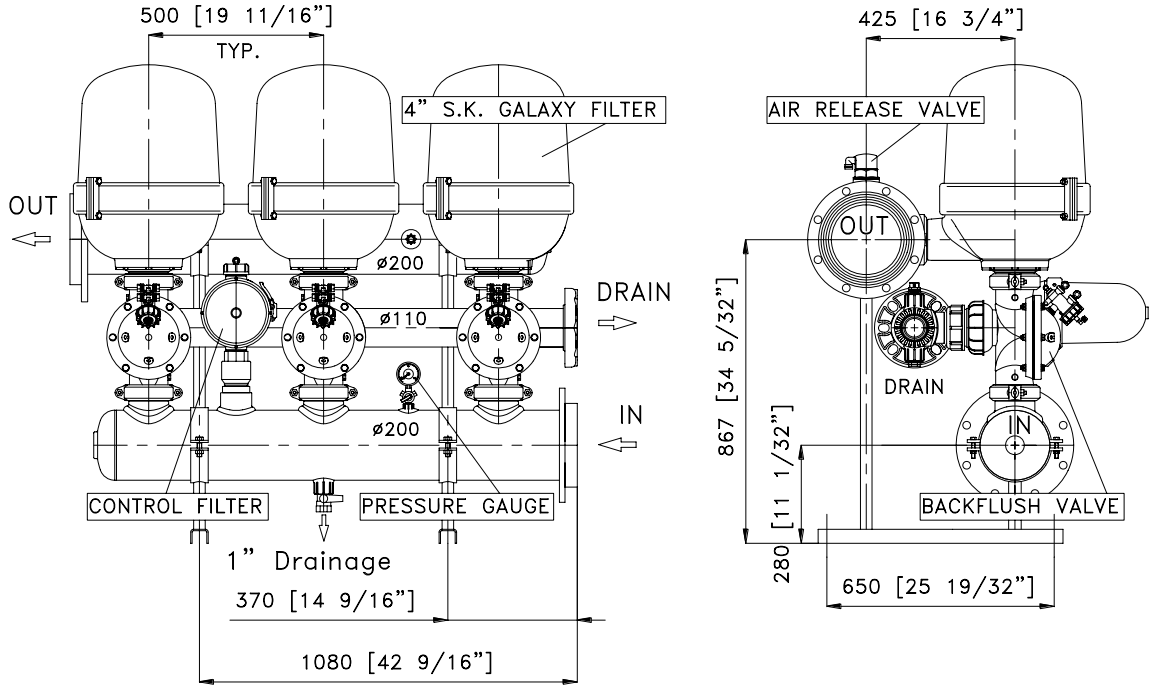
Parameters	Metric	US
Maximum pressure	10 bar	145 psi
Minimum pressure	2.8 bar	38 psi
Backwash flow rate per POD	40 m^3/h	176 gpm
Water volume per backwash	166 liters	44 gallons
Maximum temperature	70 °C	158 °F

5. Headloss Chart



6. Installation

Galaxy System with Plaslite valves



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).
B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).
C. Connect backwash drainage line.
D. Cover clamps need to be properly closed.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- Close the downstream (flow control) valve (if available).
- Flush few cycles until clean.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

7. Backwashing Controller – Filtron 246

The **FILTRON 246** is a very friendly backwashing controller designed and manufactured by **TALGIL** to meet the demands for a low cost easy to use controller. The FILTRON 246 exists in 3 sizes - with 2, 4 or 6 stations. **DC and AC** versions are available. The DC versions are powered by a 12V alkaline battery. The AC versions include transformer for 24V. The program selection is made by two **ROTARY SWITCHES** and an internal **DIP-SWITCH** enables to set the rarely changing parameters. An optional counter can be requested to count the number of backwashing cycles.

List of Features

- **DC** or **AC** versions available.
- Flushing triggered by Pressure Difference only.
- Flushing triggered by Pressure Difference and/or time intervals.
- User selectable parameters include:
  - Mode of operation: **Manual**, **DP** only, **DP** with time override.
  - Flushing cycle.
  - Flushing time.
  - Dwell time.
  - Differential pressurstat delay (response time to **DP**).
  - Number of consecutive backwash cycles caused by faulty **DP** that will be considered circular endless looping.
- Optional activation counter.
- Detecting and eliminating circular endless looping.

Program Selection

The two rotary switches on the front panel are used for selecting the desired backwashing program. The right switch selects the **FLUSHING MODE** and the left switch selects the **FLUSHING TIME PER STATION.**

Flushing Time Per Station		Flushing Mode	
180 SEC		OFF	
140 SEC	10 SEC	24 HOUR	DP
120 SEC	15 SEC	12 HOUR	MANUAL
60 SEC	20 SEC	6 HOUR	10MIN
60 SEC	25 SEC	3 HOUR	25 MIN
50 SEC	30 SEC	2 HOUR	40 MIN
40SEC		1 HOUR	

- When the right switch points to the **OFF** position the controller is switched off and no flushing will take place. he internal buzzer keeps sounding every 4 seconds to indicate that the controller is energized.
- When the right switch points to the **DP** position the controller will start backwashing only when the pressure differential indication is received
- When the right switch points to **MANUAL** position a single flushing cycle is initiated.
- In all the other positions of the right switch, the controller will flush according to the specified cycle or upon detection of the pressure differential signal, the one which occurs first.
- Changing the position of each of the switches will sound the buzzer. The right switch will make a longer beep at the **OFF** position and at the left switch the longer beep will be at the **10 SEC** position. The longer beep helps to adjust the knobs.

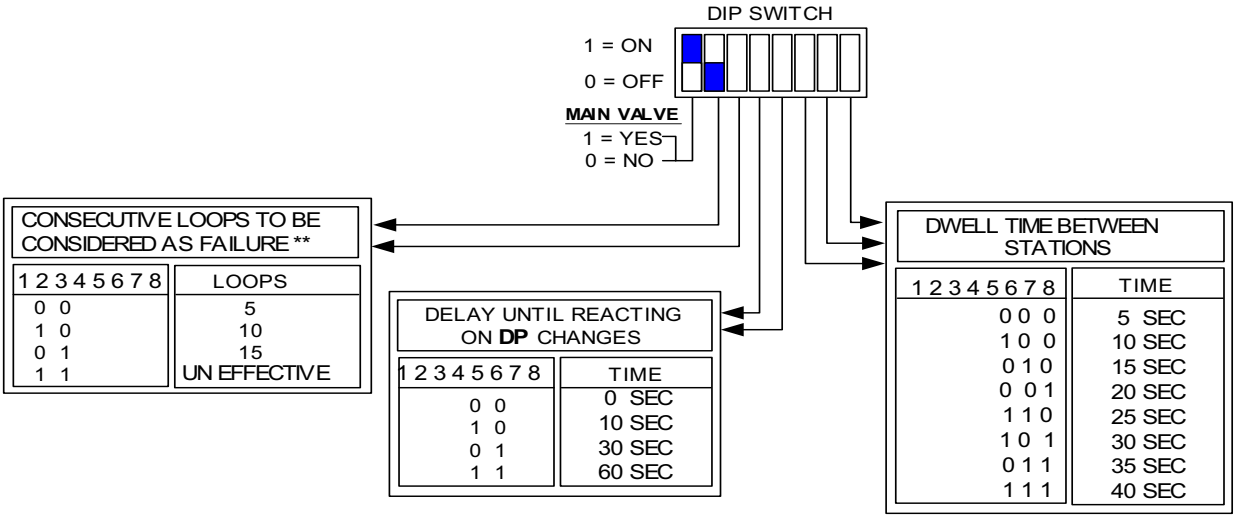
HOW TO READJUST THE KNOBS OF THE ROTARY SWITCHES IN CASE THEY GET LOOSE?

1. Keep turning the rotary switch clockwise until you hear the longer beep.
2. At the right switch, fasten the knob with the arrow pointing on **OFF**.
3. At the left switch, fasten the knob with the arrow pointing on **10 SEC**.

SETTING THE CONSTANT PARAMETERS

Three constant parameters can be set by the internal **DIP-SWITCH**, the following chart describes which of the switches is responsible for each parameter and what are the options.

The **DIP-SWITCH** is located at the bottom right corner of the electronic board.



When the **DP** signal would not stop, then after the specified number of consecutive backwashing cycles it will be considered a failure. An alarm sound will indicate the failure and there will be no more backwashing by **DP** until the **DP** signal is stopped and the right rotary switch turned OFF and back to its normal position. If the selected flushing mode included time override, the time based cycles will continue uninterruptedly with the selected interval.

MAIN VALVE

The unit can control a downstream main valve which is turned off while flushing to increase pressure. When such a main valve is incorporated in the system, **DIP SWITCH** No. 1 will be set **ON**, otherwise it will remain **OFF**. The main valve will be connected to output No.2 in **FILTRON 2**. to output No. 4 in **FILTRON 4** or to output No. 6 in **FILTRON 6**.

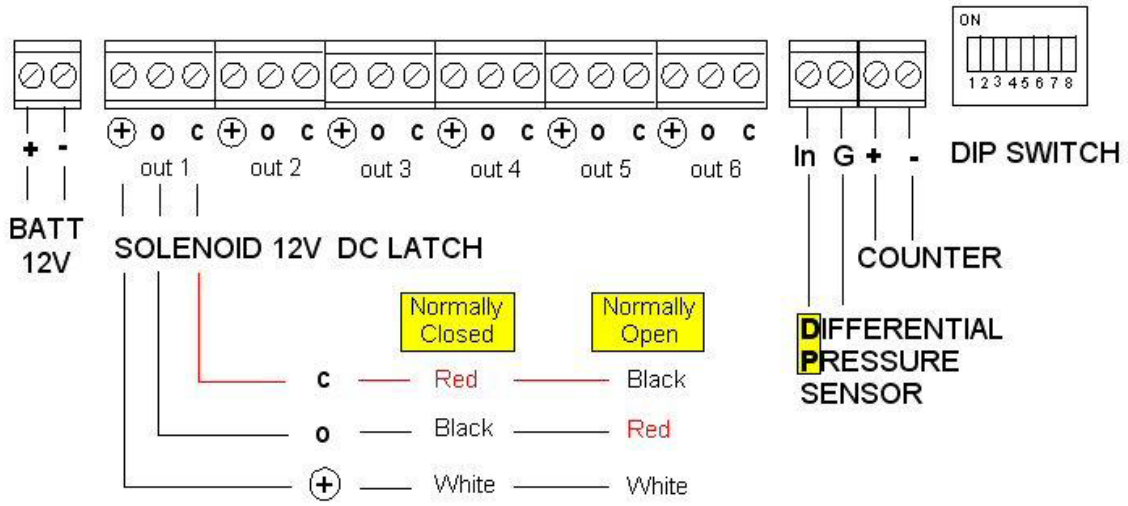
Technical Data

Power sources:

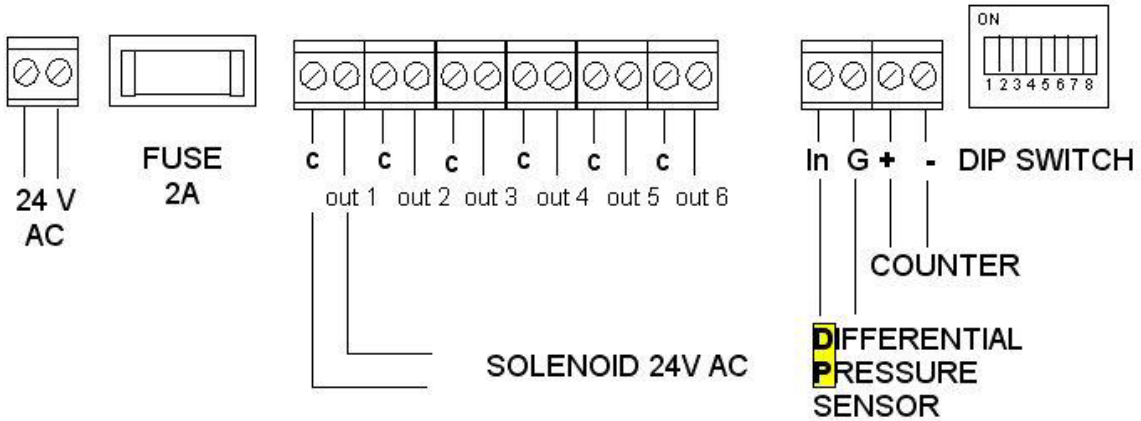
For AC models – 220v / 50Hz or 115v / 60Hz transformed into 24v AC. Maximum power 25w.

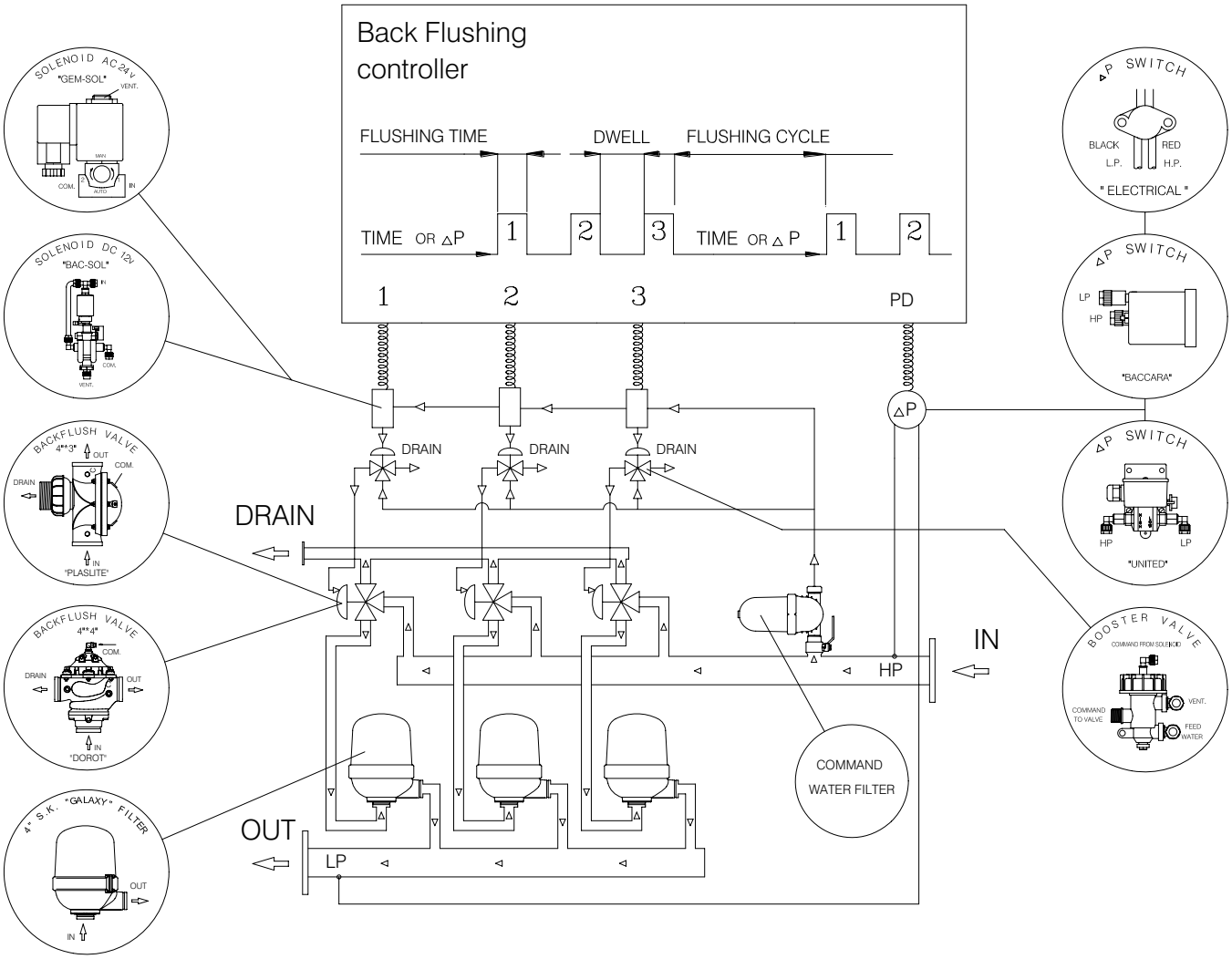
For DC models – 12v / 6Ah dry alkaline battery.

Connection Board (DC Model)



Connection Board (AC Model)





Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 – 8 p.s.i.).
- Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

8. Galaxy Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing – drain all the water from the filter battery and the command filter and leave the drain valve open.

SEASONAL MAINTENANCE - DISCS

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. Make certain that there is no pressure in the system and unscrew the nuts. (**Figure 1**)
Open the clamp. (**Figure 2**)
Remove the cover. (**Figure 3**)

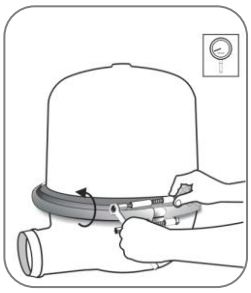


Figure 1

Figure 2

Figure 3

Unscrew the butterfly nuts on the filtration elements. (**Figure 4**)
Remove the tightening cylinders. (**Figure 5**)
Remove the disc sets (for convenience we recommend using a plastic bag). (**Figure 6**)

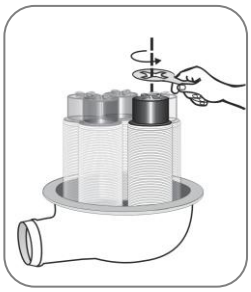


Figure 4

Figure 5

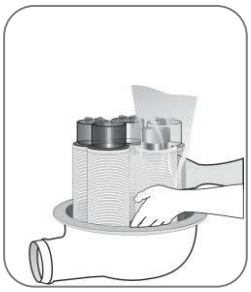


Figure 6

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to "Cleaning Recommendations Clogged Filtration Discs". (**Figure 7-8**)

Figure 7

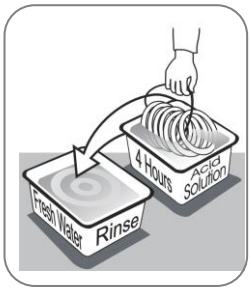


Figure 8

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (**Figure 9**)
Reassemble the tightening cylinders onto the spines, return the cover and tighten the clamp. (**Figure 10**)

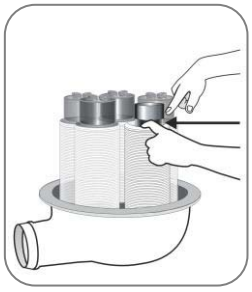


Figure 9

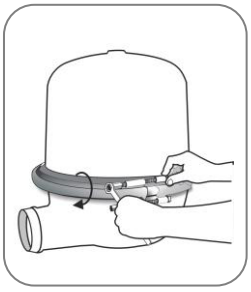


Figure 10

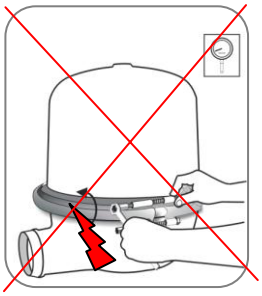
Attention:

When carrying out any of the following seasonal maintenance, service, or cleaning the discs – After backwashing the system and after closing the water inlet, **make certain that there is no pressure in the system!**

Unscrew the nuts and open the clamp.

Please Note:

- Before removing the cover you may experience the vacuum phenomenon – which will make the removing of the cover very difficult or almost impossible.
- **Do Not** - insert any sharp tools (objects) in between the cover and the body! You may damage the hydraulic seal and the cover!
- In order to remove the cover easily – **you should drain the water from the system**!
- You can drain the system through the command filter, or the back flush valves, once the system is empty the cover can then be removed safely and easily.



Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:
  1) Pour 10 liters of water into one of the large containers.
  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.
  Soak the discs in the solution so that both sides will be covered.
  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).
  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

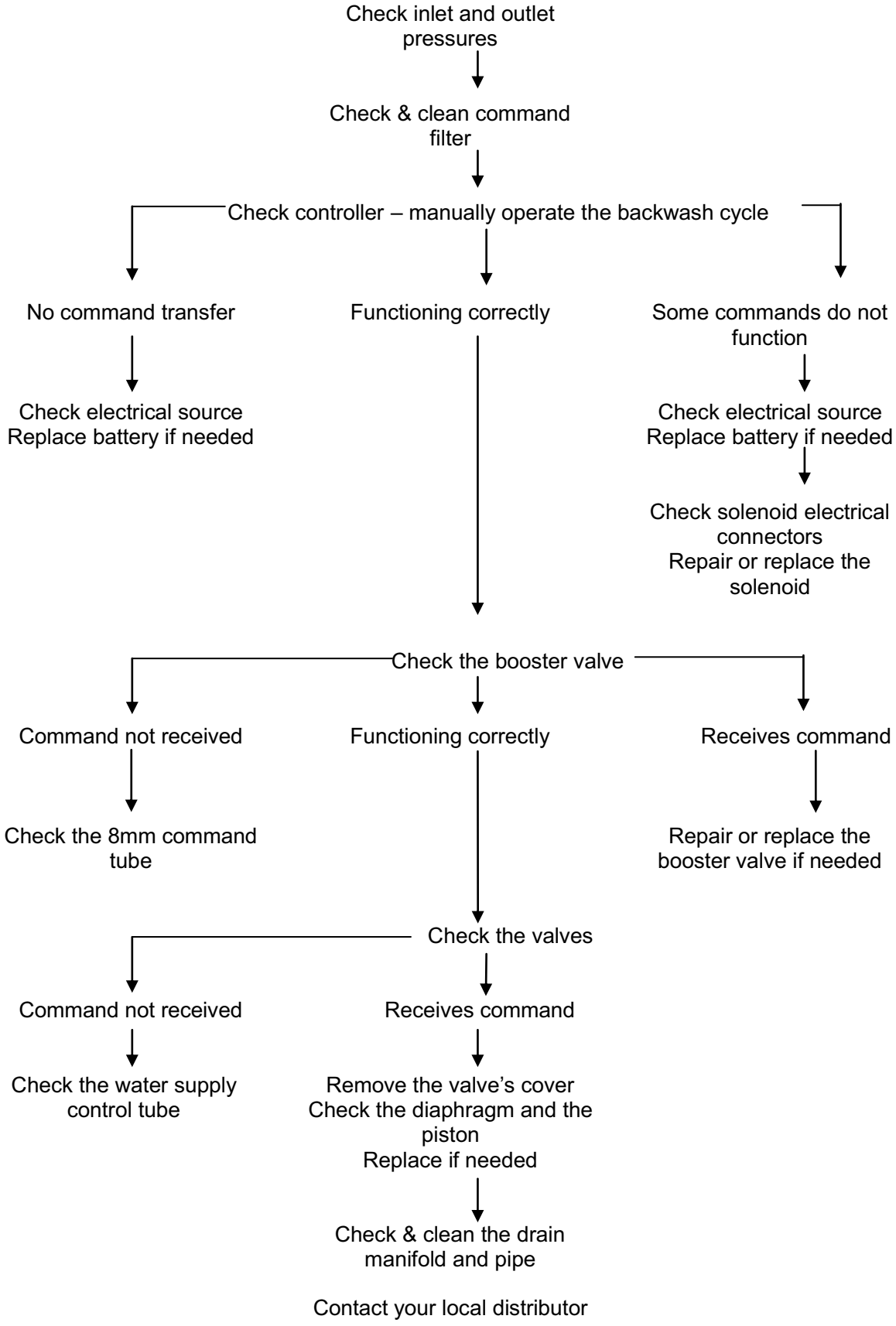
Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.
  Preparation of the solution:
  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.
  Preparation of the solution:
  Pour 2½ cups (= 500ml) of water into a small container, then add carefully
  ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:
  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.
  If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:
  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes. If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

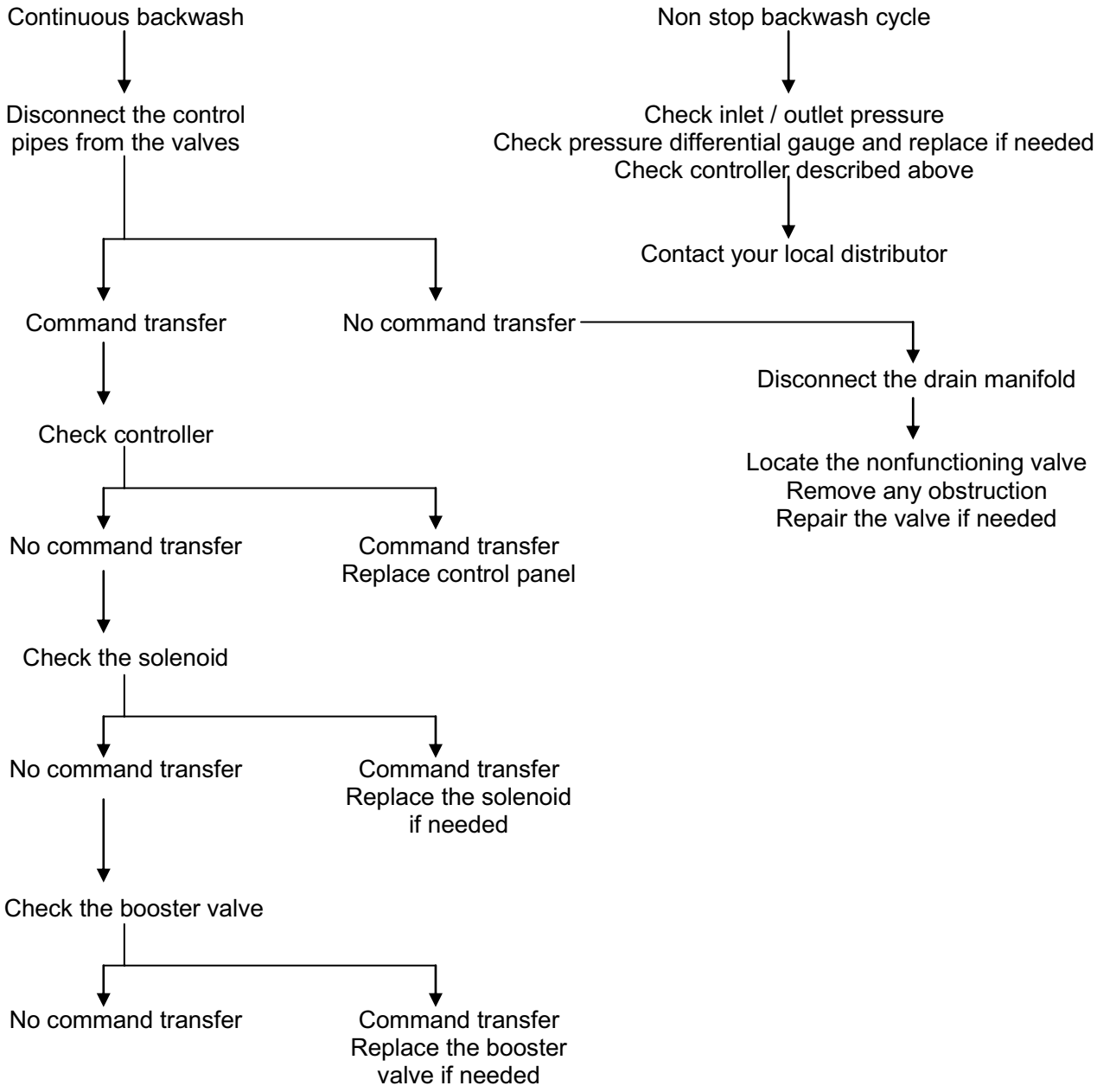
9. Troubleshooting

No Backwash Operation



Identifying Malfunctions in the Galaxy system

Continuous or Non-stop Backwashing



Limited Warranty

ARKAL FILTRATION SYSTEMS ("ARKAL FILTRATION SYSTEMS") warrants to the original end user ("CUSTOMER") who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

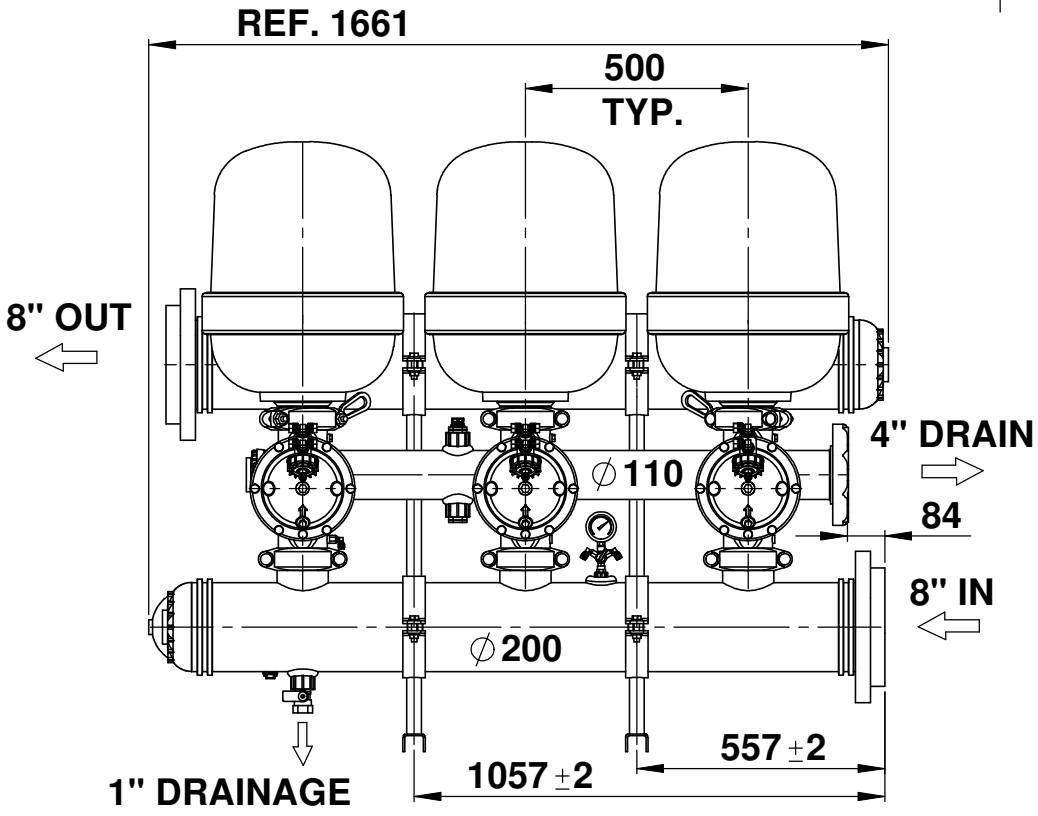
THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

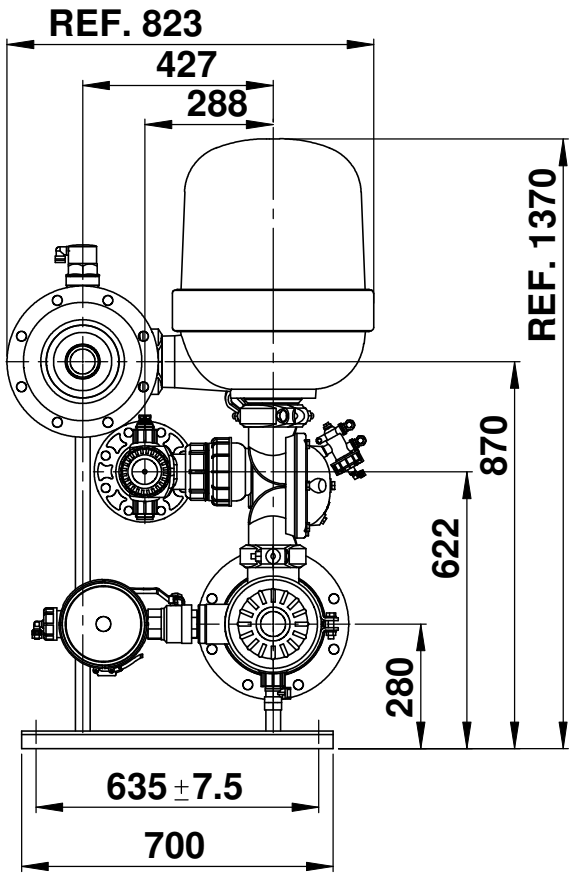
Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

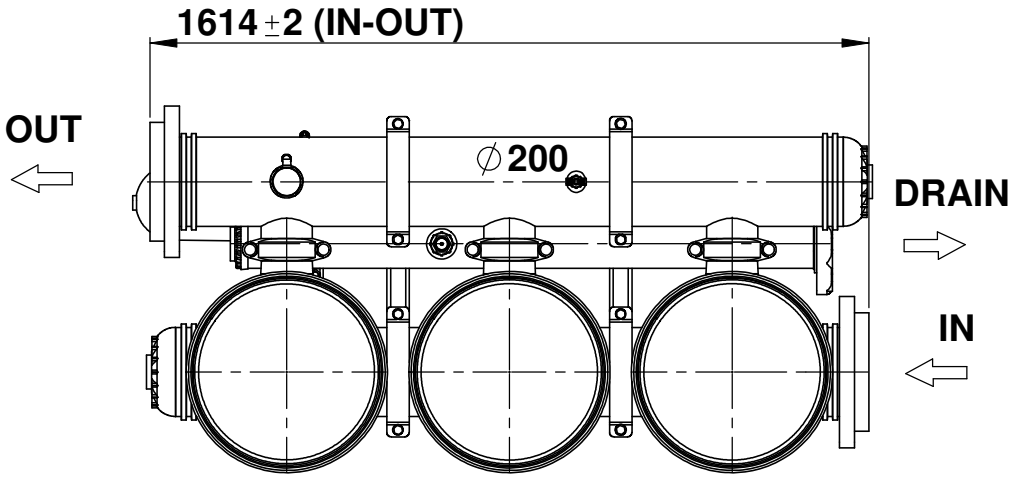
Drawings

4" Spin Klin Galaxy Batteries

(With Plaslite Valves)







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
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FAX. 972-4-6775461
ISRAEL

PROJECT: 3*4" S.K. GALAXY SYNTETIC FILTERS BATTERY				PAGE 1_OF 6_
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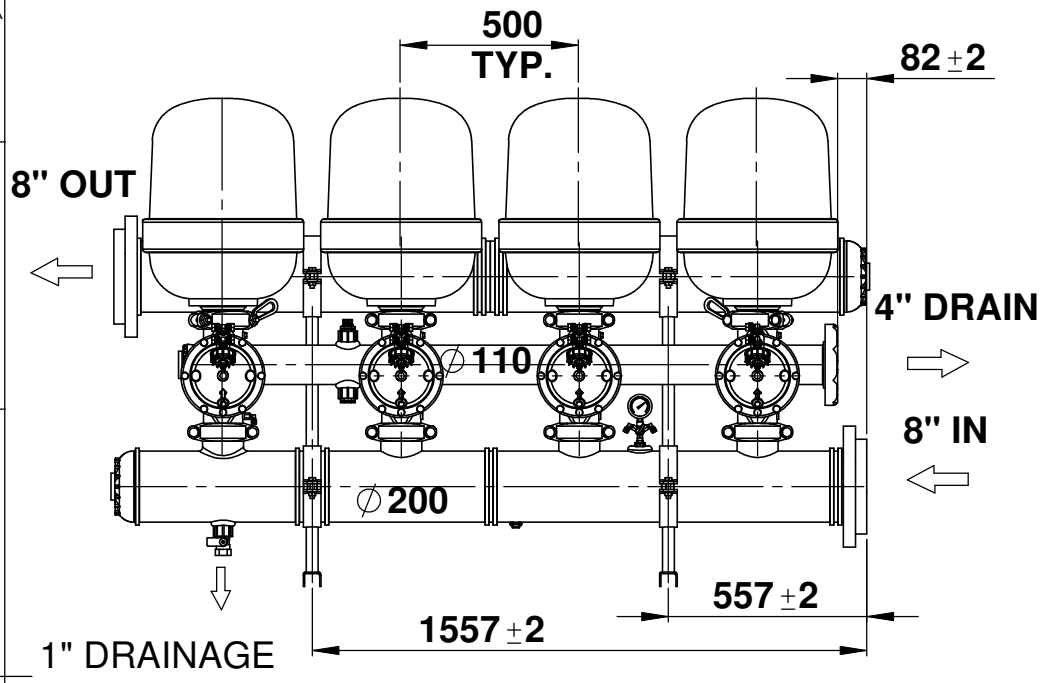
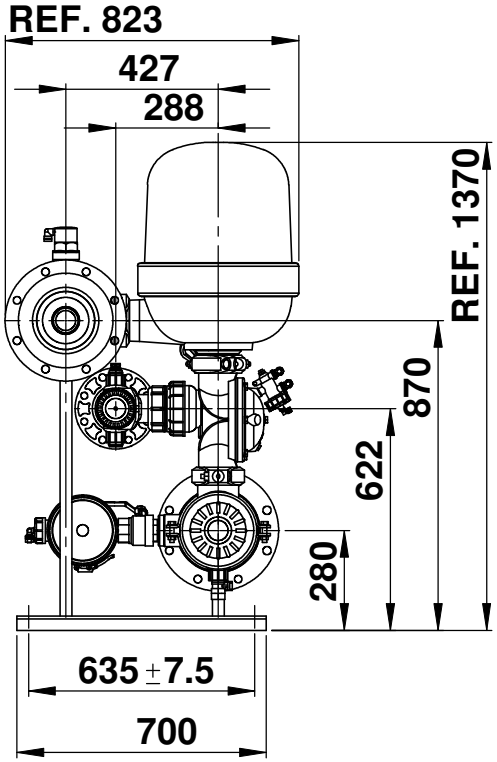
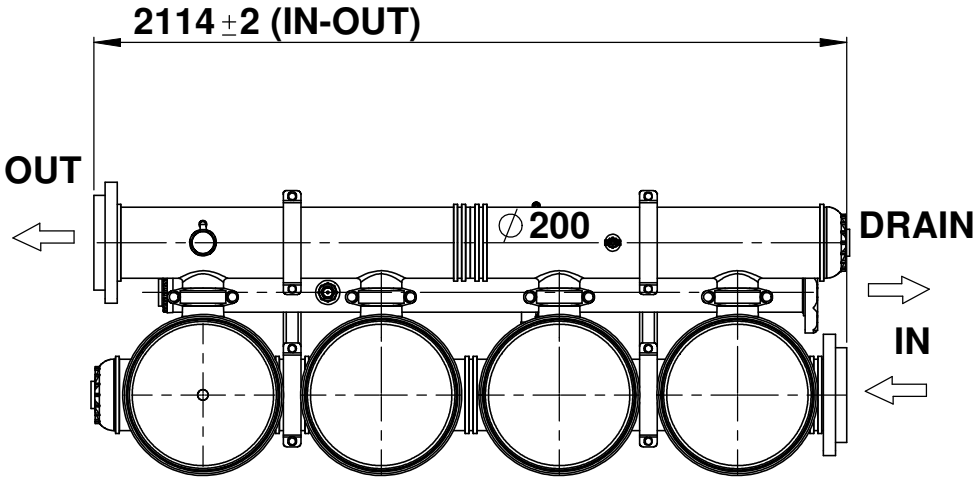
CHECKED	NIKOLAY	07/12/2009		
APPROVED	TAMIR	07/12/2009	FILE CODEDRAWING OF MANIFOLDS :	DRAWING:
B.O.M.	OLEG	07/12/2009	6673 0803A2	6016

PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\4 inch Filters\GALAXY\Plastic\South America\

Sunday, January 31, 2010 8:10:49 AM







MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 4*4" S.K. GALAXY SYNTETIC FILTERS BATTERY — PAGE 1_OF 6_

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4663H0804D2

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CHECKED	OMRY	27/12/2009		
APPROVED	OMRY	27/12/2009	FILE CODEDRAWING OF MANIFOLDS :	DRAWING:
B.O.M.	OLEG	27/12/2009	6673 0804D2	6016

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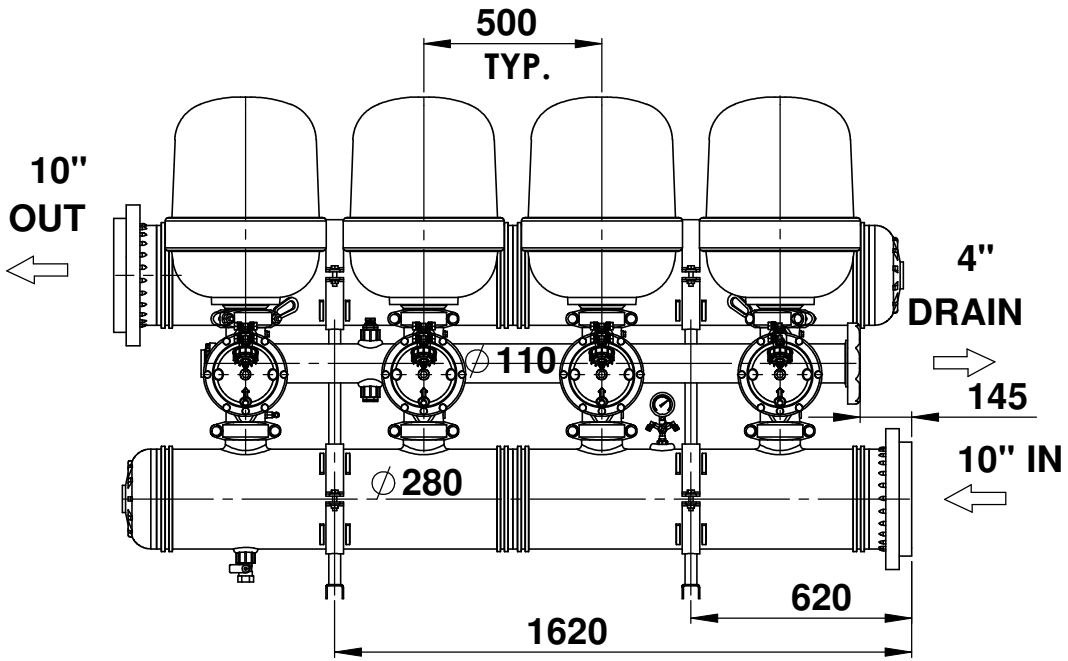
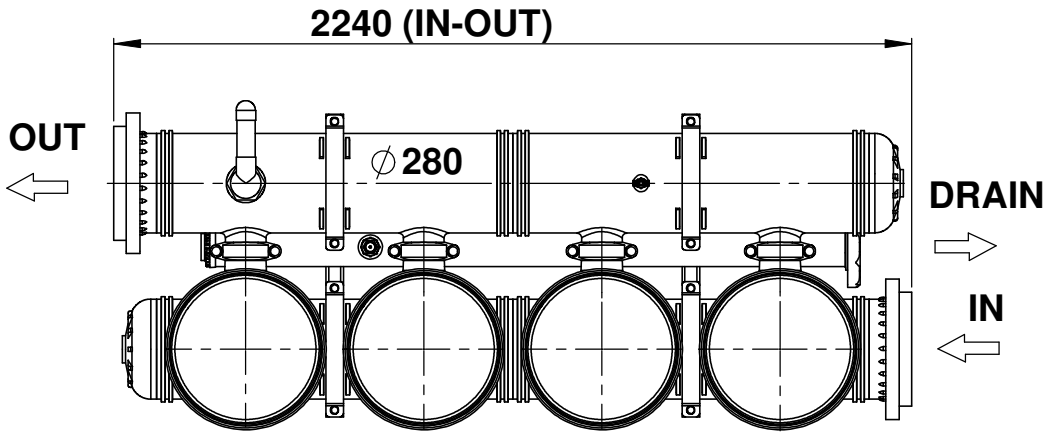
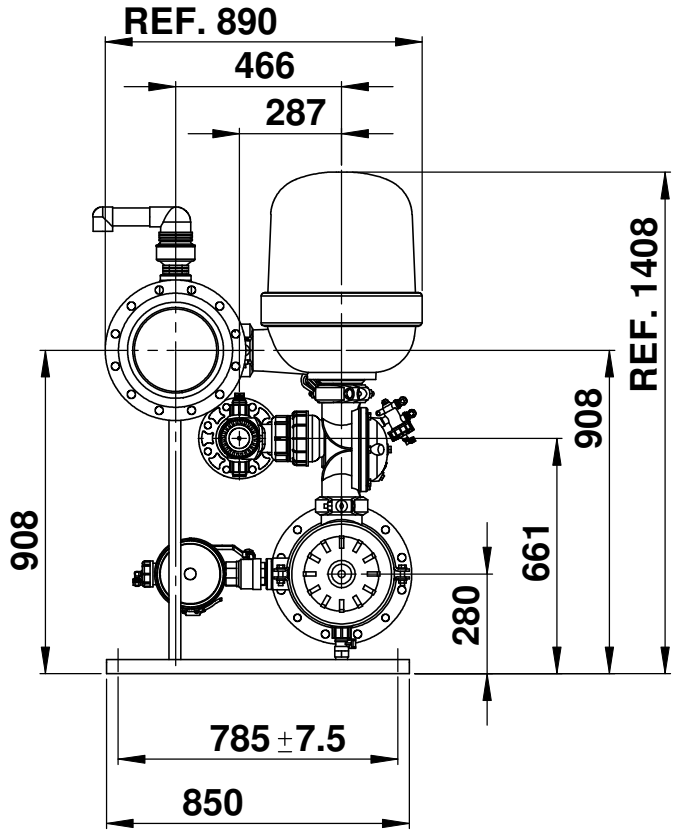
Sunday, January 31, 2010 12:01:12 PM







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PROJECT: 4*4" S.K. GALAXY FILTERS PLASTIC BATTERY				PAGE 1_OF 4_
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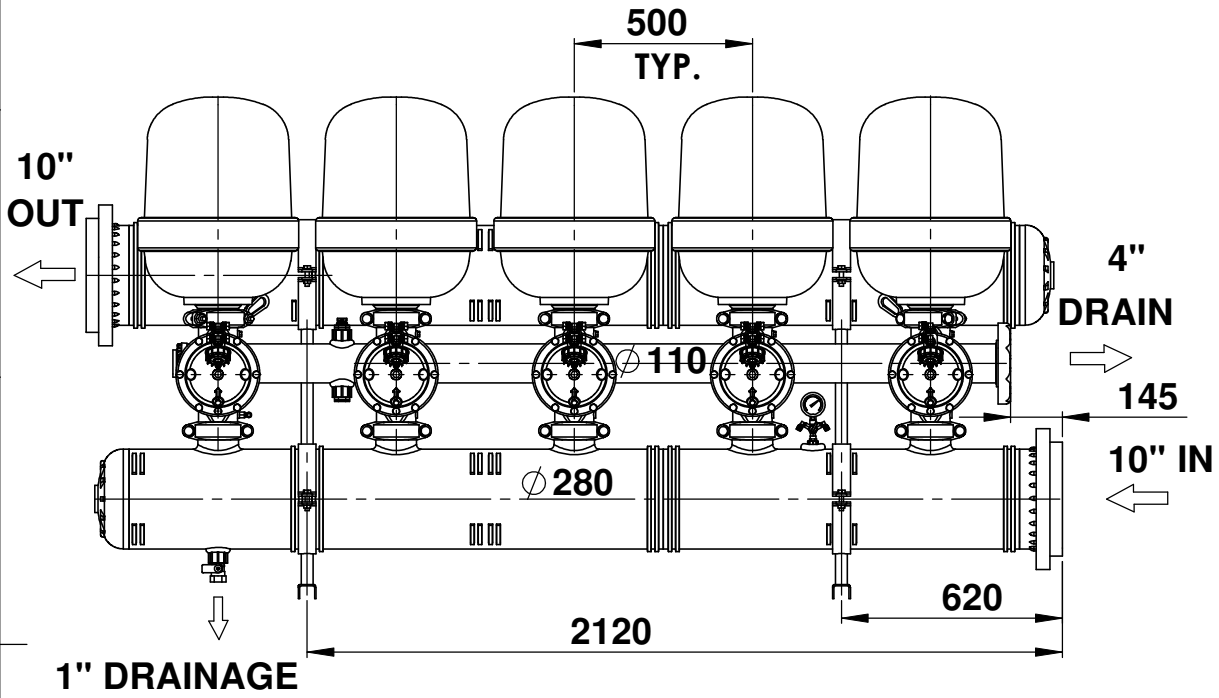
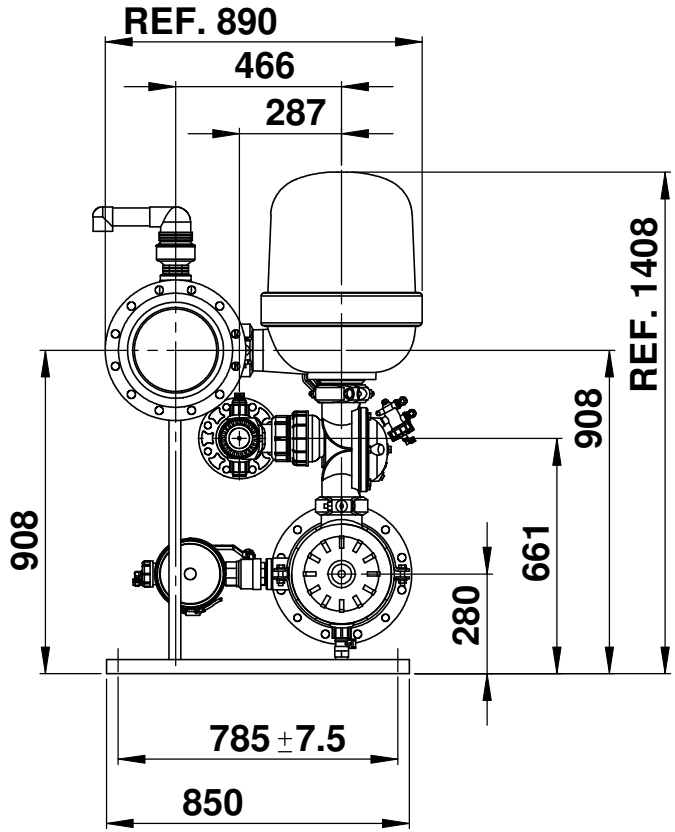
CHECKED	NIKOLAY	27/12/2009		
APPROVED	ZALI	27/12/2009	FILE CODE DRAWING OF MANIFOLDS::	DRAWING:
B.O.M.	IRINA	27/12/2009	6673 1004D2	6016

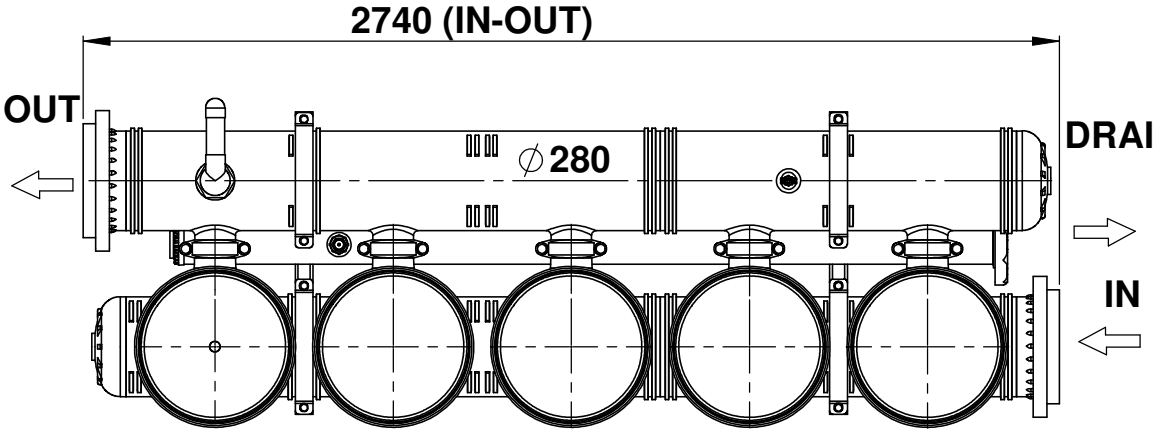
PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\4 inch Filters\GALAXY\Plastic\South America\

Sunday, January 31, 2010 2:23:47 PM

SHEET 1 OF 1







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PROJECT: 5*4" S.K. GALAXY FILTERS PLASTIC BATTERY				PAGE 1_OF 4_
TITLE: ASEMBLY DRAWING				CATALOGUE No: 4663H1005D2
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B.O.M.	IRINA	05/10/2009	6673 1005D2	6016

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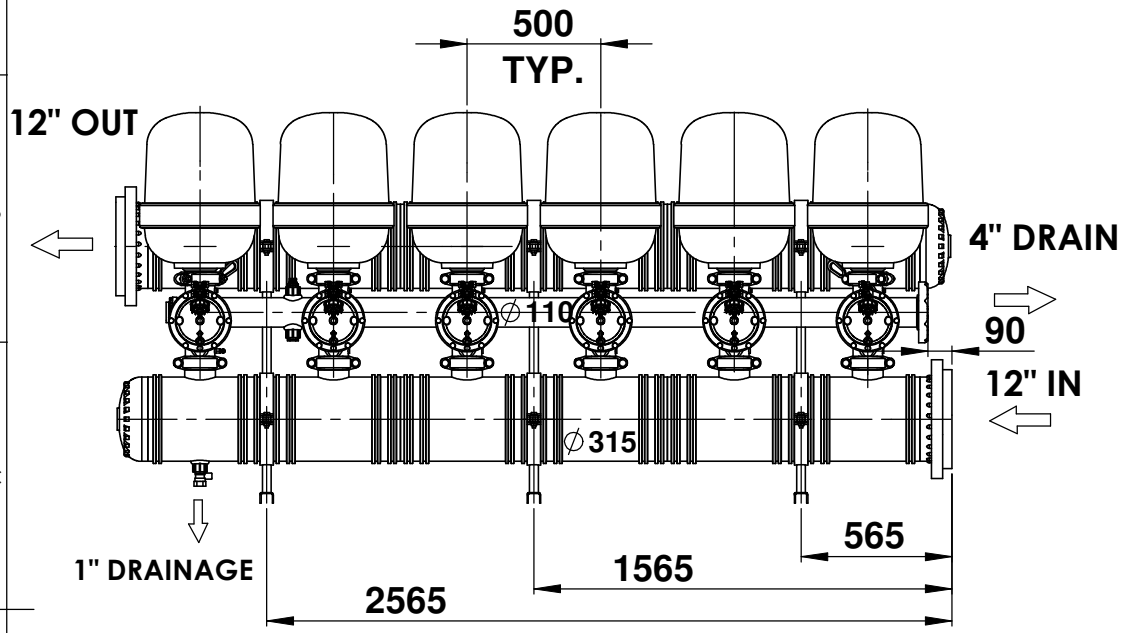

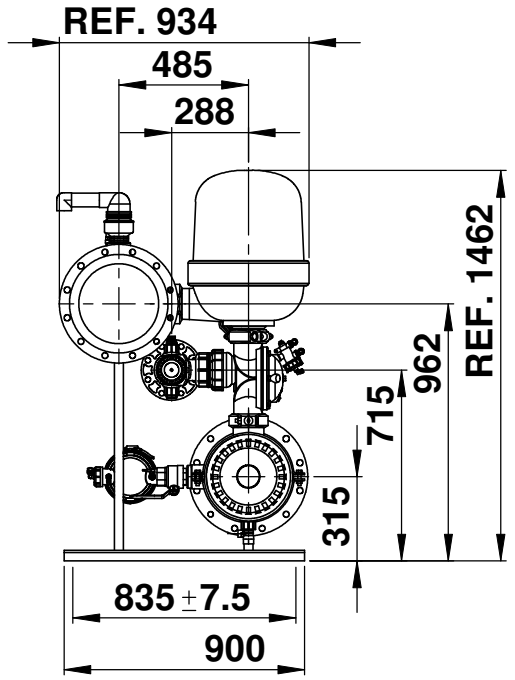

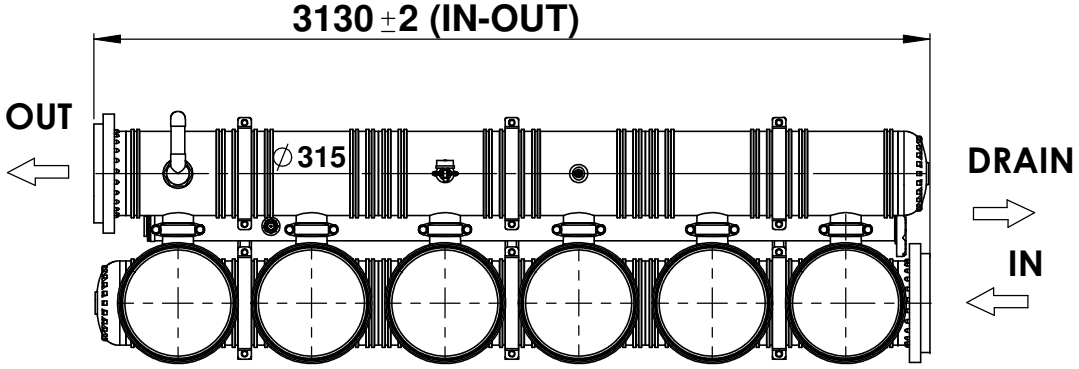

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PROJECT: 6*4" S.K. GALAXY FILTERS PLASTIC BATTERY				PAGE 1_OF 6_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 4663H1206D2
SOLIDWORKS FILE CODE: 4663H12____2		FILE CODE: 4663H1206D2 C		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
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CHECKED	OMRY	12/10/2009		
APPROVED	OMRY	12/10/2009	FILE CODE DRAWING OF MANIFOLDD:	DRAWING:
B.O.M.	OLEG	12/10/2009	6673 1206D2	6016

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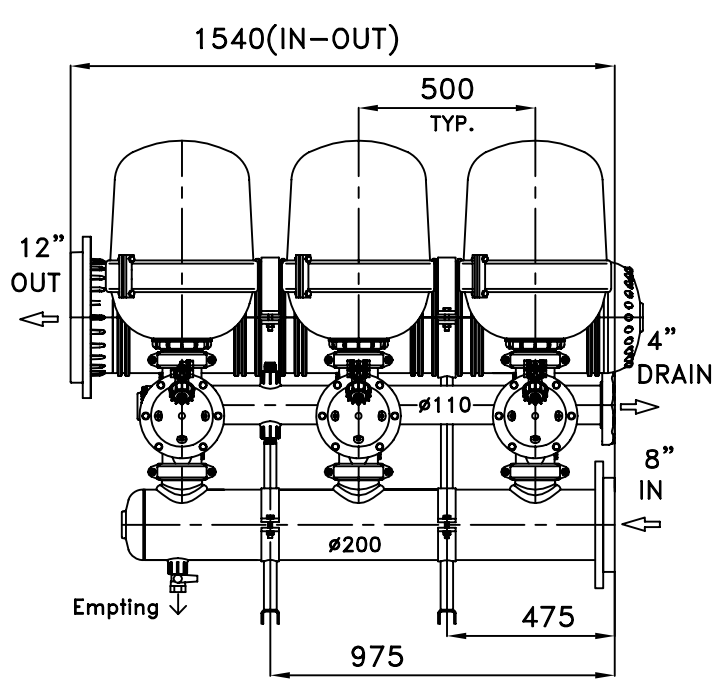
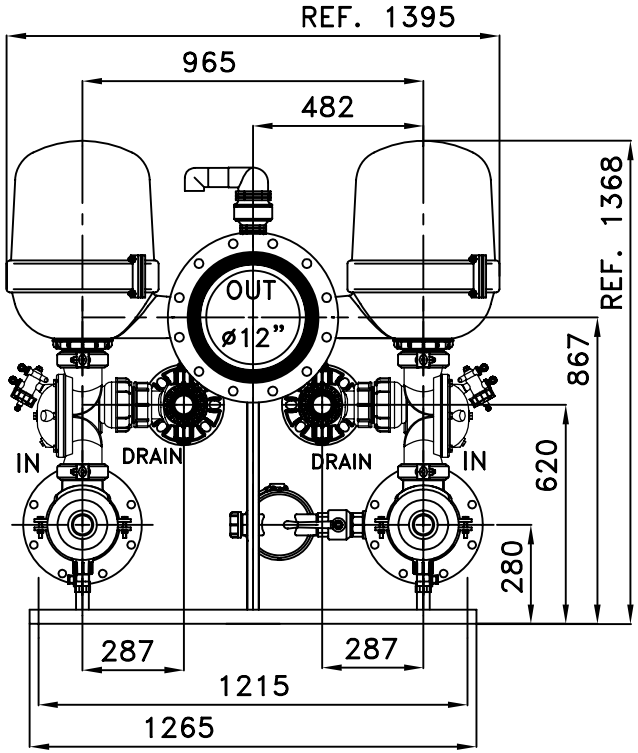
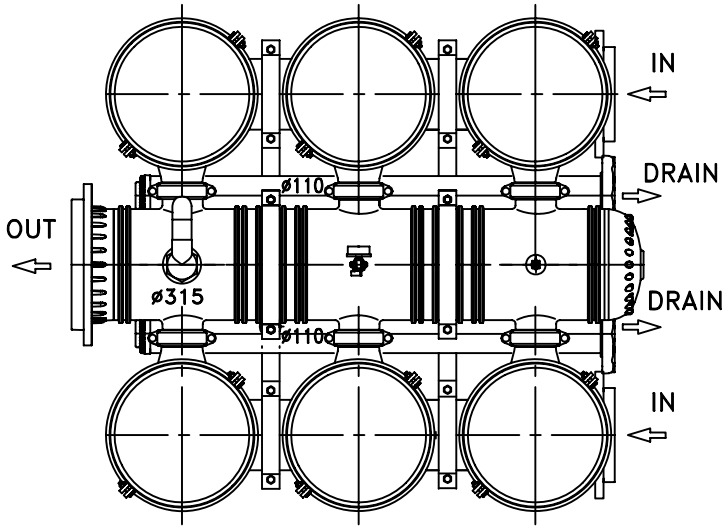
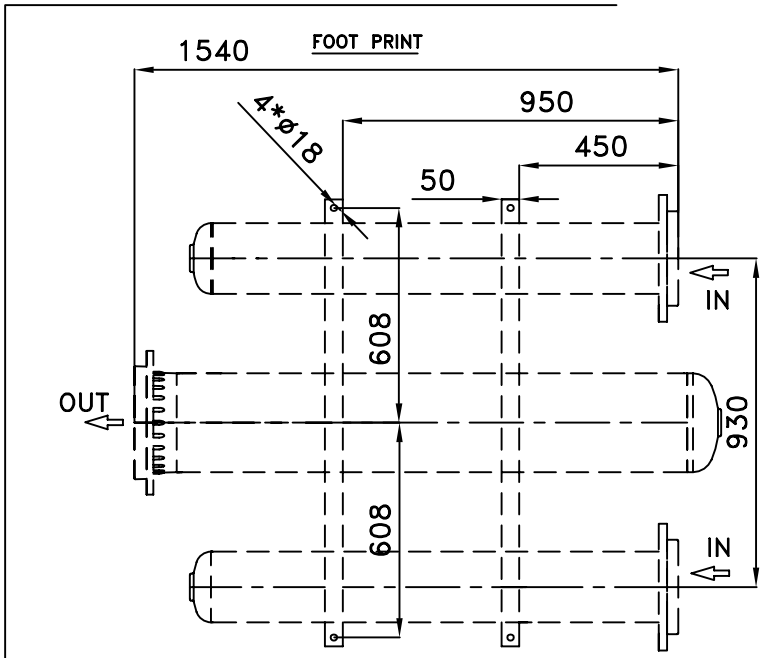
Monday, February 01, 2010 8:57:03 AM









MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
6*4" S.K. "GALAXY" FILTERS PLASTIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No:
4663H1206_20002

	NAME	DATE	FILE CODE	NAME	DATE	SIGNATURE
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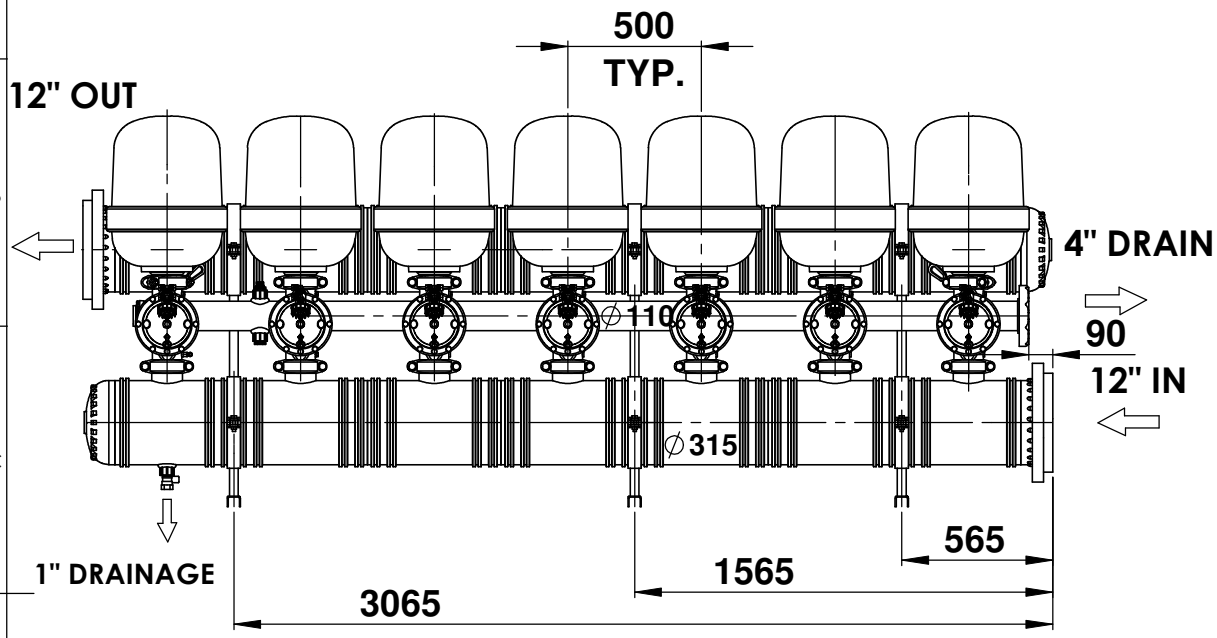
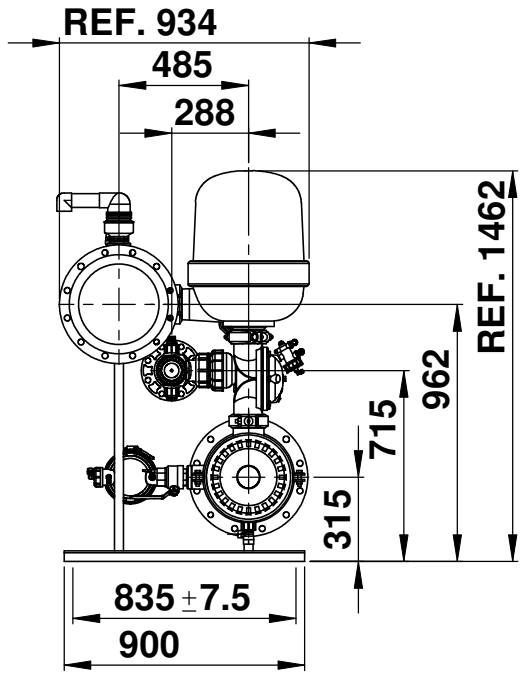
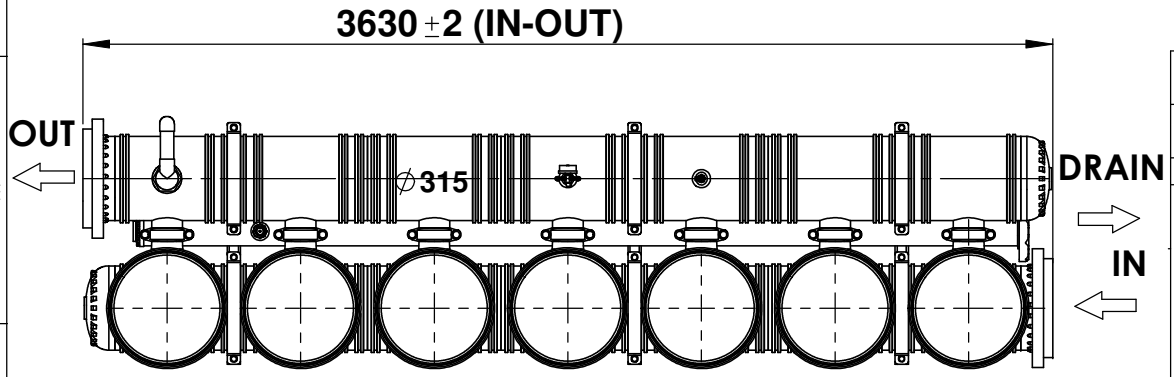
DRAWN	MAYA	03.04.08	FILE CODE DRAWING OF MANIFOLD: 6673 1206_00003 (1-2),	BACKUP: DISK-33		
CHECKED	NIKOLAY	03.04.08	6673 0403VCO DR,6120 0449,	DRAWER N: 6020		
APPROVED	ZECA	03.04.08	PALLET-418 (5201 5924)			







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		THIS DRAWING CANCEL DRAWING FROM 26.02.2007	

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PROJECT: 7*4" S.K. GALAXY FILTERS PLASTIC BATTERY				PAGE 1_OF 6_
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 4663H1207D20010
SOLIDWORKS FILE CODE: 4663H12____2		FILE CODE: 4663H1207D20010 C		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
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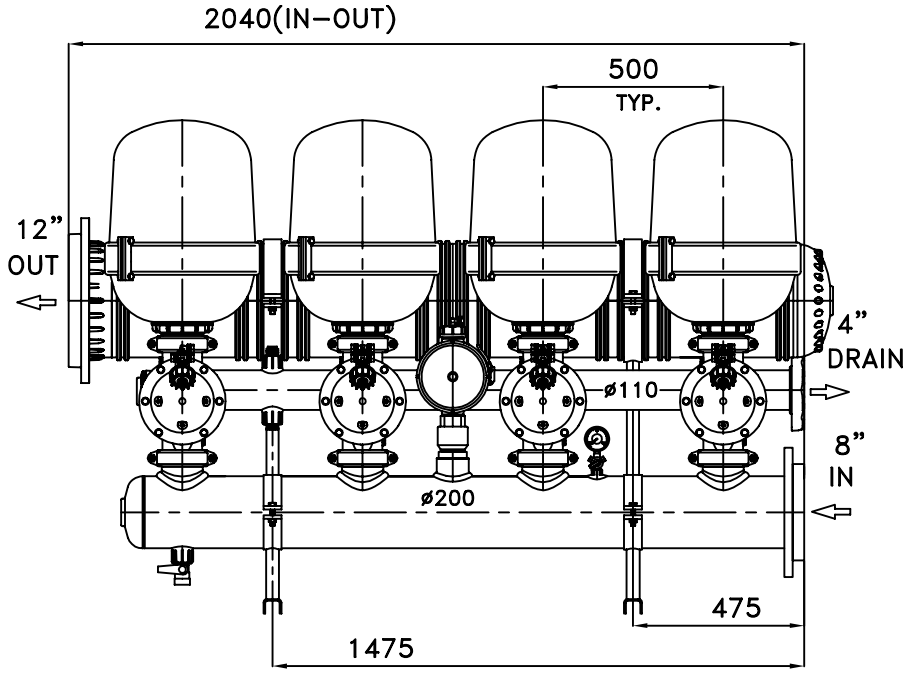
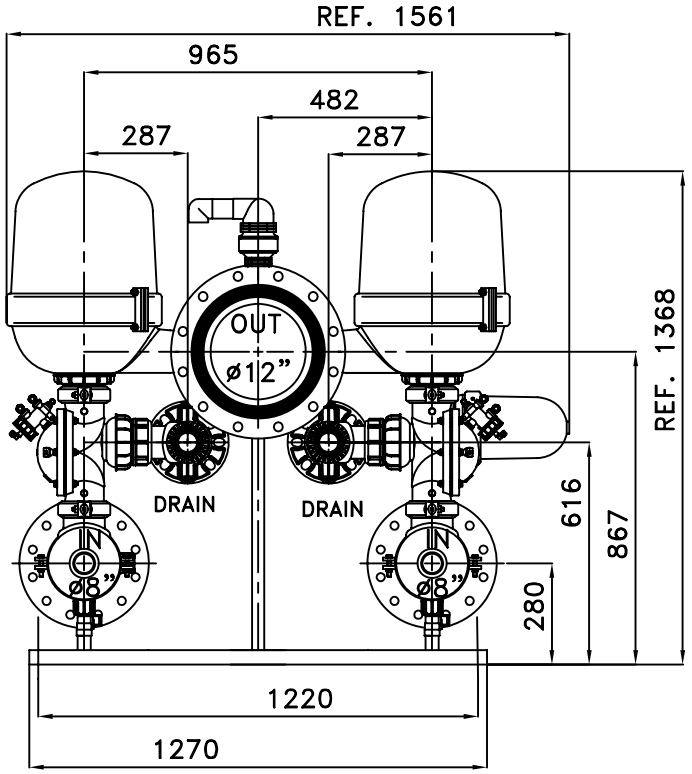
CHECKED	OMRY	15/11/2009		
APPROVED	OMRY	15/11/2009	FILE CODE DRAWING OF MANIFOLDD:	DRAWING:
B.O.M.	OLEG	15/11/2009	6673 1207D20010	6016

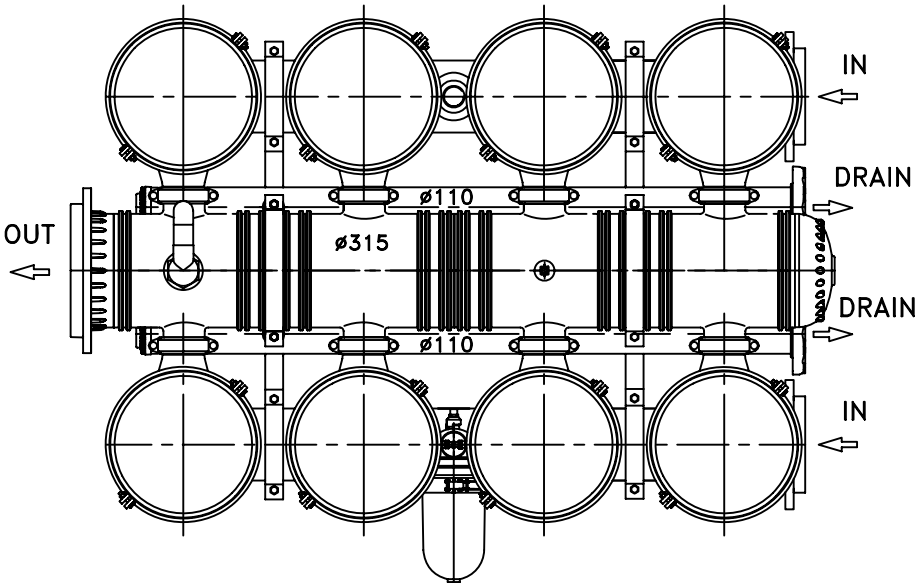
PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\4 inch Filters\GALAXY\Plastic\South America\

SHEET 1 OF 1

Monday, February 01, 2010 8:59:54 AM







THIS DRAWING CANCEL DRAWING FROM 06.11.06

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT
8*4" S.K. "GALAXY" FILTERS PLASTIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 6

CATALOGUE No:
4663H1208_2

	NAME	DATE
DRAWN	NIKOLAY	01.04.08
CHECKED	NIKOLAY	01.04.08
APPROVED	ZALI	01.04.08

PATH BATERIES\4INCH\GALAXY PLASLITE\PLASTIC\DROM AMERICA
FILE CODE 4663H1208_2
FILE CODE DRAWING OF MANIFOLD: 6673 1208_0 ,6120 0449
6673 0404VCO DR.
PALET-382(5201 5887)

NAME IRINA
DATE 01.04.08
SIGNATURE IRINA
BACKUP: DISK-33
DRAWER N: 6016

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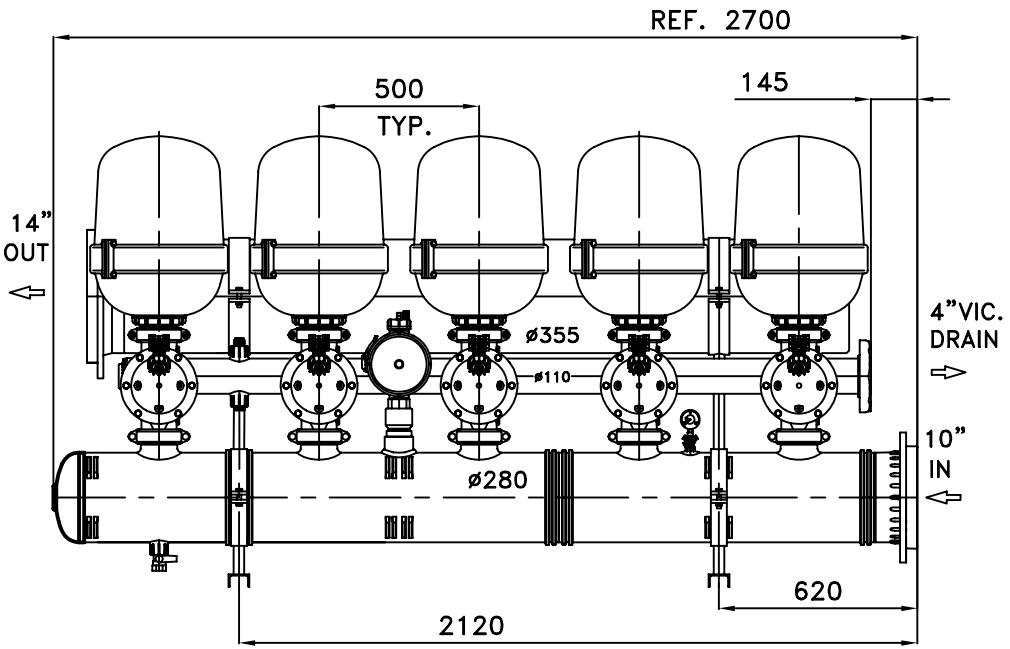
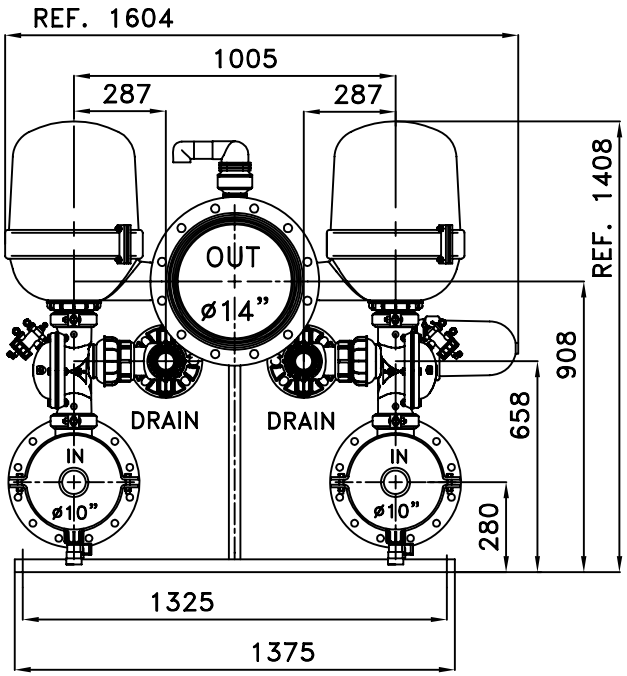
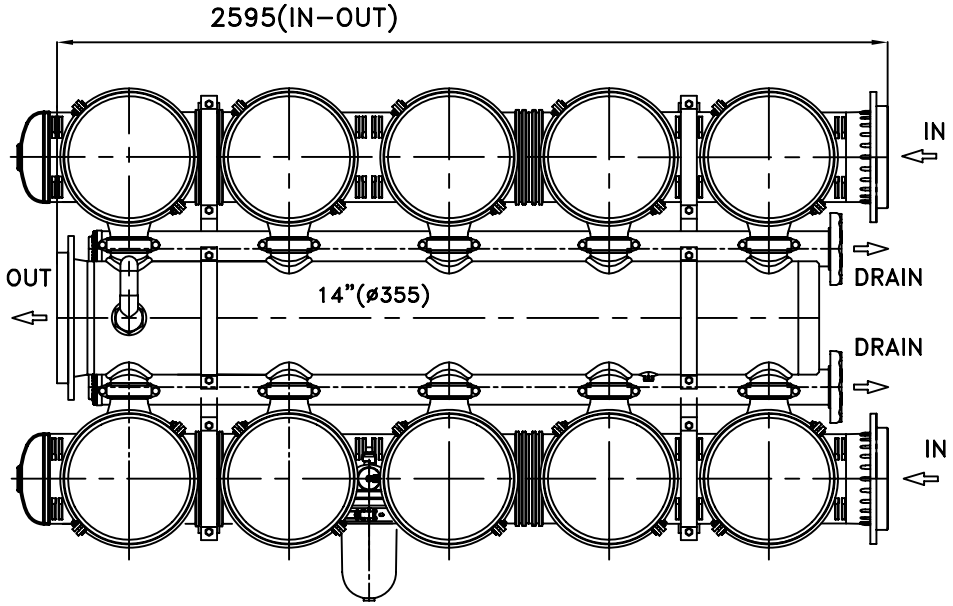
FRONT VIEW



SIDE VIEW



TOP VIEW



		THIS DRAWING CANCEL DARWING FROM 05.10.06	
MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
10*4" S.K. "GALAXY" FILTERS PLASTIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 5

CATALOGUE No:
4663H1410_2

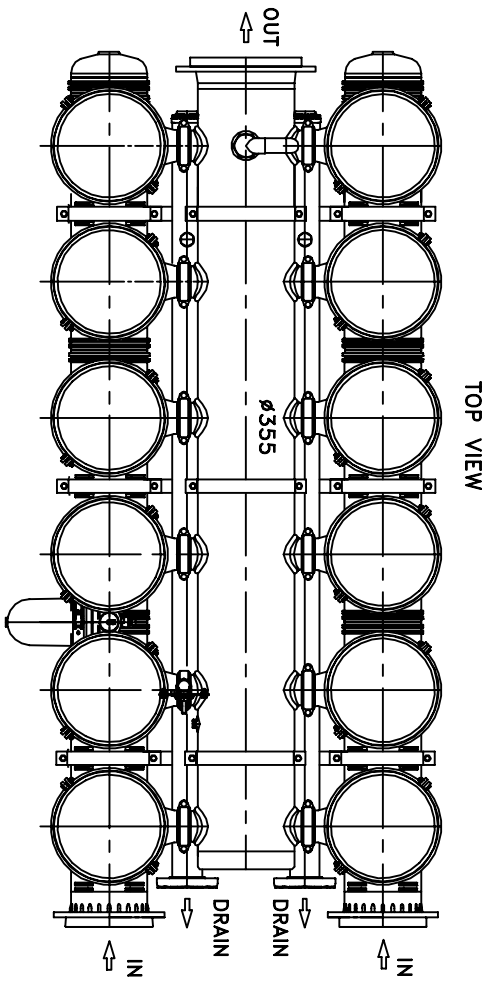
	NAME	DATE
DRAWN	NIKOLAY	09.04.08
CHECKED	NIKOLAY	09.04.08
APPROVED	ZEKA	09.04.08

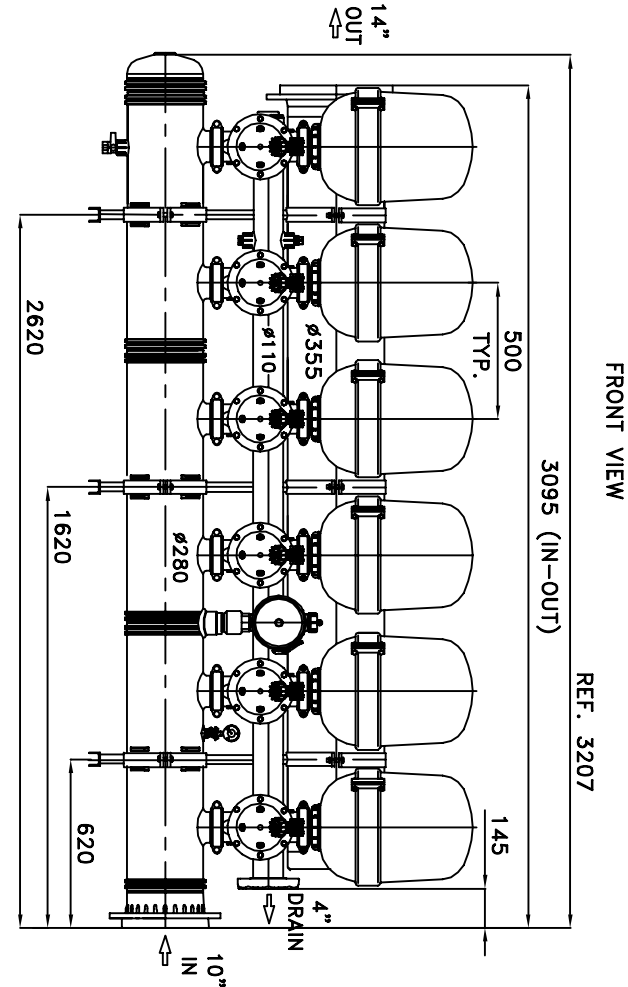
PATH BATERIES\4INCH\GALAXY\PLASLITE\PLASTIC\DROM_AM
FILE CODE 4663H1410_2

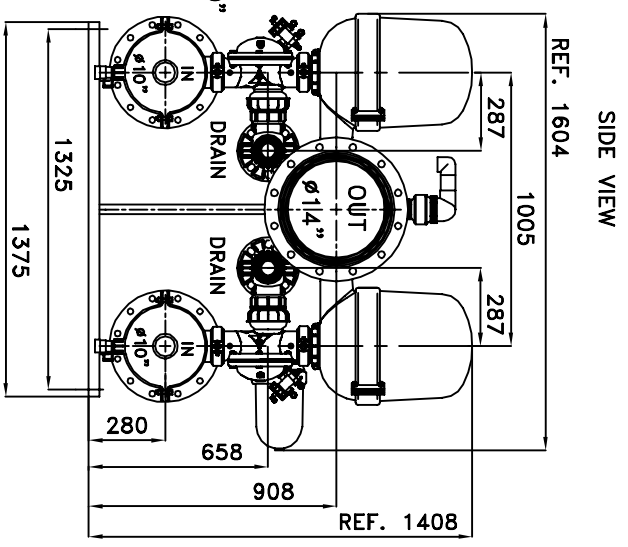
FILE CODE DRAWING OF MANIFOLD:	NAME	DATE	SIGNATURE
6673 1410_0,6120 0388,	IRINA	09.04.08	
6673 0405VCO DR			
PALET-336 (5201 5839)			

BACKUP: DISK-33

DRAWER N: 6016







		THIS DRAWING CANCEL DARWING FROM 01.02.07	
MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
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FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 12*4" S.K. "GALAXY" FILTERS PLASTIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4663H1412_2

PATH	FILE CODE	NAME	DATE	SIGNATURE
BATERIES\4INCH\GALAXY PLASLITE\PLASTIC\DROM_AM	4663H1412_2	IRINA	25.06.08	IRINA

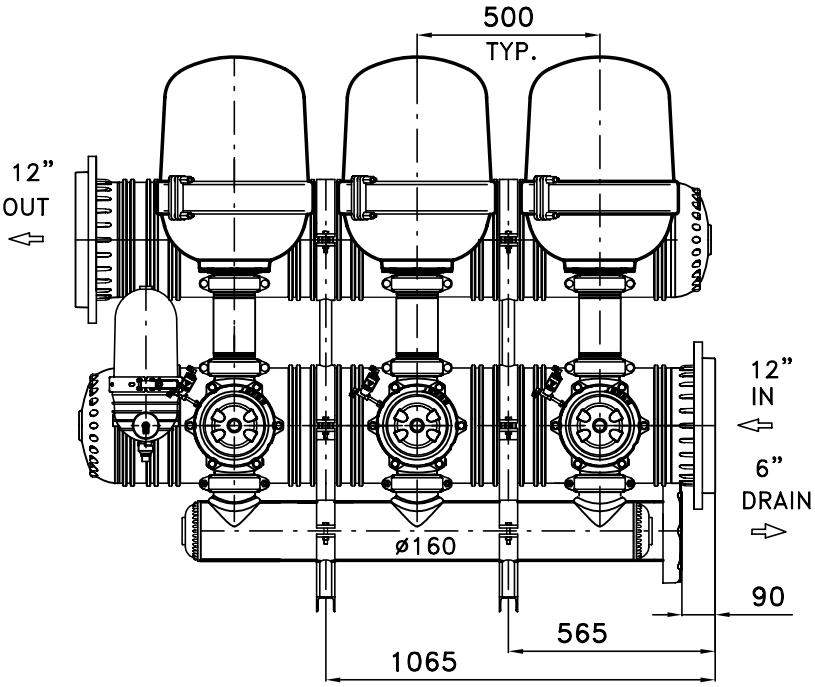
	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	MAYA	25.06.08	6673 1412_0,6120 0388,	DISK-33
CHECKED	NIKOLAY	25.06.08	6673 0406VCO DR,	DRAWER N:
APPROVED	TAMIR	25.06.08	PALET-345 (5201 5848)	6016

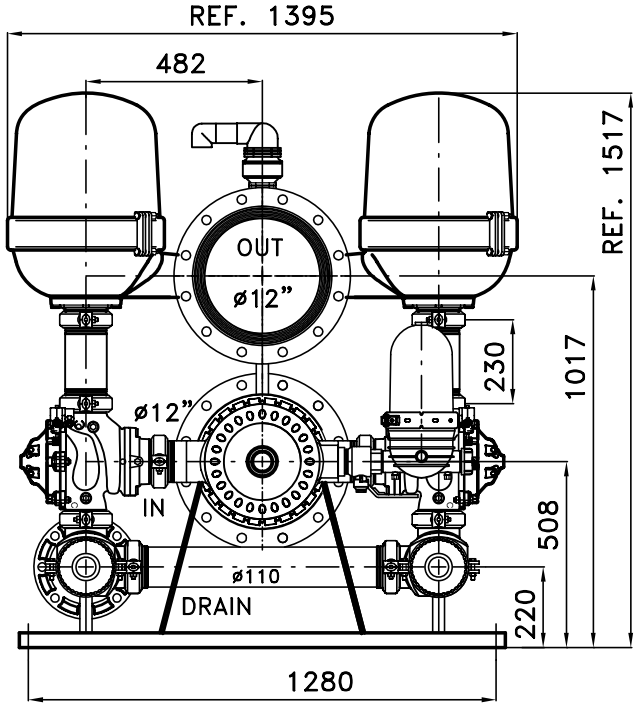
PDF created with pdfFactory trial version www.pdffactory.com

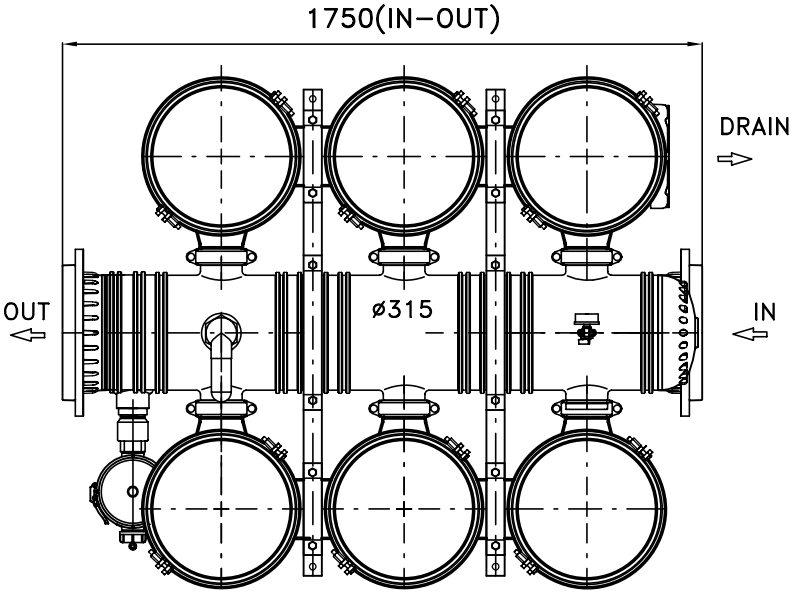
Drawings

4" Spin Klin Galaxy Batteries

(With Dorot 63 C.I Valves)







MODIFIC.	DATE	DESCRIPTION	SIGN.

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FAX. 972-4-6775461
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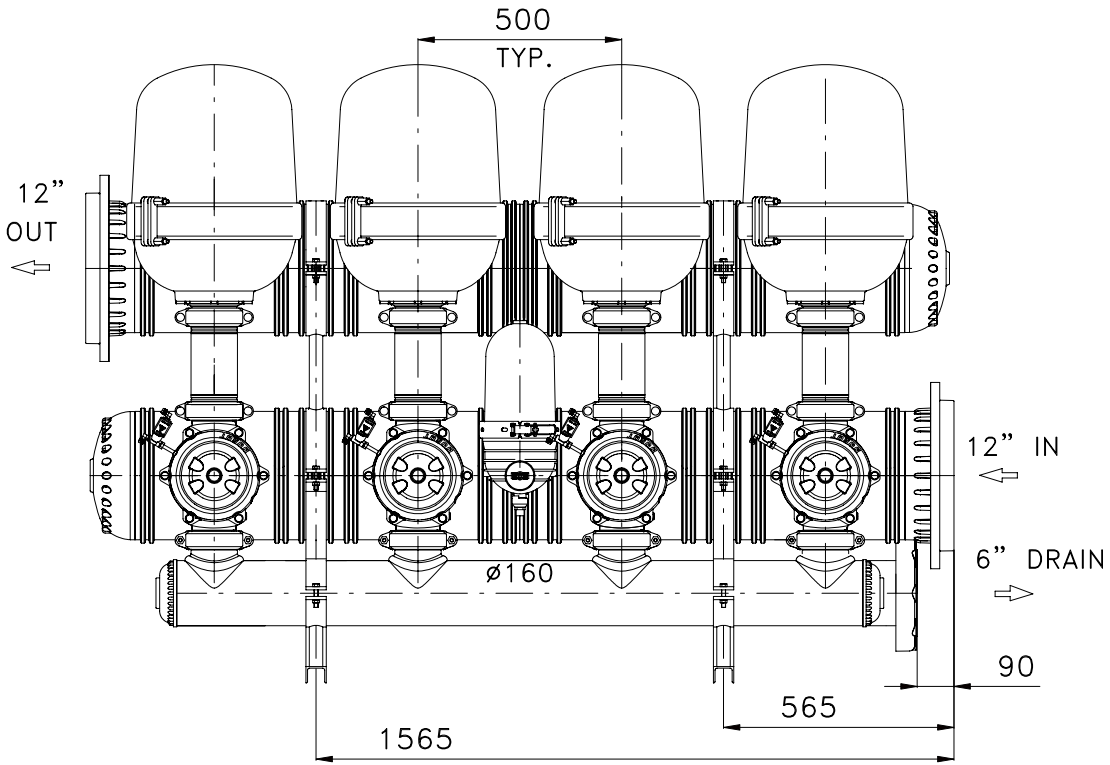
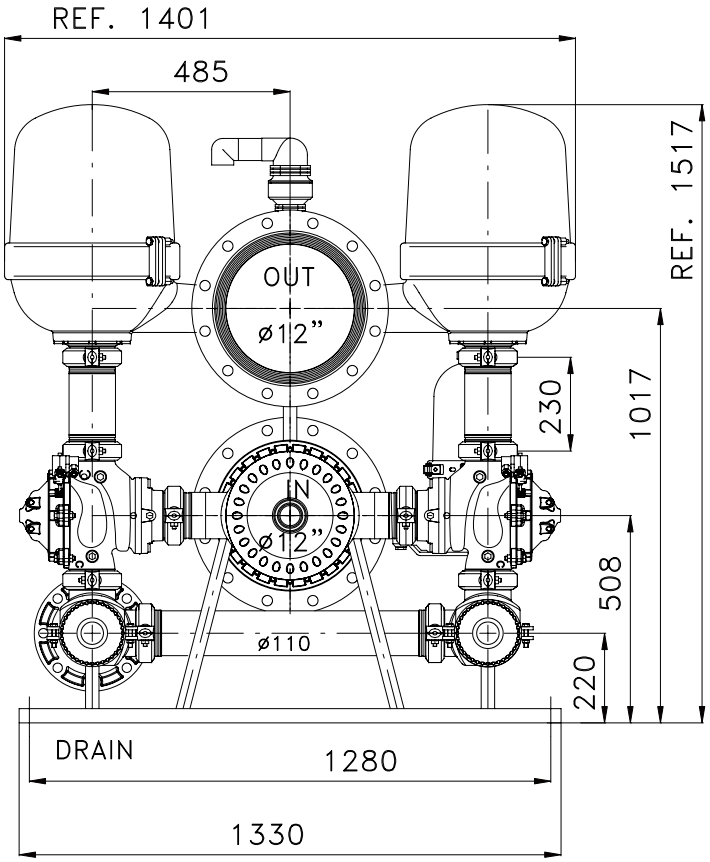
PROJECT: 6*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY — PAGE 1 OF 6

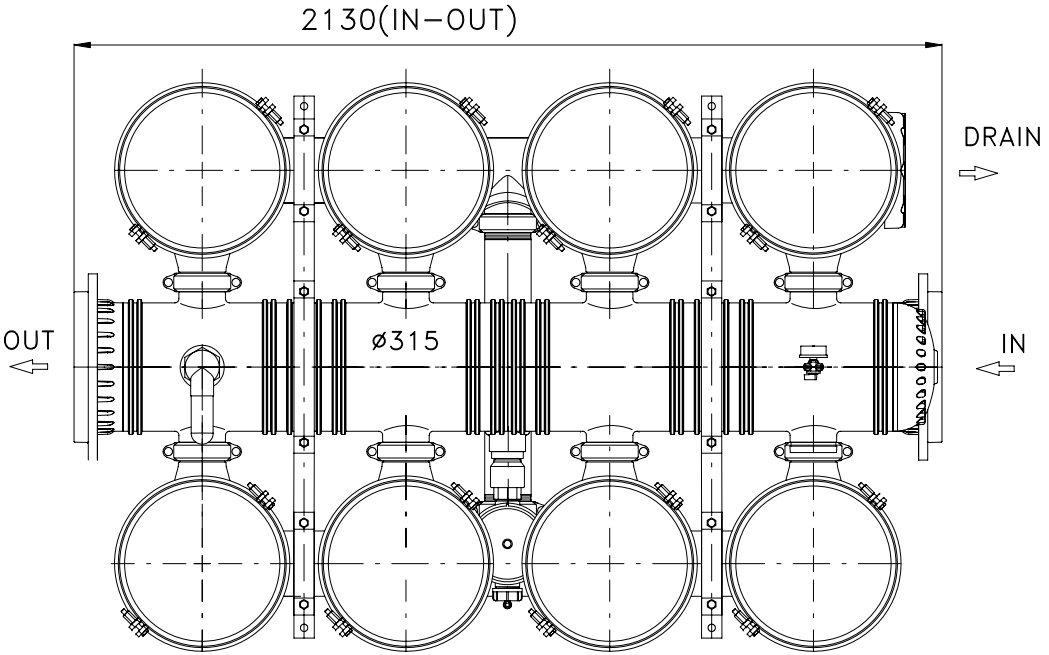
TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4660E1206_30018

PATH	FILE CODE	NAME	DATE	SIGNATURE
BATERIES\4INCH\GALAXY DOROT\PLASTIC\NEW VALVE	4660E1206_30018	IRINA	28.09.06	ORLY

	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	MAYA	28.09.06	6660 1206_20001(1-3),6120 0501	DISK-32
CHECKED	OMRY	28.09.06	5999 170080	DRAWER N: 6018
APPROVED			PALET-432 (5201 5937)	







		THIS DRAWING CANCEL DRAWING FROM 23.04.08	
MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
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BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 8*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4660E1208_30008

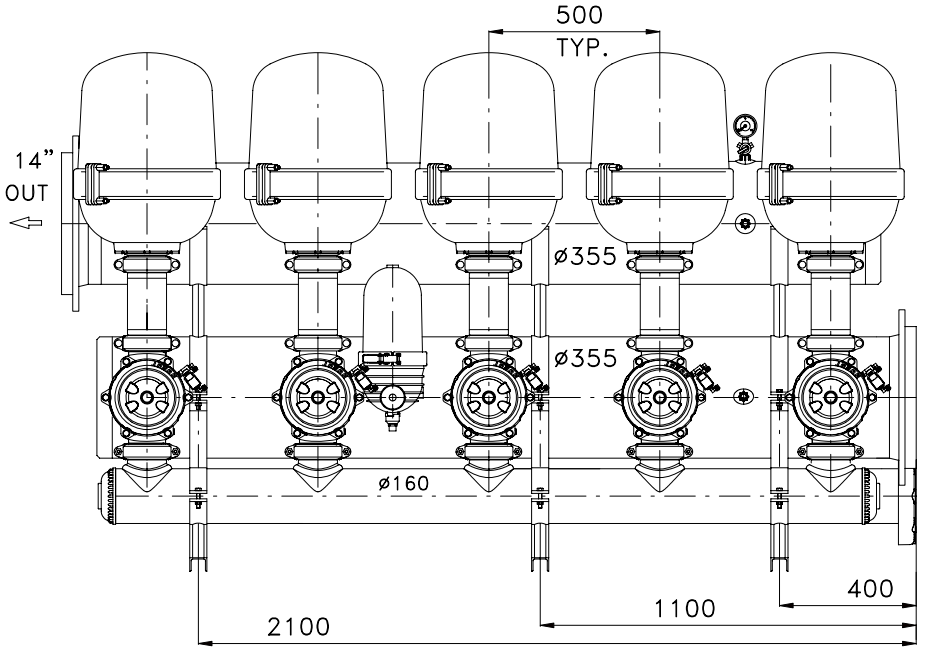
PATH BATERIES\4INCH\GALAXY DOROT\PLASTIC\NEW VALVE — FILE CODE 4660E1208_30008

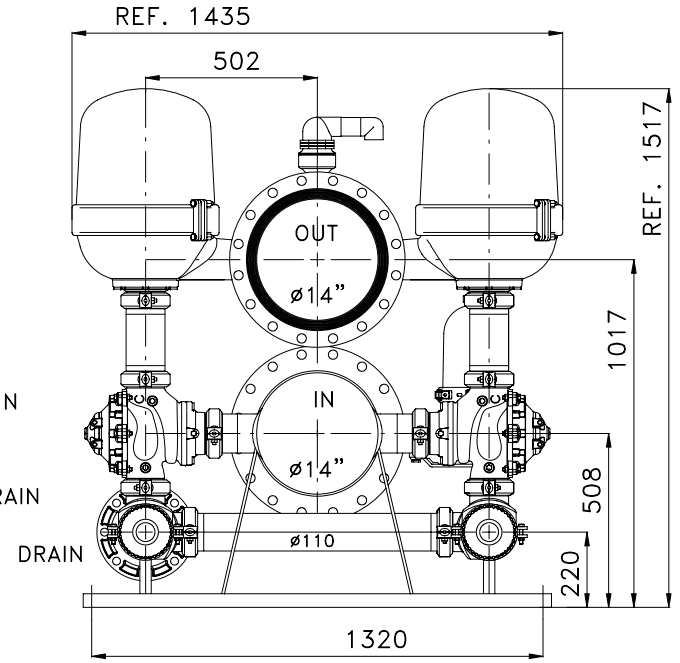
	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	12.05.08	IRINA
CHECKED	NIKOLAY	12.05.08	
APPROVED	DEKEL	12.05.08	

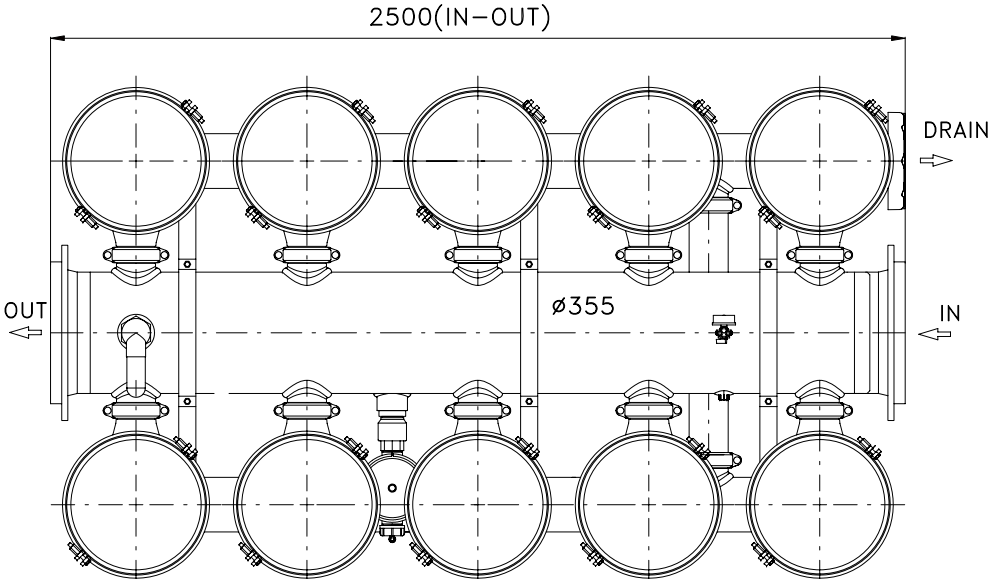
FILE CODE DRAWING OF MANIFOLD: 6660 1208_20008(1-2),6121 0501, 5999 174230, PALET-479 (5201 5988)

BACKUP: DISK-33

DRAWER N: 6018







THIS DRAWING CANCEL DRAWING FROM 03.12.06

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT
10*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 7

CATALOGUE No: 4660E1410_30008

PATH BATERIES\4INCH\GALAXY
DOROT\PLASTIC\NEW VALVE

FILE CODE 4660E1410_30008

	NAME	DATE
DRAWN	MAYA	12.05.08
CHECKED	DEKEL	12.05.08
APPROVED		

FILE CODE DRAWING OF MANIFOLD:
6660 1410_20008(1-3),
5999 170080,6121 0393,
PALET-226 (5201 5740)

NAME IRINA DATE 12.05.08 SIGNATURE IRINA

BACKUP: DISK-33

DRAWER N: 6018

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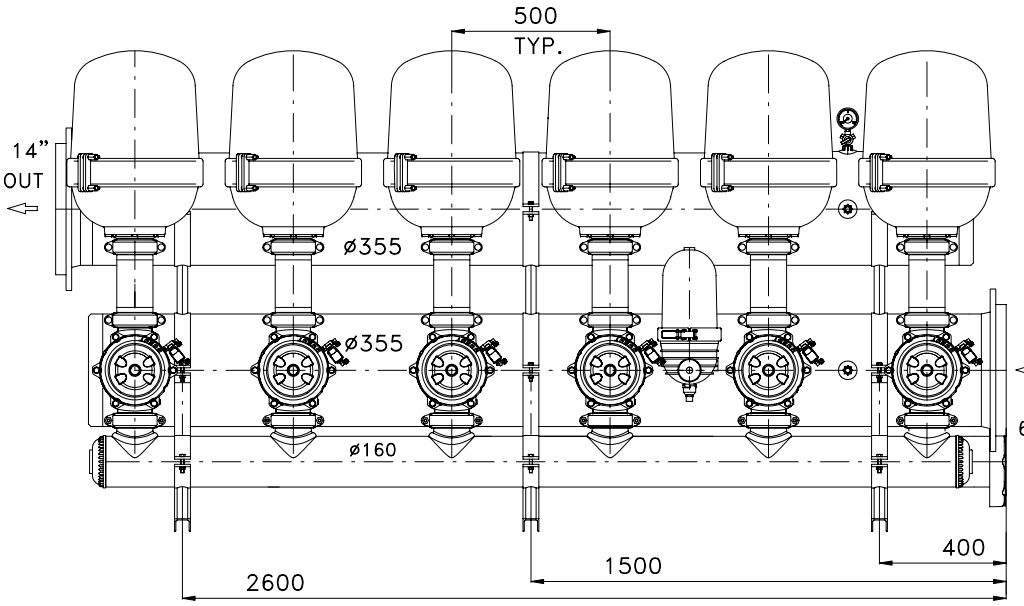

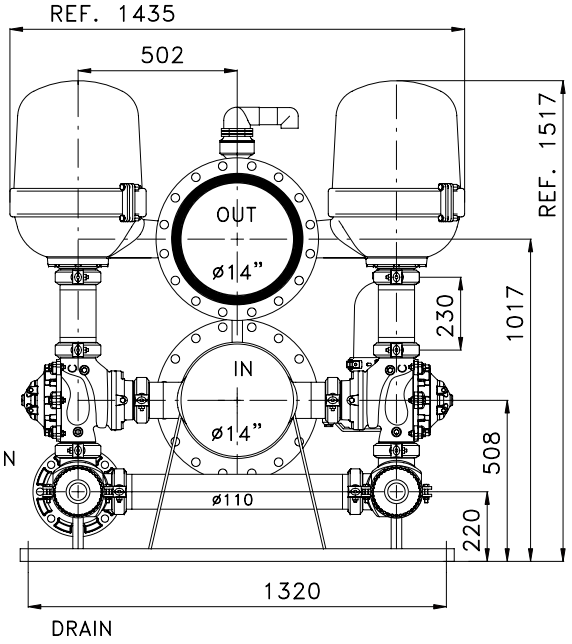

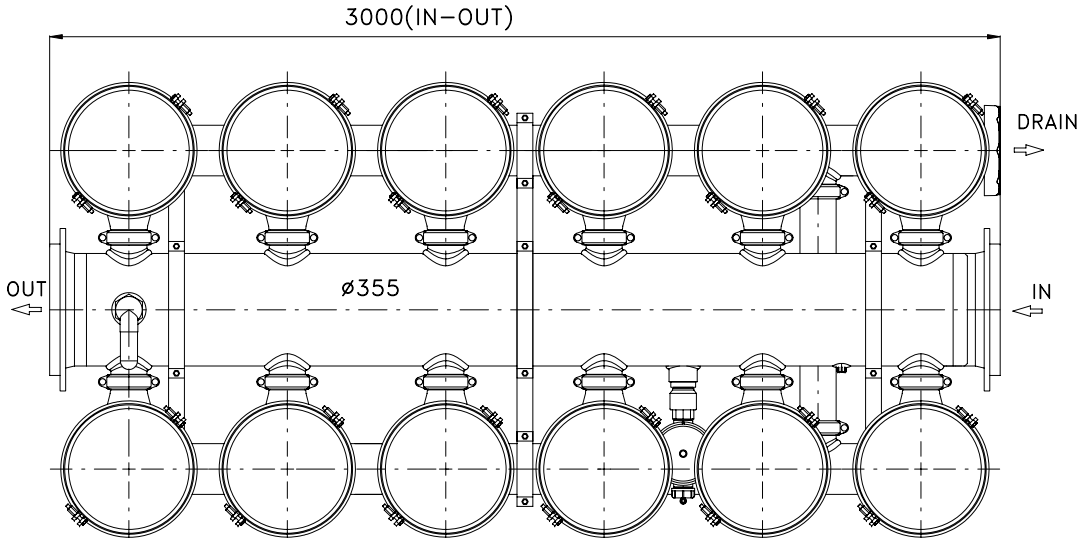

THIS DRAWING CANCEL DRAWING FROM 18.05.06

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
12*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY

TITLE
ASSEMBLY DRAWING

PAGE 1 OF 6

CATALOGUE No: 4660E1412_30008

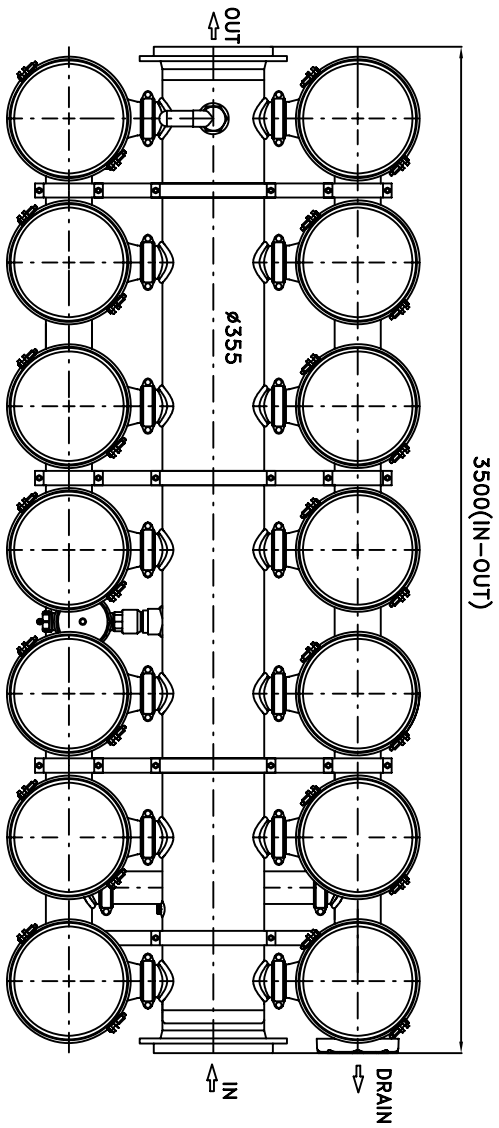
PATH BATERIES\4INCH\GALAXY DOROT\PLASTIC\NEW VALVE

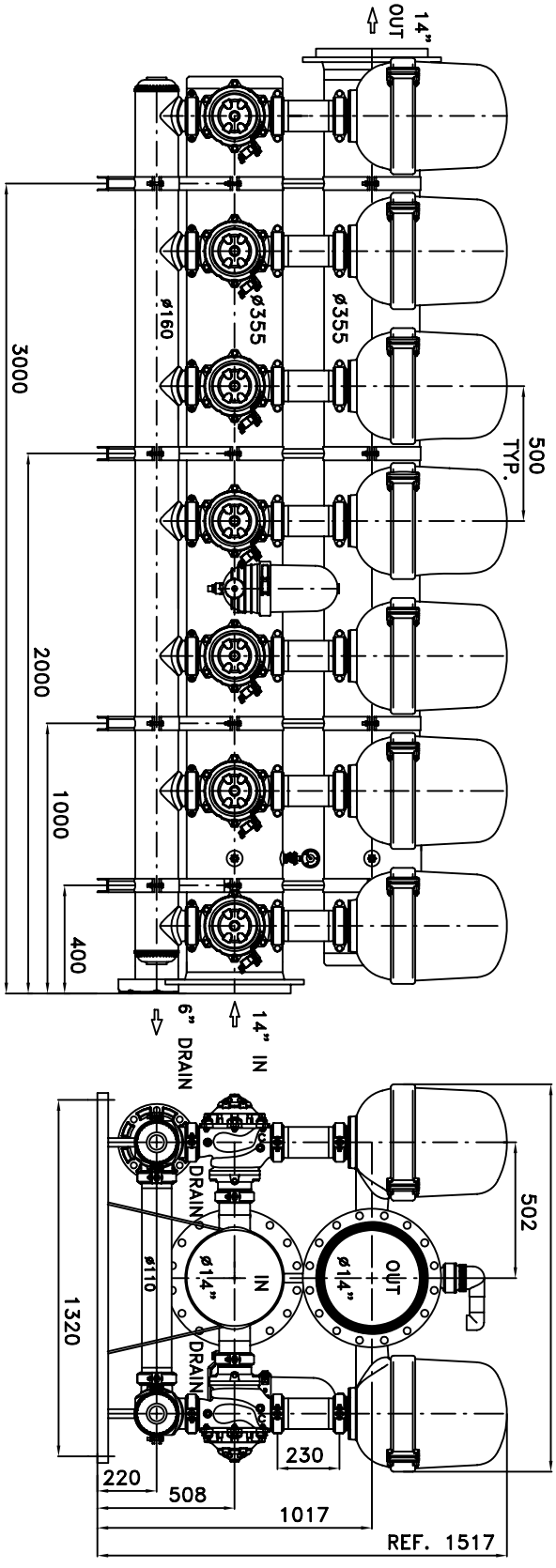
	NAME	DATE	FILE CODE
DRAWN	NIKOLAY	12.05.08	4660E1412_30008
CHECKED	DEKEL	12.05.08	6660 1412_20008(1-3),6121 0393 5999 170080 PALET-205 (5201 5718)
APPROVED			

	NAME	DATE	SIGNATURE
	IRINA	12.05.06	IRINA

BACKUP: DISK-33

DRAWER N: 6018





		THIS DRAWING CANCEL DRAWING FROM 11.09.08	
MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
14*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY

PAGE 1 OF 6

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
4660E1414_30008

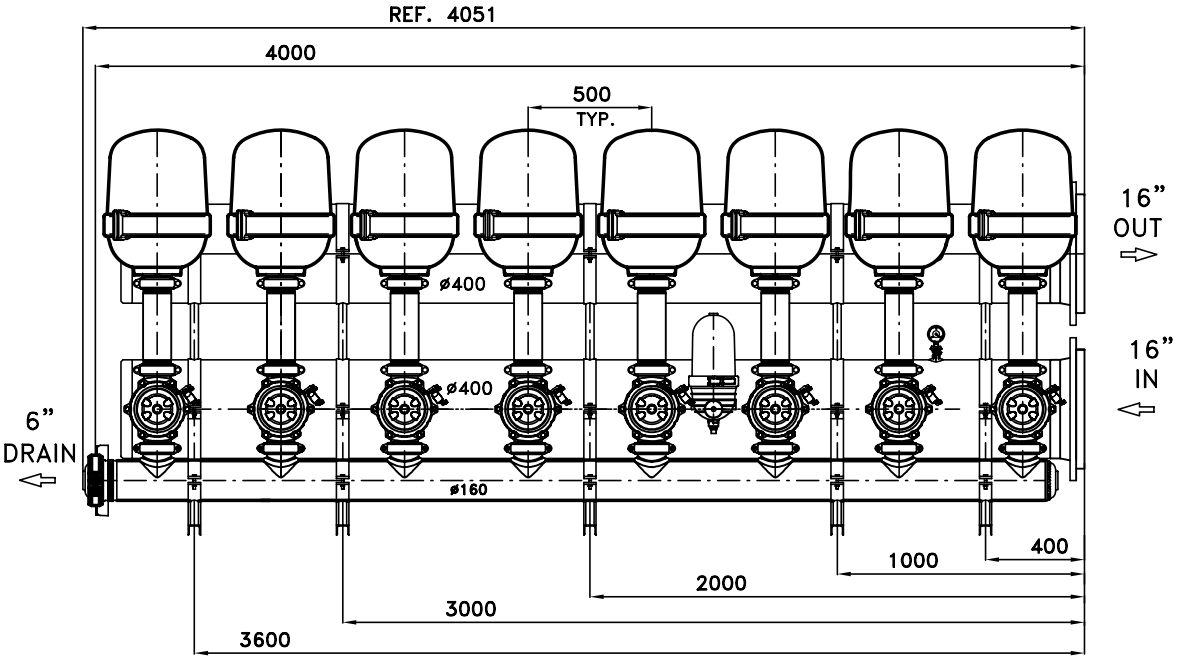
PATH	FILE CODE	NAME	DATE	SIGNATURE
BATERIES\4INCH\GALAXY DOROT\PLASTIC\NEW VALVE	4660E1414_30008	IRINA	14.09.08	OLEG

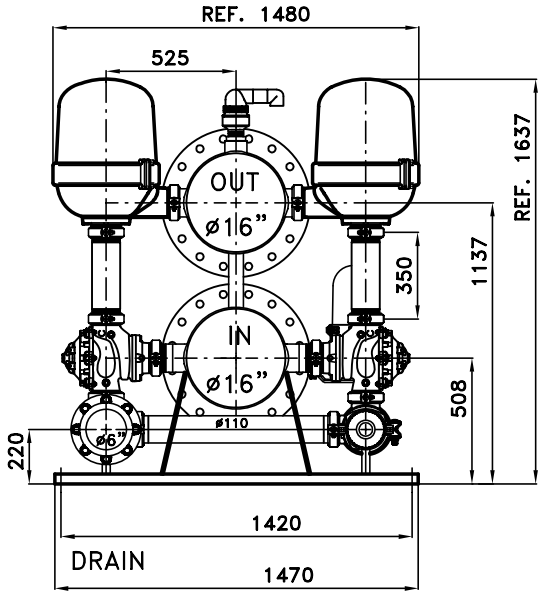
	NAME	DATE
DRAWN	NIKOLAY	14.09.08
CHECKED	NIKOLAY	14.09.08
APPROVED	DEKEL	14.09.08

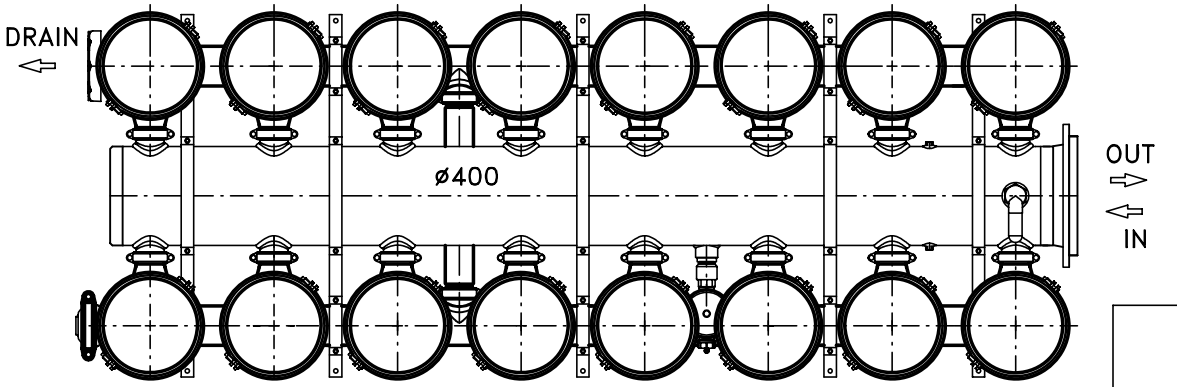
FILE CODE DRAWING OF MANIFOLD:
6660 1414_20018(1-3),6121 0393, 5999 174230
PALET-508 (5201 5012)

BACKUP:
DISK-33

DRAWER N:
6018







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TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 16*4" S.K. "GALAXY" FILTERS SYNTHETIC BATTERY

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 4660E1616_30018

PATH	FILE CODE	NAME	DATE	SIGNATURE
BATERIES\4INCH\GALAXY DOROT\PLASTIC\NEW VALVE	4660E1616_30018	IRINA	08.10.06	IRINA

	NAME	DATE
DRAWN	PABLO	08.10.06
CHECKED	OMRY	08.10.06
APPROVED		

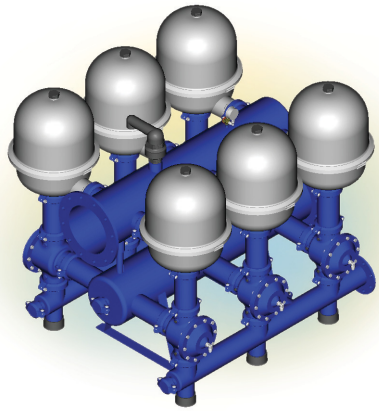
FILE CODE DRAWING OF MANIFOLD: 6660 1616_20018(1-3) 5999 170180,6120 0445,

BACKUP: DISK-32

DRAWER N: 6018

Galaxy

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for high flow rates
- Continuous flow during backwash
- Plastic parts - corrosion free
- Highly durable filter element
- Lightweight, compact design
- Simple and reliable operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Filtration surface area per unit	**cm^2**	4,400	**in^2**	680
Filtration volume per unit	**cm^3**	6,600	**in^3**	410
Backwash water volume per unit	**lit**	165	**gal**	44

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m^3/h**						**gpm**					
400-130 µ	Good	300	400	500	600	700	800	1320	1760	2200	2640	3080	3520
	Average	225	300	375	450	525	600	990	1320	1650	1980	2310	2640
	Poor	150	200	250	300	350	400	660	880	1100	1320	1540	1760
	Very Poor	100*	130	160	200	230	260	435*	580	725	870	1015	1160
100 µ	Good	270	360	450	540	630	720	1190	1585	1980	2375	2770	3165
	Average	205	270	340	410	480	550	900	1200	1500	1800	2100	2400
	Poor	135*	180	225	270	315	360	600*	800	1000	1200	1400	1600
	Very Poor	90**	120	150	180	210	240	400**	530	660	790	920	1050
55 µ	Good	170	225	280	335	390	445	750	990	1235	1480	1725	1970
	Average	125*	165	210	255	300	345	555*	740	925	1110	1295	1480
	Poor	85**	110*	140	170	200	230	370**	490*	615	740	865	990
	Very Poor	60**	80**	100*	120*	140	160	260**	340**	430*	520*	610	700
20 µ	Good	N/A***	N/A***	140	170	200	230	N/A***	N/A***	630	745	870	995
	Average	N/A***	N/A***	105*	125*	150	175	N/A***	N/A***	475*	565*	660	755
	Poor	N/A***	N/A***	70**	85**	100*	115*	N/A***	N/A***	310**	370**	435*	500*
	Very Poor	N/A***	N/A***	50**	60**	70**	80**	N/A***	N/A***	220**	260**	315*	350*

Higher flow rates available with additional unit design

* External source for backwash is necessary

** When pressure is low, it is necessary to close downstream valve during backwash

*** The 3" Spin Klin Battery is recommended

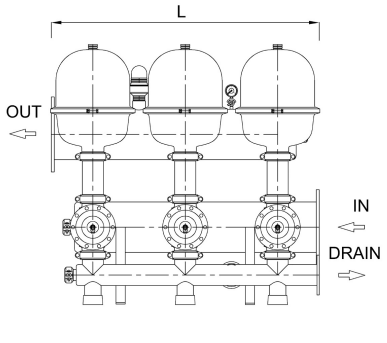
Galaxy

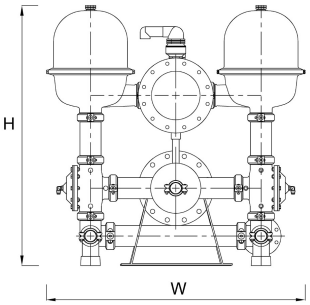
Filtration Batteries

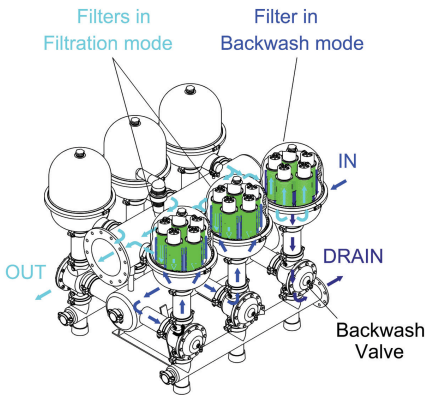
Dimensions and Weights

No. of units		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	mm	225	280	280	315	315	355	inch	8	10	10	12	12	14
L Length	mm	1450	1950	2450	1450	1950	1950	inch	57	77	96	57	77	77
H Height	mm	1405	1405	1405	1405	1405	1405	inch	55	55	55	55	55	55
W Width	mm	830	900	970	1450	1450	1510	inch	33	35	38	57	57	59
Shipping weight (approx.)	kg	290	370	485	610	720	912	lbs	638	814	1067	1342	1584	2006

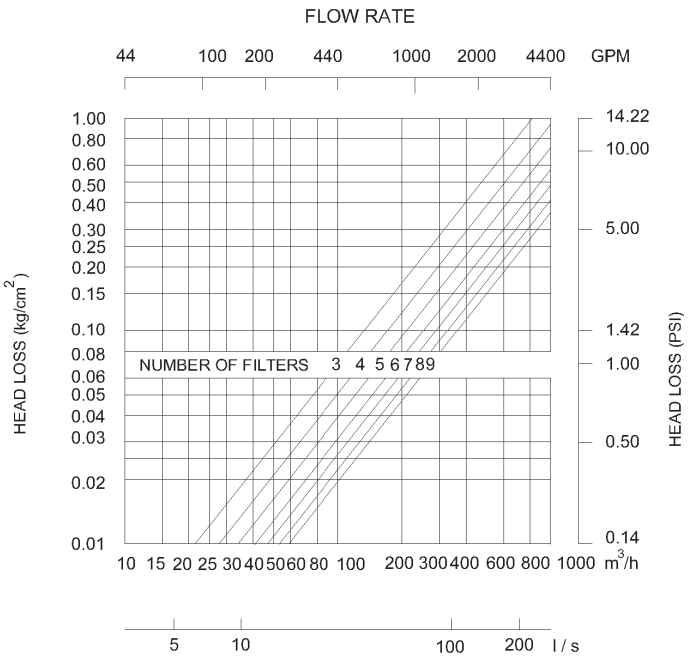
NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.







Head Loss Chart - for 130-400µ, Clean State

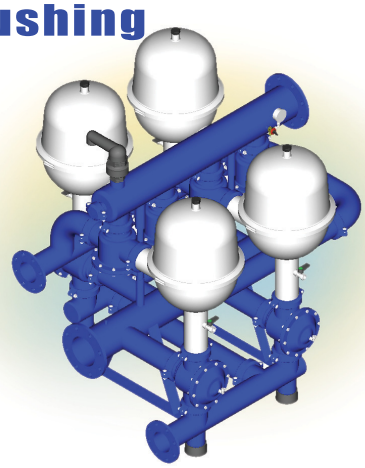


GALAXY filtration batteries are available with:

- Polyester coated steel, Stainless steel or Polypropelene manifolds.
- Stainless steel 316, Polyester coated steel or Polymer pods.

Galaxy External Source Flushing

Filtration Batteries



Features

- Precise filtration with Spin Klin technology
- Automatic filtration for high flow rates
- Plastic parts - corrosion free
- Highly durable filter element
- Easy installation and operation
- Lightweight, compact design
- Simple and reliable operation
- Low-pressure operation

Technical Data

	METRIC		US	
Max. pressure	**bar**	10	**psi**	145
Min. backwash pressure	**bar**	2.8	**psi**	40.6
Min. filtration pressure	**bar**	0.8	**psi**	12
Filtration surface area per unit	**cm²**	4,400	**in²**	680
Filtration volume per unit	**cm³**	6,600	**in³**	410
Backwash water volume per unit	**lit**	165	**gal**	44

Maximum Filtration Flow Rate / Water Quality

No. of units		3	4	5	6	7	8	3	4	5	6	7	8
Filtration Grade	**Water Quality**	**m³/h**						**gpm**					
400-130 µ	Good	300	400	500	600	700	800	1320	1760	2200	2640	3080	3520
	Average	225	300	375	450	525	600	990	1320	1650	1980	2310	2640
	Poor	150	200	250	300	350	400	660	880	1100	1320	1540	1760
	Very Poor	100	130	160	200	230	260	435	580	725	870	1015	1160
100 µ	Good	270	360	450	540	630	720	1190	1585	1980	2375	2770	3165
	Average	205	270	340	410	480	550	900	1200	1500	1800	2100	2400
	Poor	135	180	225	270	315	360	600	800	1000	1200	1400	1600
	Very Poor	90	120	150	180	210	240	400	530	660	790	920	1050
55 µ	Good	170	225	280	335	390	445	750	990	1235	1480	1725	1970
	Average	125	165	210	255	300	345	555	740	925	1110	1295	1480
	Poor	85	110	140	170	200	230	370	490	615	740	865	990
	Very Poor	60	80	100	120	140	160	260	340	430	520	610	700
20 µ	Good	N/A*	N/A*	140	170	200	230	N/A*	N/A*	630	745	870	995
	Average	N/A*	N/A*	105	125	150	175	N/A*	N/A*	475	565	660	755
	Poor	N/A*	N/A*	70	85	100	115	N/A*	N/A*	310	370	435	500
	Very Poor	N/A*	N/A*	50	60	70	80	N/A*	N/A*	220	260	315	350

Higher flow rates available with additional unit design

* The 3" Spin Klin battery is recommended

Galaxy

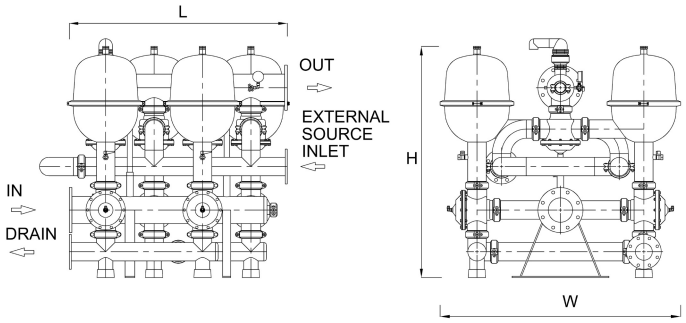
Filtration Batteries

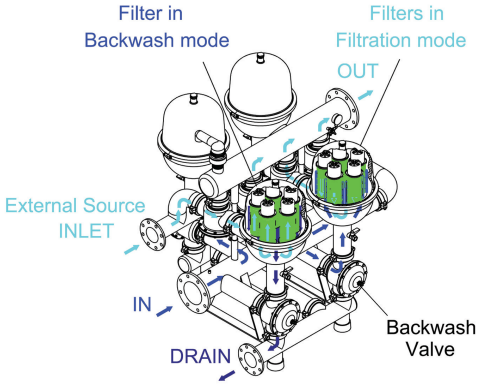
External Source Flushing

Dimensions and Weights

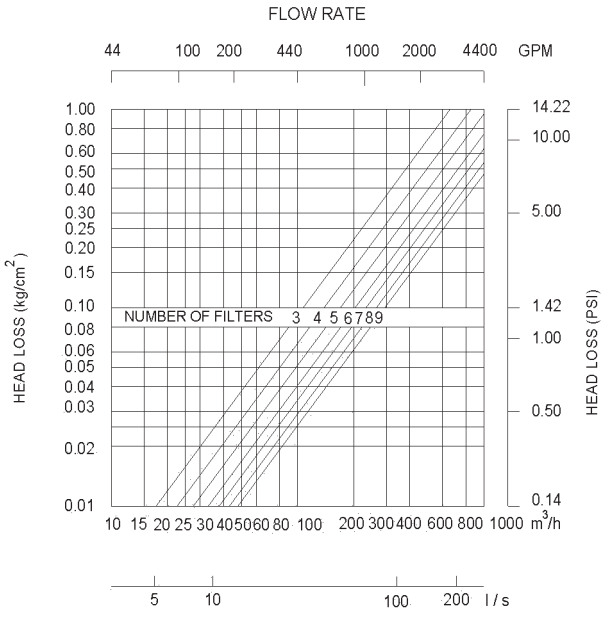
No. of units		3	4	5	6	7	8		3	4	5	6	7	8
D Inlet\Outlet diameter	**mm**	225	280	280	315	315	355	**inch**	8	10	10	12	12	14
L Length	**mm**	1305	1805	2305	2105	2405	2655	**inch**	51	71	91	83	95	105
H Height	**mm**	1533	1587	1587	1633	1633	1666	**inch**	60	62	62	64	64	66
W Width	**mm**	1112	1112	1112	1813	1813	1511	**inch**	44	44	44	71	71	59
Shipping weight (approx.)	**kg**	750	863	998	1146	1290	1462	**lbs**	1654	1909	2200	2526	2844	3223

NOTE: Above dimensions are for standard models only: Polyester coated steel flanged inlet\outlet and drainage manifolds.





Head Loss Chart - for 130-400µ, Clean State



GALAXY filtration batteries are available with:

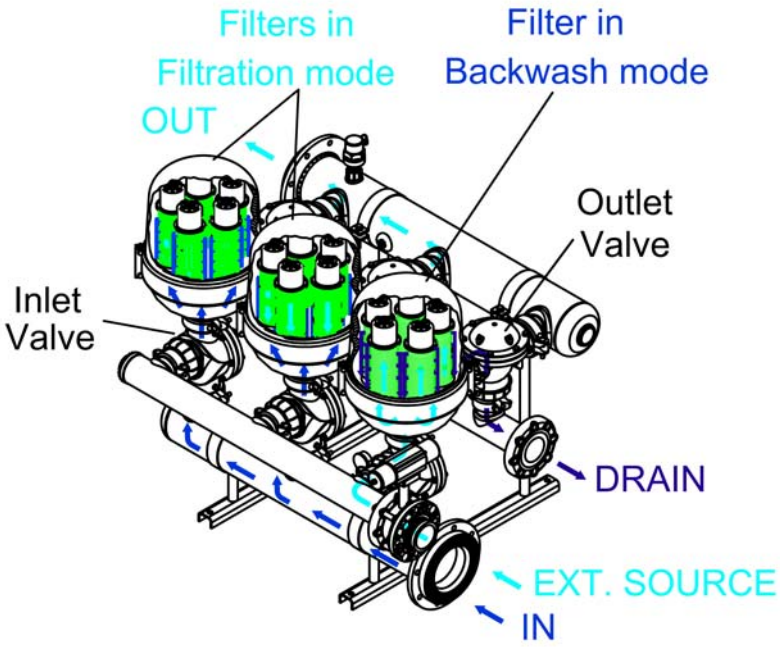
- Polyester coated steel, Stainless steel or Polypropelene manifolds.
- Stainless steel 316, Polyester coated steel or Polymer modules.

Galaxy Spin Klin® Battery
External Source Automatic Backwash

Operation and Maintenance Manual

Filtration Process

During filtration, water flows from inlet manifold, through the 4”x4” inlet valve into the filters, and through the 4”x4” outlet valve. Filtered water gathers in the outlet manifold and flows into the user system.



Backwash Process

The backwash process is initiated by the control unit according to differential pressure between the inlet and outlet or time.

The first solenoid transmits a command to two valves:

1. In the Inlet valve the inlet port closes and the drain port opens.
2. In the outlet valve the outlet port closes and the external source port opens.

Filter No. 1 is now in backwash mode.

The 5 Spin Klin spines in filter No. 1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied by an external source through the external source manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is 15-20 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

The solenoid releases the command allowing the inlet / outlet valve and the discs of the 5 spines to return to filtration mode.

Once filter No. 1 is in the filtration position again the control unit sends a command to begin the backwash process in filter No. 2.

Spin Klin Technology- Spin Klin Spine Model 2

General:

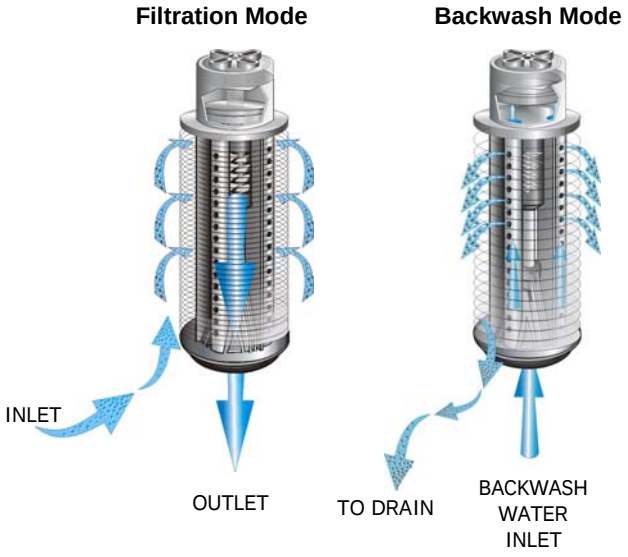
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded by micron **size,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.

Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs**.**

Backwash Mode:

During backwash the discs are released hydraulically, simultaneously pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.



Backwash valve

The Backwash valves have two built-in chambers.

Each port has its own valve seat, but they share a common shaft and diaphragm.

The valve chambers are mutually integrated units. When one port is open, the other is closed, permitting the backwash valve to perform two modes of operation:

Filtration mode: The valve permits flow from the inlet manifold through the filter, into the system.

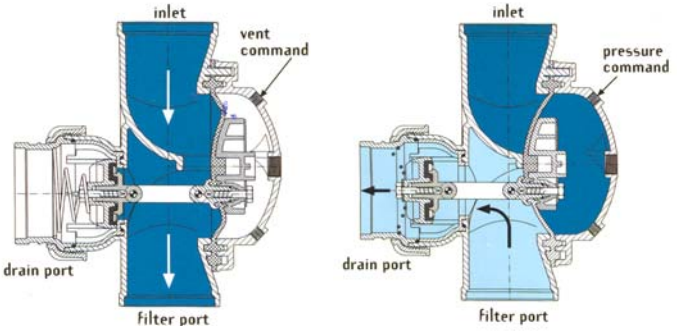
Flushing mode: The valve closes the inlet port and opens the drain port, causing reverse flow through the filter, ejecting impurities via the drain port.

Operation is initiated by an electric solenoid.

The backwash valve is either controlled by water pressure, or a pneumatic source.

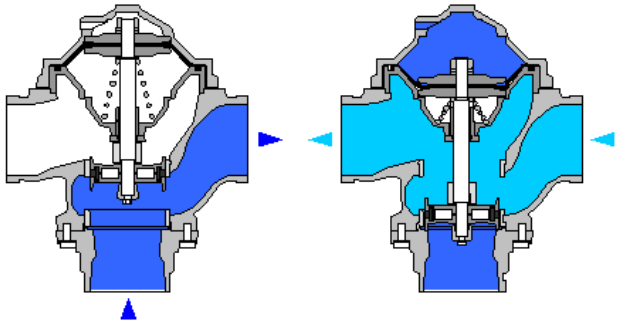
Plaslite backwash valve (single chember velve)*

Filtration Mode **Backwash Mode**



Dorot backwash angle valve

Filtration Mode **Backwash Mode**

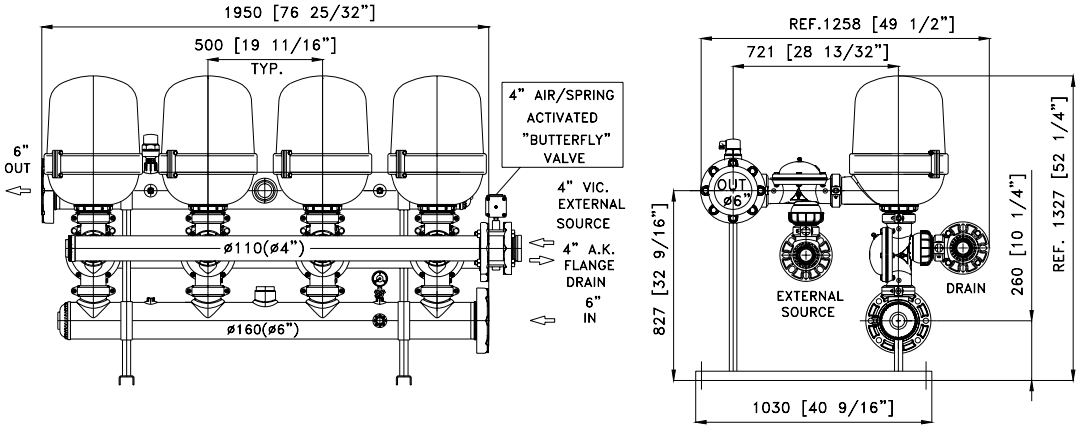


* Require valve delay

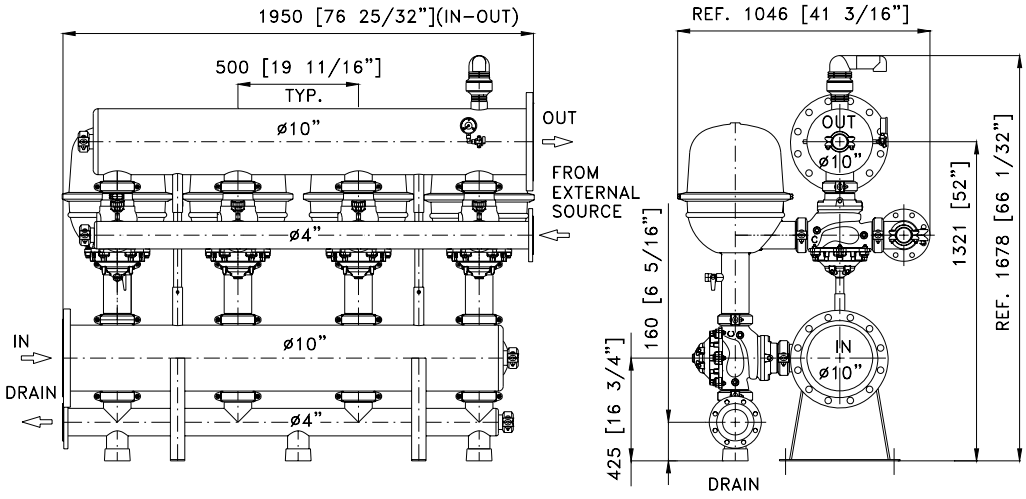
Technical Data

Maximum pressure	10 bar	145 psi
Minimum pressure	0.8 bar	12 psi
Minimum backwash pressure	2.8 bar	40.6 psi
Backwash flow rate per unit	50 m^3/hr	220 gpm
Water volume per backwash	200 liter	53 gallons
Maximum temperature	70°C	158°F

Galaxy System
Polymer
Plaslite Valves



Galaxy System
Stainless Steel 316
Dorot Valves



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).

B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).

C. Connect backwash drainage line.

D. Cover clamps need to be properly closed.

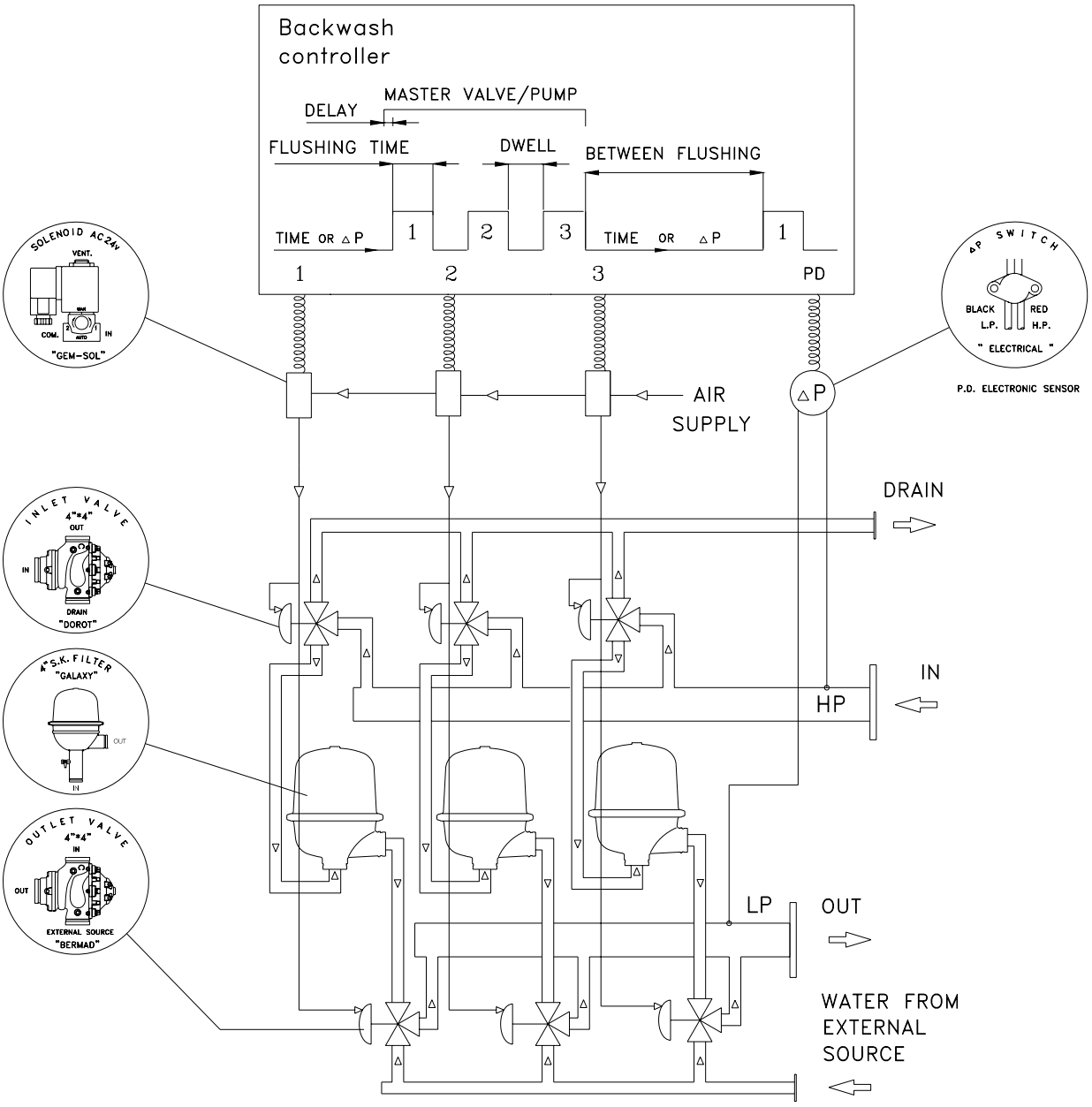
Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

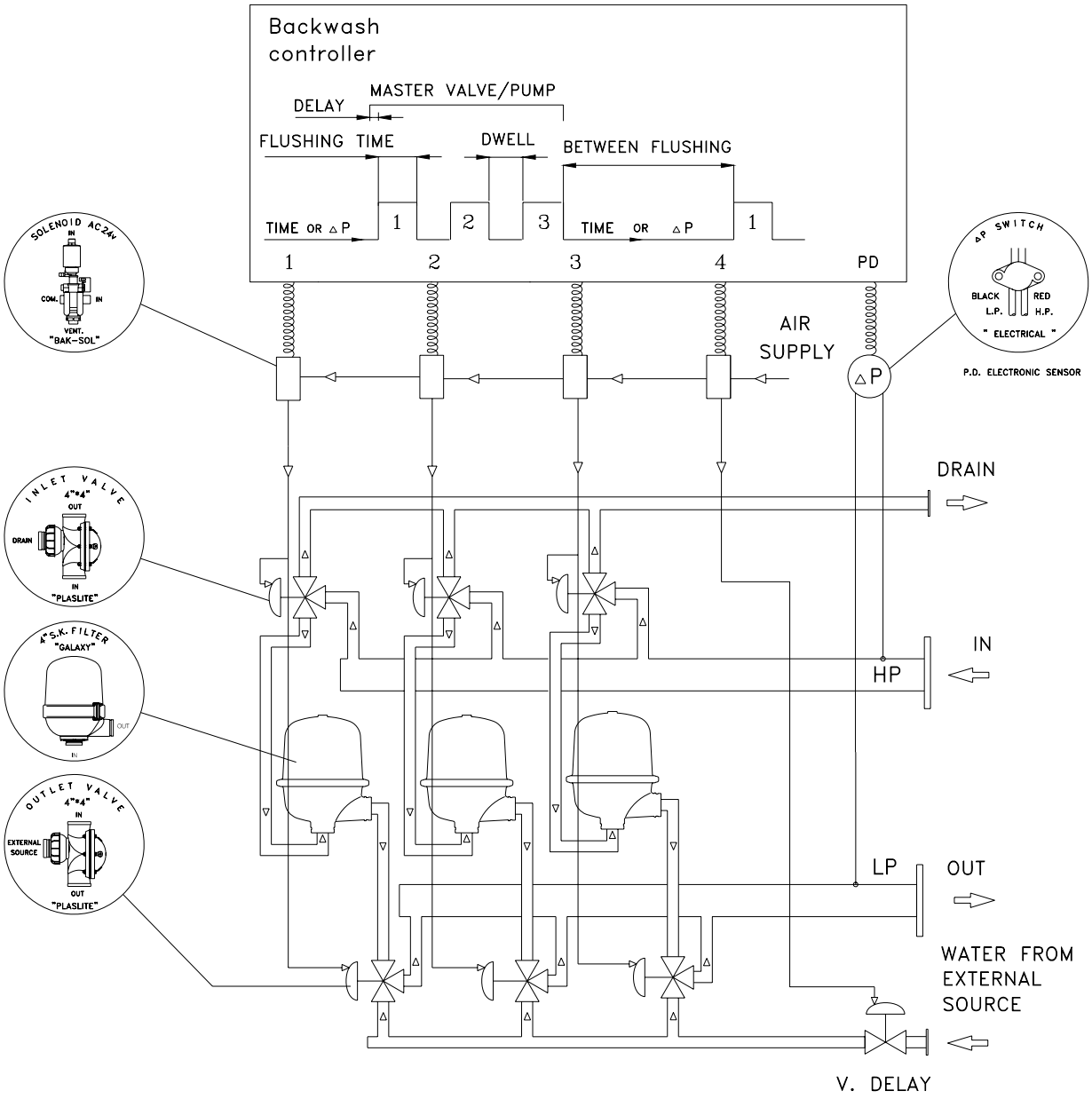
Filter Load-up during Start-up

- ❑ Close the downstream (flow control) valve (if available).
- ❑ Flush few cycles until clean.
- ❑ Slowly reopen the downstream valve.
- ❑ If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

Control Schema of Galaxy System Stainless Steel 316 Dorot Valves



Control Schema of Galaxy System Polymer Plaslite Valves



Control

- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin - System Maintenance

Monthly Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin filter battery.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped at the command filter, remove the cover. Thoroughly clean the filtration element and then reinstall the command filter element and cover, then open the inlet valve.

Winterization:

In order to prevent the filter battery becoming damaged during water freezing – drain all the water from the filter battery and the command filter and leave the drain valve open.

Seasonal Maintenance – Cleaning the Discs

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. Make certain that there is no pressure in the system and unscrew the nuts. (**Figure 1**)
Open the clamp. (**Figure 2**)
Remove the cover. (**Figure 3**)

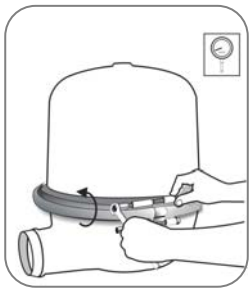


Figure 1

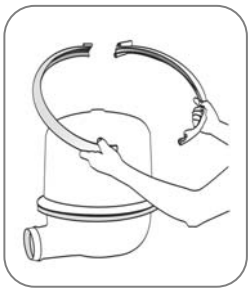


Figure 2

Figure 3

Unscrew the butterfly nuts on the filtration elements. (**Figure 4**)
Remove the tightening cylinders. (**Figure 5**)
Remove the disc sets (for convenience we recommend using a plastic bag). (**Figure 6**)

Figure 4

Figure 5

Figure 6

Tie each set on a string and place them in a cleaning solutions (HCL, Chlorine, or other) refer to "Cleaning Recommendations Clogged Filtration Discs". (**Figure 7-8**)

Figure 7

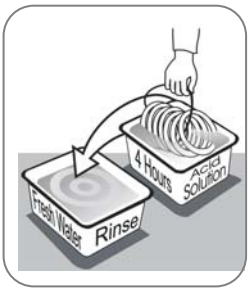


Figure 8

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (**Figure 9**)
Reassemble the tightening cylinders onto the spines, return the cover and tighten the clamp. (**Figure 10**)

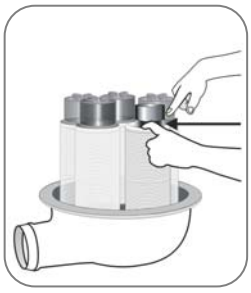


Figure 9

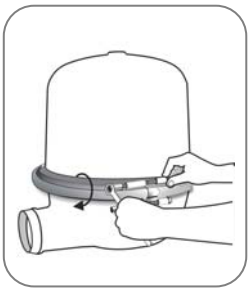


Figure 10

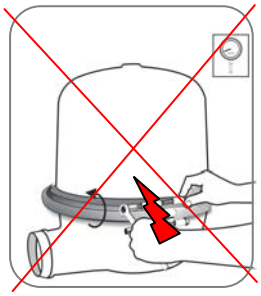
Attention:

When carrying out any of the following seasonal maintenance, service, or cleaning the discs – After backwashing the system and after closing the water inlet, **make certain that there is no pressure in the system!**

Unscrew the nuts and open the clamp.

Please Note:

- Before removing the cover you may experience the vacuum phenomenon – which will make the removing of the cover very difficult or almost impossible.
- **Do Not** - insert any sharp tools (objects) in between the cover and the body! You may damage the hydraulic seal and the cover!
- In order to remove the cover easily – **you should drain the water from the system**!
- You can drain the system through the command filter, or the back flush valves, once the system is empty the cover can then be removed safely and easily.



Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green
  in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

ATTENTION!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing
- Work in a well ventilated area
- Follow the manufacturer's instructions

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.
  Attention – Never open the filter before the pressure has been released.
- Arrange the discs loosely on the plastic rope
- Prepare a 5% Sodium Hypochlorite solution:
  1) Pour 5 liters of water into one of the large containers.
  2) Add 5 liters of Sodium Hypochlorite (10%) into the water.
- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: up to 8 hours
- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.
- Arrange the discs loosely on the plastic rope.
- Prepare a 5% Solution of Hydrochloric Acid:

  1) Pour 10 liters of water into one of the large containers.

  2) Carefully add 2 liters of Hydrochloric Acid (30%) into the water.

  Soak the discs in the solution so that both sides will be covered.

  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).

  To achieve maximum cleaning, agitate the discs several times with a stirring stick.
- Contact time with cleaning solution: 1 - 8 hours.
- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.
- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.

  Preparation of the solution:

  Pour 1 cup of water into a small container, then add 1 cup of Sodium Hypochlorite (10% NaOCl).
- Soak 2 discs in a 5% Hydrochloric Acid Solution.

  Preparation of the solution:

  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).
- Keep one disc as a control.
- Observe the cleaning process:

  - If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.

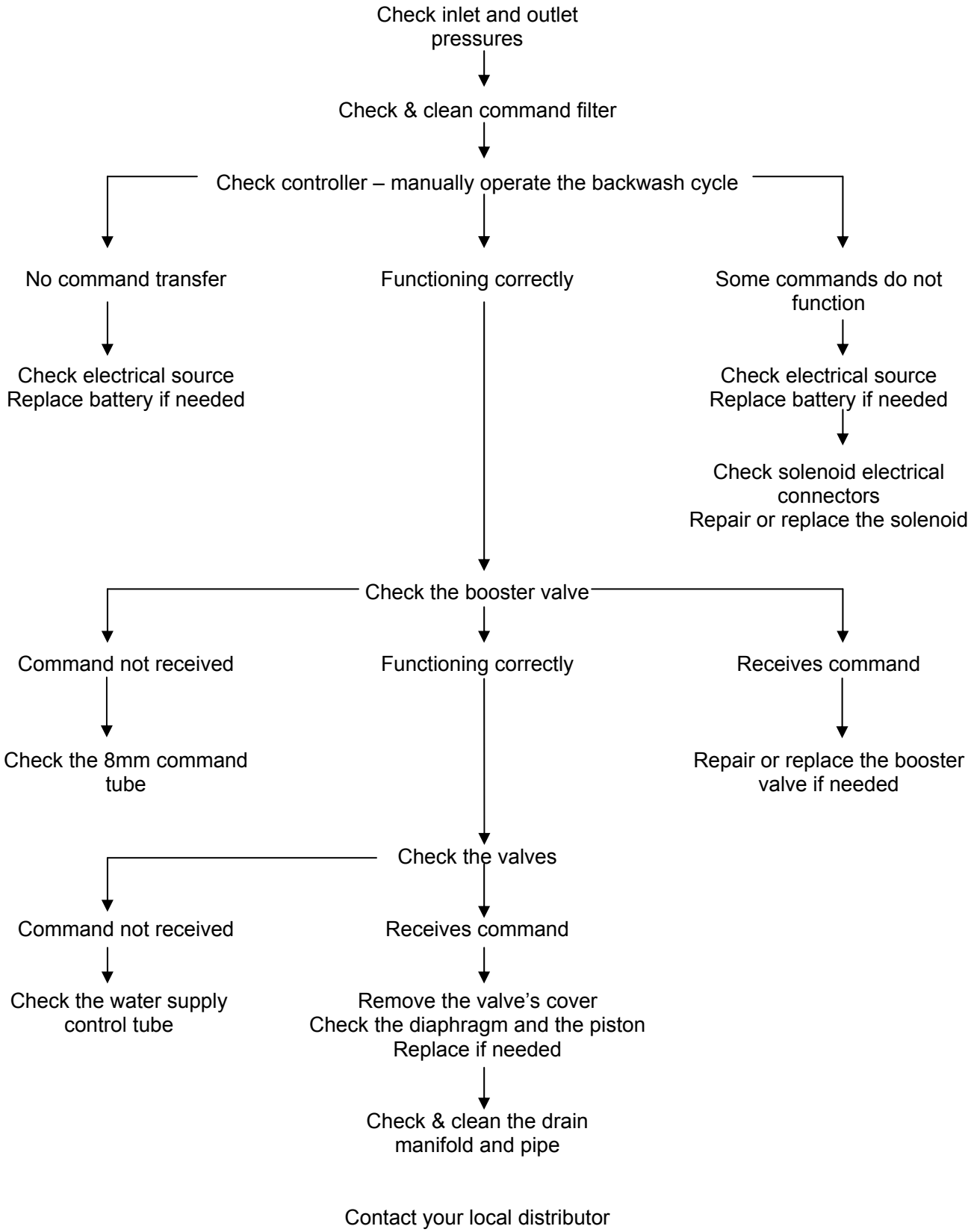
  - If neither solution removes the deposit completely, continue with the test procedure.
- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.
- Check the cleaning process:

  - If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.

  - If the deposit hasn't been completely removed, send a set of untreated discs to the laboratory for further examination.

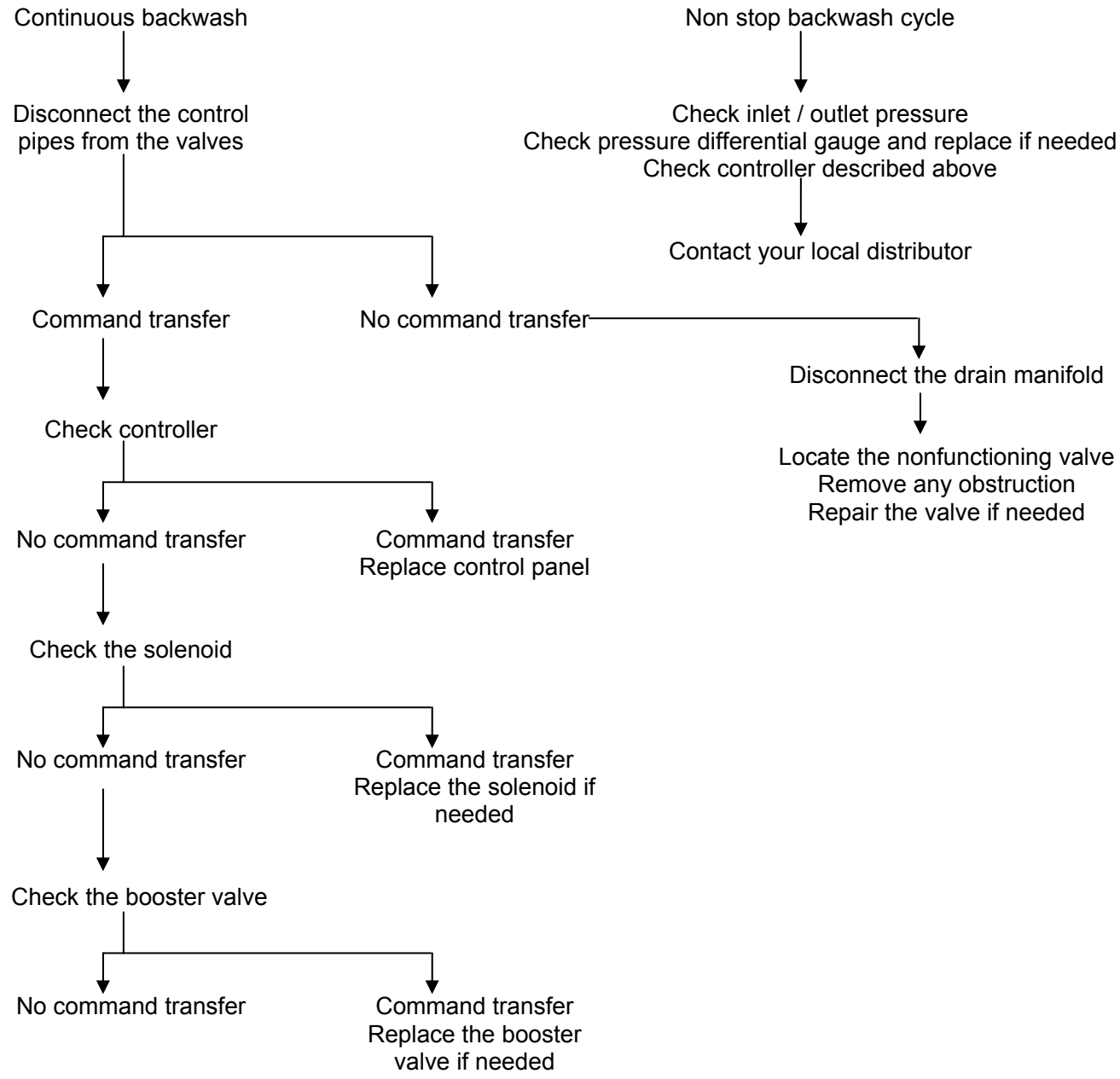
Identifying Malfunctions in the Galaxy system

No Backwash Operation



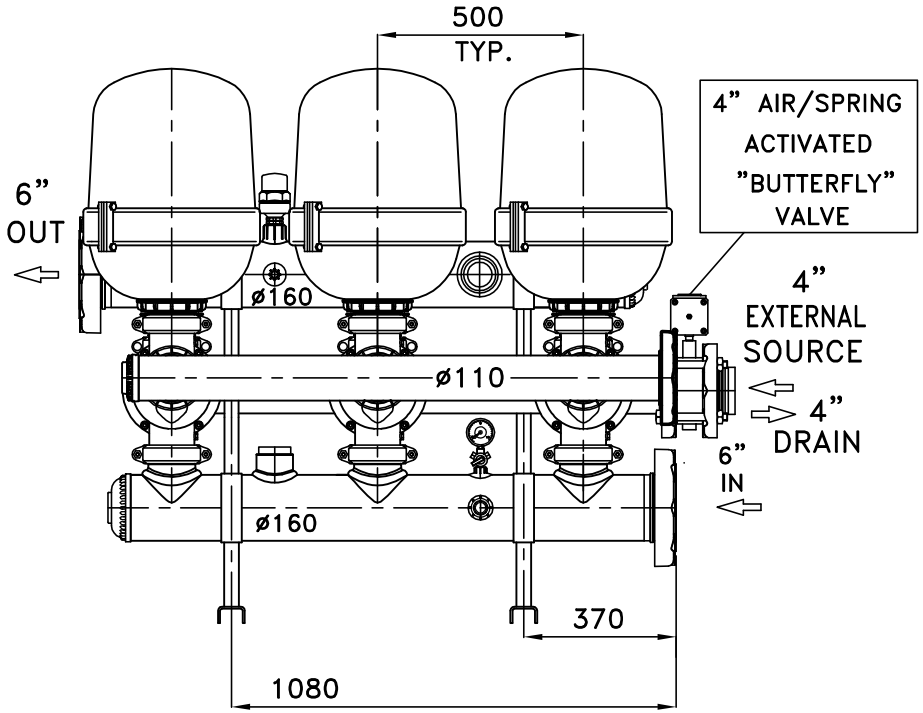
Identifying Malfunctions in the Galaxy system

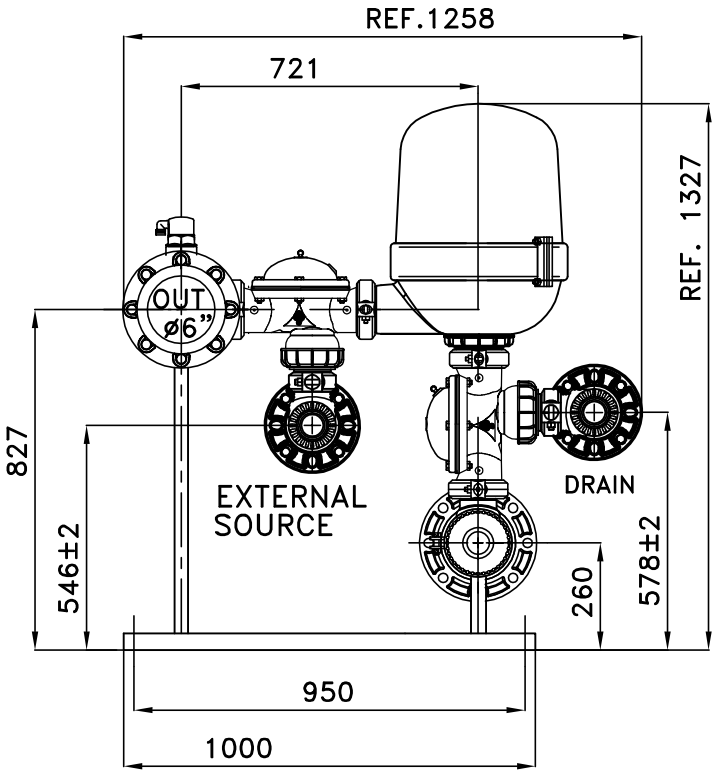
Continuous or Non-stop Backwashing

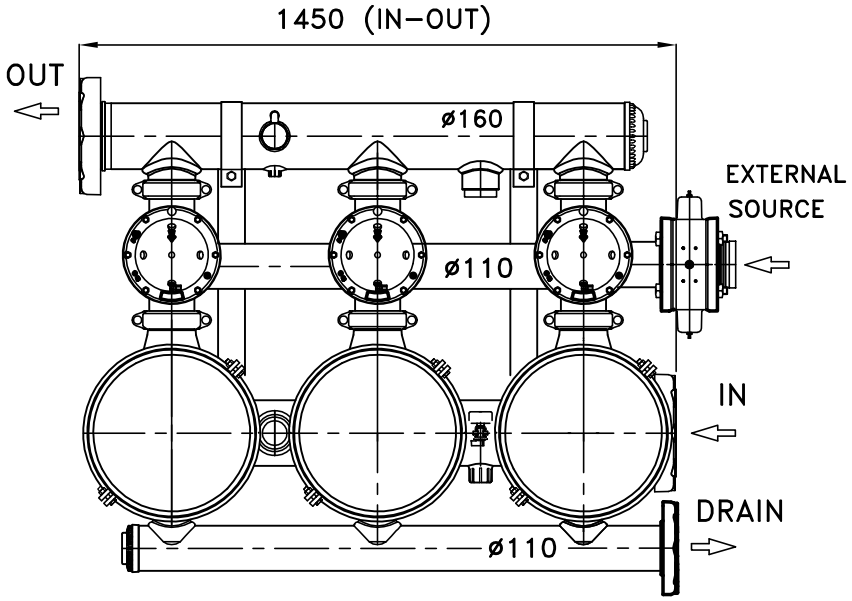


Drawings

4" Galaxy Batteries External Source







THIS DRAWING CANCEL DRAWING FROM 27.08.04

MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT 3*4 S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 7

TITLE ASSEMBLY DRAWING

CATALOGUE No: 4666P0603U2F

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	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
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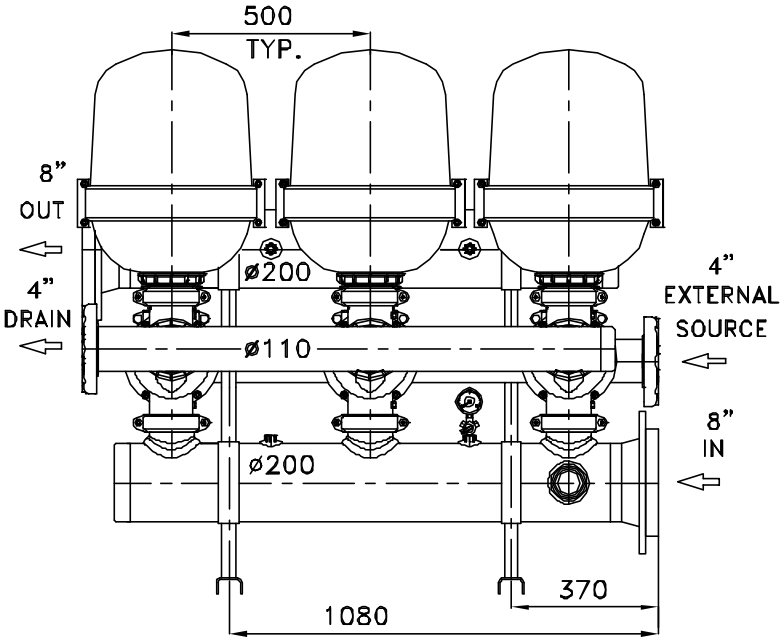
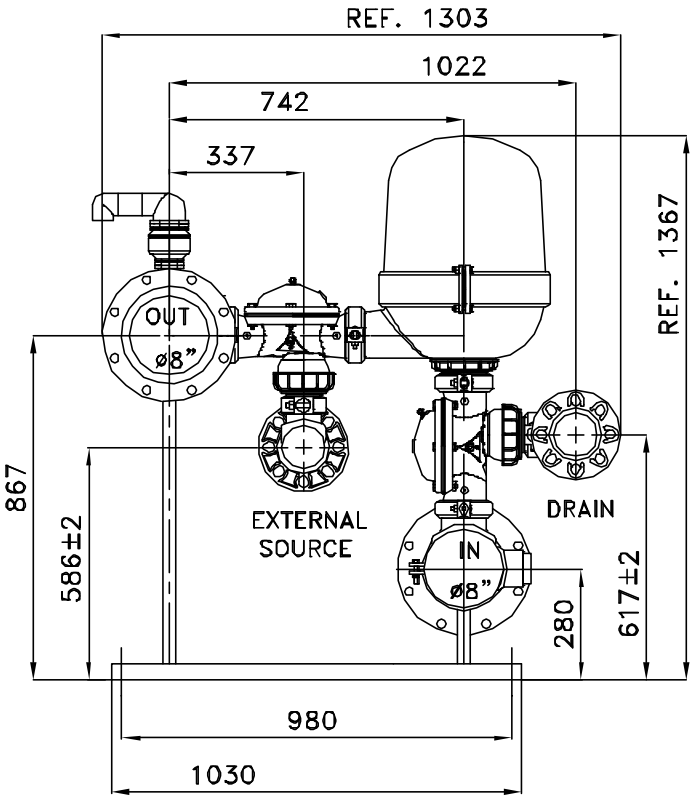
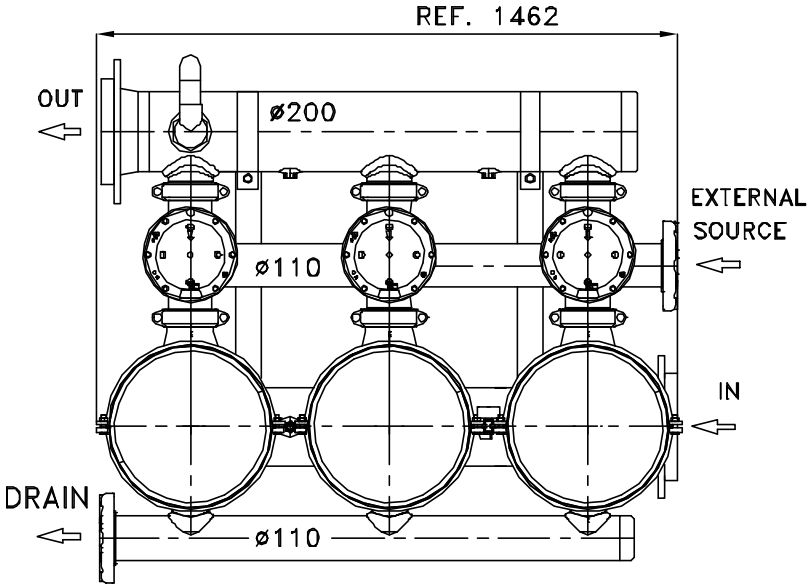
CHECKED	NIKOLAY	22.01.07	6666 0403VCO DR.2253 1425, PALET-351 (5201 5855),	DRAWER N: 6019
APPROVED	ZALI		TRIWALL-238 (5200 5689)	

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL







MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT: 3*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 3

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 4666P0803_2

	NAME	DATE	SIGNATURE
DRAWN	NIKOLAY	01.02.04	
CHECKED	OMRY	01.02.04	
APPROVED			

PATH BATERIES\4INCH\GALAXY PLASLITE\PLASTIC\EXTERNAL

FILE CODE 4666P0803_2

IRINA 01.02.04

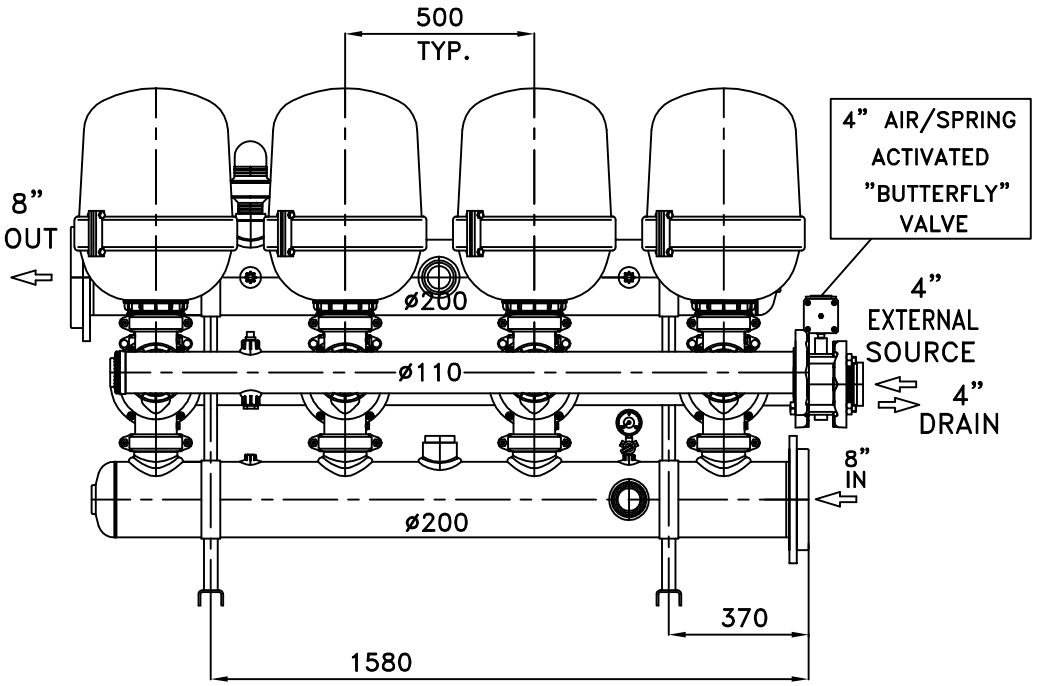
FILE CODE DRAWING OF MANIFOLD: 6666 0803_2,6120 0285

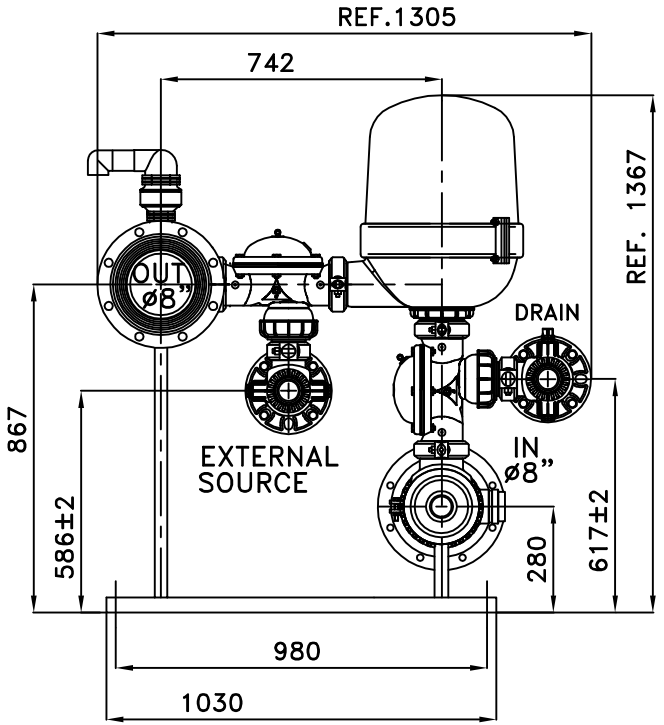
BACKUP: DISK-21

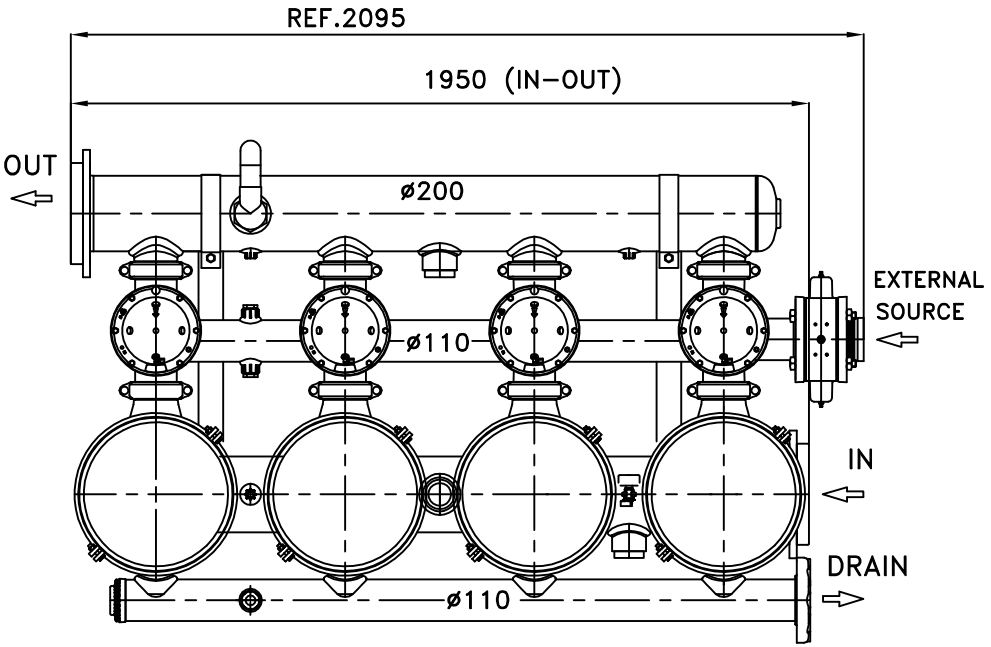
VIEW: FRONT.TOP & SIDE VIEWS

DRAWER N: 6020

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL







MODIFIC.	DATE	DESCRIPTION	SIGN.
		THIS DRAWIG CANCEL DRAWING FROM 15.07.04	

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FAX. 972-4-6775461
ISRAEL

PROJECT
4*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 6

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
4666P0804_2F

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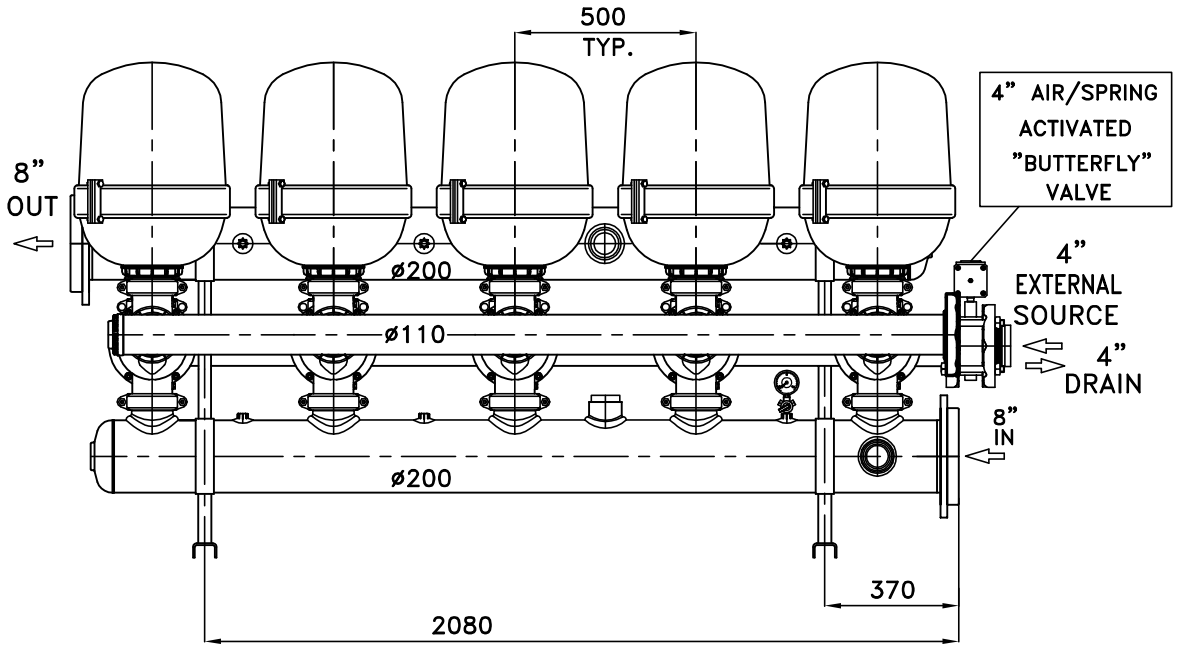

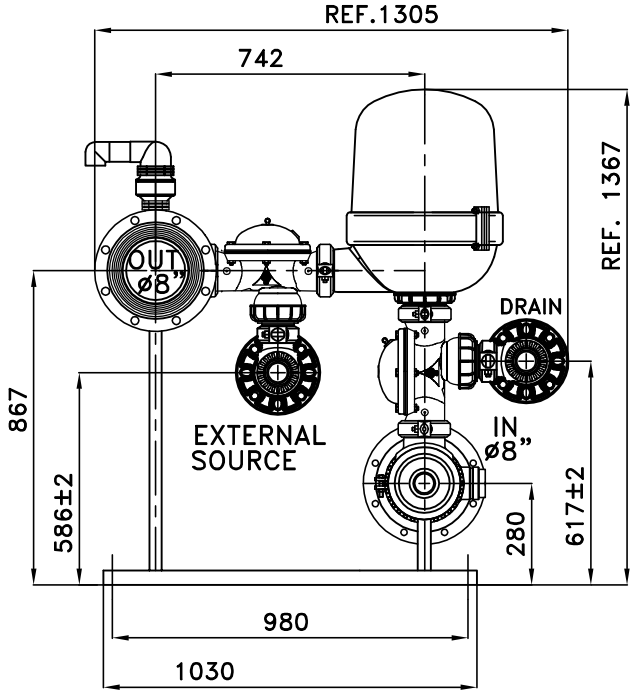

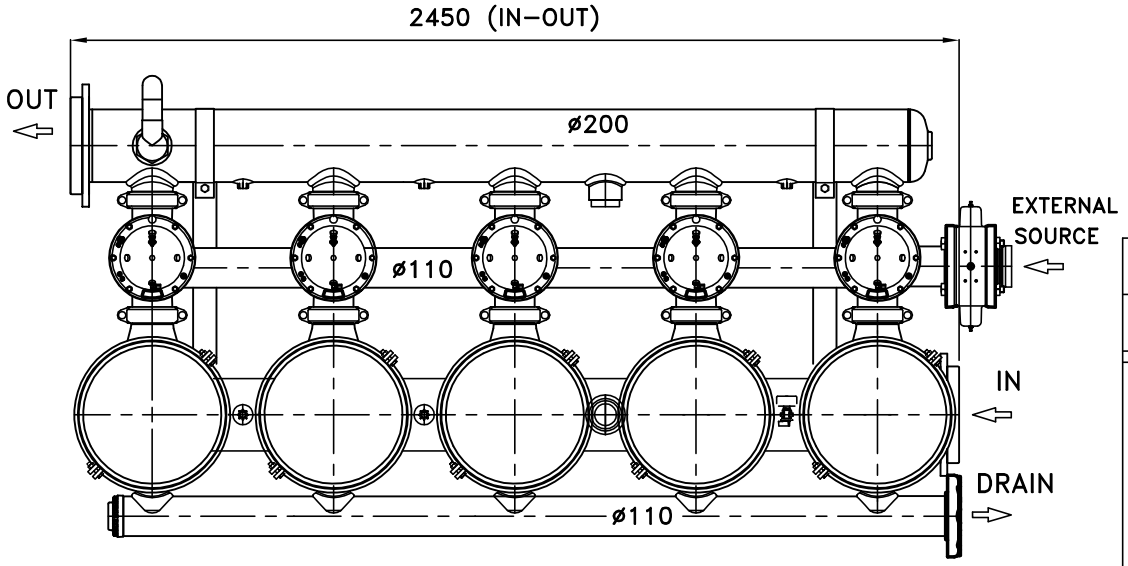

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5*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 5

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
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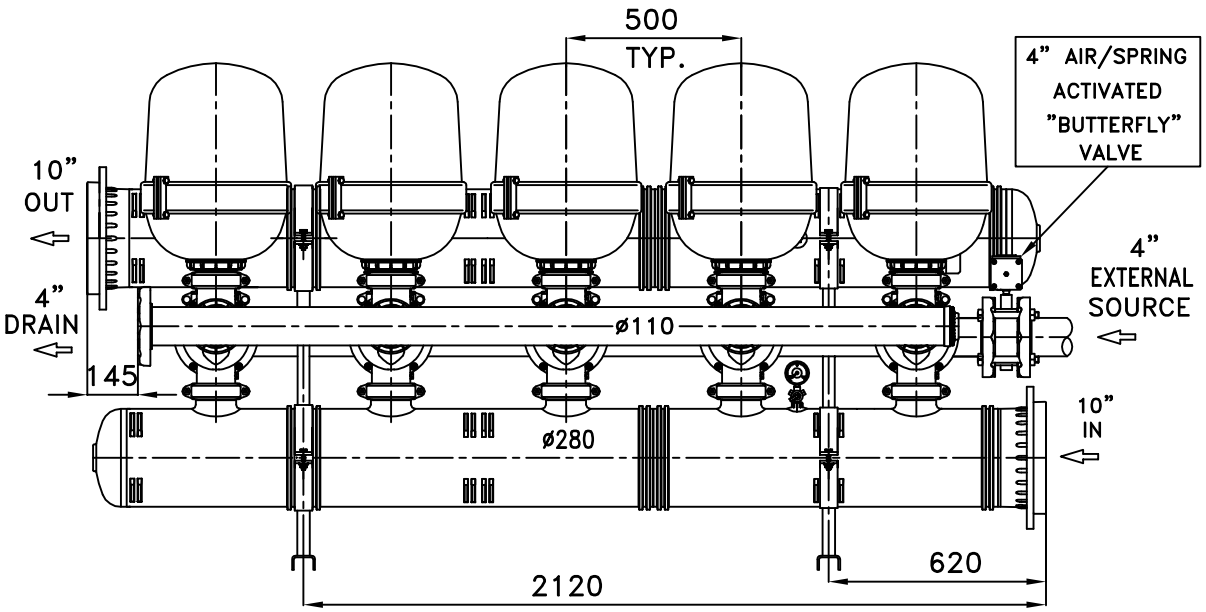

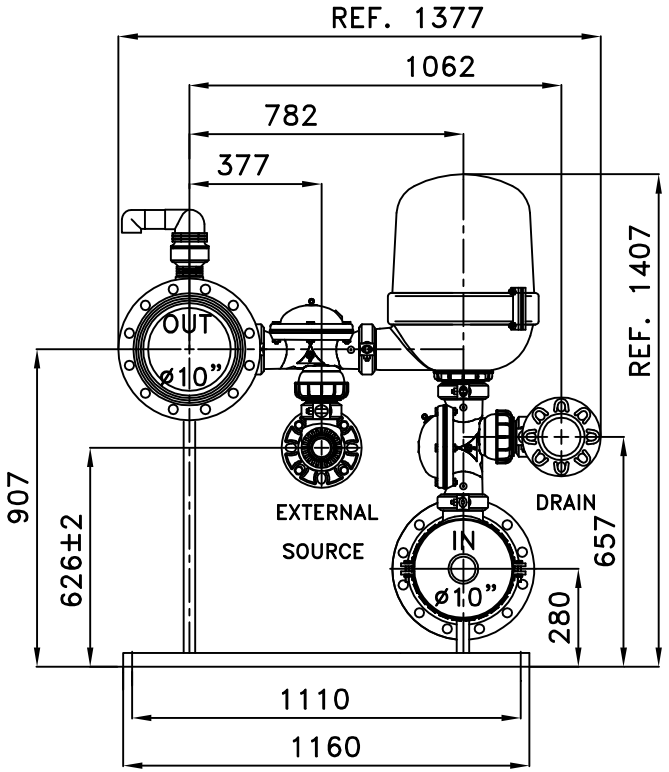

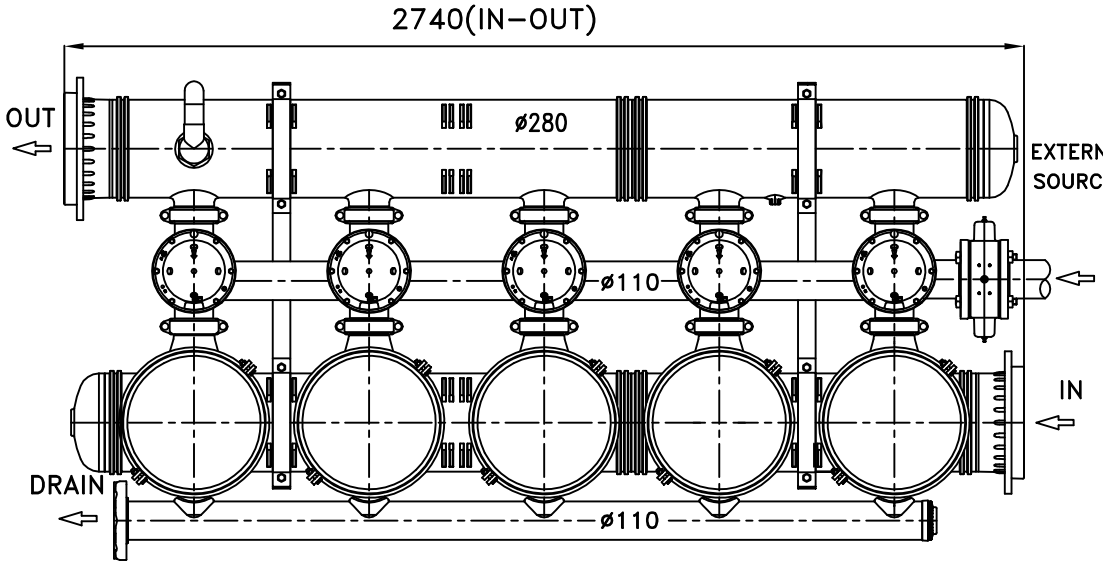

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PAGE 1 OF 6

TITLE
ASSEMBLY DRAWING

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APPROVED	YOEL	19.06.07

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BACKUP:
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DRAWER N:
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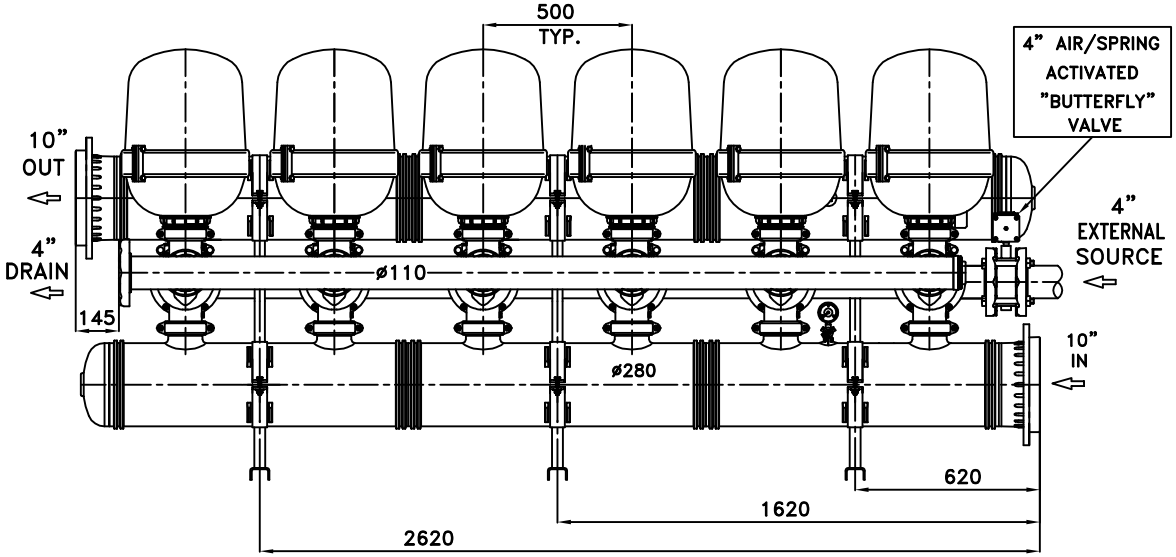

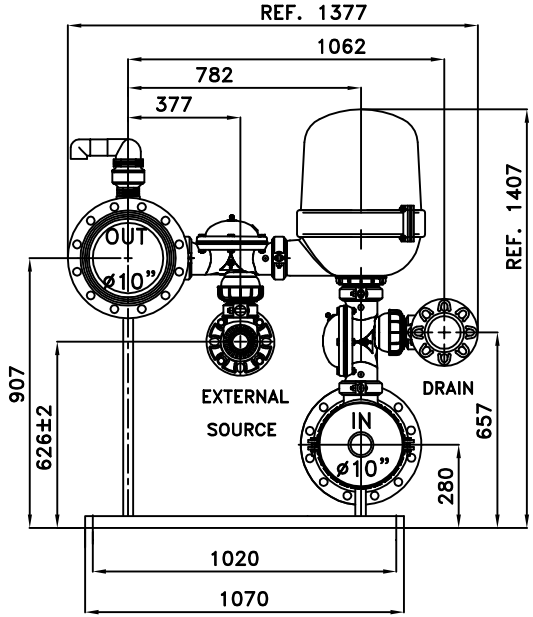

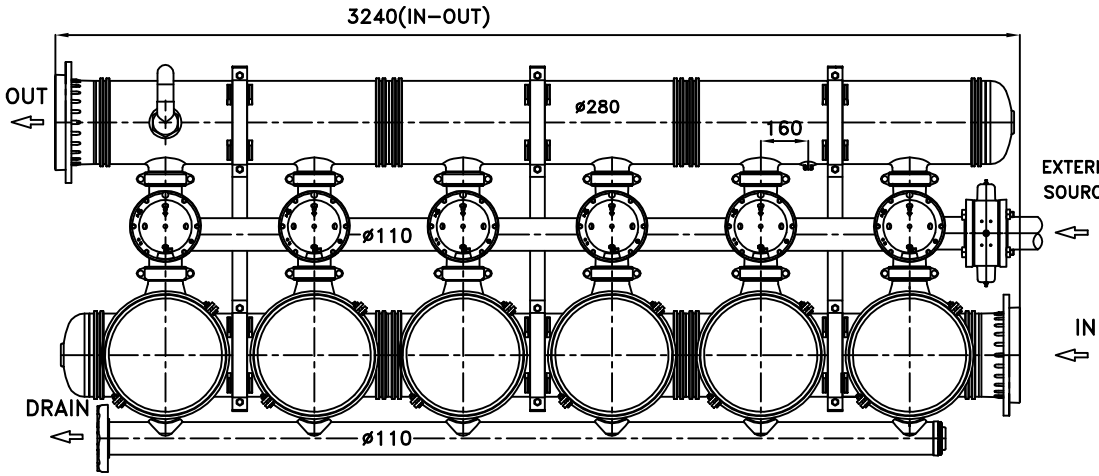

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PROJECT
6*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 5

TITLE
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APPROVED	GADI	10.04.08

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DRAWER N:
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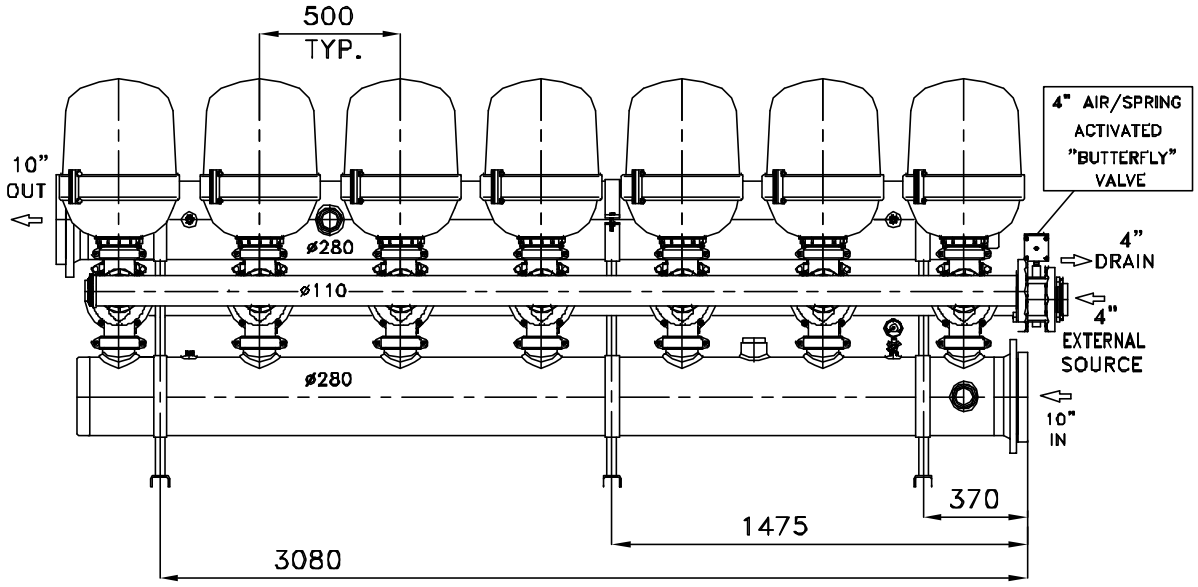

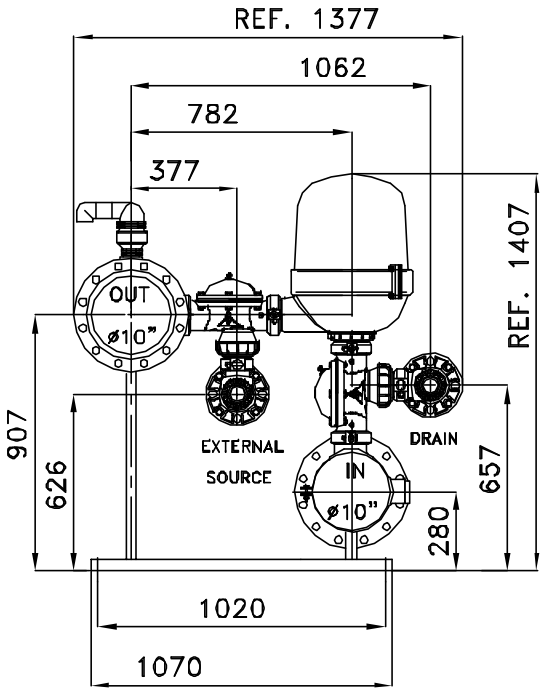

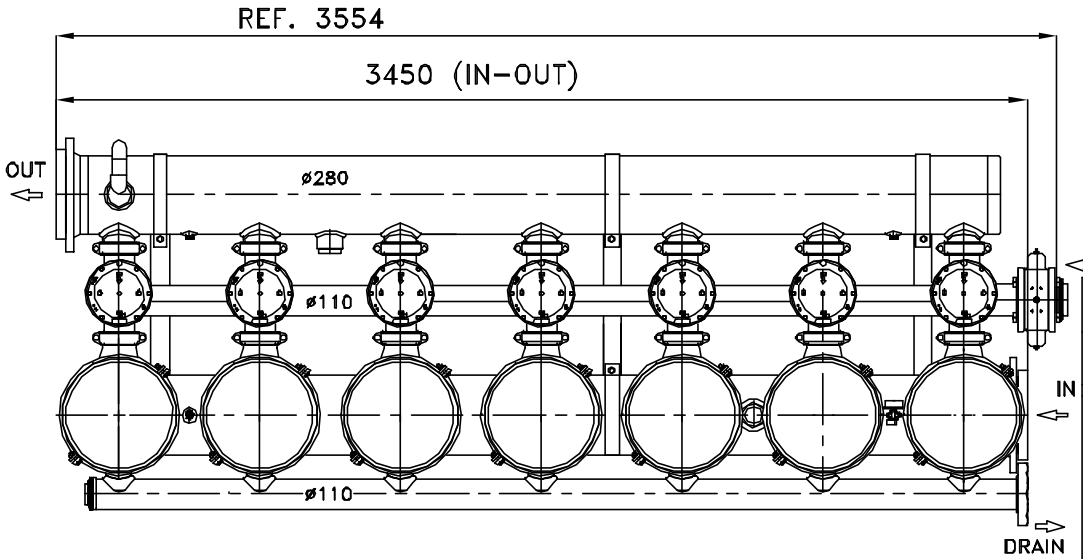

MODIFIC.	DATE	DESCRIPTION	SIGN.

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7*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 5

TITLE
ASSEMBLY DRAWING

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4666P1007_2F

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DRAWN	MAYA	26.08.04
CHECKED	OMRY	26.08.04
APPROVED		

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TRIWALL-XXX

BACKUP:
DISK-23

DRAWER N:
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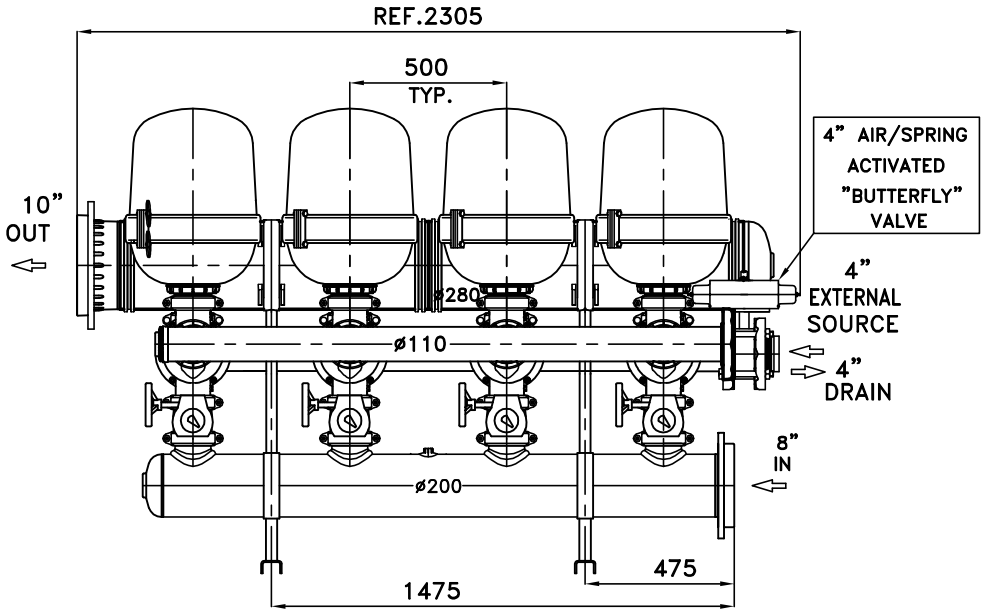

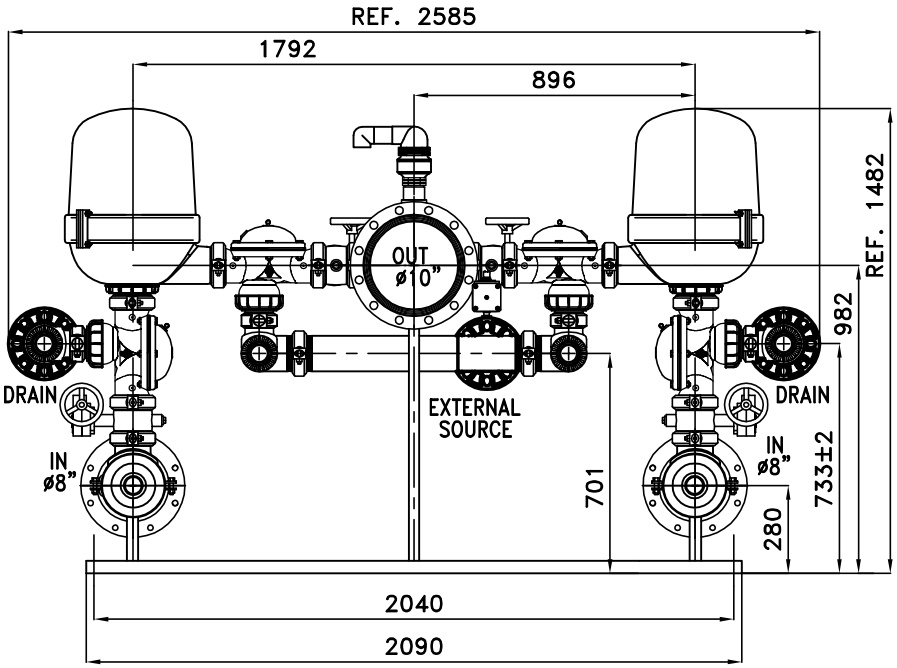

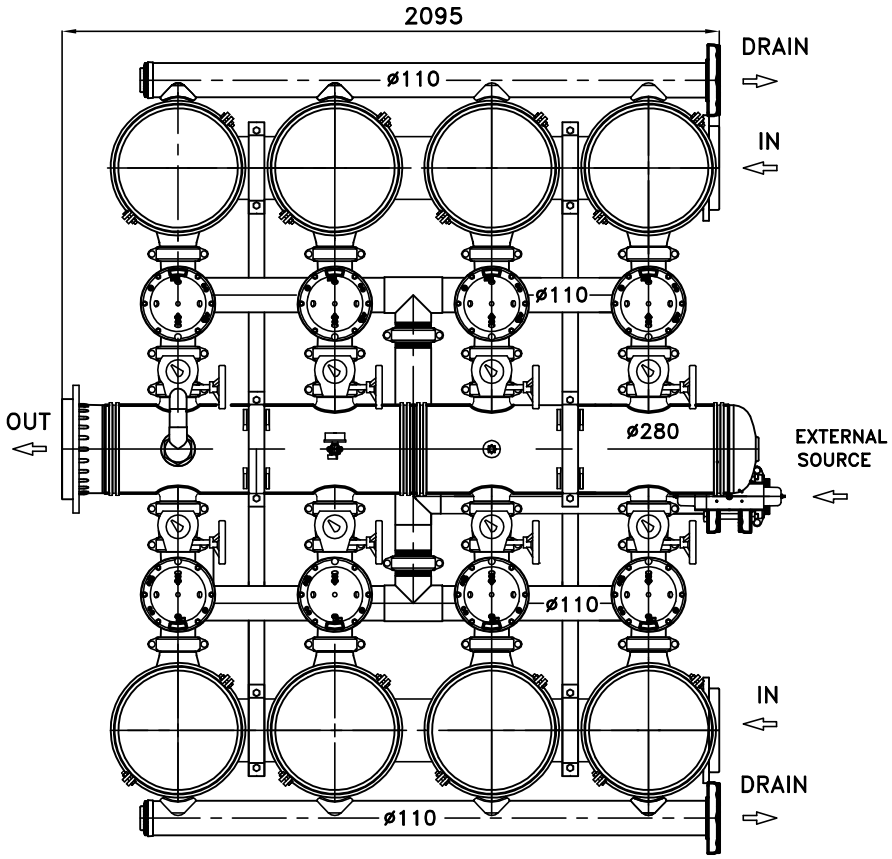

MODIFIC.	DATE	DESCRIPTION	SIGN.

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8*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 5

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
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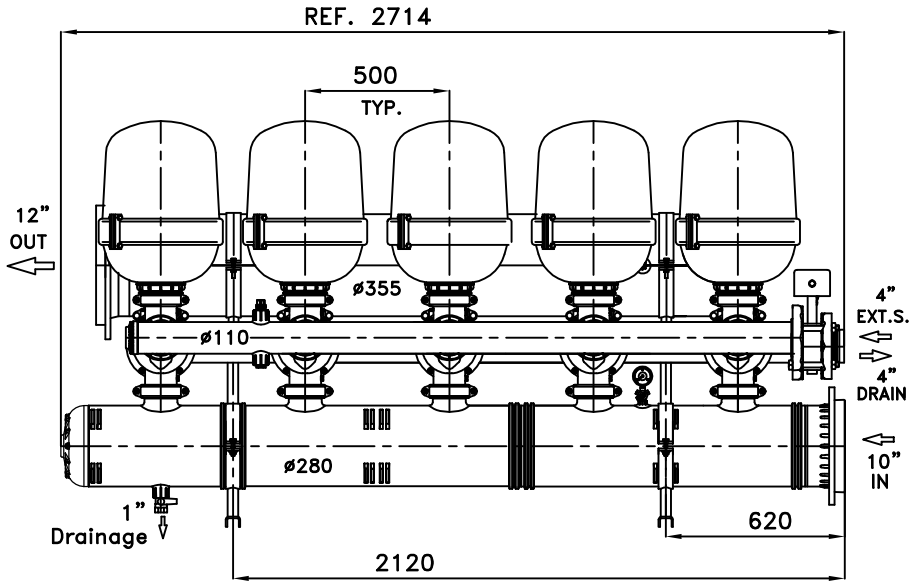
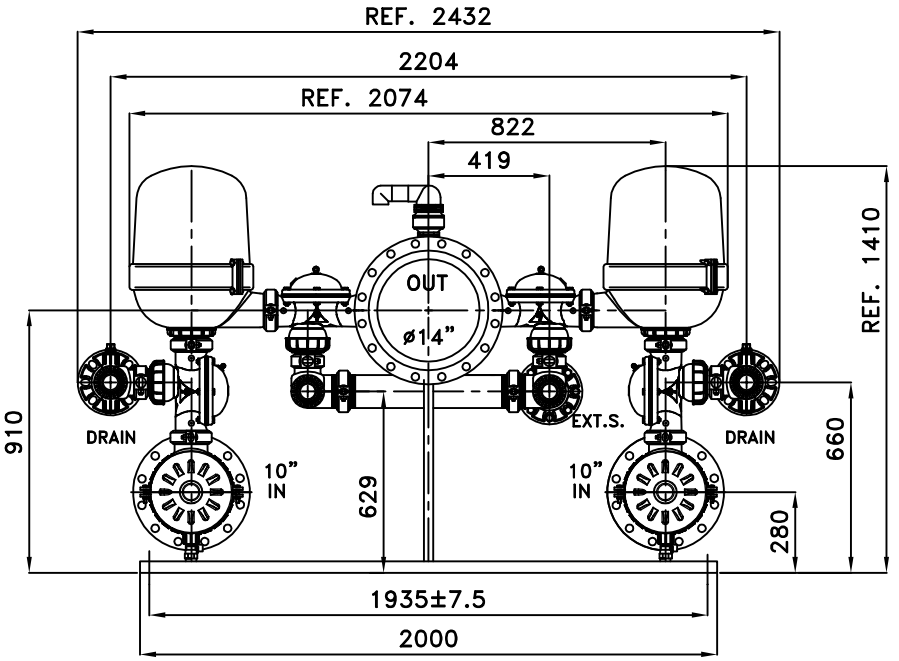
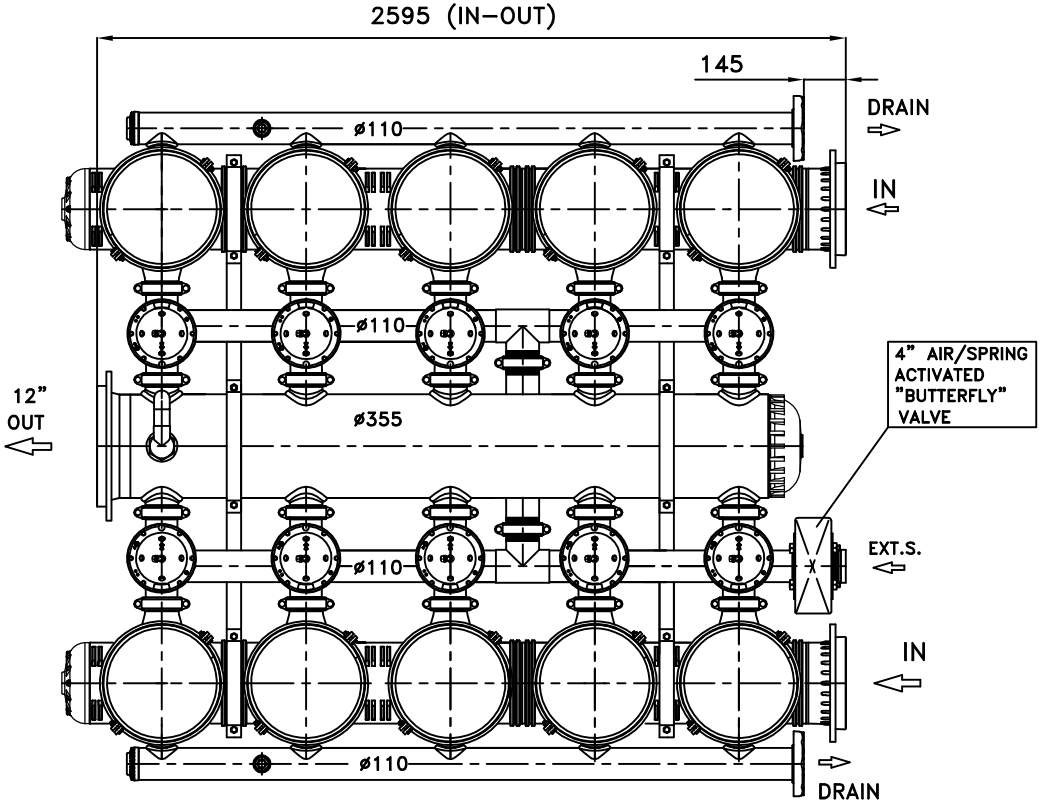
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-32

DRAWER N: 6019







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PAGE 1 OF 6

TITLE
ASSEMBLY DRAWING

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CHECKED	NIKOLAY	16.02.10
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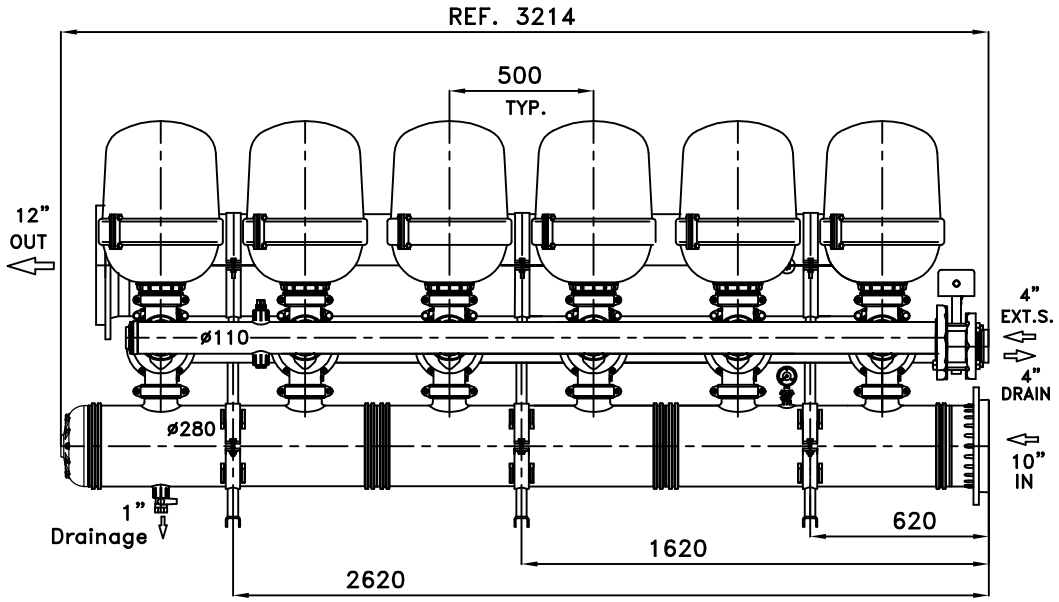

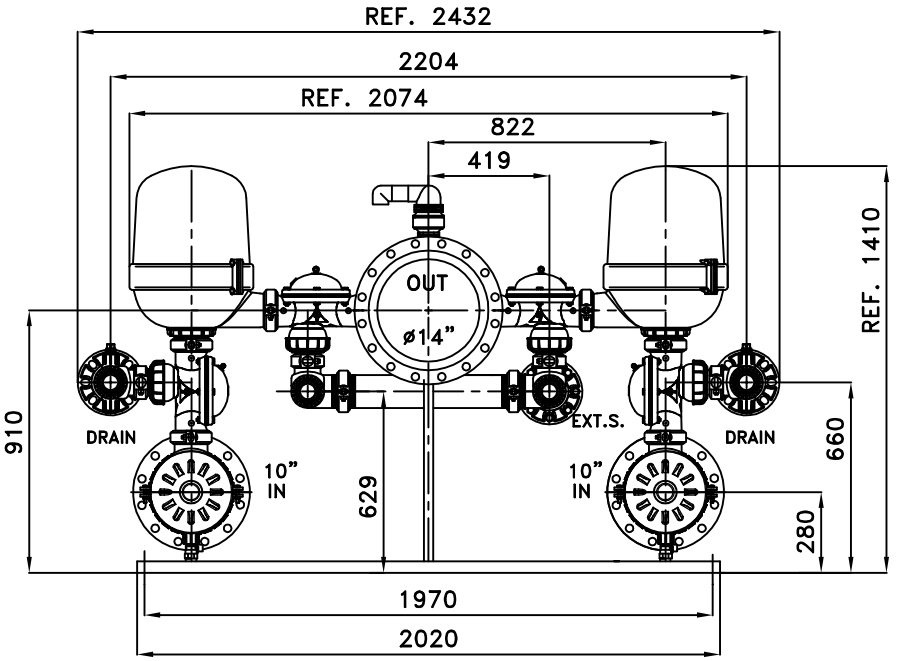

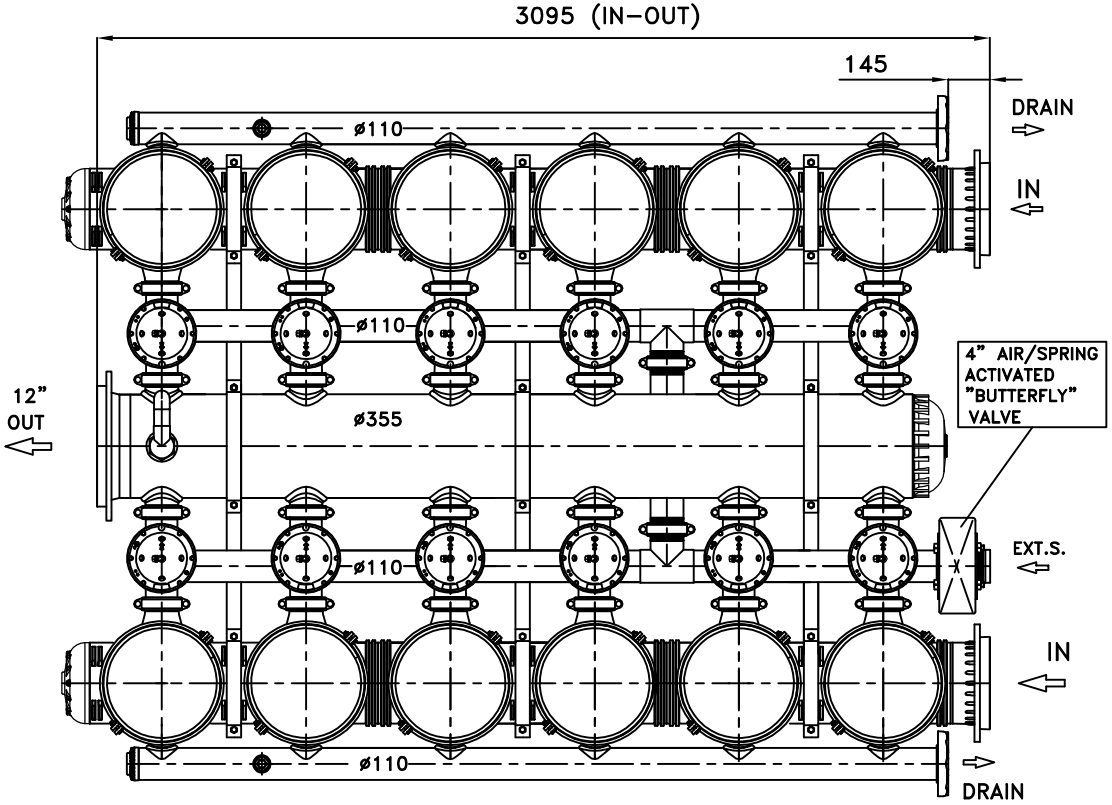

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PROJECT
12*4" S.K. "POLYMER" FILTERS PLASTIC BATTERY WITH EXTERNAL SOURCE FOR BACK FLUSH

TITLE
ASSEMBLY DRAWING

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	NAME	DATE
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APPROVED	ROTEM	30.07.09

FILE CODE DRAWING OF MANIFOLD:
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BACKUP:
DISK-34

DRAWER N:
6019

Spin Klin
6" Galaxy

6” Galaxy Spin Klin® Module
Standard Automatic Backwash

General Information, Operation and Maintenance Manual

System Description

The filtration system is constructed of modules - groups of 6” Spin Klin filters that are built on common manifolds and are backwashed together.

In each 6” Spin Klin filter there are eight Spin Klin spines. The number of 6" Spin Klin filters in the module will range between 2 to 10 according to the needs of application, i.e. the flow rate, the quality of source water and the filtration grade.

The modules are installed in parallel to each other on main inlet and outlet headers. Each module is equipped with 2 automatic butterfly valves: Inlet valve and drain valve. An additional gear operated (manual) butterfly valve on the outlet port, for module isolation, is optional.

An electronic controller is responsible for the filtration and backwash cycles of the filtration system. It is equipped with solenoids to activate the backwash of each module in sequence.

Filtration Process

During filtration, water flows through the inlet header, to each module’s inlet butterfly valve, to the module’s inlet manifold, then to the filters and through the filtration discs of the Spin Klin spines. The filtrated water flows to the module’s outlet manifold, through each module’s outlet butterfly valve (if added) and to the outlet header. During filtration the drain valve is close.

The minimum working pressure of the Spin Klin system is the determined set point of the head loss, which triggers the system's backwash. If there is a requirement for a certain pressure after the Spin Klin system, then that pressure should be added to the Spin Klin head loss set point.

Backwash Process

The backwash process is initiated by a predefined command of the delta P gage to the control unit, according to the differential pressure between the inlet and outlet of the system, or time elapse between two backwash cycles (time backup).

The solenoid of the module No.1 transmits a command to the 2 automatic butterfly valves of the first module, so that simultaneously, the inlet valve closes and the drain valve opens.

Module No. 1 is now in backwash mode.

The eight Spin Klin spines in all of the filters of module No. 1, operate simultaneously, releasing their compressed discs. Tangential jets of water are sprayed against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The contaminated water from the backwashed filters drains through module No 1’s drain valve to the drainage manifold/canal.

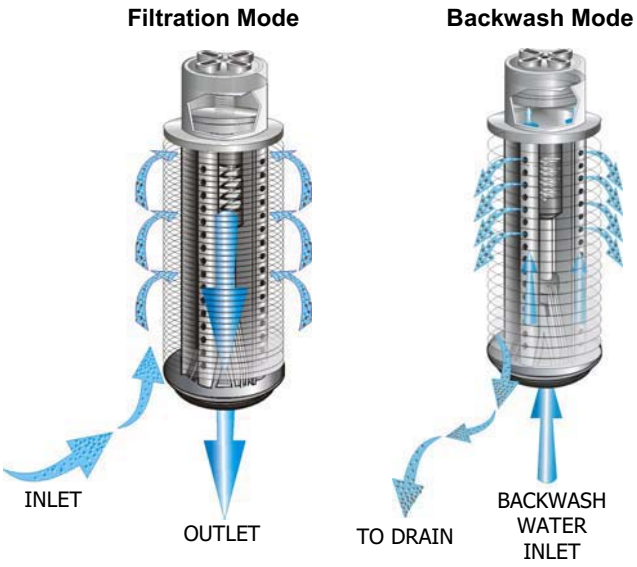
Backwash time per module is 20 seconds. When backwash cycle time elapses the control unit stops the backwash signal to the solenoid. The solenoid releases the command to the two valves and all the Spin Klin spines return to filtration mode.

Once module No. 1 is in the filtration position again the control unit sends a command to begin the backwash process in module No. 2 and so on.

Spin Klin Technology- Spin Klin Spine Performance:

General:

The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded according micron size, and are assembled according to costumer's water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.



Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs.

Backwash Mode:

During backwash a counter pressure is formed, causing the piston to rise and release the tightened discs. Simultaneously multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

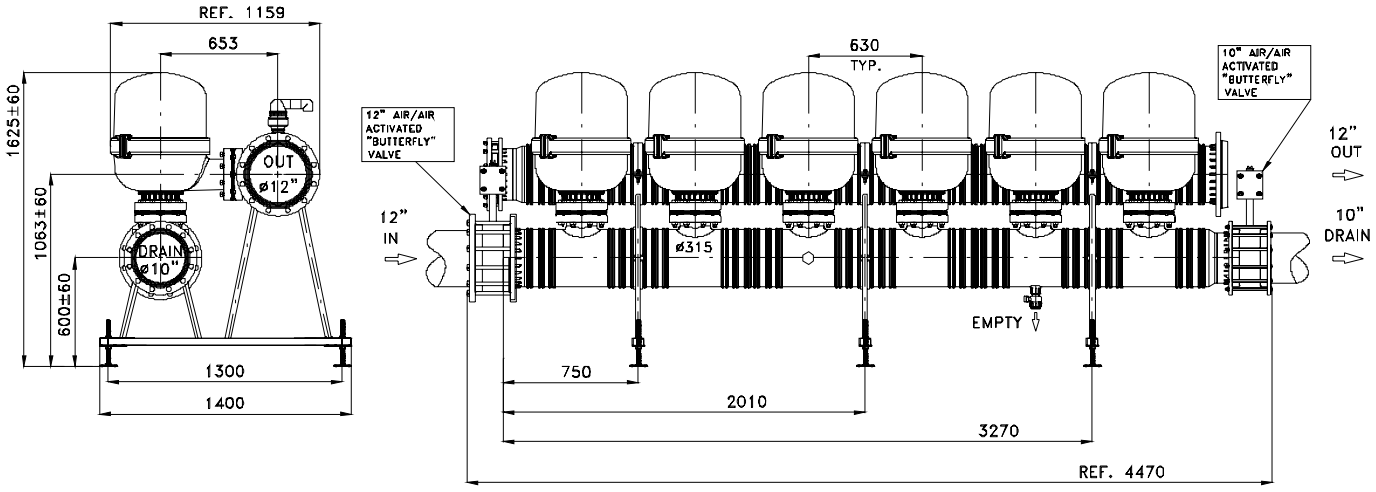
Technical Data - Galaxy 6" Spin Klin Filter

Maximum pressure	8 bar	115 PSI
Minimum backwash pressure	2.8 bar	40 PSI
Backwash flow rate per filter	80 m^3/hr	350 GPM
Water volume per backwash per filter	450 liter	120 gallons
Maximum temperature	60°C	140°F
Filtration surface area per filter	7,040 cm^2	1,100 $inch^2$
Filtration volume per filter	10,560 cm^3	645 $inch^3$

Recommended Flow Rates in Average Water Quality, per 6" Spin Klin Filter

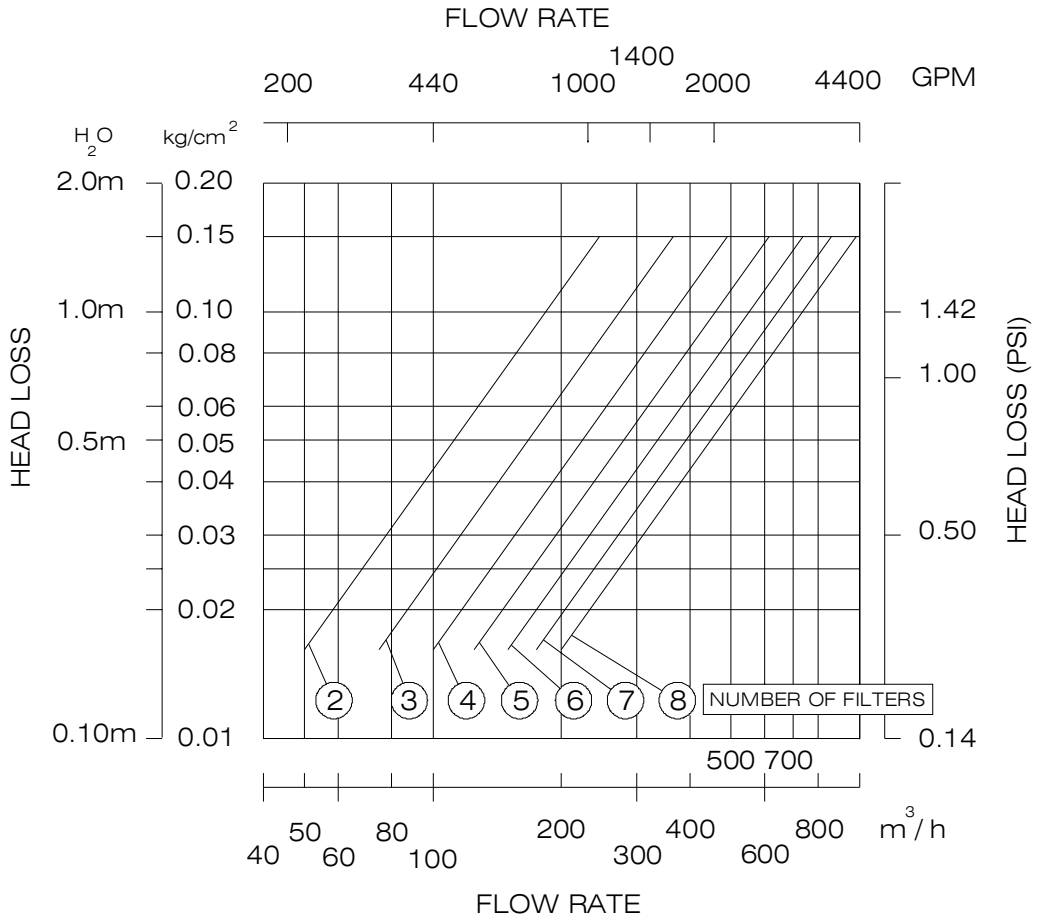
Grey (20µ)	Green (55µ)	Black (100µ)	Red (130µ)	Yellow (200µ)	Blue (400µ)
40 m^3/hr	80 m^3/hr	100 m^3/hr	110 m^3/hr	120 m^3/hr	120 m^3/hr
175 GPM	350 GPM	440 GPM	480 GPM	530 GPM	530 GPM

Single Module Dimensions



Side View **Front View**

Head Loss in Clean State for 6" Galaxy Modules, 130µ Discs



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on the module manifold).
B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).
C. Connect backwash drainage lines (to a pipe line with diameter not smaller than Arkal's drainage lines).
D. Ensure that the cover clamps are securely closed.
E. Connect air pressure to the activated butterfly valves and solenoids.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up During Start-up

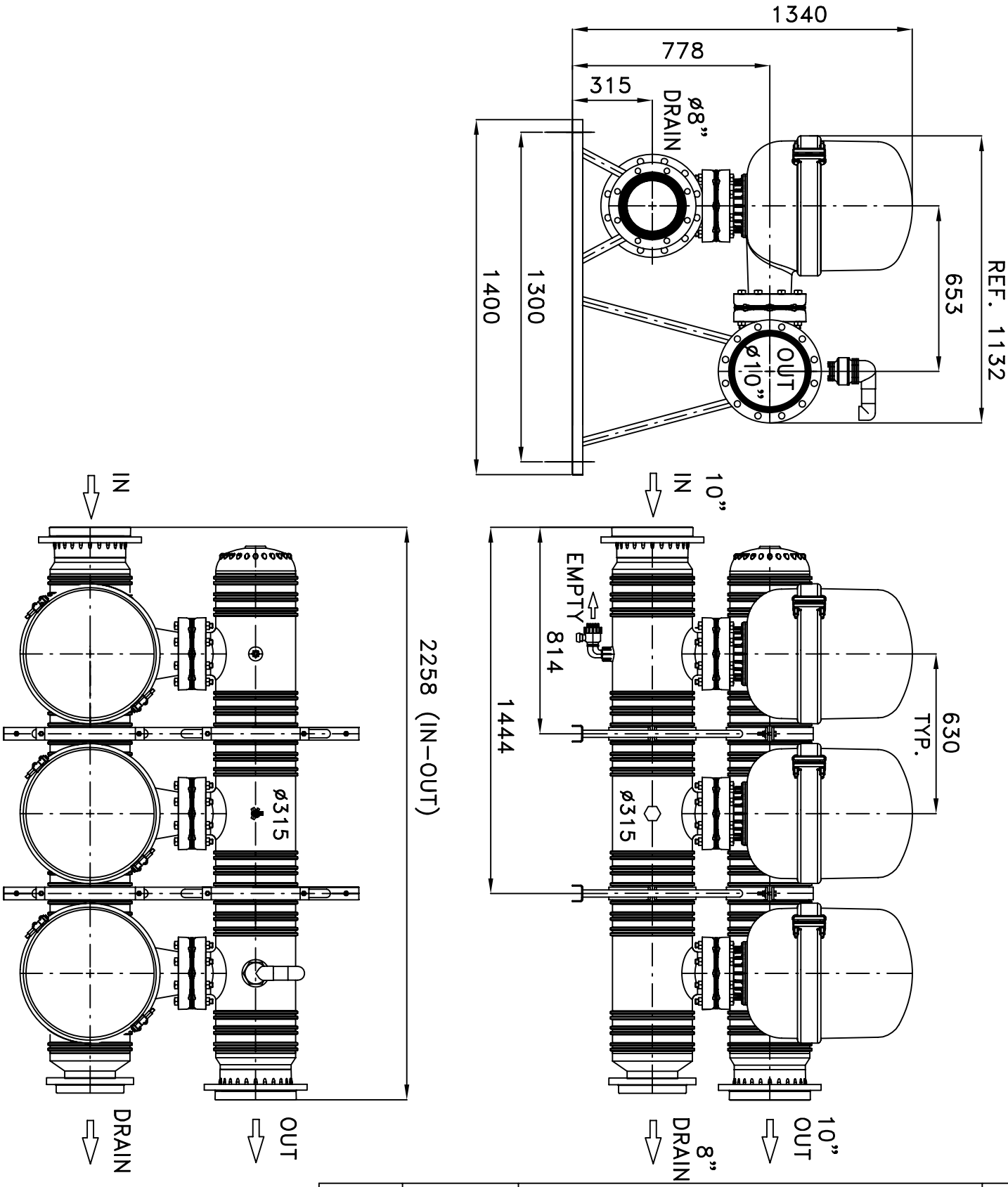
- ❑ Close the downstream (flow control) valve (if available).
- ❑ Run a few backwash cycles until clean.
- ❑ Slowly reopen the downstream valve.
- ❑ If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

Control

- ❑ Refer to the manufacturer's handbook before installing the controller.
- ❑ Make sure that the voltage of both the solenoid unit and controller are correct.
- ❑ Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- ❑ Set the starting backwash switch to the required ΔP (Recommended ΔP will range between 2.5 – 6 m, 3.5-8 PSI according to site conditions).
- ❑ Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Drawings

6" Spin Klin Galaxy Batteries



MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
3*6"S.K. "GALAXY" FILTER MODULE

PAGE 1 OF 4

TITLE
ASSEMBLY DRAWING

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1660P1003_0000K

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	NAME	DATE
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CHECKED	NIKOLAY	03.05.07
APPROVED	ZALI	03.05.07

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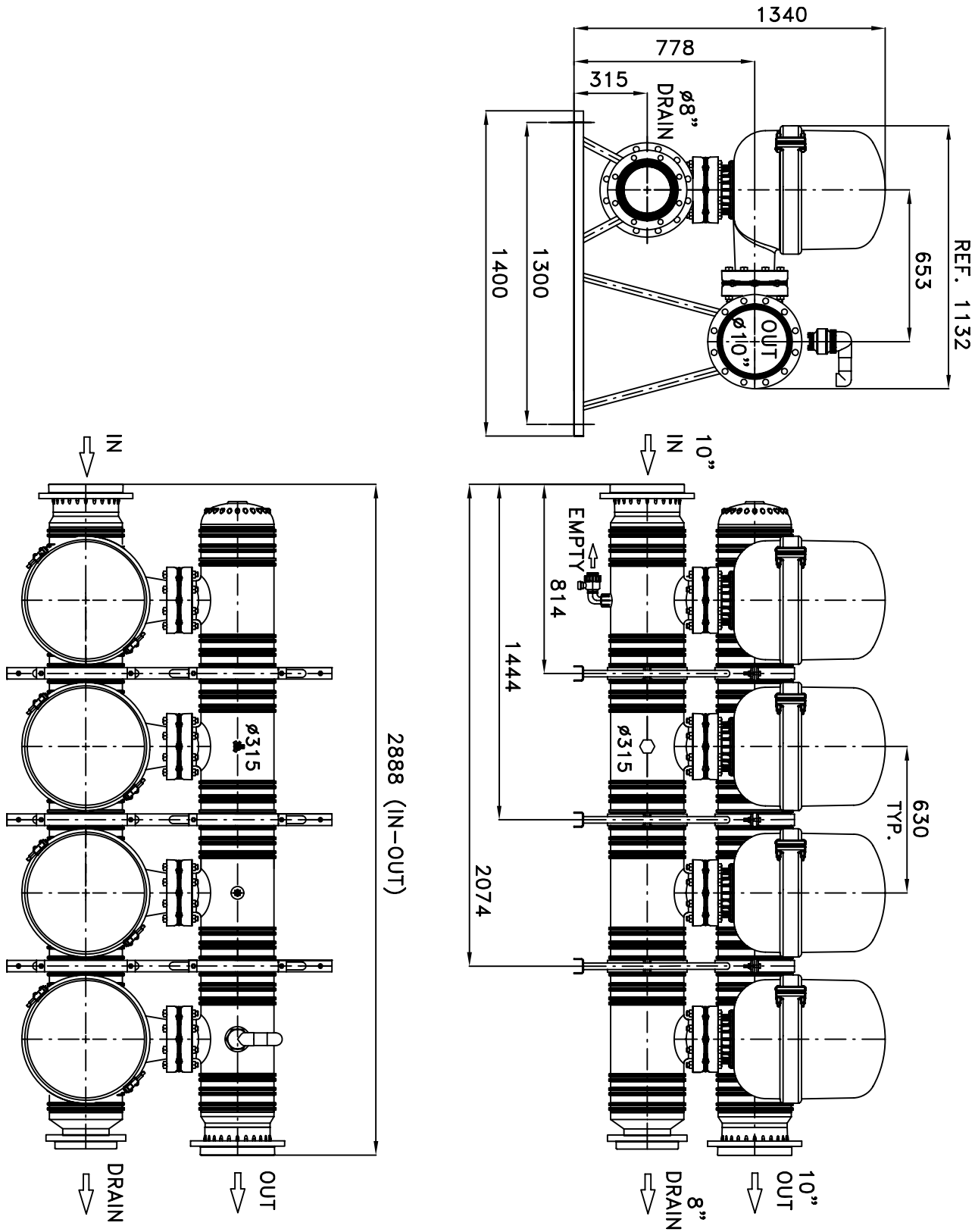

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 4*6"S.K. "GALAXY" FILTER MODULE — PAGE 1 OF 4

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1660P1004_0000K

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	1660P1004_0000K	IRINA	03.05.07	ORLY

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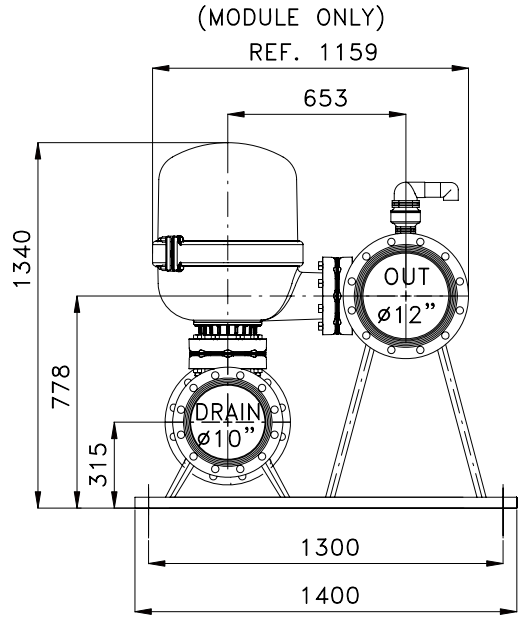
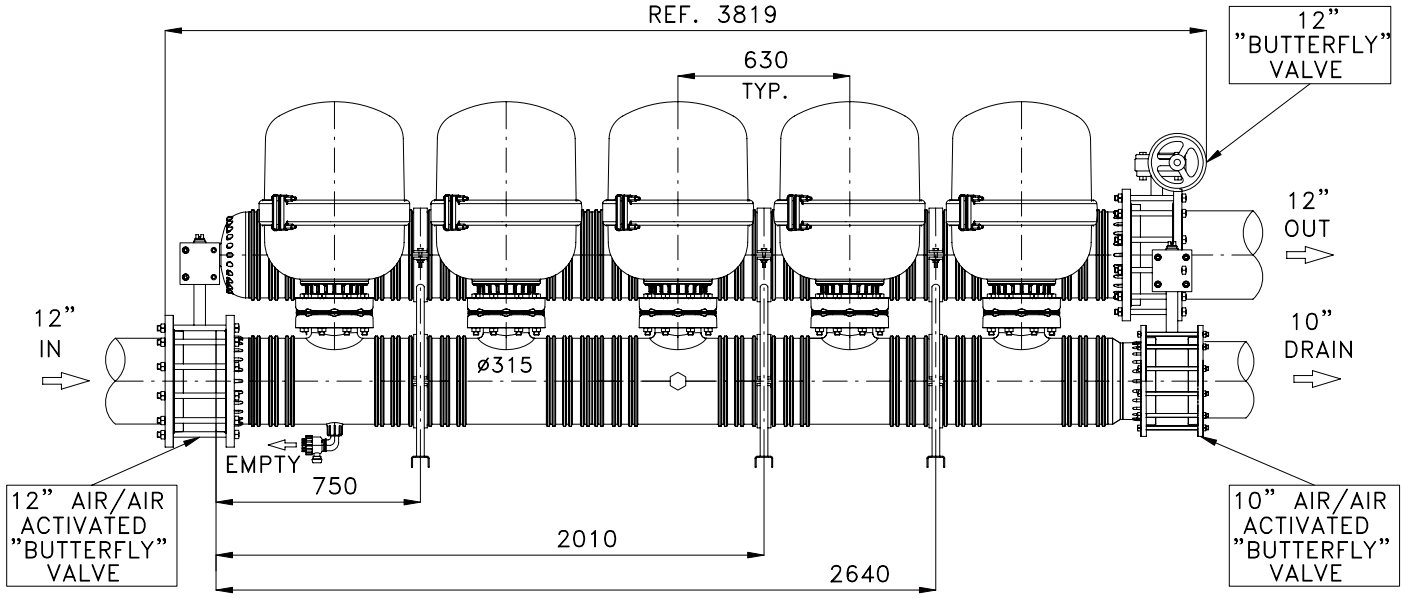
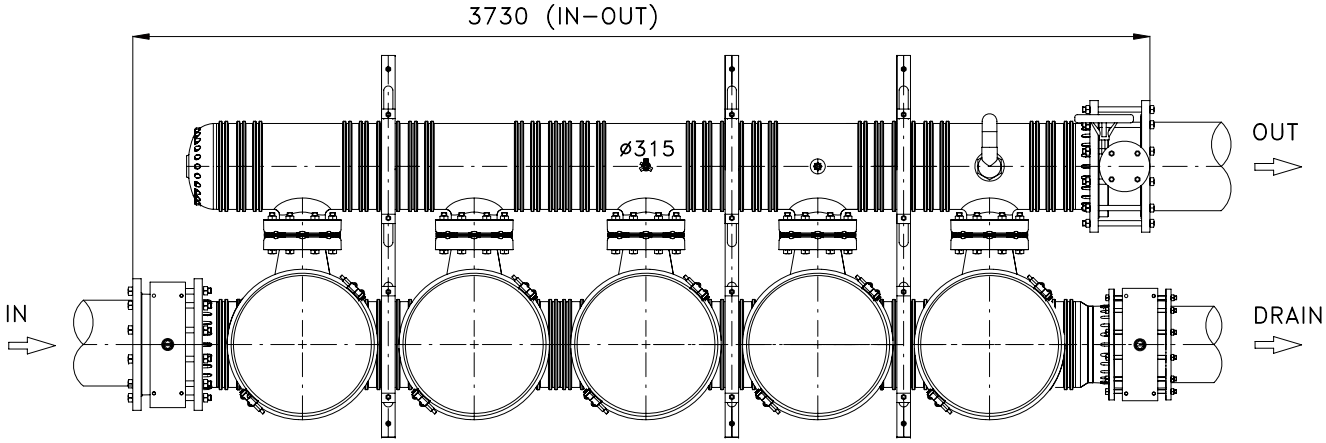
DRAWN	MAYA	03.05.07	5660 1004_0000K	DISK-32
CHECKED	NIKOLAY	03.05.07	6120 0002	DRAWER N:
APPROVED	ZALI	03.05.07	PALET-410(5201 5917)	7010







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 5*6"S.K. "GALAXY" FILTER MODULE — PAGE 1 OF 4

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1660P1205_200C2

PATH BATERIES\6INCH\MODULES	FILE CODE	NAME	DATE	SIGNATURE
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DRAWN	PABLO	23.09.07
CHECKED		23.09.07
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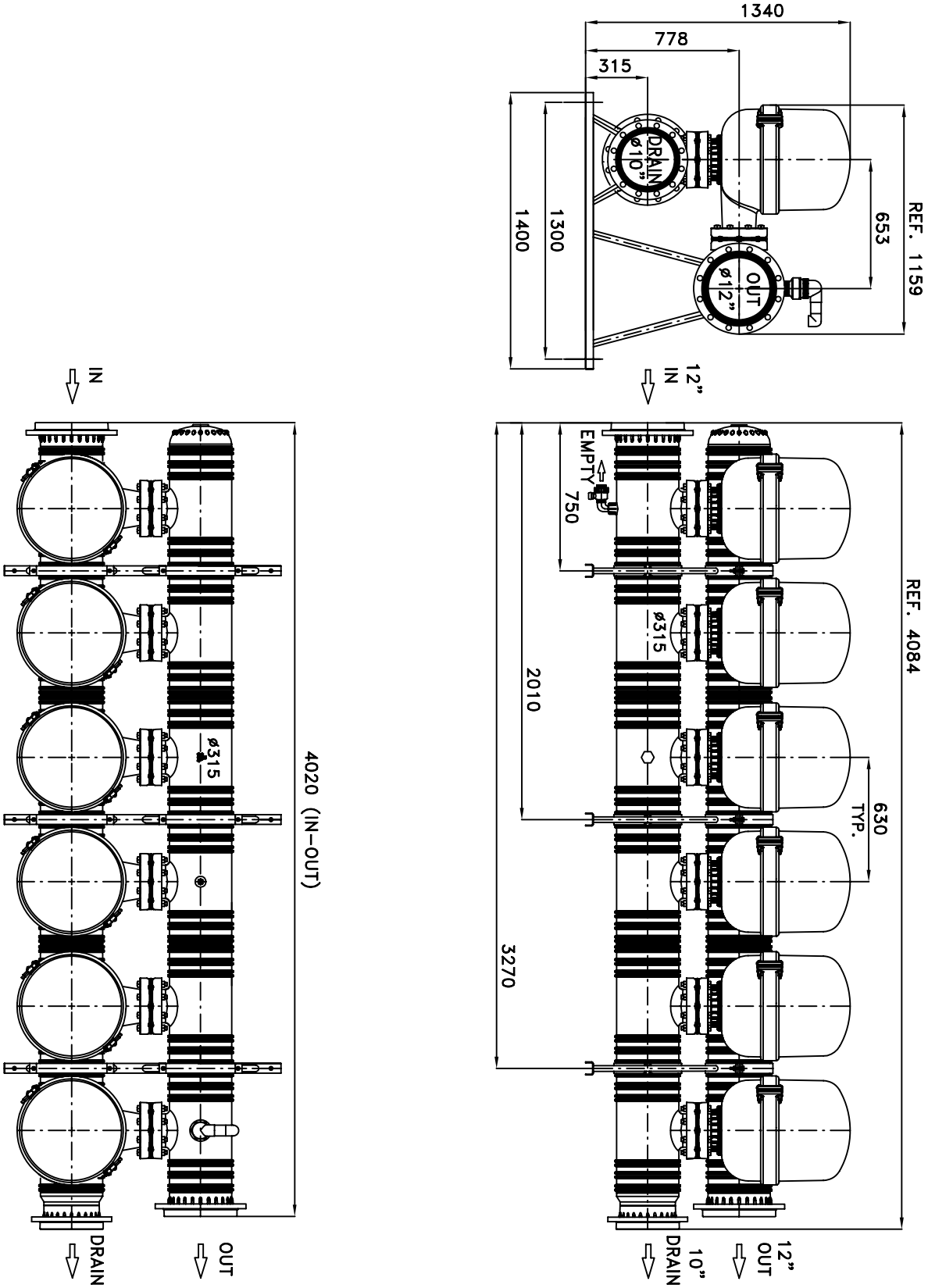
BACKUP: DISK-32

DRAWER N: 7010



MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 6*6"S.K. "GALAXY" FILTER MODULE — PAGE 1 OF 4

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1660P1206_0000K

PATH BATERIES\6INCH\MODULES	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	MAYA	03.05.07
CHECKED	NIKOLAY	03.05.07
APPROVED	ZALI	03.05.07

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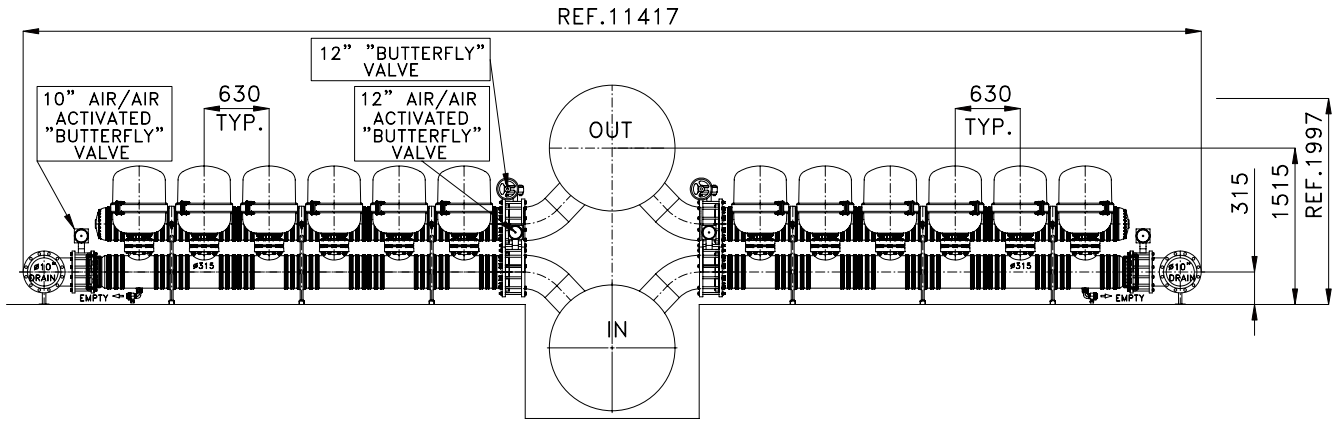
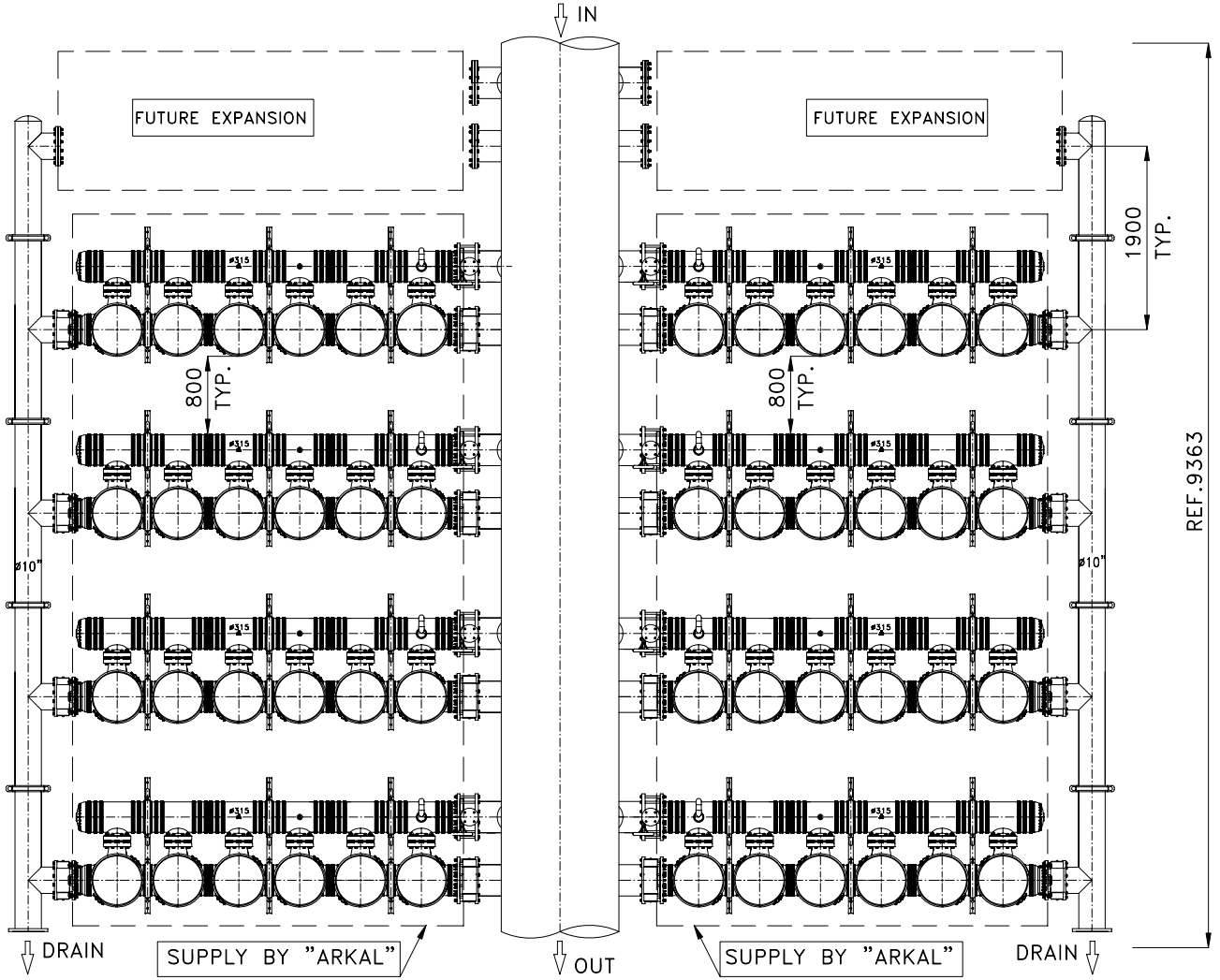
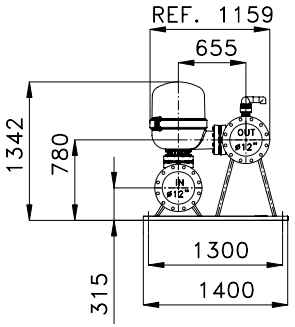
6121 0002
PALET-410(5201 5917)

BACKUP: DISK-32
DRAWER N: 7010





(BATTERY ONLY)



MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT 8*(6*6")S.K. "GALAXY" FILTER MODULES

TITLE ASSEMBLY DRAWING

PAGE 1 OF 4

CATALOGUE No: 1660P1206_00013 4110 100000088

PATH BATERIES\6INCH\MODULES | FILE CODE 1660P1206_00013EX | NAME | DATE | SIGNATURE

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CHECKED	NIKOLAY	02.09.08	
APPROVED	EYAL	02.09.08	

IRINA 02.09.08

BACKUP: DISK-33

DRAWER N: 7010

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FILTRATION SYSTEM

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5660 1206 00003

Spin Klin
6" Galaxy
External Source

6” Galaxy Spin Klin® Module
External Source Automatic Backwash

General Information, Operation and Maintenance Manual

System Description

The filtration system is constructed of modules - groups of 6” Spin Klin filters that are built on common manifolds and are backwashed together.

In each 6” Spin Klin filter there are eight Spin Klin spines. The number of 6" Spin Klin filters in the module will range between 2 to 10 according to the needs of application, i.e. the flow rate, the quality of source water and the filtration grade.

The modules are installed in parallel to each other on main inlet and outlet headers. Each module is equipped with 4 automatic butterfly valves: Inlet valve, outlet valve, external backwash water source valve and drain valve.

An electronic controller is responsible for the filtration and backwash cycles of the filtration system. It is equipped with solenoids to activate the backwash of each module in sequence.

Filtration Process

During filtration, water flows through the inlet header, to each module’s inlet butterfly valve, to the module’s inlet manifold, then to the filters and through the filtration discs of the Spin Klin spines. The filtrated water flows to the module’s outlet manifold, through each module’s outlet butterfly valve and to the outlet header. During filtration the external source butterfly valves and the drain valves are closed.

The minimum working pressure of the Spin Klin system is the determined set point of the head loss, which triggers the system's backwash. If there is a requirement for a certain pressure after the Spin Klin system, then that pressure should be added to the Spin Klin head loss set point.

Backwash Process

The backwash process is initiated by a predefined command of the delta P gage to the control unit, according to the differential pressure between the inlet and outlet of the system, or time elapse between two backwash cycles (time backup).

First, the main solenoid transmits a command to initiate the external backwash water source (pump or valve or other).

Then, the solenoid of the module No.1 transmits a command to the 4 automatic butterfly valves of the first module, so that simultaneously, the inlet and the outlet valves close and the drain and external source valves open.

Module No. 1 is now in backwash mode.

The eight Spin Klin spines in all of the filters of module No. 1, operate simultaneously, releasing their compressed discs. Tangential jets of water are sprayed against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The contaminated water from the backwashed filters drains through module No 1’s drain valve to the drainage manifold/canal.

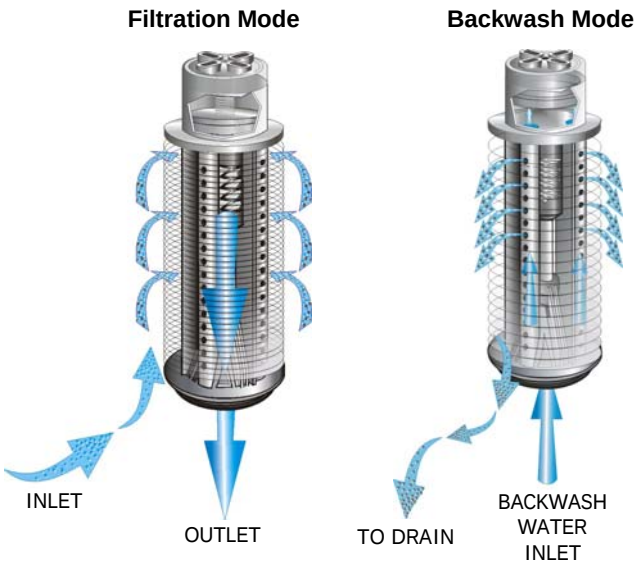
Backwash time per module is 15-20 seconds. When backwash cycle time elapses the control unit stops the backwash signal to the solenoid. The solenoid releases the command to the four valves and all the Spin Klin spines return to filtration mode.

Once module No. 1 is in the filtration position again the control unit sends a command to begin the backwash process in module No. 2 and so on.

Spin Klin Technology- Spin Klin Spine Performance:

General:

The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded according micron size**,** and are assembled according to costumer's water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.



Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs**.**

Backwash Mode:

During backwash a counter pressure is formed, causing the piston to rise and release the tightened discs. Simultaneously multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

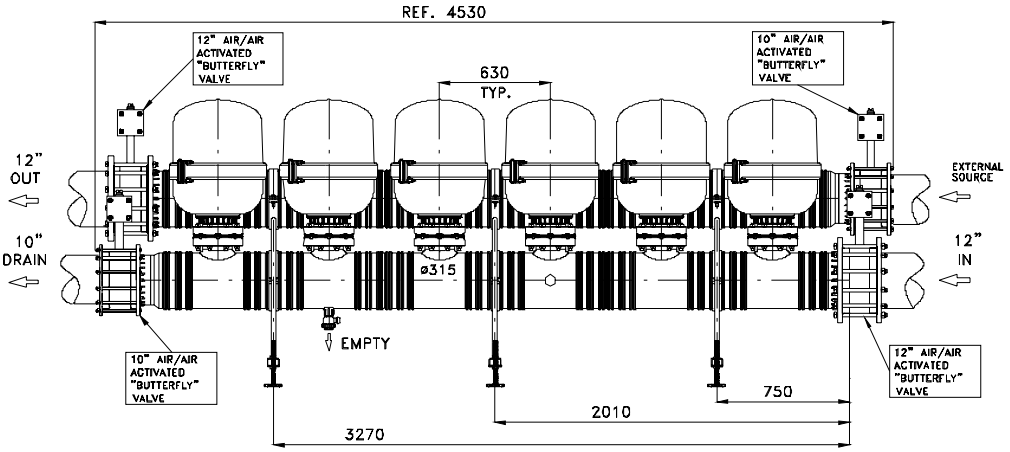
Technical Data - Galaxy 6" Spin Klin Filter

Maximum pressure	8 bar	115 PSI
Minimum backwash pressure	2.8 bar	40 PSI
Backwash flow rate per filter	80 m^3/hr	350 GPM
Water volume per backwash per filter	450 liter	120 gallons
Maximum temperature	60°C	140°F
Filtration surface area per filter	7,040 cm^2	1,100 $inch^2$
Filtration volume per filter	10,560 cm^3	645 $inch^3$

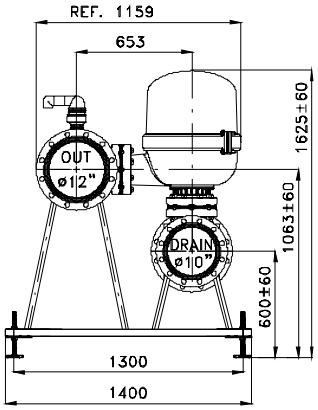
Recommended Flow Rates in Average Water Quality, per 6" Spin Klin Filter

Grey (20µ)	Green (55µ)	Black (100µ)	Red (130µ)	Yellow (200µ)	Blue (400µ)
40 m^3/hr	80 m^3/hr	100 m^3/hr	110 m^3/hr	120 m^3/hr	120 m^3/hr
175 GPM	350 GPM	440 GPM	480 GPM	530 GPM	530 GPM

Single Module Dimensions

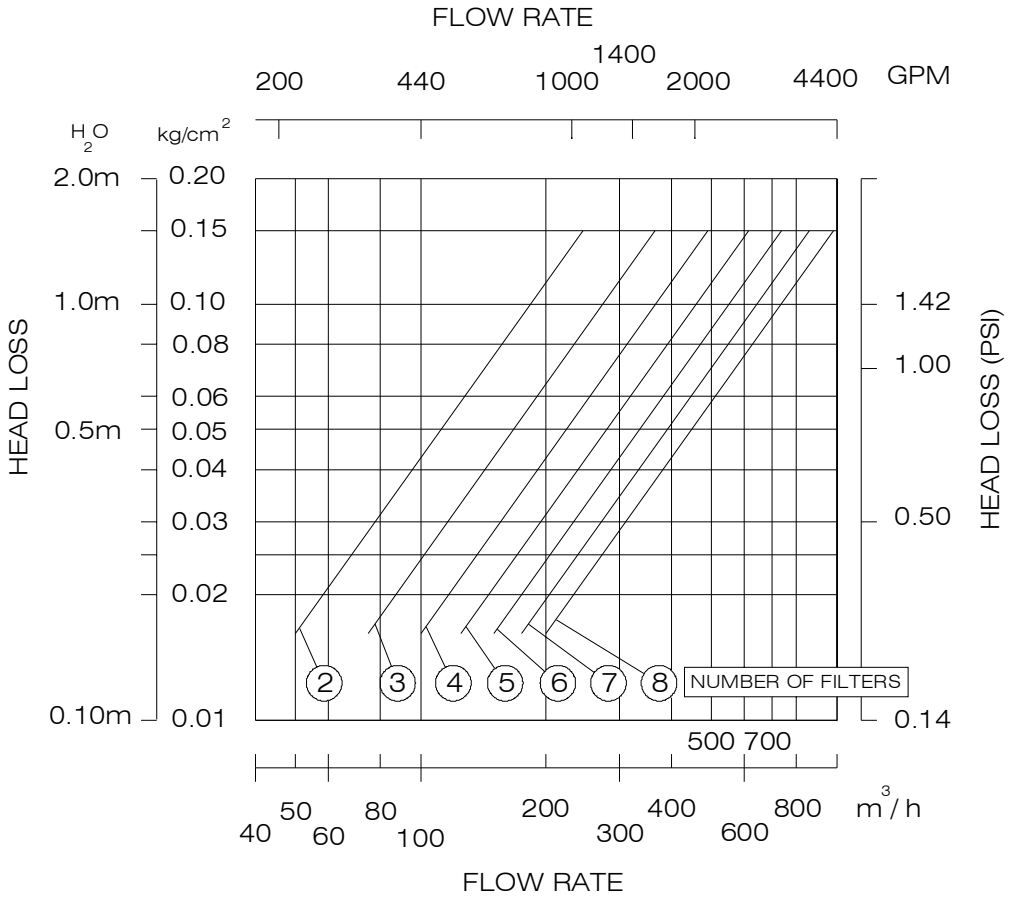


Front View



Side View

Head Loss in Clean State of 6" Galaxy Modules, 130µ Discs



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on the module manifold).
B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).
C. Connect backwash drainage lines (to a pipe line with diameter not smaller than Arkal's drainage lines).
D. Ensure that the cover clamps are securely closed.
E. Connect air pressure to the activated butterfly valves and solenoids.

Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up During Start-up

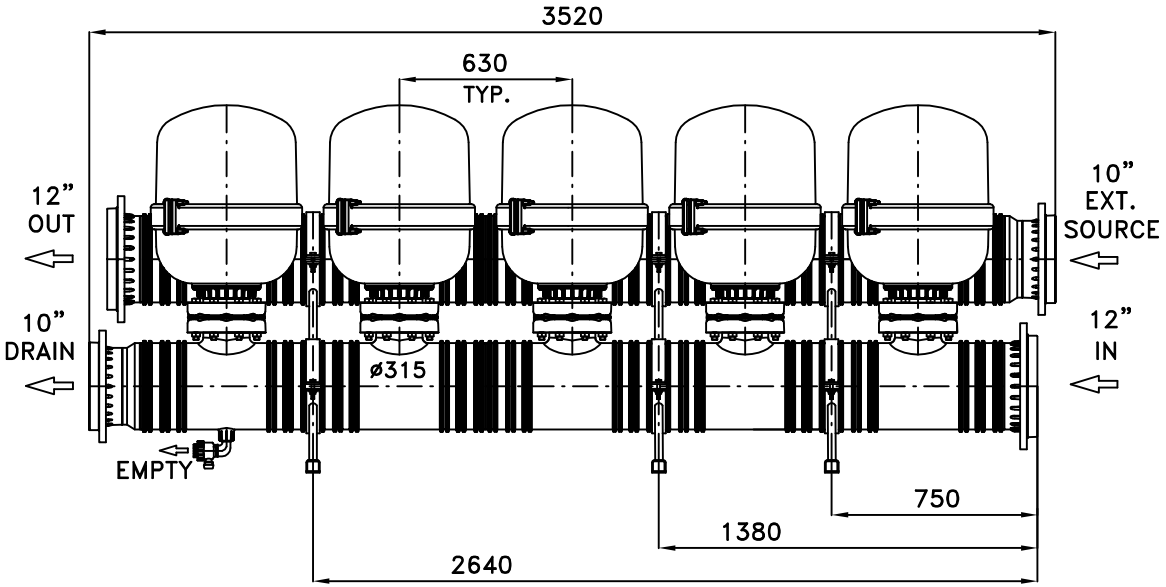
- Close the downstream (flow control) valve (if available).
- Run a few backwash cycles until clean.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

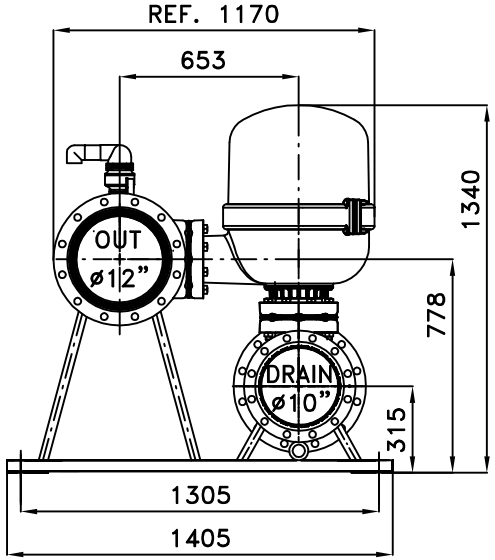
Control

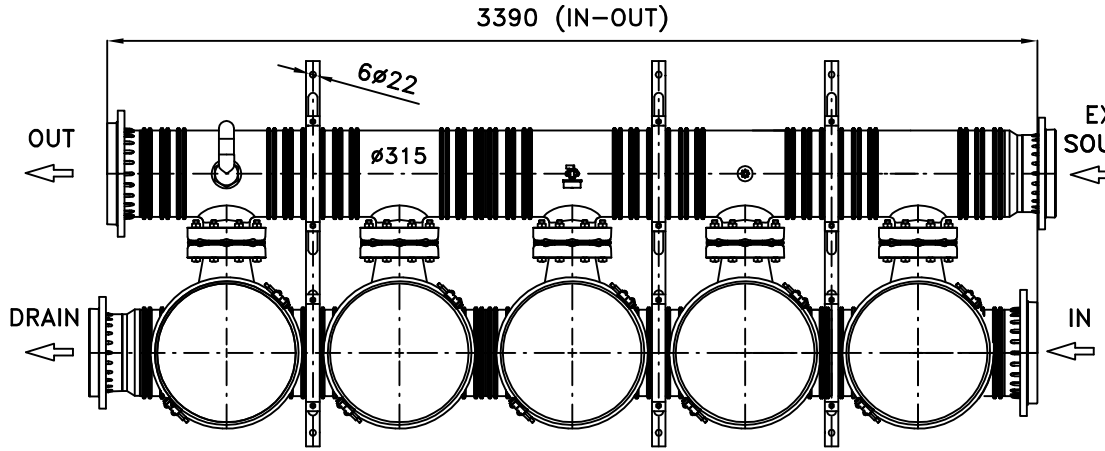
- Refer to the manufacturer's handbook before installing the controller.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to the required ΔP (Recommended ΔP will range between 2.5 – 6 m, 3.5-8 PSI according to site conditions).
- Set the controller to a flush time of 20 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Drawings

6" Spin Klin Galaxy Batteries External Source







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
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FILTRATION SYSTEM
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FAX. 972-4-6775461
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PROJECT: 5*6"S.K. "GALAXY" FILTER MODULE — PAGE 1 OF 4

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1661P1205_0000N

PATH BATERIES\6INCH\MODULES	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
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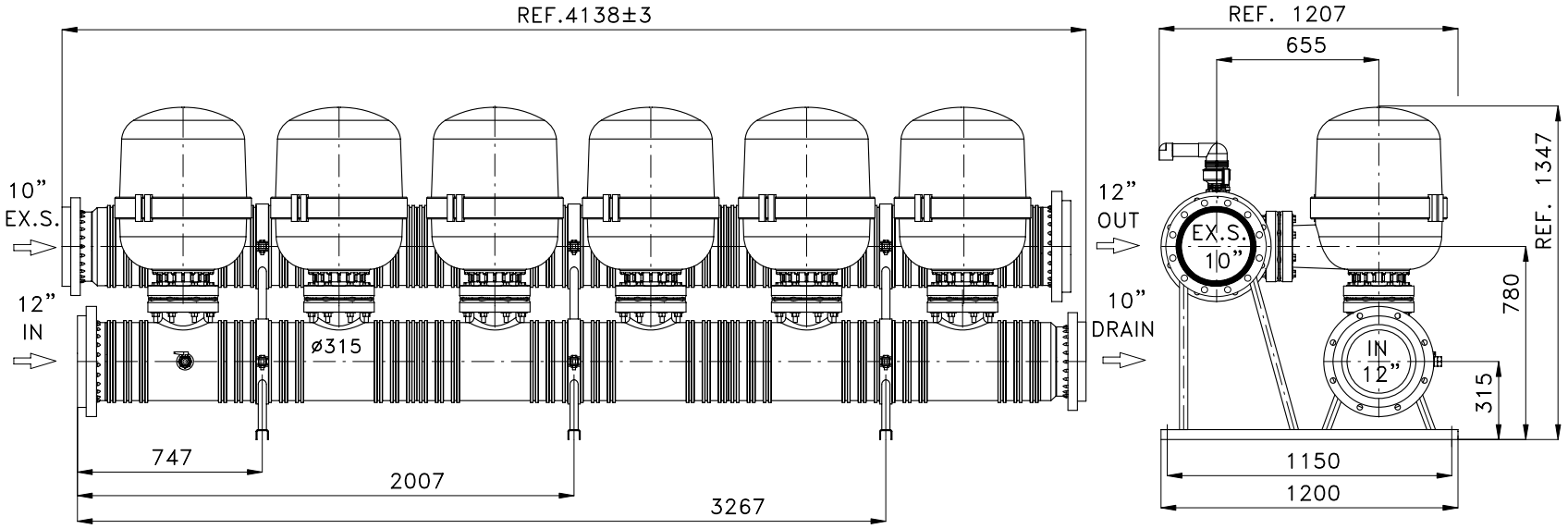
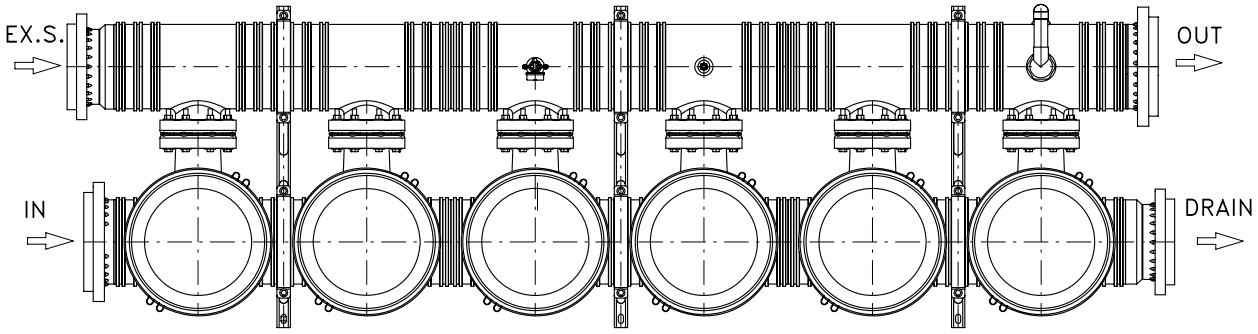
CHECKED	NIKOLAY	12.06.07
APPROVED	YOEL	12.06.07

FILE CODE DRAWING OF MANIFOLD:
5661 1205_0000N
6120 XXXX

BACKUP: DISK-32
DRAWER N: 7010





MODIFIC.	DATE	DESCRIPTION	SIGN.

PROJECT
6*6"S.K. "GALAXY" FILTER MODULE
WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 4

TITLE
ASSEMBLY DRAWING

CATALOGUE No:

PATH BATERIES\6INCH\MODULES
EXTERNAL SOURCE

FILE CODE
1661P1206_0000Y

FILE CODE DRAWING OF MANIFOLD:

	NAME	DATE	SIGNATURE
DRAWN	IRINA	26.10.09	
CHECKED		26.10.09	
APPROVED		26.10.09	

BACKUP: DISK-34

DRAWER N: 7010

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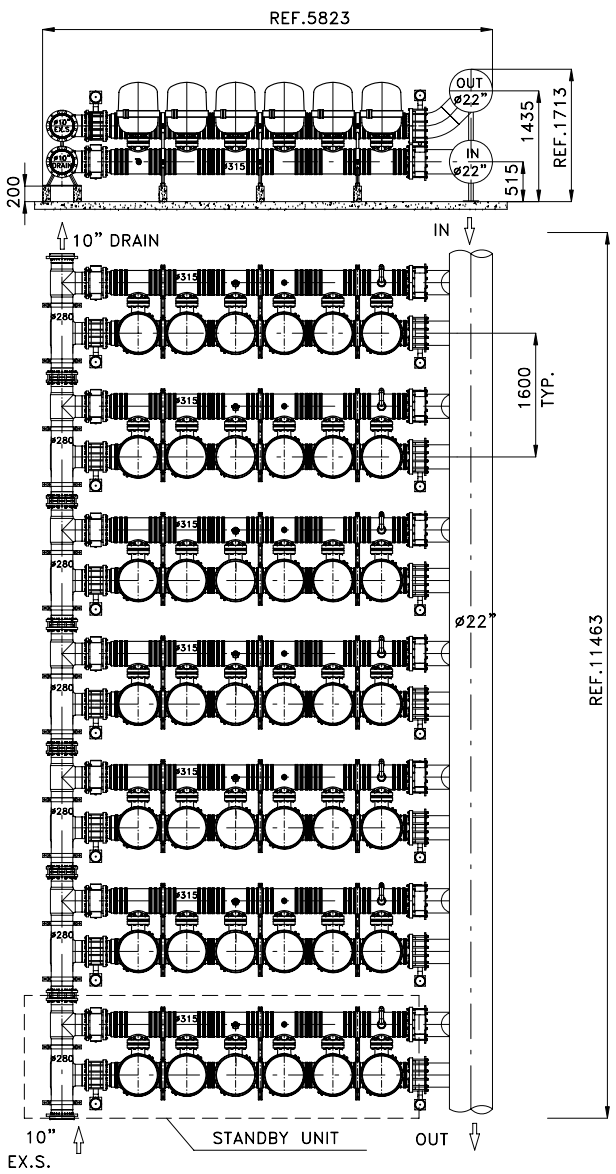

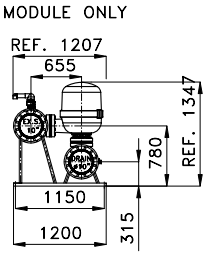

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
(6+1)*(6*6")S.K. "GALAXY" FILTER MODULE
WITH EXTERNAL SOURCE FOR BACK FLUSH

PAGE 1 OF 4

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1661P1206_000YY
4110 1000D00YY

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	NAME	DATE
DRAWN	MAYA	08.12.09
CHECKED	NIKOLAY	08.12.09
APPROVED	DOTAN	08.12.09

FILE CODE DRAWING OF MANIFOLD:

BACKUP:
DISK-34

DRAWER N:
7010

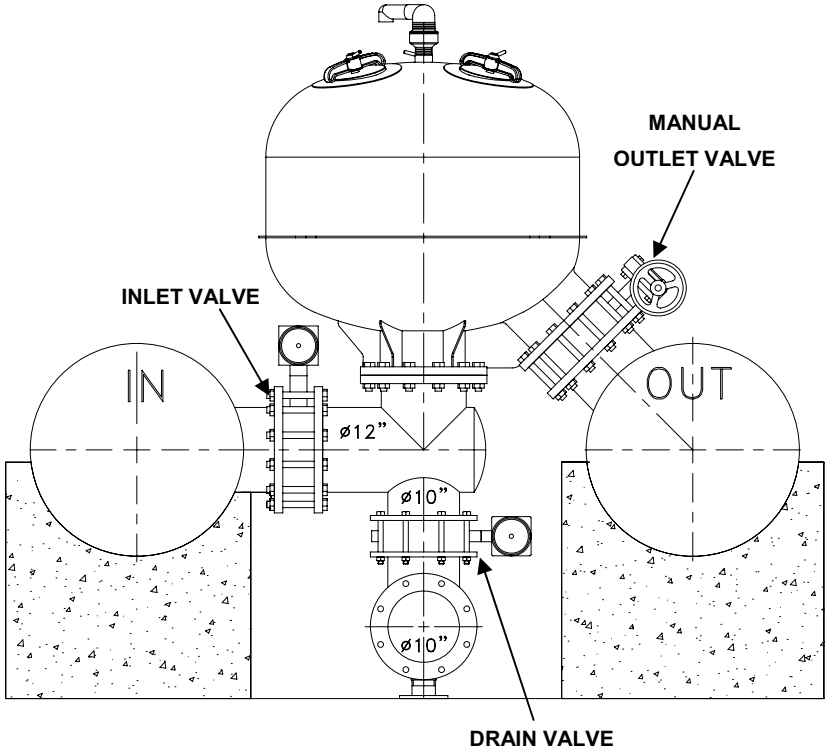
Spin Klin 12" Super Flow

Galaxy Super Flow Spin Klin® Battery
Standard Automatic Backwash

Operation and Maintenance Manual

Filtration Process

During filtration, water flows from the inlet manifold, through the 12” inlet valve into the filter, and through the 12” manual outlet valve (which serves as an isolation valve only, when needed). Filtered water gathers in the outlet manifold and flows into the user system. Drain valve is close.



Backwash Process

The backwash process is initiated by the control unit according to differential pressure between the inlet and outlet or by time sequence, set by the user.

The first solenoid transmits a command to filter no. 1's valves.

The Inlet valve shuts off and the drain valve opens.

Filter no. 1 is now in backwash mode.

The 51 Spin Klin spines in filter no. 1 operate simultaneously, releasing the compressed discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out though the drain.

The filtered backwash water is supplied by the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Filters backwash will take 20-30 seconds (valve type and size effects the total flushing time). When the time elapses the control unit stops the backwash signal to the solenoid. The solenoid releases the command, allowing the valves and the discs of the 51 spines to return to filtration mode.

Once filter no. 1 is in the filtration position again, the control unit sends a command to begin the backwash process of filter no. 2.

Spin Klin Technology- Spine Model 2

General:

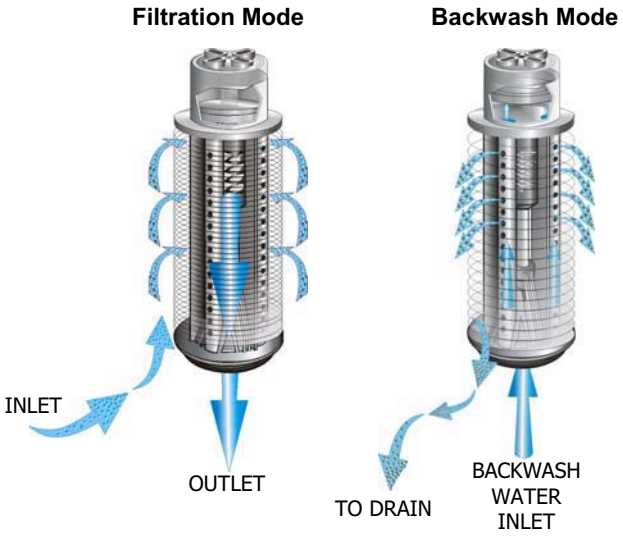
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded according to nominal micron size and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.

Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs.

Backwash Mode:

During backwash the discs are released hydraulically, simultaneously with the pressure release. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin and flush out the retained solids to the drain.



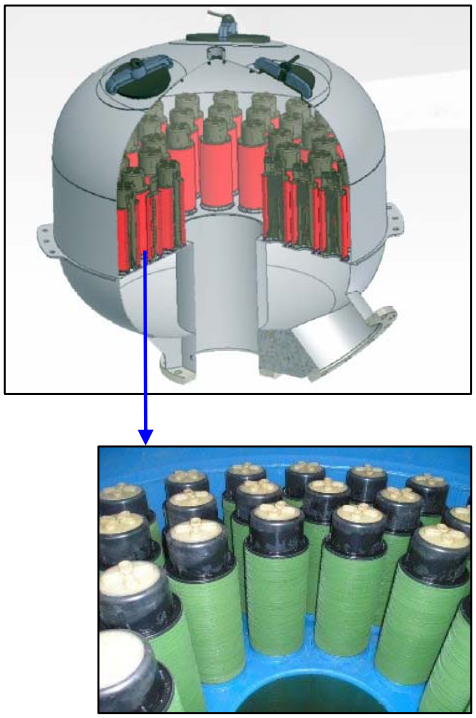
Valves Operation

Each filter is equipped with 2 automatic valves (butterfly or other, according to the application's requirements) to switch between filtration and backwash mode. The 12" manual outlet valve serves as an isolation valve only, when needed.

Filtration mode: The inlet valve permits flow from the inlet manifold through the filter, into the system.

Flushing mode: The inlet valve closes and the drain valve opens, causing reverse flow through the filter, ejecting impurities via the drain manifold. Operation is initiated by an electric solenoid.

The valves are operated by means of pneumatic, hydraulic or electric source*.



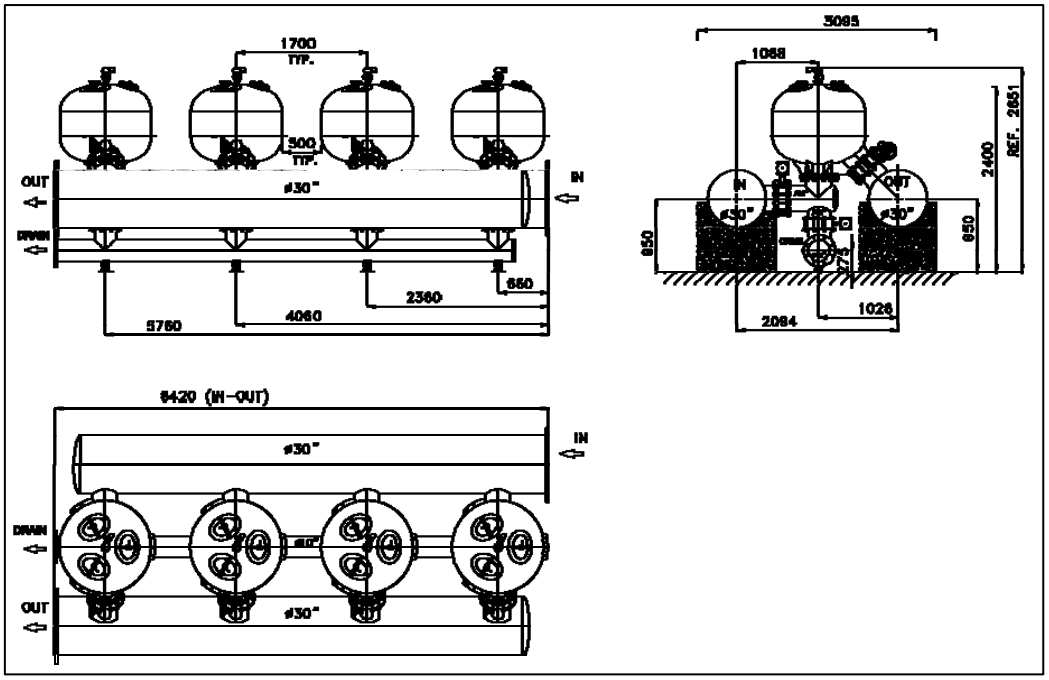
Technical Data

Maximum pressure	10 bar	115psi
Minimum backwash pressure	3 bar	42 psi
Backwash flow rate per unit	500 m^3/hr	2200 gpm
Filtration surface area per unit	44,880 cm^2	6,955 in^2
Filtration volume	68,000 cm^3	4,150 in^3
Maximum temperature	70°C	158°F

* Please consult Arkal's engineering department.

Galaxy Super Flow System

An example of 4 Super Flow filters system layout drawing (Stainless Steel 316 or Carbon Steel Polyester Coated)



Installation

A. Ensure that the inlet and outlet orientation is correct (shown by arrows on filter).
B. Prior to start-up check for any transport damage to the unit (the system operates under pressure!).
C. Connect backwash drainage line.
D. Lids need to be properly closed and sealed.

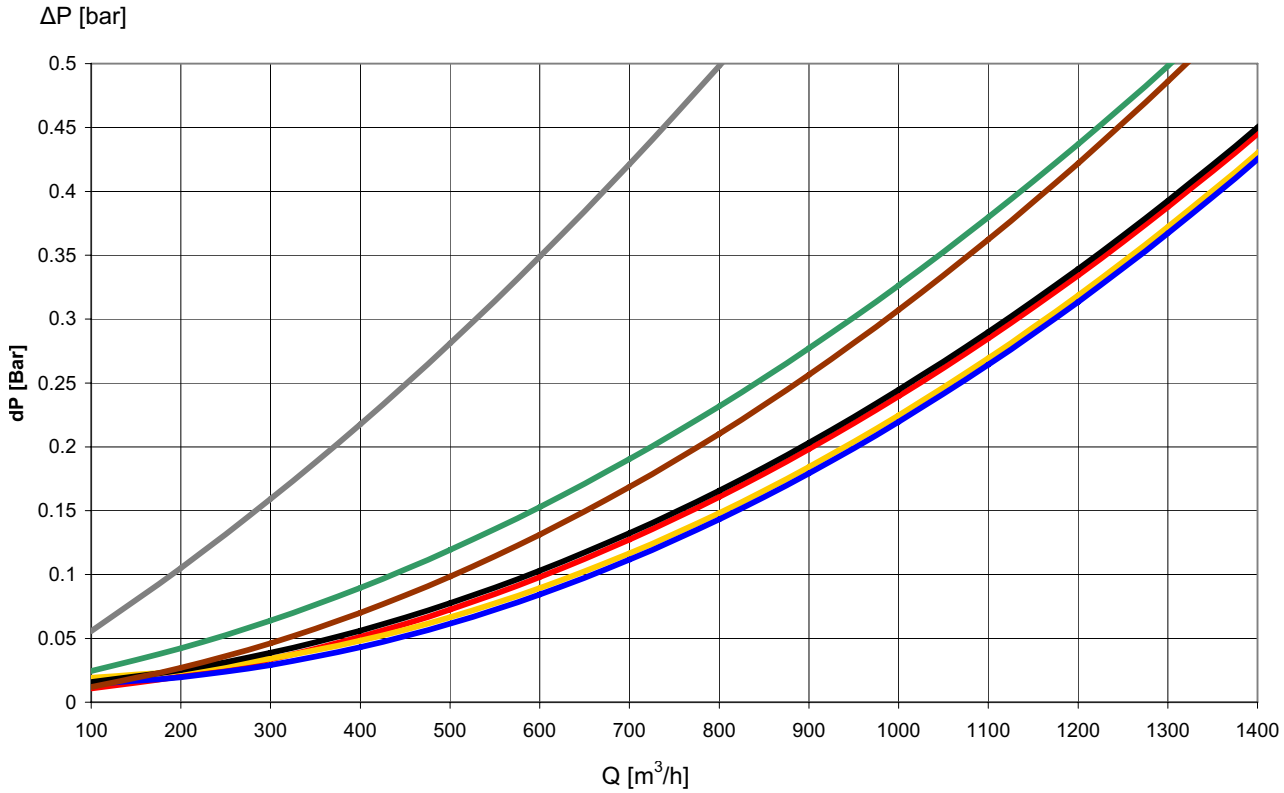
Start-up Operation

Open the inlet valve. Start the backwash cycle, ensuring that all system components function correctly.

Filter Load-up during Start-up

- ❑ Adjust the downstream (flow control) valve (if available) until downstream pressure reaches the recommended backwash pressure.
- ❑ Flush few cycles until clean, at least once for each filter.
- ❑ Slowly reopen the downstream valve.
- ❑ If the pressure difference remains high, check and see if the flow rate is too high. Excessive flow rate through the filter may increase pressure loss.

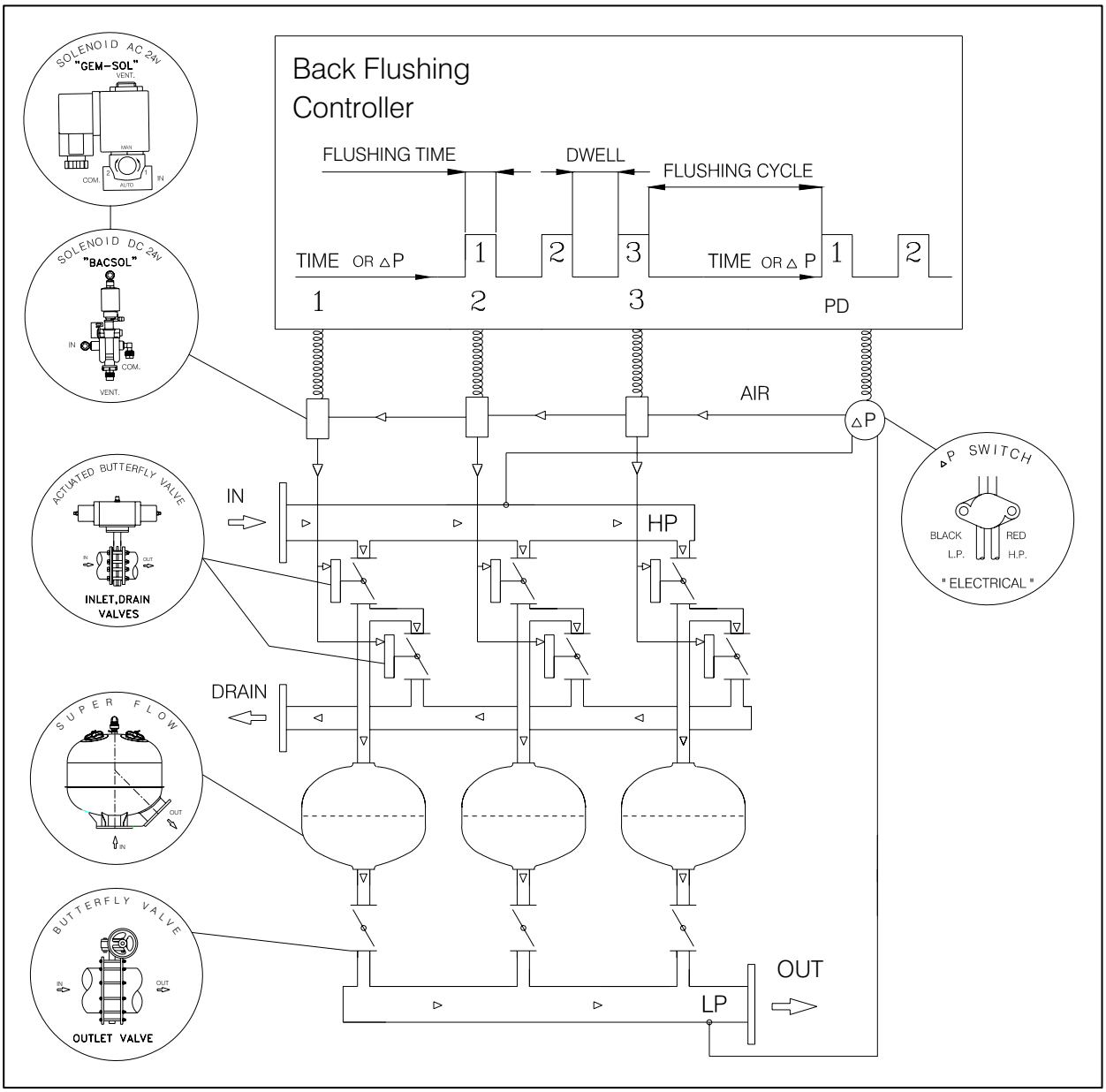
Galaxy Super Flow Headloss Chart



Filtration Grades

Color code	Blue	Yellow	Red	Black	Brown	Green	Gray
Micron	400	200	130	100	70	55	20
Mesh	40	80	120	140			

Control system scheme



Control

- ❑ Refer to the manufacturer's handbook before installing the controller (In case control system is supplied with the Galaxy Super Flow system).
- ❑ Ensure that the voltage of both the solenoid unit and controller is correct.
- ❑ Set the manual operation button to automatic.
- ❑ Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the right ports.
- ❑ Set the starting backwash switch to ΔP of 5-7 meters (6 - 8psi).
- ❑ Set the controller to flush time of 20-30 seconds and dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Normally, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin - System Maintenance

Check inlet /outlet pressure:

If pressure differential is above 5 m / 7 psi:

Start the automatic backwash process of the Spin Klin Galaxy Super Flow filter.

In case that the pressure differential after backwash remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the valve.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Water-formed deposits:

During the filtration process, water-formed deposits may settle on the filtration discs and clog the filter. The formation and composition of these deposits depend on the water quality and on environmental conditions like temperature, pH, light, flow velocity, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily by touch; beige, brown or green in color)
- Manganese or iron compounds (black, brown or orange deposits)
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend cleaning the filter periodically with a suitable cleaning solution. Make sure the cleaning solution is compatible with the filter materials.

Seasonal Maintenance – Cleaning the Discs

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. **Make certain that there is no pressure in the system** and open the lids (**Figure 1**).

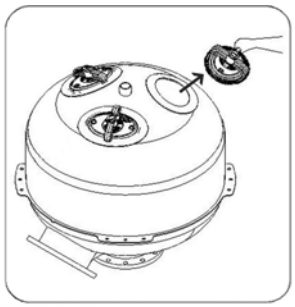


Figure 1

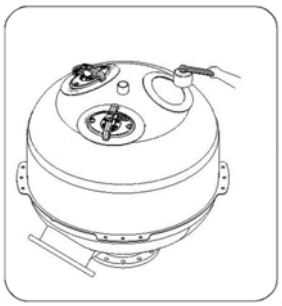


Figure 2

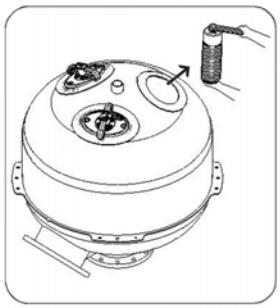


Figure 3

Unscrew the spine using a ranch with a special spine nut (Arkal Catalog No. 5076 0097) and take out the spine out of the Super Flow vessel (**Figure 3**). Unscrew the butterfly nuts on the filtration elements (**Figure 4**). Remove the disc sets (for convenience we recommend using a plastic bag (**Figure 5**).

Figure 4

Figure 5

Cleaning solution

Figure 6

Tie each set on a string, place them in a suitable cleaning solutions, soak them for a few hours and then rinse them well with clean water to remove remaining deposits and chemicals (**Figure 6**).

Figure 7

Figure 8

Figure 9

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted lines on the outside of nozzles pipes. Reassemble the tightening cylinders into the spines (**Figure 7**), screw back the spines into their seats and seal the vessels ports by the lids (**Figure 8, 9**).

Attention:

When carrying out any seasonal maintenance, service, or cleaning of the discs – after backwashing the system and closing the water inlet, make certain that **there is no pressure in the system!**

Optional (should be added to specific customers only):

Suitable cleaning solutions for cleaning filtration discs outside the filter:

For biological deposits (biofilms) - up to 5% chlorine (NaClO) or peroxide (H_2O_2) solution

For organic deposits - up to 5% detergent solution (based on NaOH)

For manganese deposits - up to 10% citric acid solution

For iron and carbonate deposits - up to 5% acid solution (as HCl or H_3PO_4)

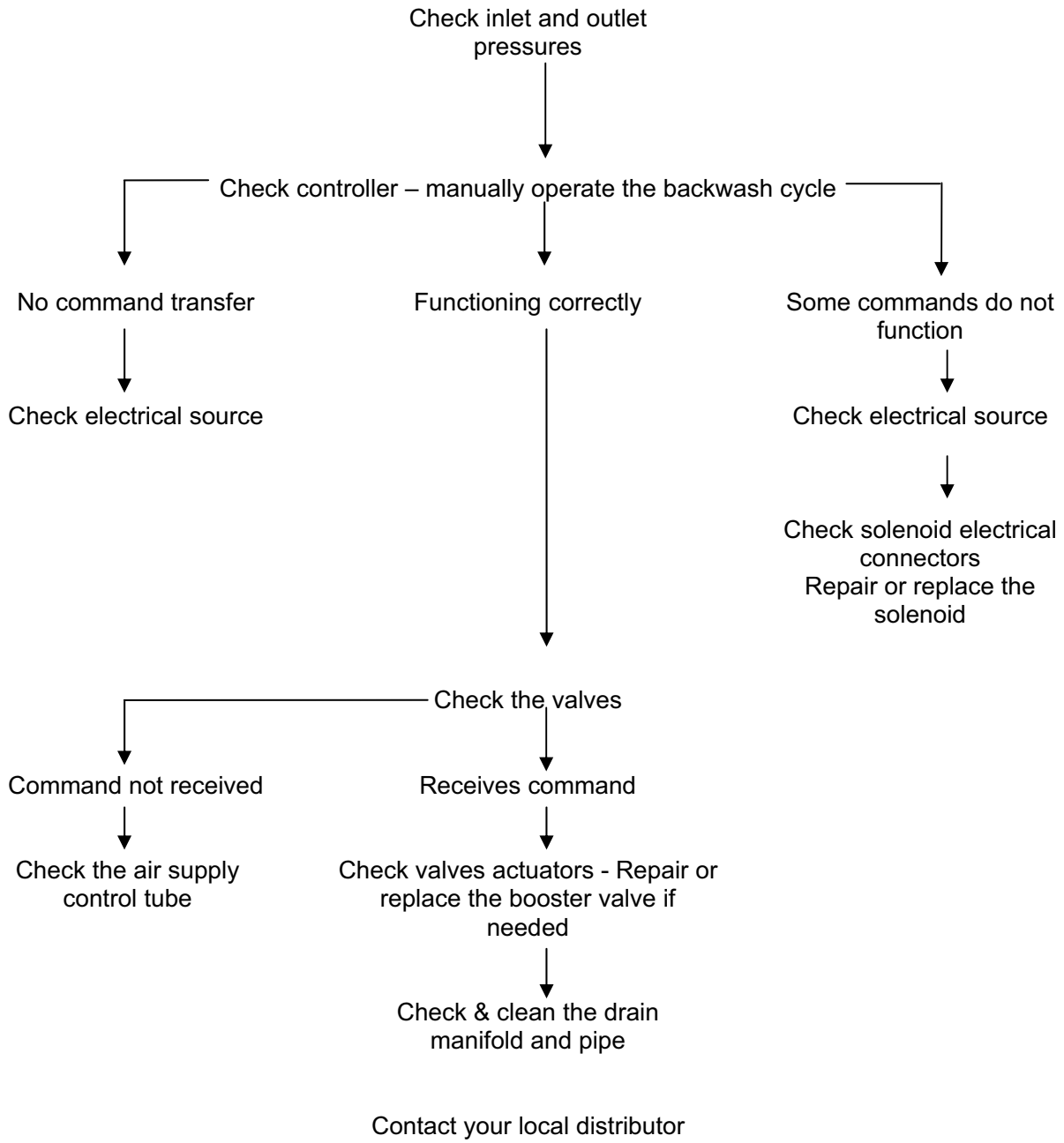
Do not expose filtration discs to chemicals longer than absolutely necessary (max. 4 hours).

For your personal safety, strictly follow the safety instructions of the chemical supplier.

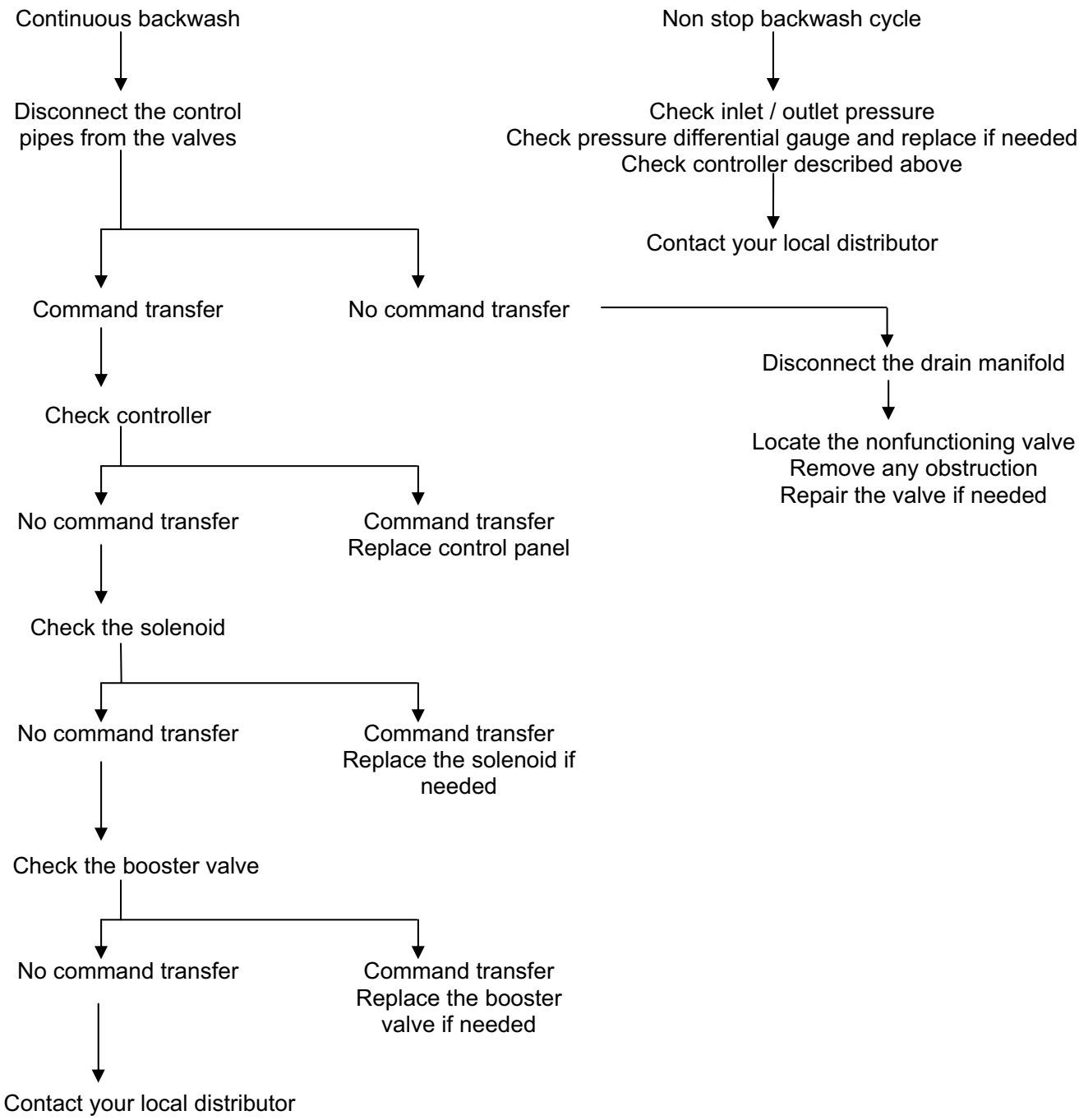
For online cleaning procedures, please contact your ARKAL consultant.

Identifying Malfunctions in the Galaxy Super Flow system

No Backwash Operation



Continuous or Non-stop Backwashing



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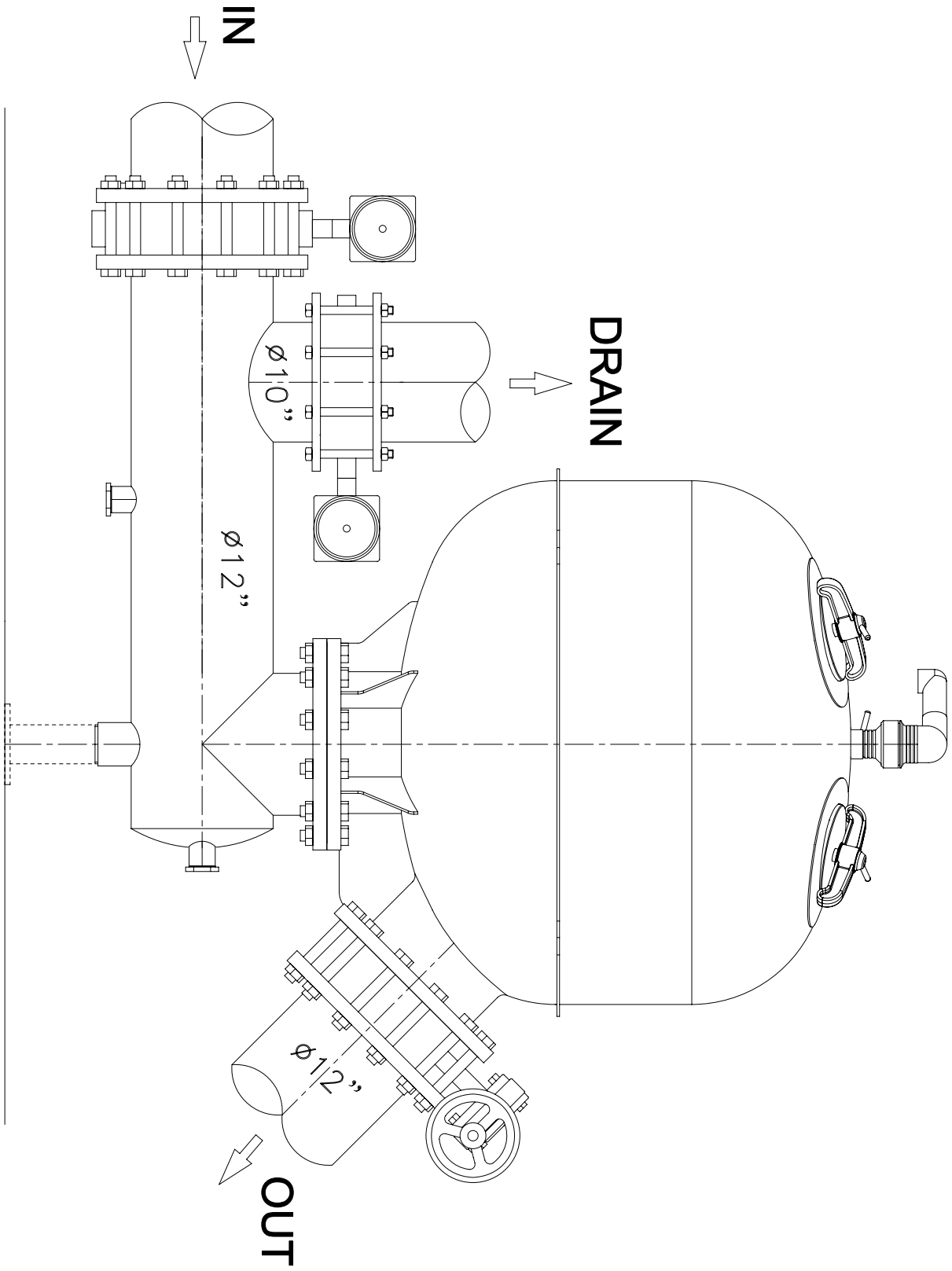
Email: filters@arkal.com Web: www.arkal-filters.com

Drawings

12" Spin Klin super flow Batteries



		THIS DRAWING CANCEL DRAWING FROM 29.11.04	
MODIFIC.	DATE	DESCRIPTION	SIGN.

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ISRAEL

PROJECT: 4 SUPER "GALAXY" FILTER — PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1780H1201_50003

PATH BATERIES\SUPER FLOW — FILE CODE 1780H1201_50003

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	NAME	DATE
DRAWN	MAYA	28.01.07
CHECKED	NIKOLAY	28.01.07
APPROVED	EYAL	28.01.07

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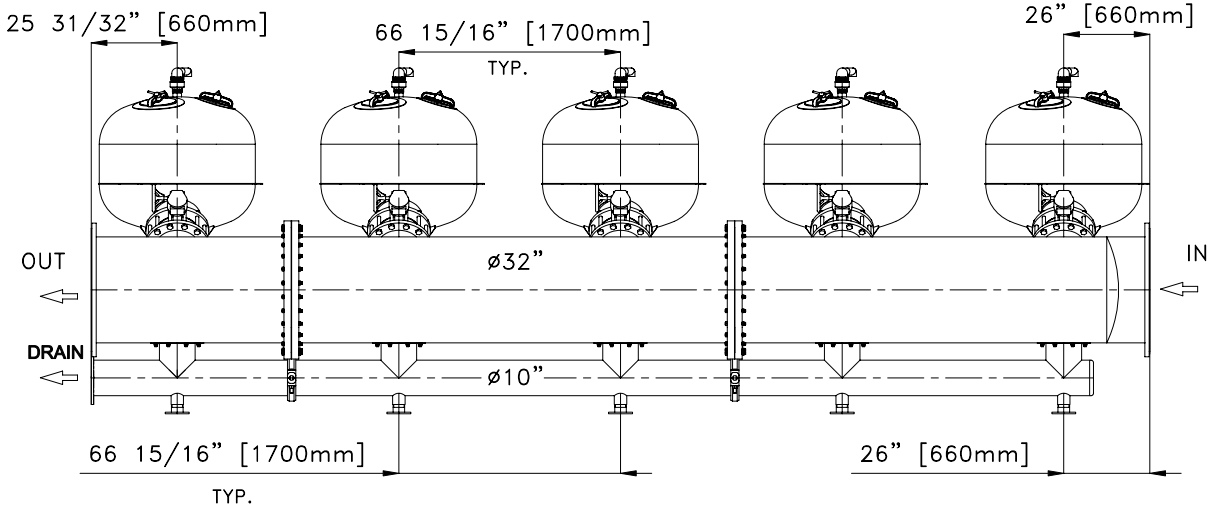

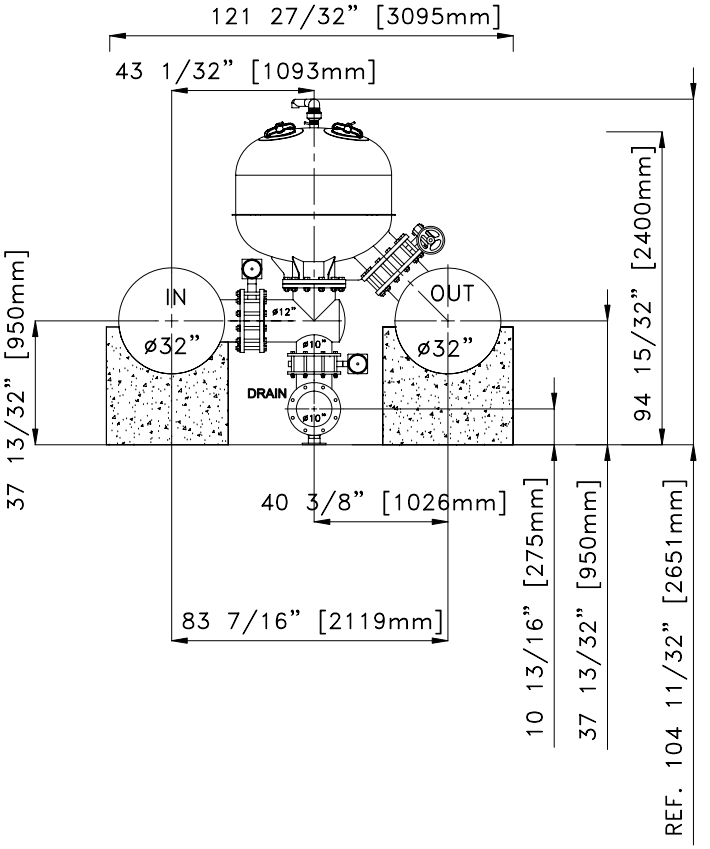

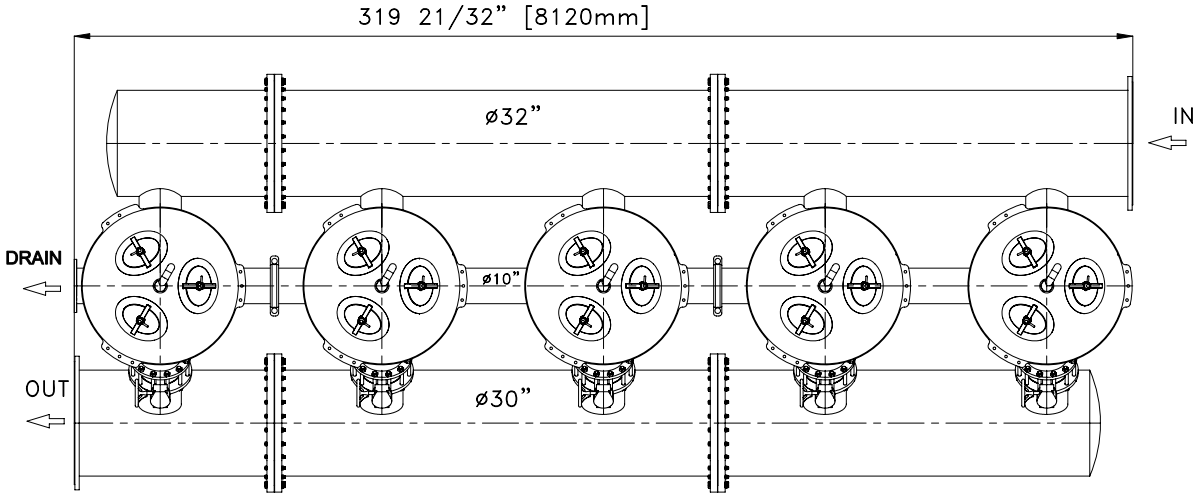

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PROJECT: 5 SUPER "GALAXY" FILTERS BATTERY

TITLE: ASSEMBLY DRAWING

CATALOGUE No:
1482 7BL___
4110 1000A0041
4110 1200A0036

PATH: BATERIES\SUPER FLOW

FILE CODE: 5AGFT132

	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	NIKOLAY	01.03.06
CHECKED	DOTAN	01.03.06
APPROVED		

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-30

VIEW: FRONT,TOP & SIDE VIEWS

DRAWER N: 5050

Spin Klin 12" Super Flow

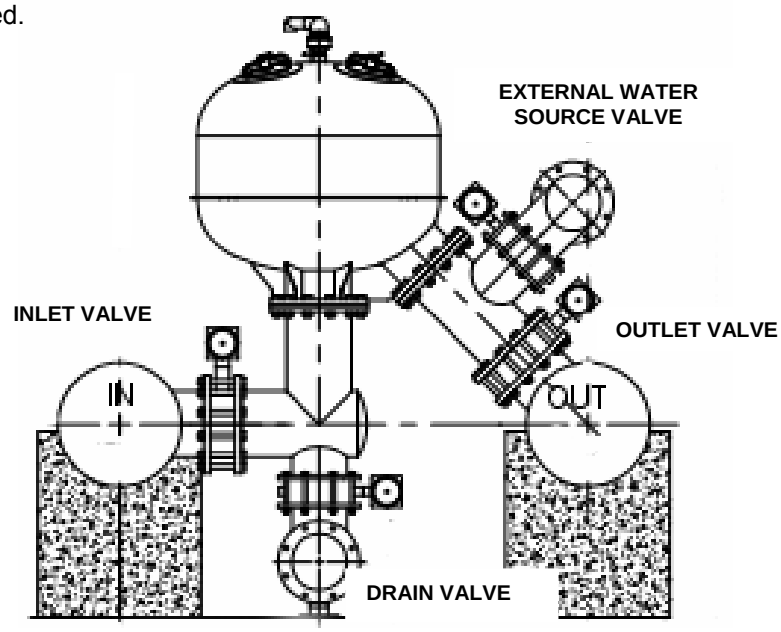
External Source

Galaxy Super Flow Spin Klin® Battery External Source Automatic Backwash

Operation and Maintenance Manual

Filtration Process

During filtration, water flows from inlet manifold, through the 12” inlet valve into the filter, and through the 12” outlet valve. Filtered water gathers in the outlet manifold and flows into the user system. External source valve and drain valve are closed.



Backwash Process

The backwash process is initiated by the control unit according to differential pressure between the inlet and outlet or time.

The first solenoid transmits a command to the four valves of filter No. 1:

1. The Inlet valve closes & outlet valves close
2. The drain valve opens & external source valves open.

Filter No. 1 is now in backwash mode.

The 51 Spin Klin spines in filter No. 1 operate simultaneously, releasing the compressed discs. Tangential jets of water are pumped against the discs, causing them to spin fast and free, flushing trapped solids out to the drain.

The filtered backwash water is supplied by an external source through the external source manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Backwash time per filter is 20-30 seconds. When the time elapses the control unit stops the backwash signal to the solenoid.

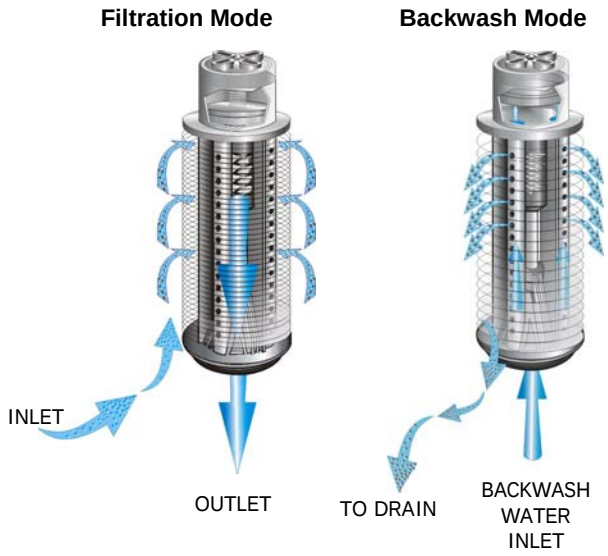
The solenoid releases the command allowing the valves and the discs of the 51 spines to return to filtration mode.

Once filter No. 1 is in the filtration position again the control unit sends a command to begin the backwash process in filter No. 2.

Spin Klin Technology- Spin Klin Spine Model 2

General:

The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded by nominal micron **size,** and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.



Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs**.**

Backwash Mode:

During backwash the discs are released hydraulically, simultaneously pressure. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin, and release the retained solids, which are flushed out to the drain.

Valves

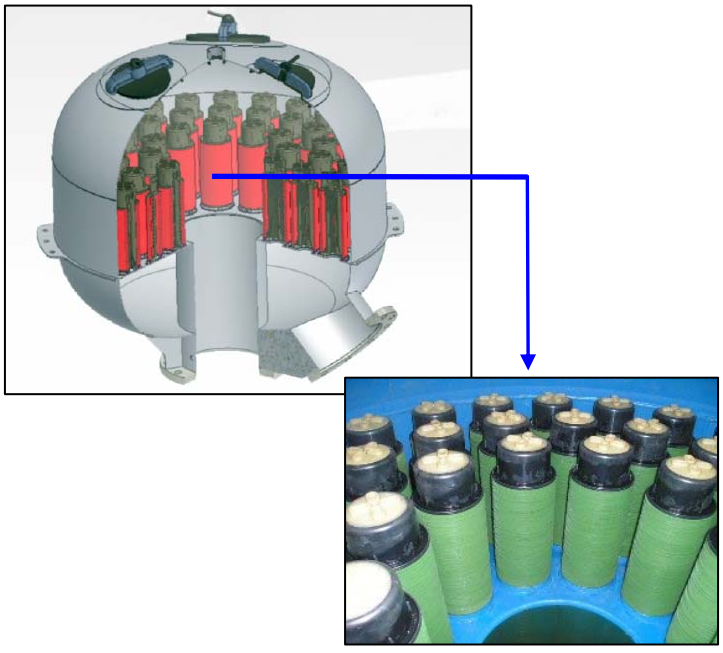
Each filter is equipped with 4 automatic valves (Butterfly or another type, according to client's preferring) to change between filtration and backwash mode.

Filtration mode: The inlet and outlet valves permit flow from the inlet manifold through the filter, into the system.

Flushing mode: The inlet and outlet valves close and the external source and drain valves open, causing reverse flow through the filter, ejecting impurities via the drain manifold.

Operation is initiated by an electric solenoid.

The valves are controlled by a pneumatic source.



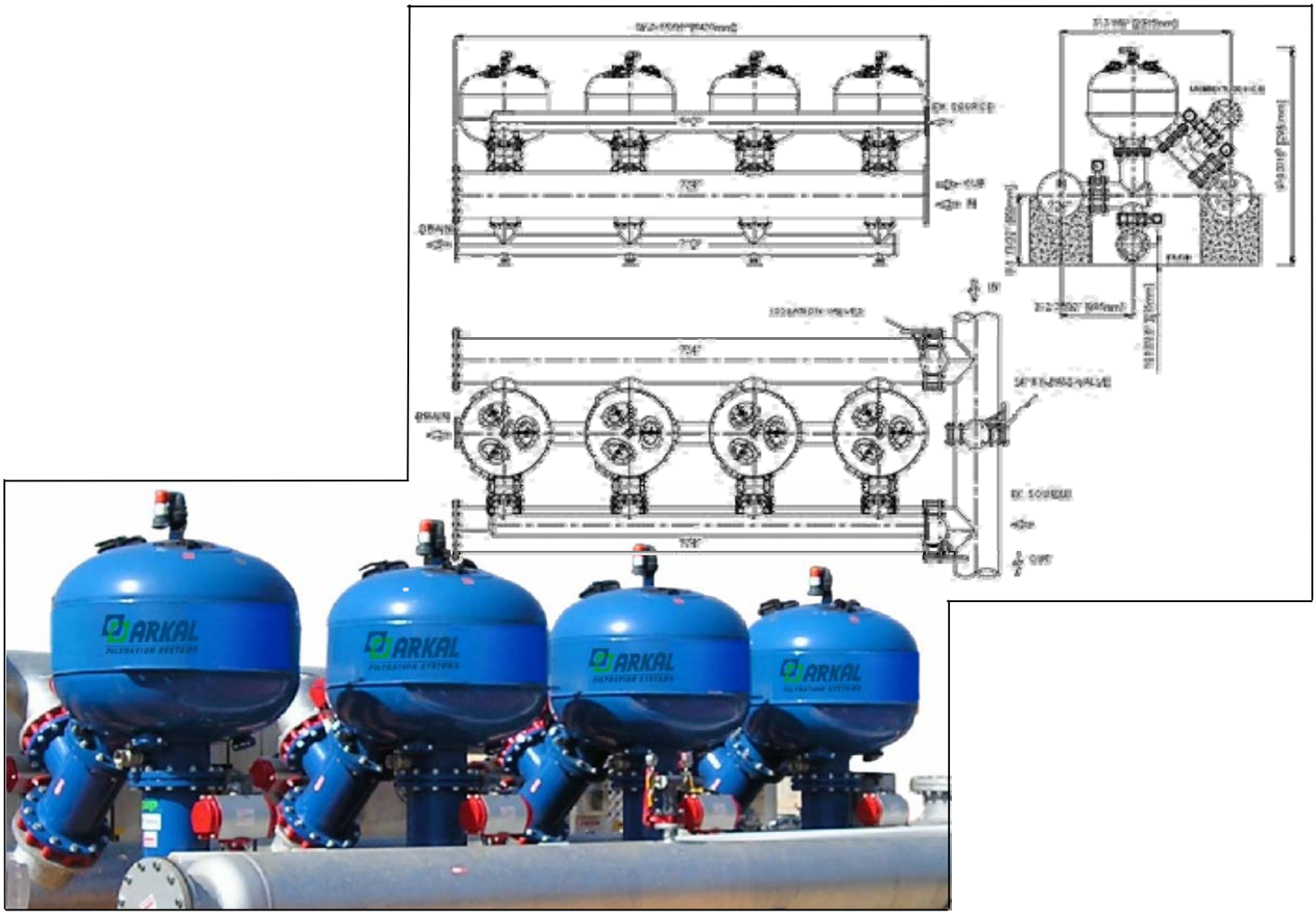
Technical Data

Maximum pressure	10 bar	115psi
Minimum backwash pressure	3 bar	42 psi
Backwash flow rate per unit	500 m^3/hr	2200 gpm
Filtration surface area per unit	44,880 cm^2	6,955 in^2
Filtration volume	68 litter	18 gallon
Maximum temperature	70°C	158°F

Galaxy Super Flow System

An example of 4 Super Flow filters system layout drawing

(Stainless Steel 316 or Polyester Coated)



Installation

A. Make sure that the inlet and outlet orientation is correct (shown by arrows on filter).
B. Prior to start-up check for any transport damage to the unit (system operates under pressure!).
C. Connect backwash drainage line.
D. Cover clamps need to be properly closed.

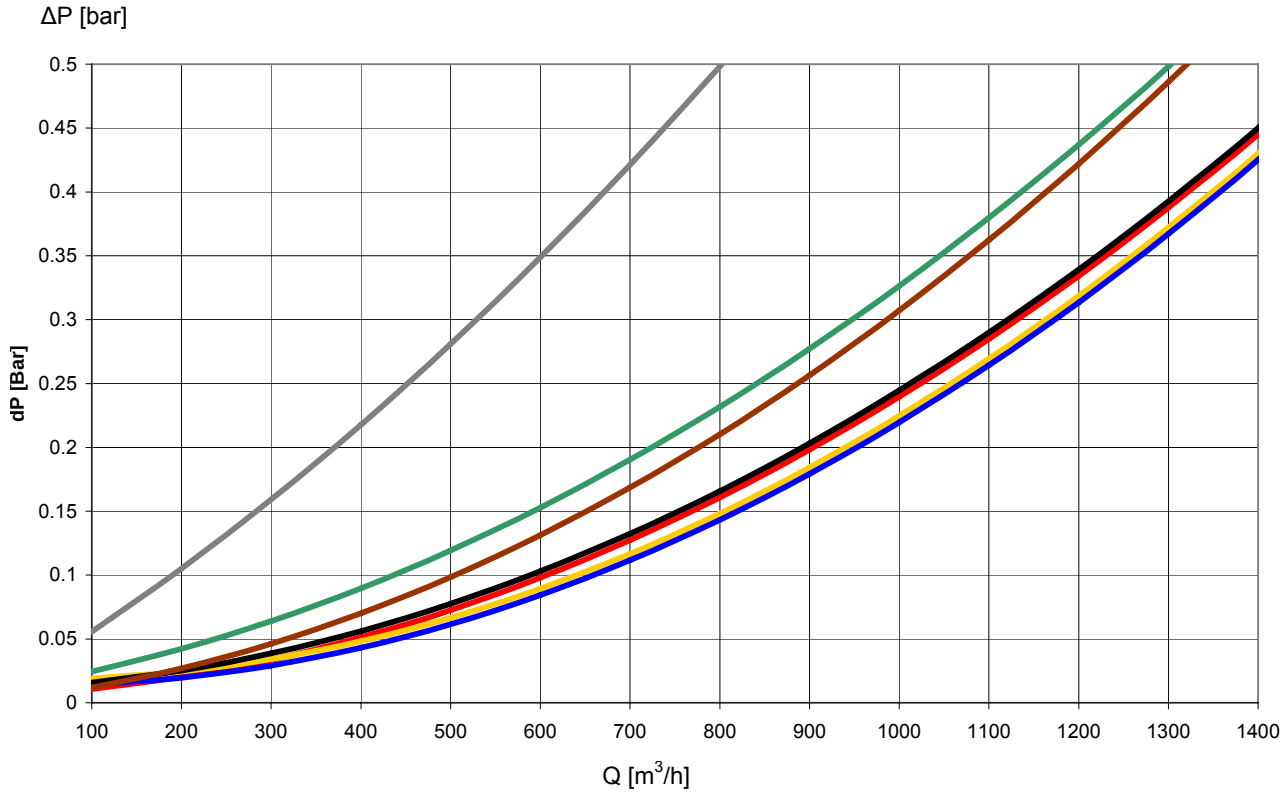
Start-up Operation

Start the backwash cycle, making sure that all system components function correctly.

Filter Load-up during Start-up

- ❑ Close the downstream (flow control) valve (if available) until downstream pressure reaches the recommended backwash pressure.
- ❑ Flush few cycles until clean.
- ❑ Slowly reopen the downstream valve.
- ❑ If the pressure difference remains high, check and see if the flow rate is too high. An excessive flow rate through the filter causes excessive pressure loss.

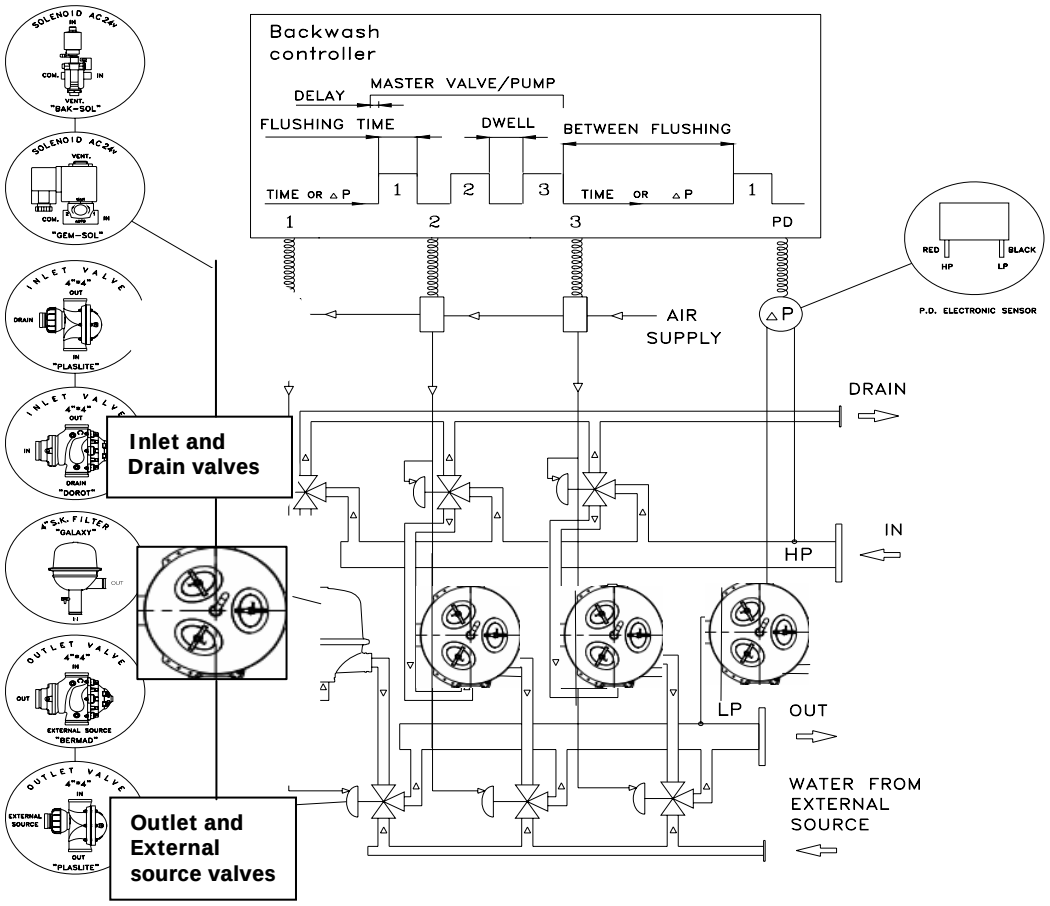
Galaxy Super Flow Headloss Chart



Filtration Grades

Color code	Blue	Yellow	Red	Black	Brown	Green	Gray
Micron	400	200	130	100	70	55	20
Mesh	40	80	120	140			

Control System Schema



Control

- Refer to the manufacturer's handbook before installing the controller (Incase control system is supplied with the Galaxy Super Flow system.
- Make sure that the voltage of both the solenoid unit and controller are correct.
- Set the manual operation button to automatic.
- Check that the ΔP hydraulic switch HIGH and LOW pressure lines are correctly connected to the appropriate ports.
- Set the starting backwash switch to ΔP of 5-7 meters (6 - 8p.s.i.).
- Set the controller to a flush time of 20-30 seconds and a dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Typically, a 1 to 3 hour interval between backwashes is recommended.

Spin Klin - System Maintenance

Check inlet /outlet pressures:

In case the pressure differential is above 5 m / 7 PSI.

Activate automatic backwash of the Spin Klin Galaxy Super Flow filter.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold:

In case there is a leakage of water during the filtration stage, check for possible failure at the valve.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

Water-formed deposits:

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

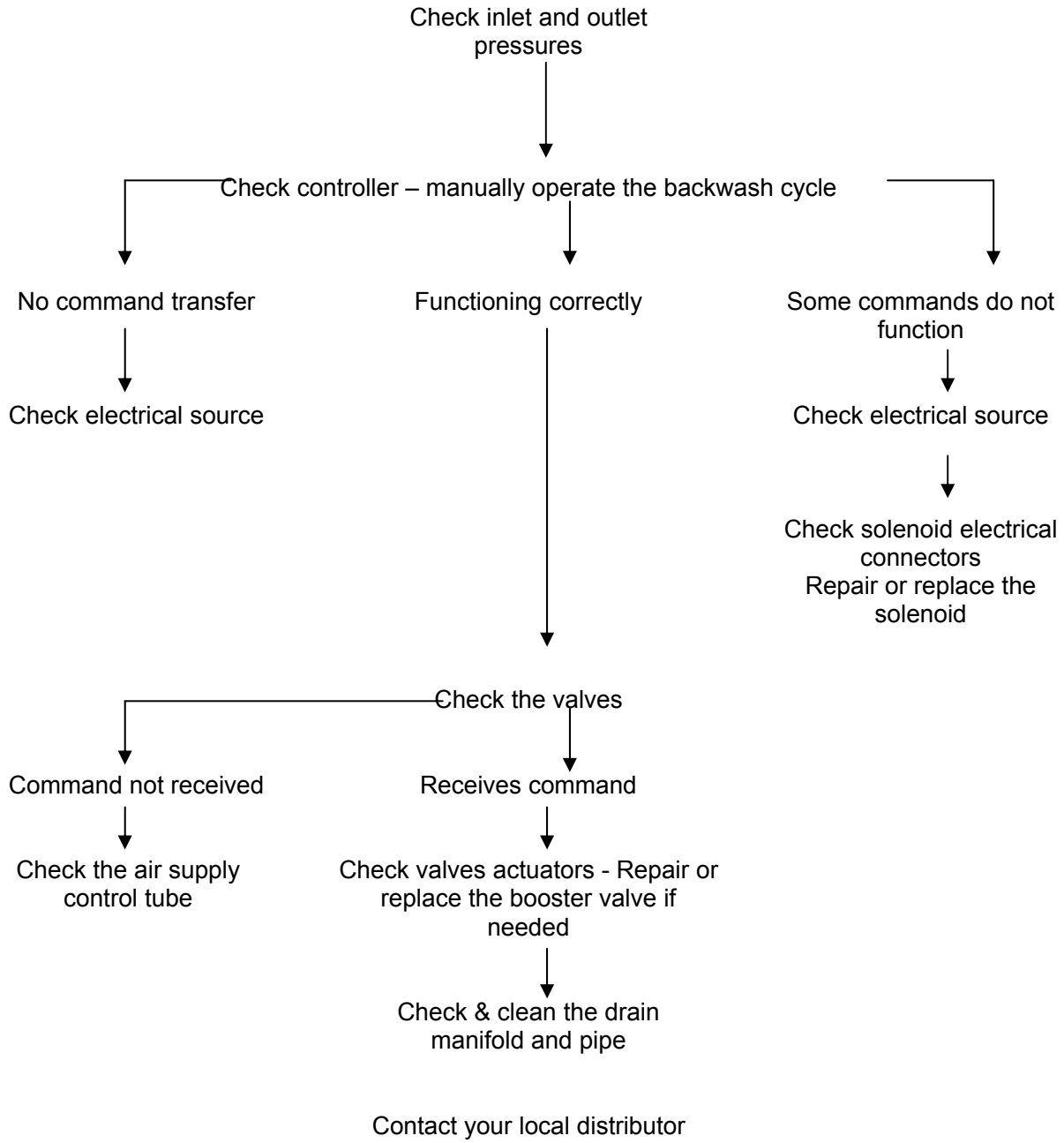
Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

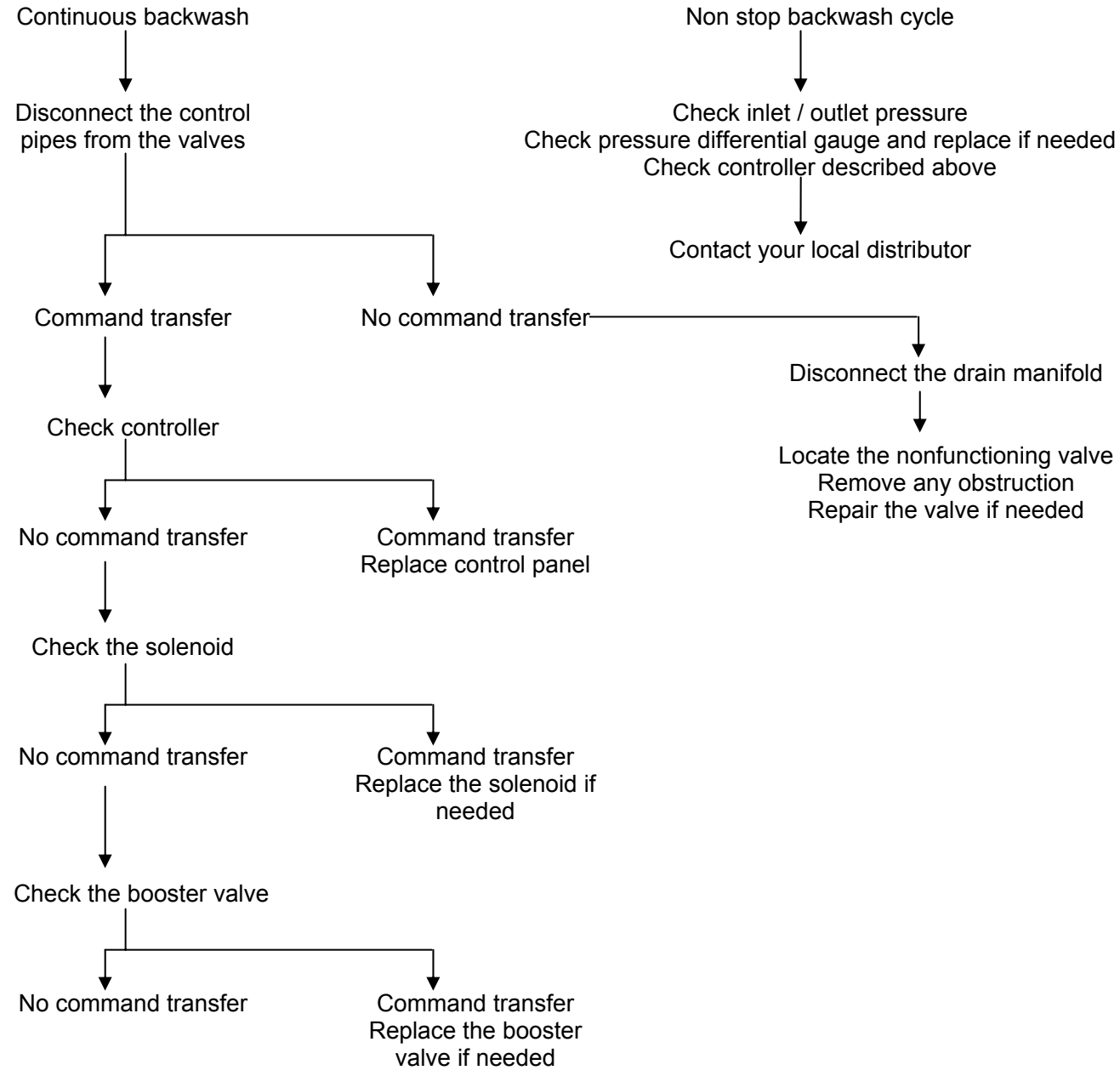
If these deposits cannot be eliminated by pretreatment of the water, we recommend a cleaning procedure of half soakage of the filter, once a week, with chlorinated water: 10-20ppm of 12% hypo chloride solution. Another option is to inject ~ 5ppm of 12% hypo chloride solution to the inlet manifold of the system.

Identifying Malfunctions in the Galaxy Super Flow system

No Backwash Operation



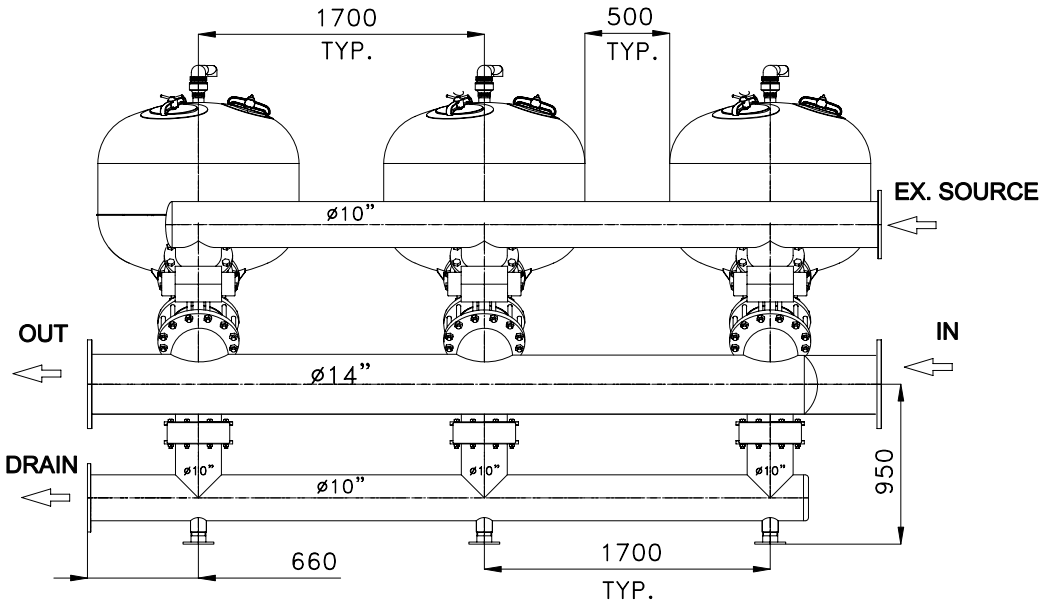
Continuous or Non-stop Backwashing

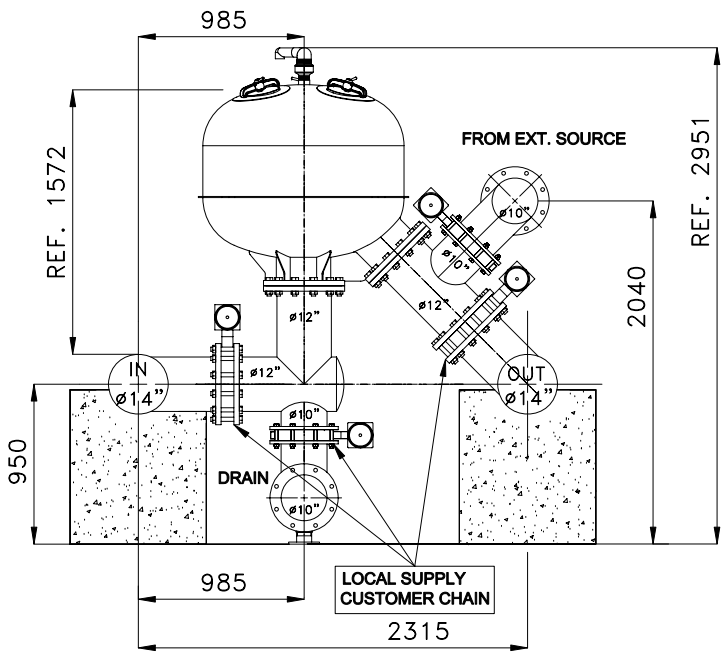


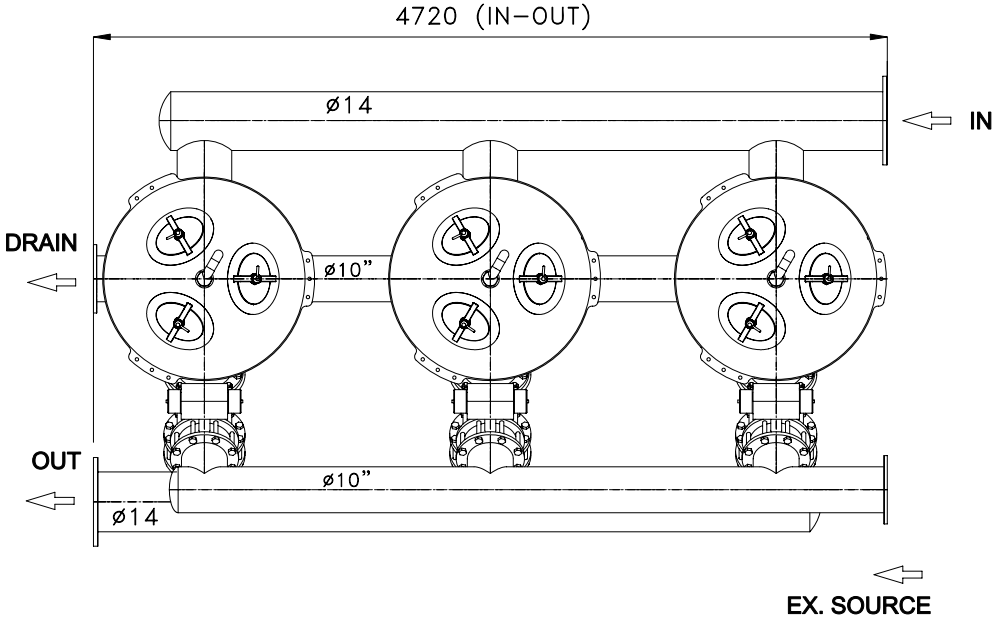
Contact your local distributor

Spin Klin 12" Super Flow

External Source







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PROJECT
3 SUPER "GALAXY" FILTERS BATTERY WITH EXTERNAL SOURCE FOR BACKFLUSH

PAGE 1 OF 3

TITLE
ASSEMBLY DRAWING

CATALOGUE No:

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	MAYA	24.11.08
CHECKED		24.11.08
APPROVED		24.11.08

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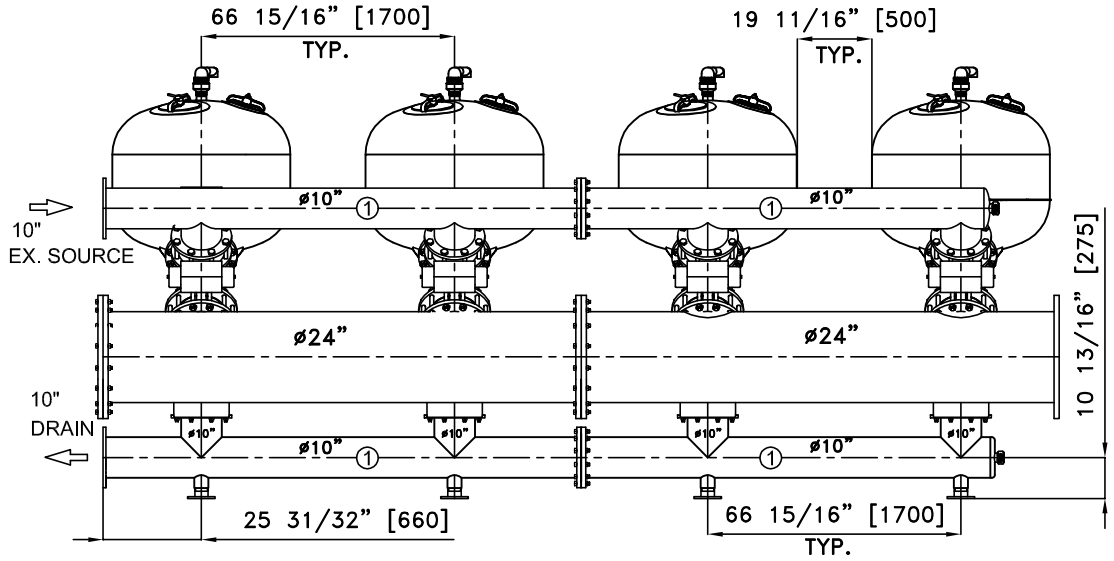
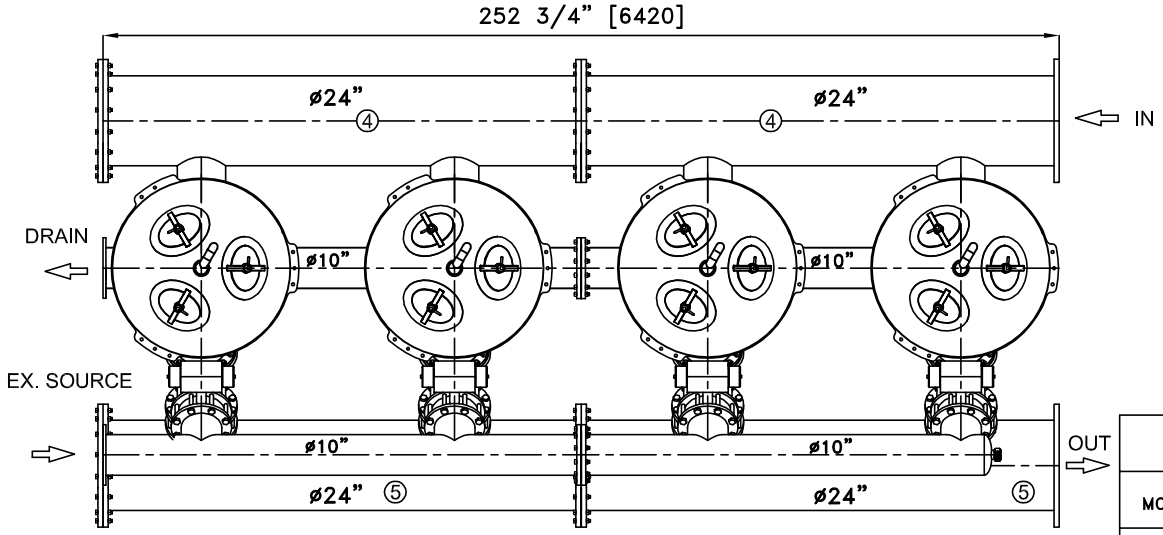
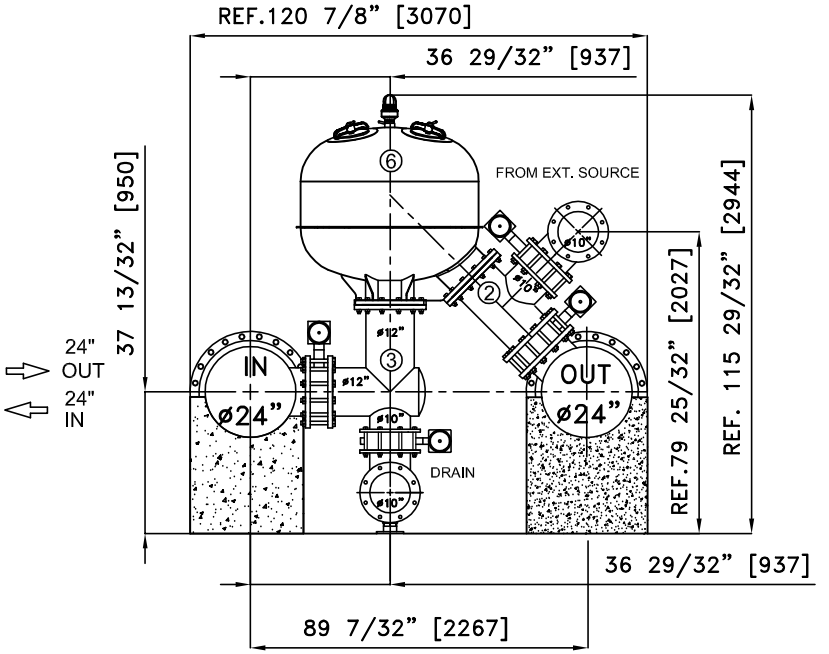
BACKUP: DISK-34

VIEW: FRONT & SIDE VIEW

DRAWER N: 5050







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2.	"Tee" for OUTLET	4110 1200A0032	4
3.	"Tee" for INLET	4110 1200A0033	4
4.	INLET MANIFOLDS	4110 2400A0003	1
5.	OUTLET MANIFOLDS	4110 2400A0004	1
6.	SUPER "GALAXY" FILTER	1482 7___	4

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
4 SUPER "GALAXY" FILTERS BATTERY WITH EXTERNAL SOURCE FOR BACKFLUSH

PAGE 1 OF 5

TITLE
ASSEMBLY DRAWING

CATALOGUE No:

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
DRAWN	LEAH	27.10.05
CHECKED	ITAI	27.10.05
APPROVED		

FILE CODE DRAWING OF MANIFOLD:

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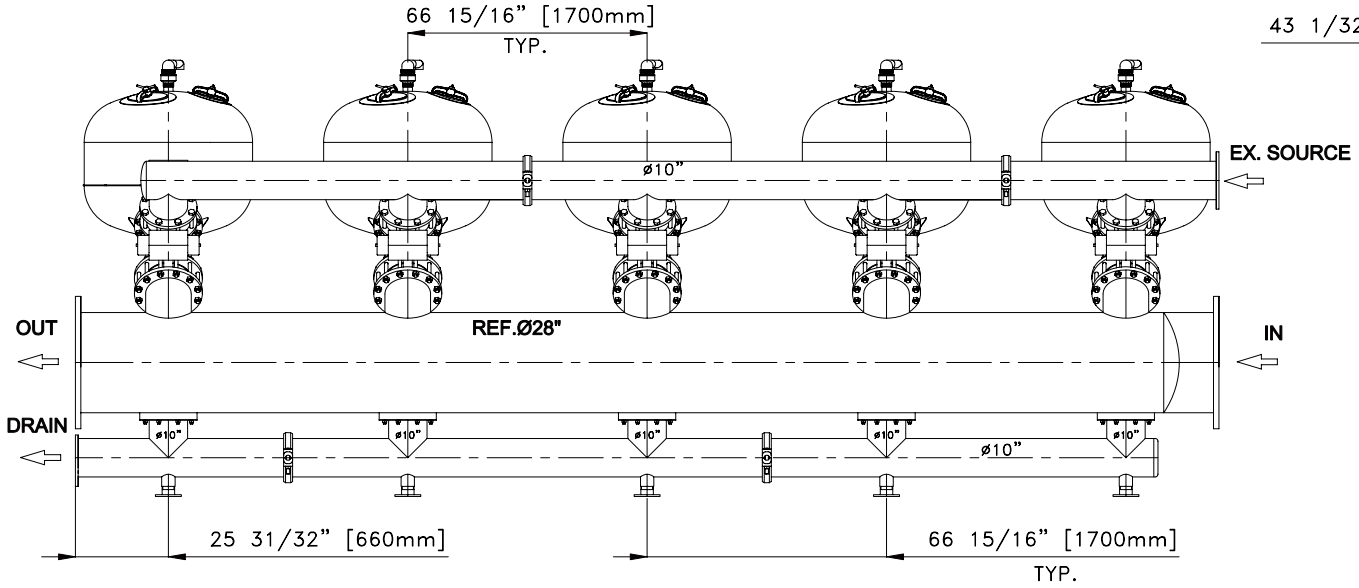
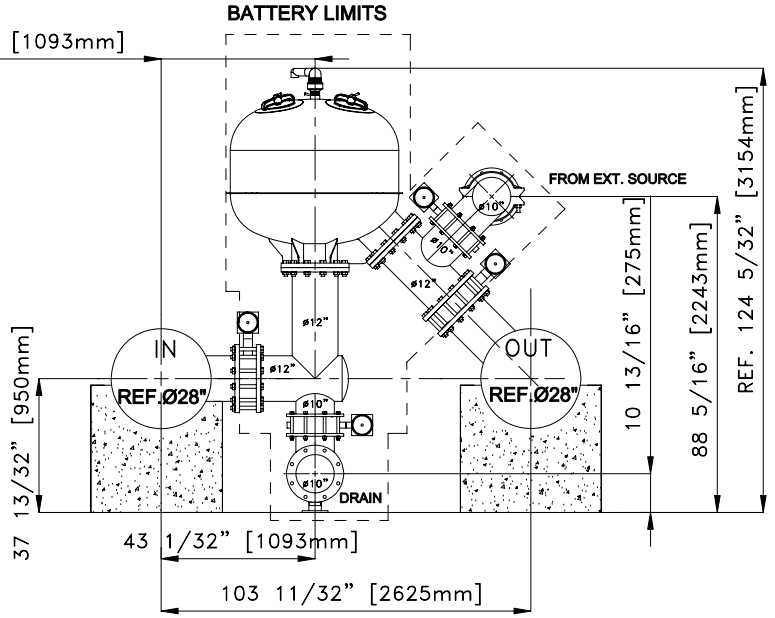
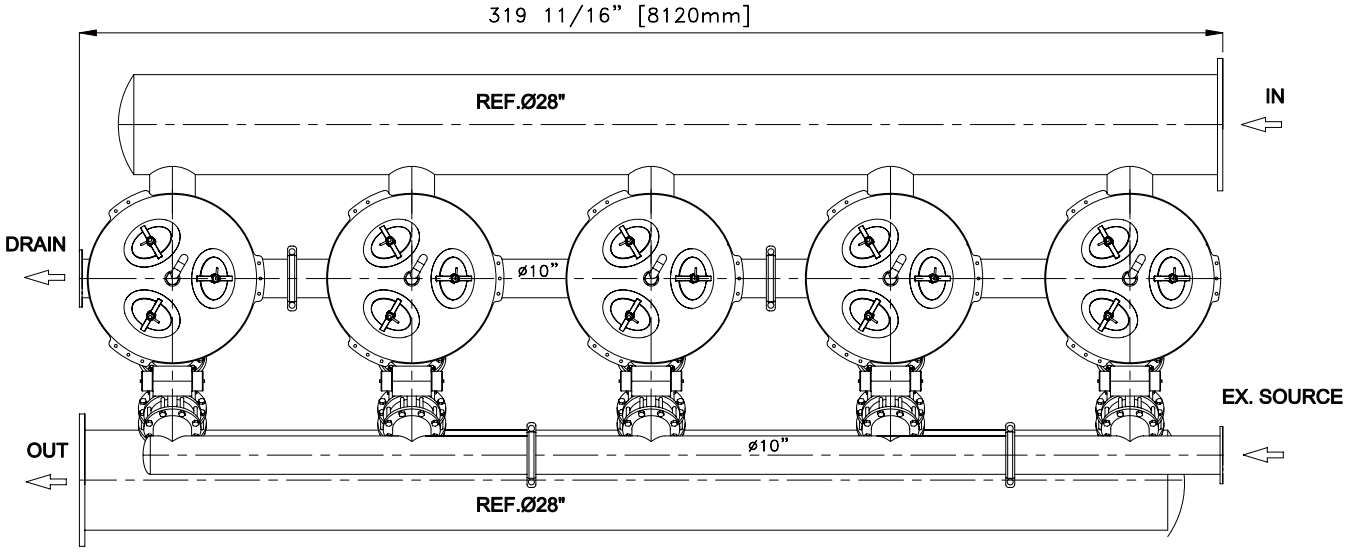
VIEW: FRONT & SIDE VIEW

DRAWER N: 5050







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FAX. 972-4-6775461
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PROJECT
5 SUPER "GALAXY" FILTERS BATTERY WITH EXTERNAL SOURCE FOR BACKFLUSH

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1482 7BL___
6110 1200A0037

PATH	FILE CODE	NAME	DATE	SIGNATURE
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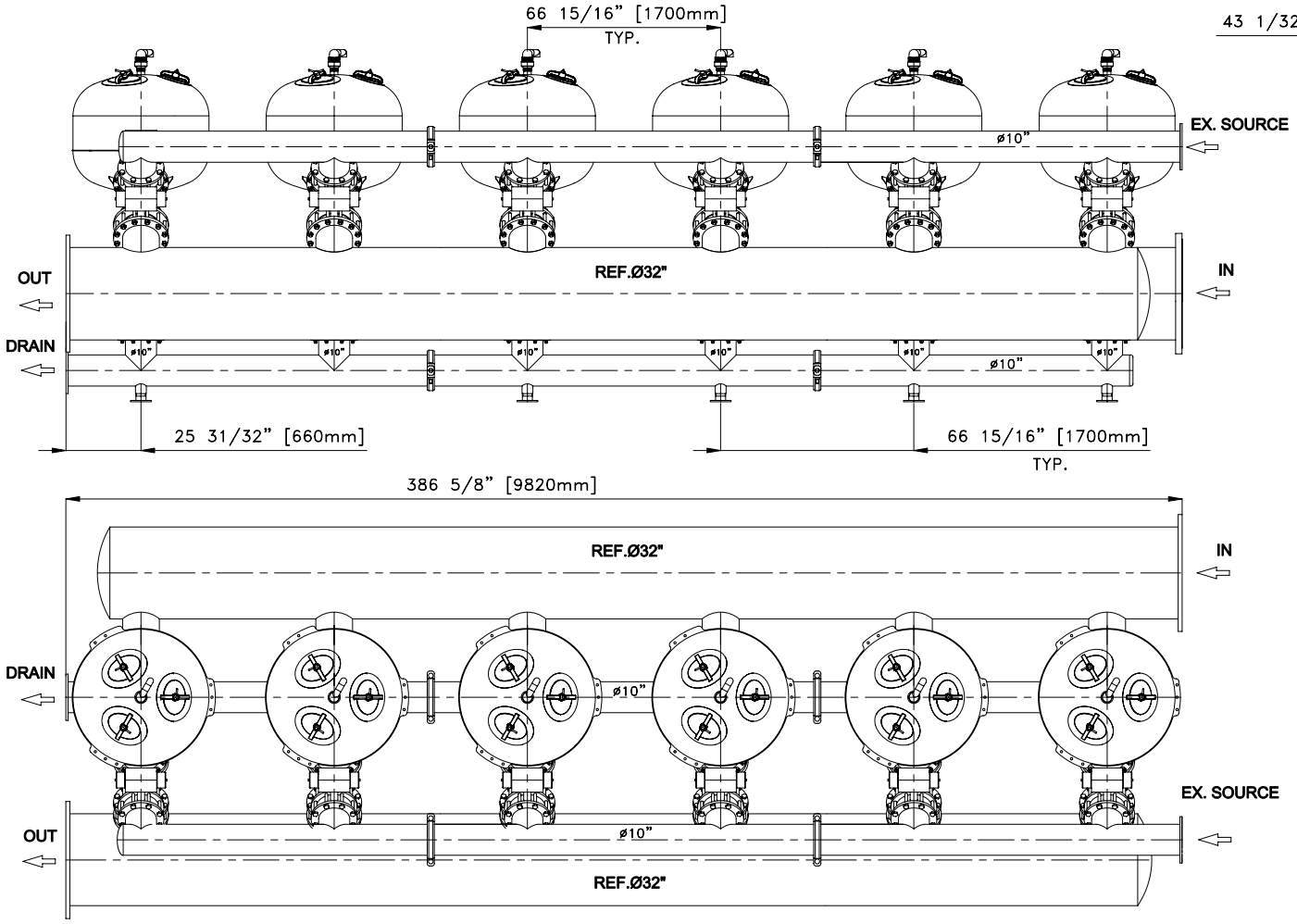
	NAME	DATE
DRAWN	MAYA	24.11.08
CHECKED	NIKOLAY	24.11.08
APPROVED	JACKY	24.11.08

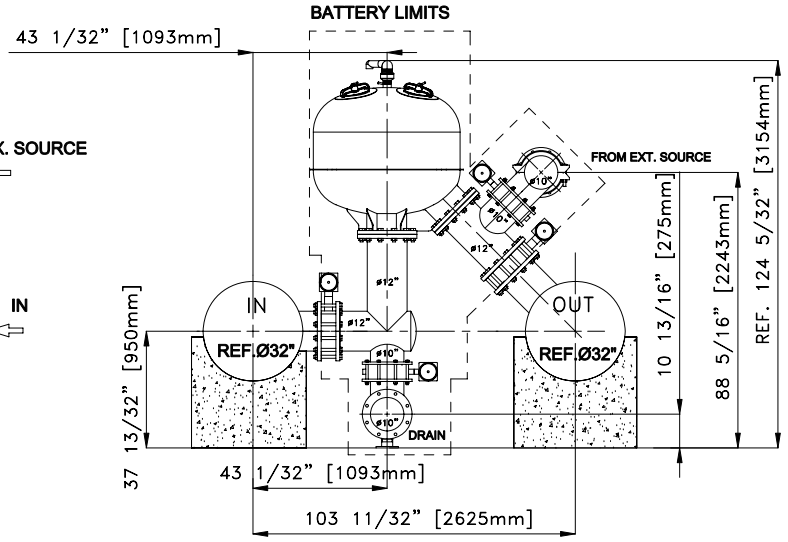
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-34

VIEW: FRONT & SIDE VIEW

DRAWER N: 5050





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PROJECT
6 SUPER "GALAXY" FILTERS BATTERY WITH EXTERNAL SOURCE FOR BACKFLUSH

PAGE 1 OF 3

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1482 7BL___
6110 1200A0037

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	NAME	DATE
DRAWN	MAYA	24.11.08
CHECKED	NIKOLAY	24.11.08
APPROVED	JACKY	24.11.08

FILE CODE DRAWING OF MANIFOLD:

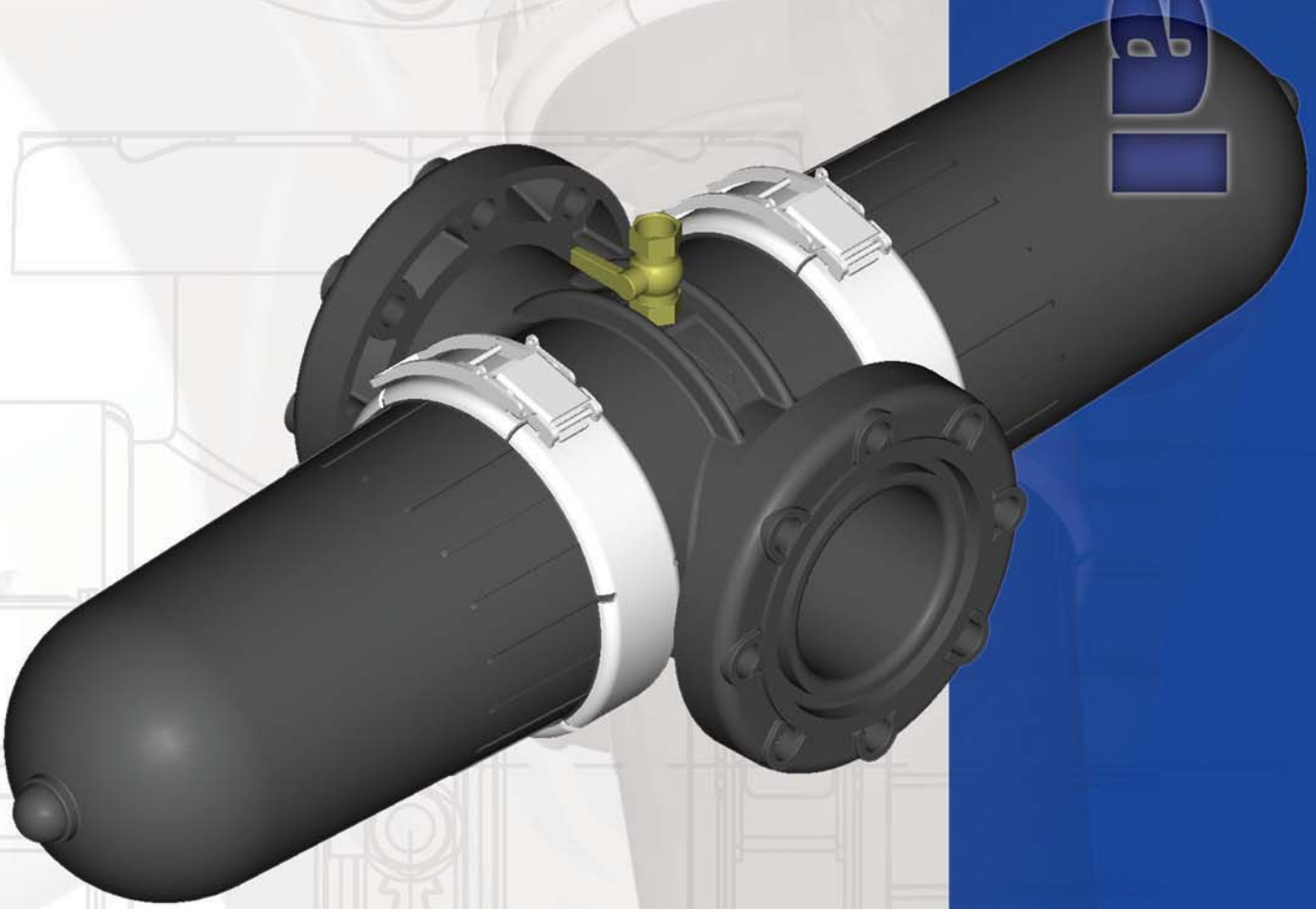
BACKUP: DISK-34

VIEW: FRONT & SIDE VIEW

DRAWER N: 5050

ARKAL
FILTRATION SYSTEMS

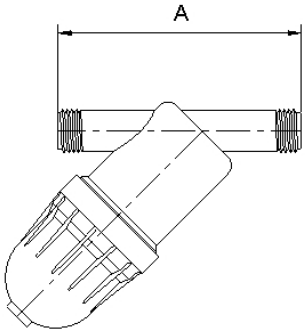
Manual

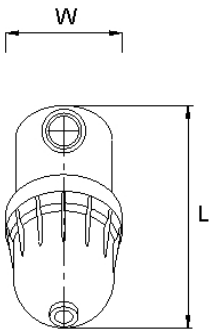


Manual Filters For Chemical Use

Arkal ¾” Filter for Chemical Use

Catalog No. 1070 1_ _ _

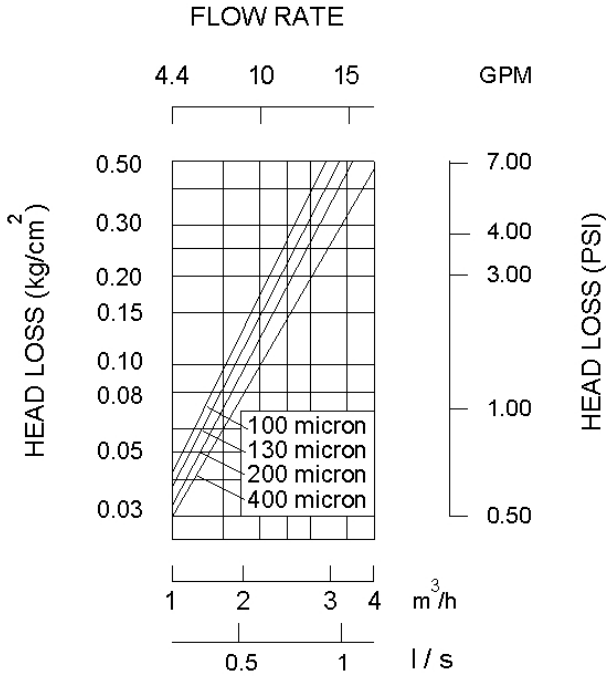




Filtration Grades

Blue	(400 micron / 40 mesh)
Yellow	(200 micron / 80 mesh)
Red	(130 micron / 120 mesh)
Black	(100 micron / 140 mesh)

Head Loss Chart



Technical Data

Inlet/Outlet diameter	¾” BSPT (male)	¾” BSPT (male)
	20 mm - nominal diameter	¾”
Maximum pressure	10 bar	145 psi
Maximum flow rate	4 m^3/h (1.1 l/sec)	18 gpm
Total filtration area	160 cm^2	24 $^{13}/_{16}$ in^2
Total filtration volume	95 cm^3	5 $^{13}/_{16}$ in^3
Filter length L	144 mm	5 11/16”
Filter width W	74 mm	2 29/32”
Distance between connections A	150 mm	5 29/32”
Weight	0.37 Kg	0.8 lbs
Maximum temperature	50º C	122° F
pH	2-13	2-13

AK ¾” CHEMICAL 9605 710701EN 11/07

Installation

1. Use Teflon tape on filter threads.
2. Ensure correct inlet/outlet direction.
3. When connecting filter to pipe - do not over tighten.

Dismantling

1. Make certain that no pressure remains in pipeline.
2. Unscrew cover at bottom of filter.
3. Pull out entire filter element.
4. Move tightening ring to end of spine and flush discs with pressurized water.

Assembly

1. Verify that spring is in place inside the filter cover.
2. Assemble in reverse order.
3. Tighten filter cover securely. Do not over tighten.

Winterization

Drain all the water from filter to avoid cracking due to freezing.

Part List

No.	Cat. No.	Description	Materials
1	2500 0070	Filter body	PBT
2	5001 5436	Cover o-ring	VITON
3	2507 0070	Spine ring	P.P.
4	2507 0071	Spine tightening ring	R.P.P.
5	2502 0070	Filter spine	P.P.
6	2007 1_ _ _	Disc set	P.P.
7	5044 0008L	Filer tightening spring	S.S. Electro polish
8	2501 0070	Filter cover	PBT
9	2107 1_ _ _	Filter element	

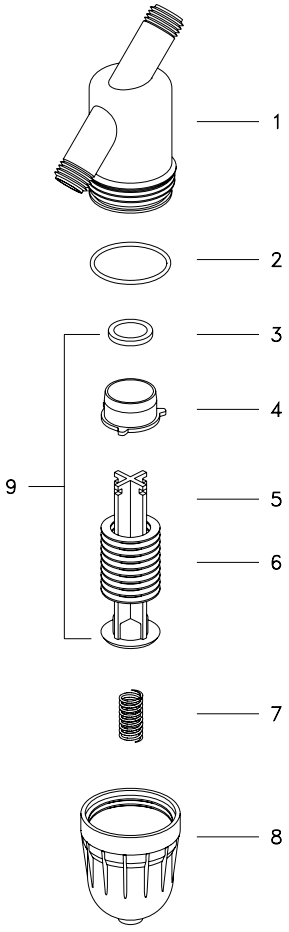
Materials:

PBT - Polyester

S.S. - Stainless steel

P.P. - Polypropylene

R.P.P. - Reinforced Polypropylene

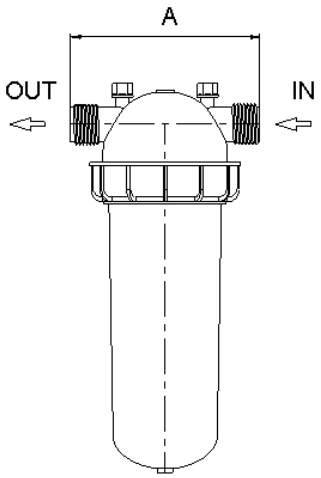


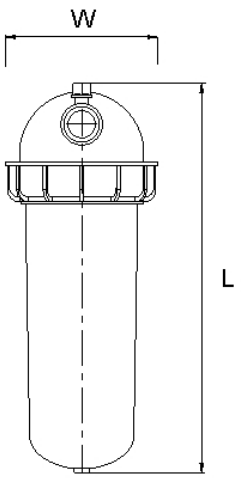
AK ¾" CHEMICAL 9605 710701EN 11/07

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Arkal 1” Super Filter for Chemical Use

Catalog No. 1116 0_ _ _

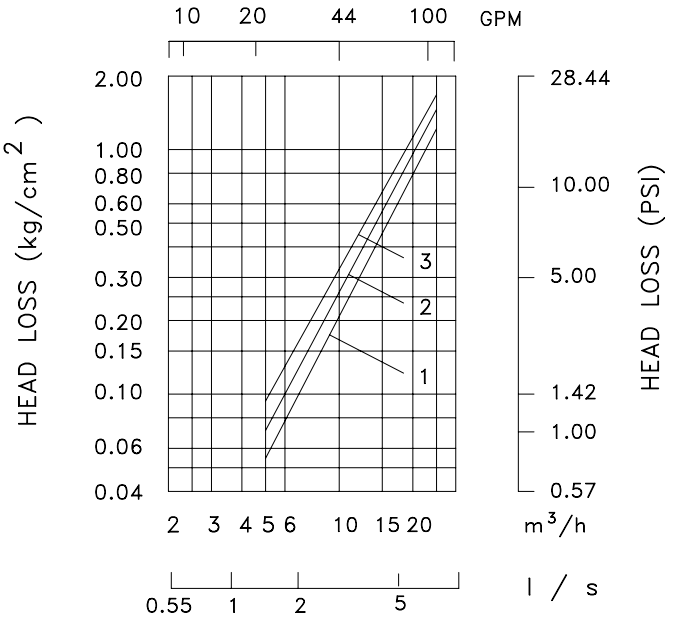




Filtration Grades

Blue	(400 micron / 40 mesh)
Yellow	(200 micron / 80 mesh)
Red	(130 micron / 120 mesh)
Black	(100 micron /140 mesh)
Green	(55 micron)

Head Loss Chart



Technical Data

Inlet/outlet diameter	1” BSPT (male)	1” NPT (male)
	25.0 mm - nominal diameter	1"
Maximum pressure	6 bar	87 psi
Maximum flow rate	8 m^3/h (1.7 l/sec)	35 gpm
General filtration area	500 cm^2	77.5 in^2
Filtration volume	600 cm^3	37 in^3
Filter length L	340 mm	13 13/32”
Filter width W	130 mm	5 3/32”
Distance between end connections A	158 mm	6 7/32“
Weight	1.420 kg	3.13 lbs.
Maximum temperature	50° C	122° F
pH	2-13	2-13

AK 1”SUPER CHEMICAL 9605 71116EN 11/07

Installation

1. Filter may be installed either vertically or horizontally.
2. Use Teflon tape on filter end connections.
3. Never use spanners for tightening the filter cover.

Maintenance

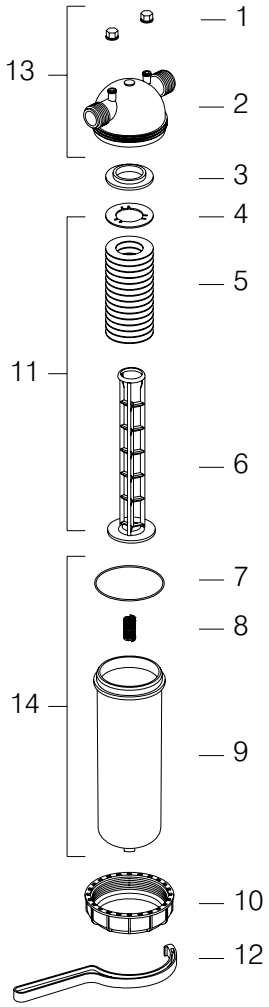
If the filter discs are covered with lime deposits then remove the element and treat with Chloric acid.

Dismantling

1. Turn off the water.
2. Make sure that the pressure is released from the filter.
3. Unscrew the cover from the filter body.
4. Pull out the filter element.
5. Move the sealing ring to the end of the spine.
6. Flush the discs with the water jet.

Assembly

1. Verify that the tightening spring is placed at the bottom of the filter cover.
2. Assemble in reverse order.
3. Tighten the cover by turning the fixing nut clockwise and don't over tighten.



Part List

No.	Catalog No.	Description	Materials
1	2511 0100	¼" Cap	R.P.P.
2	2500 6100	Filter body (BSP)	R.P.P.
3	2507 0100	Filter adaptor ring	R.P.P.
4	2507 0102	Stop ring for element	BPT
5	2012 1_ _ _	Disc set	P.P.
6	2502 0111	Spine	R.P.P.
7	5001 9004	O-ring 90x4	VITON
8	5044 0011L	Filter spring	S.S. Electro polish
9	2501 6111	Filter cover	R.P.P.
10	2506 6100	Fixing nut	R.P.P.
11	2112 1_ _ _	Filter element	
12	2530 0115	1" filter wrench	R.P.A.
13	2208 6001	Filter body complex (BSP)	
14	2202 6011	Filter cover complex	

Materials

R.P.P. - Reinforced Polypropylene
R.P.A. - Reinforced Polyamide
S.S. - Stainless Steel
P.P. - Polypropylene

AK 1"SUPER CHEMICAL 9605 71116EN 11/07

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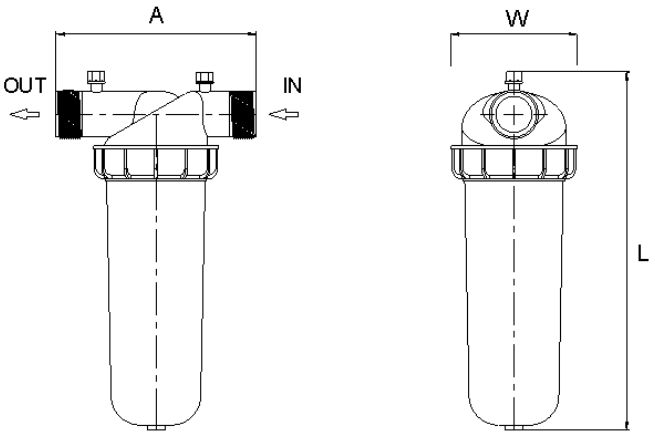
Email: filters@arkal.com Web: www.arkal-filters.com

Arkal 1½” Super Filter for Chemical Use

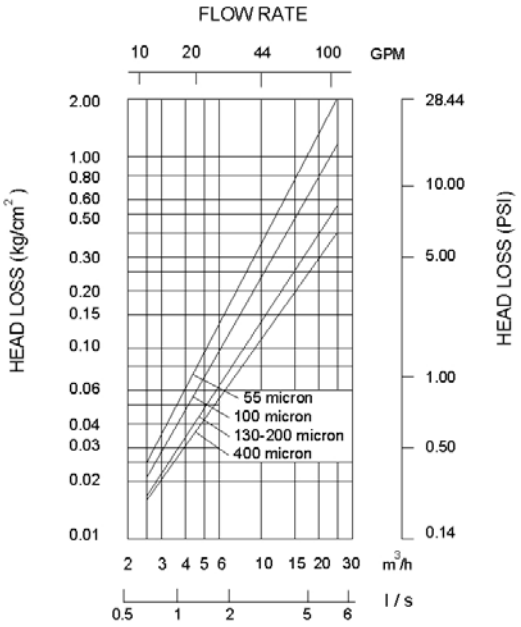
Catalog No. 1146 0_ _ _



Filtration Grades

Blue (400 micron / 40 mesh)
Yellow (200 micron / 80 mesh)
Red (130 micron / 120 mesh)
Black (100 micron / 140 mesh)
Green (55 micron)

Head Loss Chart



Technical Data

Inlet/outlet diameter	1½” BSPT (male)	1½” NPT (male)
	40 mm – nominal diameter	1½”
Maximum pressure	6 bar	87 psi
Maximum flow rate	12 m^3/h (2.22 l/sec)	52.8 gpm
General filtration area	500 cm^2	77.5 in^2
Filtration volume	600 cm^3	37 in^3
Filter length L	350 mm	13 25/32”
Filter width W	130 mm	5 3/32”
Distance between end connections A	200 mm	7 7/8”
Weight	1.51 kg	3.32 lbs.
Maximum temperature	50° C	122° F
pH	2-13	2-13

AK 1 ½”SUPER CHEMICAL 9605 71146EN 11/07

Installation

1. Filter may be installed either vertically or horizontally.
2. Use Teflon tape on filter end connections.
3. Never use spanners for tightening the filter cover.

Maintenance

If the filter discs are covered with lime deposits then remove the element and treat with chloric acid.

Dismantling

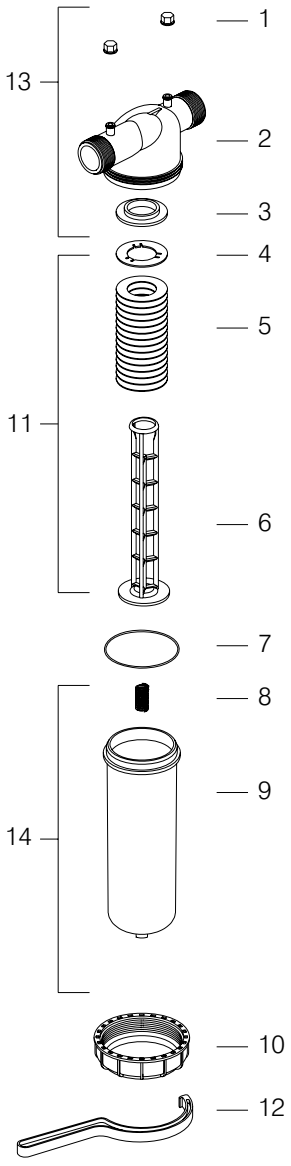
1. Turn off the water.
2. Make sure that the pressure is released from the filter.
3. Unscrew the cover from the filter body.
4. Pull out the filter element.
5. Move the sealing ring to the end of the spine.
6. Flush the discs with the water jet.

Assembly

1. Verify that the tightening spring is placed at the bottom of the filter cover.
2. Assemble in reverse order.
3. Tighten the cover by turning the fixing nut clockwise and don't over tighten.

Part List

No.	Catalog No.	Description	Materials
1	2511 0100	¼" Cap	R.P.P.
2	2500 6150	Filter body (BSP)	R.P.P.
3	2507 0100	Filter adaptor ring	R.P.P.
4	2507 0102	Stop ring for element	BPT
5	2012 1_ _ _	Disc set	P.P.
6	2502 0111	Spine	R.P.P.
7	5001 9004	O-ring 90x4	VITON
8	5044 0011L	Filter spring	S.S. Electro polish
9	2501 6111	Filter cover	R.P.P.
10	2506 6100	Fixing nut	R.P.P.
11	2112 1_ _ _	Filter element	
12	2530 0115	1" filter wrench	R.P.A.
13	2208 6003	Filter body complex (BSP)	
14	2202 6011	Filter cover complex	



Materials

R.P.P. - Reinforced Polypropylene
R.P.A. - Reinforced Polyamide
S.S. - Stainless Steel
P.P. - Polypropylene

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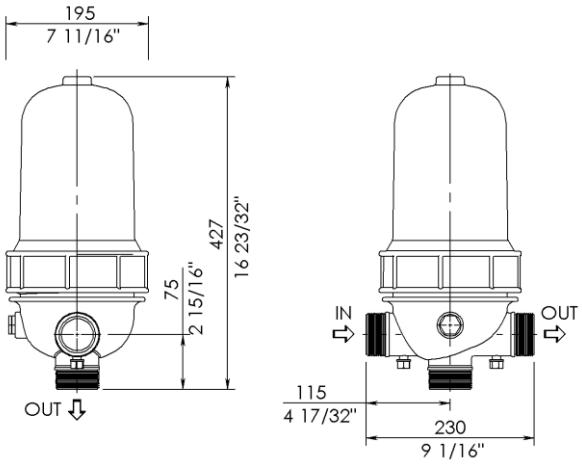
Arkal 2” Leader Filter for Chemical Use

Catalog No. 1224 1_ _ _

Angle/Line Filter



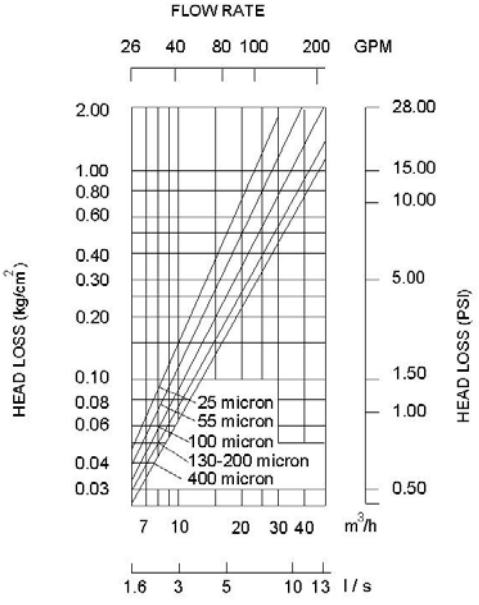
Technical Data

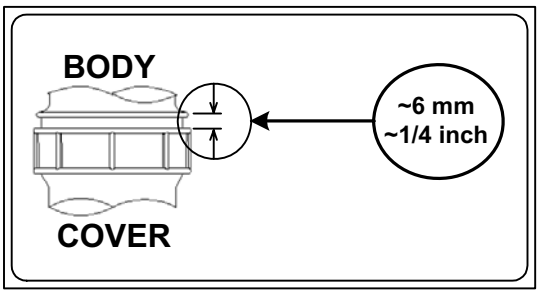
Inlet/Outlet diameter	2” Thread (male)	2” Thread (male)
Max. Pressure	10 bar	145 psi
Max. Flow rate 400-100 micron	≤25 m^3/h (6.9 l/sec)	≤110 gpm
55 micron	≤16 m^3/h (4.4 l/sec)	≤70 gpm
20 micron	≤8 m^3/h (2.2 l/sec)	≤35 gpm
Total filtration area	950 cm^2	147 in^2
Total filtration volume	1225 cm^3	75.7 in^3
Filter length L	425 mm	16 $^{23}/_{32}$”
Filter width W	230 mm	9 $^{1}/_{16}$”
Distance between connections	A. 115 mm B. 75 mm	A. 4 $^{17}/_{32}$” B. 21 $^{5}/_{16}$”
Weight	3.2 Kg	7 lbs
Maximum temperature	50º C	122º F
pH	2-13	2-13

Filtration Grades

Blue	(400 micron / 40 mesh)
Yellow	(200 micron / 80 mesh)
Red	(130 micron / 120 mesh)
Black	(100 micron / 140 mesh)
Green	(55 micron)
Grey	(20 micron)

Headloss Chart





Dismantling

1. Make sure that the water pressure is turned off!
2. Drain the filter through the drainage ball valve.
3. Open the filter cover, and remove it from the filter body.
   * *Please Note*: Tools are not required! (Manual use only).
4. The detachable spine is loose in the cover.
5. Flush the filter element.
6. If the filter discs require acid treatment you may dip the complete filter element in acid.

Assembly (in reverse order)

1. Position the filter element into the filter cover.
2. To verify that the element is in position, turn the cover while gently pressing on top, until it is in place.
3. Tighten the filter cover on the body and close.
   * *Please Note*: Tools are not required! (Manual use only).

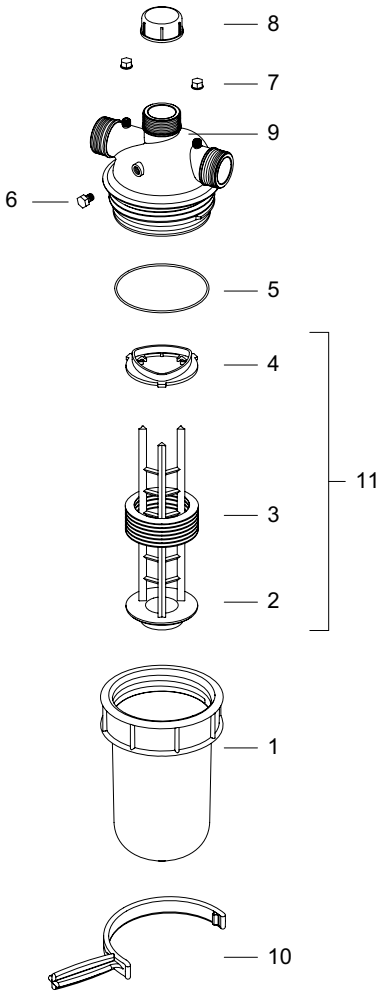
Attention! To verify proper closing, (without tools) please follow the instructions below.

Part List

No.	Cat. No.	Description	Materials
1	2501 0230	Cover	P.P.
2	2502 0230	Spine	P.P.
3	2021 1_ _ _	Disc sets	P.P.
4	2507 0208	Stop ring element	P.P.
5	5001 1457	O-ring 144.3x5.7	VITON
6	5019 0112	½" Plag	P.P.
7	2511 0100	¼" Cap	R.P.P.
8	5022 0200	2" Cap	P.P.
9	2500 0234	Filter body	P.P.
10	2530 0117	Spine wrench	R.P.A.
11	2125 1_ _ _	Single filter element	P.P.

Materials

R.P.P. - Reinforced Polypropylene
R.P.A. - Reinforced Polyamide
P.P. - Polypropylene



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3/4" Filter

M a n u a l D i s c F i l t e r

Features

- Durable filter element
- Corrosion free
- All Plastic
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	mm	20	in	3/4
Filtration surface area	cm^2	160	in^2	24.8
Filtration volume	cm^3	95	in^3	5.8
Pressure rating	bar	10	psi	145
Max. temp.	^{0}C	60	^{0}F	140

Maximum Filtration Flow Rate / Water Quality

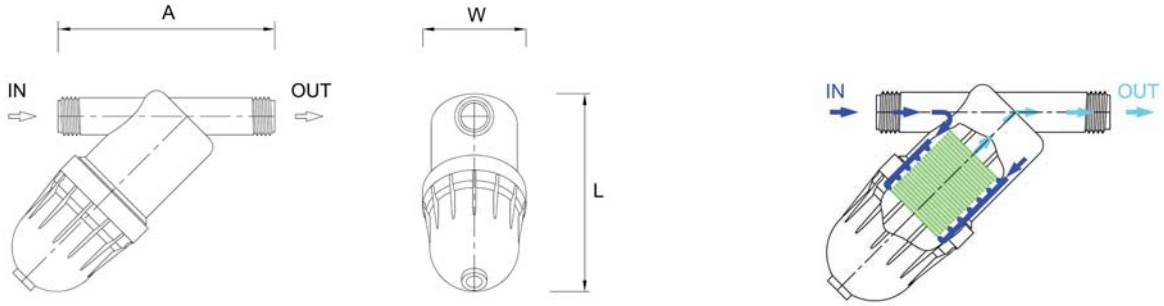
Filtration Grade	Water Quality	m^3/h	gpm
400-130 µ	Good	4	17.6
	Average	3	13.5

3/4" Filter

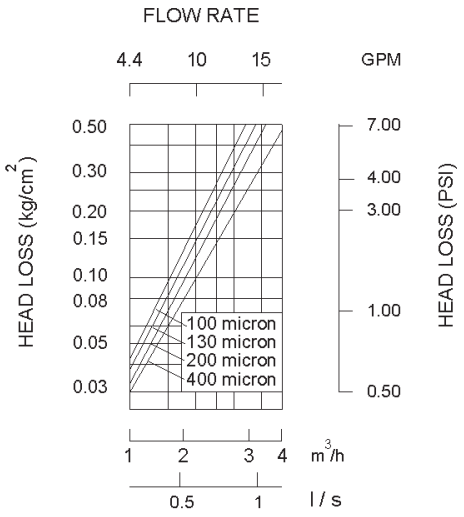
Manual Disc Filter

Dimensions and Weights

D Inlet\Outlet diameter	**mm**	20	**inch**	3/4
L Length	**mm**	144	**inch**	5 11/16
W Width	**mm**	74	**inch**	2 29/32
A	**mm**	150	**inch**	5 29/32
Shipping weight (approx.)	**kg**	0.37	**lbs**	0.8



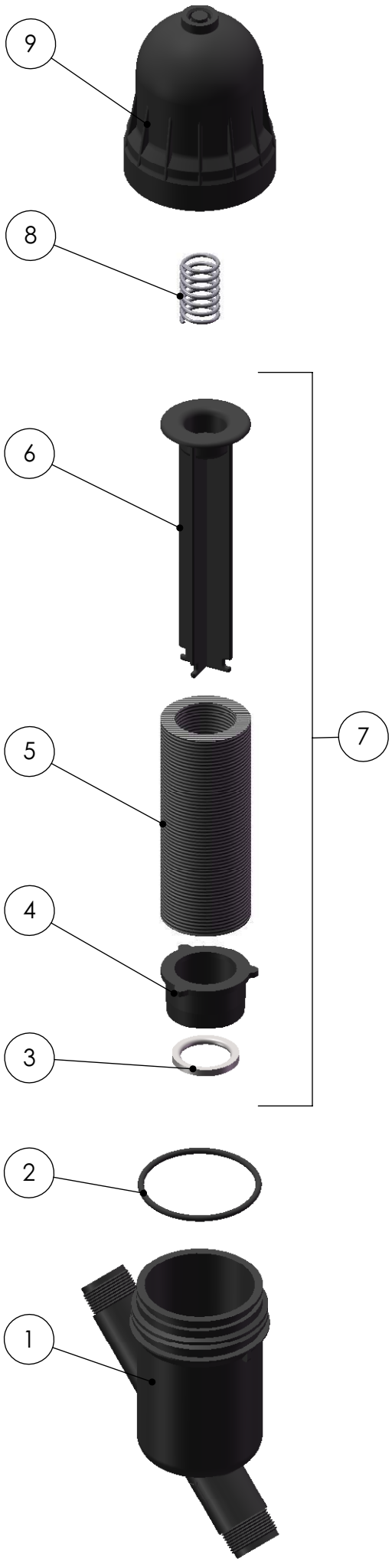
Head Loss Chart, Clean State



3/4" Filter is available in:
Polyester.

ARKAL 3/4" FILTER

Cat. no. 1070 0___



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY	2500 0070	PBT
2	COVER "O" RING	5002 5436	N.R.
3	SPINE RING	2507 0070	P.P.
4	SPINE TIGHTENING RING	2507 0071	P.P.
5	DISC SET	2007 1___	P.P.
6	FILTER SPINE	2502 0070	P.P.
7	FILTER ELEMENT	2107 1___	
8	FILTER TIGHTENING SPRING	5044 0008	S.S.
9	FILTER COVER	2501 0070	PBT

MATERIALS:

1) P.P. - POLYPROPYLENE

2) PBT - POLYESTER

3) S.S. - STAINLESS STEEL

4) N.R. - NITRILE RUBBER

3/4" Filtap

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- Durable filter element
- All plastic-corrosion free
- Built in, integral tap

Technical Data

	METRIC		US	
Connection diameter	mm	20	in	3/4
Filtration surface area	cm^2	160	in^2	24 13/16
Filtration volume	cm^3	95	in^3	5 13/16
Pressure rating	bar	10	psi	145
Max. temp.	^{0}C	60	^{0}F	140

Maximum Filtration Flow Rate / Water Quality

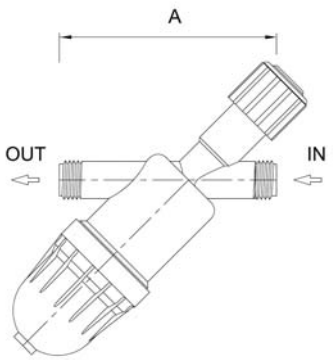
Filtration Grade	Water Quality	m^3/h	gpm
400-130 µ	Good	4	18
	Average	3	13.5

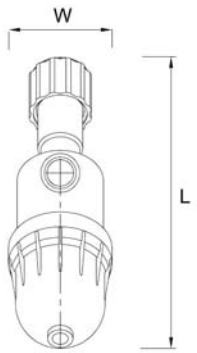
3/4" Filtap

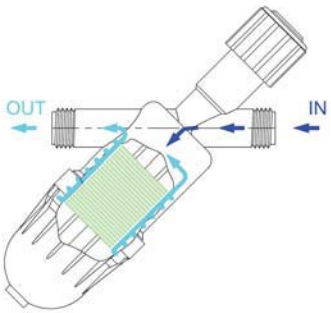
Manual Disc Filter

Dimensions and Weights

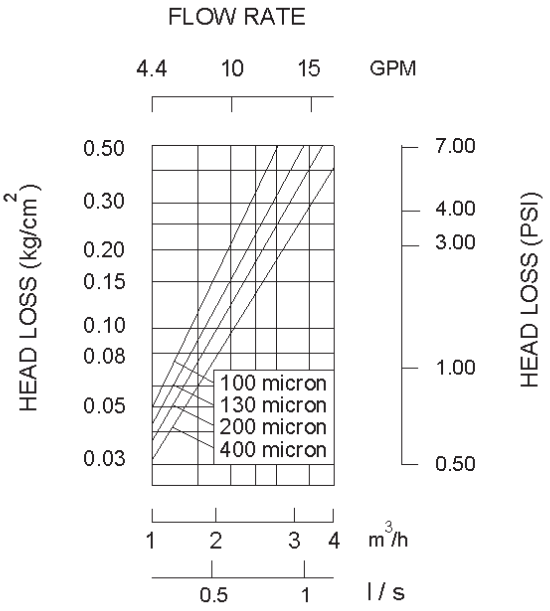
D Inlet\Outlet diameter	**mm**	20	**inch**	3/4
L Length	**mm**	210	**inch**	8 1/4
W Width	**mm**	74	**inch**	2 29/32
A	**mm**	155	**inch**	6 3/32
Shipping weight (approx.)	**kg**	0.420	**lbs**	0.9







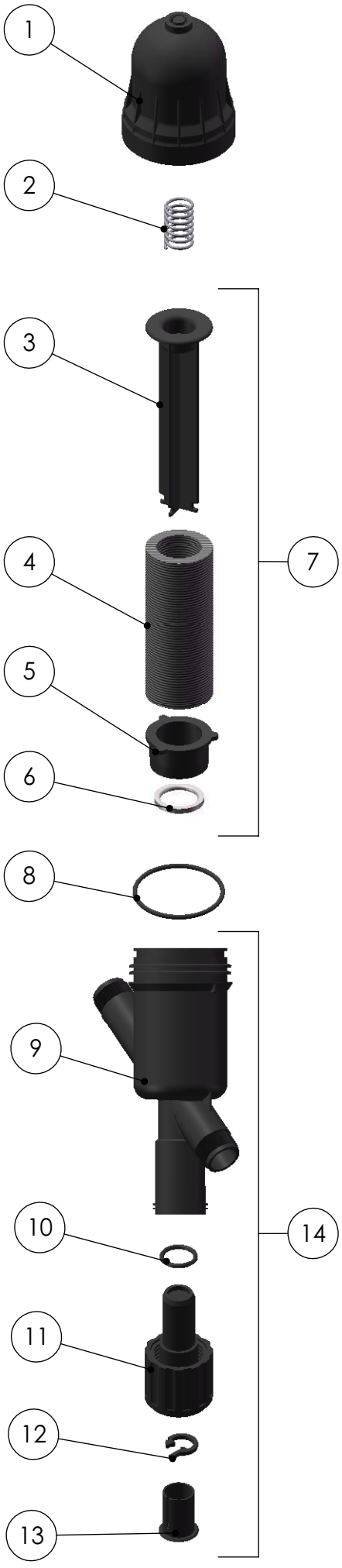
Head Loss Chart, Clean State



3/4" Filtap is available in:
Polyester.

ARKAL 3/4" FILTAP

Cat. no. 1072 0___



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0070	PBT
2	FILTER TIGHTENING SPRING	5044 0008	S.S.
3	FILTER SPINE	2502 0070	P.P.
4	DISC SET	2007 1___	P.P.
5	SPINE TIGHTENING RING	2507 0071	P.P.
6	SPINE RING	2507 0070	P.P.
7	FILTER ELEMENT	2107 1___	
8	COVER "O" RING	5002 5436	NITRILE
9	FILTER BODY	2500 0072	PBT
10	TAP "O" RING	5002 1903	NITRILE
11	VALVE STEM	2530 0070	P.P.
12	FILTAP RETAINING RING	2507 0072	ACETAL
13	VALVE COVER	2511 0140	P.C.
14	FILTER BODY COMPLETE	2207 0002	

MATERIALS:

1) P.P. - POLYPROPYLENE

2) P.C. - POLICARBONAT

3) S.S. - STAINLESS STEEL

4) PBT - POLYESTER

1" Short

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	**mm**	25	**in**	1
Filtration surface area	**cm²**	308	**in²**	48
Filtration volume	**cm³**	370	**in³**	22
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

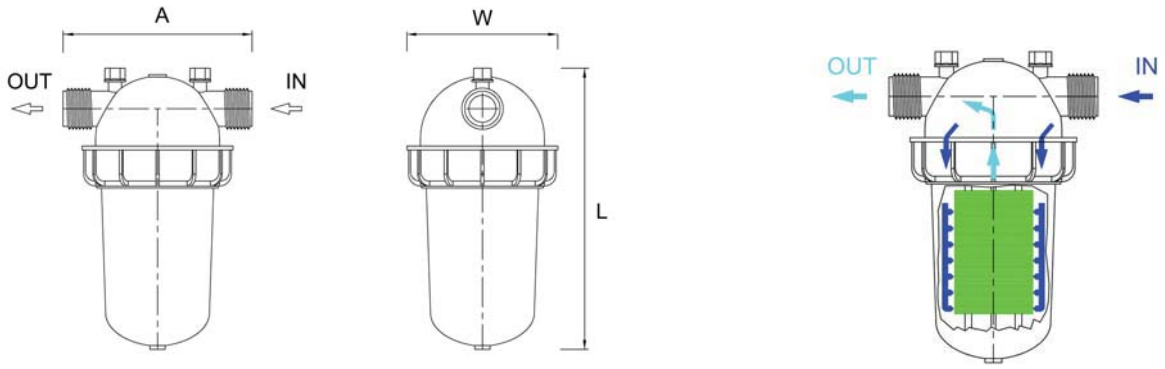
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	6	26.5
	Average	4.5	20
55 µ	Good	4.2	18.5
	Average	3.15	14

1'' Short

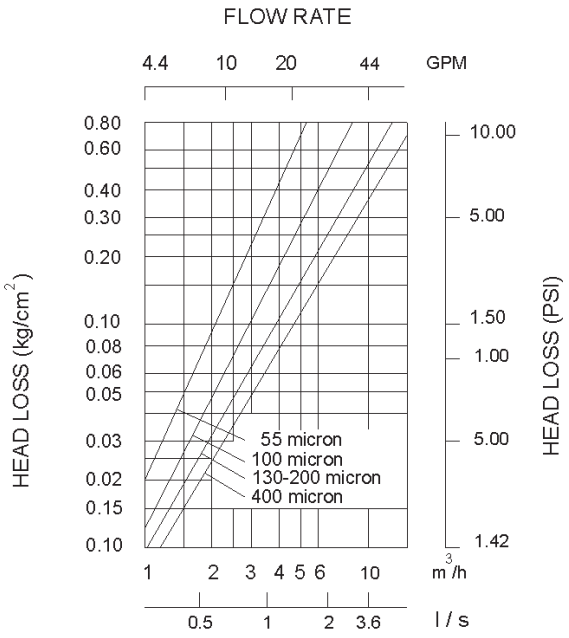
Manual Disc Filter

Dimensions and Weights

D Inlet\Outlet diameter	**mm**	25	**inch**	1
L Length	**mm**	233	**inch**	9 3/16
W Width	**mm**	130	**inch**	5 3/32
A	**mm**	158	**inch**	6 7/32
Shipping weight (approx.)	**kg**	1.1	**lbs**	2.4



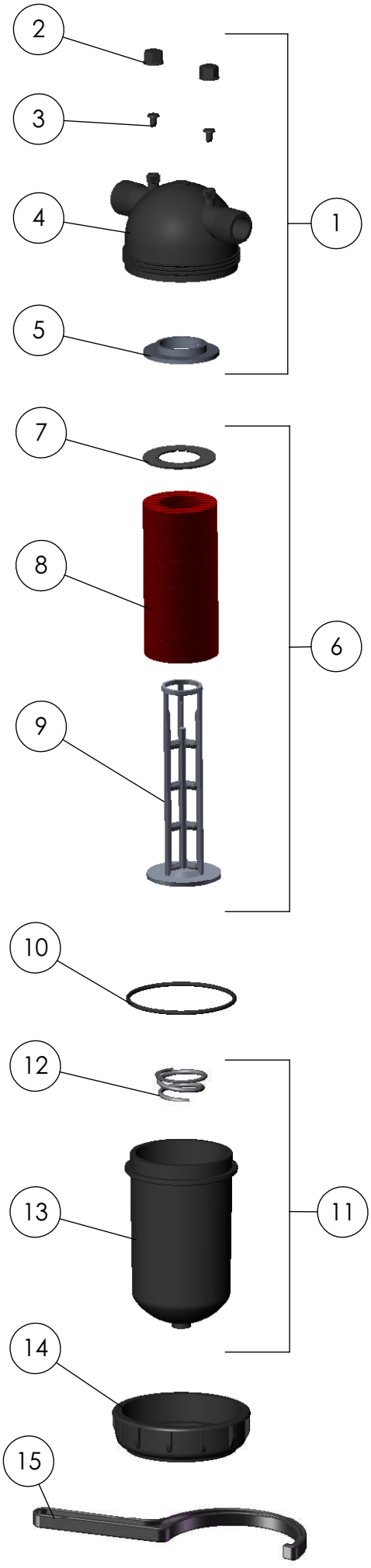
Head Loss Chart, Clean State



1'' Short is available in:
Polyamide or Polypropylene.

ARKAL 1" SHORT FILTER

Cat. no. 1100 0___STANDARD (BSP)
1103 0___STANDARD (NPT)



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0001 2208 0002	
2	GAUGE PORTS NUT	2511 0103	R.P.P.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	FILTER BODY BSP FILTER BODY NPT	2500 0100 2500 0101	R.P.A.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	FILTER ELEMENT	2110 1___	
7	RING RETANING DISC	2507 0102	PBT
8	DISC SET	2010 1___	P.P.
9	SPINE	2502 0100	R.P.P.
10	90*4 "O" RING	5002 9004	N.R.
11	COVER COMPLEX	2202 0010	
12	FILTER SPRING	5044 0010	S.S.
13	1" FILTER COVER	2501 0100	R.P.A.
14	FIXING NUT	2506 0100	R.P.A.
15	1" FILTER WRENCH	2530 0115	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

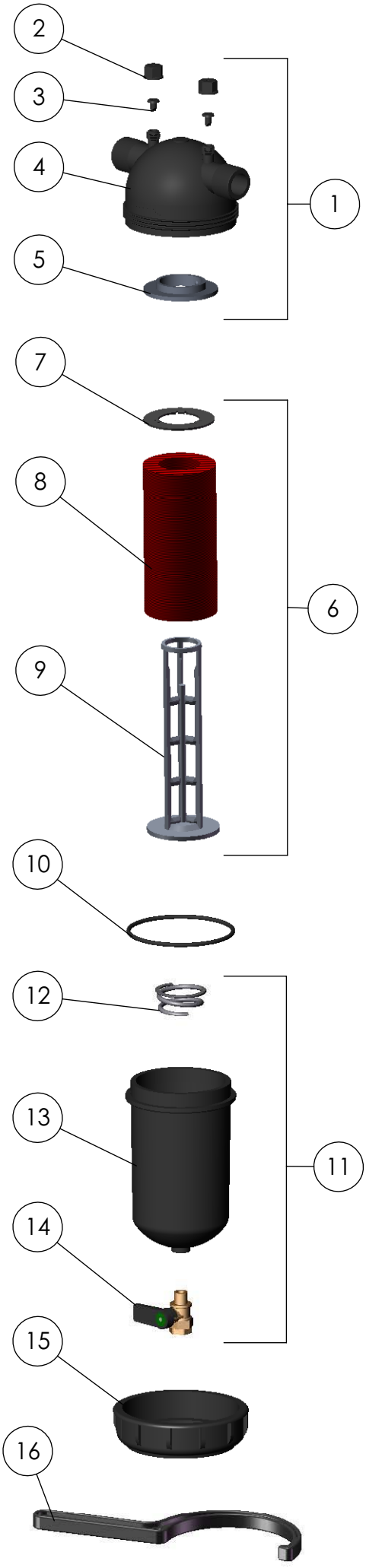
3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

ARKAL 1" SHORT FILTER

Cat. no. 1100 1___WITH TAP (BSP)
1103 1___WITH TAP (NPT)



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0001 2208 0002	
2	GAUGE PORTS NUT	2511 0103	R.P.P.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	FILTER BODY BSP FILTER BODY NPT	2500 0100 2500 0101	R.P.A.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	FILTER ELEMENT	2110 1___	
7	RING RETANING DISC	2507 0102	PBT
8	DISC SET	2010 1___	P.P.
9	SPINE	2502 0100	R.P.P.
10	90*4 "O" RING	5002 9004	N.R.
11	COVER COMPLEX	2202 0013	
12	FILTER SPRING	5044 0010	S.S.
13	1" FILTER COVER	2501 0100	R.P.A.
14	1/4" TAP	5054 0008	BRASS
15	FIXING NUT	2506 0100	R.P.A.
16	1" FILTER WRENCH	2530 0115	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

1" Super

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	**mm**	25	**in**	1
Filtration surface area	**cm²**	501.2	**in²**	77.78
Filtration volume	**cm³**	592	**in³**	36.1
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

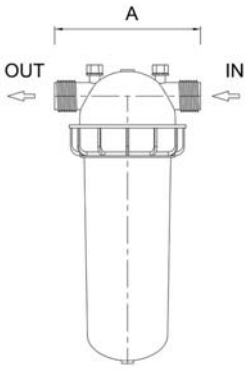
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	8	35
	Average	6	26.5
55 µ	Good	5.6	25
	Average	4.2	18.5

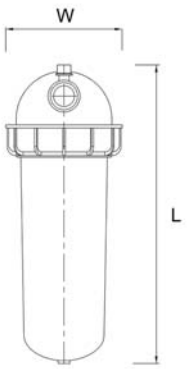
1" Super

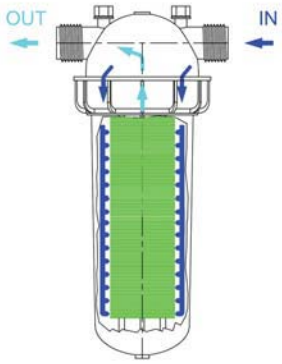
Manual Disc Filter

Dimensions and Weights

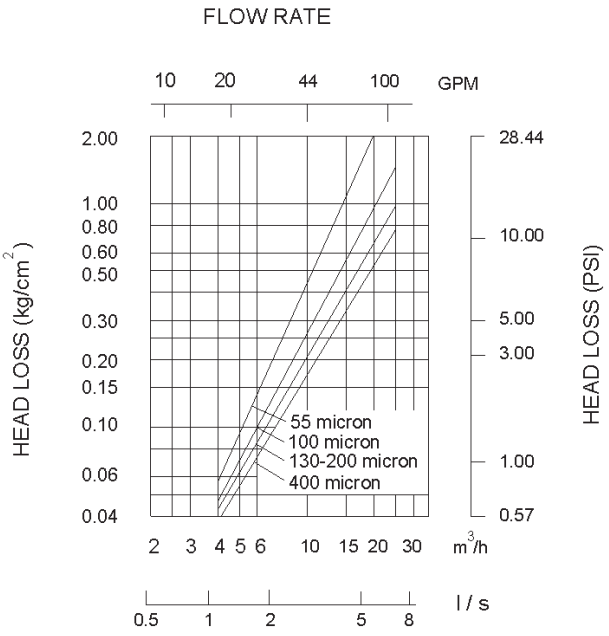
D Inlet\Outlet diameter	**mm**	25	**inch**	1
L Length	**mm**	340	**inch**	13 13/32
W Width	**mm**	130	**inch**	5 3/32
A	**mm**	158	**inch**	6 7/32
Shipping weight (approx.)	**kg**	1.42	**lbs**	3.13







Head Loss Chart, Clean State



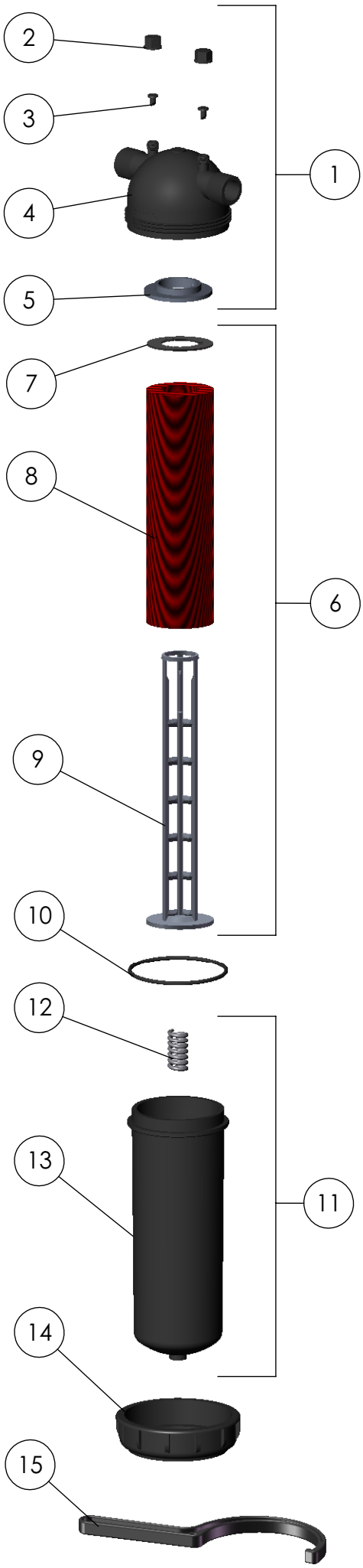
1" Super is available in:
Polyamide or Polypropylene.

ARKAL 1" SUPER FILTER

Cat. no. 1102 0___STANDART (BSP)
1104 0___STANDART (NPT)

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0001 2208 0002	
2	GAUGE PORTS NUT	2511 0103	R.P.P.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	FILTER BODY BSP FILTER BODY NPT	2500 0100 2500 0101	R.P.A.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	FILTER ELEMENT	2112 1___	
7	RING RETANING DISC	2507 0102	PBT
8	DISC SET	2012 1___	P.P.
9	SPINE	2502 0111	R.P.P.
10	90*4 "O" RING	5002 9004	N.R.
11	COVER COMPLEX	2202 0011	
12	FILTER SPRING	5044 0011	S.S.
13	1" SUPER COVER	2501 0111	R.P.A.
14	FIXING NUT	2506 0100	R.P.A.
15	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

ARKAL 1" SUPER FILTER

Cat. no. 1102 1___WITH TAP (BSP)

1104 1___WITH TAP (NPT)

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0001 2208 0002	
2	GAUGE PORTS NUT	2511 0103	R.P.P.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	FILTER BODY BSP FILTER BODY NPT	2500 0100 2500 0101	R.P.A.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	FILTER ELEMENT	2112 1___	
7	RING RETANING DISC	2507 0102	PBT
8	DISC SET	2012 1___	P.P.
9	SPINE	2502 0111	R.P.P.
10	90*4 "O" RING	5002 9004	N.R.
11	COVER COMPLEX	2202 0012	
12	FILTER SPRING	5044 0011	S.S.
13	1" SUPER COVER	2501 0111	R.P.A.
14	1/4" TAP	5054 0008	BRASS
15	FIXING NUT	2506 0100	R.P.A.
16	1" FILTER WRENCH	2530 0115	R.P.A.

MATERIALS:

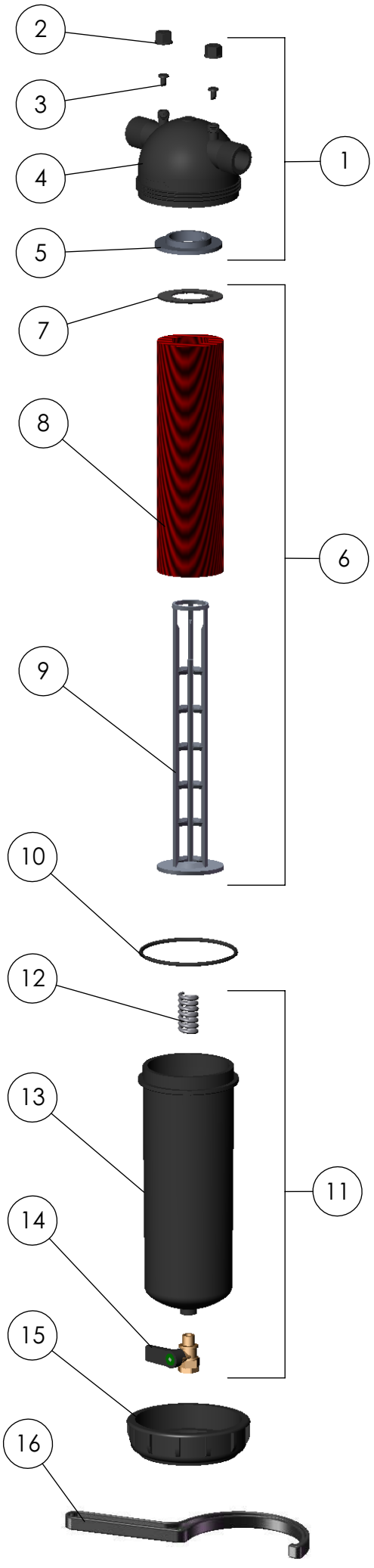
1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER



1 1/2" Short

Manual Disc Filter

Features

- Precise disc filtration
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	mm	40	in	1 1/2"
Filtration surface area	cm^2	308	in^2	48
Filtration volume	cm^3	370	in^3	23
Pressure rating	bar	10	psi	145
Max. temp.	^0C	70	^0F	158

Maximum Filtration Flow Rate / Water Quality

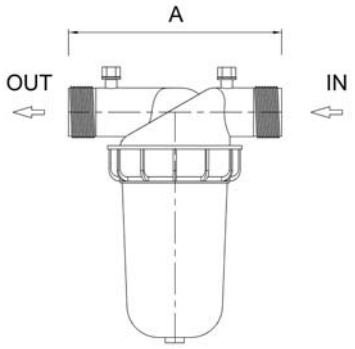
Filtration Grade	Water Quality	m^3/h	gpm
400-130 µ	Good	8	35
	Average	6	26.5
55 µ	Good	5.6	25
	Average	4.2	18.5

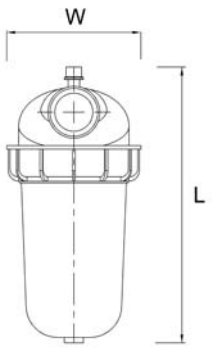
1 ½" Short

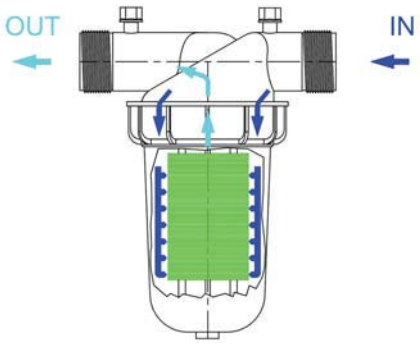
Manual Disc Filter

Dimensions and Weights

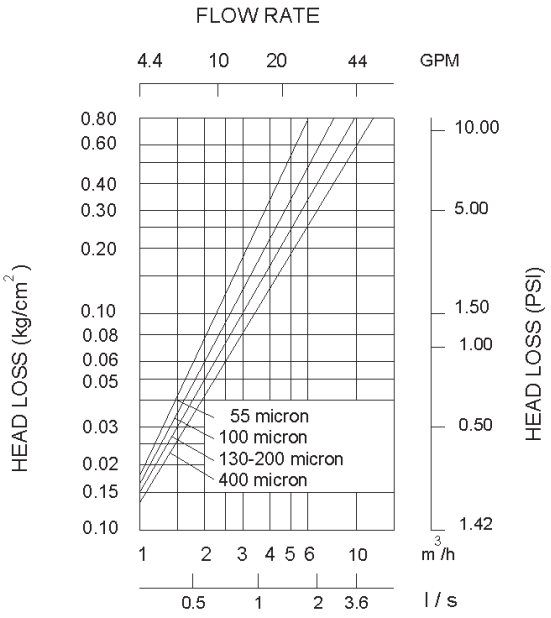
D Inlet\Outlet diameter	**mm**	40	**inch**	1 1/2
L Length	**mm**	250	**inch**	9 27/32
W Width	**mm**	130	**inch**	5 3/32
A	**mm**	200	**inch**	7 7/8
Shipping weight (approx.)	**kg**	1.3	**lbs**	2.9







Head Loss Chart, Clean State



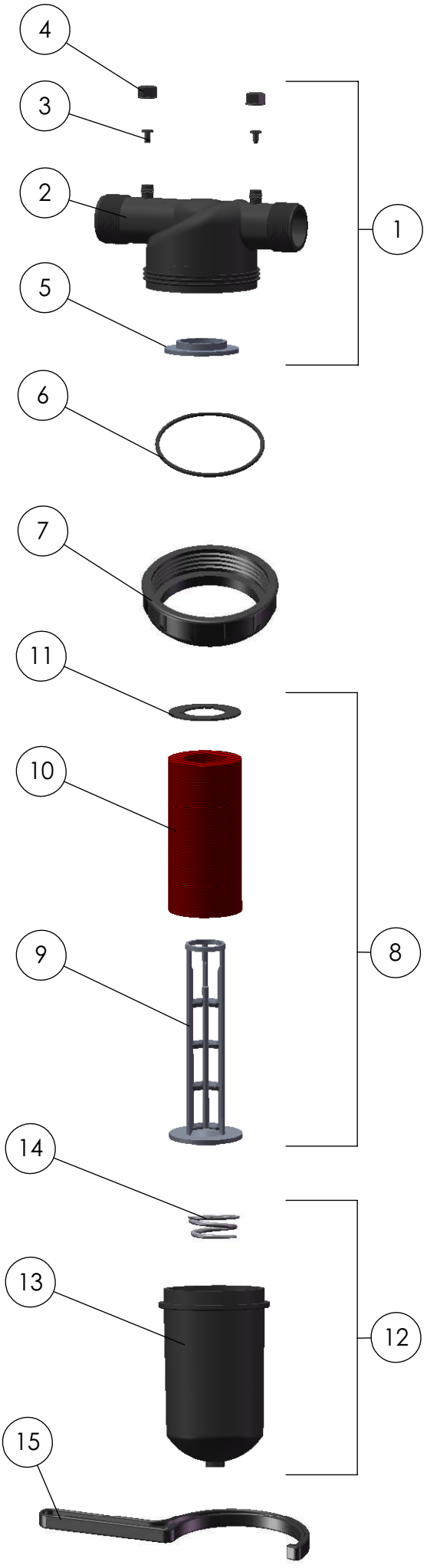
1½" Short is available in:
Polyamide or Polypropylene.

ARKAL 1 1/2" SHORT FILTER

Cat. no. 1150 0___
1153 0___

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0003 2208 0004	
2	FILTER BODY BSP FILTER BODY NPT	2500 0150 2500 0151	R.P.A. R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2110 1___	
9	SPINE	2502 0100	R.P.P.
10	DISC SET	2010 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0010	
13	1" SHORT COVER	2501 0100	R.P.A.
14	FILTER SPRING	5044 0010	S.S.
15	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

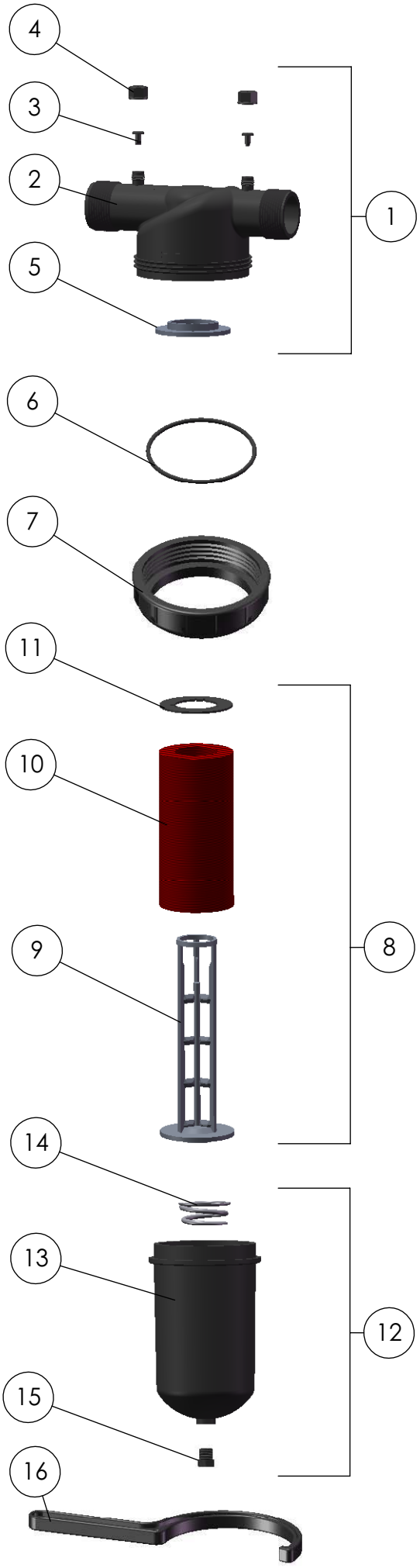
ARKAL 1 1/2" SHORT FILTER

Cat. no. 1150 2___ WITH CAP

1153 2___ WITH CAP

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP	2208 0003	
	FILTER BODY COMPLEX NPT	2208 0004	
2	FILTER BODY BSP	2500 0150	R.P.A.
	FILTER BODY NPT	2500 0151	R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2110 1___	
9	SPINE	2502 0100	R.P.P.
10	DISC SET	2010 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0016	
13	1" SHORT COVER	2501 0100	R.P.A.
14	FILTER SPRING	5044 0010	S.S.
15	1/4" TEFEN PLUG	5078 0104	P.E.
16	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

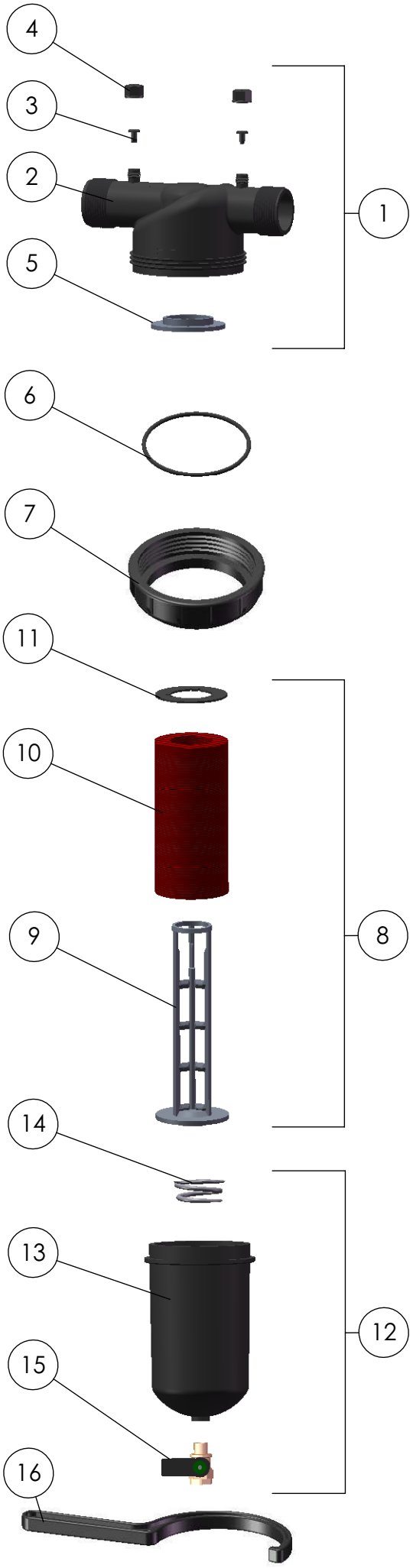
ARKAL 1 1/2" SHORT FILTER

Cat. no. 1150 1___ WITH TAP

1153 1___ WITH TAP

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP	2208 0003	
	FILTER BODY COMPLEX NPT	2208 0004	
2	FILTER BODY BSP	2500 0150	R.P.A.
	FILTER BODY NPT	2500 0151	R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2110 1___	
9	SPINE	2502 0100	R.P.P.
10	DISC SET	2010 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0013	
13	1" SHORT COVER	2501 0100	R.P.A.
14	FILTER SPRING	5044 0010	S.S.
15	1/4" TAP	5054 0008	BRASS
16	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

1 1/2" Super

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	**mm**	40	**in**	1 1/2
Filtration surface area	**cm²**	501.8	**in²**	77.78
Filtration volume	**cm³**	592	**in³**	36 3/32
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

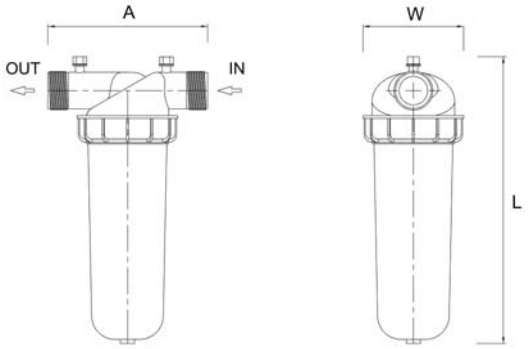
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	12	53
	Average	9	40
55 µ	Good	8.4	37
	Average	6.3	28

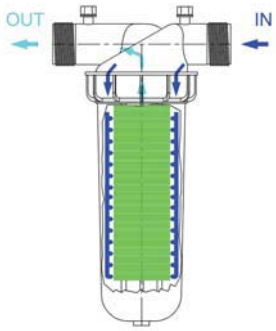
1½" Super

Manual Disc Filter

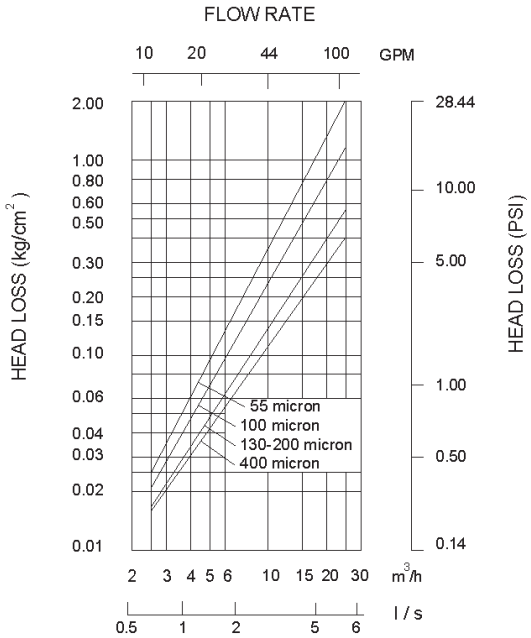
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	40	**inch**	1 1/2
L Length	**mm**	350	**inch**	13 25/32
W Width	**mm**	130	**inch**	5 3/32
A	**mm**	200	**inch**	7 7/8
Shipping weight (approx.)	**kg**	1.51	**lbs**	3.32





Head Loss Chart, Clean State



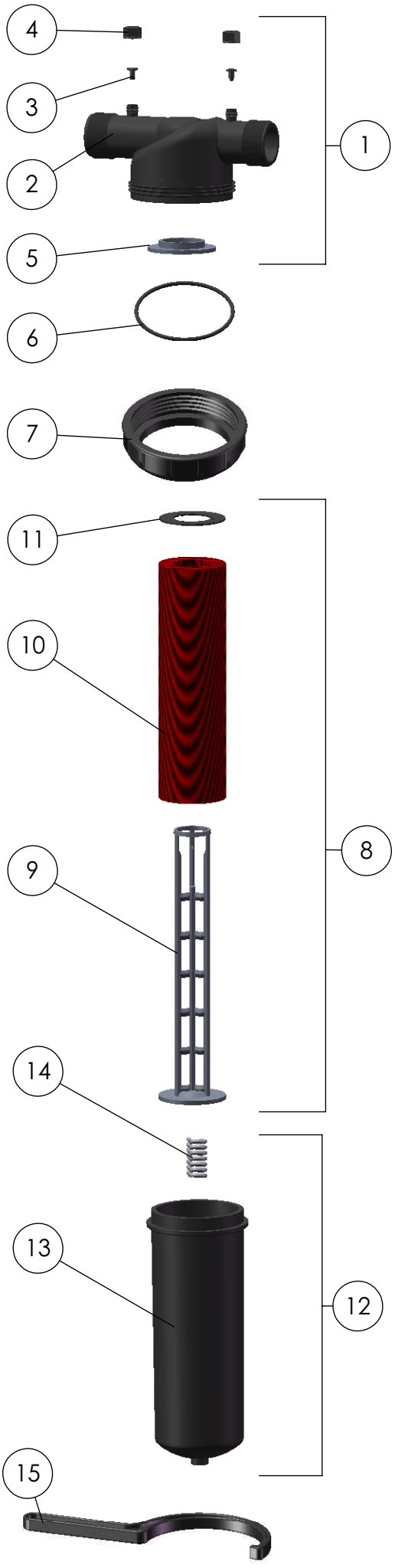
1½" Super is available in:
Polyamide or Polypropylene.

ARKAL 1 1/2" SUPER FILTER

Cat. no. 1152 0___
1154 0___

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2208 0003 2208 0004	
2	FILTER BODY BSP FILTER BODY NPT	2500 0150 2500 0151	R.P.A. R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2112 1___	
9	SPINE	2502 0111	R.P.P.
10	DISC SET	2012 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0011	
13	1" SUPER COVER	2501 0111	R.P.A.
14	FILTER SPRING	5044 0011	S.S.
15	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

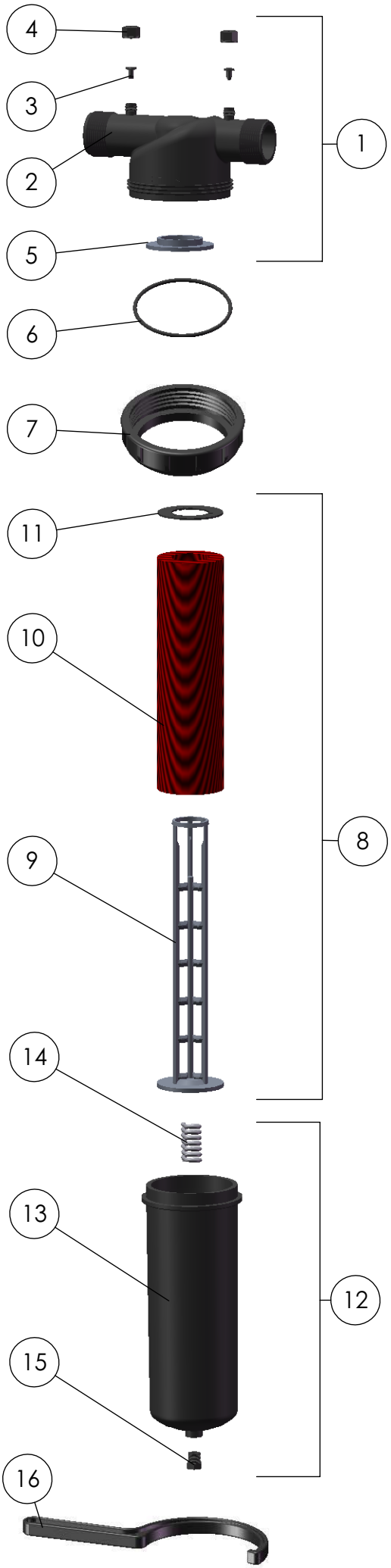
ARKAL 1 1/2" SUPER FILTER

Cat. no. 1152 2___ WITH CAP

1154 2___ WITH CAP

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP	2208 0003	
	FILTER BODY COMPLEX NPT	2208 0004	
2	FILTER BODY BSP	2500 0150	R.P.A.
	FILTER BODY NPT	2500 0151	R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2112 1___	
9	SPINE	2502 0111	R.P.P.
10	DISC SET	2012 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0018	
13	1" SUPER COVER	2501 0111	R.P.A.
14	FILTER SPRING	5044 0011	S.S.
15	1/4" TEFEN PLUG	5078 0104	P.E.
16	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) N.R. - NITRILE RUBBER

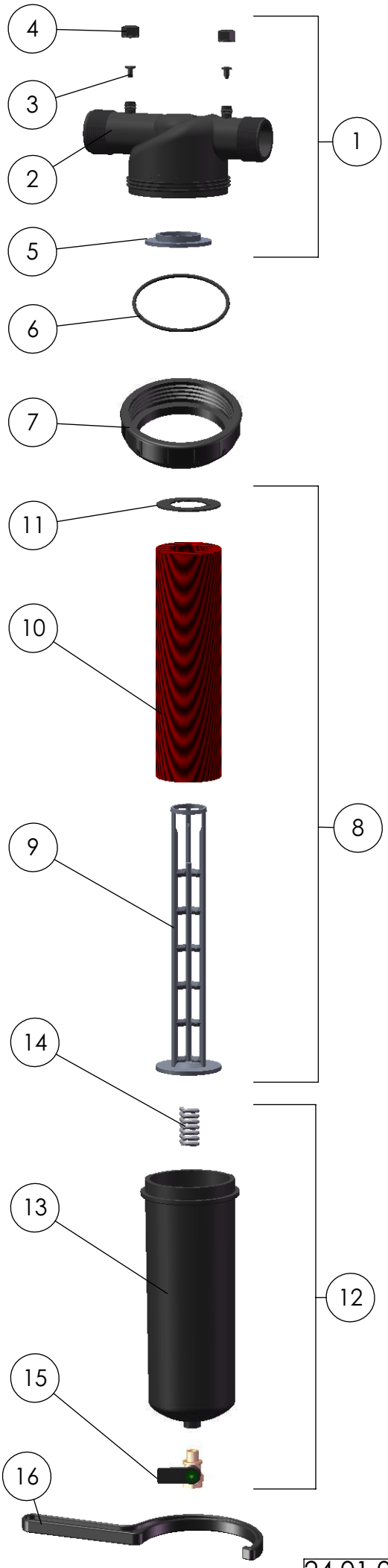
ARKAL 1 1/2" SUPER FILTER

Cat. no. 1152 1___ WITH TAP

1154 1___ WITH TAP

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY COMPLEX BSP	2208 0003	
	FILTER BODY COMPLEX NPT	2208 0004	
2	FILTER BODY BSP	2500 0150	R.P.A.
	FILTER BODY NPT	2500 0151	R.P.A.
3	GAUGE PORTS SEAL	5006 0004	EPDM
4	GAUGE PORTS NUT	2511 0103	R.P.P.
5	FILTER ADAPTER RING	2507 0100	R.P.P.
6	90*4 "O" RING	5002 9004	N.R.
7	FIXING NUT	2506 0100	R.P.A.
8	FILTER ELEMENT	2112 1___	
9	SPINE	2502 0111	R.P.P.
10	DISC SET	2012 1___	P.P.
11	RING RETANING DISC	2507 0102	PBT
12	COVER COMPLEX	2202 0012	
13	1" SUPER COVER	2501 0111	R.P.A.
14	FILTER SPRING	5044 0011	S.S.
15	1/4" TAP	5054 0008	BRASS
16	1" FILTER WRENCH	2530 0115	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

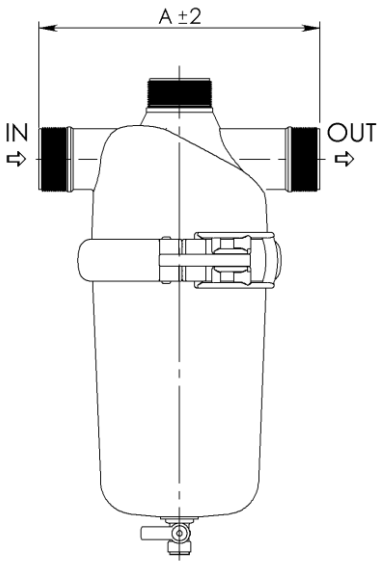
5) N.R. - NITRILE RUBBER

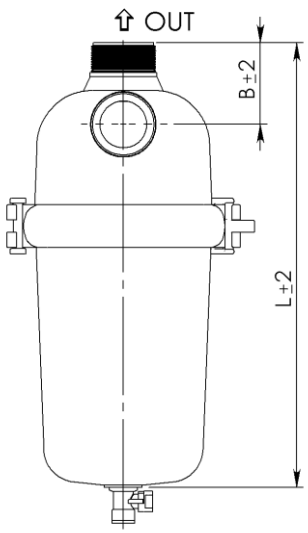
Arkal 2” Dual Lite Filter (detachable spine)

Catalog No. 1205 3_ _ _

Features

- Two outlets options – inline or angle
- Highly resistant to corrosion
- Detachable spine
- Pressure differential disc compression
- Adapts to horizontal or vertical installation
- Available in various filtration grades



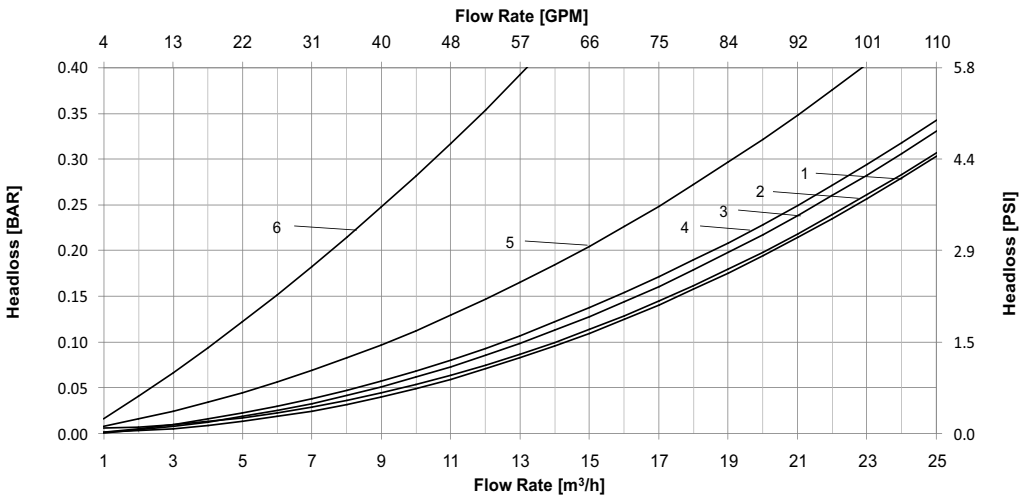


Technical Data

Inlet/Outlet diameter	2” Male Threads	
Max. Pressure	8bar	116psi
Max. Flow rate 400-100 micron	≤25m^3/h (6.9 l/sec)	≤110gpm
55 micron	≤16m^3/h (4.4 l/sec)	≤70gpm
20 micron	≤8m^3/h (2.2 l/sec)	≤35gpm
Filtration area	950 cm^2	147 in^2
Filtration volume	1225 cm^3	75.7 in^3
Filter length L	416mm	16.37inch
Filter width A	260mm	10.23inch
Distance between connections	A. 260mm B. 75mm	A. 10.23inch B. 2.95inch
Weight	3Kg	6.6lbs
Maximum temperature *	60º C	140º F
pH	2-13	

* Work pressure and pH resistance reduced at elevated temperature.

Headloss Chart

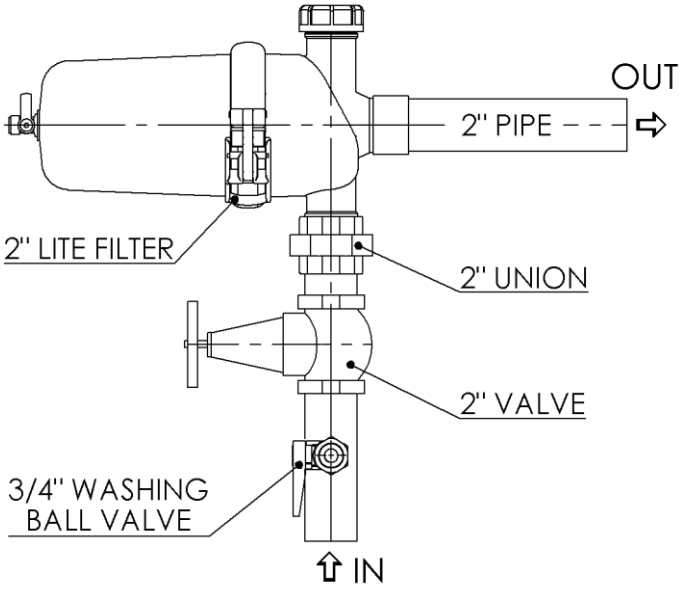


Filtration Grades

1 - Blue (400 micron / 40 mesh)
2 -Yellow (200 micron / 80 mesh)
3 -Red (130 micron / 120 mesh)
4 - Black (100 micron / 140 mesh)
5 - Green (55 micron)
6 - Grey (20 micron)

AK 2” LITE 9606 71205EN 12/08

Typical Recommended Installation



Dismantling

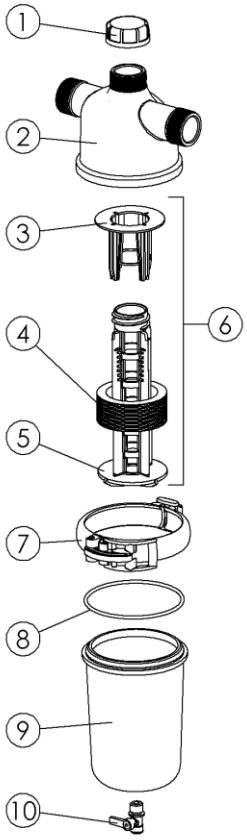
1. Turn off the water.
2. Release the pressure through the drainage ball valve.
3. Open the filter clamp and remove the cover.
4. Unscrew and remove the filter element.
5. Wash the filter element.
6. If the filter discs require acid treatment you may dip the complete filter element in acid according to our recommendation.

Assembly

1. Place the spine, turn clockwise until secure. Verify that the spine is tightened in place.
2. Place the cover and attach the clamp. Verify that the clamp is securely locked.

Winterization:

To prevent filter damage due to freezing water - drain all the water from the filter and leave the drain valve open.



Part List

No.	Cat. No.	Description	Materials
1	2511 0200	2" Cap	R.PA
2	2212 0002	Filter body	PP
3	2507 0203	Spine extension	PP
4	2021 1_ _ _	Disc set	PP
5	2502 0202	Spine body	PP
6	2126 1_ _ _	Filtration element	PP
7	2253 0235	Clamp	R.PA
8	5003 2361	O-ring 2-361(151.77x5.33)	EPDM
9	2501 0202	Filter cover	PP
10	5054 0212	½" ball valve	BRASS

Materials

PP - POLYPROPYLENE

R.PA - REINFORCED POLYAMIDE

Note: This filter is equipped with a pressure safety device. If pressure exceeds the maximum work pressure, the seal will act as a pressure release element. If such occurs, please open the clamp, place the seal on the cover and reassemble.

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

AK 2" LITE 9606 71205EN 12/08

ARKAL 2" LITE FILTER

Cat. no. 1205 2___ WITH PLUG

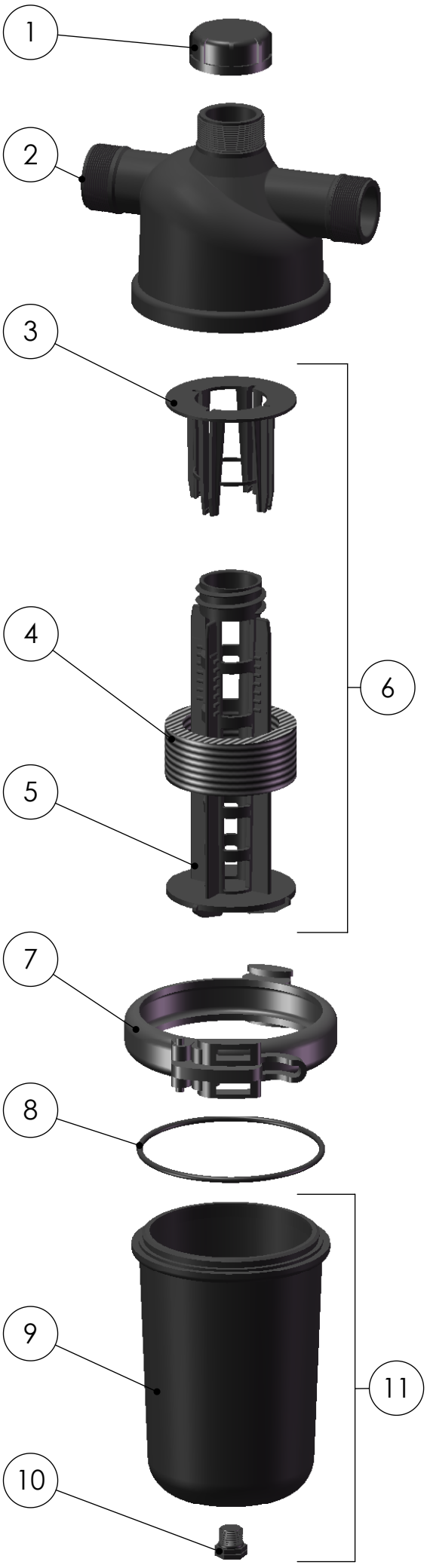
PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	2" CAP	2511 0200	R.P.A.
2	FILTER BODY	2212 0002	P.P.
3	SPINE EXTENSION	2507 0203	P.P.
4	DISC SET	2021 1___	P.P.
5	SPINE BODY	2502 0202	P.P.
6	FILTRATION ELEMENT	2126 1___	
7	CLAMP	2253 0235	R.P.A
8	"O" RING 2-361(151.765x5.334)	5003 2361	EPDM
9	FILTER COVER	2202 0232	P.P.
10	1/2" PLUG	5019 0112	P.P.
11	COVER COMPLETE	2202 0234	

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE



ARKAL 2" LITE FILTER

Cat. no. 1205 3___ WITH TAP

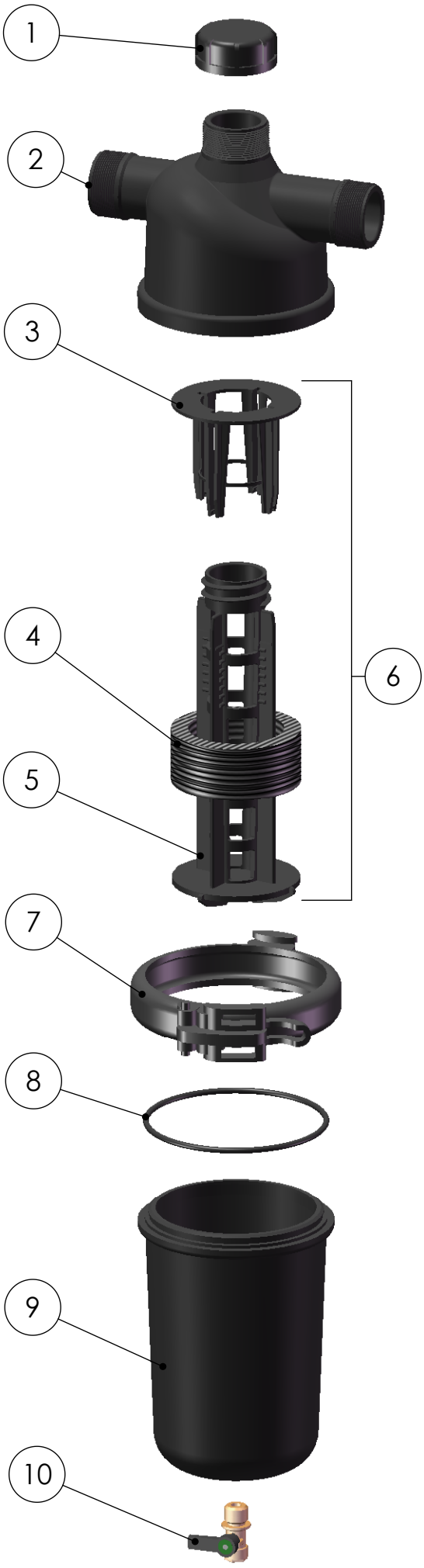
PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	2" CAP	2511 0200	R.P.A.
2	FILTER BODY	2212 0002	P.P.
3	SPINE EXTENSION	2507 0203	P.P.
4	DISC SET	2021 1___	P.P.
5	SPINE BODY	2502 0202	P.P.
6	FILTRATION ELEMENT	2126 1___	
7	CLAMP	2253 0235	R.P.A
8	"O" RING 2-361(151.765x5.334)	5003 2361	EPDM
9	FILTER COVER	2202 0232	P.P.
10	1/2" TAP	5054 0212	BRASS

MATERIALS:

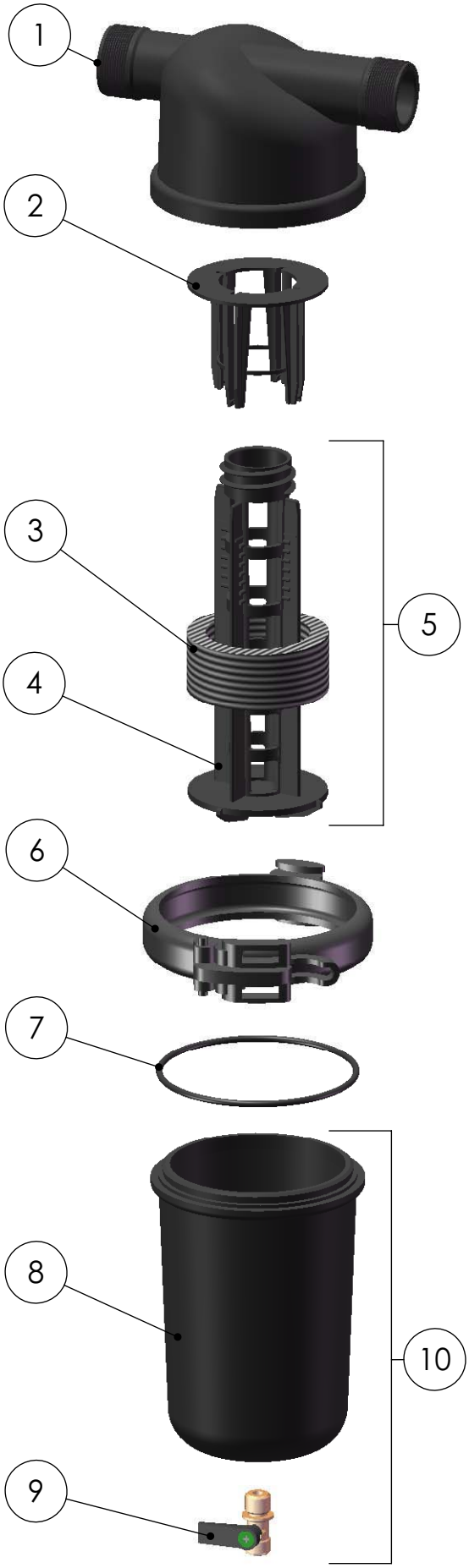
1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE



ARKAL 2" LITE FILTER

Cat. no. 1207 1___ WITH TAP



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY	2212 0005	P.P.
2	SPINE EXTENSION	2507 0203	P.P.
3	DISC SET	2021 1___	P.P.
4	SPINE BODY	2502 0202	P.P.
5	FILTRATION ELEMENT	2126 1___	
6	CLAMP	2253 0235	R.P.A
7	"O" RING 2-361(151.765x5.334)	5003 2361	EPDM
8	FILTER COVER	2202 0232	P.P.
9	1/2" TAP	5054 0212	BRASS
10	COVER COMPLETE	2202 0235	

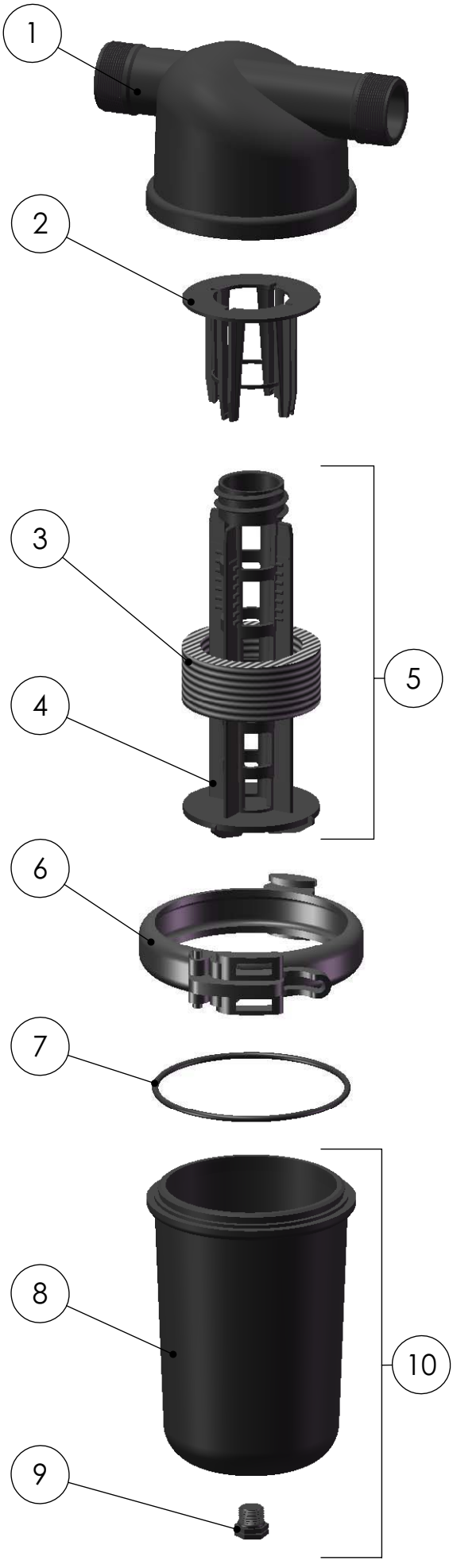
MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

ARKAL 2'' LITE FILTER

Cat. no. 1207 2___ WITH PLUG



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER BODY	2212 0005	P.P.
2	SPINE EXTENSION	2507 0203	P.P.
3	DISC SET	2021 1___	P.P.
4	SPINE BODY	2502 0202	P.P.
5	FILTRATION ELEMENT	2126 1___	
6	CLAMP	2253 0235	R.P.A
7	''O'' RING 2-361(151.765x5.334)	5003 2361	EPDM
8	FILTER COVER	2202 0232	P.P.
9	1/2'' PLUG	5019 0112	P.P.
10	COVER COMPLETE	2202 0234	

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

2" Dual

Manual Disc Filter

Features

- Precise disc filtration
- High flow capacity
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	**mm**	50	**in**	2
Filtration surface area	**cm²**	950	**in²**	148
Filtration volume	**cm³**	1,225	**in³**	75
Pressure rating	**bar**	12	**psi**	168
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

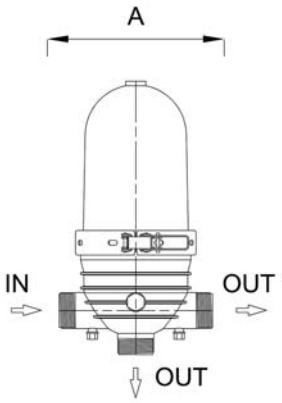
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	25	110
	Average	18.75	82.5
55 µ	Good	17.5	77
	Average	13.1	58
20 µ	Good	12.5	55
	Average	9.37	41

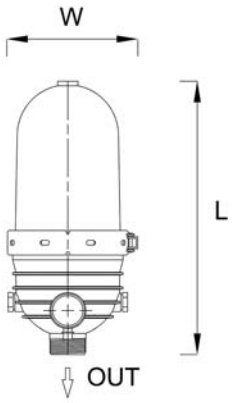
2" Dual

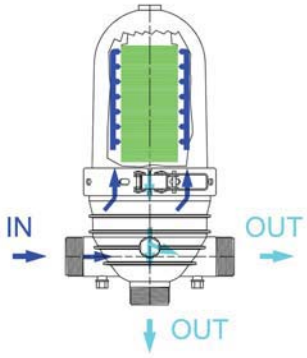
Manual Disc Filter

Dimensions and Weights

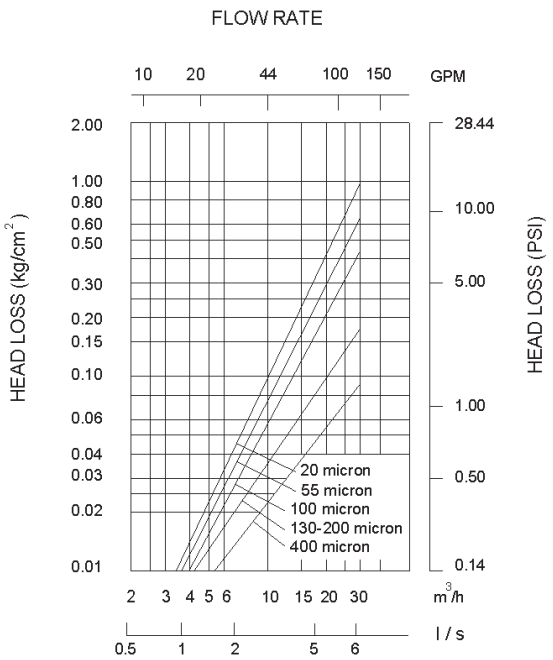
D Inlet\Outlet diameter	**mm**	50	**inch**	2
L Length	**mm**	465	**inch**	18 5/16
W Width	**mm**	200	**inch**	7 7/8
A	**mm**	260	**inch**	10 1/4
Shipping weight (approx.)	**kg**	5	**lbs**	11







Head Loss Chart, Clean State



2" Dual is available in:
Polyamide or Polysolfon.

ARKAL 2" DUAL FILTER

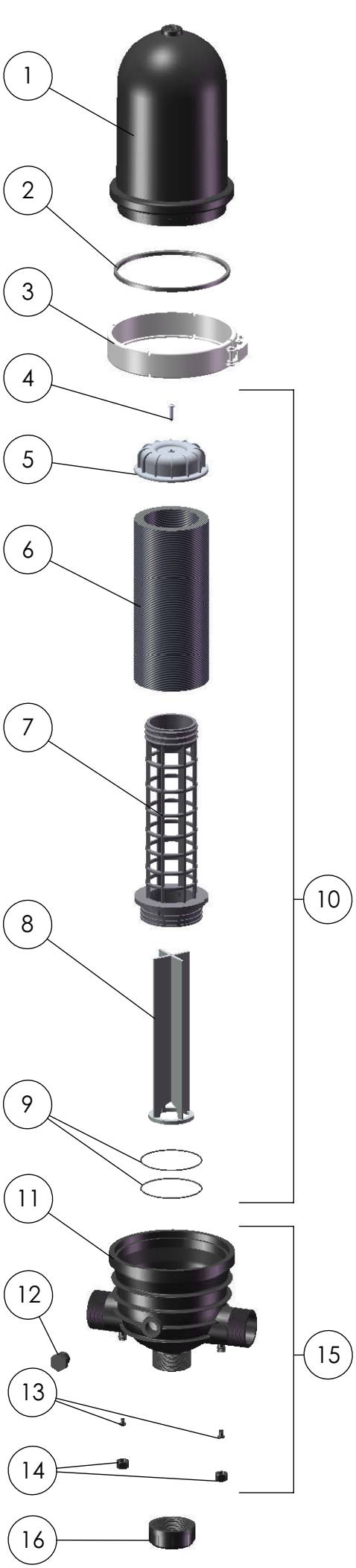
WITH A DETACHABLE SPINE

Cat. no. 1204 0___ (BSP)

1204 8___ (NPT)

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	2-3" FILTER COVER W/O STOPE	2501 0210	R.P.A.
	2-3" TRANSPARENT COVER W/STOP.	2202 0020	P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	FASTNING BOLT	5040 1010	S.S.
5	FIXING NUT	2506 0211	R.P.P.
6	DISC SET	2021 1___	P.P.
7	SPINE	2502 0212	R.P.P.
8	SPINE EXTENSION	2502 0214	P.P.
9	O RING 2-238	5003 2238	EPDM
10	FILTER ELEMENT	2121 1___	
11	FILTER BODY BSP	2500 0204	R.P.A.
	FILTER BODY NPT	2500 0205	R.P.A.
12	1/2" CAP THREAD	5019 0112	P.P.
13	GAUGE PORTS SEAL	5006 0004	EPDM
14	GAUGE PORTS NUT	2511 0103	R.P.P.
15	FILTER BODY COMPLEX BSP	2204 0001	
	FILTER BODY COMPLEX NPT	2204 0002	
16	2" CAP	2511 0200	R.P.A.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBOTANE

ARKAL 2" DUAL FILTER

WITH A DETACHABLE SPINE

Cat. no. 1204 3___ WITH TAP (BSP)

1204 7___ WITH TAP(NPT)

PARTS LIST

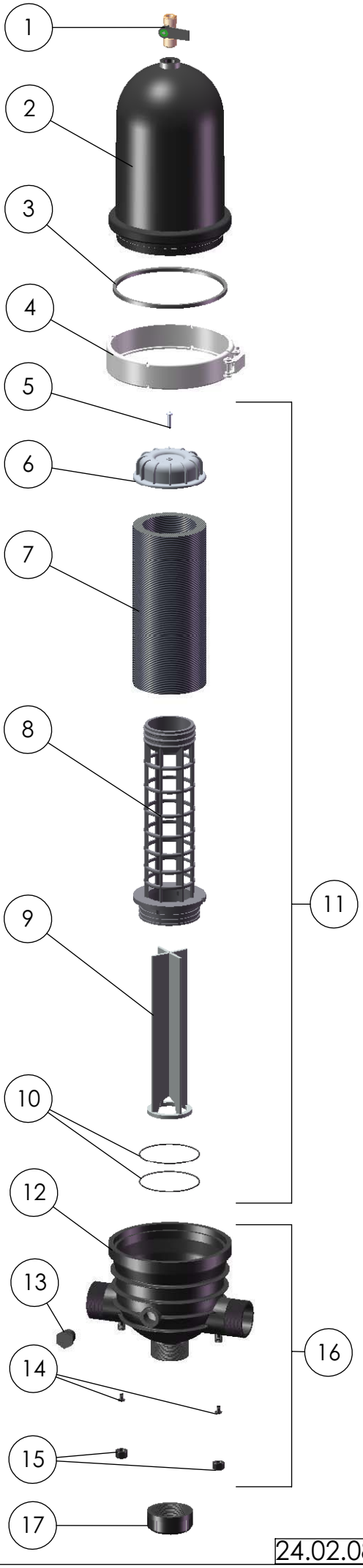
No.	DESCRIPTION	CAT. No	MATERIALS
1	1/2-1/4" TAP	5054 0212	BRASS
2	2" FILTER COVER WITH 1/2"THREAD	2202 0020	R.P.A.
3	COVER SEAL	5005 0002	EPDM
4	CLAMP	5042 0030	S.S.
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET	2021 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	O RING 2-238	5003 2238	EPDM
11	FILTER ELEMENT	2121 1___	
12	FILTER BODY BSP FILTER BODY NPT	2500 0204 2500 0205	R.P.A. R.P.A.
13	1/2" CAP THREAD	5019 0112	P.P.
14	GAUGE PORTS SEAL	5006 0004	EPDM
15	GAUGE PORTS NUT	2511 0103	R.P.P.
16	FILTER BODY COMPLEX BSP FILTER BODY COMPLEX NPT	2204 0001 2204 0002	
17	2" CAP	2511 0200	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE



2" Super

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- High flow capacity
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	mm	50	in	2
Filtration surface area	cm^2	950	in^2	148
Filtration volume	cm^3	1,225	in^3	75
Pressure rating	bar	10	psi	145
Max. temp.	^0C	70	^0F	158

Maximum Filtration Flow Rate / Water Quality

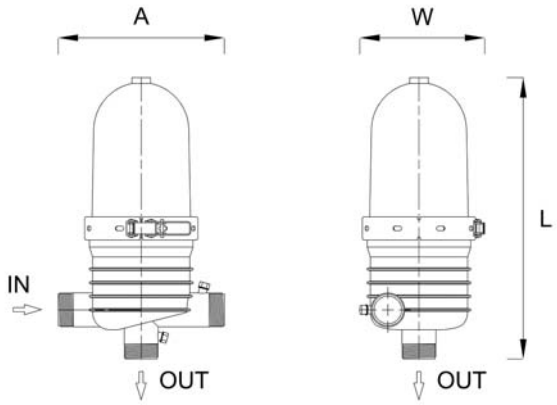
Filtration Grade	Water Quality	m^3/h	gpm
400-130 µ	Good	25	110
	Average	18.75	82.5
55 µ	Good	17.5	77
	Average	13.1	58
20 µ	Good	12.5	55
	Average	9.37	41

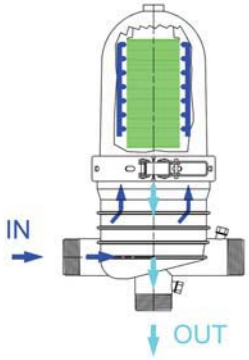
2" Super

Manual Disc Filter

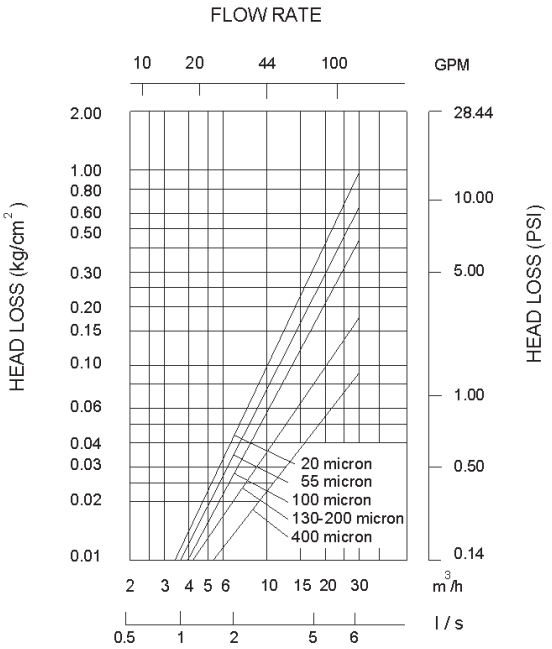
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	50	**inch**	2
L Length	**mm**	495	**inch**	19 1/2
W Width	**mm**	200	**inch**	7 7/8
A	**mm**	290	**inch**	11 13/32
Shipping weight (approx.)	**kg**	6	**lbs**	13.2





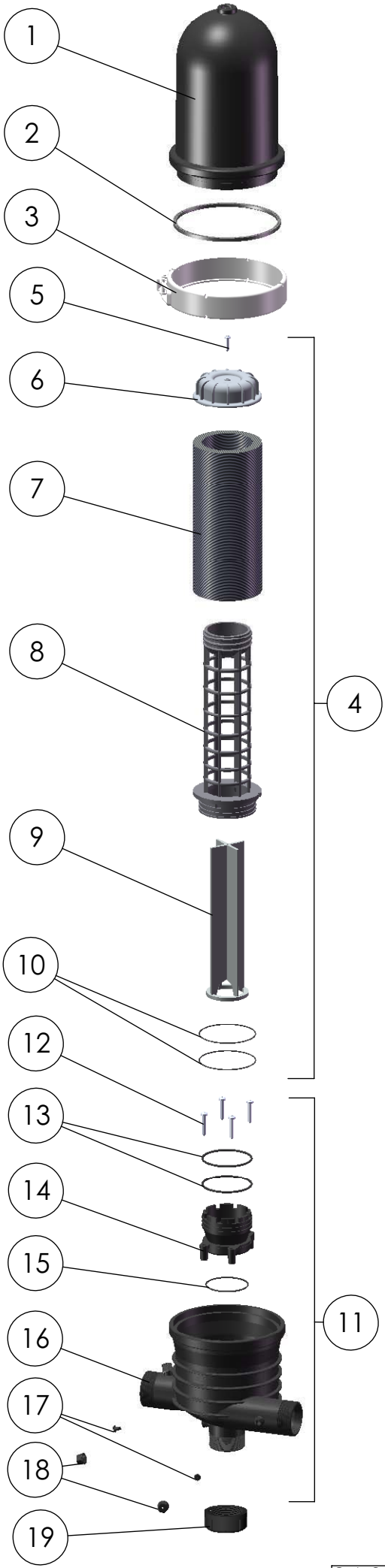
Head Loss Chart, Clean State



2" Super is available in:
Polyamide.

ARKAL 2" SUPER FILTER

Cat. no. 1212 0___ STANDARD



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0210	R.P.A.
	TRANSPARENT COVER	2501 9220	P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	FILTER ELEMENT	2121 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET	2021 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX	2222 0002	
12	FASTENING BOLTS	5040 1027	S.S.
13	"O" RING 2-234	5003 2234	EPDM
14	SPINE BASE	2503 0210	R.P.P.
15	"O" RING 2-146	5003 2146	EPDM
16	FILTER BODY BSP	2500 0210	R.P.A.
17	GAUGE PORTS SEAL	5006 0004	EPDM
18	GAUGE PORTS NUT	2511 0103	R.P.P.
19	2" CAP	2511 0200	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

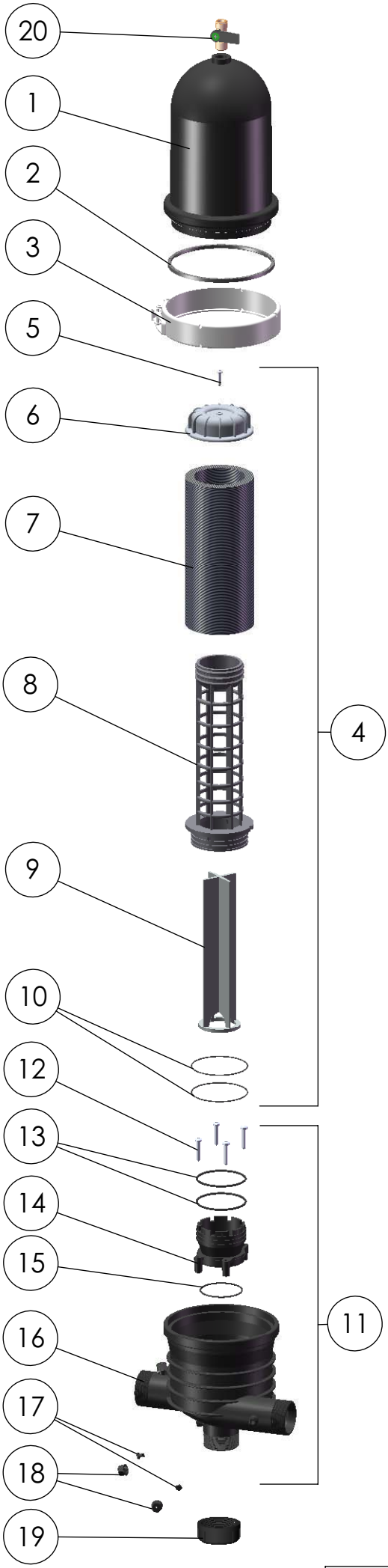
4) P.C. - POLYCARBONATE

ARKAL 2" SUPER FILTER

Cat. no. 1212 3___ WITH TAP

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER TRANSPARENT COVER	2202 0020 2501 9220	R.P.A. P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	FILTER ELEMENT	2121 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET	2021 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX	2222 0002	
12	FASTENING BOLTS	5040 1027	S.S.
13	"O" RING 2-234	5003 2234	EPDM
14	SPINE BASE	2503 0210	R.P.P.
15	"O" RING 2-146	5003 2146	EPDM
16	FILTER BODY BSP	2500 0210	R.P.A.
17	GAUGE PORTS SEAL	5006 0004	EPDM
18	GAUGE PORTS NUT	2511 0103	R.P.P.
19	2" CAP	2511 0200	R.P.A.
20	1/2" TAP	5054 0212	BRASS



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

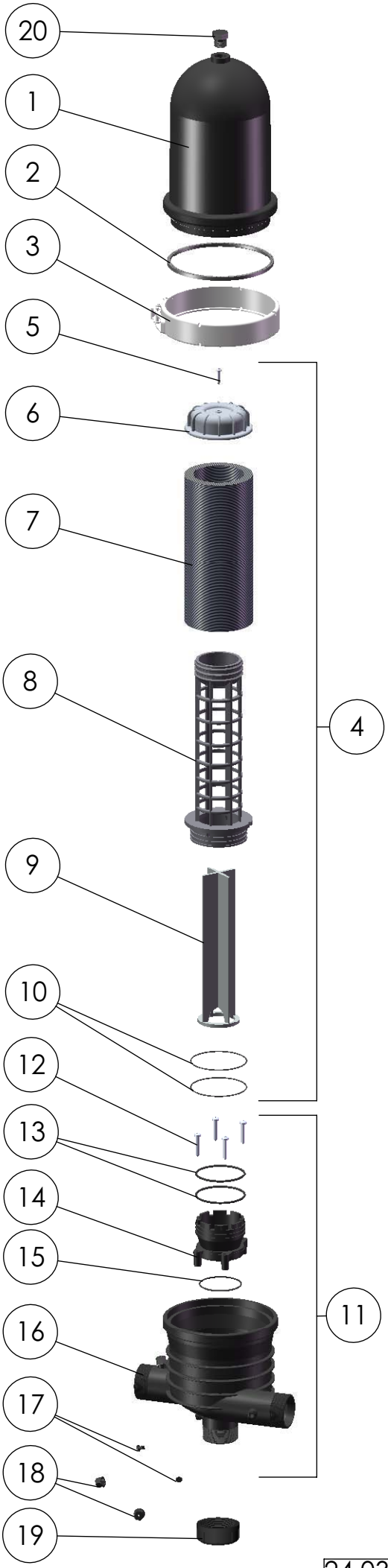
4) P.C. - POLYCARBONATE

ARKAL 2" SUPER FILTER

Cat. no. 1212 2___ WITH PLUG

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2202 0020	R.P.A.
	TRANSPARENT COVER	2501 9220	P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	FILTER ELEMENT	2121 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET	2021 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX	2222 0002	
12	FASTENING BOLTS	5040 1027	S.S.
13	"O" RING 2-234	5003 2234	EPDM
14	SPINE BASE	2503 0210	R.P.P.
15	"O" RING 2-146	5003 2146	EPDM
16	FILTER BODY BSP	2500 0210	R.P.A.
17	GAUGE PORTS SEAL	5006 0004	EPDM
18	GAUGE PORTS NUT	2511 0103	R.P.P.
19	2" CAP	2511 0200	R.P.A.
20	1/2" CAP	5019 0112	P.P.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE

2" Leader

Manual Disc Filter

Features

- Durable filter element
- Corrosion free
- All Polypropylene
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	50	**in**	2
Filtration surface area	**cm²**	950	**in²**	148
Filtration volume	**cm³**	1,225	**in³**	75
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

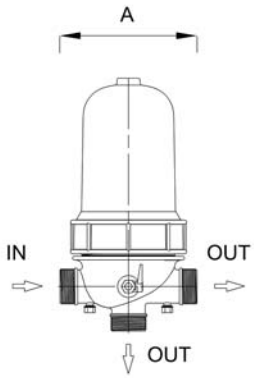
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	30	132
	Average	21	92
55 µ	Good	16	70.4
	Average	11	48.5
20 µ	Good	8	35.2
	Average	5	22

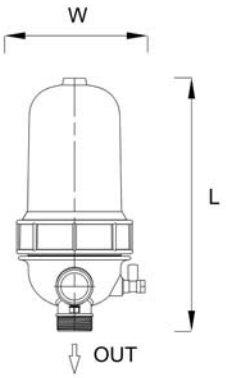
2" Leader

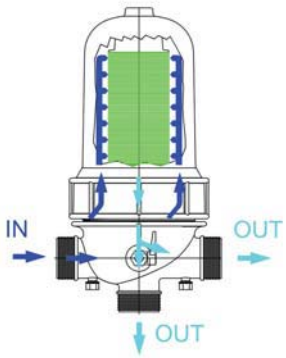
Manual Disc Filter

Dimensions and Weights

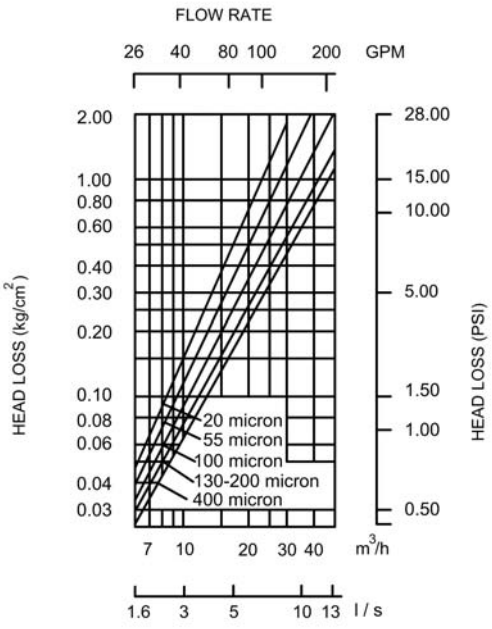
D Inlet\Outlet diameter	**mm**	50	**inch**	2
L Length	**mm**	425	**inch**	16 23/32
W Width	**mm**	215	**inch**	8 14/32
A	**mm**	230	**inch**	9 1/16
Shipping weight (approx.)	**kg**	3.2	**lbs**	7







Head Loss Chart, Clean State



2" Leader is available in:
Polypropylene.

ARKAL 2" "LEADER" FILTER

Cat. no. 1224 3___THREADED ENDS

PARTS LIST

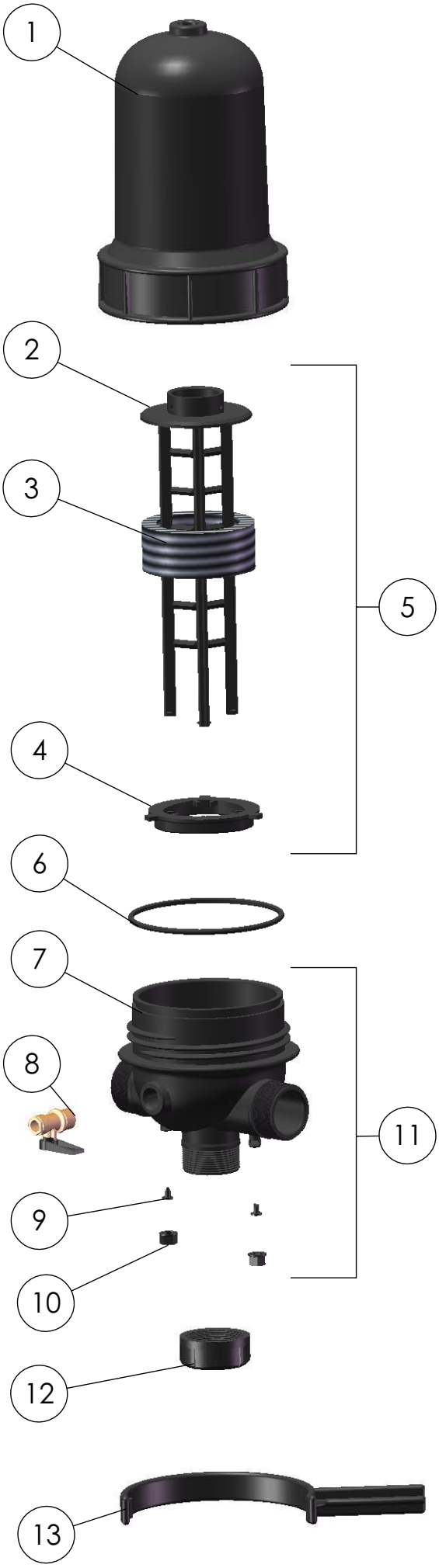
No:	PART DESCRIPTION	CAT. No:	MATERIALS
1	LEADER COVER	2501 0230	P.P.
2	LEADER SPINE	2502 0230	P.P.
3	DISC SET	2021 1___	P.P.
4	STOP RING ELEMENT	2507 0208	P.P.
5	SINGLE FILTER ELEMENT	2125 1___	P.P.
6	O RING 144.3*5.7	5003 1457	EPDM
7	LEADER THREAD BODY	2500 0234	P.P.
8	1/2"*1/4" TAP	5054 0212	BRASS
9	GAUGE PORT SEAL	5006 0004	EPDM
10	GAUGE PORT NUT	2511 0103	R.P.P.
11	LEADER THREAD BODY COMPLEX	2224 0001	
12	CAP 2"	2511 0200	R.P.A.
13	SPINE WRENCH	2530 0117	R.P.P.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

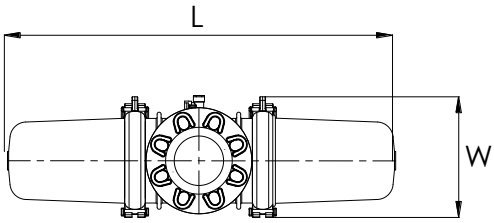


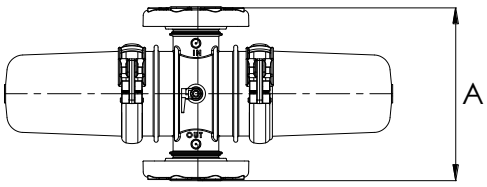
Arkal 3” Twin Lite Filter with a detachable spine

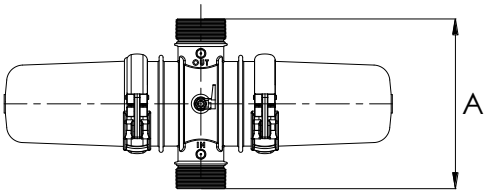
Catalog No. 1326 3_ _ _ Threaded BSPT
1327 3_ _ _ Threaded NPT
1325 3_ _ _ Victaulic
1325 5_ _ _ Arkal Flange

Features

- Inlet / Outlet options 3”- VIC, AR-Flange, Threaded
- Parts in contact with water are made of polypropylene
- Highly resistant to corrosion
- Detachable spine
- Pressure differential disc compression
- Available in various filtration grades
- Unique polymeric clamp
- Drain ball valve







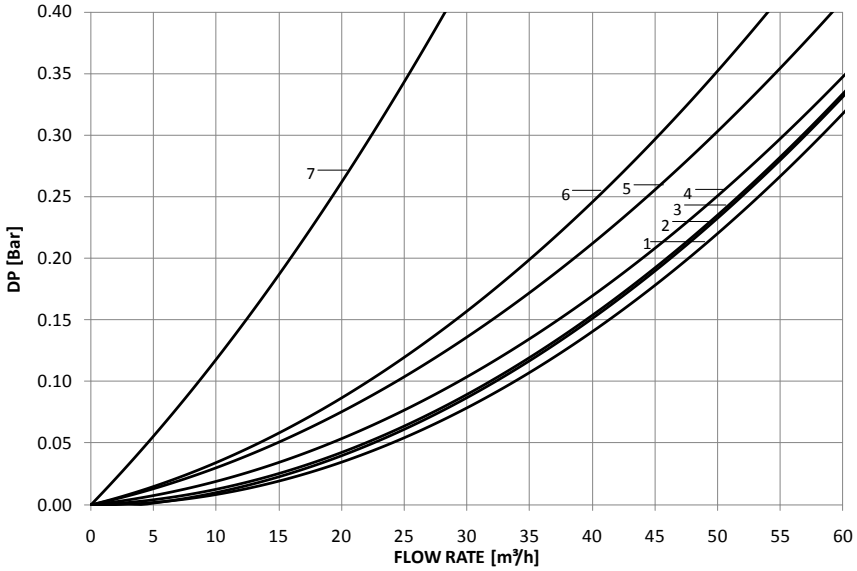
Technical Data

Inlet/Outlet diameter	3” Arkal Flange / Threaded / Grooved	
Max. Pressure	8 bar	116 psi
Max. Flow rate 400-100 micron	50 m^3/h (13.9 l/sec)	220 gpm
70 micron	40 m^3/h (11.1 l/sec)	176 gpm
55 micron	34 m^3/h (8.9 l/sec)	150 gpm
20 micron	16 m^3/h (4.4 l/sec)	70 gpm
Filtration area	1900 cm^2	294 in^2
Filtration volume	2450 cm^3	150 in^3
Filter width W	225 mm	8 $^{27}/_{32}$”
Filter length L	730 mm	28 $^{3}/_{4}$"
Distance between connections A	320 mm	12 $^{19}/_{32}$”
Weight (Victaulic, Threaded)	6.3 Kg	14 lbs
Weight (Flanged)	7.8 Kg	17 lbs
Maximum temperature	60º C	140º F
pH	2-13	

Filtration Grades

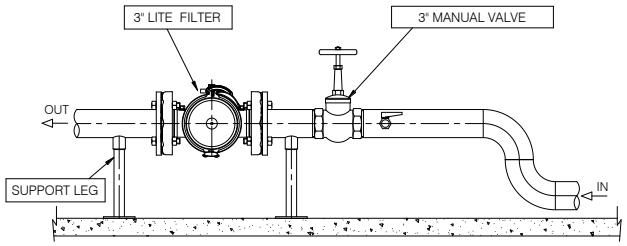
1 - Blue (400 micron / 40 mesh)
2 - Yellow (200 micron / 80 mesh)
3 - Red (130 micron / 120 mesh)
4 - Black (100 micron /140 mesh)
5 - Brown (70 micron)
6 - Green (55 micron)
7 - Grey (20 micron)

Headloss Chart

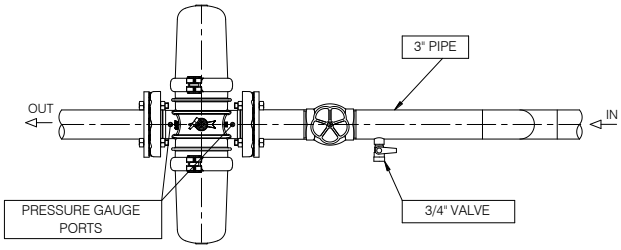


Installation Recommendations

FRONT VIEW



TOP VIEW



Dismantling

1. Turn off the water.
2. Release the pressure through the drainage ball valve.
3. Open the filter clamp and remove the cover.
4. Unscrew and remove the filter element.
5. Wash the filter element.
6. If the filter discs require acid treatment you may dip the complete filter element in acid according to our recommendation.

Assembly

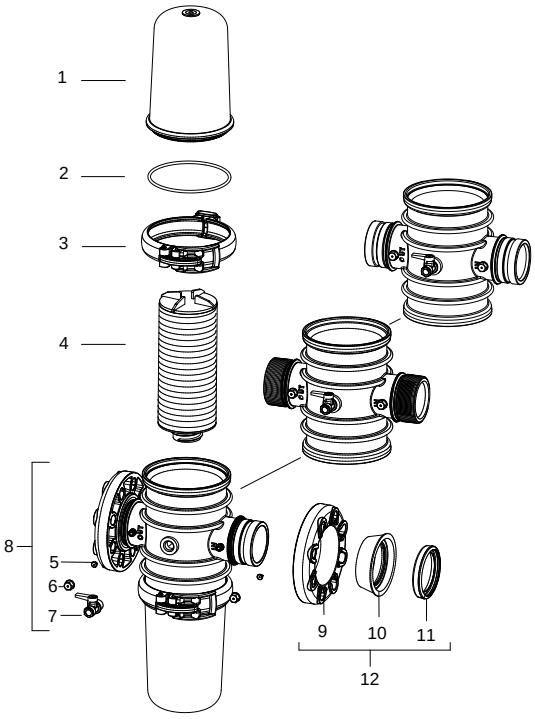
1. Place the filter element, turn clockwise until secure. Verify that the filter element is tightened in place.
2. Place the cover and attach the clamp. Verify that the clamp is securely locked.

Winterization:

To prevent filter damage due to freezing water - drain all the water from the filter and leave the drain valve open.

Part List

No.	Cat. No.	Description	Materials
1	2501 0202	Filter cover	PP
2	5003 2361	O-ring 2-361(151.77x5.33)	EPDM
3	2253 0235	Clamp	RPA
4	2126 1_ _ _	Filter element	PP
5	5006 0004	Gauge port seal	EPDM
6	2511 0103	Gauge port nut	RPP
7	5054 0212	½" ball valve	BRASS
8	2232 5013	Body + flanges Assembly	-
	2232 1013	Body grooved Assembly	-
	2232 0013	Body threaded BSPT Assembly	-
	2232 0014	Body threaded NPT Assembly	-
9	2510 0325	Ring flange 3"	RPA
10	2507 0308	Cone flange	POM
11	5005 2013	Gasket 3"	EPDM
12	2253 0325	Flange complete	-



Materials

PP - POLYPROPYLENE

RPA - REINFORCED POLYAMIDE

RPP - REINFORCED POLYPROPYLENE

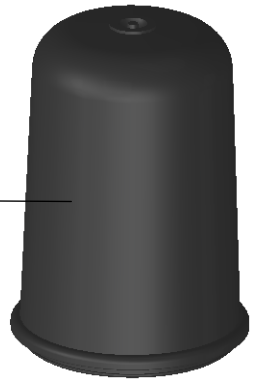
POM - ACETAL

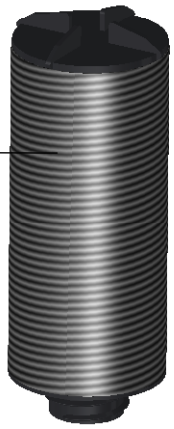
Note:

- This filter is equipped with a pressure safety device. If pressure exceeds the maximum work pressure, the seal will act as a pressure release element. If such occurs, please open the clamp, place the seal on the cover and reassemble.
- Before opening the filter clamp, check that there is no pressure on the filter.

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

AK 3" TWIN LITE 9605 71325EN 02/2010





ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL
1	2501 0202	FILTER COVER 2-3"	PP
2	5003 2361	O-RING 2-361	EPDM
3	2253 0235	CLAMP COMPLETE	RPA
4	2126 1___	FILTER ELEMENT	PP
5	5006 0004	GAUGE PORT SEAL	EPDM
6	2511 0103	GAUGE STOPER	RPP
7	5054 0212	BALL TAP "1/2*"1/4	BRASS
8	2232 5013	LITE VIC BODY 3" +A.K.F	-
9	2510 0325	RING FLANGE 3"	RPA
10	2507 0308	CONE FLANGE	POM
11	5005 2013	GASKET 3"	EPDM
12	2253 0325	A.K. FLANGE COMPLETE	-

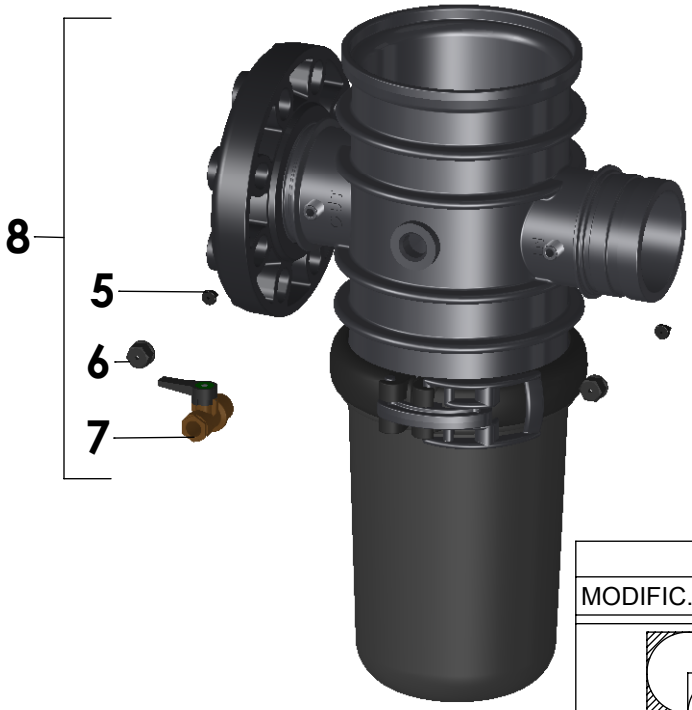
MATERIALS:

1) PP - POLYPROPYLENE

2) RPA - REINFORCED POLYAMIDE

3) RPP - REINFORCED POLYPROPYLENE

4) POM- ACETAL



MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3"LITE FILTER				PAGE___OF___
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CHECKED	OMRY	19.01.10		
APPROVED	OMRY	19.01.10	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	19.01.10		

PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\3 INCH FILTERS\3"LITE FILTER\

יום חמישי, 21 ינואר 2010 10:47:03

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL
1	2501 0202	2-3"FILTER COVER	PP
2	5003 2361	O-RING 2-361	EPDM
3	2253 0235	CLAMP COMPLETE	RPA
4	2126 1___	3" FILTER ELEMENT	PP
5	5006 0004	GAUGE PORT SEAL	EPDM
6	2511 0103	GAUGE STOPER	RPP
7	5054 0212	1/4"*1/2" BALL TAP	BRASS
8	2232 0014	3"LITE TRH NPT BODY	-

MATERIALS:

1) PP - POLYPROPYLENE

2) RPA - REINFORCED POLYAMIDE

3) RPP - REINFORCED POLYPROPYLENE

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3"LITE FILTER NPT				PAGE___OF___
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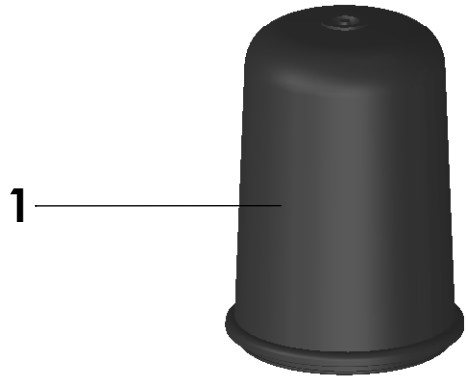
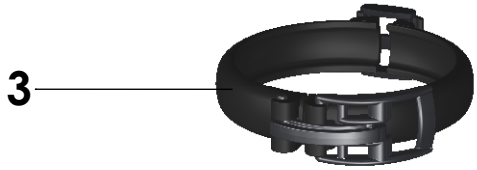
APPROVED	OMRY	19.01.10	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	19.01.10		

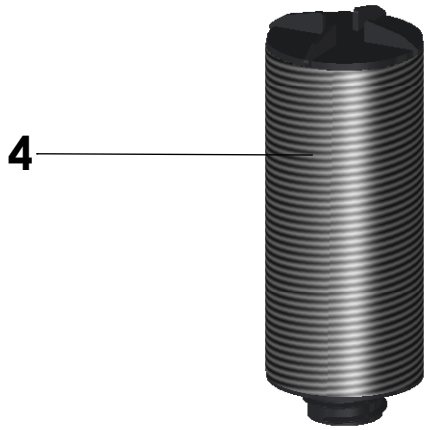
PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\3 INCH FILTERS\3"LITE FILTER\

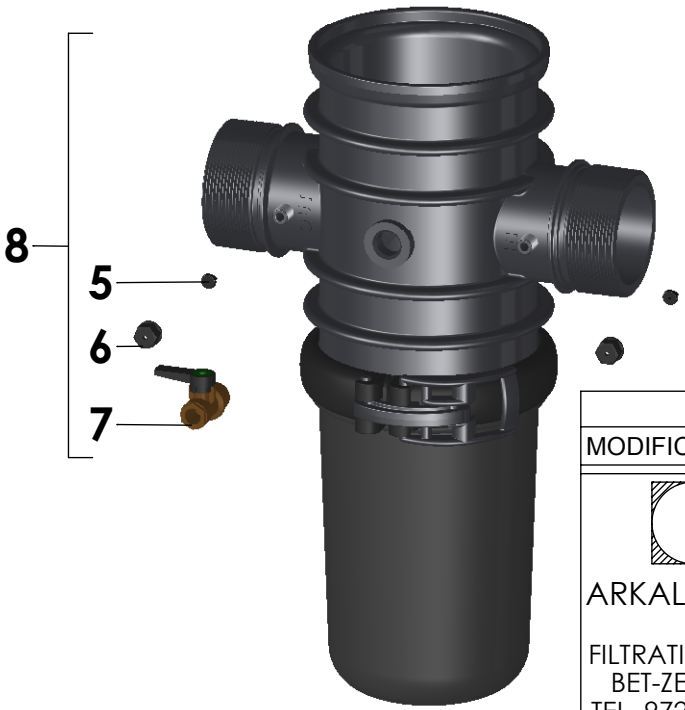
יום חמישי 21 יולי 2010 09:32:01

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL
1	2501 0202	FILTER COVER 2-3"	PP
2	5003 2361	O-RING 2*361	EPDM
3	2253 0235	CLAMP COMPLETE	RPA
4	2126 1___	FILTER ELEMENT	PP
5	5006 0004	GAUGE PORT SEAL	EPDM
6	2511 0103	GAUGE STOPER	RPP
7	5054 0212	BALL TAP "1/2*"1/4	BRASS
8	2232 0013	LITE TRH BSP BODY 3"	-









MATERIALS:

1) PP - POLYPROPYLENE

2) RPA - REINFORCED POLYAMIDE

3) RPP - REINFORCED POLYPROPYLENE

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3"LITE FILTER BSPT				PAGE___OF___
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	NAME	DATE	FILE CODE DRAWINGS:	BACKUP: DISK-2S
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CHECKED	OMRY	19.01.10		
APPROVED	OMRY	19.01.10	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	19.01.10		

PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\3 INCH FILTERS\3"LITE FILTER\

יום חמישי 21 יוני 2010 10:08:13

3" Twin

M a n u a l D i s c F i l t e r

Features

- Precise disc filtration
- High flow capacity
- Durable filter element
- All plastic-corrosion free

Technical Data

	METRIC		US	
Connection diameter	**mm**	80	**in**	3
Filtration surface area	**cm²**	1,900	**in²**	294
Filtration volume	**cm³**	2,450	**in³**	150
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

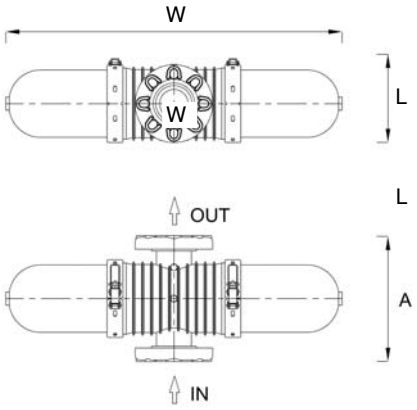
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	40	176
	Average	30	132
55 µ	Good	28	123
	Average	21	92.5
20 µ	Good	20	88
	Average	15	66

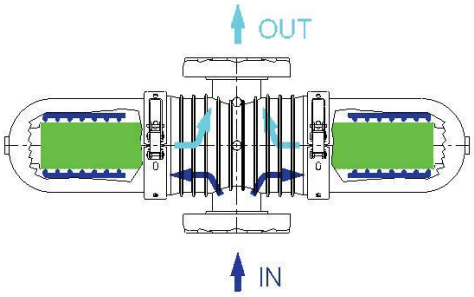
3" Twin

Manual Disc Filter

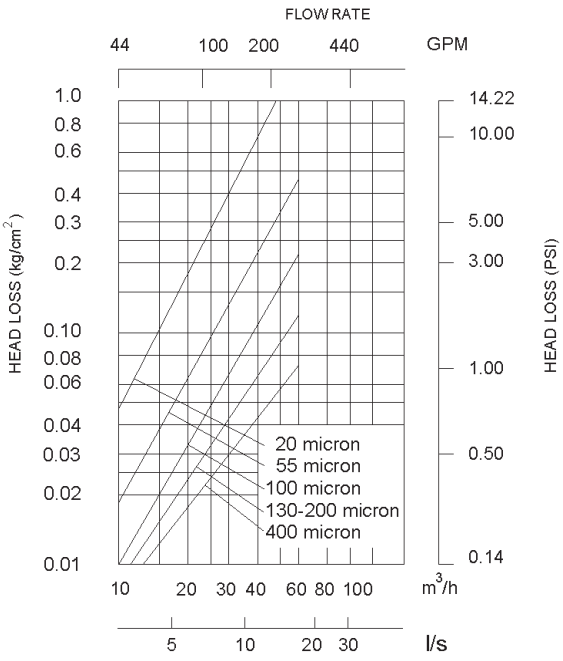
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	90	**inch**	3
L Length	**mm**	865	**inch**	34 1/16
W Width	**mm**	217	**inch**	8 9/16
A	**mm**	320	**inch**	12 19/32
Shipping weight (approx.)	**kg**	9.85	**lbs**	21.7





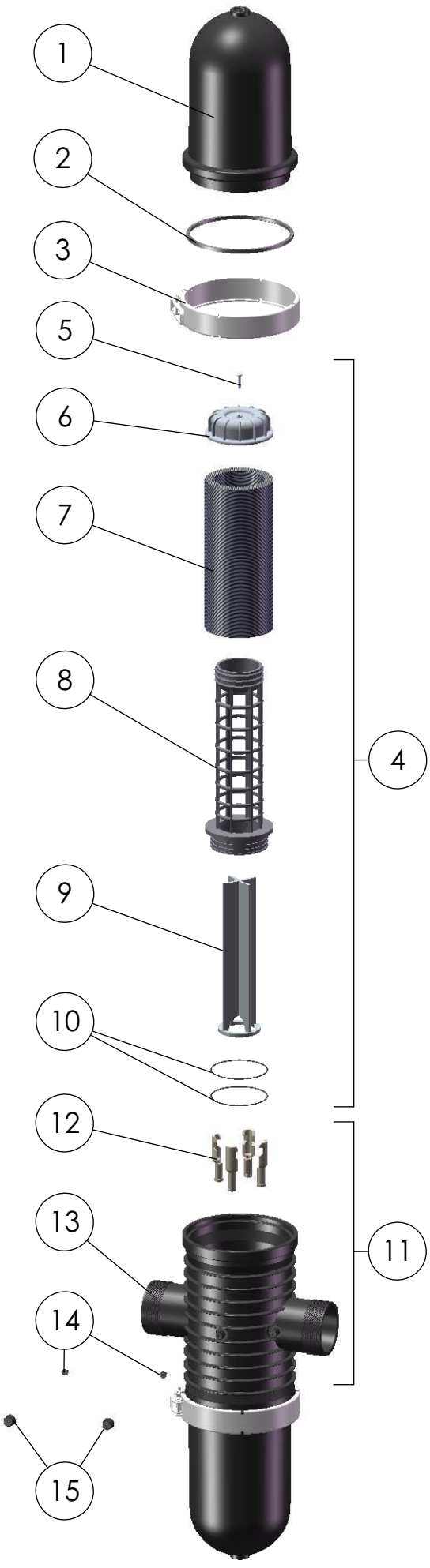
Head Loss Chart, Clean State



3" Twin is available in:
Polyamide.

ARKAL 3" TWIN FILTER

Cat. no. 1353 0___ THREADED ENDS



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER TRANSPARENT COVER	2501 0210 2501 9220	R.P.A. P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	SINGLE FILTER ELEMENT DOUBLE FILTER ELEMENT	2121 1___ 2131 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET PAIR DISC SET	2021 1___ 2031 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX	2232 0001	
12	SPINE HOLDER *	2530 0202	R.P.A.
13	FILTER BODY BSP	2500 0302	R.P.A.
14	GAUGE PORTS SEAL	5006 0004	EPDM
15	GAUGE PORTS NUT	2511 0103	R.P.P.

* - OPTIONAL

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

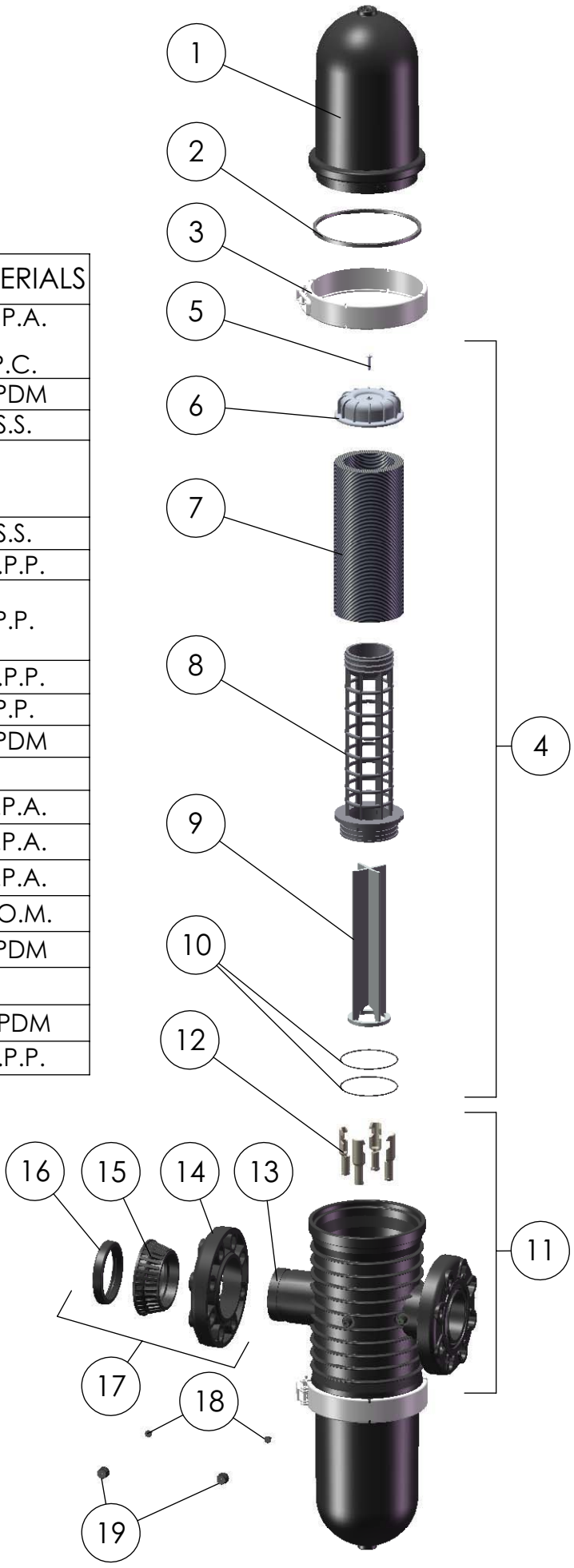
4) P.C. - POLYCARBONATE

ARKAL 3" TWIN FILTER

Cat. no. 1353 8___ ARKAL FLANGE

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0210	R.P.A.
	TRANSPARENT COVER	2501 9220	P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	SINGLE FILTER ELEMENT	2121 1___	
	DOUBLE FILTER ELEMENT	2131 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET	2021 1___	P.P.
	PAIR DISC SET	2031 1___	
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX+AKF	2232 8001	
12	SPINE HOLDER *	2530 0202	R.P.A.
13	FILTER BODY VIC.	2500 0301	R.P.A.
14	3" RING FLANGE	2510 0325	R.P.A.
15	CONE FLANGE	2507 0308	P.O.M.
16	3" GASKET	5005 2013	EPDM
17	3" ARKAL FLANGE COMPLEX	2253 0325	
18	GAUGE PORTS SEAL	5006 0004	EPDM
19	GAUGE PORTS NUT	2511 0103	R.P.P.



* - OPTIONAL

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE

5) POM - ACETAL

ARKAL 3" TWIN FILTER

Cat. no. 1353 1___ VICTAULIC ENDS

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER TRANSPARENT COVER	2501 0210 2501 9220	R.P.A. P.C.
2	COVER SEAL	5005 0002	EPDM
3	CLAMP	5042 0030	S.S.
4	SINGLE FILTER ELEMENT DOUBLE FILTER ELEMENT	2121 1___ 2131 1___	
5	FASTNING BOLT	5040 1010	S.S.
6	FIXING NUT	2506 0211	R.P.P.
7	DISC SET PAIR DISC SET	2021 1___ 2031 1___	P.P.
8	SPINE	2502 0212	R.P.P.
9	SPINE EXTENSION	2502 0214	P.P.
10	"O" RING 2*238	5003 2238	EPDM
11	FILTER BODY COMPLEX	2232 1001	
12	SPINE HOLDER *	2530 0202	R.P.A.
13	FILTER BODY VIC.	2500 0301	R.P.A.
14	GAUGE PORTS SEAL	5006 0004	EPDM
15	GAUGE PORTS NUT	2511 0103	R.P.P.

* - OPTIONAL

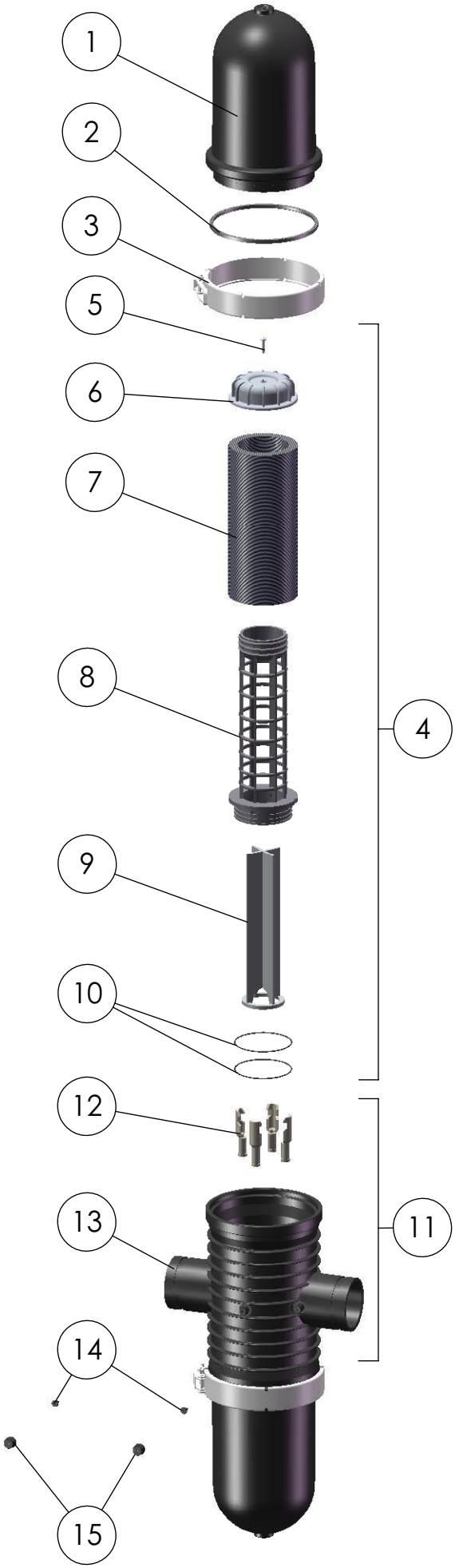
MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE



3" Leader

Manual Disc Filter

Features

- Durable filter element
- Corrosion free
- All Polypropylene
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	90	**in**	3
Filtration surface area	**cm²**	1900	**in²**	294
Filtration volume	**cm³**	2450	**in³**	150
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

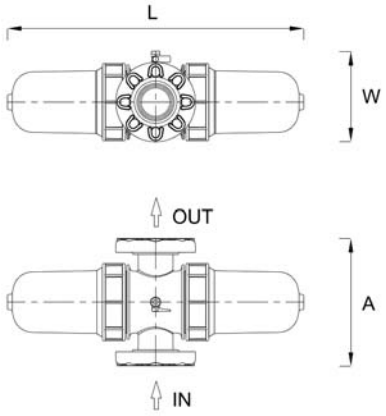
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	50	220
	Average	35	154
55 µ	Good	32	141
	Average	22	97
20 µ	Good	16	70
	Average	11	48.4

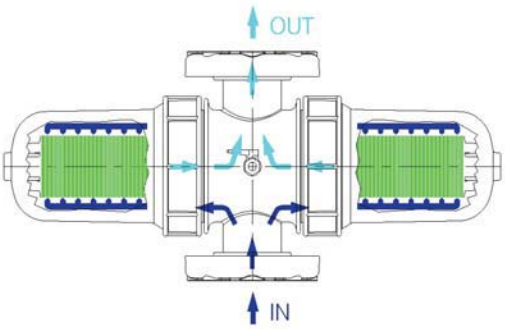
3" Leader

Manual Disc Filter

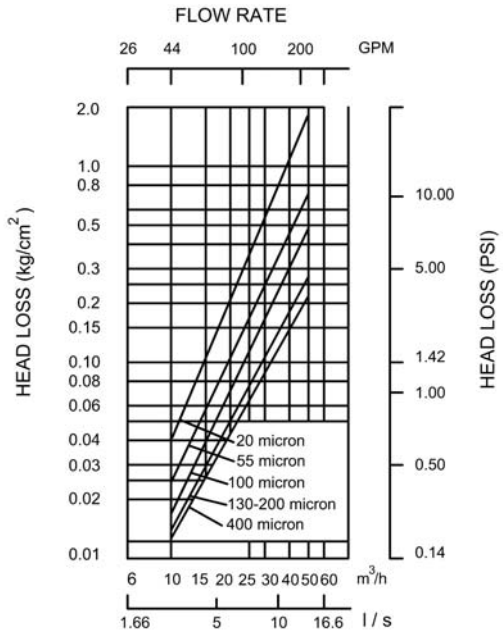
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	90	**inch**	3
L Length	**mm**	742	**inch**	29 7/32
W Width	**mm**	228	**inch**	8 3/32
A	**mm**	320	**inch**	12 19/32
Shipping weight (approx.)	**kg**	6.3	**lbs**	13.9





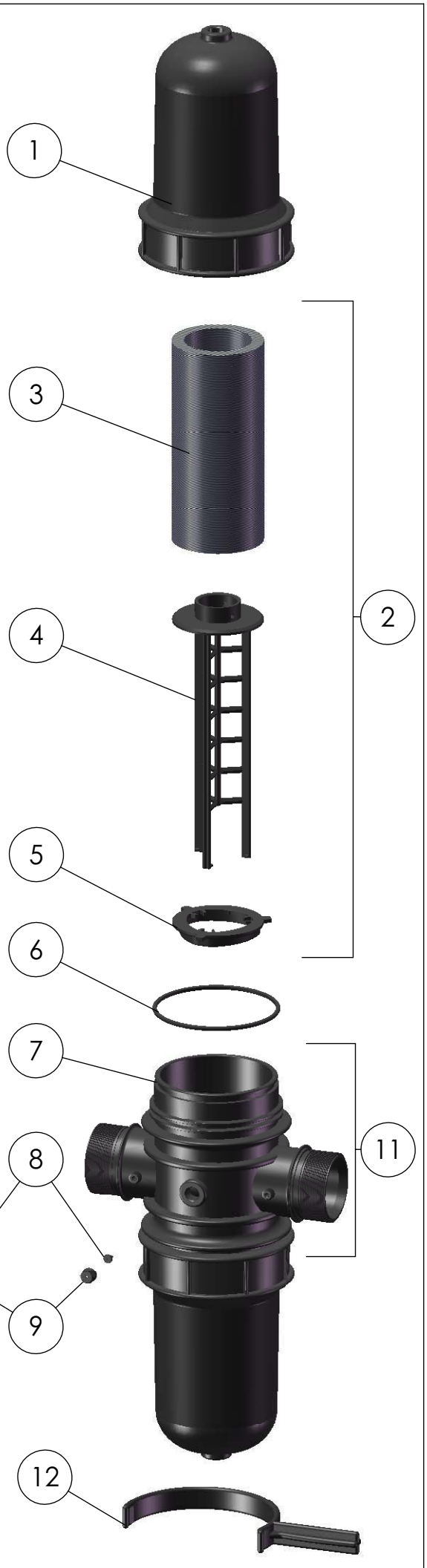
Head Loss Chart, Clean State



3'' Leader Filter is available in:
Polypropylene.

ARKAL 3" "LEADER" TWIN FILTER

Cat. no. 1320 3___ (BSP)
1323 3___ (NPT)



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	"LEADER COVER	2501 0230	P.P.
2	FILTER ELEMENT DOBLE FILTER ELEMENT	2125 1___ 2135 1___	
3	DISC SET DOUBLE DISC SET	2021 1___ 2031 1___	P.P.
4	"LEADER" SPINE	2502 0230	P.P.
5	STOP RING ELEMENT	2507 0208	P.P.
6	"O" RING 144.3*5.7	5003 1457	EPDM
7	FILTER BODY BSP FILTER BODY NPT	2500 0306 2500 0307	P.P.
8	GAUGE PORTS SEAL	5006 0004	EPDM
9	GAUGE PORTS NUT	2511 0103	R.P.P.
10	1/2-1/4" TAP	5054 0212	BRASS
11	BODY COMPLEX BSP BODY COMPLEX NPT	2232 0011 2232 0012	
12	2-3" "LEADER" WRENCH	2530 0117	R.P.A.

MATERIALS:

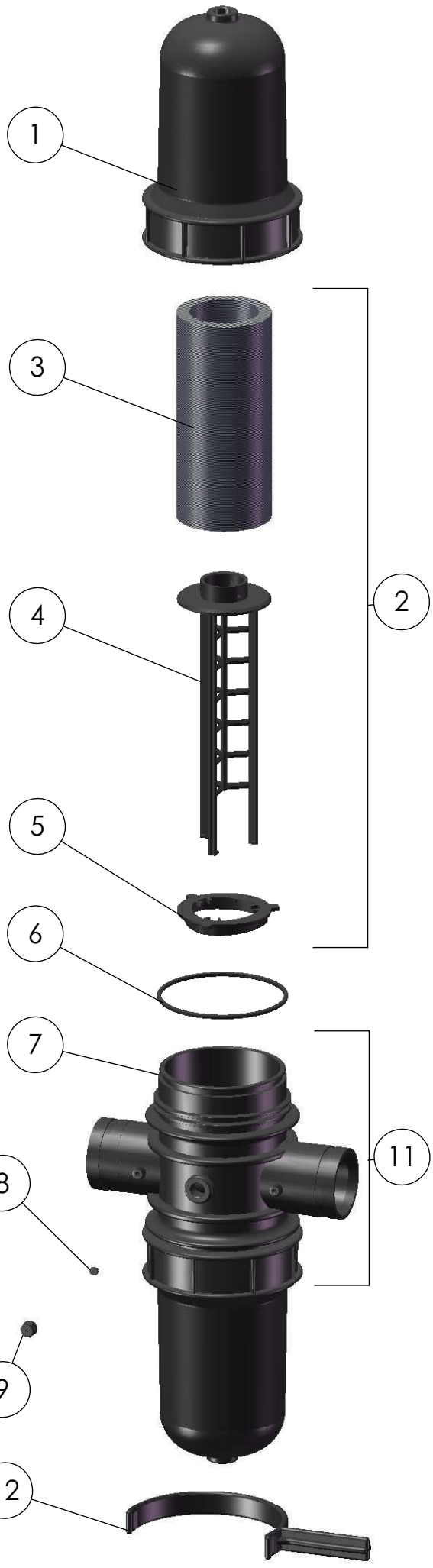
1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

ARKAL 3" "LEADER" TWIN FILTER

Cat. no. 1321 3___



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	"LEADER COVER	2501 0230	P.P.
2	FILTER ELEMENT DOUBLE FILTER ELEMENT	2125 1___ 2135 1___	
3	DISC SET DOUBLE DISC SET	2021 1___ 2031 1___	P.P.
4	"LEADER" SPINE	2502 0230	P.P.
5	STOP RING ELEMENT	2507 0208	P.P.
6	"O" RING 144.3*5.7	5003 1457	EPDM
7	FILTER BODY VIC	2500 0308	P.P.
8	GAUGE PORTS SEAL	5006 0004	EPDM
9	GAUGE PORTS NUT	2511 0103	R.P.P.
10	1/2-1/4" TAP	5054 0212	BRASS
11	BODY COMPLEX	2232 1011	
12	2-3" "LEADER" WRENCH	2530 0117	R.P.A.

MATERIALS:

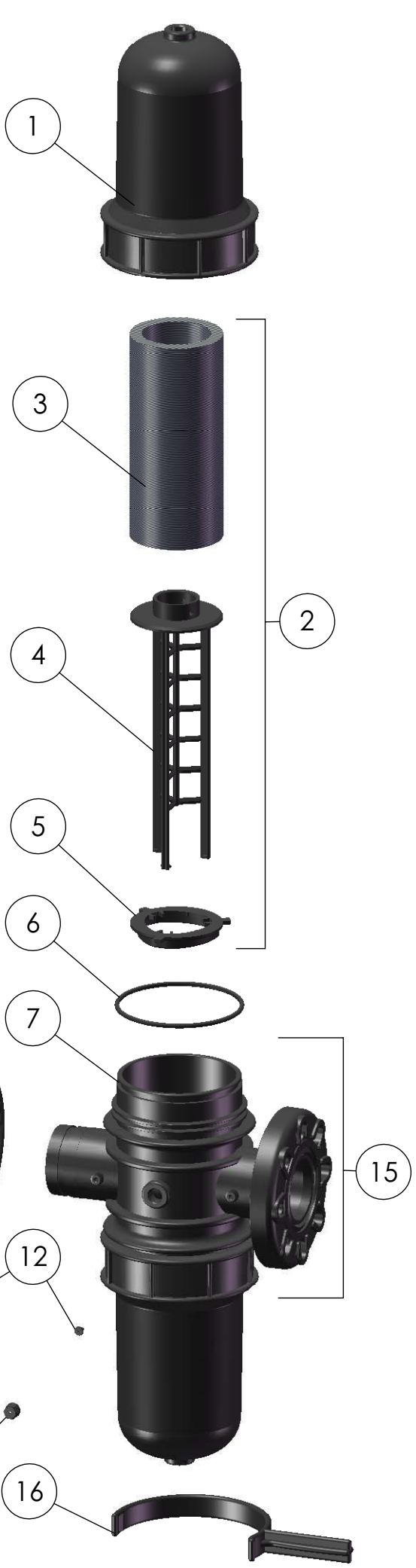
1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

ARKAL 3" "LEADER" TWIN FILTER

Cat. no. 1321 5___



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	"LEADER" COVER	2501 0230	P.P.
2	FILTER ELEMENT DUBLE FILTER ELEMENT	2125 1___ 2135 1___	
3	DISC SET DOUBLE DISC SET	2021 1___ 2031 1___	P.P.
4	"LEADER" SPINE	2502 0230	P.P.
5	STOP RING ELEMENT	2507 0208	P.P.
6	"O" RING 144.3*5.7	5003 1457	EPDM
7	FILTER BODY VIC	2500 0308	P.P.
8	3" RING FLANGE	2510 0325	R.P.A.
9	CONE FLANGE	2507 0308	P.O.M.
10	3" GASKET	5005 2013	EPDM
11	3" ARKAL FLANGE COMPLETE	2253 0325	
12	GAUGE PORTS SEAL	5006 0004	EPDM
13	1/2-1/4" TAP	5054 0212	BRASS
14	GAUGE PORTS NUT	2511 0103	R.P.P.
15	BODY COMPLEX +AKF	2232 5011	
16	2-3" "LEADER" WRENCH	2530 0117	R.P.A.

MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.O.M.-ACETAL

3" Super Angle

M a n u a l D i s c F i l t e r

Features

- High flow capacity
- Durable filter element
- Corrosion free
- All Plastic
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	90	**in**	3
Filtration surface area	**cm²**	1,852	**in²**	287
Filtration volume	**cm³**	1,774	**in³**	108
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰ C**	70	**⁰ F**	158

Maximum Filtration Flow Rate / Water Quality

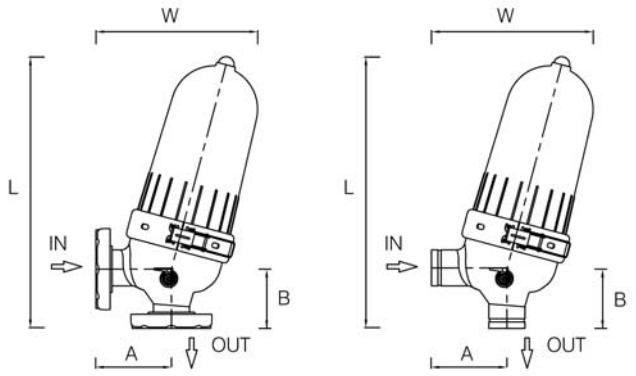
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	60	264
	Average	50	220
100 µ	Good	50	220
	Average	40	176
55 µ	Good	35	154
	Average	24	106
20 µ	Good	18	79
	Average	12	53

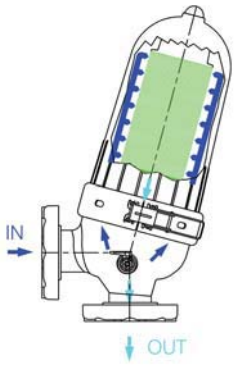
3" Super Angle

Manual Disc Filter

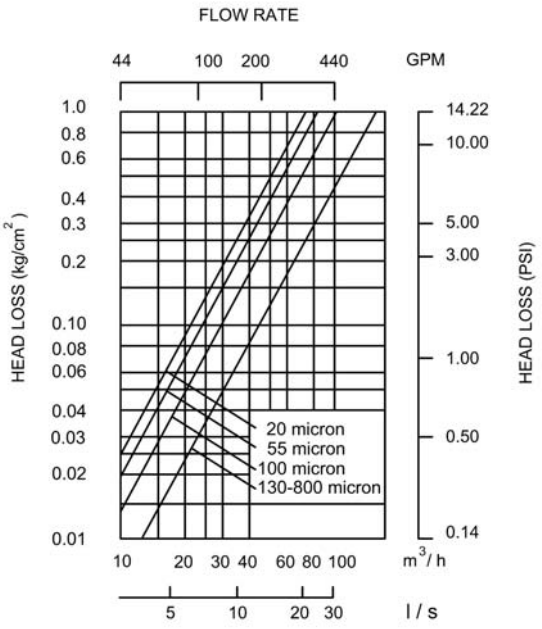
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	90	**inch**	3
L Length	**mm**	700	**inch**	27 9/16
W Width	**mm**	400	**inch**	15 3/4
A	**mm**	185	**inch**	7 9/32
B	**mm**	145	**inch**	5 23/32
Shipping weight (approx.)	**kg**	11.47	**lbs**	25.3





Head Loss Chart, Clean State



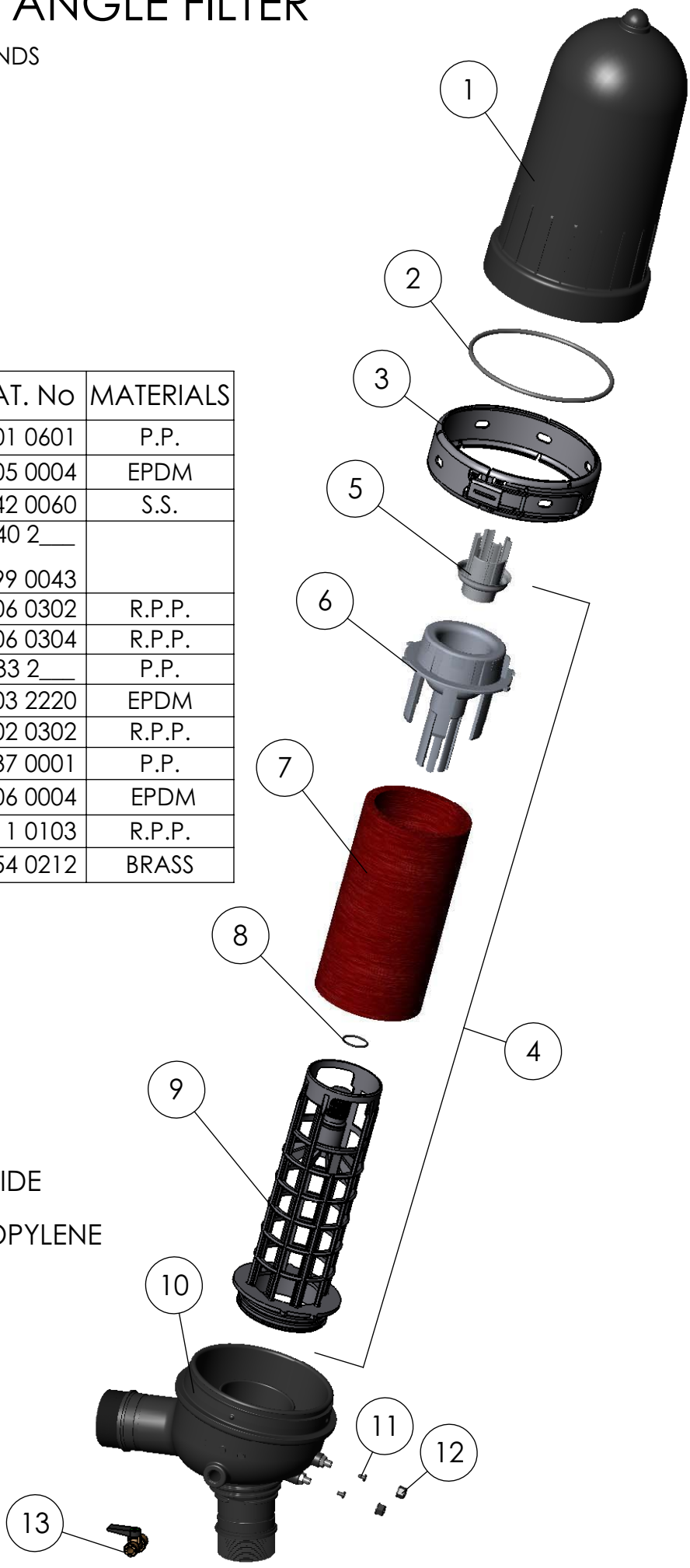
3" Super Angle Filter is available in:
Polypropylene.

ARKAL 3" SUPER ANGLE FILTER

Cat. no. 1370 0___ THREADED ENDS

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0601	P.P.
2	COVER SEAL	5005 0004	EPDM
3	CLAMP	5042 0060	S.S.
4	FILTER ELEMENT FILTER ELEMENT (W/O DISC SET)	2140 2___ 2199 0043	
5	SPINE TIGHTENING NUT	2506 0302	R.P.P.
6	SPINE CAP	2506 0304	R.P.P.
7	DISC SET	2033 2___	P.P.
8	"O" RING 2-200	5003 2220	EPDM
9	SPINE 99	2502 0302	R.P.P.
10	FILTER BODY THREAD	2237 0001	P.P.
11	GAUGE PORTS SEAL	5006 0004	EPDM
12	GAUGE PORTS NUT	2511 0103	R.P.P.
13	1/2" TAP	5054 0212	BRASS



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

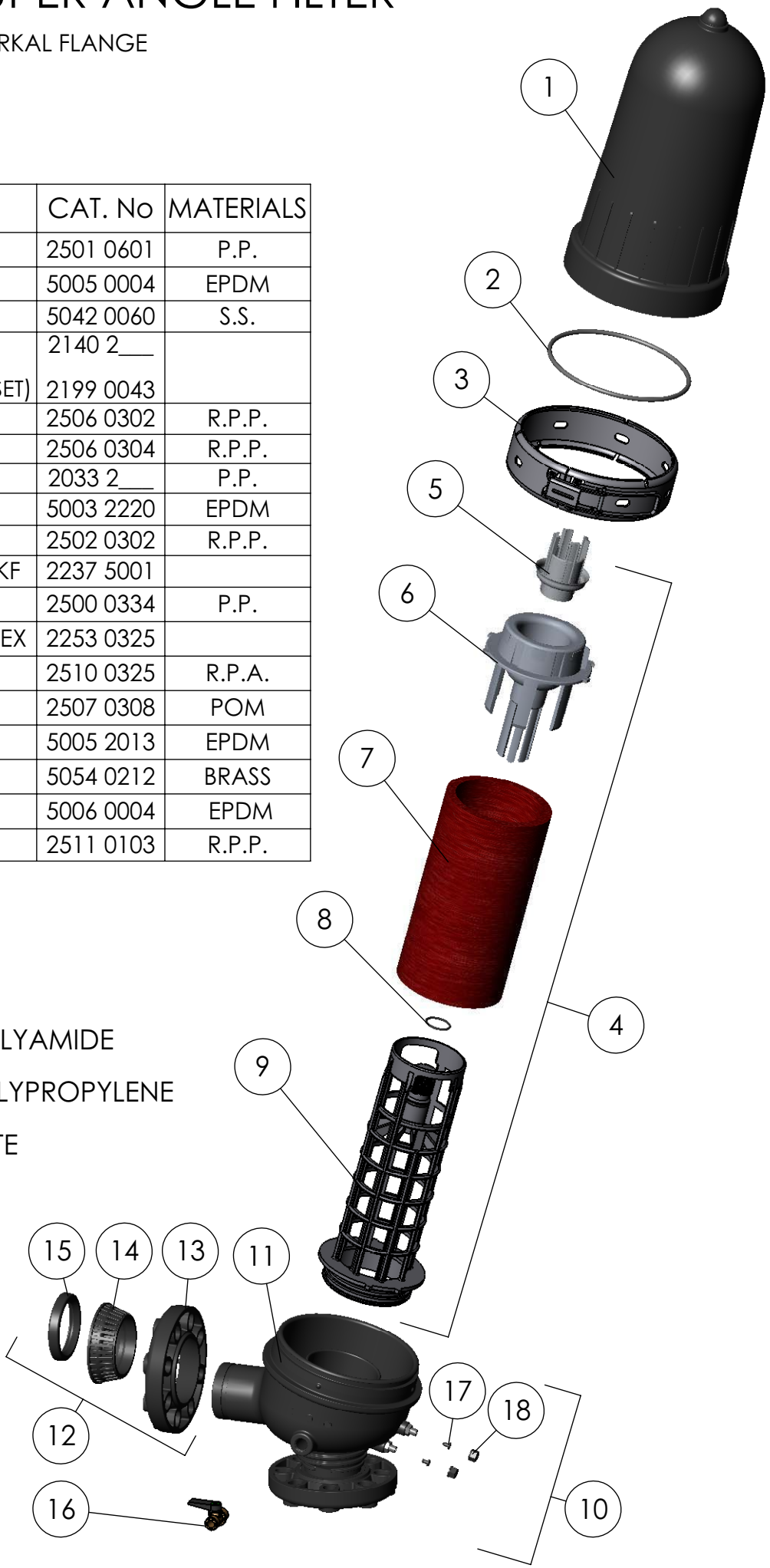
4) P.C. - POLYCARBONATE

ARKAL 3" SUPER ANGLE FILTER

Cat. no. 1370 5___ 3" ARKAL FLANGE

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0601	P.P.
2	COVER SEAL	5005 0004	EPDM
3	CLAMP	5042 0060	S.S.
4	FILTER ELEMENT FILTER ELEMENT (W/O DISC SET)	2140 2___ 2199 0043	
5	SPINE TIGHTENING NUT	2506 0302	R.P.P.
6	SPINE CAP	2506 0304	R.P.P.
7	DISC SET	2033 2___	P.P.
8	"O" RING 2-200	5003 2220	EPDM
9	SPINE 99	2502 0302	R.P.P.
10	FILTER BODY COMPLEX+AKF	2237 5001	
11	FILTER BODY VIC.	2500 0334	P.P.
12	3" ARKAL FLANGE COMPLEX	2253 0325	
13	RING FLANGE	2510 0325	R.P.A.
14	CONE FLANGE	2507 0308	POM
15	GASKET STYLE	5005 2013	EPDM
16	1/2" TAP	5054 0212	BRASS
17	GAUGE PORTS SEAL	5006 0004	EPDM
18	GAUGE PORTS NUT	2511 0103	R.P.P.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

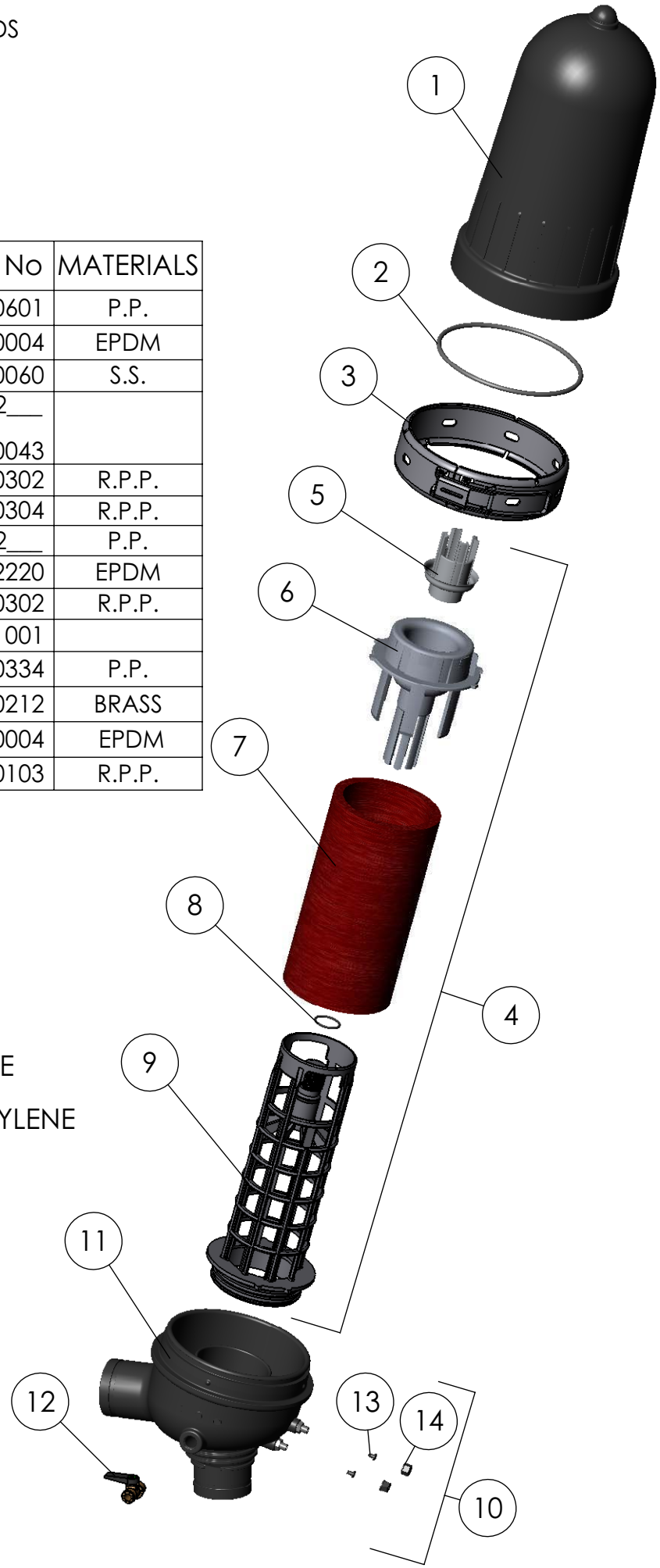
4) P.C. - POLYCARBONATE

ARKAL 3" SUPER ANGLE FILTER

Cat. no. 1370 1___ VICTAULIC ENDS

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0601	P.P.
2	COVER SEAL	5005 0004	EPDM
3	CLAMP	5042 0060	S.S.
4	FILTER ELEMENT FILTER ELEMENT (W/O DISC SET)	2140 2___ 2199 0043	
5	SPINE TIGHTENING NUT	2506 0302	R.P.P.
6	SPINE CAP	2506 0304	R.P.P.
7	DISC SET	2033 2___	P.P.
8	"O" RING 2-200	5003 2220	EPDM
9	SPINE 99	2502 0302	R.P.P.
10	FILTER BODY COMPLEX	2237 1001	
11	FILTER BODY VIC.	2500 0334	P.P.
12	1/2" TAP	5054 0212	BRASS
13	GAUGE PORTS SEAL	5006 0004	EPDM
14	GAUGE PORTS NUT	2511 0103	R.P.P.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE

4" Super Angle

M a n u a l D i s c F i l t e r

Features

- High flow capacity
- Durable filter element
- Corrosion free
- All Plastic
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	110	**in**	4
Filtration surface area	**cm²**	1,852	**in²**	287
Filtration volume	**cm³**	1,774	**in³**	108
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

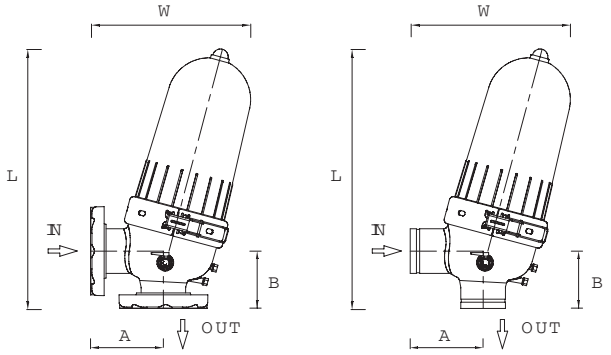
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	90	396
	Average	60	264
100 µ	Good	50	220
	Average	40	176
55 µ	Good	35	154
	Average	24	106
20 µ	Good	18	79
	Average	12	53

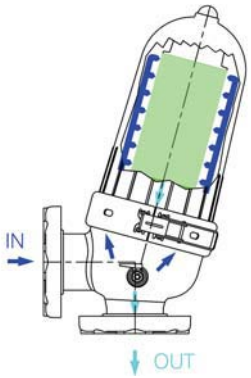
4” SuperAngle

Manual Disc Filter

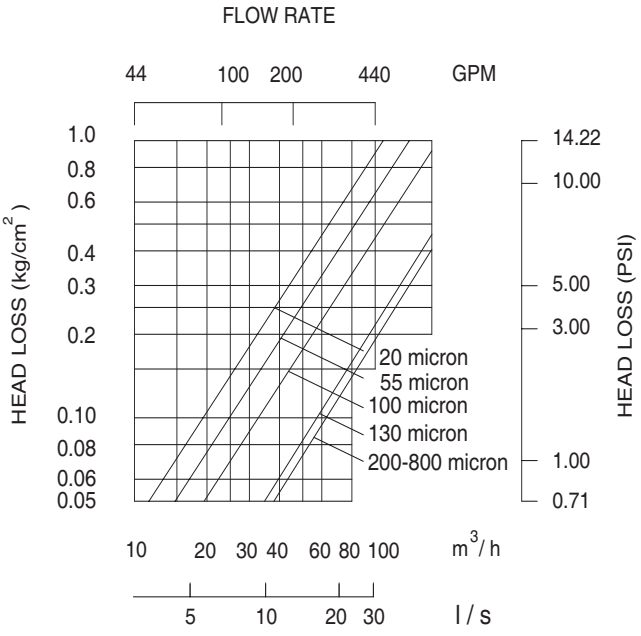
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	110	**inch**	4
L Length	**mm**	700	**inch**	27 9/16
W Width	**mm**	400	**inch**	15 3/4
A	**mm**	185	**inch**	7 9/32
B	**mm**	145	**inch**	5 23/32
Shipping weight (approx.)	**kg**	13.16	**lbs**	29





Head Loss Chart, Clean State



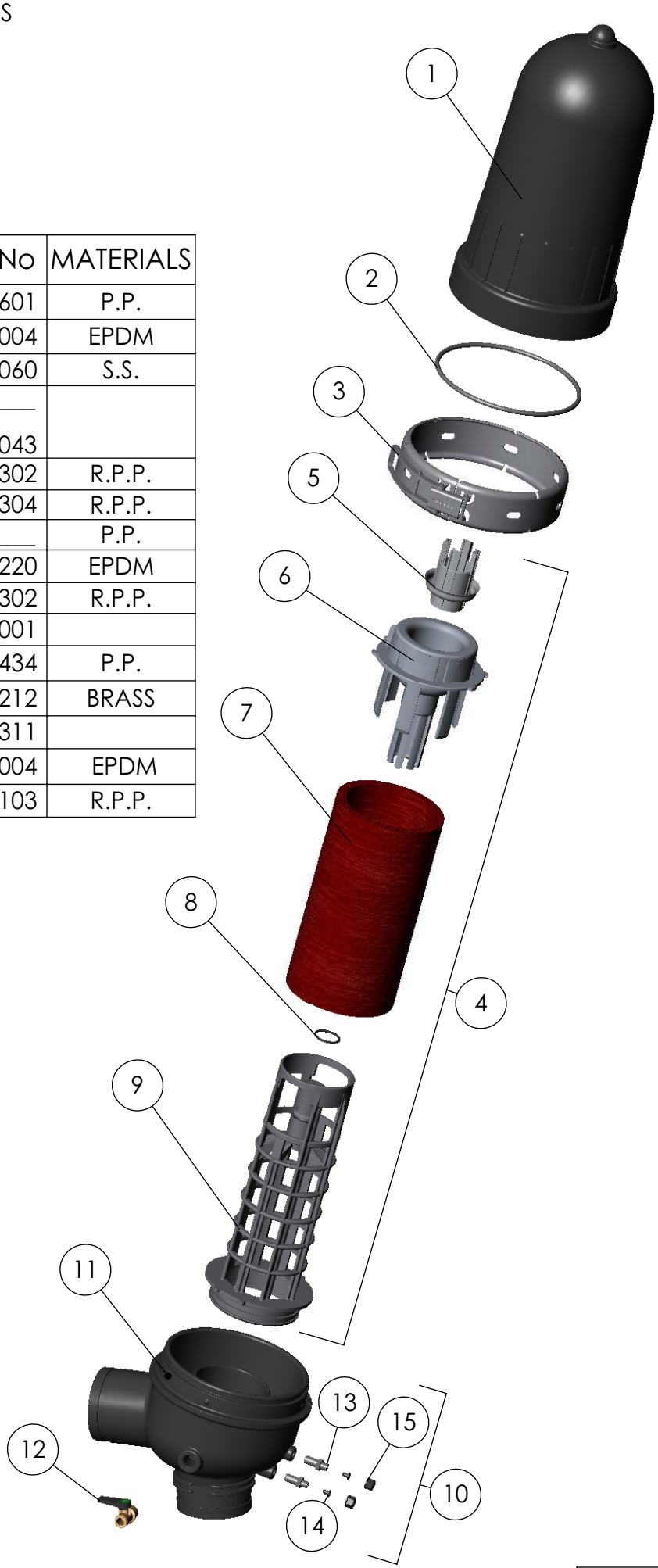
4” SuperAngle Filter is available in:
Polypropylene.

ARKAL 4" SUPER ANGLE FILTER

Cat. no. 1410 1___ VICTAULIC ENDS

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0601	P.P.
2	COVER SEAL	5005 0004	EPDM
3	CLAMP	5042 0060	S.S.
4	FILTER ELEMENT FILTER ELEMENT (W/O DISC SET)	2140 2___ 2199 0043	
5	SPINE TIGHTENING NUT	2506 0302	R.P.P.
6	SPINE CAP	2506 0304	R.P.P.
7	DISC SET	2033 2___	P.P.
8	"O" RING 2-200	5003 2220	EPDM
9	SPINE 99	2502 0302	R.P.P.
10	FILTER BODY COMPLEX	2247 1001	
11	FILTER BODY VIC.	2500 0434	P.P.
12	1/2" TAP	5054 0212	BRASS
13	NIPPLE 1/4"	2530 0311	
14	GAUGE PORTS SEAL	5006 0004	EPDM
15	GAUGE PORTS NUT	2511 0103	R.P.P.



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE

ARKAL 4" SUPER ANGLE FILTER

Cat. no. 1410 5___ ARKAL FLANGES

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER	2501 0601	P.P.
2	COVER SEAL	5005 0004	EPDM
3	CLAMP	5042 0060	S.S.
4	FILTER ELEMENT FILTER ELEMENT (W/O DISC SET)	2140 2___ 2199 0043	
5	SPINE TIGHTENING NUT	2506 0302	R.P.P.
6	SPINE CAP	2506 0304	R.P.P.
7	DISC SET	2033 2___	P.P.
8	"O" RING 2-200	5003 2220	EPDM
9	SPINE 99	2502 0302	R.P.P.
10	FILTER BODY COMPLEX+AKF	2247 5001	
11	FILTER BODY VIC.	2500 0434	P.P.
12	4" RING FLANGE	2510 0425	R.P.A.
13	CONE FLANGE	2507 0402	POM
14	4" GASKET	5005 2014	EPDM
15	4" ARKAL FLANGE	2253 0425	
16	1/2" TAP	5054 0212	BRASS
17	GAUGE PORTS SEAL	5006 0004	EPDM
18	GAUGE PORTS NUT	2511 0103	R.P.P.

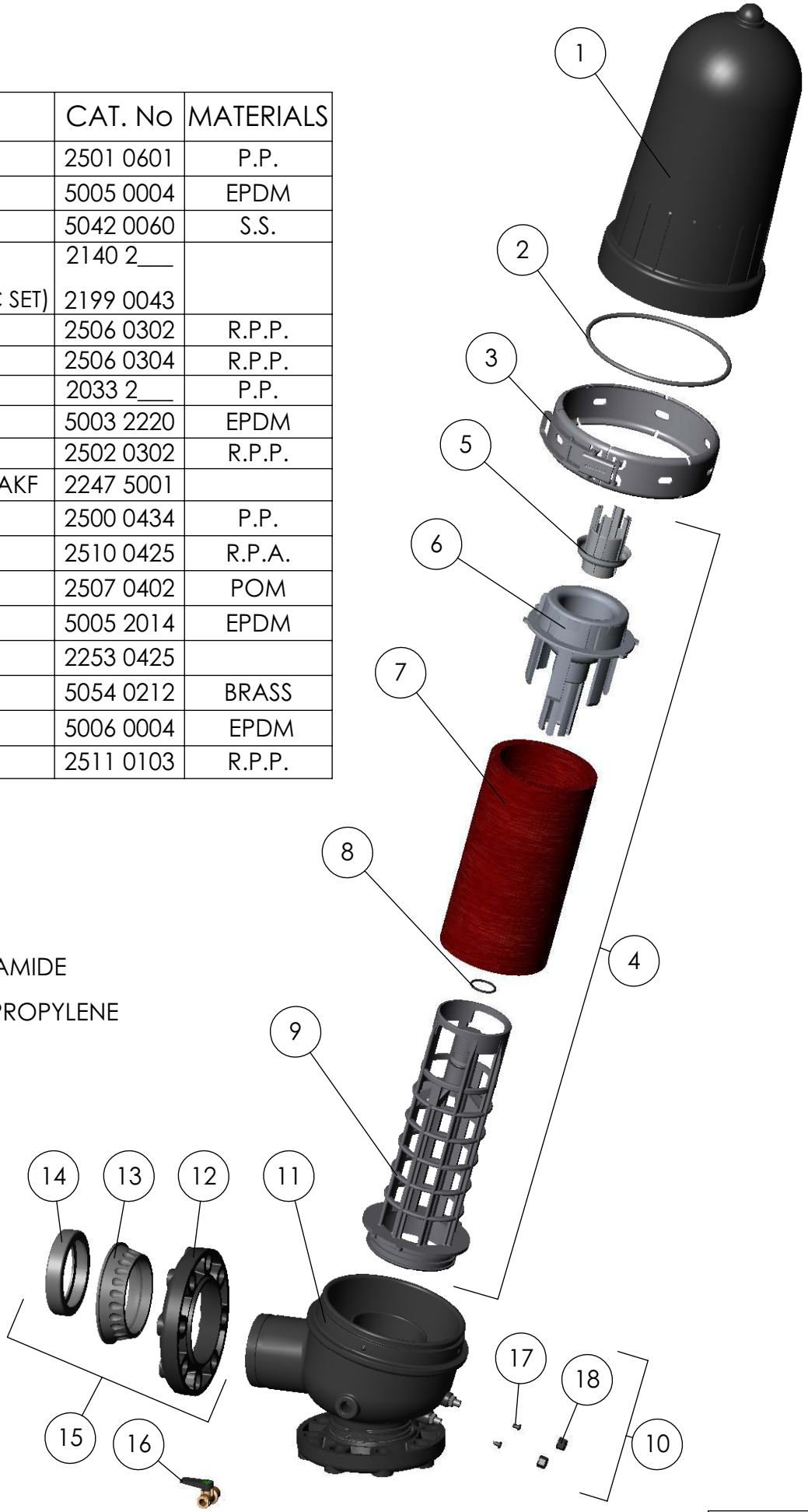
MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) P.C. - POLYCARBONATE



4" Super Leader

M a n u a l D i s c F i l t e r

Features

- High flow capacity
- Durable filter element
- Corrosion free
- All Polypropylene
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	110	**in**	4
Filtration surface area	**cm²**	3,704	**in²**	574
Filtration volume	**cm³**	3,548	**in³**	216
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

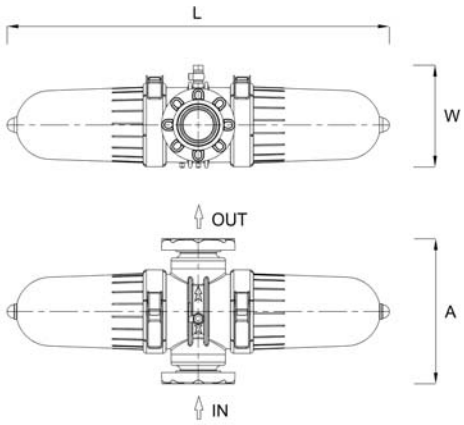
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	110	484
	Average	77	339
55 µ	Good	60	264
	Average	42	185
20 µ	Good	38	167
	Average	26	114

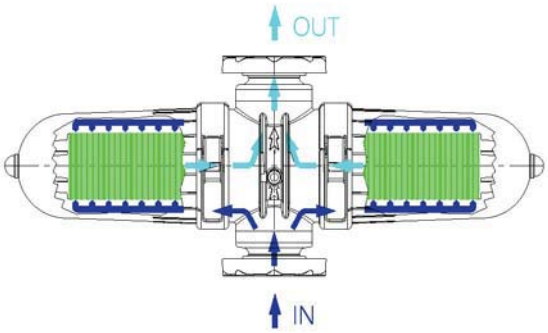
4'' Super Leader

Manual Disc Filter

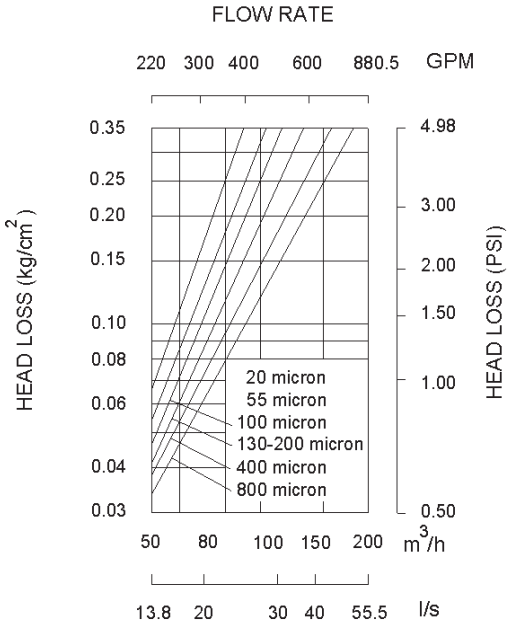
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	110	**inch**	4
L Length	**mm**	1188	**inch**	46 25/32
W Width	**mm**	319	**inch**	12 9/16
A	**mm**	445	**inch**	17 1/2
Shipping weight (approx.)	**kg**	28.8	**lbs**	63.5





Head Loss Chart, Clean State



4'' Super Leader Filter is available in:
Polypropylene.

ARKAL 4" SUPER LEADER" FILTER

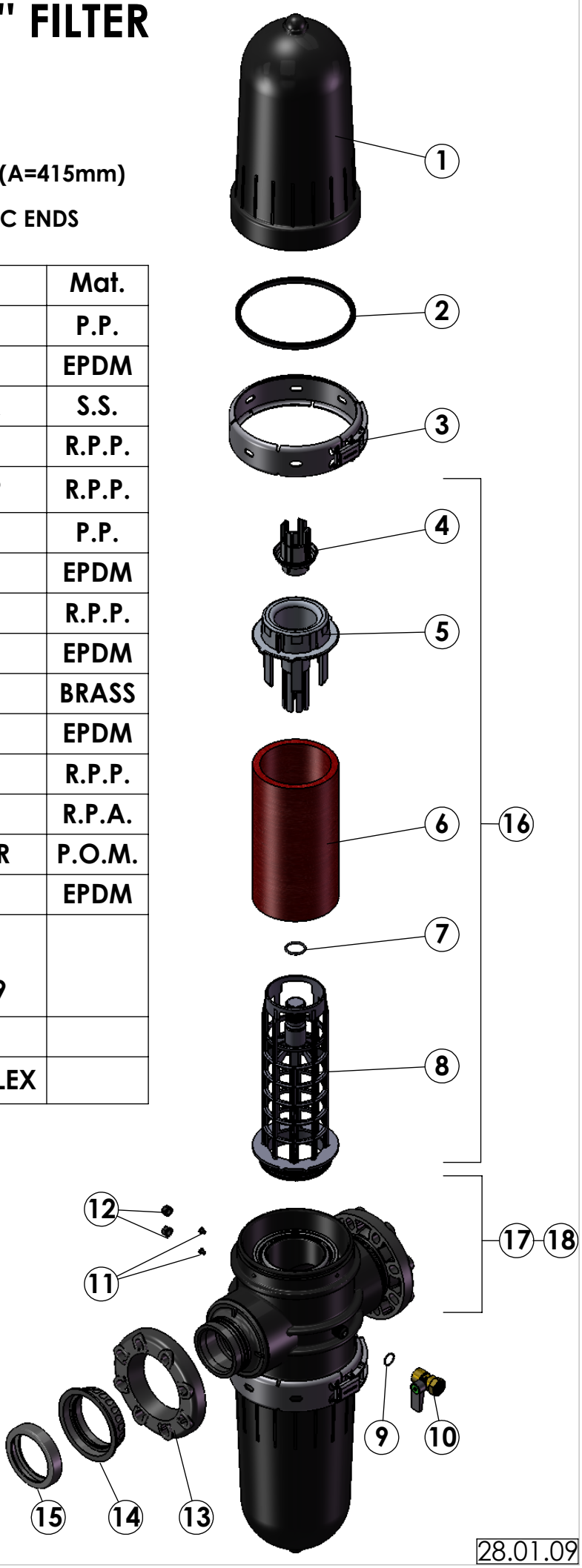
Cat. no. 1440 1___ VICTAULIC ENDS

1440 5___ A.K. 6" FLANGE

1441 1___ VICTAULIC ENDS(A=415mm)
FOR RETROFIT OF
4" "V" FILTER WITH VICTAULIC ENDS

PARTS LIST

No:	Cat. No.:	Description	Mat.
1	2501 0601	FILTER COVER	P.P.
2	5005 0004	3"-4"HYDRAULIC SEAL	EPDM
3	5042 0060	CLAMP F/SUPER LEADER	S.S.
4	2506 0302	SPINE TEGHTENING NUT	R.P.P.
5	2506 0304	SPINE TIGHTENING CAP	R.P.P.
6	2033 2___	3-4"SK DISC SET	P.P.
7	5003 2220	O-RING 2-220 EPDM	EPDM
8	2502 0302	3"-4" SPINE-99	R.P.P.
9	5003 2311	O-RING 2-311 EPDM	EPDM
10	5054 0112	3/4" -SN TAP	BRASS
11	5006 0004	GAUGE PORT SEAL	EPDM
12	2511 0103	GAUGE PORT NUT	R.P.P.
13	2510 0425	4" AK FLANGE	R.P.A.
14	2507 0402	4"AK FLAN.RING STOPPER	P.O.M.
15	5005 2014	4" SEAL FOR Q/F	EPDM
16	2140 2___ 2199 0043	3-4"FILTER ELEMENT 3"-4" SPINE COMPLEX-99	
17	2245 0001	4"SUP.BODY COMPLEX	
18	2245 0002	4"SUP.BODY SHORT COMPLEX	



MATERIALS:

1) P.P. - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) P.O.M.- POLYACETAL

6" Super Leader

M a n u a l D i s c F i l t e r

Features

- High flow capacity
- Durable filter element
- Corrosion free
- All Polypropylene
- Precise disc filtration

Technical Data

	METRIC		US	
Connection diameter	**mm**	160	**in**	6
Filtration surface area	**cm²**	3,704	**in²**	574
Filtration volume	**cm³**	3,548	**in³**	216
Pressure rating	**bar**	10	**psi**	145
Max. temp.	**⁰C**	70	**⁰F**	158

Maximum Filtration Flow Rate / Water Quality

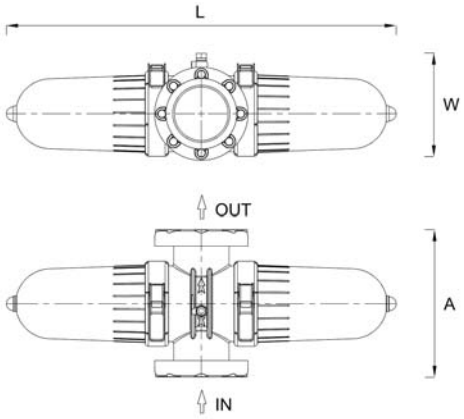
Filtration Grade	Water Quality	m³/h	gpm
400-130 µ	Good	140	616
	Average	98	431
55 µ	Good	70	308
	Average	49	216
20 µ	Good	42	185
	Average	29	128

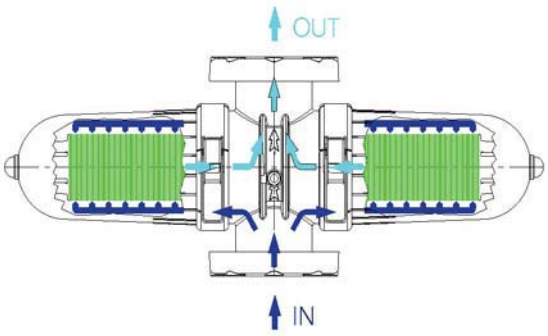
6'' Super Leader

Manual Disc Filter

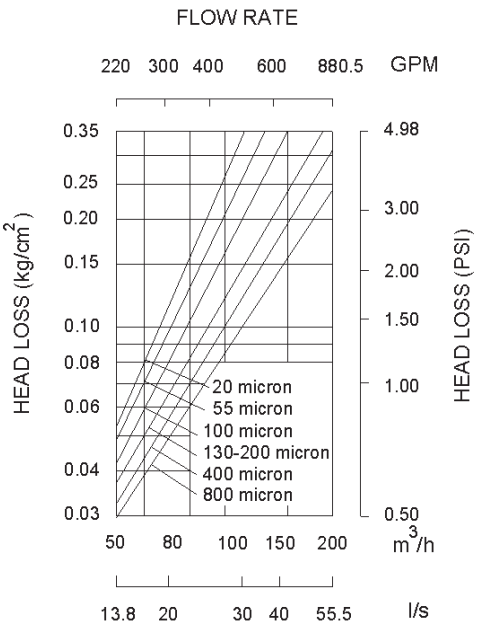
Dimensions and Weights

D Inlet\Outlet diameter	**mm**	160	**inch**	6
L Length	**mm**	1188	**inch**	46 7/32
W Width	**mm**	319	**inch**	12 9/16
A	**mm**	415	**inch**	16 11/32
Shipping weight (approx.)	**kg**	30.4	**lbs**	67





Head Loss Chart, Clean State



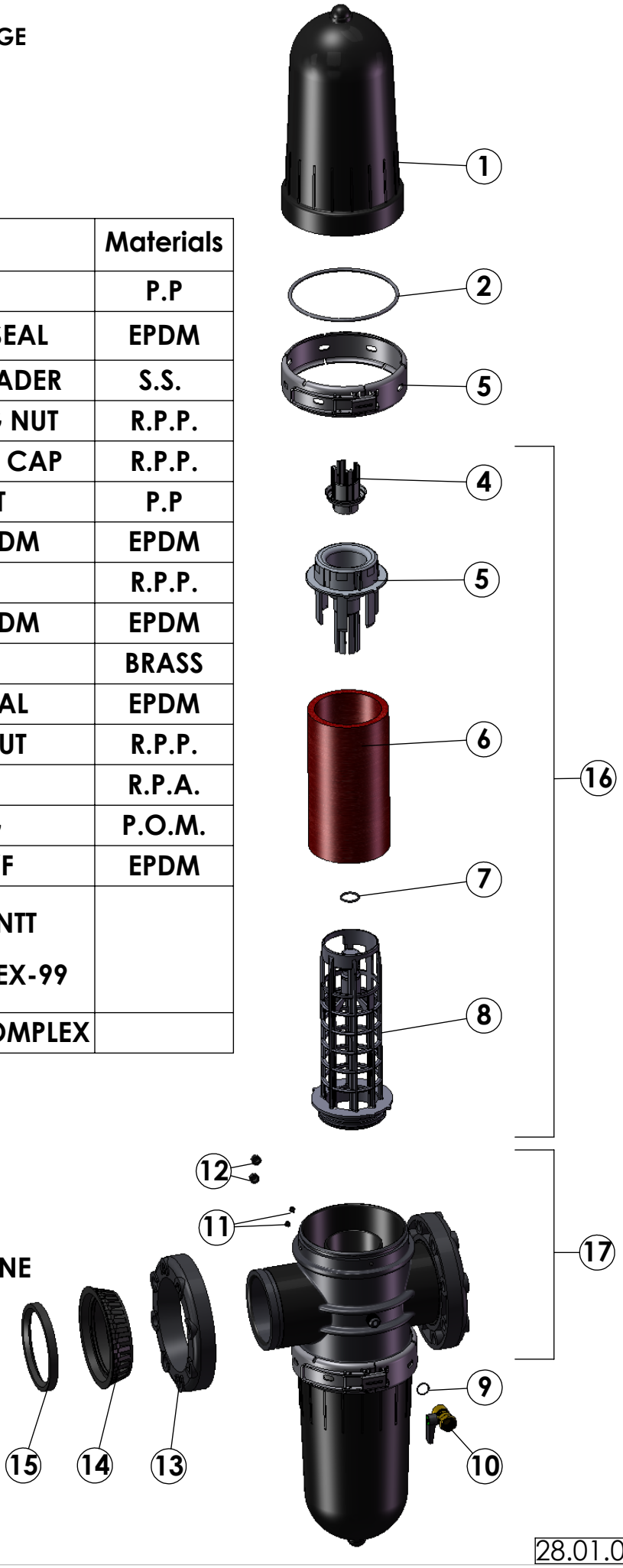
6'' Super Leader Filter is available in:
Polypropylene.

ARKAL 6" SUPER LEADER" FILTER

Cat. no. 1460 5___ A.K. 6" FLANGE

PARTS LIST

No.:	Cat. No.:	Description	Materials
1	2501 0601	FILTER COVER	P.P
2	5005 0004	3"-4"HYDRAULIC SEAL	EPDM
3	5042 0060	CLAMP F/SUPER LEADER	S.S.
4	2506 0302	SPINE TEGHTENING NUT	R.P.P.
5	2506 0304	SPINE TIGHTENING CAP	R.P.P.
6	2033 2___	3-4"SK DISC SET	P.P
7	5003 2220	O-RING 2-220 EPDM	EPDM
8	2502 0302	3"-4" SPINE-99	R.P.P.
9	5003 2311	O-RING 2-311 EPDM	EPDM
10	5054 0112	3/4" -SN TAP	BRASS
11	5006 0004	GAUGE PORT SEAL	EPDM
12	2511 0103	GAUGE PORT NUT	R.P.P.
13	2510 0625	6" AK FLANGE	R.P.A.
14	2507 0602	6" CONE RING	P.O.M.
15	5005 2016	6" SEAL FOR Q/F	EPDM
16	2140 2___ 2199 0043	3-4"FILTER ELEMENTT 3"-4" SPINE COMPLEX-99	
17	2246 0001	6"SUP.LEAD.BODY COMPLEX	



MATERIALS:

1) P.P - POLYPROPYLENE

2) R.P.A. - REINFORCED POLYAMIDE

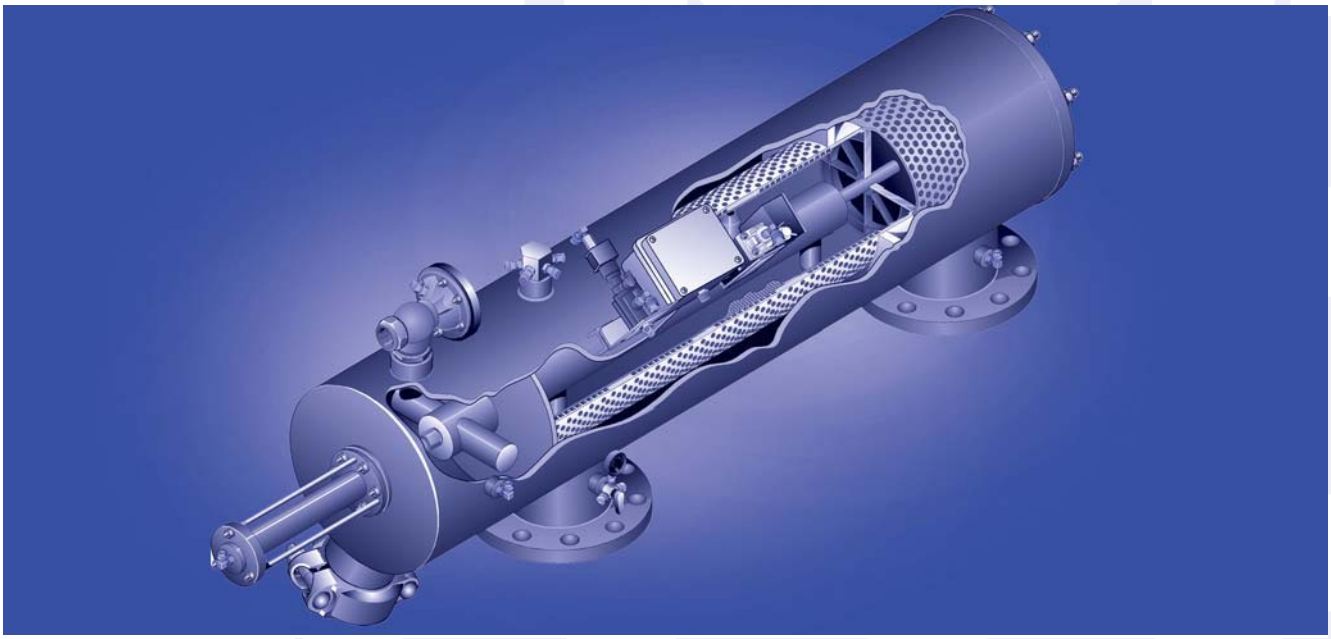
3) R.P.P. - REINFORCED POLYPROPYLENE

4) S.S. - STAINLESS STEEL

5) P.O.M.- POLYACETAL

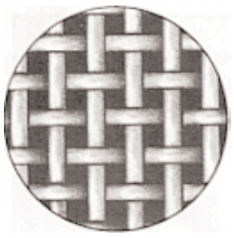
ARKAL
FILTRATION SYSTEMS

Screen Filters



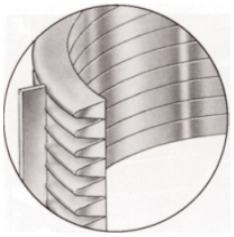
Screen Filtration Technology

- Screen filters can be built in almost any size and are commercially available for a wide range of flow rates.
- Screens are made either of a woven mesh, perforated plates or a wedge wire construction.
- A screen filter is a surface filter with only one retention point for solids. While dirty water passes through the filter vessel from the inside to the outside of the screen, the larger particles are physically prevented from passing and are retained on the screen.



Woven Screen

Perforated Screen



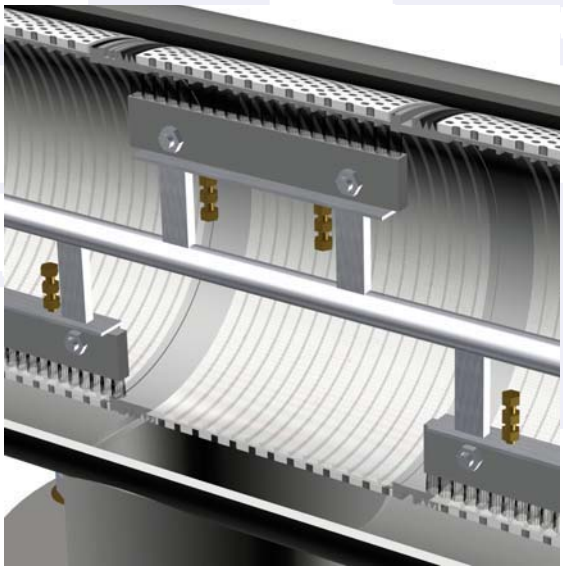
Wedge Wire Screen

Screen Filtration Technology

Screen sizes are available from 3000 to 20 micron.

The effective filtration area of a screen filter can be quite high and the initial "clean" head loss is quite low. The PD however, can build up quickly, making an effective cleaning schedule essential. Screen filters can be cleaned manually or automatically, like all other types of filter.

Manual cleaning usually involves removing the filter element and hosing/brushing it clean. Automatic cleaning is activated automatically as the particles, trapped on the inside surface of the fine screen create a differential pressure buildup. A number of cleaning methods are available:



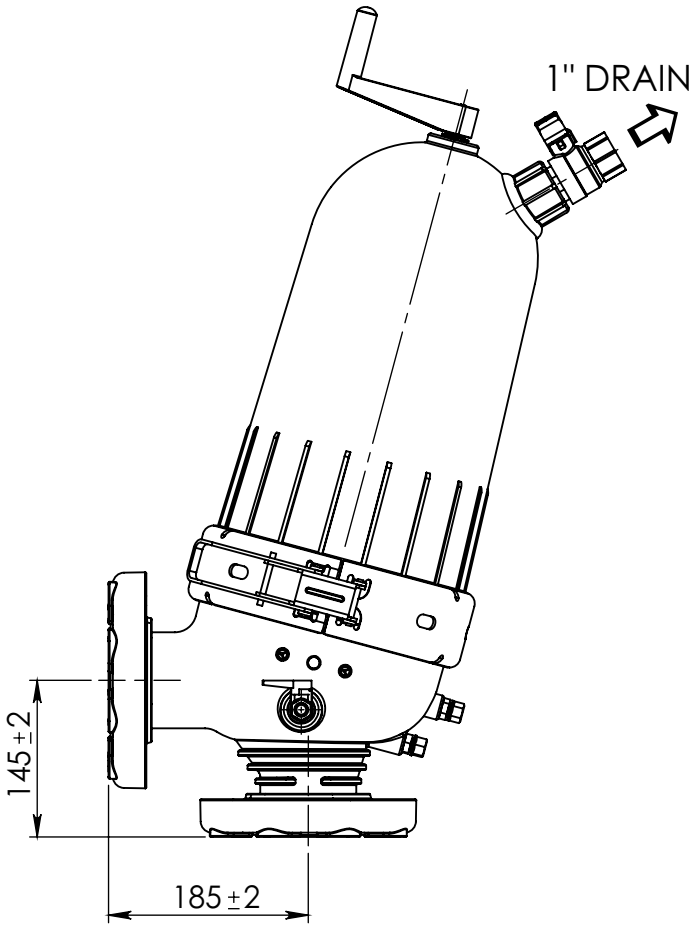
Rotating brush cleaning:

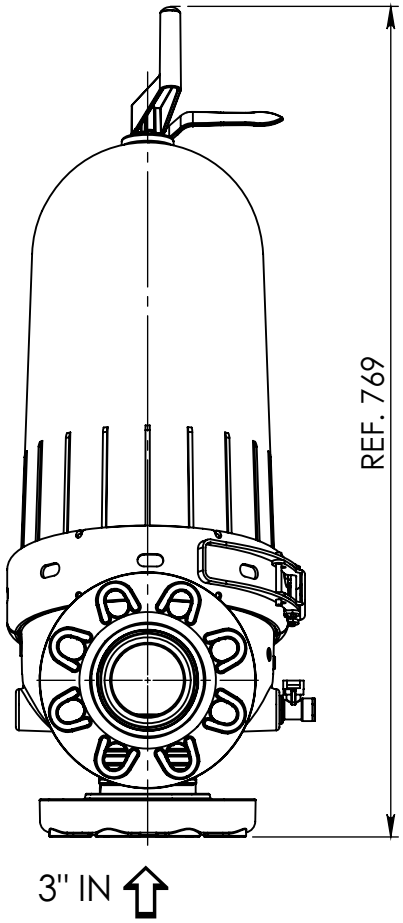
A brush rotates over the screen element dislodging the "filter cake" and a purge valve flushes the dirt out through a drain whilst the system is under pressure.

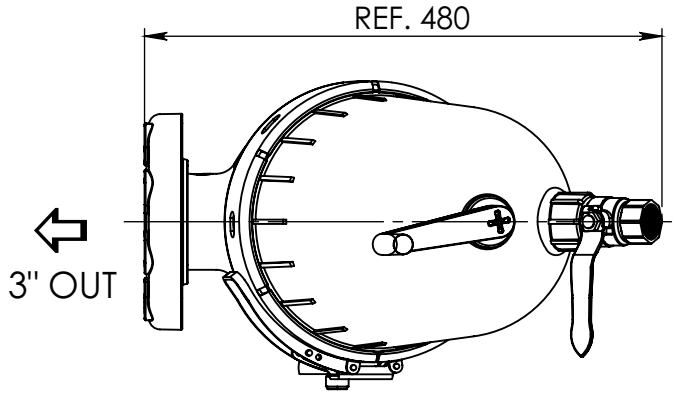
Vacuum scanner cleaning:

A rotating vacuum scanner lifts "filter cake" off the screen without actually making physical contact. The rotation and linear movement of the scanner allow it to reach every part of the screen in minimal time. This system can be very effective and does not damage the screen as a brush may do.

Semi-Automatic Screen Filters







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: ARKAL SEMI-AUTOMATIC 3" ANGLE SCREEN FILTER — PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 1373 5___

PATH: MASTERS – SOLID\ FILTERS COMPLETE\ 3 INCH FILTERS — FILE CODE: 1373 5___

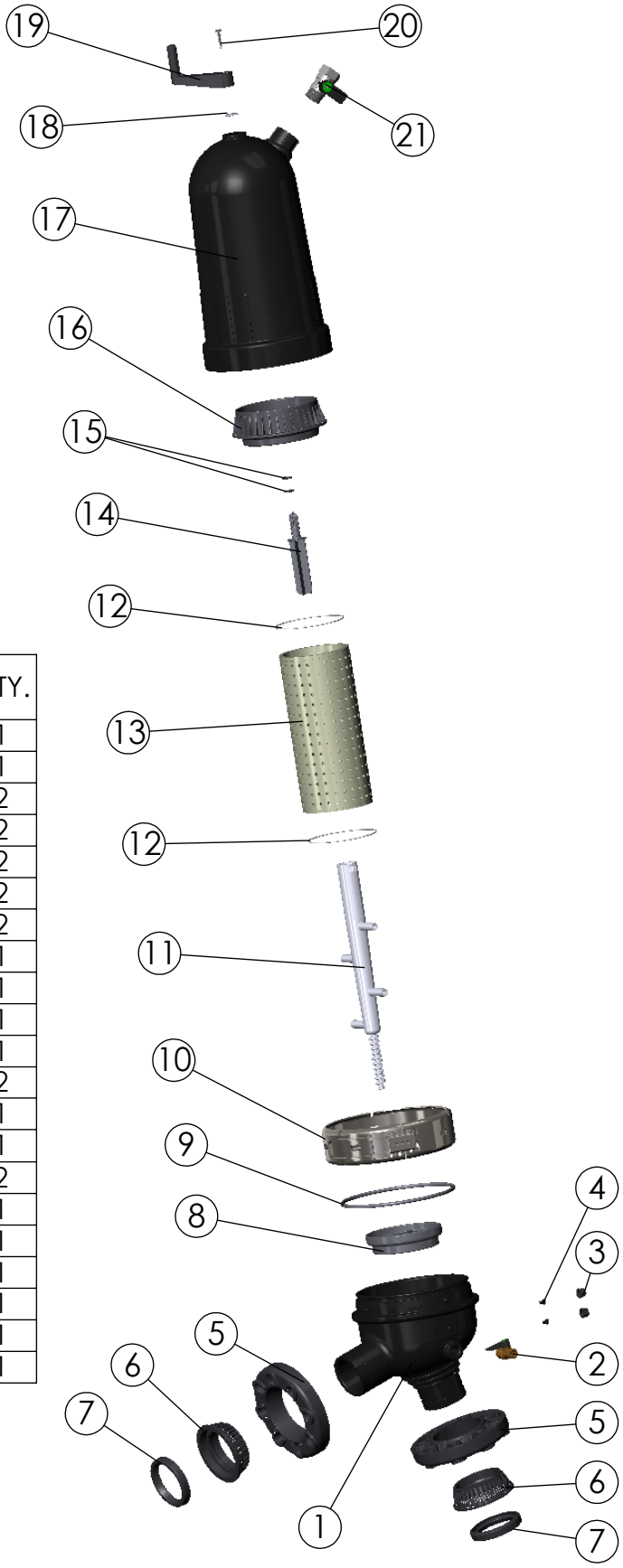
	NAME	DATE	SIGNATURE
	MARINA	29/06/2008	MARINA

	NAME	DATE
DRAWN	OLEG	29/06/2008
CHECKED	OMRY	29/06/2008
APPROVED	OMRY	29/06/2008

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N:



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2500 0334	3" ANGLE BODY VIC	1
2	5054 0212	BALL TAP 1/4"x1/2	1
3	2511 0103	GAUGE PORT NUT	2
4	5006 0004	GAUGE PORT SEAL	2
5	2510 0325	3" LOOSE FLANGE	2
6	2507 0308	3" CONE RING	2
7	5005 2013	3" SEAL FOR Q/F	2
8	2503 0407	LOWER SEAT	1
9	5005 0004	3"-4" HYDRAULIC SEAL	1
10	5042 0060	CLAMP F/SUPER LEADER	1
11	2505 0403	DIRT COLLECTOR	1
12	5002 2250	SEAL FOR SCREEN	2
13	5052 082_	SCREEN	1
14	2505 0402	DIRT COLLECTOR AXIS	1
15	5003 1403	O-RING 14x3 EPDM	2
16	2503 0408	UPPER SEAT	1
17	2202 0066	COVER ASSEMBLY	1
18	2507 0409	1" CLAMPING DISK	1
19	2530 0409	HANDLE	1
20	5040 1027	BOLT 6.3x38 SS304	1
21	5054 0016	SAGIV- SA 1" B.TAP	1

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: ARKAL SEMI-AUTOMATIC 3" ANGLE SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1373 5___

PATH: MASTERS – SOLID\ FILTERS COMPLETE\ 3 INCH FILTERS

FILE CODE: 1373 5___ EXPL

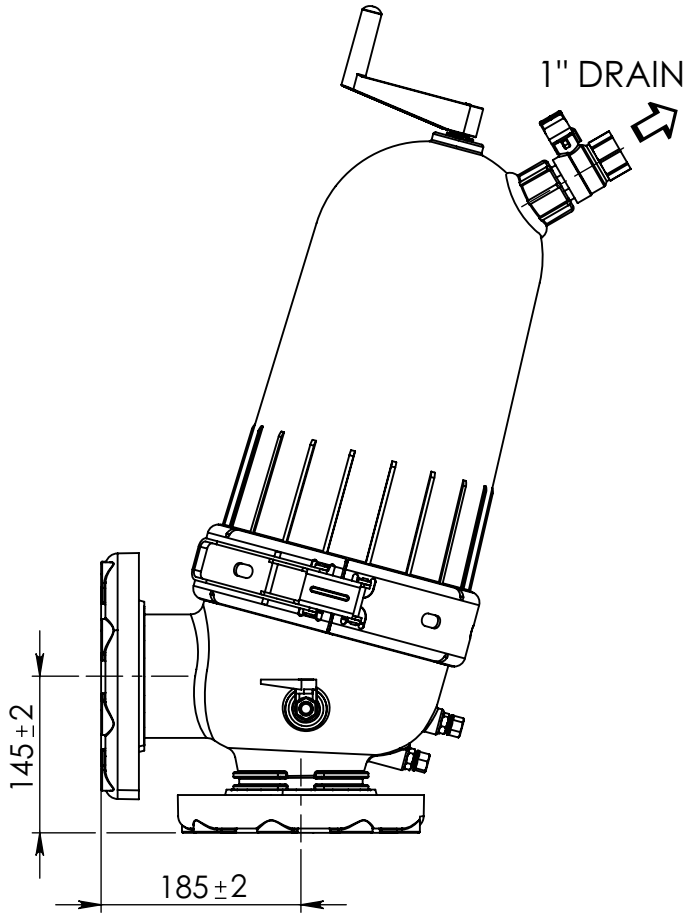
	NAME	DATE	SIGNATURE
	MARINA	12/05/2009	MARINA

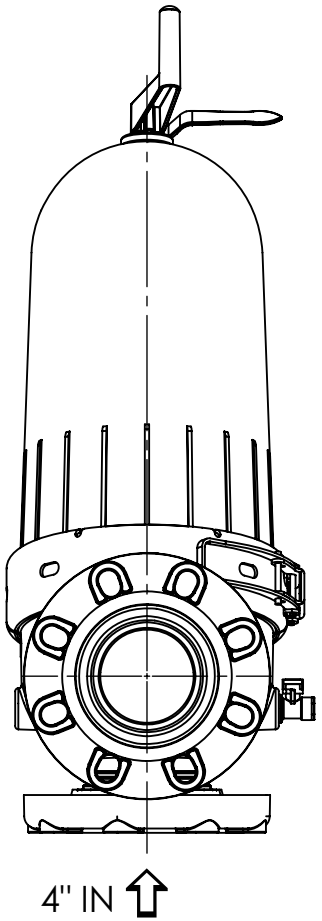
	NAME	DATE
DRAWN	OLEG	12/05/2009
CHECKED	OMRY	12/05/2009
APPROVED		

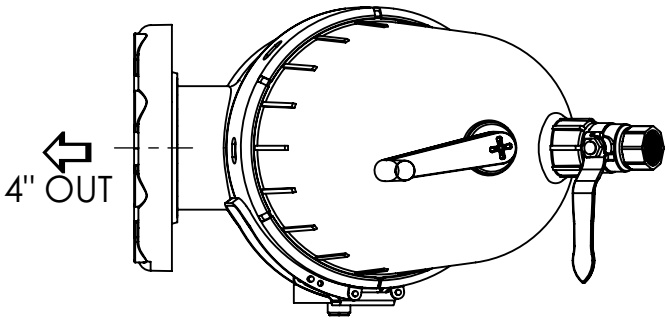
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-2S

DRAWER N:







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: ARKAL SEMI-AUTOMATIC 4" ANGLE SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1413 5___

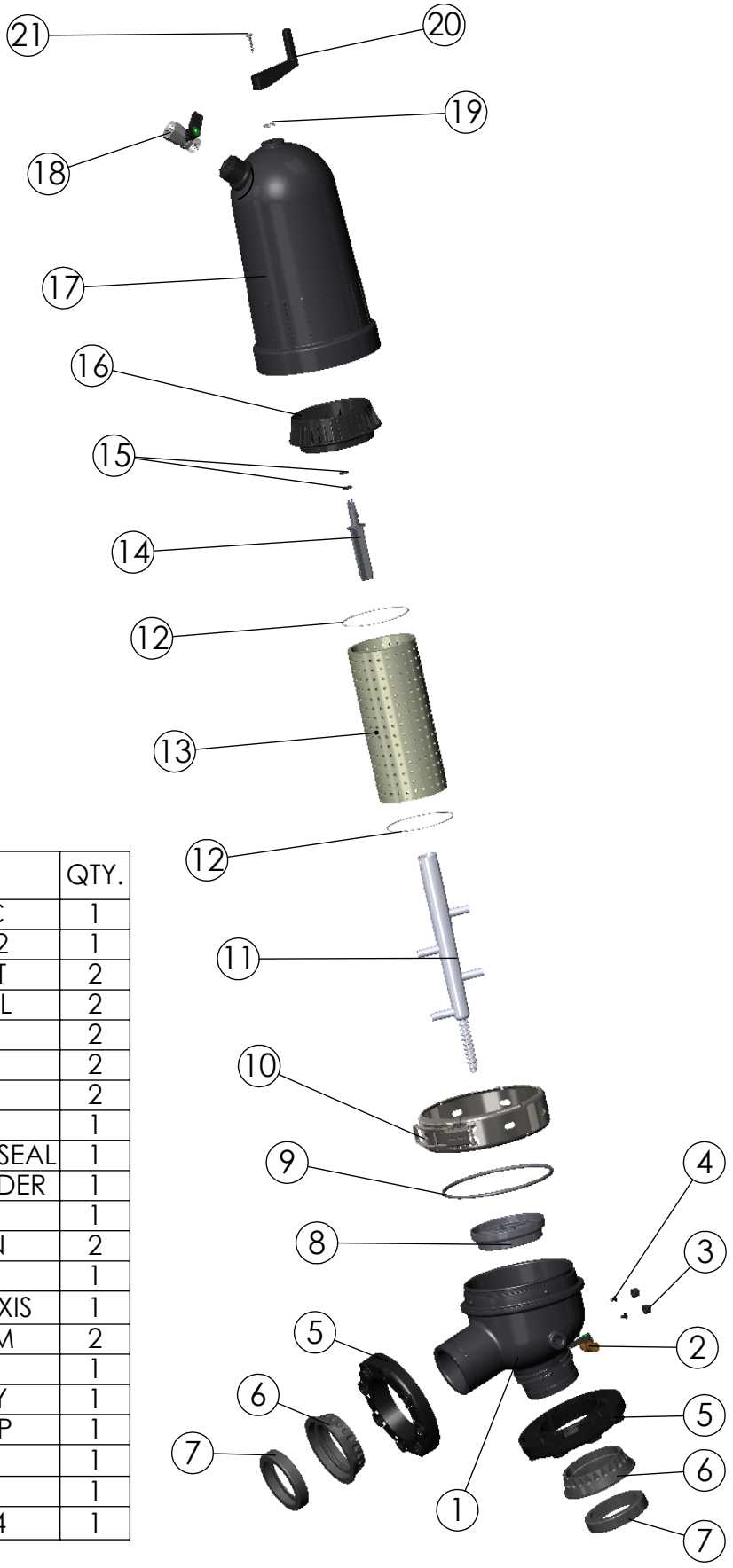
PATH	FILE CODE	NAME	DATE	SIGNATURE
MASTERS – SOLID\ FILTERS COMPLETE\SCREEN FILTERS\ SEMI-AUTOMATIC 4" ANGLE SCREEN FILTER	1413 5___	MARINA	29/06/2008	MARINA

	NAME	DATE
DRAWN	OLEG	29/06/2008
CHECKED	OMRY	29/06/2008
APPROVED	OMRY	29/06/2008

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N:



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2500 0434	4" ANGLE BODY VIC	1
2	5054 0212	BALL TAP 1/4"x1/2	1
3	2511 0103	GAUGE PORT NUT	2
4	5006 0004	GAUGE PORT SEAL	2
5	2510 0425	4" LOOSE FLANGE	2
6	2507 0402	4" CONE RING	2
7	5005 2014	4" SEAL FOR Q/F	2
8	2503 0407	LOWER SEAT	1
9	5005 0004	3"-4" HYDRAULIC SEAL	1
10	5042 0060	CLAMP F/SUPER LEADER	1
11	2505 0403	DIRT COLLECTOR	1
12	5002 2250	SEAL FOR SCREEN	2
13	5052 082_	SCREEN	1
14	2505 0402	DIRT COLLECTOR AXIS	1
15	5003 1403	O-RING 14x3 EPDM	2
16	2503 0408	UPPER SEAT	1
17	2202 0066	COVER ASSEMBLY	1
18	5054 0016	SAGIV-SA 1" B. TAP	1
19	2507 0409	CLAMPING DISK	1
20	2530 0409	HANDLE	1
21	5040 1027	BOLT 6.3x38 SS304	1

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: ARKAL SEMI-AUTOMATIC 4" ANGLE SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1413 5___

PATH	FILE CODE		NAME	DATE	SIGNATURE
MASTERS – SOLID\FILTERS COMPLETE\4 INCH FILTERS\4" SEMI AUTOMATIC	1413 5___	EXPL	MARINA	12/05/2009	MARINA

	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	OLEG	12/05/2009		DISK-2S
CHECKED	OMRY	12/05/2009		DRAWER N:
APPROVED	OMRY	12/05/2009		

Arkal Filtration Systems

Semi-Automatic Suction Screen Filters

3"-4” Angle

Service & Maintenance Manual

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

Safety Instructions

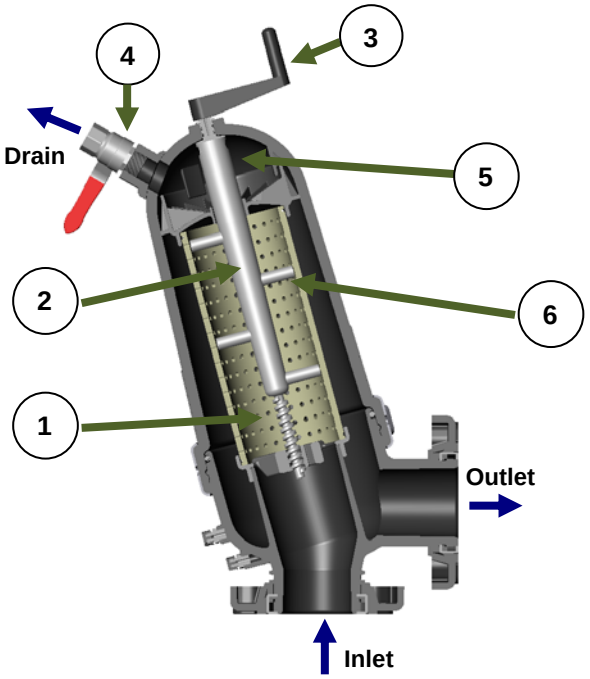
Prior to installation or handling of the filter, read the Installation and Operation Instructions carefully.

1. Take safety precautions while lifting, transporting or installing the filter.
2. Confirm that the total filter weight meets the support construction requirements.
3. Prior to installation, make sure that the line pressure matches the filter's operational pressure.
4. Check that all filter flanges are secured properly.
5. Make sure that the filter is drained prior to servicing.
6. During filter maintenance use original parts only.
7. Changes or modifications to the filtration equipment are not allowed.
8. Do not perform any maintenance activities other than those specified in this manual.

Description

The Arkal's 3” - 4" Super Angle Semi-Automatic filters consists of the following major parts:

1. Screen
2. Dirt Collector
3. Handle
4. Flushing Ball Valve
5. Flushing Chamber
6. Nozzles



Operation Description

Filtration Mode

Water enters the filter through the “Inlet”. Water then reaches the screen (1), which purifies the flow by separating smaller particles from the water. As more water flows through, impurities build up on the screen. As the impurities on the screen accumulate, a pressure imbalance is built up between the internal section of the screen (1) and the external section of the screen.

Cleaning Process in Suction Type Filter

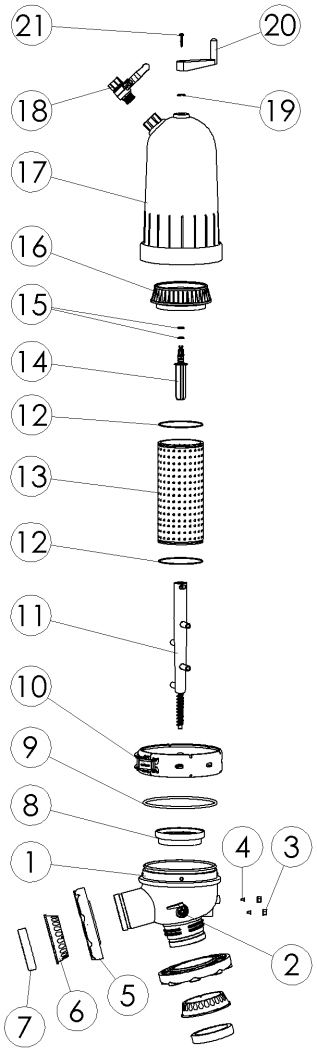
When the differential pressure (ΔP) reaches the determined value (no more than 0.8 bar), or according to the timetable specified by the operator, a series of events occurs while the water continues to flow into the system's units.

Before opening the flushing ball valve (4) the operator should check:

- ☒ That the dirt collector (2) is fully returned to the rear by turning the handle (3) clockwise until it stops.
- ☒ When the flushing ball valve (4) opens, water flows out.
- ☒ Pressure in the flushing chamber (5) and the dirt collector (2) is significantly reduced, which will cause suction through the collector's nozzles (6).
- ☒ Rotating the dirt collector (2) by the handle will cause full scanning of the screen (1) by the nozzles (6).
- ☒ The combination of linear movement and rotation cleans the whole internal screen (1) surface.
- ☒ The flushing cycle will take only a few seconds.

Spare Parts List 4"

No.	Cat. No.	Description	Materials
1	2500 0434	4" Angle filter body vic.	PP
2	5054 0212	½" ball valve	BRASS
3	2511 0103	Gauge port nut	RPP
4	5006 0004	Gauge port seal	EPDM
5	2510 0425	4" Loose flange	RPA
6	2507 0402	4" Cone ring	POM
7	5005 2014	4" Seal for Q/F	EPDM
8	2503 0407	Lower seat	RPA
9	5005 0004	3"-4" Hydraulic seal	EPDM
10	5042 0060	Clamp	SS
11	2505 0403	Dirt collector	RPA
12	5002 2250 250	Screen seal	EPDM
13	5052 0822	120 micron screen	PVC + SS
	5052 0825	200 micron screen	PVC + SS
14	2505 0402	Dirt collector axis	RPA
15	5003 1403	O-ring 14x3	EPDM
16	2503 0408	Upper seat	RPA
17	2202 0066	Cover assembly	PP
18	5054 0017	1" ball valve	BRASS
19	2507 0409	Clamping disk	RPA
20	2530 0409	Handle	RPA
21	5040 1027	Bolt 6.3x38	SS



Materials

RPP - Reinforced Polypropylene

PP - Polypropylene

RPA - Polyamide

POM - Polyacetal

SS - Stainless Steel

Filtration Grade Conversion Table

Micron	100	120	200	400
Mesh	140	120	80	40

General Technical Data

Max Pressure: 10 bar / 145 psi

Max. Temperature: 60 °C / 140 °F

Filtration Grades (currently): 400µ, 200µ, 120µ

Model Number	Conn. Size ØD (Inch)	Screen Area (Cm^2)	* Max. Flow Rate (m^3/h)	L (mm)	H (mm)	Weight (Kg)
AKSP3LT	3	1250	60	825	509	12
AKSP3LV	3	1250	60	789	509	12
AKSP3LF	3	1250	60	789	509	13
AKSP4LV	4	1250	90	789	509	12
AKSP4LF	4	1250	90	789	509	14

AKSP = Arkal Semi Automatic Polypropylene

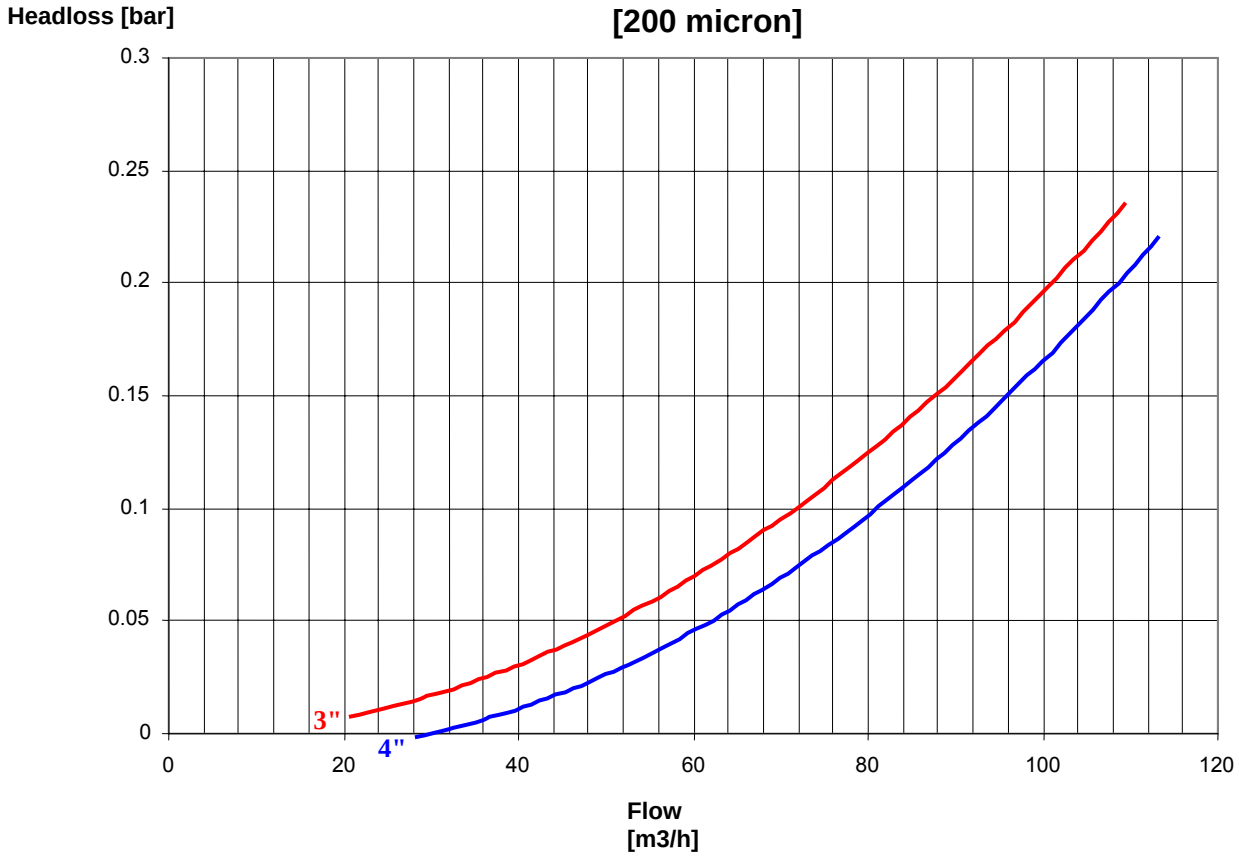
L = Angel Filter Connection

T = Threaded Filter Connection

V = Victaulic Filter Connection.

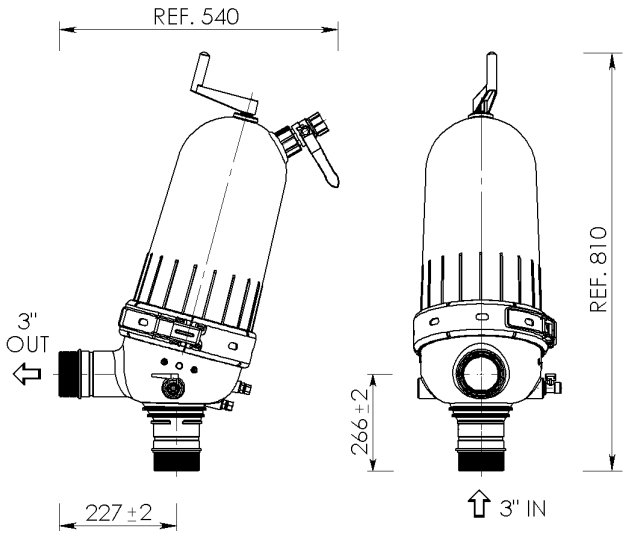
F = Flanged Filter Connection.

Headloss for ARKAL Semi Automatic Screen Filter

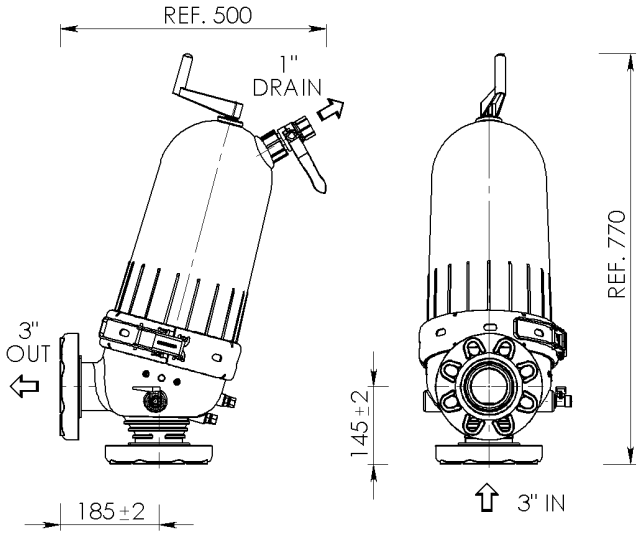


* Flow rate data is for high quality water at a filtration grade of 200 micron.

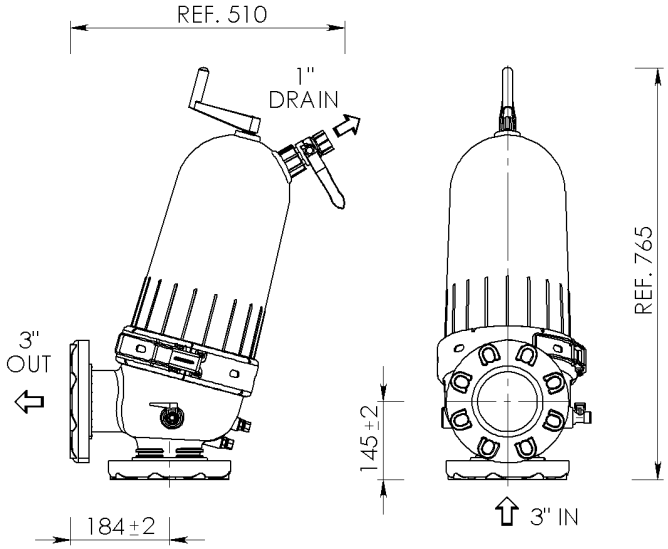
3" Threaded



3" Flange



4" Flange



Installation

1. Remove the assembled filter from the box.
2. Install the assembled filter on the inlet line and outlet line.
3. Connect the drainpipe to the flush ball valve outlet opening (at least 32 mm or 1” diameter and 5 m long). **Make sure that water runs freely out of the drainpipe.**
4. Check that all connections are secured properly.

Operation

1. Gradually open the inlet ball valve (If the outlet valve is already installed, then make sure that it is open).
2. Check the filter assembly and its connections for leaks.
3. Turn the handle counterclockwise until it stops and then do the same in the opposite direction (don’t use force).
4. Start the flush cycle by opening the flush ball valve and turn the handle until the dirt collector comes to a stop (don’t use force). When the dirt collector stops, the flushing valve can be closed.
5. After the filter is cleaned, make sure that the differential pressure between inlet and outlet does not exceed 0.1 bars.

Screen Removal and Assembly

1. Shut off the inlet water supply.
2. Open the drain ball valve in order to release the pressure.
3. Turn the handle clockwise until the end (until it's stopped).
4. Open and remove the clamp.
5. Holding the cover with two hands, shake it gently to the right and left until it's separated from the body. Keep the cover from falling off on its own by pulling it away from the filter body.
6. Remove the screen and wash the inner side of the screen with a water jet.
7. Place the screen firmly it's lower seat. Make sure that the seals are positioned right.
8. Assemble the cover to the filter body. Make sure that the screwing rod is in the center of the lower seat.
9. Secure the clamp.
10. Close the flushing ball valve.
11. Perform a flushing cycle to ensure that there are no leaks.

Periodic Checks

Periodically check the following at the beginning of each season:

1. Check for leaks.
2. Check the condition of the handle bearing and sealing. If any of the bearings are defective (oval), replace the defective bearing with a new one.
3. Check the condition of the fine screen assembly. If defective, replace the fine screen.
4. Check the height of the dirt collector suction nozzles. If defective, replace according

Troubleshooting

Leakage from the nut handle:

1. Check if the sealing tightening nut handle is turned to the end (without force).
2. If necessary, replace the sealing “o-ring “.

The handle does not turn:

1. Open the filter cover.
2. Check that hard particles are not trapped under the nozzles, release if necessary.
3. Check the condition of the sealing handle and the tightening nuts, and if necessary replace it, if necessary.

The handle turns but the filter is not clean:

1. Open the filter.
2. Check the height of the suction nozzles. If the nozzles are damaged, replace the dirt collector.
3. Remove the dirt collector
4. Check the hexagon hole in the upper side of the dirt collector. If it is damaged, replace the dirt collector.

Check the spiral thread on the upper side of the dirt collector. If it is damaged, replace the dirt collector.

Arkal Filtration Systems reserves the right to make changes and improvements with no prior notice to customers.

ARKAL FILTRATION SYSTEMS STANDARD INTERNATIONAL WARRANTY

ARKAL FILTRATION SYSTEMS (hereinafter -"ARKAL FILTRATION SYSTEMS") guarantees to the customers who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year as of the day it left ARKAL FILTRATION SYSTEMS premises, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

ARKAL FILTRATION SYSTEMS will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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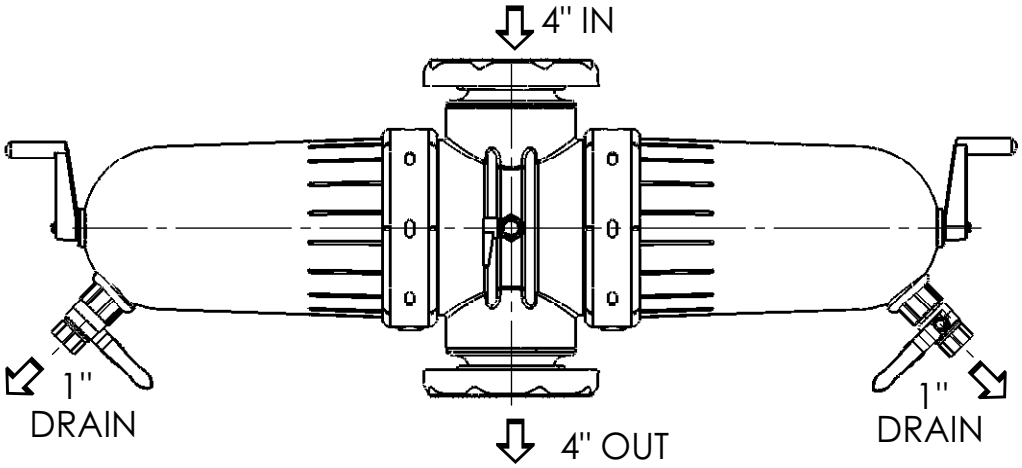
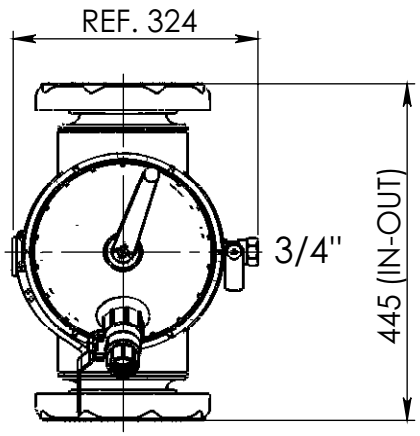
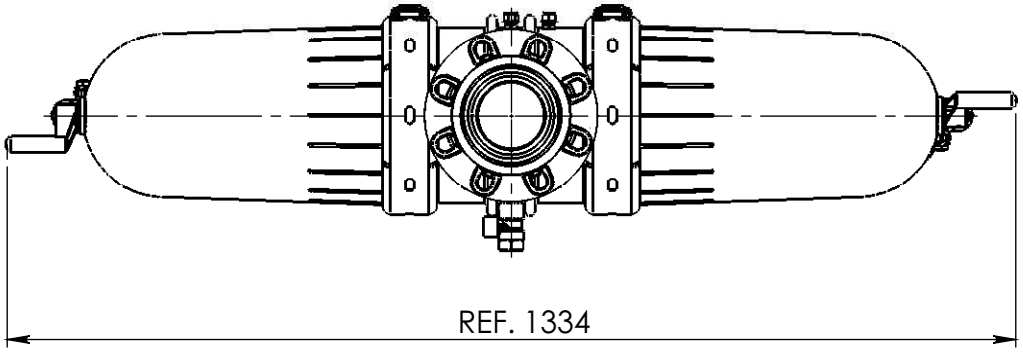
Email: filters@arkal.com Web: www.arkal-filters.com







MODIFIC.	DATE	DESCRIPTION	SIGN.

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FILTRATION SYSTEMS
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PROJECT: ARKAL SEMI-AUTOMATIC 4" SUPER LEADER SCREEN FILTER					PAGE 1 OF 1
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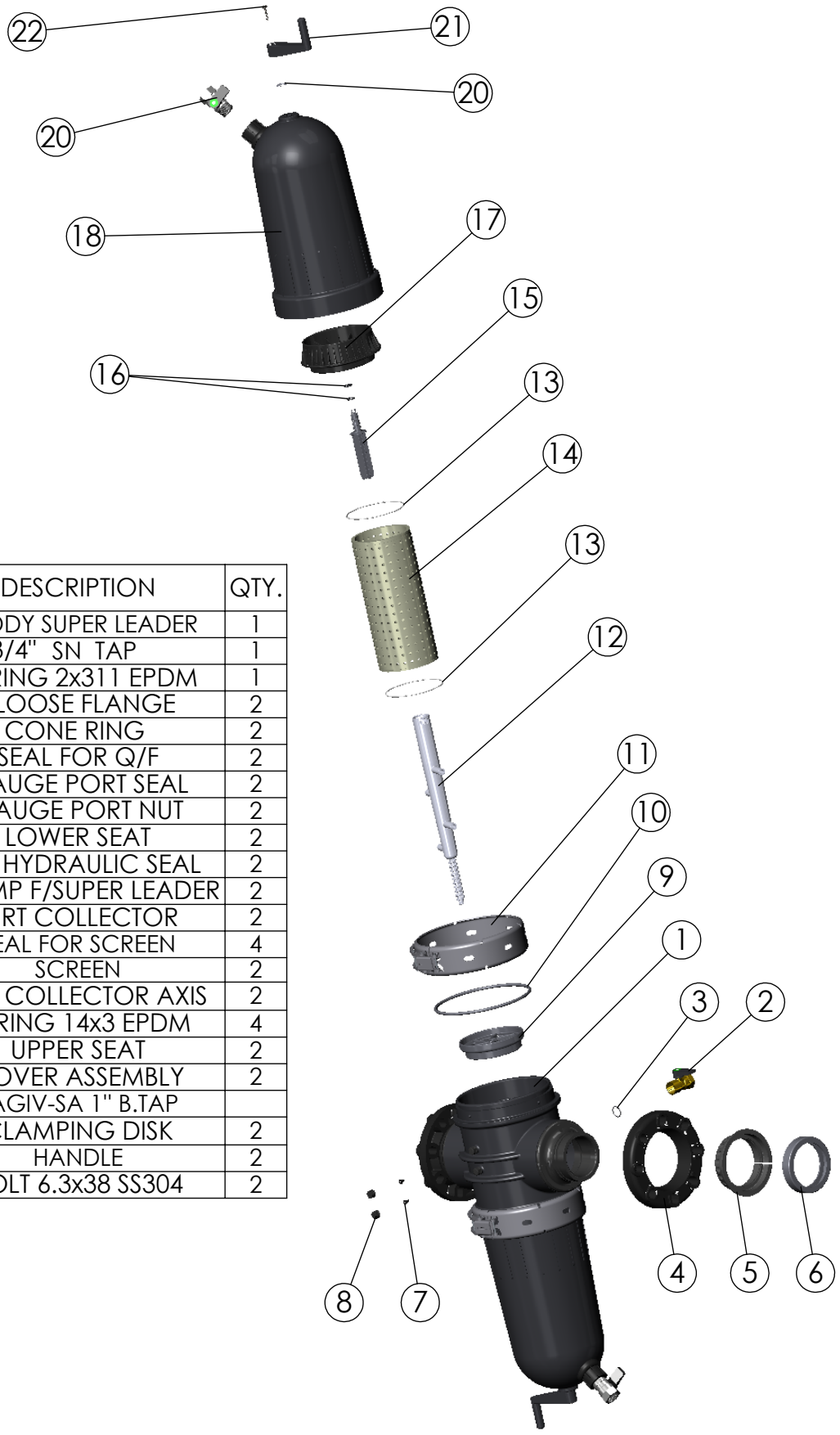

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2200 4445	4" BODY SUPER LEADER	1
2	5054 0112	3/4" SN TAP	1
3	5003 2311	O-RING 2x311 EPDM	1
4	2510 0425	4" LOOSE FLANGE	2
5	2507 0402	4" CONE RING	2
6	5005 2014	4" SEAL FOR Q/F	2
7	5006 0004	GAUGE PORT SEAL	2
8	2511 0103	GAUGE PORT NUT	2
9	2503 0407	LOWER SEAT	2
10	5005 0004	3"-4" HYDRAULIC SEAL	2
11	5042 0060	CLAMP F/SUPER LEADER	2
12	2505 0403	DIRT COLLECTOR	2
13	5002 2250	SEAL FOR SCREEN	4
14	5052 082_	SCREEN	2
15	2505 0402	DIRT COLLECTOR AXIS	2
16	5003 1403	O-RING 14x3 EPDM	4
17	2503 0408	UPPER SEAT	2
18	2202 0066	COVER ASSEMBLY	2
19	5054 0016	SAGIV-SA 1" B.TAP	
20	2507 0409	CLAMPING DISK	2
21	2530 0409	HANDLE	2
22	5040 1027	BOLT 6.3x38 SS304	2

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PROJECT: ARKAL SEMI-AUTOMATIC 4" SUPER LEADER SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

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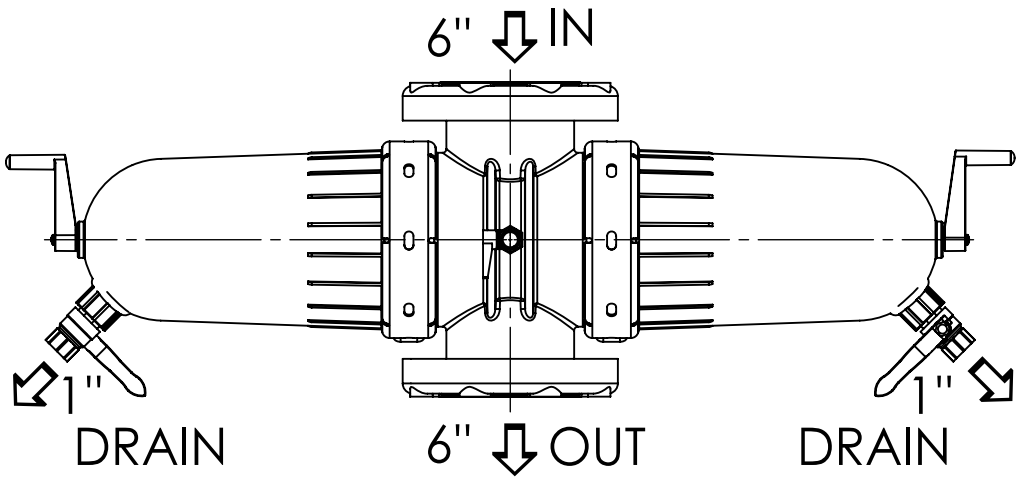

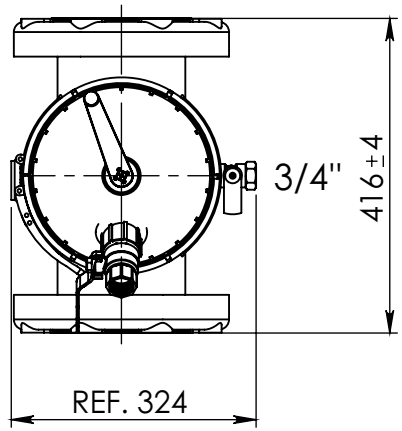

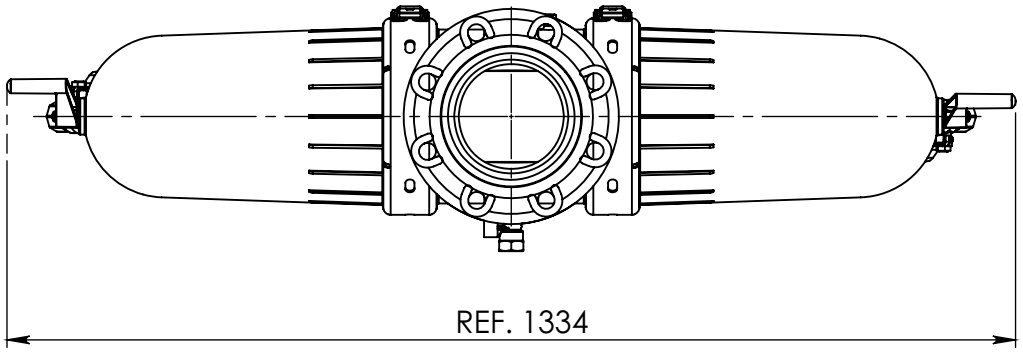

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: ARKAL SEMI-AUTOMATIC 6" SUPER LEADER SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1463 5___

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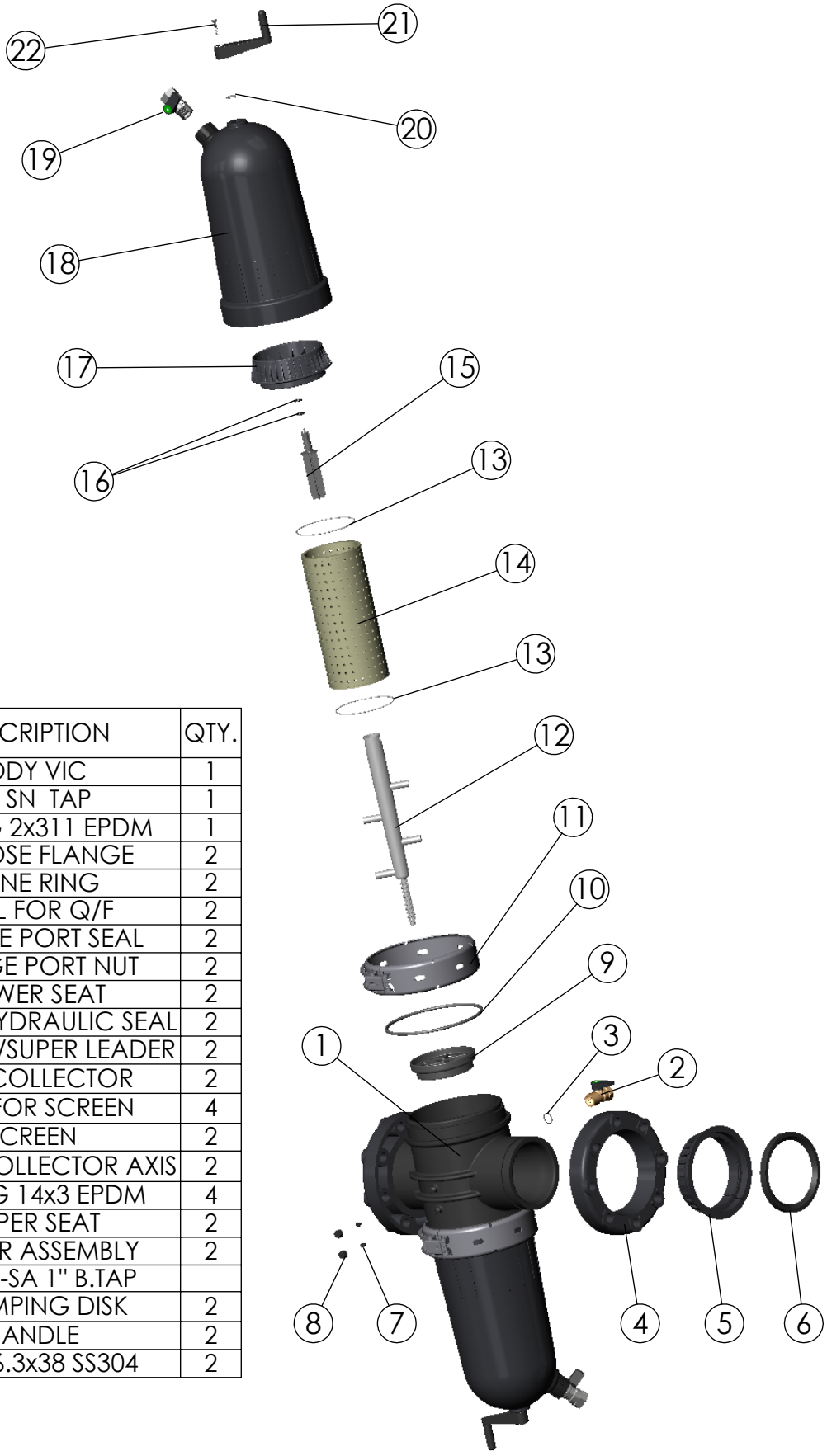

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2200 0600	6" BODY VIC	1
2	5054 0112	3/4" SN TAP	1
3	5003 2311	O-RING 2x311 EPDM	1
4	2510 0625	6" LOOSE FLANGE	2
5	2507 0602	6" CONE RING	2
6	5005 2016	6" SEAL FOR Q/F	2
7	5006 0004	GAUGE PORT SEAL	2
8	2511 0103	GAUGE PORT NUT	2
9	2503 0407	LOWER SEAT	2
10	5005 0004	3"-4" HYDRAULIC SEAL	2
11	5042 0060	CLAMP F/SUPER LEADER	2
12	2505 0403	DIRT COLLECTOR	2
13	5002 2250	SEAL FOR SCREEN	4
14	5052 082_	SCREEN	2
15	2505 0402	DIRT COLLECTOR AXIS	2
16	5003 1403	O-RING 14x3 EPDM	4
17	2503 0408	UPPER SEAT	2
18	2202 0066	COVER ASSEMBLY	2
19	5054 0016	SAGIV-SA 1" B.TAP	
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21	2530 0409	HANDLE	2
22	5040 1027	BOLT 6.3x38 SS304	2

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PROJECT: ARKAL SEMI-AUTOMATIC 6" SUPER LEADER SCREEN FILTER

PAGE 1 OF 1

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1463 5___

PATH	FILE CODE		NAME	DATE	SIGNATURE
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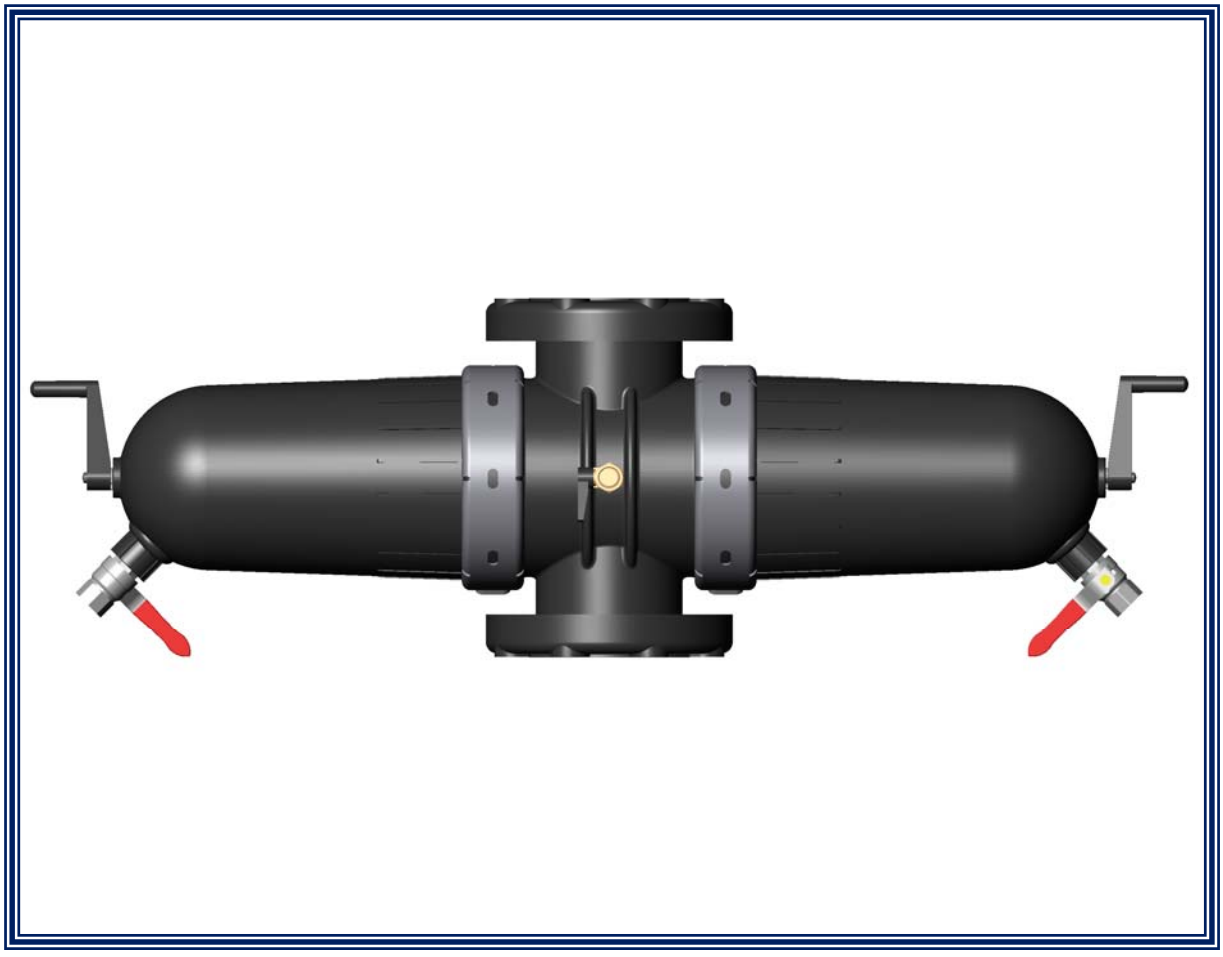
APPROVED				

Semi-Automatic Suction Screen Filters

4”-6” Twin

Service & Maintenance Manual



Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

Safety Instructions

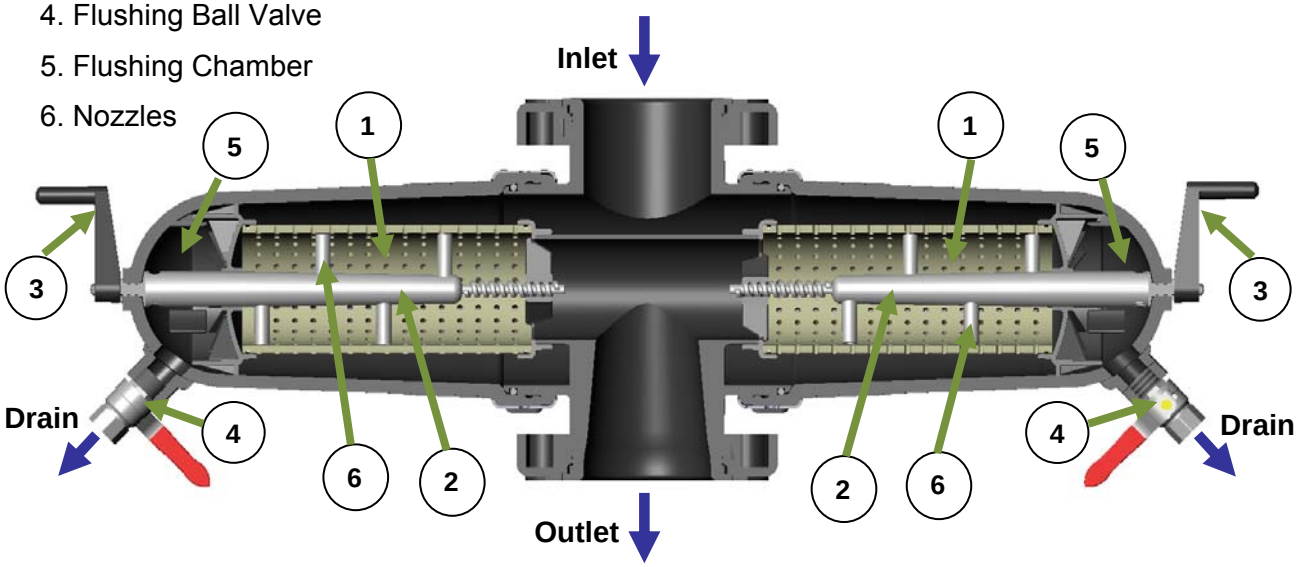
Prior to installation or handling of the filter, read the Installation and Operation instructions carefully.

1. Take safety precautions while lifting, transporting or installing the filter.
2. Confirm that the total filter weight meets the support construction requirements.
3. Prior to installation, make sure that the line pressure matches the filter's operational pressure.
4. Check that all filter flanges are secured properly.
5. Make sure that the filter is drained prior to servicing.
6. During filter maintenance use original parts only.
7. Changes or modifications to the filtration equipment are not allowed.
8. Do not perform any maintenance activities other than those specified in this manual.

Description

The Arkal's 4” - 6" Twin Semi-Automatic filters consists of the following major parts:

1. Screen
2. Dirt Collector
3. Handle
4. Flushing Ball Valve
5. Flushing Chamber
6. Nozzles



Operation Description

Filtration Mode

Water enters the filter through the “Inlet”. Water then reaches the screen (1), which purifies the flow by separating smaller particles from the water. As more water flows through, impurities build up on the screen. As the impurities on the screen accumulate, a pressure imbalance is built up between the internal section of the screen (1) and the external section of the screen.

Cleaning Process in Suction Type Filter

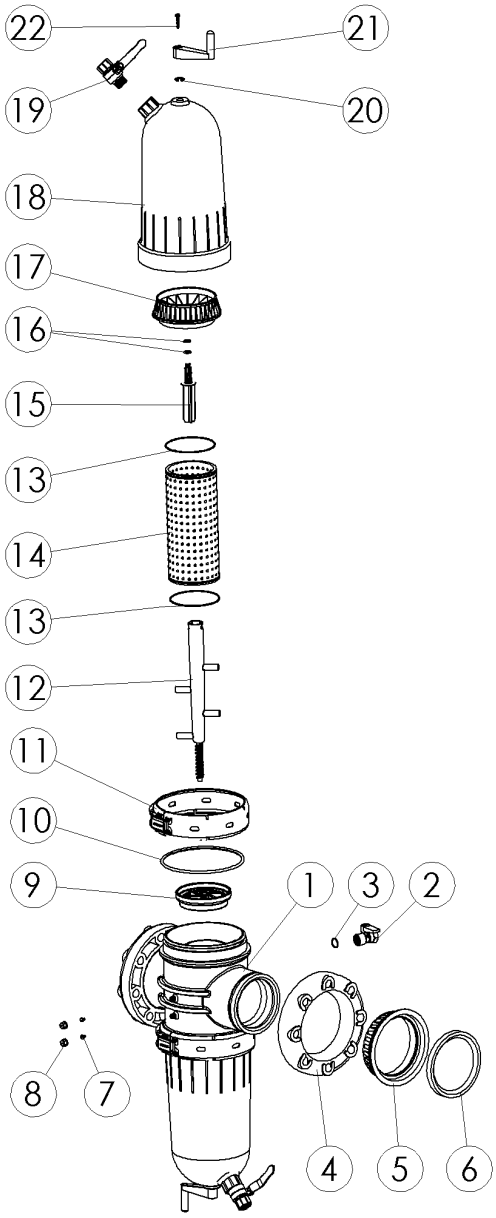
When the differential pressure (ΔP) reaches the determined value (no more than 0.8 bar), or according to the timetable specified by the operator, a series of events occurs while the water continues to flow into the system's units.

Before opening the flushing ball valve (4) the operator should check:

- ☒ That the dirt collector (2) is fully returned to the rear by turning the handle (4) clockwise until it stops.
- ☒ When the flushing ball valve (4) opens, water flows out.
- ☒ Pressure in the flushing chamber (5) and the dirt collector (2) is significantly reduced, which will cause suction through the collector's nozzles (6).
- ☒ Rotating the dirt collector (2) by the handle will cause full scanning of the screen (1) by the nozzles (6).
- ☒ The combination of linear movement and rotation cleans the whole internal screen (1) surface.
- ☒ The flushing cycle will take only a few seconds.

Spare Parts List 6"

No.	Cat. No.	Description	Material
1	2200 0600	6" double filter body vic.	PP
2	5054 0112	¾" ball valve	BRASS
3	5003 2311	O-ring 2x311	EPDM
4	2510 0625	6" Loose flange	RPA
5	2507 0602	6" Cone ring	POM
6	5005 2016	6" Seal for Q/F	EPDM
7	5006 0004	Gauge port seal	EPDM
8	2511 0103	Gauge port nut	RPP
9	2503 0407	Lower seat	RPA
10	5005 0004	3"-4" Hydraulic seal	EPDM
11	5042 0060	Clamp	SS
12	2505 0403	Dirt collector	RPA
13	5002 2250 250	Screen seal	EPDM
14	5052 0822	120 micron screen	PVC + SS
	5052 0825	200 micron screen	PVC + SS
15	2505 0402	Dirt collector axis	RPA
16	5003 1403	O-ring 14x3	EPDM
17	2503 0408	Upper seat	RPA
18	2202 0066	Cover assembly	PP
19	5054 0017	1" ball valve	BRASS
20	2507 0409	Clamping disk	RPA
21	2530 0409	Handle	RPA
22	5040 1027	Bolt 6.3x38	SS



Materials

RPP - Reinforced Polypropylene

PP - Polypropylene

RPA - Polyamide

POM - Polyacetal

SS - Stainless Steel

Filtration Grade Conversion Table

Micron	100	120	200	400
Mesh	140	120	80	40

General Technical Data

Max Pressure: 10 bar / 145 psi

Max. Temperature: 60 °C / 140 °F

Filtration Grades (currently): 400µ, 200µ, 120µ

Model Number	Conn. Size ØD (Inch)	Screen Area (Cm^2)	* Max. Flow Rate (M^3/h)	L (Mm)	H (Mm)	Weight (Kg)
AKSP4S	4	2500	110	445	1368	26
AKSP6S	6	2500	140	445	1368	28

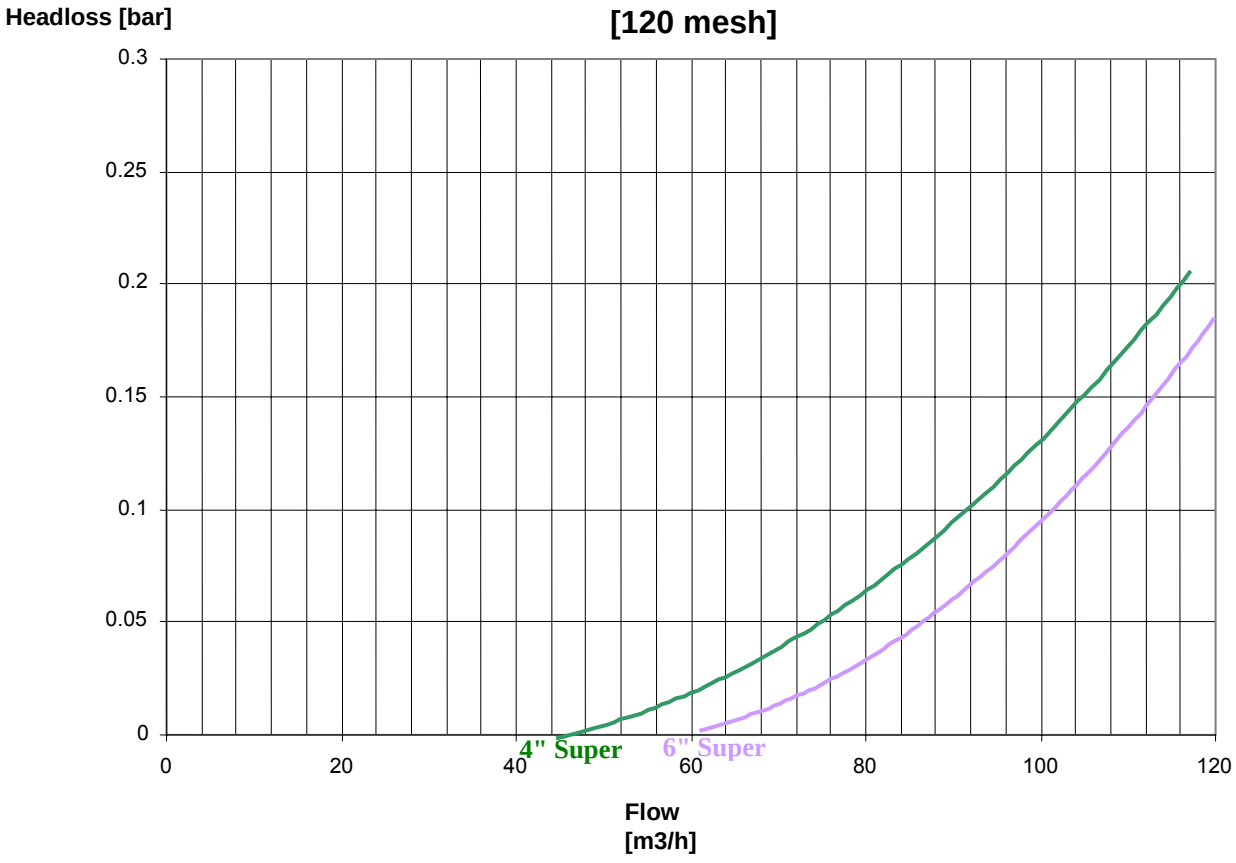
AKSP = Arkal Semi Automatic Polypropylene

V = Victaulic Filter Connection.

F = Flanged Filter Connection.

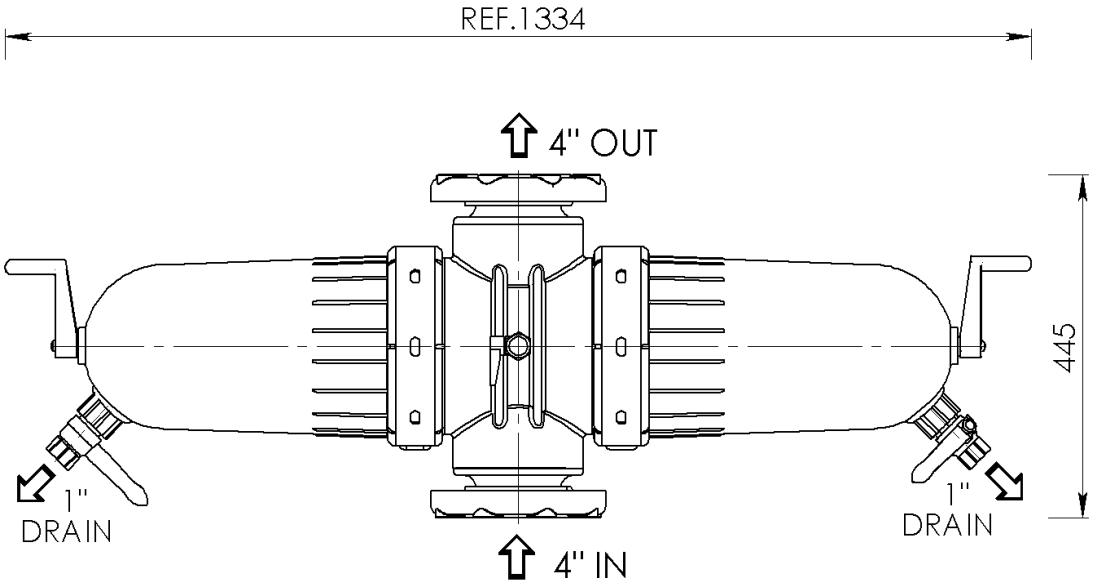
S = Super Leader Filter (Inline Filter Connection)

Headloss for ARKAL Semi Automatic Screen Filter

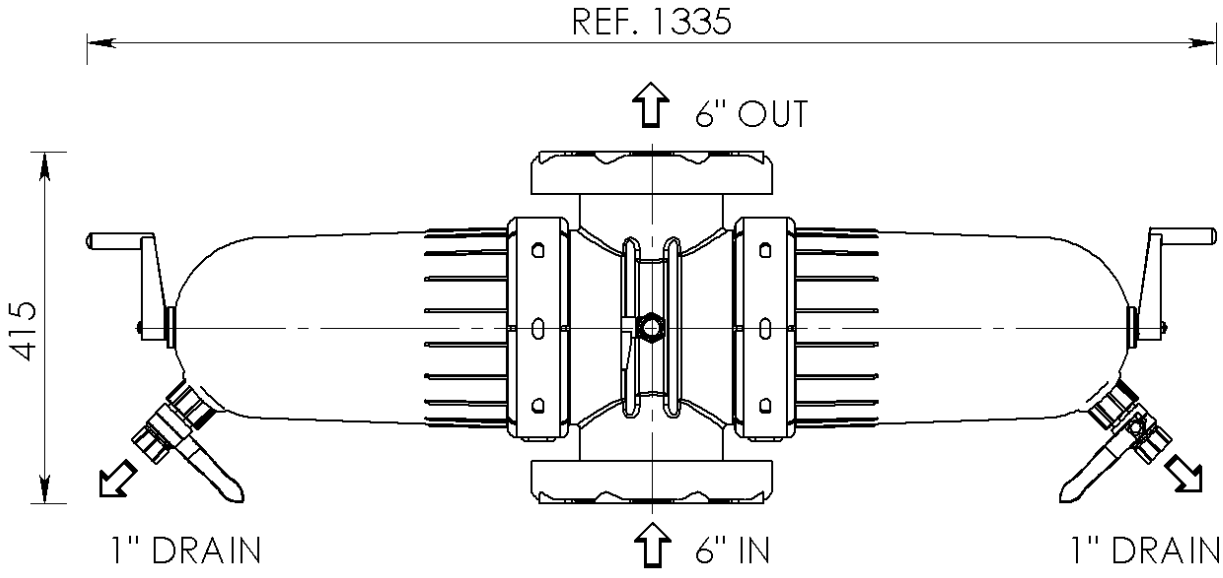


* Flow rate data is for high quality water at a filtration grade of 200 micron.

4" Super



6" Super



Installation

1. Remove the assembled filter from the box.
2. Install the assembled filter on the inlet line and outlet line.
3. Connect the drainpipe to the flush ball valve outlet opening (at least 32 mm or 1” diameter and 5 m long). **Make sure that water runs freely out of the drainpipe**.
4. Check that all connections are secured properly.

Operation

1. Gradually open the inlet ball valve (If the outlet valve is already installed, then make sure that it is open).
2. Check the filter assembly and its connections for leaks.
3. Turn the handle counterclockwise until it stops and then do the same in the opposite direction (don’t use force).
4. Start the flush cycle by opening the flush ball valve and turn the handle until the dirt collector comes to a stop (don’t use force). When the dirt collector stops, the flushing ball valve can be closed.
5. After the filter is cleaned, make sure that the differential pressure between inlet and outlet does not exceed 0.1 bars.

Screen Removal and Assembly

1. Shut off the inlet water supply.
2. Open the drain ball valve in order to release the pressure.
3. Turn the handle clockwise until the end (until it's stopped).
4. Open and remove the clamp.
5. Holding the cover with two hands, shake it gently to the right and left until it's separated from the body. Keep the cover from falling off on its own by pulling it away from the filter body.
6. Remove the screen and wash the inner side of the screen with a water jet.
7. Place the screen firmly it's lower seat. Make sure that the seals are positioned right.
8. Assemble the cover to the filter body. Make sure that the screwing rod is in the center of the lower seat.
9. Secure the clamp.
10. Close the flushing ball valve.
11. Perform a flushing cycle to ensure that there are no leaks.

Periodic Checks

Periodically check the following at the beginning of each season:

1. Check for leaks.
2. Check the condition of the handle bearing and sealing. If any of the bearings are defective (oval), replace the defective bearing with a new one.
3. Check the condition of the fine screen assembly. If defective, replace the fine screen.
4. Check the height of the dirt collector suction nozzles. If defective, replace according

Troubleshooting

Leakage from the nut handle:

1. Check if the sealing tightening nut handle is turned to the end (without force).
2. If necessary, replace the sealing “o-ring “.

The handle does not turn:

1. Open the filter cover.
2. Check that hard particles are not trapped under the nozzles, release if necessary.
3. Check the condition of the sealing handle and the tightening nuts, and if necessary replace it, if necessary.

The handle turns but the filter is not clean:

1. Open the filter.
2. Check the height of the suction nozzles, if the nozzles are damaged, replace the dirt collector.
3. Remove the dirt collector
4. Check the hexagon hole in the upper side of the dirt collector. If it is damaged, replace the dirt collector.

Check the spiral thread on the upper side of the dirt collector. If it is damaged, replace the dirt collector.

Arkal Filtration Systems reserves the right to make changes and improvements with no prior notice to customers.

ARKAL FILTRATION SYSTEMS STANDARD INTERNATIONAL WARRANTY

ARKAL FILTRATION SYSTEMS (hereinafter -"ARKAL FILTRATION SYSTEMS") guarantees to the customers who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year as of the day it left ARKAL FILTRATION SYSTEMS premises, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

ARKAL FILTRATION SYSTEMS will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL
FILTRATION SYSTEMS

Hydrocyclone

HYDROCYCLONE

SAND SEPARATOR TECHNOLOGY

The Separation Process

- The water stream enters the cyclone at a relatively high velocity via the inlet pipe, which is positioned, tangentially to the body of the cyclone.
- The shape of the cone creates a vortex of water.
- The resulting centrifugal force pushes the sand and other solids of a high specific gravity, out of the main flow stream.
- The low flow speed, next to the cyclone walls, cannot carry the heavy particles and allows them to drop by gravity to the collecting tank below, while the clean water rises up in a spiral motion to the outlet port.
- Evacuation of the dirt collected by the chamber is achieved by opening a control valve, normally activated by a controller usually triggered by time or set volume.

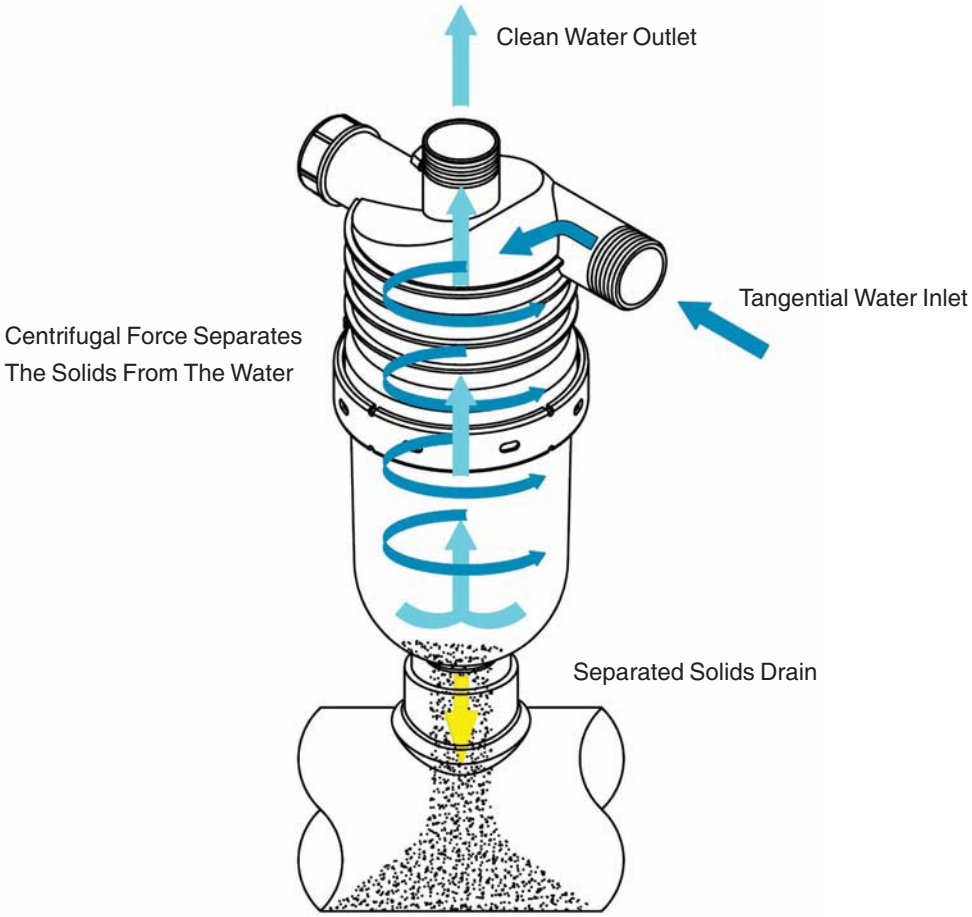
HYDROCYCLON - SAND SEPARATOR TECHNOLOGY

Hydrocyclones operate effectively and efficiently under a set flow rate. Constancy of flow rate and adaptability of design enhance efficiency further.

When flushed regularly, cyclones require minimal maintenance.

The Hydro-cyclone is a function specific product, designed for the removal of sand and therefore comprising an invaluable element in any total filtration system where sand is an issue.

Although the Hydrocyclone will remove / separate any particles with a higher specific gravity (SG) than water (1g/cm3 or 8.345 lb/ft3), maximum benefits are gained with an optimal SG ratio of 1.4:1, where the sand SG is 40% greater than the water SG (i.e. 1.4g/cm3 or 11.683 lb/ft3).



2" Sand Separator

Hydro-Cyclone

Features

- High efficiency sand separation
- Long-term self-operated
- Minimal maintenance
- Corrosion free

Technical Data

	Metric		US	
Connection diameter	mm	50	inch	2
Maximum pressure	bar	10	psi	145
Maximum temp.	^{0}C	70	^{0}F	149

Separation Efficiancy / Flow rate

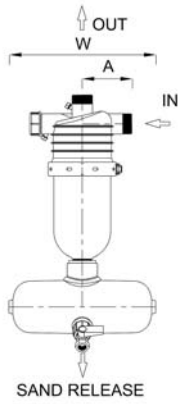
	Particle size larger than (micron):			m³/h	gpm
	150	100	50		
% Efficiency	90	85	82	15	66
	95	90	85	20	88
	98	95	90	25	110

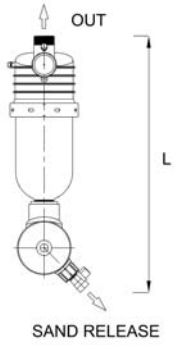
2" Sand Separator

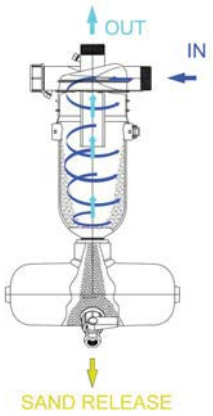
Hydro-Cyclone

Dimensions and Weights

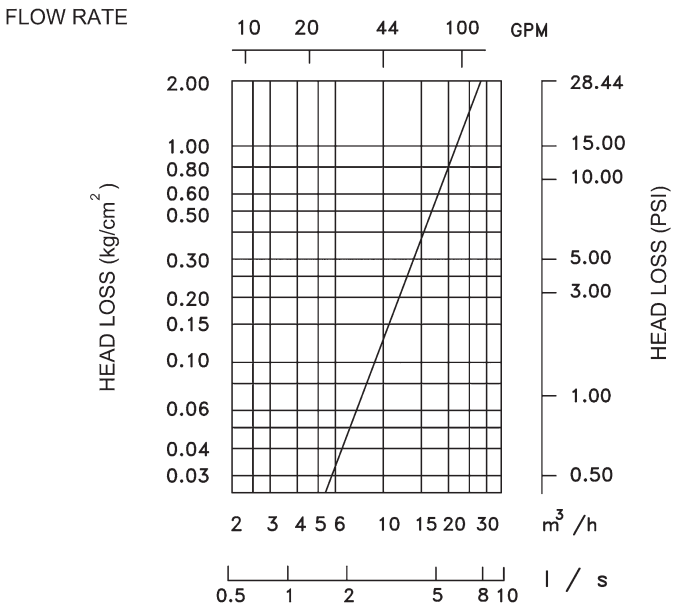
D-Inlet\Outlet diameter	**mm**	50	**inch**	2
L- Length	**mm**	755	**inch**	$29^{23}/_{32}$
W	**mm**	430	**inch**	$16^{15}/_{16}$
A	**mm**	145	**inch**	$5\ ^{23}/_{32}$
Approximate shipping weight	**kg**	7.8	**lbs**	17.2







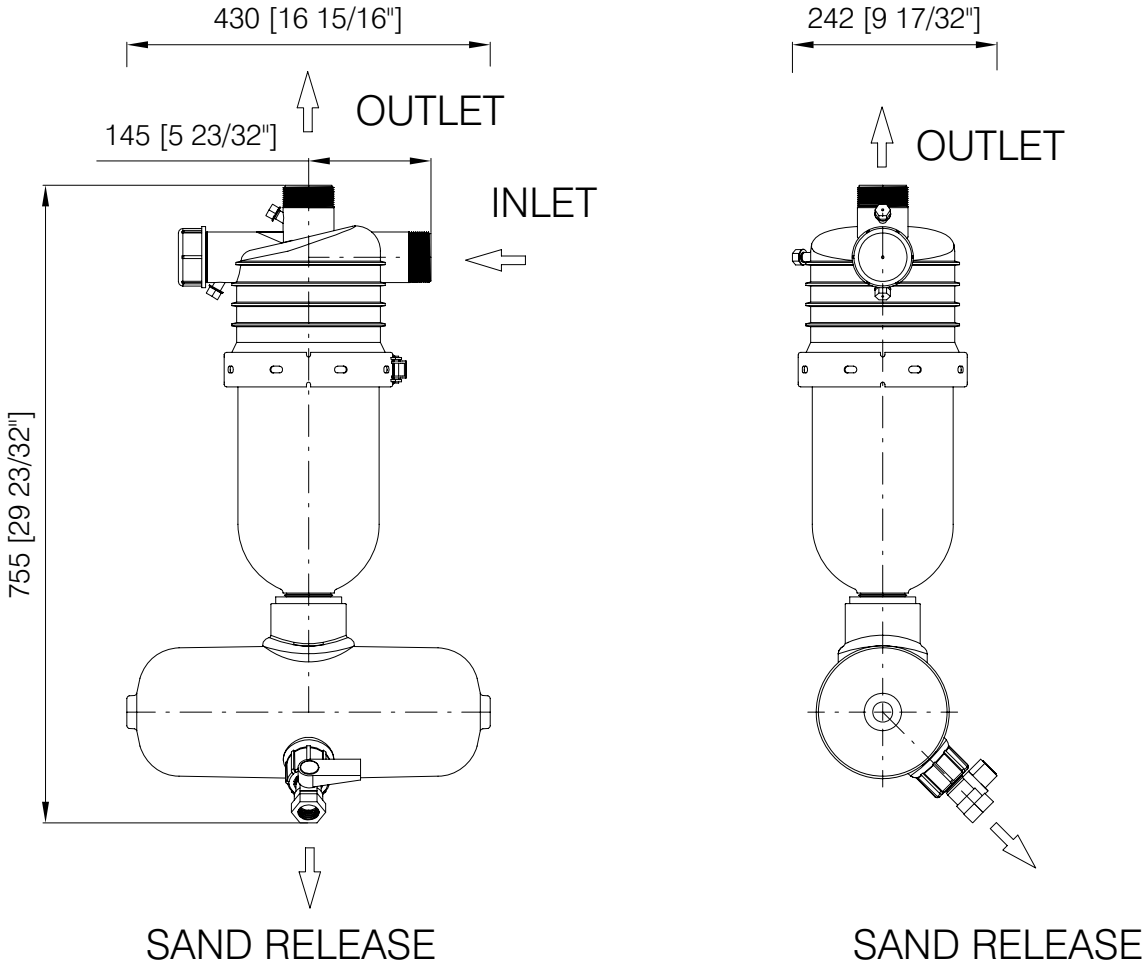
Head Loss Chart



2" Sand Separator can be supplied in:
Polyamide

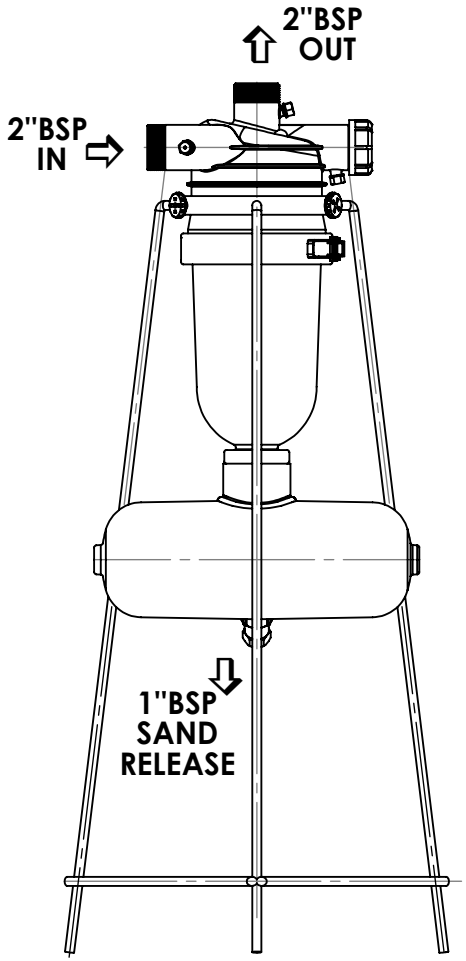
ARKAL 2" SAND SEPARATOR

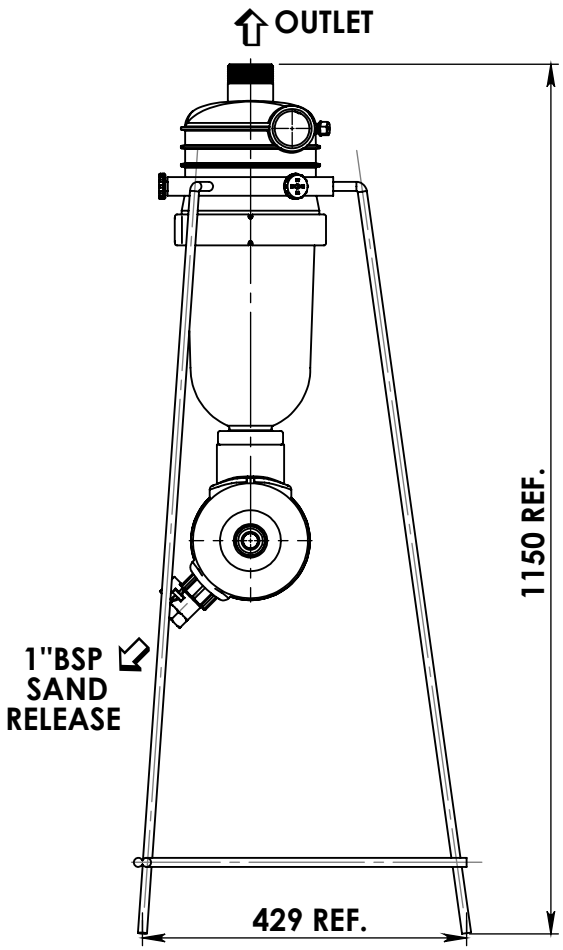
Cat. no.: 1218 0009

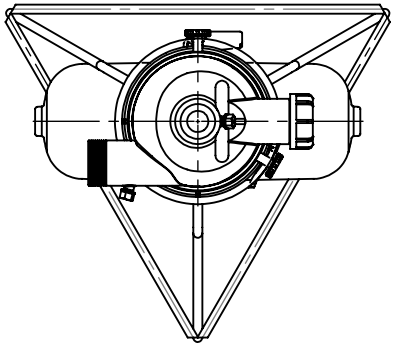


TECHNICAL DATA

INLET , OUTLET DIAMETERS	2" (MALE)	2" (MALE)
	50mm-NOMINAL DIAMETER	
MAX. PRESSURE	10 Bar	145 psi
RECOMMENDED FLOW RATE	25 m^3/ h (6.9 l/sec)	110 gpm
MIN. FLOW RATE	15 m^3/ h (1.94 l/sec)	30.8 gpm
WEIGHT	7.8 Kg	17.2 lbs
CONNECTION TO SEDIMENTATION	3/4" THREAD	







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2" SAND SEPARATOR & SUPPORT				PAGE___OF___
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1218 0009 5999 270028
SOLIDWORKS FILE CODE: 1218 0009SUP		FILE CODE: 1218 0009SUP		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP: DISK-2S
DRAWN	HELEN	25.05.09	PALLET-XXX (5200 XXXX)	
CHECKED	OMRY	25.05.09	TRIWALL-XXX (5201 XXXX)	
APPROVED	OMRY	25.05.09	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	25.05.09		

PATH- Z:\MASTERS – SOLID\FILTERS COMPLETE\2 INCH FILTERS\SAND SEPARATOR\

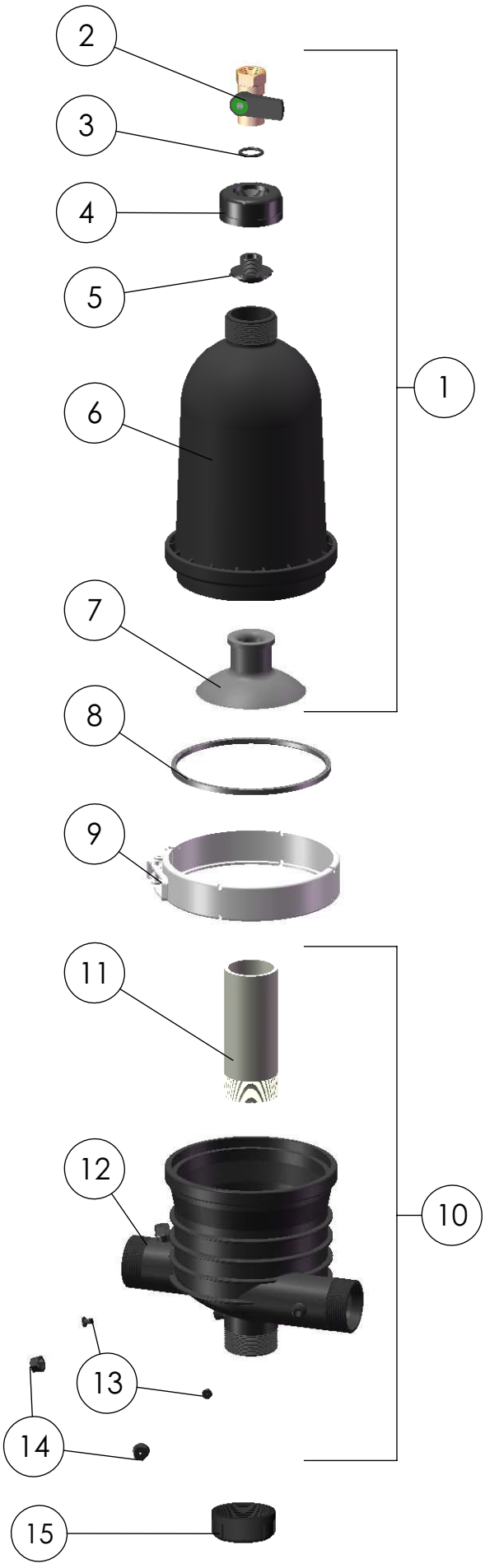
SW-Print:26/05/2009

ARKAL 2" SAND SEPARATOR

Cat. no. 1218 0001 THREADED ENDS (SINGLE)

PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER COMPLEX	2202 0026	
2	3/4" TAP	5054 0112	BRASS
3	"O" RING 2-210	5002 2210	NITRILE
4	2" CAP WITH 41mm HOLE	2253 1019	R.P.A.
5	ADAPTOR 3/4"	2253 2534	P.P.
6	FILTER COVER	2501 0222	R.P.A.
7	EROSION PREVENTER	2200 0022	EPDM
8	COVER SEAL	5005 0002	EPDM
9	CLAMP	5042 0030	S.S.
10	FILTER BODY COMPLEX	2218 0002	
11	2" NIPPLE	5020 0051	PVC
12	FILTER BODY BSP	2200 2218	R.P.A.
13	GAUGE PORTS SEAL	5006 0004	EPDM
14	GAUGE PORTS NUT	2511 0103	R.P.P.
15	2" CAP	2511 0200	R.P.A.



MATERIALS:

1) S.S. - STAINLESS STEEL

2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

Sand Separator Batteries

Hydro-Cyclone Batteries

Features

- High efficiency sand separation
- Long-term self-operated
- Minimal maintenance
- Corrosion free

Technical Data

Model		HYD-2	HYD-3	HYD-4	HYD-5		HYD-2	HYD-3	HYD-4	HYD-5
	Metric					US				
Connection diameter	mm	110	110	160	160	inch	4	4	6	6
Maximum pressure	bar			10		psi			145	
Maximum temp.	^{0}C			70		^{0}F			149	

Maximum Filtration Flow Rate / Water Quality

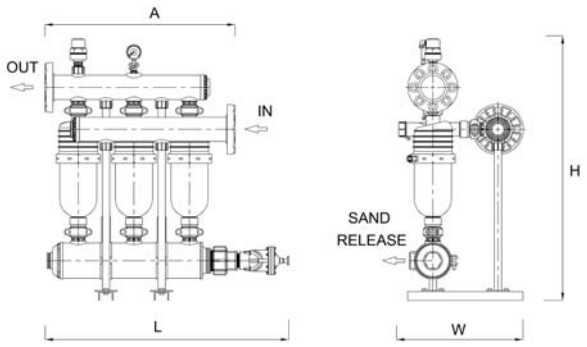
Model				HYD-2	HYD-3	HYD-4	HYD-5	HYD-2	HYD-3	HYD-4	HYD-5
	Particle size larger than (micron):			m^3/h				gpm			
	150	100	50								
% Efficiency	90	85	82	30	45	60	75	132	198	264	330
	95	90	85	40	60	80	100	176	264	352	440
	98	95	90	50	75	100	125	220	330	440	550

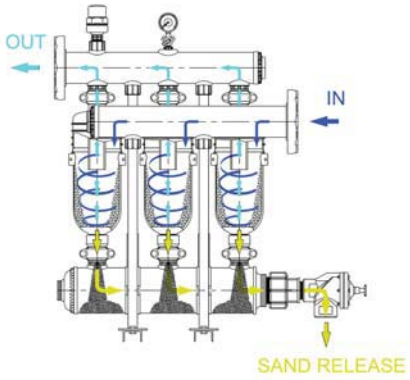
Sand Separator Batteries

Hydro-Cyclone

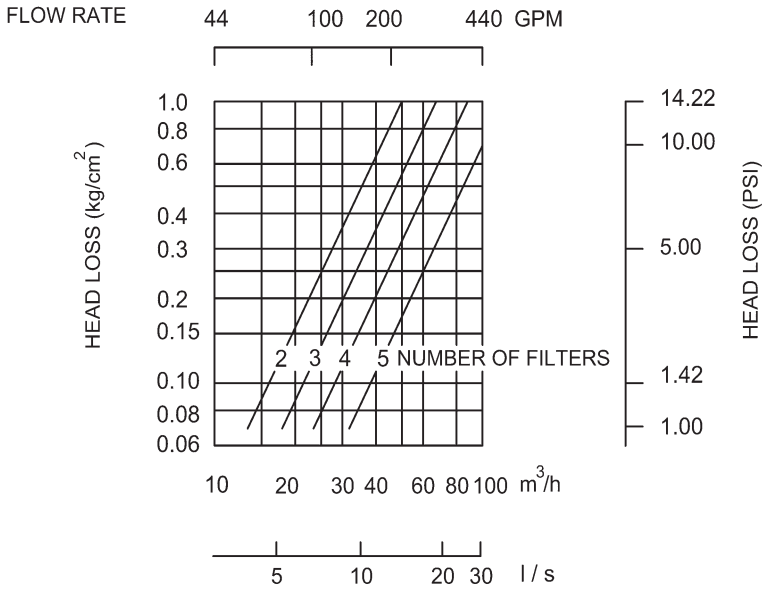
Dimensions and Weights

Model		HYD-2	HYD-3	HYD-4	HYD-5		HYD-2	HYD-3	HYD-4	HYD-5
D-Inlet\Outlet diameter	mm	110	110	160	160	inch	4	4	6	6
L - Length	mm	829	1079	1160	1410	inch	33	42	46	56
H	mm	1198	1198	1200	1200	inch	47	47	47	47
A	mm	605	855	1105	1355	inch	24	34	44	53
W	mm	564	564	778	778	inch	22	22	31	31
Approximate shipping weight	kg	52	78	118	146	lbs	115	172	260	322





Head Loss Chart

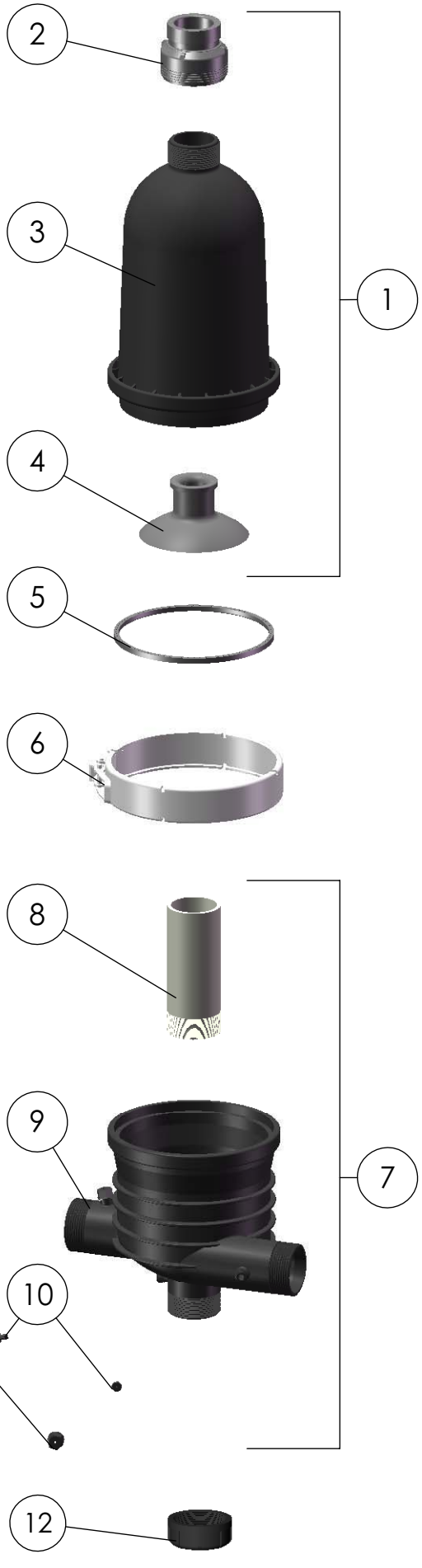


2" Sand Separator Batteries can be supplied in:
Polyamide and Polypropylene manifolds

ARKAL 2" SAND SEPARATOR

(FOR BATTERY)

Cat. no. 1218 0002 THREADED ENDS



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER COMPLEX	2202 0027	
2	2" ADAPTER VIC./THR.	2253 4016	
3	FILTER COVER	2501 0222	R.P.A.
4	EROSION PREVENTER	2200 0022	EPDM
5	COVER SEAL	5005 0002	EPDM
6	CLAMP	5042 0030	S.S.
7	FILTER BODY COMPLEX	2218 0002	
8	2" NIPPLE	5020 0051	PVC
9	FILTER BODY BSP	2200 2218	R.P.A.
10	GAUGE PORTS SEAL	5006 0004	EPDM
11	GAUGE PORTS NUT	2511 0103	R.P.P.
12	2" CAP	2511 0200	R.P.A.

MATERIALS:

1) S.S. - STAINLESS STEEL

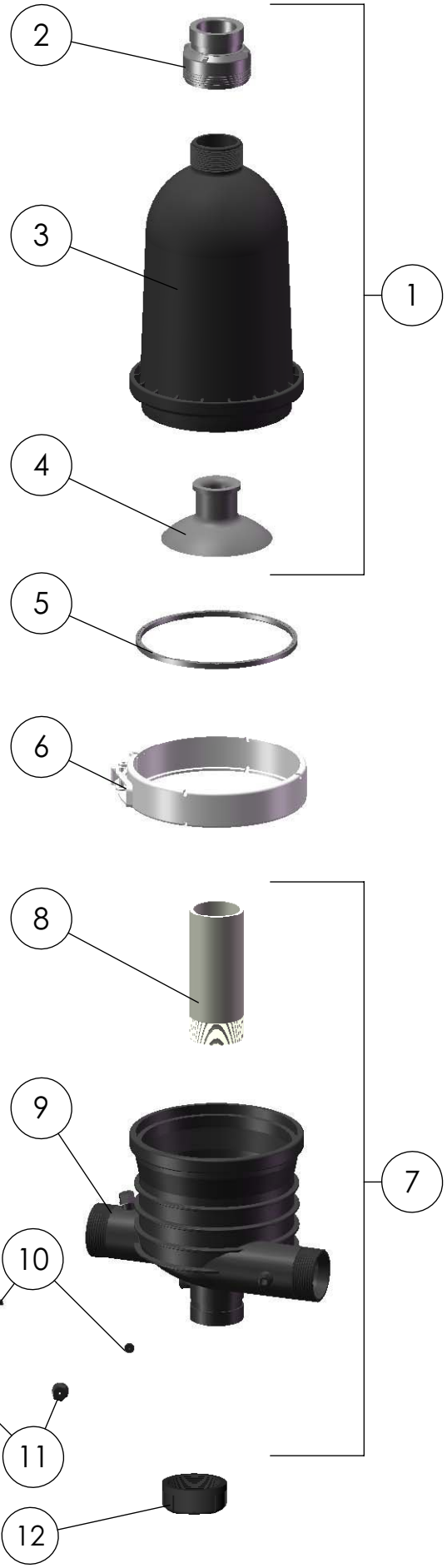
2) R.P.A. - REINFORCED POLYAMIDE

3) R.P.P. - REINFORCED POLYPROPYLENE

ARKAL 2" SAND SEPARATOR

(FOR BATTERY)

Cat. no. 1218 0003 VICTAULIC END



PARTS LIST

No.	DESCRIPTION	CAT. No	MATERIALS
1	FILTER COVER COMPLEX	2202 0027	
2	2" ADAPTER VIC./THR.	2253 4016	
3	FILTER COVER	2501 0222	R.P.A.
4	EROSION PREVENTER	2200 0022	EPDM
5	COVER SEAL	5005 0002	EPDM
6	CLAMP	5042 0030	S.S.
7	FILTER BODY COMPLEX	2218 0003	
8	2" NIPPLE	5020 0051	PVC
9	FILTER BODY	2200 2219	R.P.A.
10	GAUGE PORTS SEAL	5006 0004	EPDM
11	GAUGE PORTS NUT	2511 0103	R.P.P.
12	2" CAP	2511 0200	R.P.A.

MATERIALS:

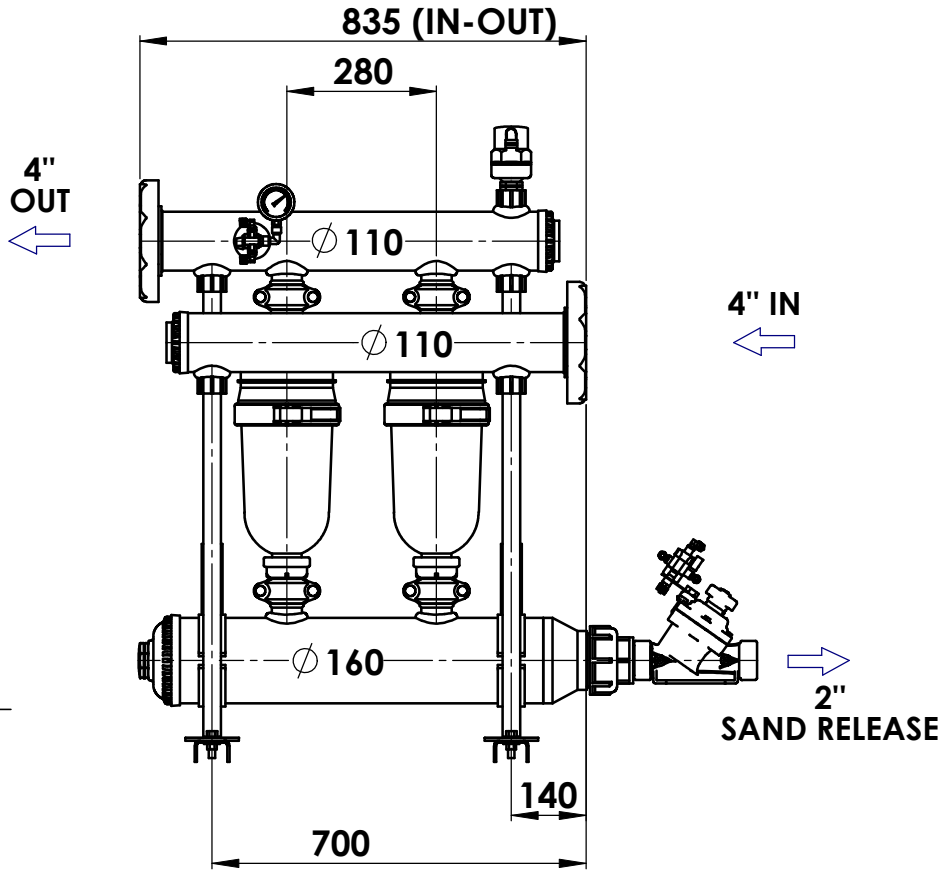
1) S.S. - STAINLESS STEEL

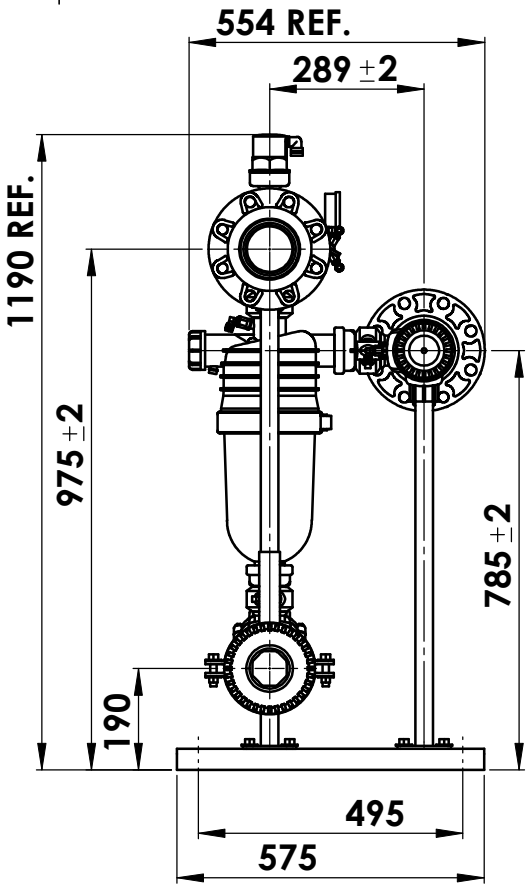
2) R.P.A. - REINFORCED POLYAMIDE

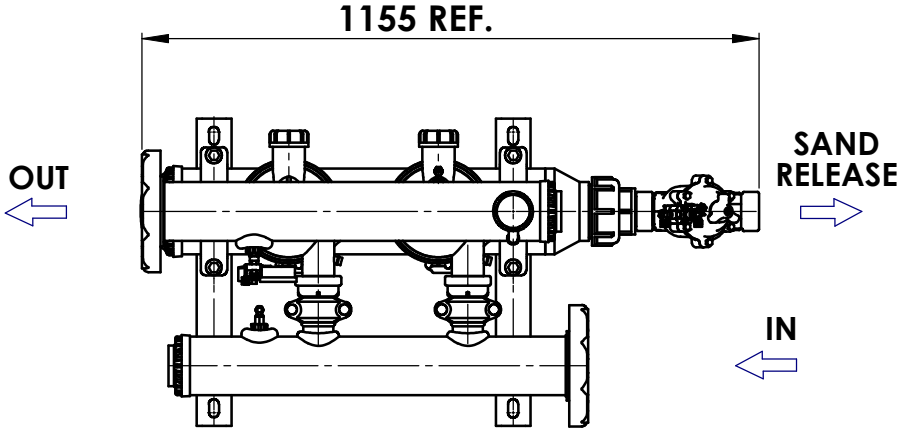
3) R.P.P. - REINFORCED POLYPROPYLENE

Drawings

Sand Separator Batteries







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 2*2" SAND SEPARATORS PLASTIC BATTERY
PAGE 1_OF 7_

TITLE: ASSEMBLY DRAWING
CATALOGUE No: 1641 0402U2

SOLIDWORKS FILE CODE: 1641 040__
FILE CODE: 1641 0402U2 C
FILE CODE OF FILTER COMPL.: 2" SAND SEP. ASSEMBLY

	NAME	DATE
DRAWN	ELENA	23/09/2009
CHECKED	NIKOLAY	23/09/2009
APPROVED	ZALI	23/09/2009
B.O.M.	OLEG	23/09/2009

FILE CODE DRAWINGS: PALLET-26 (5201 5403) TRIWALL-14 (5200 5302)
SOLIDWORKS FILE CODE OF MAN.: 5641 0402VC2
BACKUP: DISK-2S
DRAWING: 2130

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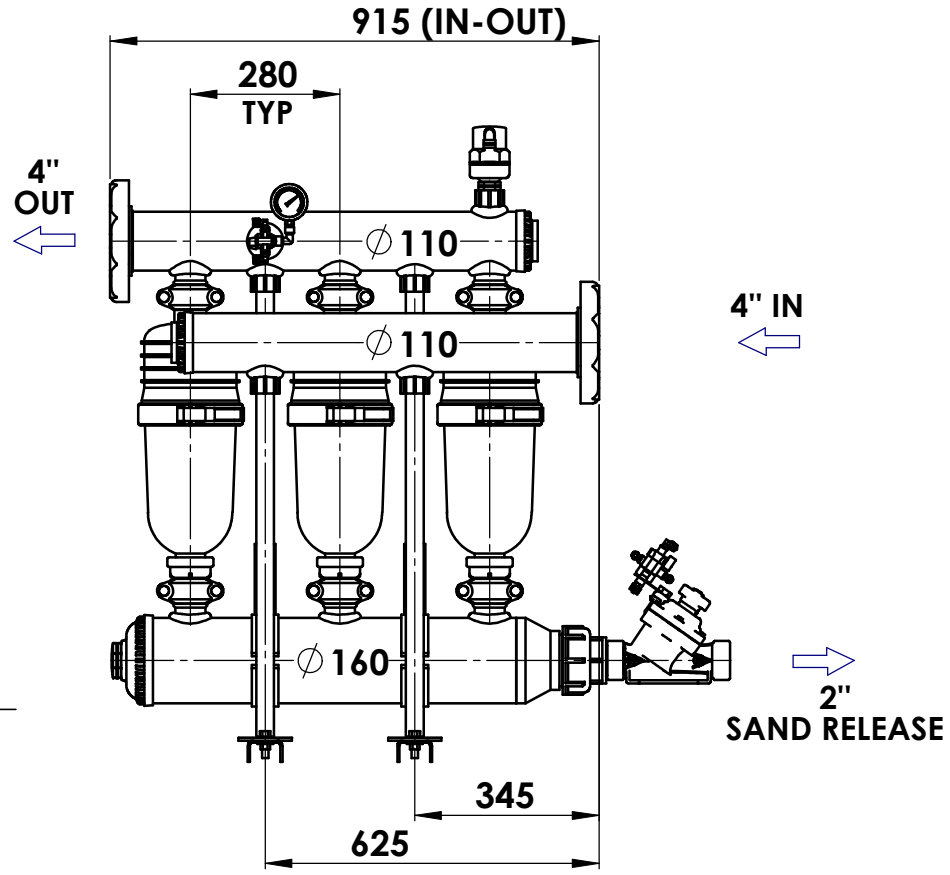

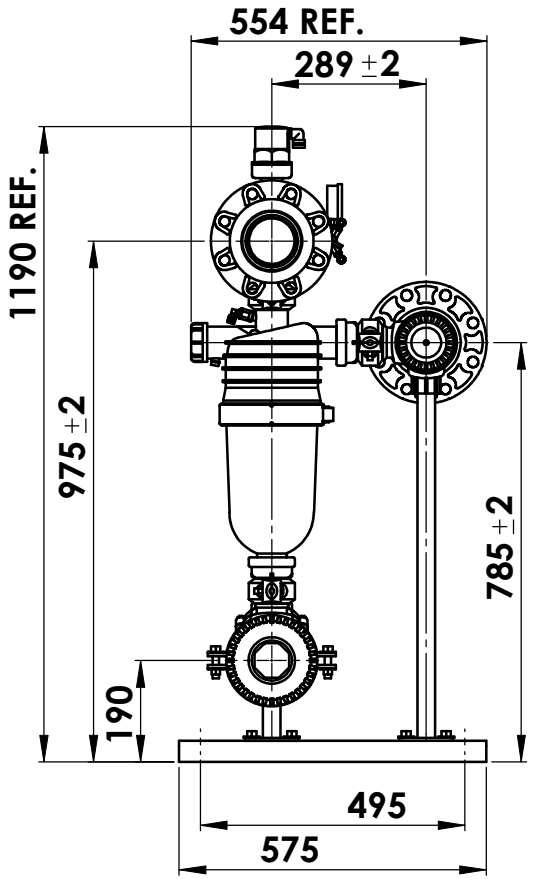

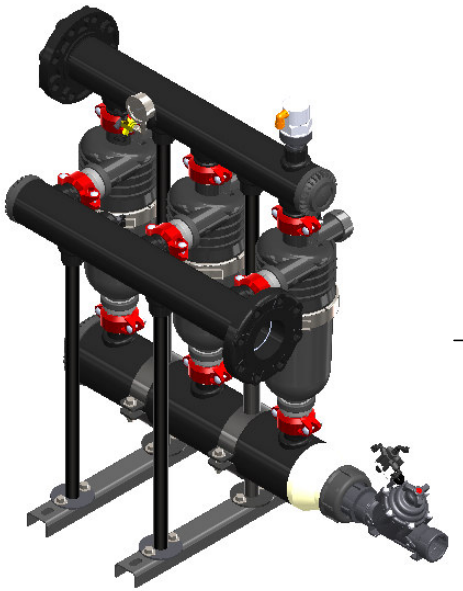

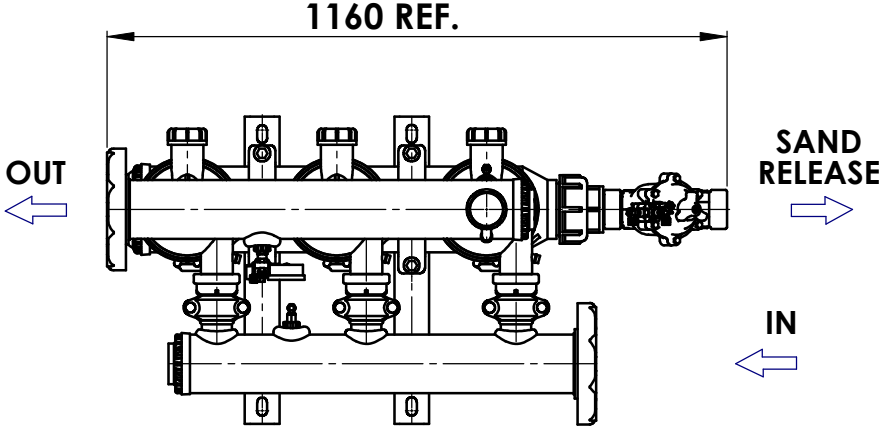

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
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PROJECT
3*2" SAND SEPARATORS PLASTIC BATTERY

PAGE 1_OF 7_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
1641 0403U2

SOLIDWORKS FILE CODE:	FILE CODE:	FILE CODE OF FILTER COMPL.:
1641 040__	1641 0403U2 C	2" SAND SEP. ASSEMBLY

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CHECKED	NIKOLAY	22/09/2009
APPROVED	ZALI	22/09/2009
B.O.M.	OLEG	22/09/2009

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TRIWALL-14 (5200 5302)

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5641 0403VC2

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DRAWING:
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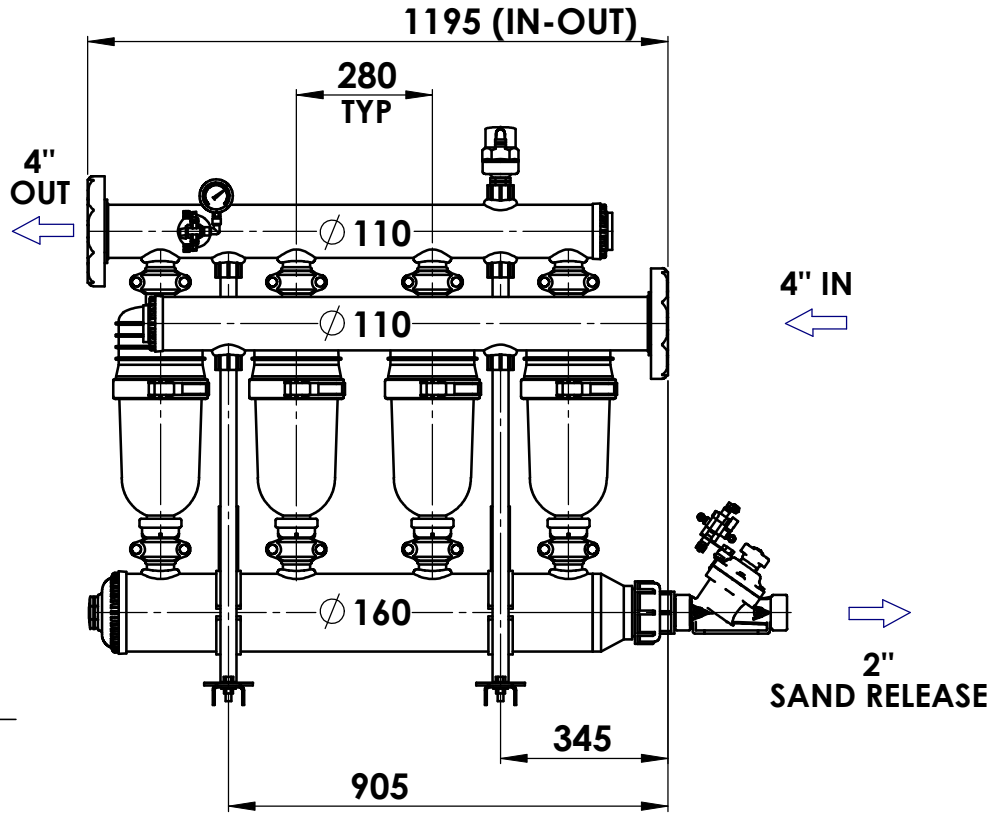

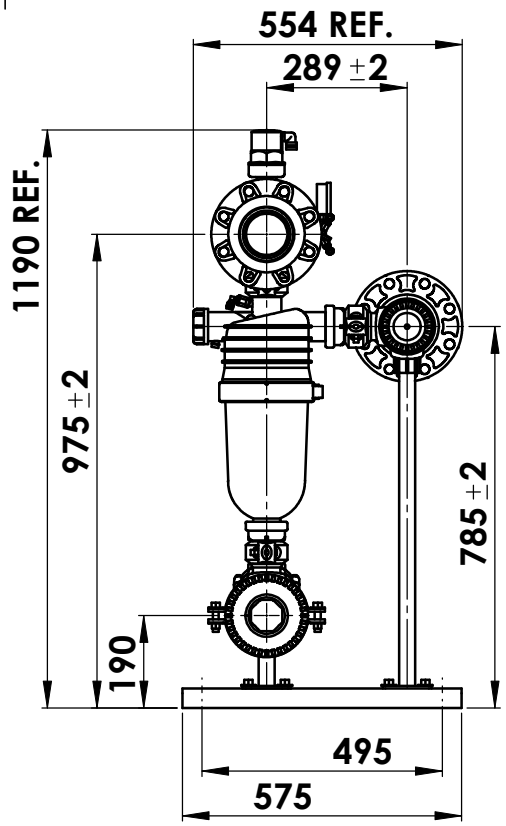

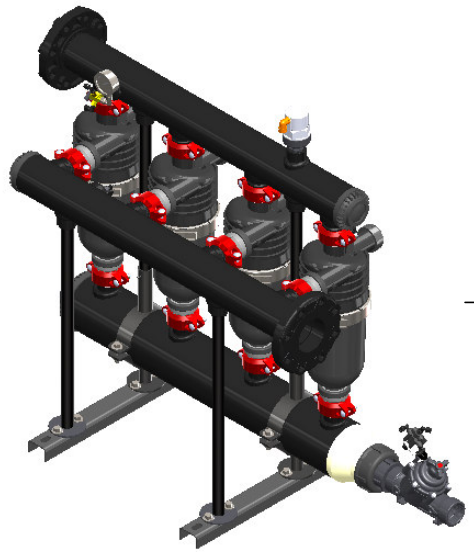

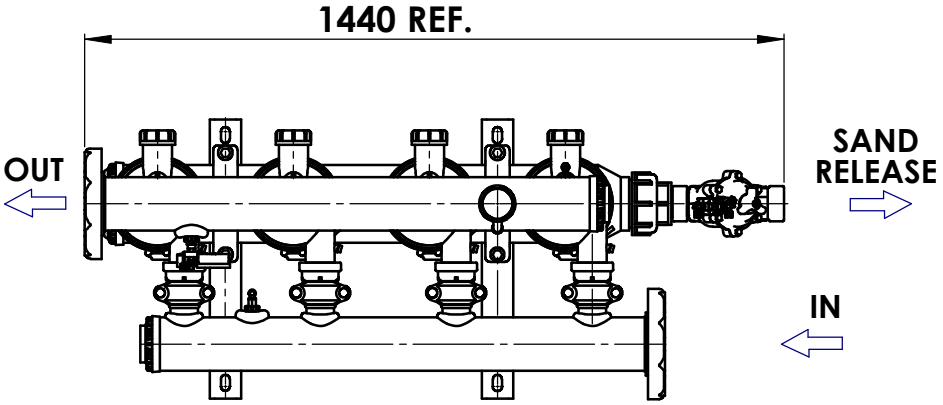

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: 4*2" SAND SEPARATORS PLASTIC BATTERY
PAGE 1_OF 7_

TITLE: ASSEMBLY DRAWING
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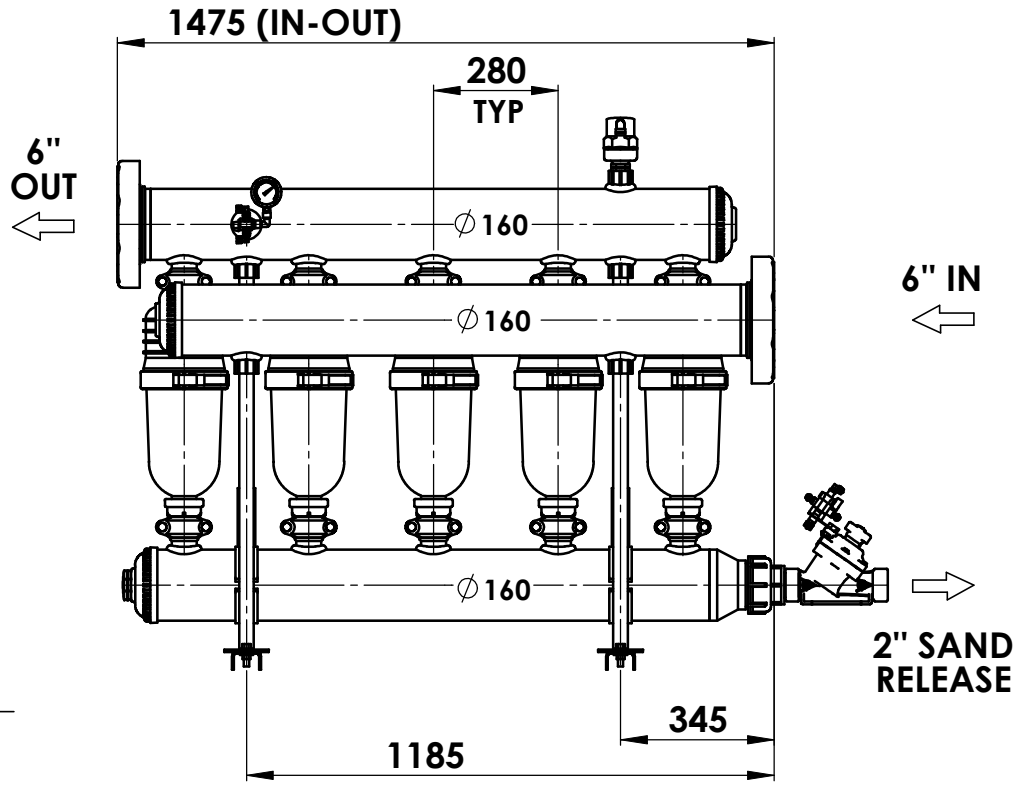

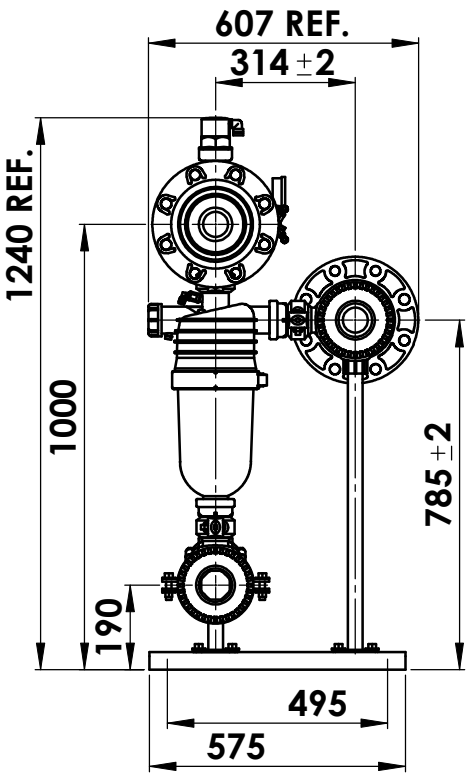

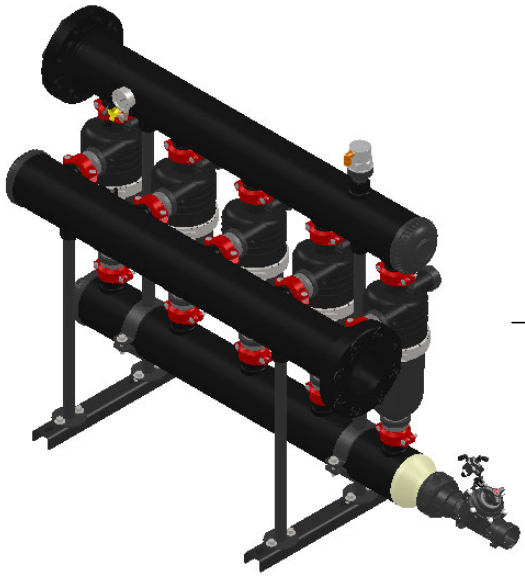

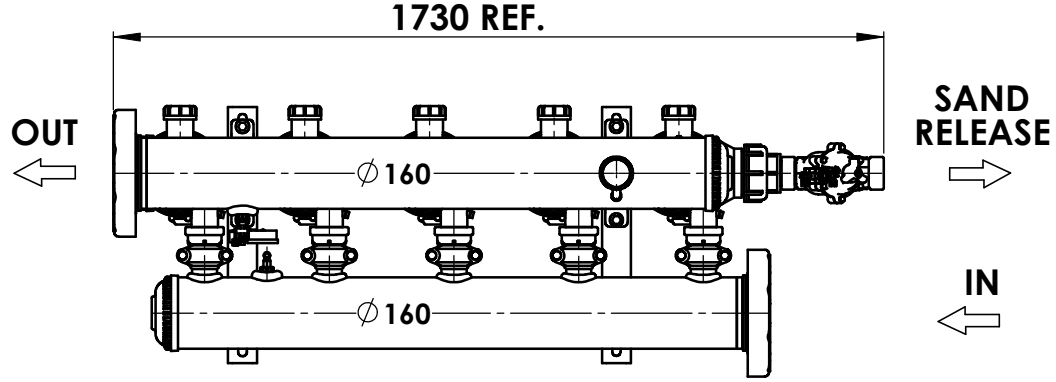

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PROJECT: 5*2" SAND SEPARATORS PLASTIC BATTERY		PAGE 1_OF 7_
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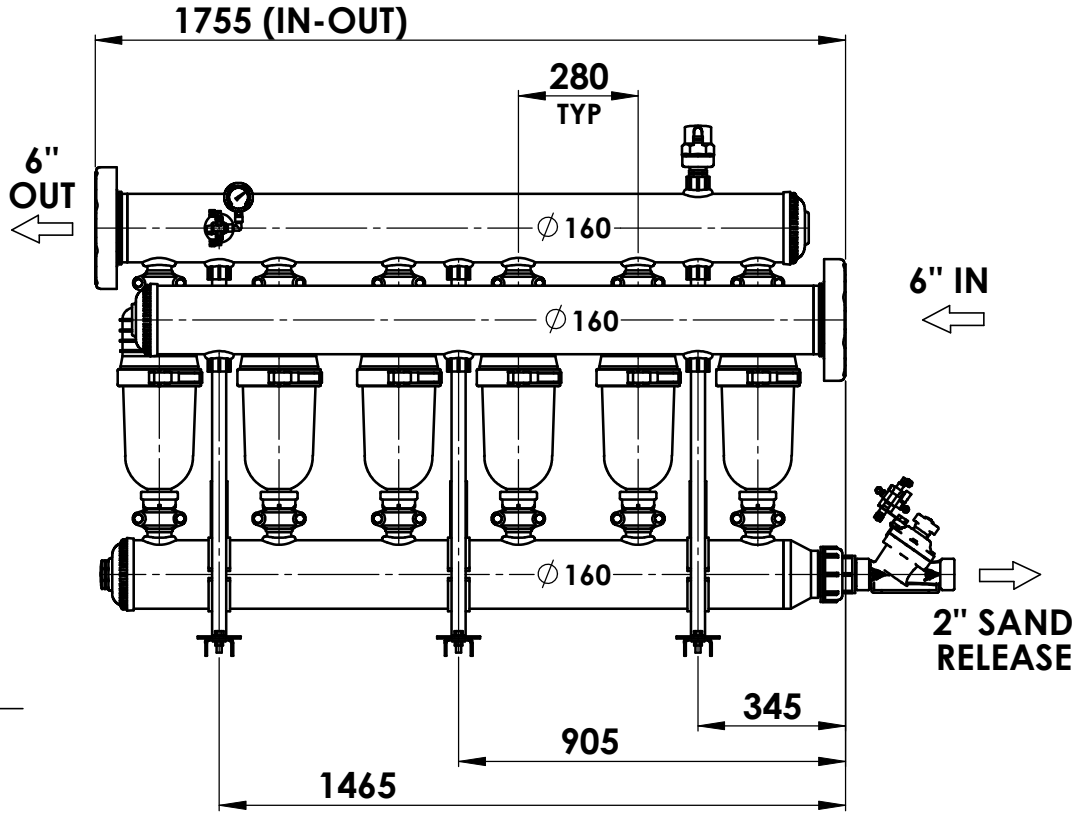

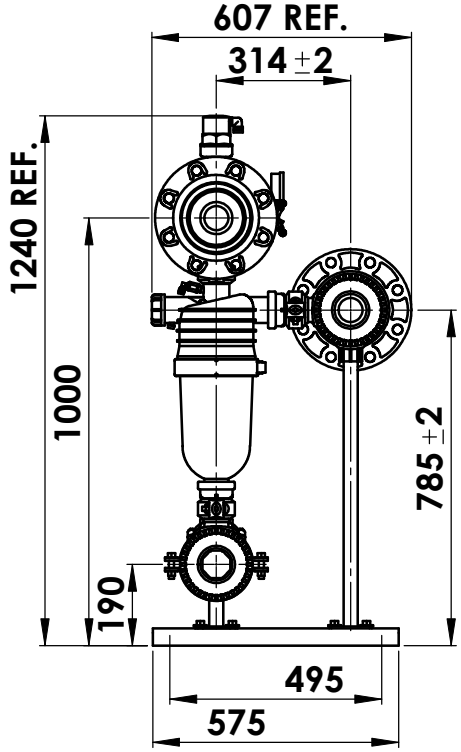

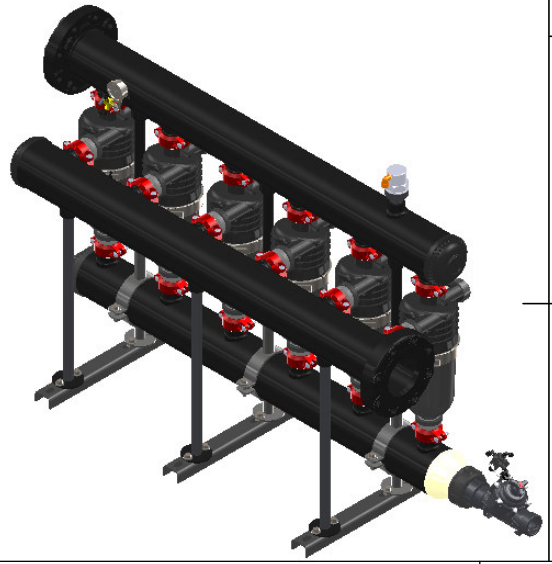

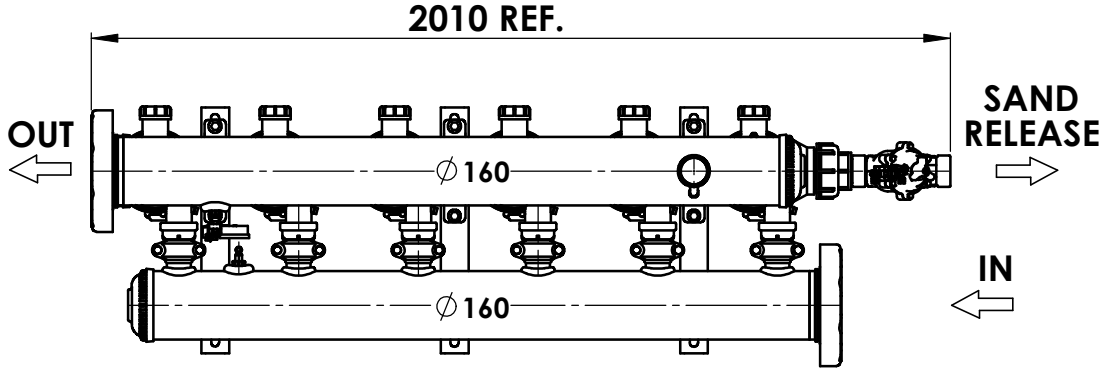

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PROJECT: 6*2" SAND SEPARATORS PLASTIC BATTERY			PAGE 1_OF 7_
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SHEET 1 OF 1

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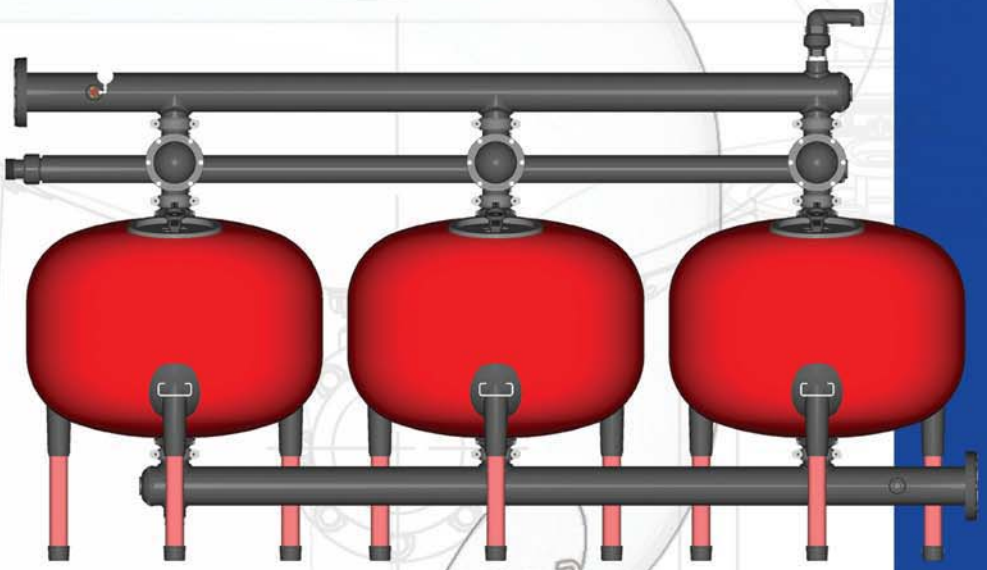
Arkal Media Filters

ARKAL
FILTRATION SYSTEMS

AGF Filters



Sand Media Technology

AGF Filter - The Principle

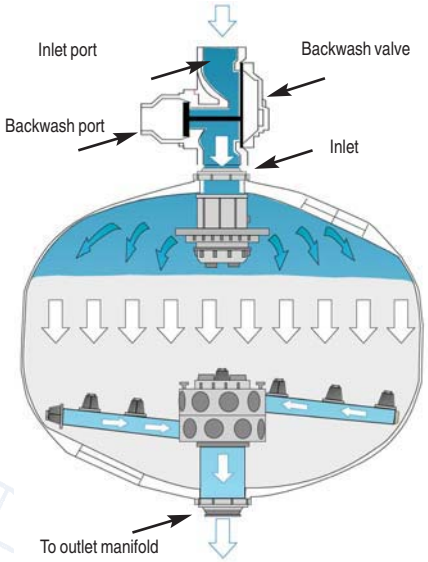
- Sand Media filters operate by separating the suspended materials in unfiltered water as it flows through a bed of media in a pressurized tank.
- The recommended filter medias - crushed basalt, quartz sand or catalytic media, have many varying aperture sizes that cause the water to flow through a maze of passages on its way from the inlet to the outlet of the filter.

Sand Media Technology

Due to the large volume and contact area between the water and the media/gravel particles, various physical forces are put into effect and act to retain the contaminating particles.
The efficiency of large particle retention is high as long as the gravel is kept clean.
The catalytic media type applies an additional chemical-physical attraction between the media and particles - especially those of organic nature, giving more efficient organic material separation. In addition, the round shaped particles degrade more quickly and their cleaning requires less water in comparison with other media types.

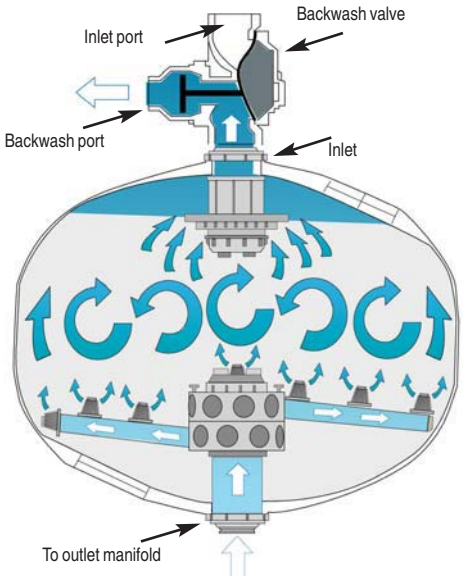
Filtration Process

During the filtration process, unfiltered water enters the media filter system via the inlet manifold. It is cleaned by flowing through the media and discharged via the outlet manifold.
During filtration the inlet ports are open and the backwash ports are closed. Water flows from the top, over the diffuser, down through the media layer to the outlet through the "mushrooms" located in the bottom part of the filter.



Backwash Process

During the backwash process the inlet port closes and the backwash port opens, allowing reverse water flow into the filter.
Clean pressurized water from the other filters now flows into the bottom of the filter, lifting the media and freeing the accumulated dirt and debris that is then flushed out through the backwash valve and into the backwash manifold.



If the backwash restriction valve is adjusted properly, the debris will be flushed out of the filter while the media, being of a higher Bulk Density than the debris will remain fluidized in the filter tank.
Only one filter at a time should backwash. The water that is being used to backwash one filter would have already passed through another filter or filters so that the backwash process is carried out with clean, filtered water.

AGF

All Plastic Media Filters

Features

- Corrosion free
- Special synthetic materials
- Unique under-drain "Mushroom" drainage system
- Two large access ports

Technical Data

	METRIC		US	
Connection diameter	mm	114	inch	4
Filtration surface area	m^2	1.16	ft^2	12.48
Minimum backwash pressure	bar	2	psi	28
Maximum pressure	bar	6	psi	85
Backwash flow rate	m^3/h	40-60	gpm	176-264
Maximum temp.	^{0} C	50	^{0} F	122

Maximum Filtration Flow Rate / Water Quality

No. of units			
Filtration Grade	Water Quality	m^3/h	gpm
Media: Basalt media grade 1			
100-80 µ	Good	68	300
	Average	51	220
	Poor	41	180
	Very Poor	33	145
Media: Quartz media grade 1			
50-20 µ	Good	18	79
	Average	16	70
	Poor	13	57
	Very Poor	10	44
Media: AFM Media gradient for absolute depth filtration. Advantage in high organic load in raw water			
20-10 µ	Good	22	97
	Average	19	79
	Poor	16	70
	Very Poor	13	57

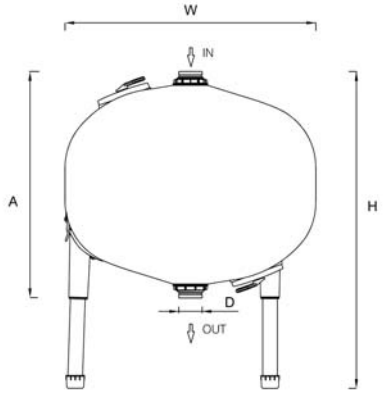
AGF

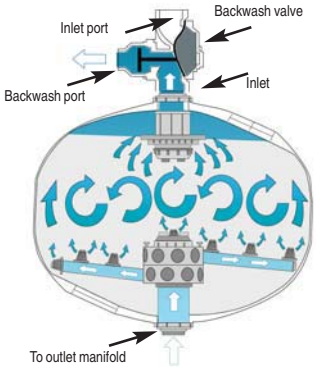
All Plastic Media Filters

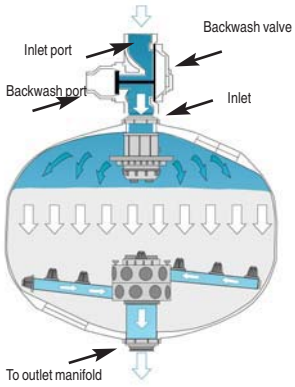
Dimensions and Weights

		Metric		US
D-Inlet\Outlet diameter	**mm**	114	**inch**	4
H (height)	**mm**	1553	**inch**	61
A (Dist. between filters connect)	**mm**	1110	**inch**	43 23/32
W	**mm**	1227	**inch**	48 5/16
Approximate shipping weight*	**kg**	120	**lbs**	265

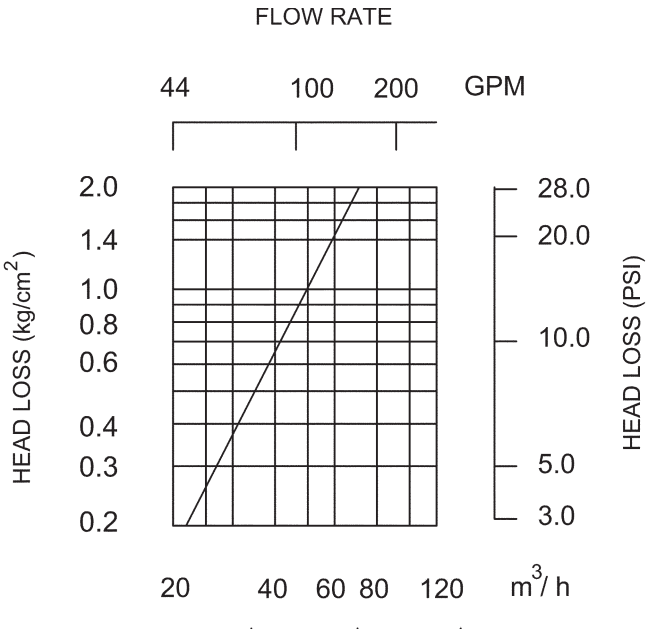
(*) Weight of media not included







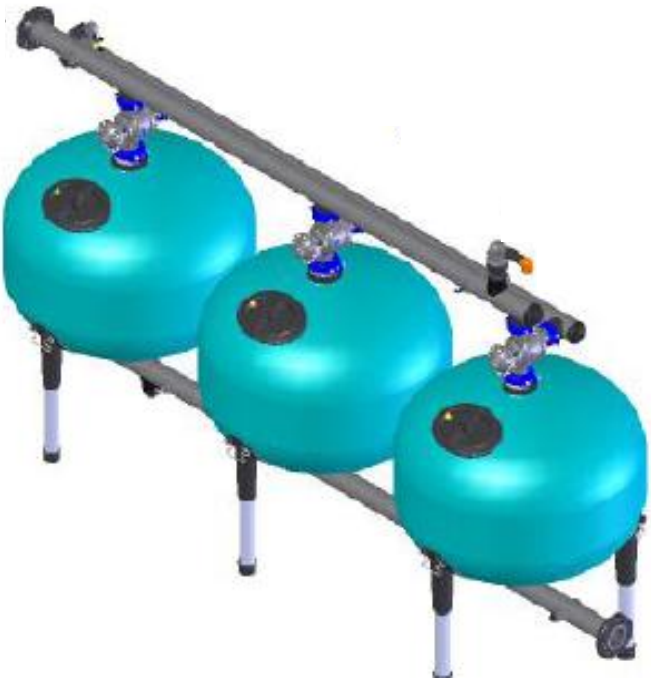
Head Loss Chart at, Clean State



AGF Filters are available in:
Polymer materials

AGF Filter

Installaion, Operation & Design Manual



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Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

Welcome to Arkal Filtration Systems

Your decision to purchase the highest quality filter will be rewarded with years of reliable, dependable performance. This manual will take you step-by-step through the process of assembling your ***AGF*** *Media Filter Station and its operation. Please familiarize yourself with this manual before assembly.*

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A. ASSEMBLY & CONNECTING THE AGF

I UNPACKING IN THE FIELD

1. Bring the pallet as close to the cement pad as possible.
2. Remove the plastic straps and the cover wrapping.
3. Take the 3 legs aside, remove the styrofoam packaging and lay it next to the tank.
4. Lay the tank on its side on top of the packing material.
5. Insert the unattached legs.
6. When lifting the filter, make sure that two legs are resting firmly on the ground (two people are recommended for this process).
7. Transfer filter to proper location on the pad.

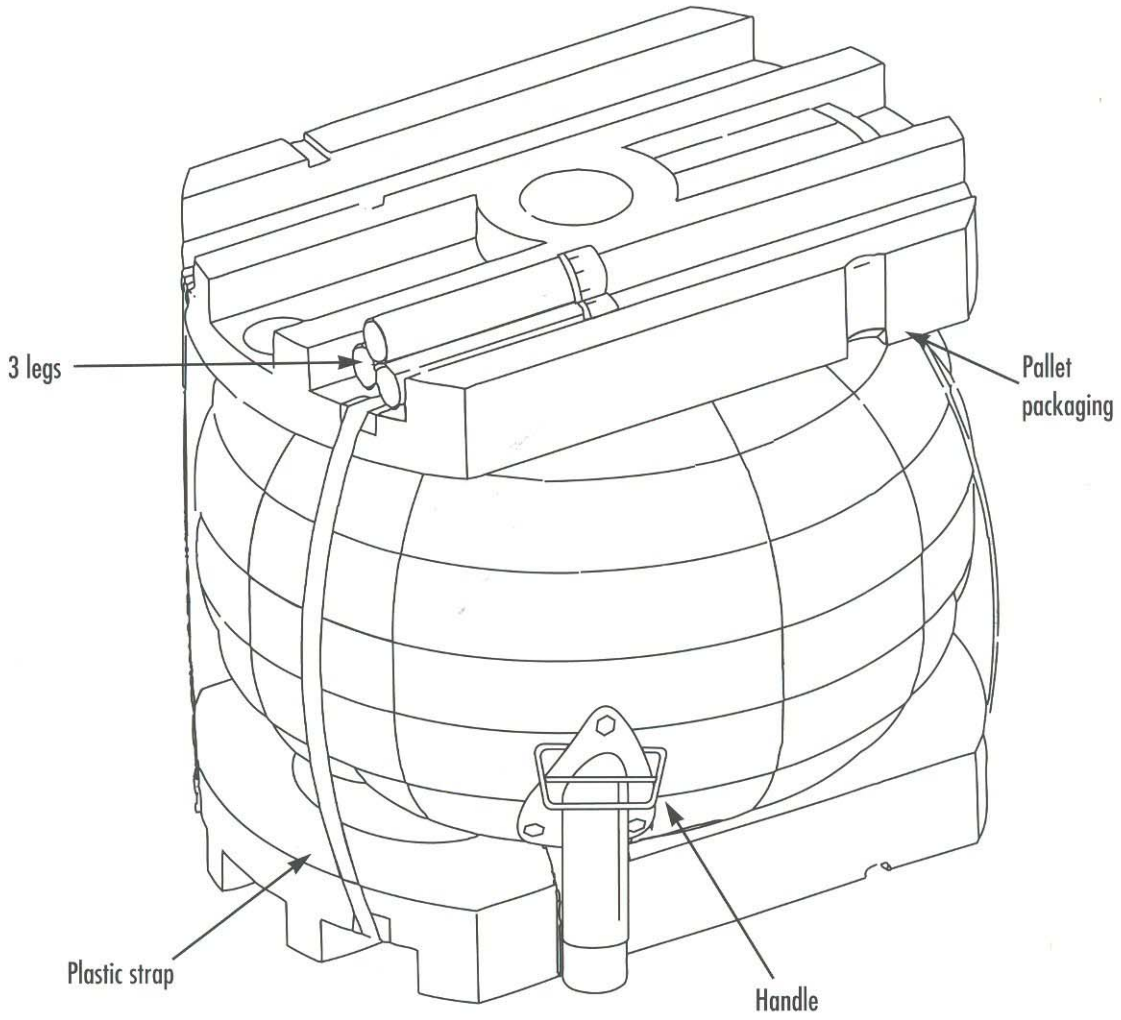


***Figure 0*: Unpacking Instructions**

II. ASSEMBLY THE AGF SYSTEM

1. **Concrete Pad Recommendation**
   a. Should be flat within 1/4" (10.0 mm) from the end to end.
   b. Should be at least 4" (100 mm) thick with 6"x6" (150x150 mm) footing on the perimeter.
   c. The concrete surface should be relatively smooth.

2.

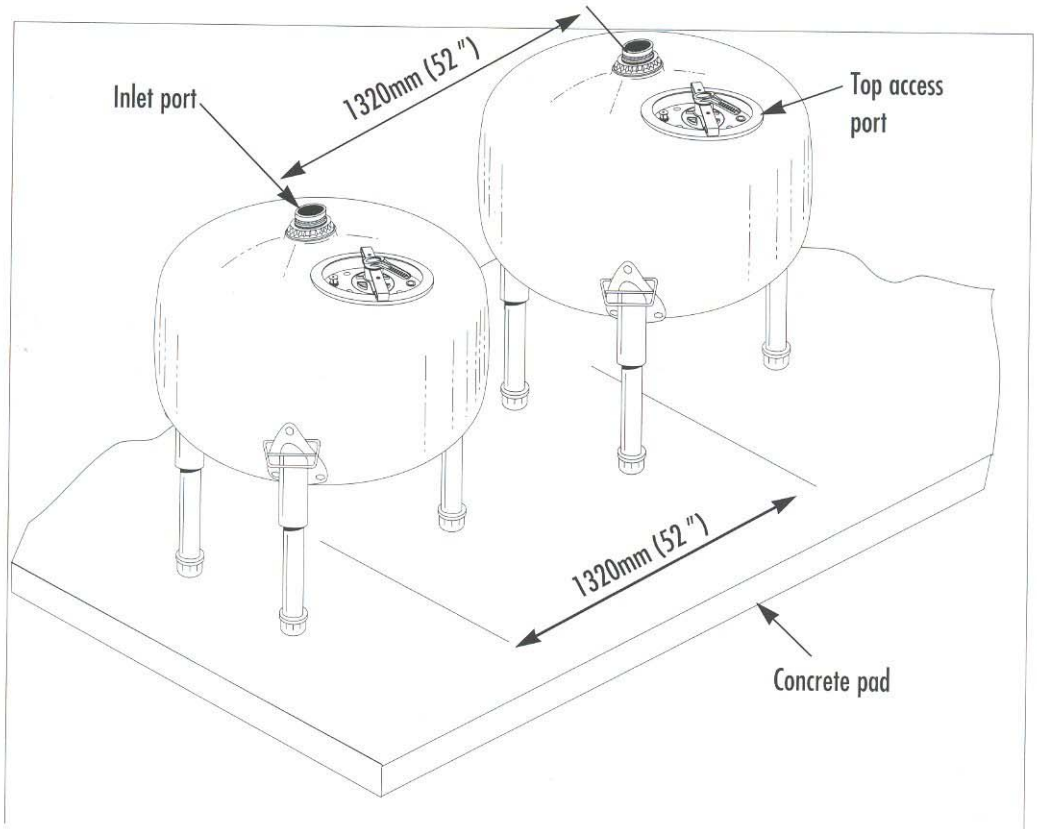


***Figure 1*: Orient the access ports of the filters**

Orient the AGF tanks on the foundation by positioning tank access ports on the same side (*see Figure 1*). Make no permanent mounting until system is completely assembled.

3. **Grooved coupling assembly** (victaulic coupling)

   a. Arkal AGF filters are assembled with grooved coupling connecting the components. These fittings permit easy assembly and disassembly of components. AGF stations can be easily expanded. Grooved fittings allow some flexibility in the joint while maintaining a water-tight seal. To assemble components using grooved fittings, please refer to the following instructions, and *see Figure 2 & 3.*

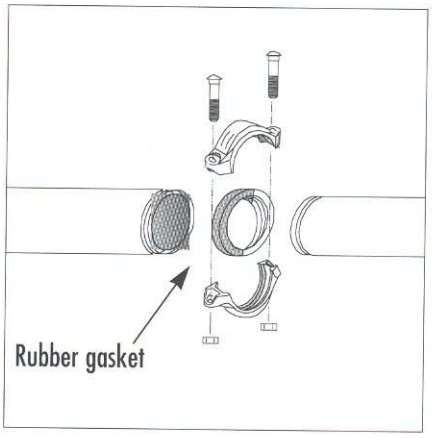


***Figure 2:* Grooved Coupling Assembly**

b. Remove bolts from coupling and place the rubber gasket completely onto one of the grooved components to be assembled. A soap, or gasket tube can be used to lubricate the gasket. Mate the two grooved components and slide the rubber gasket over both so that it is centered between the two grooved fittings. Place the clamps around the gasket and fasten bolts. Install all other components before tightening the bolts.

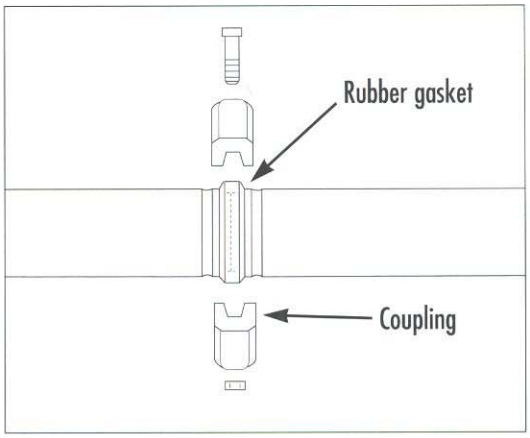


***Figure 3*: Proper positioning of gasket during assembly**

4. Backflush valve assembly

The 48" media filters use 4x4x4 valves
(4" inlet outlet, backflush port 4" vic or 3"TH). The valves are assembled on top of the tank, shown in *Figure 4*, using victaulic coupling. Be sure the valve is installed with the short side of the valve towards the filter. The arrow on the valve (*See Figure 5*) must point toward the filter.

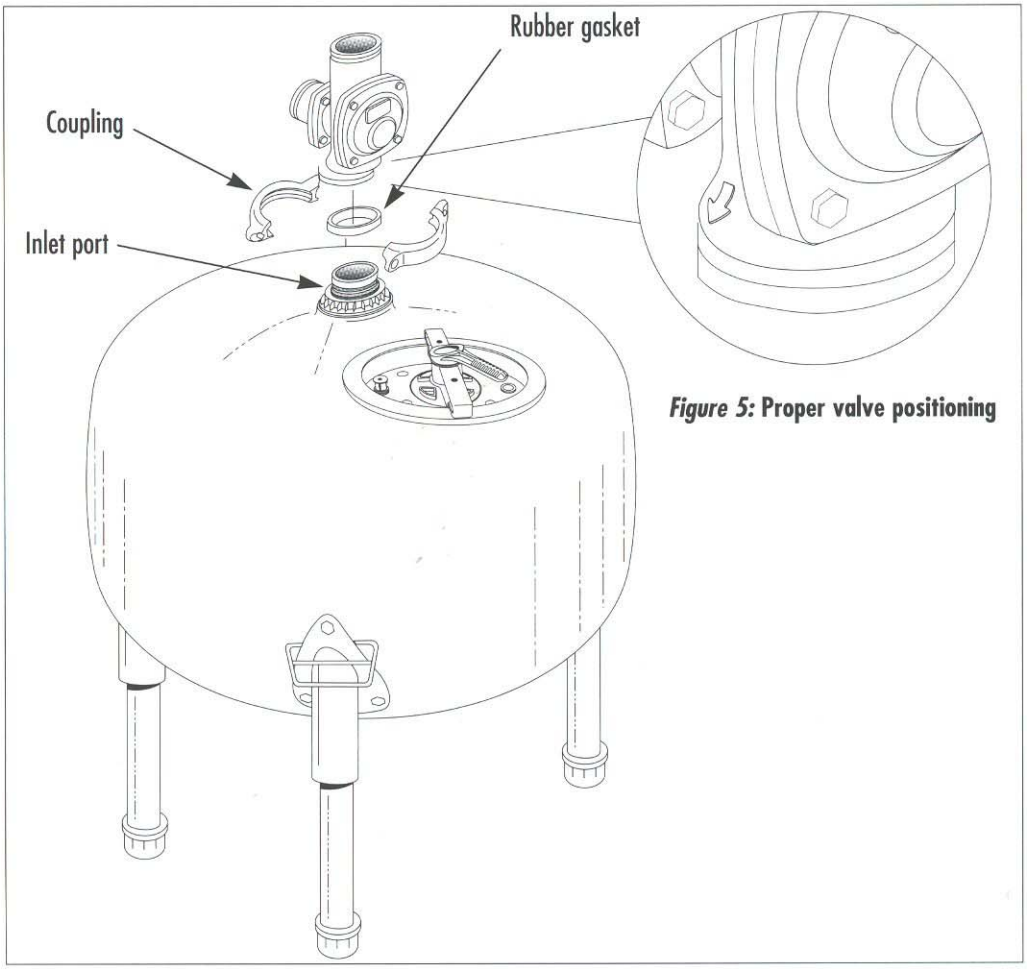


***Figure 5:* Proper valve positioning**

***Figure 4*: Valve Installation**

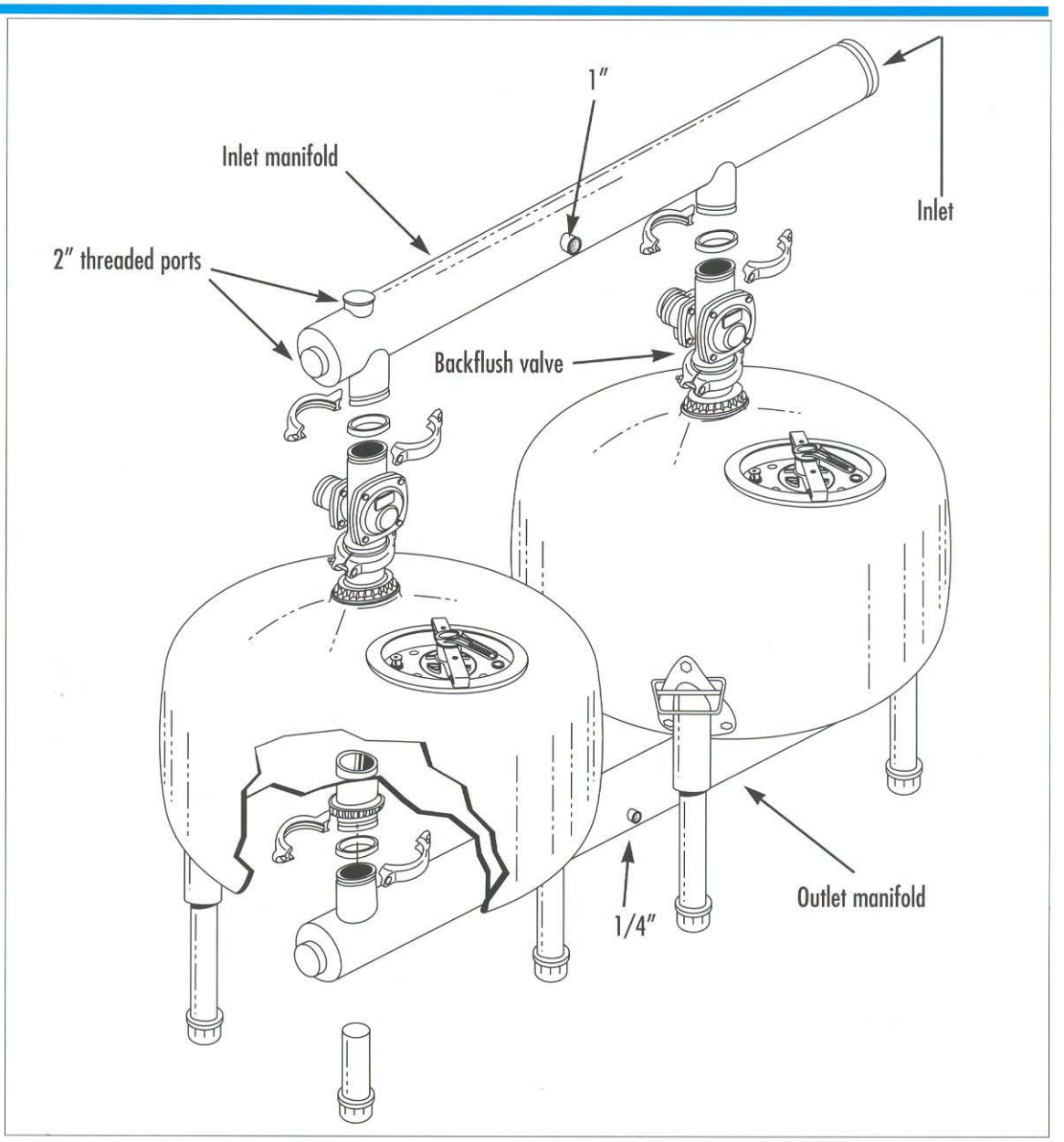


***Figure 6*: Assembly of the manifolds**

5. Assembling the manifolds

Align and attach the inlet manifold to the backflush valves.

a. Generally, the inlet manifold should be open towards the pump and the outlet manifold open towards the field, although other arrangements may be acceptable.

b. Each manifold has: two 2" threaded ports, one 1" port, and one 1/4" port.
In the inlet manifold: the end 2" port is used for pressure release valve, the top 2" port is used for air release valve. The 1" port is used for the hydraulic command assembly. The 1/4" port is used for the pressure gauge.
In the outlet manifold: the 2" port can be plugged or can be used as a manual valve for drainage. The 1" are plugged. The 1/4" port is used for the outlet pressure gauge.

c. If backup filters are not being installed, the outlet manifold can be aligned and attached directly to the outlet of the AGF filters.

***NOTE:** The inlet and outlet manifolds are identical.*

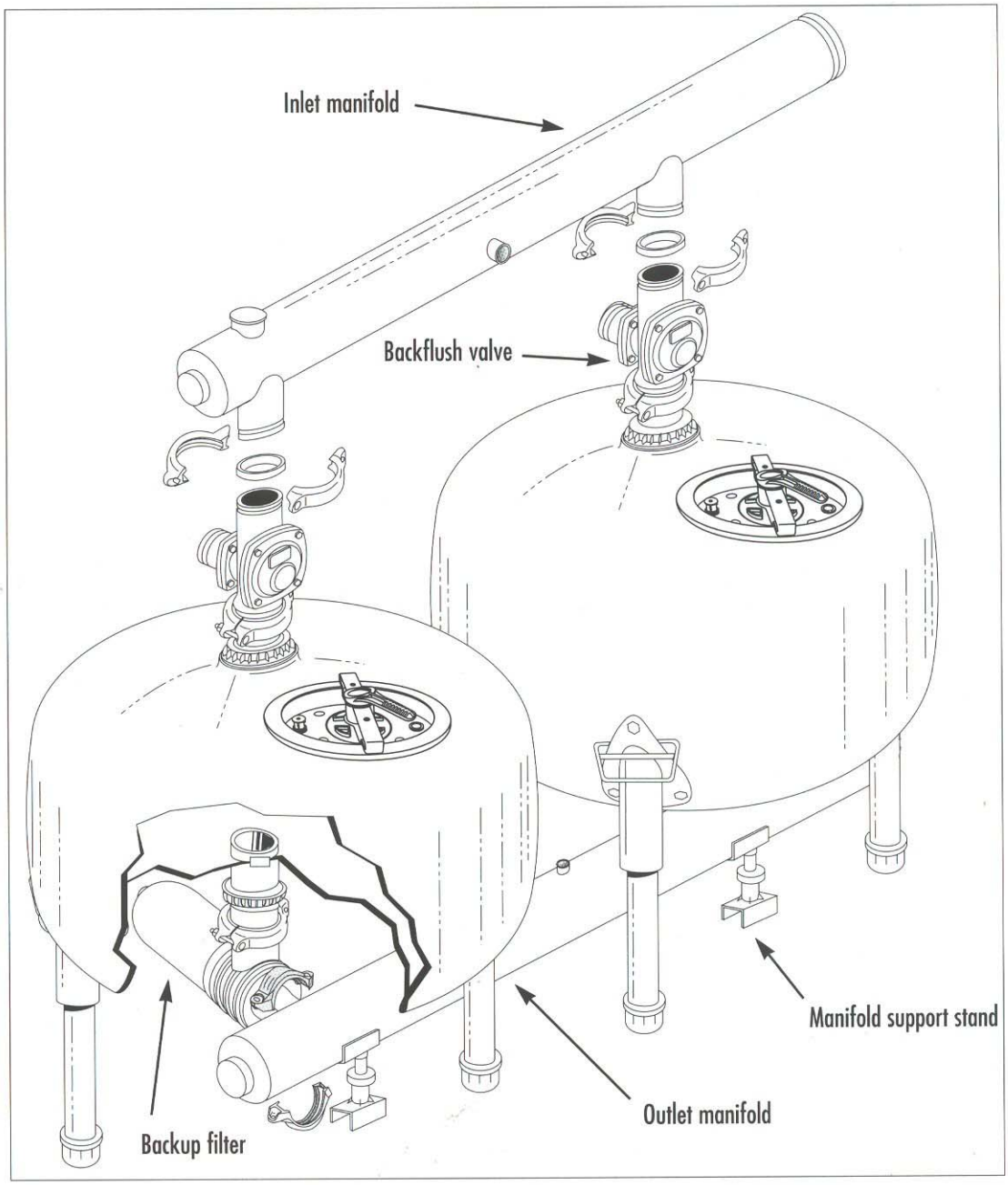


Figure 7: **Assembly of the Manifolds with Backup Filter**

6. Assembling the Manifolds with Backup Filters *(Optional)*

a. If backup 4" angle filters are being used, attach them to the outlet (below) of the media filters. The outlet manifold can then be attached to the 4"angle filters. **When backup filters are used, it is necessary to use a manifold support stand to prevent excess stress on the coupling.**

b. Arkal recommends 80 Mesh backup, if used.

7. Air/vacuum release valve assembly

a. Install the 2" air/vacuum release valve as shown in *Figure 8.*

b. It is highly recommended that a pressure relief valve be installed to protect the filter station from high pressure surges.
Install the pressure relief valve using a 2" threaded nipple. (*See figure 8.*)

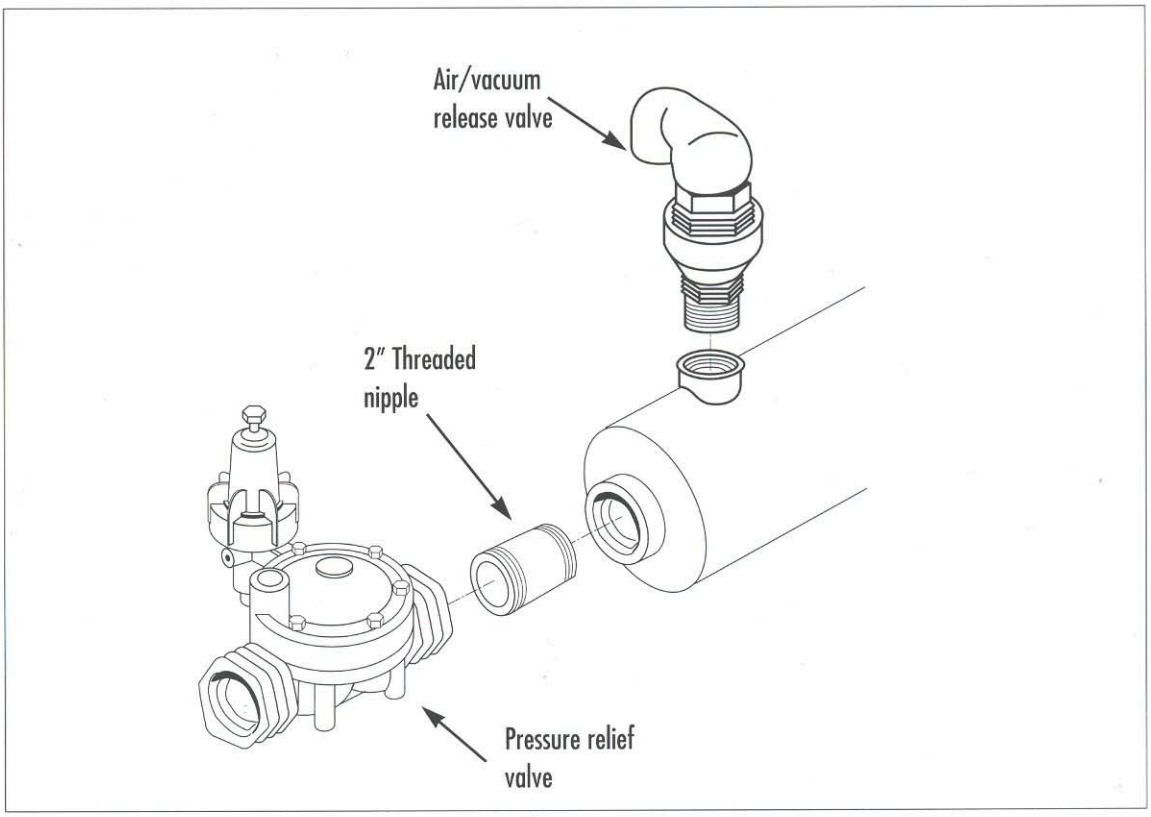


***Figure 8*: Assembly of air/vacuum release valve and relief valve.**

> ***Note**: 85 psi is the maximum pressure. If pressure raises above 85 psi (6.0 atm..) a pressure release valve must be installed with sufficient capacity to discharge over-pressurization.*

8. Constructing the backflush manifold *(See Figure 9)*

a. PVC is generally used to construct this manifold -4" (CL160) PVC for 48" filters. If using polyethylene (PE.), use 75 mm.

b. The backflush water should be discharged through an open pipe (to atmosphere) and not connected to any pressurized line. It is helpful to have the end of the discharge line accessible, and certainly it should be visible, and not submerged.

c. A flow control valve (restriction) MUST be installed on the backflush line for reliable backflush function. This valve should be installed close to the filters. Gate or globe valves can be used as a backflush restriction valve.

Adjustment of the valve is explained on page 14-3.

d. It is recommended to add a 2" vacuum valve on the backflush line in front of the restriction valve.

e. Down stream from the restriction valve it is recommended to install the "view tube" (4" clear PVC).

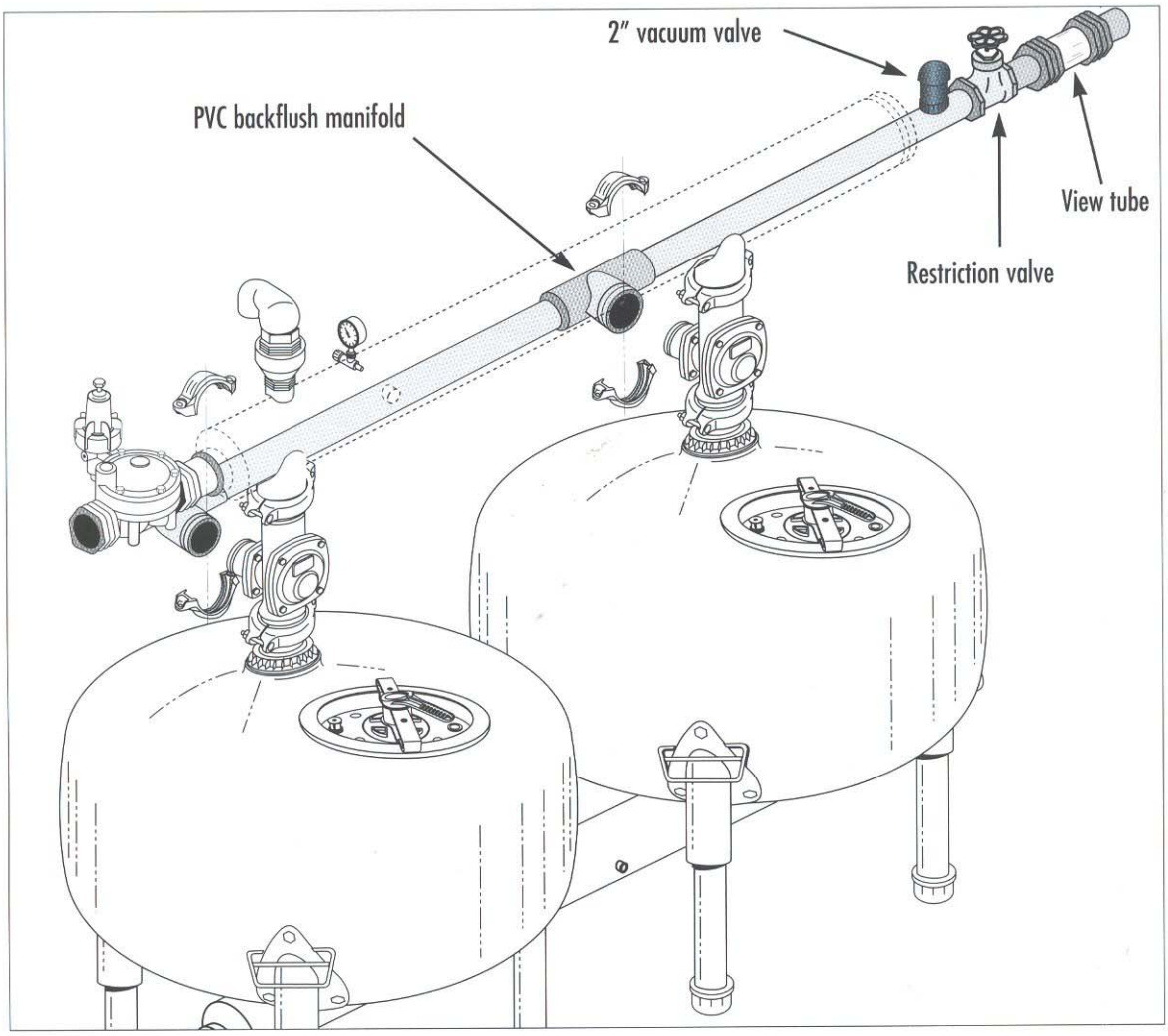


***Figure 9*: Backflush manifold assembly**

III. INSTALLATION OF THE HYDRAULIC COMMAND SYSTEM

1. Install into the inlet manifold:

   a. Install inlet pressure gauge.
   b. Install the 'hydraulic command filter' into the inlet manifold as shown in Figure 10.

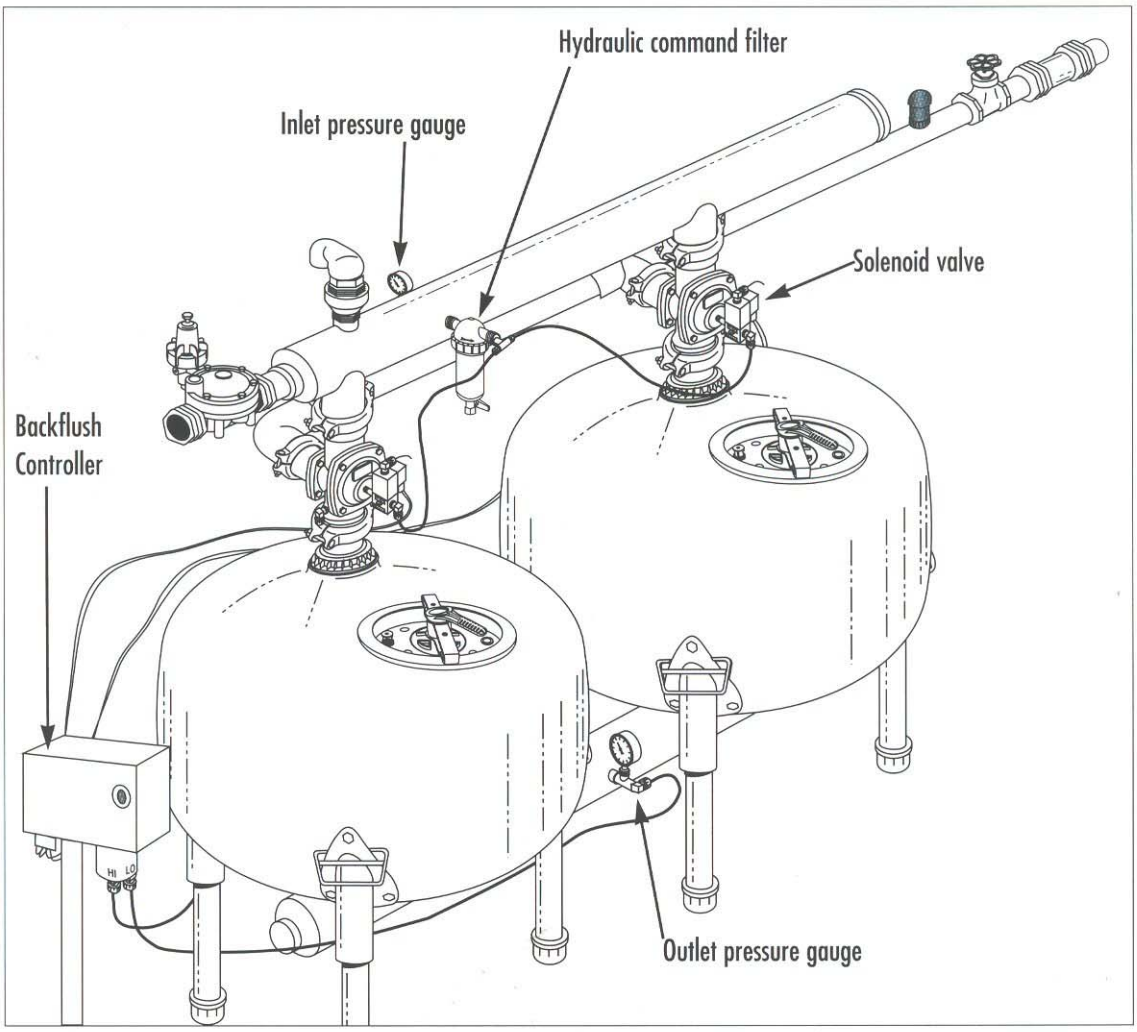


***Figure 10*: Hydraulic command system connection**

2. Install solenoid on the Backflush valve. Connect port A (see figure 11) to 1/4" TH on the valve. (In most cases, backflush valves are shipped with pre-installed solenoid.)
3 Connect with control tubing from the 'Hydraulic Command filter' on the top manifold to the port P on the solenoid.

   ■ Hydraulic command tubing, recommended, is 8mm or 5/16" black polyethylene tubing (208" I.D. .315" O.D.). Connections are made by unscrewing compression nut, inserting tube through compression nut and over nipple. Tighten compression nut by hand.

4. Connect a piece of 8 mm tubing to the elbow on the exhaust port of the solenoid for drainage.

IV. CONNECTION TO AUTOMATIC BACKFLUSH CONTROLLER

1. Following are instructions for hooking up to a backflush controller.

2. Most controllers have a pressure differential (P.D.) switch which has two threaded fittings on the bottom (1/8" male), which connect to the pressure differential switch. One of these will be marked "Hi" and one will be marked "Low". Install adapters : 1/8" female thread x compression to permit the connection of hydraulic control tubing.

3. Connect the downstream (Low) pressure sensor. Use hydraulic control tubing to connect the open connection on the hydraulic command tee (A3) with the low (downstream) pressure sensor of the backflush controller (Marked "Low") as shown in *Figure 11*.

4. Connect the upstream (High) pressure sensor. Remove the plug (A1) from the downstream side of the valve closest to the controller and replace with elbow provided. Connect this elbow using hydraulic tubing to the high pressure sensor of the backflush controller. (the middle port is always the "High" on murphy switch.)

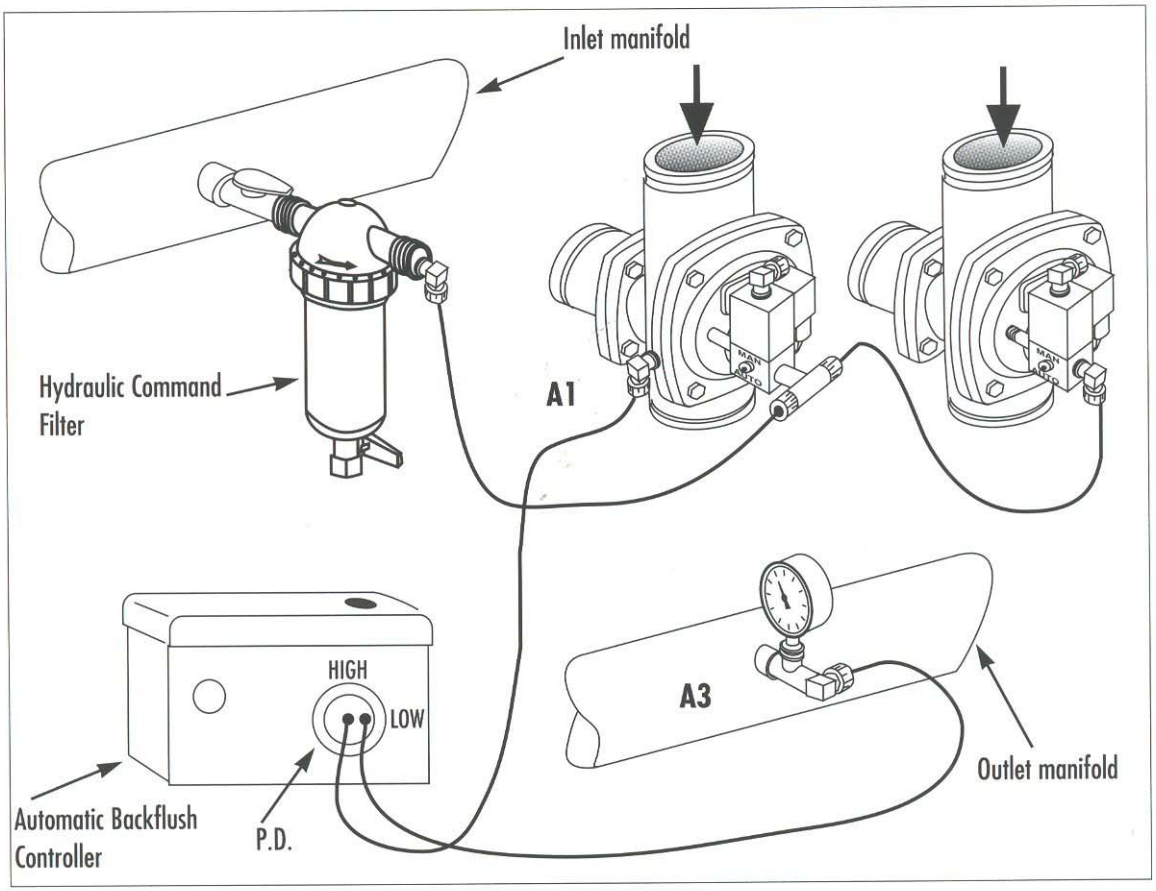
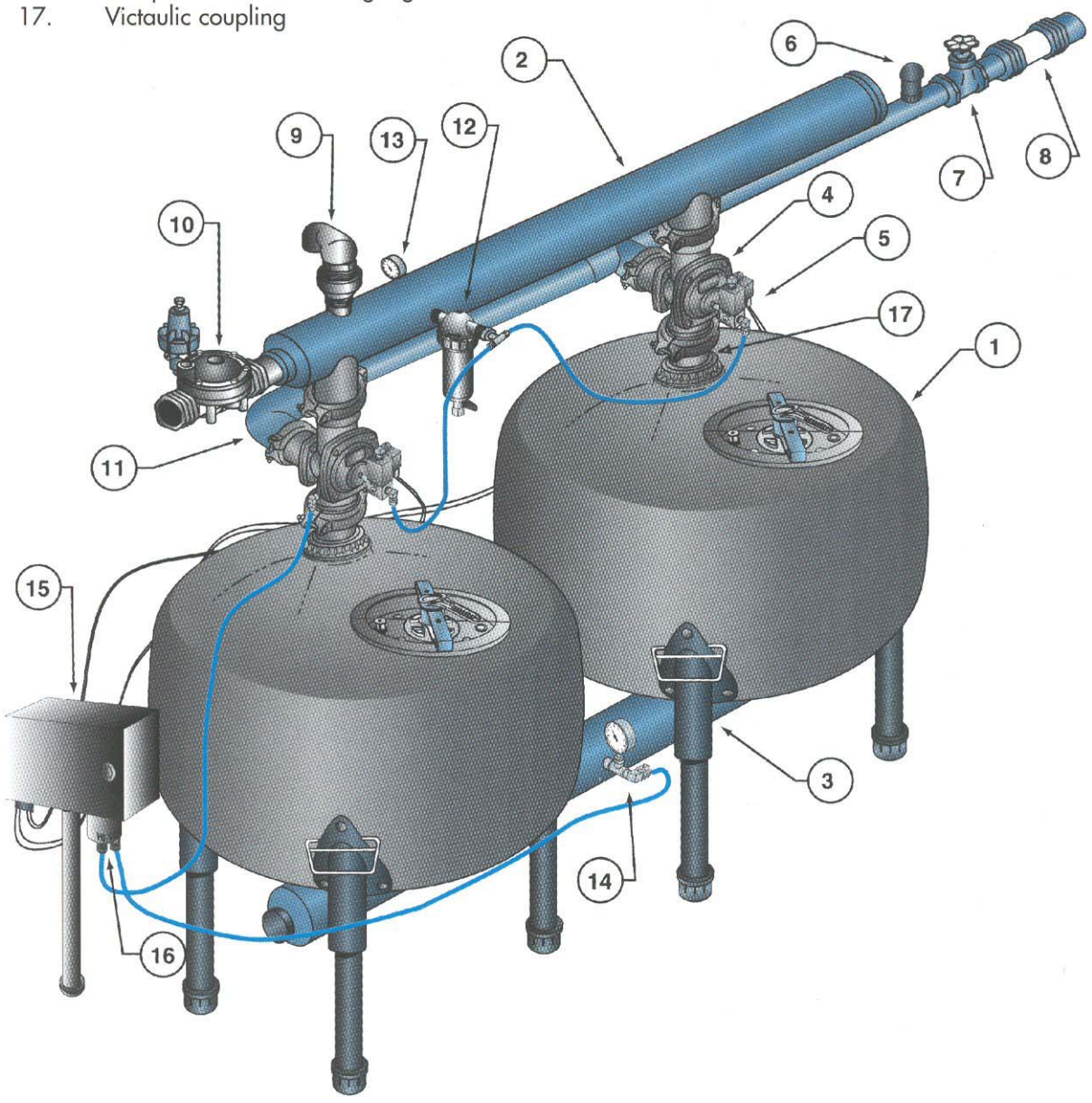


***Figure:* 11 Backflush control connections**

B. SYSTEM PART DESCRIPTION

Parts Description:

1. AGF filter body
2. Inlet manifold
3. Outlet manifold
4. Backflush valve
5. Solenoid valve
6. Vacuum breaker
7. Restriction valve
8. View tube
9. Air release
10. Pressure release valve
11. Backflush line
12. Hydraulic command filter
13. Inlet pressure gauge
14. Outlet pressure gauge
15. Backflush controller
16. P.D. pressure differential gauge
17. Victaulic coupling



C. Operation & Start-UP

I ADDING THE SAND MEDIA

1. **Recommendation of sand media**

   a. Crushed Basalt #1 ; crushed Granite #11 ; crushed Silica #12, #16, or #20 .
   These materials can generally be obtained through your local irrigation dealer.
   Specifications for acceptable sands, as well as some details regarding the filtration degree which they provide are detailed on page 23.

   b. The sand media requirement filters are shown on page 23
   In general, the AGF should be filled to approximately 5" to 6" (120-150 mm) below the distributor plate. Approximately 720 kg (1600 lbs).

2. Inspect the inside of the filters. After removing the upper access cover, and before adding any sand media to the filters, examine the bottom to be certain there are no foreign objects in the tanks, check the 'mushroom' covers and connector pins to be sure they are all in place.

   a. Tighten both the top and bottom covers by hand.

   b. Fill the AGF with water using working pressure to check it.

   c. Empty half the water from the filter and then fill the AGF with gravel from the top cover.

WARNING: The AGF can only be moved when empty (no gravel or water inside)

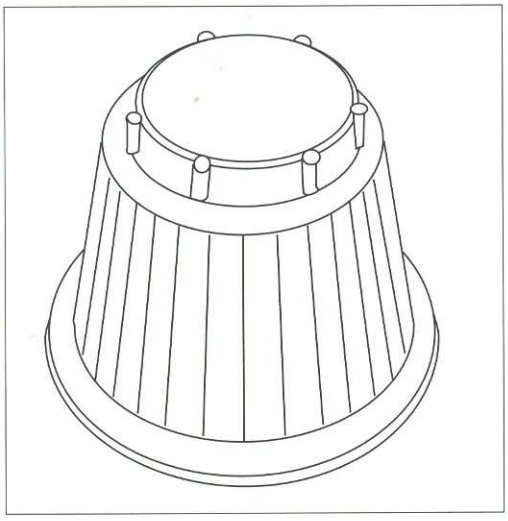


Figure 12: **Mushroom**

II. START UP

1. Check list

a. Make sure that all (Vic) groove couplers are tightened.

b. Make sure that all covers are in place and tightened.

c. Open field valves to allow water flow from filters to field.

d. Open the backflush manifold throttle valve to fully open.

e. Check backflush controller and solenoid operation (you will hear a clicking sound).

After checking, set controller to off position.

2. Start-up

a. Open main valve supplying water to filters.

b. Check pressure gauge when system is under pressure (at least 15 psi in outlet manifold). Start backflush of the first filter by using the manual override on the solenoid.

c. Keep backflush on for at least 120 seconds or until you can see clean water coming out of the backflush manifold. Repeat for each filter.

***Note**: New sand has contaminant and fines. After a few good backflush cycles, it should become clean.*

d. Start auto backflush with the controller after adjusting times.

3. Adjustment

a. Adjust the restriction valve on the backflush line to allow only a trace of media to pass through.

b. Backflush controller adjustment.

1. Time in backflush.....90-120 seconds
2. Dwell time between filters.....30 seconds
3. Time period between backflushes.....2 - 4 hours
4. Pressure differential (P.D.) adjustment over base line pressure loss.....4 - 8 psi (3-6 m)

III. BACKFLUSH OPERATION

1. General Backflush Principle

a. Filtration Mode - During filtration, unfiltered water enters the AGF system via the inlet manifold, and the filtered water exits the system to the field through the outlet manifold. During filtration, the inlet ports are open, and the backflush ports are closed. Water flows from top to bottom, across the sand layer. (*See Figure 13.*)

b. Backflush Mode - During backflush, the inlet port closes, and the backflush port opens. This reverses the flow of water in the filter. Clean water **from the other filters** now flows into the filter from the bottom, lifting the sand media and freeing the accumulated debris. The debris will be flushed out the top of the filter through the backflush valve into the backflush manifold.

Only one filter should backflush at a time.

The water which is backflushing one filter will have passed through the other filter(s), and thus backflushing will be made with filtered water.

c. The backwash flow depends on the pressure differential between the outlet manifold and the backflush line during backflush. (Between P_1-P_2)

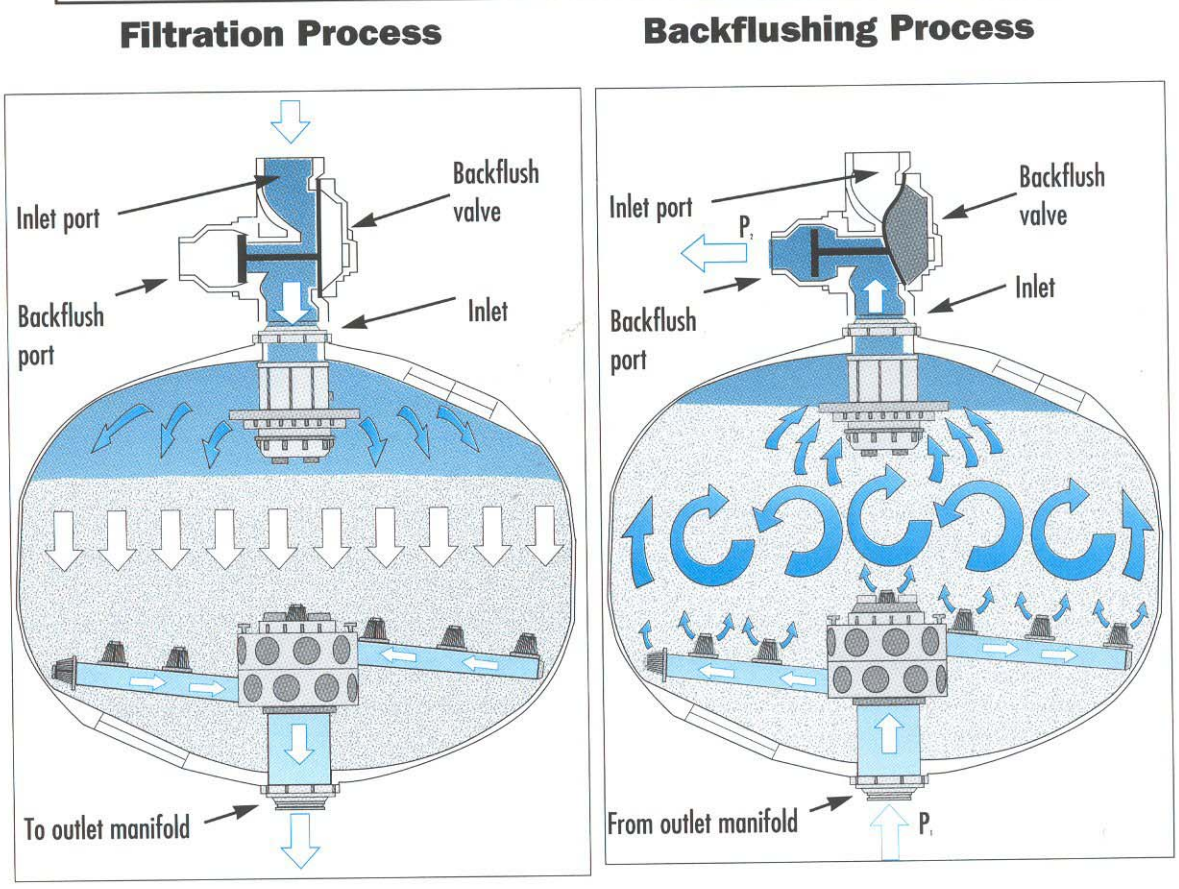


Figure 13: **Filtration and backflush operation**

2. When to Backflush

a. As debris builds up in the media filter, a pressure loss will develop across the filter. The dirtier the filter becomes, the greater the pressure loss. When the pressure loss reaches a critical limit, 6-8 psi (4-6 m), the filter is dirty, and in need of a backflush.

b Check the pressure differential when your filters are clean to get the Baseline Pressure Loss. As your filter operates, it will become dirty, and the pressure loss will increase. When the pressure loss increases over your Baseline Pressure Loss for a clean filter by 4-8 psi (3-6 m) it is time to backflush the filter.

c. Automatic backflush controllers will sense the pressure loss and activate trigger command, a backflush sequence, to start when necessary.

d. **It is recommended to flush every 2-4 hours regardless of pressure loss.**

3. Adjustment of the Backflush Restriction Valve

a. The flow to the backflush must be restricted in order to prevent the sand from being washed out with the dirty water. In the backflush mode the sand is in a turbulent suspension with the water and debris. Proper adjustment of this valve will allow the proper backflush flow as possible, with only a trace of media being lost through the backflush. A small loss of media is considered optimum.

b. Check to see if sand is being washed out with the backflush water. One method of doing this is to cup your hand, and touch the bottom of the backflush stream as it exits the backflush manifold. If sand is present in the water, you will feel its grittiness in your hand. Or, even better, place a screen over the outlet to backflush manifold and examine it for sand in the flush water. (A view tube is ideal - you can see it.)

Note: *New sand has contaminant and fines. Fill the filter to overflowing with a garden hose to float off the majority of fines. Also, backflush the filter 4 to 6 times to remove fines before adjusting the restriction valve.*

4. Backflush Pressure

a. Filters must have both adequate pressure and water velocity for proper backflush. It is recommended that AGF filters have a minimum of 20 psi (14 m) of pressure during backflush.

b. When the system consists of only two filters, the water pressure must be carefully considered. Backflushing requires that all the water flows through one filter to backflush the other filter. This can change the pressure drop through the one filter, resulting in inadequate pressure for the other filter - especially when using a pump with a steep cover.

c. If you feel you may have low pressure, or low flows, consult your dealer for recommendations. Generally, the addition of a pressure sustaining valve downstream of the filter station will solve the problem.

IV. MANUAL BACKFLUSH OPERATION

1. All backflush valves can be operated manually even if provided with a solenoid for automatic operation by using the manual override on the solenoid.

   a. A three way selector valve (also called 'Sagiv') can be used on the backwash valve of each filter allowing the system to be flushed manually.

   b. For manual operation, the handle should be facing the (o) Open position when the filter is in filtration mode (*see figure 14*). When backflushing, the handle should be turned to face the (c) Close position. This will open the backflush valve to the backflush manifold.

2. Backflushing should be maintained until the water becomes clear. At this point the handle can be returned to the (o) open position for normal irrigation. Backflushing normally requires 90 to 120 seconds.

3. Manual backflushing is activated by using the manual override of the solenoid (*see figure 15*).

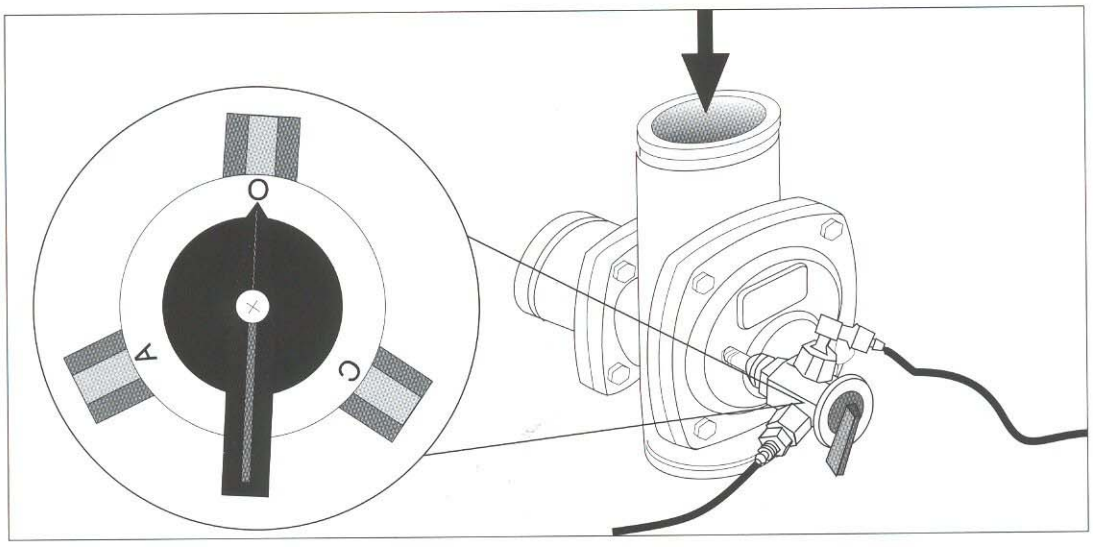


Figure 14: **Semi automatic**

V. AUTOMATIC BACKFLUSH OPERATION

1. The Automatic backflush controller

a. The automatic filter stations supplied from Arkal are shipped with a solenoid installed on the backflush valves. The controller for these valves must be ordered separately. Most filter backflush controllers will operate Arkal Filter Systems. The backflush controllers which Arkal supplies come with their own instruction manuals for installation, and operation. This instruction manual will detail the proper electrical connections to the solenoid and controller power source.

b. The controller can start a backflush cycle based on either time or pressure differential. Once the backflush cycle is initiated by the controller, each filter will backflush in sequence for a duration which can be set on the controller. Arkal recommends that pressure differential should be the primary activator of the backflush sequence, and that the controllers time clock should provide a back-up for backflush at least every 4 hours .

We recommend to backflushing at least once during every irrigation.

2. Setting the Pressure Differential Switch

The P.D switch in the backflush controller reads the current pressure loss, and has an adjustable hand which determines the set-point for backflush cycle initiation. With the filters clean, and in filtration mode, read the current pressure loss. This is the Baseline Pressure Loss for clean filters. To establish a backflush set-point, add 4 to 8 psi (3-6 m) to this Baseline Pressure Loss, and set the adjustable hand to this set point. The filter system will now enter into a backflush cycle any time this pressure loss set-point is reached.

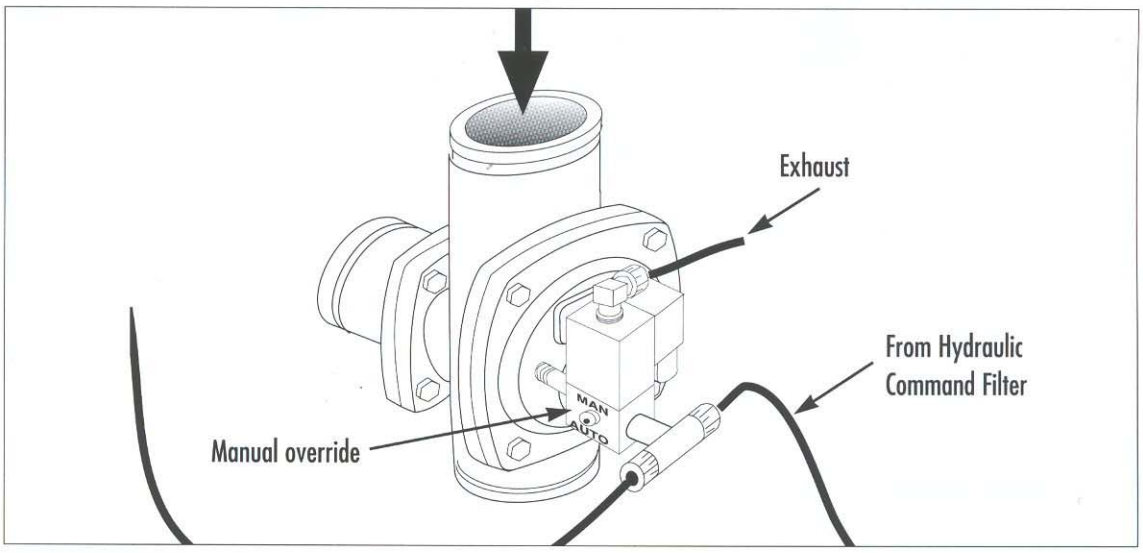


Figure 15 Full automation

3. Setting the Flush Time

This setting determines the duration of the backflush for each filter. This time should not be set for less than 1 minute. Generally, 120 seconds is adequate for even very dirty water, and 90 seconds is adequate for moderately dirty to clean water. In low pressure applications, more time may be required. If over 90 seconds is required to perform a proper backflush, it may be that the filter is becoming excessively dirty between backflushes. When 90 seconds fails to provide a complete backflush, decrease the pressure differential setting by 1-2 psi (0.7-1.5 m) to decrease the period between backflushes.

4. Setting the Periodic Start

a. This setting establishes a time schedule for backflushing. The purpose of this function is to ensure that backflushing takes place if there is a failure in the pressure differential switch. Or if no P.D is noticed, the filters will backflush periodically.

b. Typical periodic settings are:

very dirty water	1 hour
dirty water	2 hours
moderately dirty to clean water.	3 hours

c. To properly set the periodic start, you should observe the filter through several backflush cycles initiated by the pressure differential switch, marking the time it took between each backflush cycle. Multiply the amount of time between backflush cycles by 1.2 to get the proper periodic setting. For example: 90 minutes between backflush initiation cycles. Multiply 90 minutes x 1.2 = 108 minutes as the periodic setting.

It is common for open water sources to have different quantities of debris during the irrigation season, and it is important to adjust your backflush settings in response to this change. An example would be pond algae, which may be much heavier during certain times of the summer. Under these conditions, you should occasionally check and record the period of time between backflush cycles initiated by the pressure differential switch in order to re-establish the proper periodic start setting according to the process described in the paragraph above.

5. Dwell time setting

The dwell time is the time period between the flushing of each filter in a given backflushing cycle. This is necessary in some systems for the pump to recover pressure for backflushing the next filter. A normal setting is 20 to 60 seconds.

D. OPERATION TIPS

1. **Maximum working pressure is 85 psi (6.0 atm..).**

2 Pump inlet should be 3 to 4 feet (1.0 -1.2 m) below the surface and a minimum of 2.5 feet (0.75 m) from the bottom to prevent intake of excess dirt when pumping from a ditch pond or canal.

3. Add chlorine at least twice a year to control organic material and algae growth in the filter. Apply 5 to 20 p.p.m. according to the following directions:

   a. At the end of every irrigation season, add chlorine to the water in the filter for 30 minutes (no water flows through the filter). Backflush for at least 2 minutes. Drain all the water from the filter, leaving it dry and close the inlet and outlet valves.

   b. At the beginning of the irrigation season, fill the filter with water and add chlorine. Let stand for 30 minutes (no water flows through the filter). Backwash for 2 minutes and begin irrigation.

   ***NOTE**: Additional chlorine applications will be necessary in some areas.*

4. It is recommended that backup filters be installed.

5. Recommended monthly: Open upper cover and check sand level. Add media if required.

6. The sand media will need replacing every few years as the sands edges become rounded. Sharp edges are necessary for proper filtration.

Replacing the Sand:

1. Close all the valves.

2. Open the upper service cover.

3. Open the 3" plug on the lower cover (see page 21 part #16 lower plug + #32 lower cover range) and drain all the water and sand from the filter. Remove the lower cover for faster draining.

4. Carefully rinse the inside of the tank.

5. Check the inside underdrain.

6. Close the 3" plug and install the lower cover. (make sure threads are free of sand.)

7. Fill the tank with water.

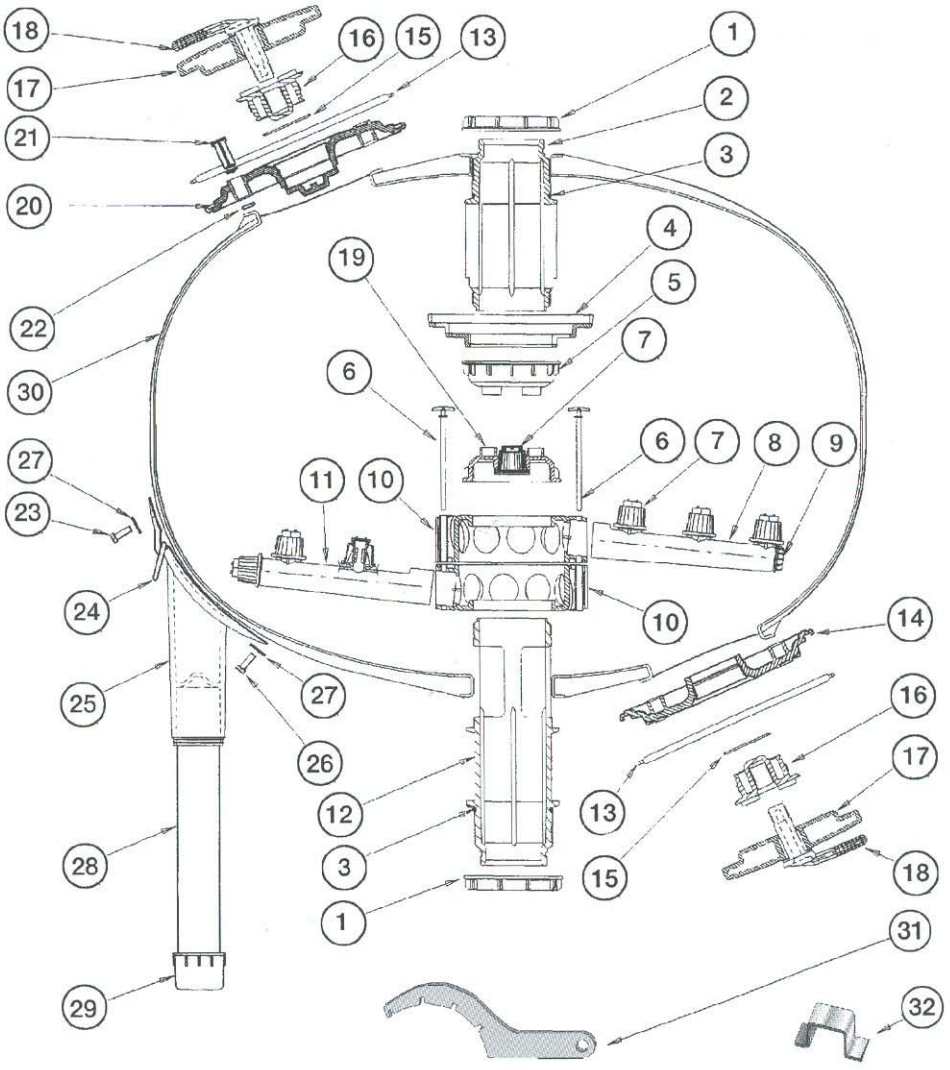
8. Add the new sand.

9. Open all the valves.

Appendix 1: AGF catalog part # list

PART No.	DESCRIPTION	MATERIAL	CAT No.
1	Locking nut	RFPA	2820 - 0012
2	Inlet	RFPA	2820 - 0014
3	0"ring	EPDM	5003 - 2429
4	Distributor plate	RFPA	2820 - 0018
5	Sealing nut	RFPA	2820 - 0010
6	Pin	RFPA	2820 - 0028
7	Mushroom	PP	2820 - 0030
8	Upper diffusion	PP	2820 - 0022
9	End cup	PP	2820 - 0026
10	Drum	RFPA	2820 - 0020
11	Lower diffuser	PP	2820 - 0024
12	Outlet	RFPA	2820 - 0016
13	Cover seal	EPDM	5005- 0548
14	Lower cover	RFPA	2820 - 0324
15	0" ring	EPDM	5003 - 2235

PART No.	DESCRIPTION	MATERIAL	CAT No.
16	Lower plug	RFPA	2820 - 0340
17	Bridge	RFPA	2820 - 0036
18	Tightening screw	RFPA	2820 - 0038
19	Upper plug	RFPA	2820 - 0342
20	Upper cover	RFPA	2820 - 0322
21	Vacuum release	PP	2820 - 0046
22	0"ring	EPDM	5003-2310
23	w 3/8" *30 Screw	ST-ST	5040 - 3830
24	Handle	ST-ST	5076-0248
25	Leg housing	RFPA	2820 - 0040
26	w 3/8" *30 screw	ST-ST	5040 - 3840
27	3/8" washer	ST-ST	5040 - 9138
28	Leg		5050 - 1400
29	Base cap	RFPA	2530 - 0112
30	Filter body		5080 - 0480
31	Locking nut range		5076 - 022
32	Lower cover range		5076 - 021

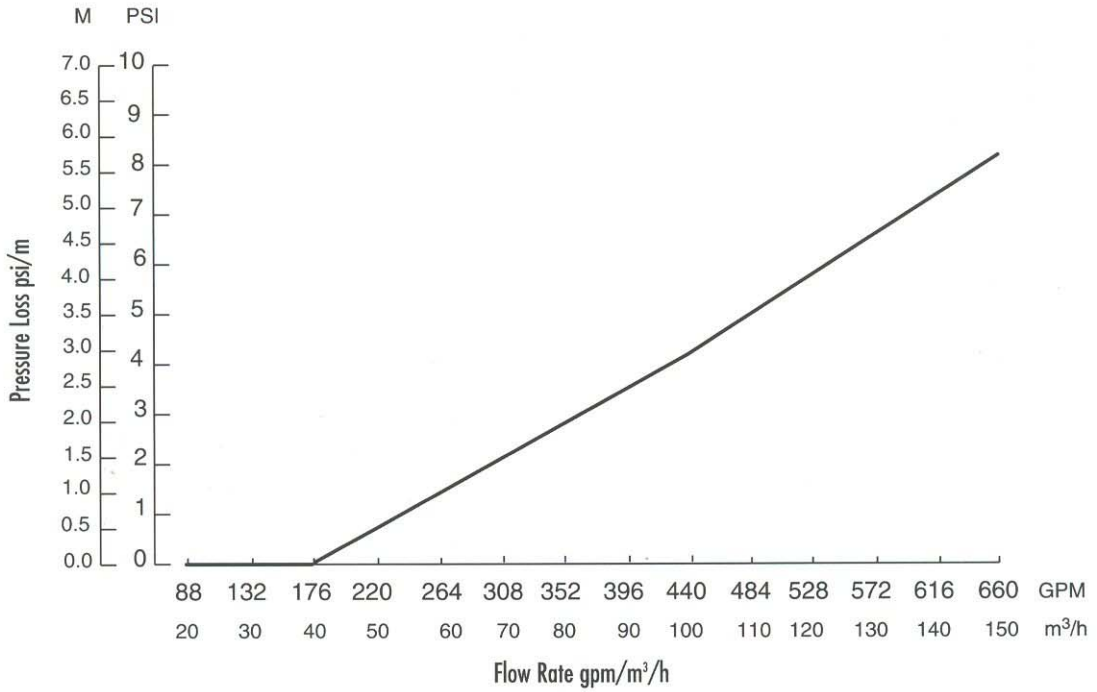


Parts view of filter

Appendix 2: Design chart & media selection

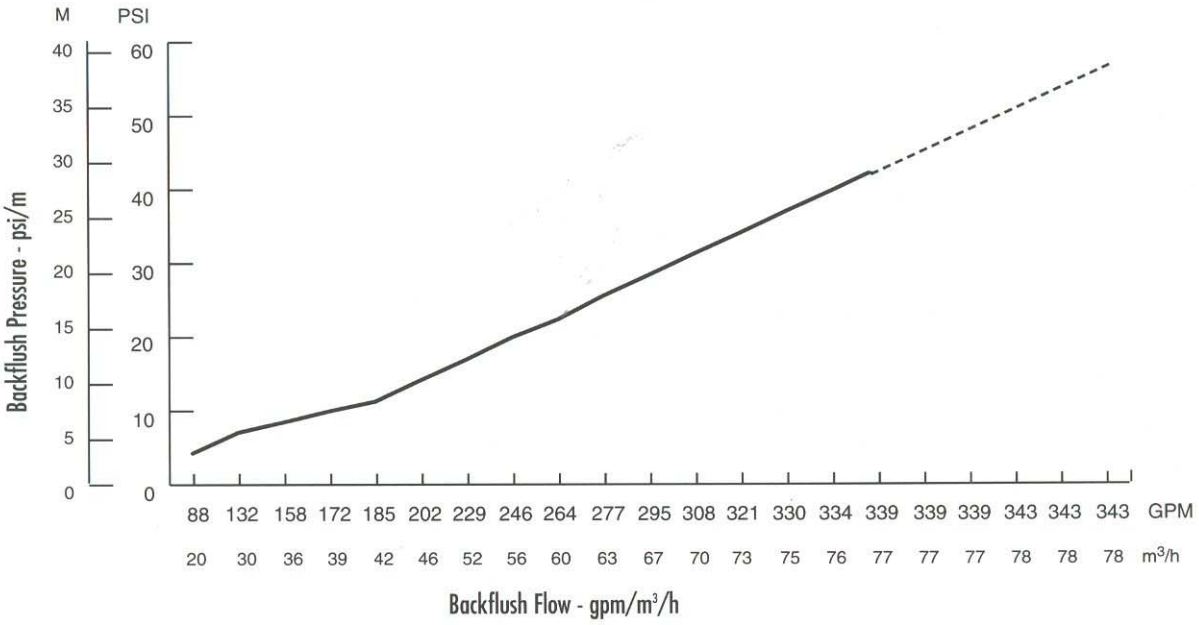
AGF Filter 48" Head Loss

(With crushed silica16#)



Test done with: sand media Silica #16

Flow vs. Pressure in Backflush Mode



Test done with: Dorot 4X4X3 backflush valve
Backflush line 3" (75 mm) Length 20 ft. (7.0 m) open to atmosphere
Sand media Silica #16

Media/Filtration Selection effects Grades

Media	Mesh	Micron	Equivalent Silica Size (mm) Min	Max	Average	Min. flow for Backflush* (gpm)	(m^3/h)
Crushed Silica #20	170-230	88-60	0.3	0.5	0.4	180	42
Crushed Silica #16	155-200	95-70	0.5	0.8	0.65	200	46
Crushed Silica #12	80-130	170-120	0.8	1.3	1.05	240	54
Crushed Basalt #1	140-180	105-80	0.4	1.1	0.75	264	60

* Adjust the backflush restriction valve to one turn below sand runoff.

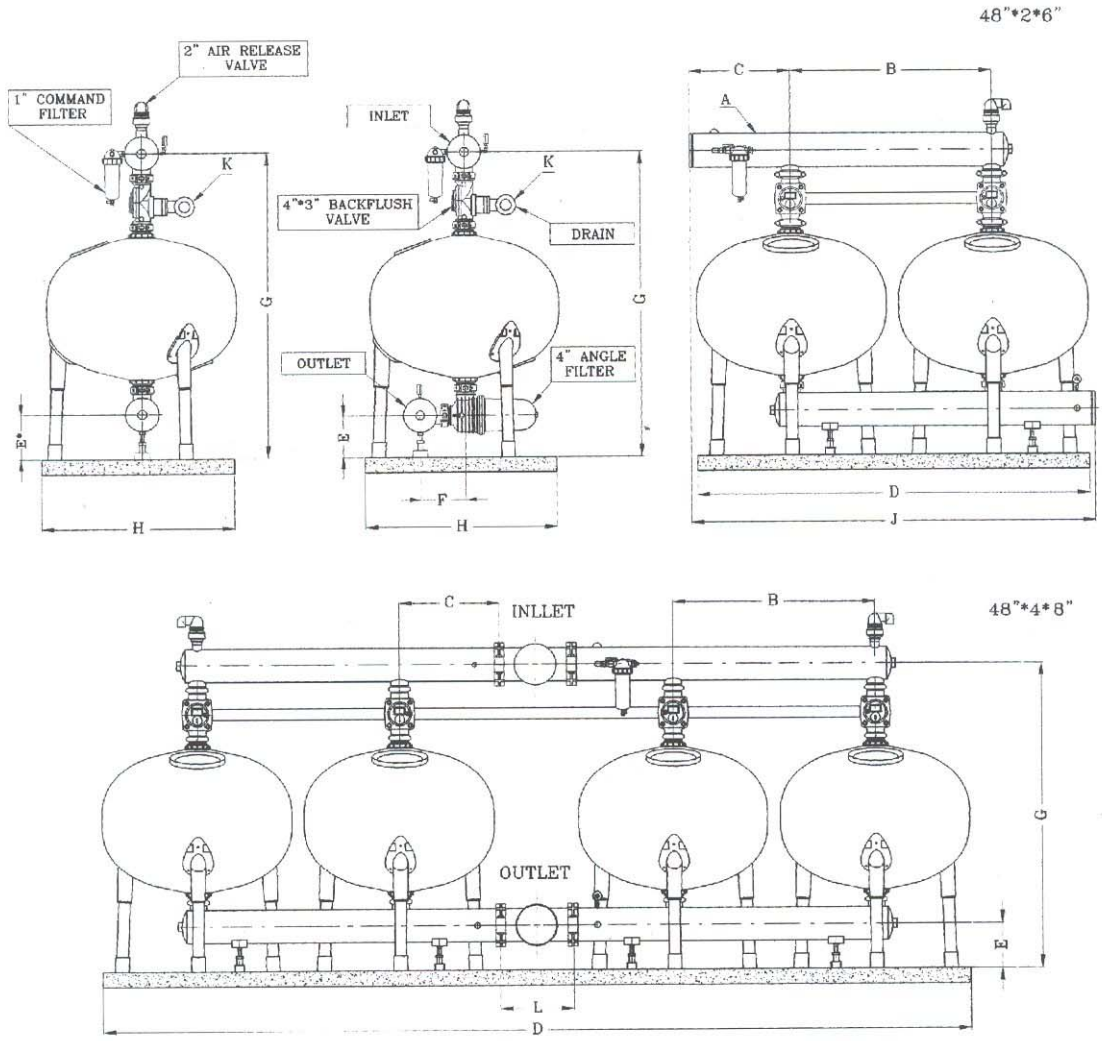
AGF Design Chart (Metric)

Filter Number	Model	Manifold	Maximum Working Pressure (m)	Filtration Area - (m^2)	Volumes at Rated Flow x m^2 Dirty Water 34-44 m^3h/m^2	Average Water 44-57 m^3h/m^2	Clean Water 57-68 m^3h/m^2	Weight (Filters Only) (kg)	Media Req. (kg)
1	AGF48-1	------	60	1.166	40-51	51-66	66-80	120	720
2	AGF48-2	6"	60	2.33	80-102	102-132	132-160	240	1440
3	AGF48-3	6"	60	3.5	120-153	153-198	198-240	360	2160
4	AGF48-4	T 6" x 10"x6"	60	4.66	160-204	204-264	264-320	480	2880
5	AGF48-5	T 6" x 10"x6"	60	5.83	200-255	255-330	330-400	600	3600
6	AGF48-6	T 6" x 10"x6"	60	7.0	240-306	306-396	396-480	720	4320

AGF Design Chart (U.S. Standard)

Filter Number	Model	Manifold	Maximum Working Pressure (psi)	Filtration Area - ft^2	Volumes at Rated Flow x ft^2 Dirty Water 14-18 gpm/ft^2	Average Water 18-23 gpm/ft^2	Clean Water 23-28 gpm/ft^2	Weight (Filters Only) (Pounds)	Media Req. (Pounds)
1	AGF48-1	------	85	12.5	175-225	225-290	290-350	265	1600
2	AGF48-2	6"	85	25.0	350-450	450-575	575-700	530	3200
3	AGF48-3	6"	85	37.5	525-675	675-860	860-1050	795	4800
4	AGF48-4	T 6" x 10"x6"	85	50.0	700-900	900-1150	1150-1400	1060	6400
5	AGF48-5	T 6" x 10"x6"	85	62.5	875-1125	1125-1440	1440-1750	1325	8000
6	AGF48-6	T 6" x 10"x6"	85	75.0	1050-1350	1350-1725	1725-2100	1590	9600

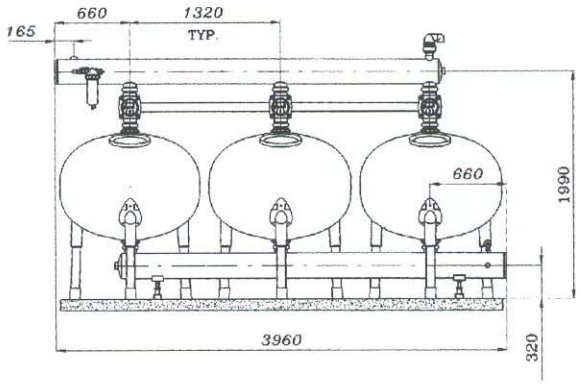
Appendix 3: AGF filter system dimension (inches)



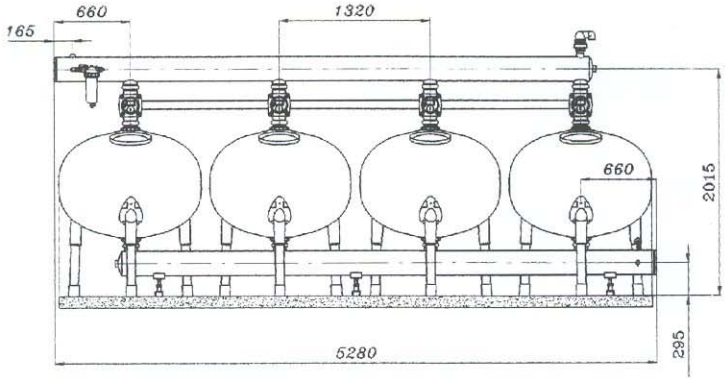
Data for 48" A.G.F. Tank Systems (U.S. Standard Dimensions*)	48*2*6"	48*3*6"	48*4*8"	48*4*8"T	48*5*8"T	48*6*10"T
A. Inlet/Outlet Diameter	6	6	8	8	8	10
B. Tank Distance	52"	52"	52"	52"	52"	52"
C. Inlet/Outlet Reference	26"	26"	26"	26"	26"	26"
D. Length	101"	153"	205"	222"	274"	325"
E. Outlet Height w. 4" Angle Filter	10 5/8"	10 5/8"	10 5/8"	10 5/8"	10 5/8"	10 5/8"
E*. Outlet Height w/o 4" Angle Filter	12 1/2"	12 1/2"	11 1/2"	12 1/2"	12 1/2"	12 1/2"
F. Outlet Location w/o 4" Angle Filter	10 3/4"	10 3/4"	11 3/4"	10 3/4"	10 3/4"	10 3/4"
G. Inlet Height	78"	78"	79"	78"	78"	78"
H. Width	49"	49"	49"	49"	49"	49"
J. Distance between Inlet/Outlet	104"	156"	208"	-	-	-
K. Backwash Line Diameter	ø4"	ø4"	ø4"	ø4"	ø4"	ø4"
L Length of T	-	-	-	17"	17"	17"

* All Dimensions above are in inches

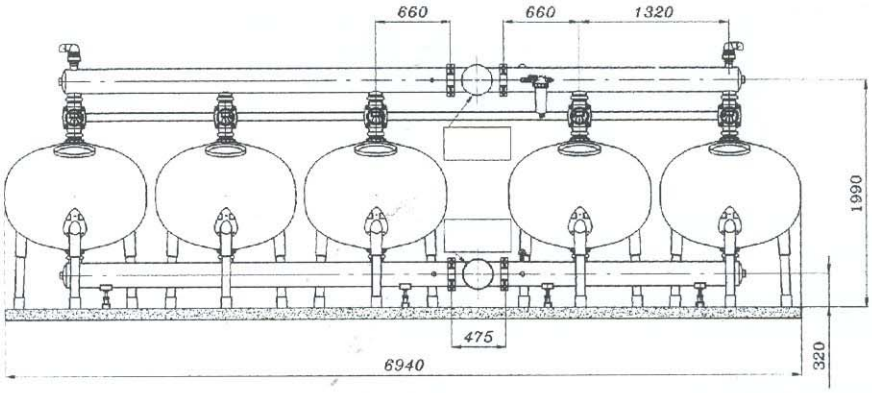
48"*3*6"



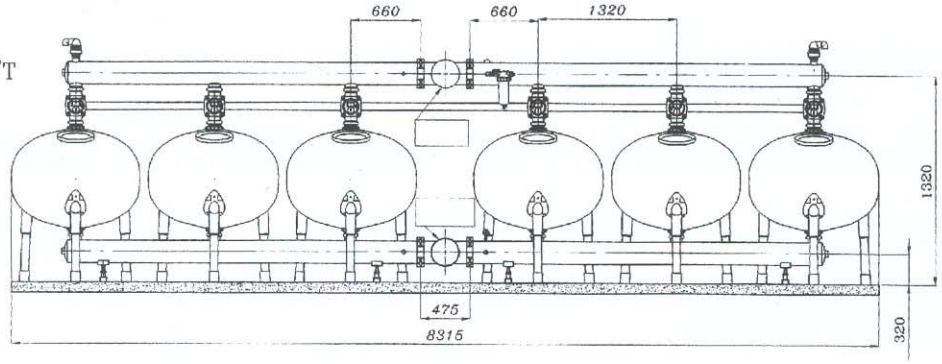
48"*4*8"



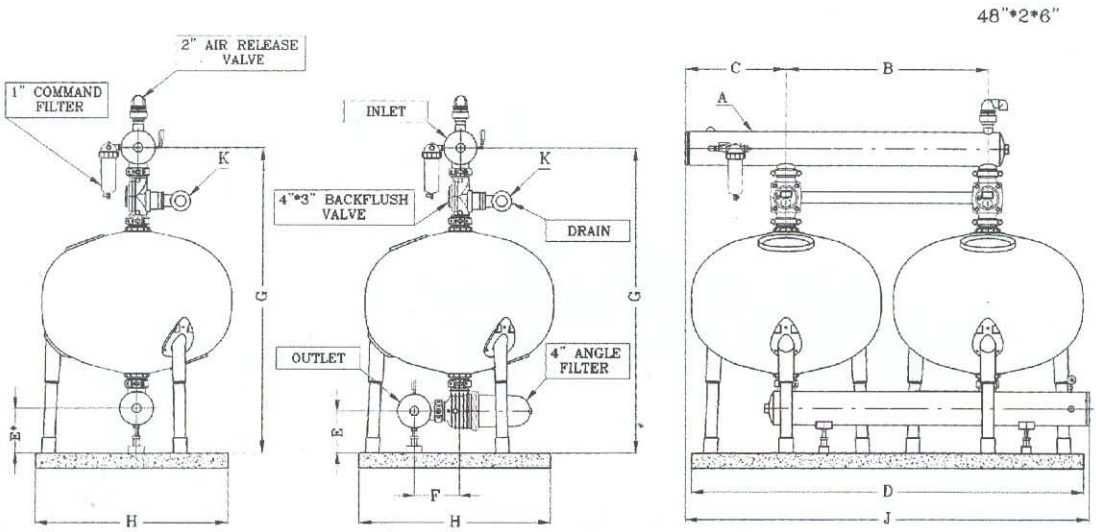
48"*5* 8"T

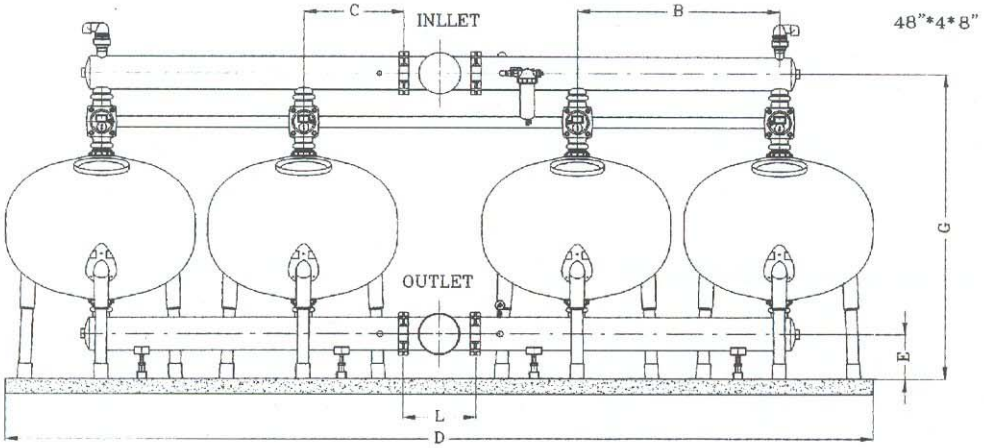


48"*6*10"T



Appendix 4: AGF filter system dimension (mm)

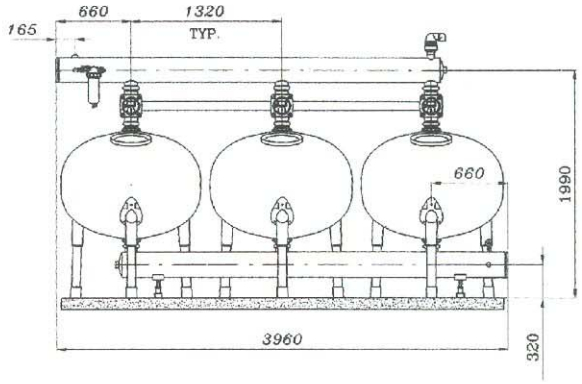




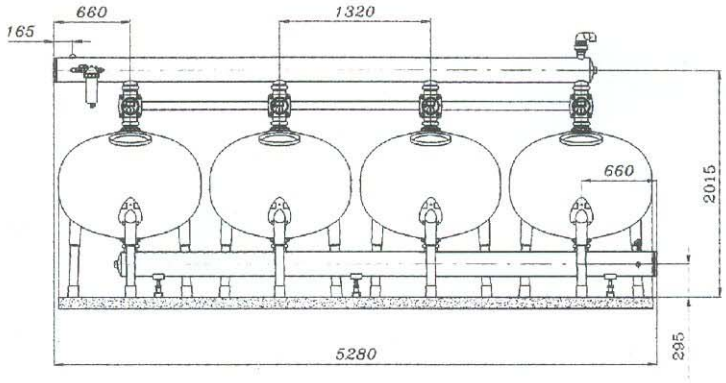
Data for 48" A.G.F. Tank Systems (Metric Dimensions*)	48*2*6"	48*3*6"	48*4*8"	48*4*8"T	48*5*8"T	48*6*10"T
A. Inlet/Outlet Diameter	6	6	8	8	8	10
B. Tank Distance	1320	1320	1320	1320	1320	1320
C. Inlet/Outlet Reference	660	660	660	660	660	660
D. Length	2640	3960	5280	5625	6945	8315
E. Outlet Height w. 4" Angle Filter	275	275	275	270	270	270
E*. Outlet Height w/o 4" Angle Filter	320	320	295	320	320	320
F. Outlet Location w/o 4" Angle Filter	275	275	300	275	275	275
G. Inlet Height	1990	1990	2015	1990	1990	1990
H. Width	1240	1240	1240	1240	1240	1240
J. Distance between Inlet/Outlet	2640	3960	5280	-	-	-
K. Backwash Line Diameter	ø75 P.A.	ø75 P.A.	ø75 P.A.	ø75 P.A.	ø75 P.A.	ø75 P.A.
L Length of T	-	-	-	425	425	475

* All Dimensions above are in mm

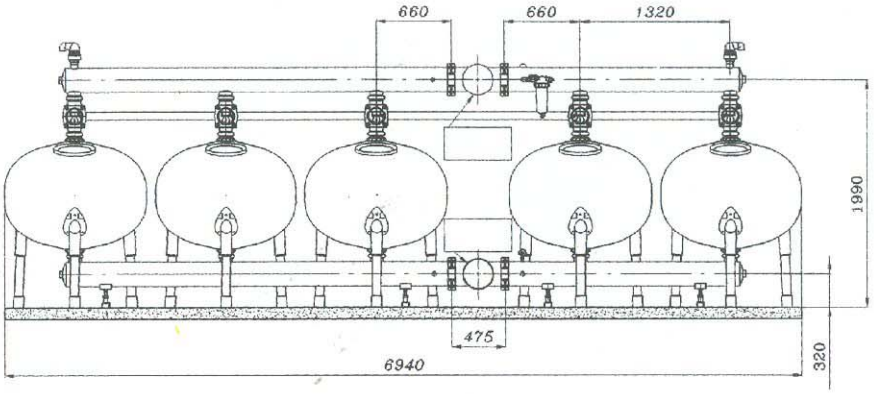
48"*3*6"



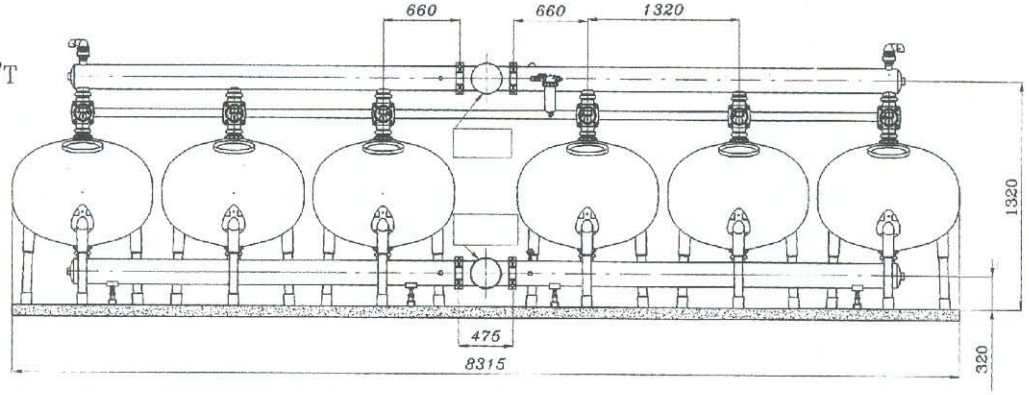
48"*4*8"



48"*5* 8"T

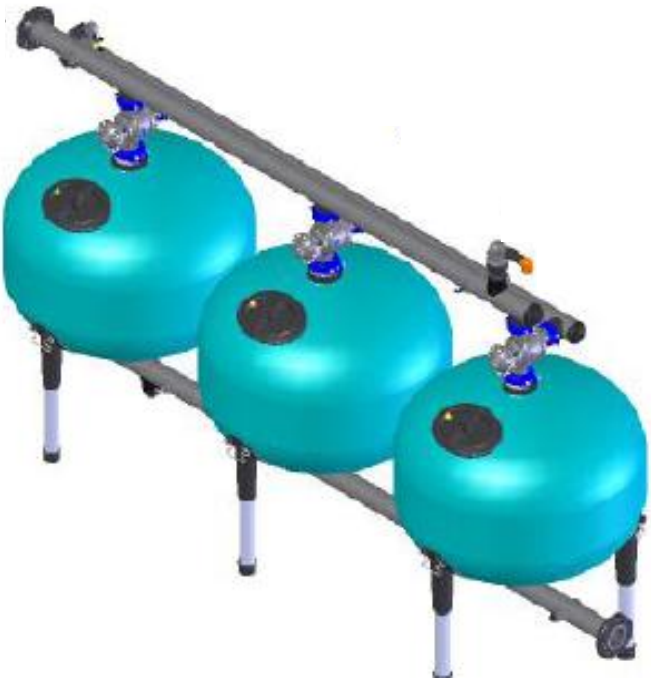


48"*6*10"T



AGF Filter

Maintenance and Troubleshooting



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Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

AGF MAINTENANCE AND TROUBLESHOOTING

Backwash Controller Adjustment

1. Adjust the restriction valve on the backwash line to allow only a trace of media to pass through.
2. Backwash controller adjustments.
    a. Time in backwash..... 90 – 120 seconds
    b. Dwell time between filters..... 30 seconds
    c. Time period between backwashes .....2 – 4 hours
    d. Pressure differential (P.D.) adjustment
    over base line pressure loss .....4 – 8 psi

Tips

1. Maximum working pressure is 60 m - 85 psi.
2. Pump inlet should be 0.2-0.3 m /3-4 feet below the surface and a minimum of 0.8 m /2.5 feet off the bottom to prevent intake of excess dirt when pumping from a ditch or reservoir.
3. Add chlorine at least twice a year to control organic growth in the filter. Apply 2 to 20 p.p.m. according to the following directions:
    a. At the end of every irrigation season, add chlorine to the water in the filter for 30 minutes and allow to set. Backwash for at least 2 minutes. Drain all the water from the filter, leaving it dry and close the inlet and outlet valves.
    b. At the beginning of the irrigation season, fill the filter with water and add chlorine. Let stand for 30 minutes. Backwash for 2 minutes.

NOTE: additional chlorine applications will be necessary in some areas.

CAUTION: Chlorine is dangerous. Exercise appropriate caution. Observe all applicable government regulations. Contact a qualified chemical dealer for assistance.

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4. It is recommended that backup filter be installed.
5. Recommended monthly: Open upper cover and check sand level. Add media if required.
6. The sand media will need replacing every few years as the sand edges become rounded. Sharp edges are necessary for proper filtration.

Replacing the sand:

1. Close all the valves. Verify that no pressure remains in the tanks.
2. Open the upper service cover.
3. Open the 3” plug on the lower cover and drain all the water and sand from the filter. Remove the lower cover for faster draining.
4. Carefully rinse the inside of the tank
5. Check the inside under-drain.
6. Close the 3” plug and install the lower cover. (Make sure threads are free of sand).
7. Fill the tank with water.
8. Add the new sand.
9. Open all the backwash valves in sequence.

TROUBLESHOOTING

Symptom: Leaking around grooved couplings.

Possible Causes:

1. Pinched gasket.
2. Torn or cracked gasket.
3. Components out of alignment

Solutions:

1. Remove couplings and inspect gasket. Apply gasket lube to prevent pinching.
2. Remove torn gasket and replace.
3. Remove couplings and gaskets and inspect grooved fittings. Fittings should join squarely, with no major gaps.

Symptom: Leaking around access ports

Possible Causes:

1. Debris between gasket and seat.
2. Torn or cracked gasket.
3. Cracked hatch cover.

Solutions:

1. Remove gasket and inspect gasket and seat for any debris.
2. Inspect gasket for cracking or other damage. Replace if necessary.
3. Inspect hatch cover for cracks or damage. Replace if cracked or defective.

Symptom: Leaking around the top hatch vent.

Possible Causes:

1. Torn or cracked o-ring
2. Damaged vent.

Solutions:

1. Remove hatch cover and inspect vent o-ring for damage. Replace if necessary.
2. Inspect the vent for possible cracks. Replace if necessary.

Symptom: One or several filter will not backwash.

Possible causes:

1. Controller output problem.
2. Solenoid wiring defective.
3. On filters with optional selector valve, valve setting incorrect.
4. Solenoids clogged or damaged.

Solutions:

1. Check for correct controller output with multi-tester or switch solenoid wires with another station to check for output signal.
2. Use Ohmmeter to verify that wiring is intact. Attempt to manually actuate the solenoid with the small knob on the base. Turn 90 degrees to open and return to close.
3. Verify that selector valve knob is pointed towards the solenoid.
4. Open solenoids and inspect internal ports for evidence of clogging. **Caution**: solenoid contains a spring-loaded plunger. Open carefully to avoid losing this component.

Symptom: All filters in station will not backwash.

Possible causes:

1. Controller output problem.
2. Insufficient downstream pressure for backwash.
3. Hydraulic command system failure.

Solutions:

1. Check that the controller is on and programmed correctly. Attempt to manually actuate the solenoids with the clock. In general, the solenoids will emit a noticeable click when actuated.
2. Use the manual actuating screw on the base of the solenoid to backwash one tank. Note the downstream pressure reading. If the pressure falls below 15 m /20 psi, it may be necessary to throttle the field valves to build up sufficient backwash pressure.
3. Check to be sure the isolation valve is in the “On” position. Remove one of the hydraulic tubes leading to the solenoids and verify that pressurized water is available. Inspect the hydraulic command filter for contamination.

Symptom: Filter station differential remains high after backwash.

Possible causes:

1. Gauge error
2. Insufficient backwash pressure.
3. Insufficient backwash flow.
4. Excessive contamination of media.

Solutions:

1. Check gauge differential on manifolds against the differential gauge in the controller. If there is a discrepancy, check readings with a new gauge.
2. Verify that the downstream pressure during backwash is at least 15 m / 20 psi. If it is not, it may be necessary to throttle a valve downstream of the filter station to develop sufficient backwash pressure.
3. Check the backwash throttling valve setting. Adjust according to the procedures outlined.
4. Open the hatch covers and inspect the media bed after a backwash. Verify that the sand level is correct and that there is not an excessive amount of debris in the sand.
5. Verify that the backwash line meets the requirements outlined.

Symptom: Filter station differential increases rapidly during operation, especially at startup.

Possible causes:

1. Excessive flow rate.
2. Unusual concentration of contaminants.

Solutions:

1. During system startup, throttle downstream flow to the design flowrate. Use a manual valve or a pump control/sustaining valve.
2. Check source water quality.

In case you do find the appropriate solution in these sheets, please refer to your local Arkal Products Representative for advice.

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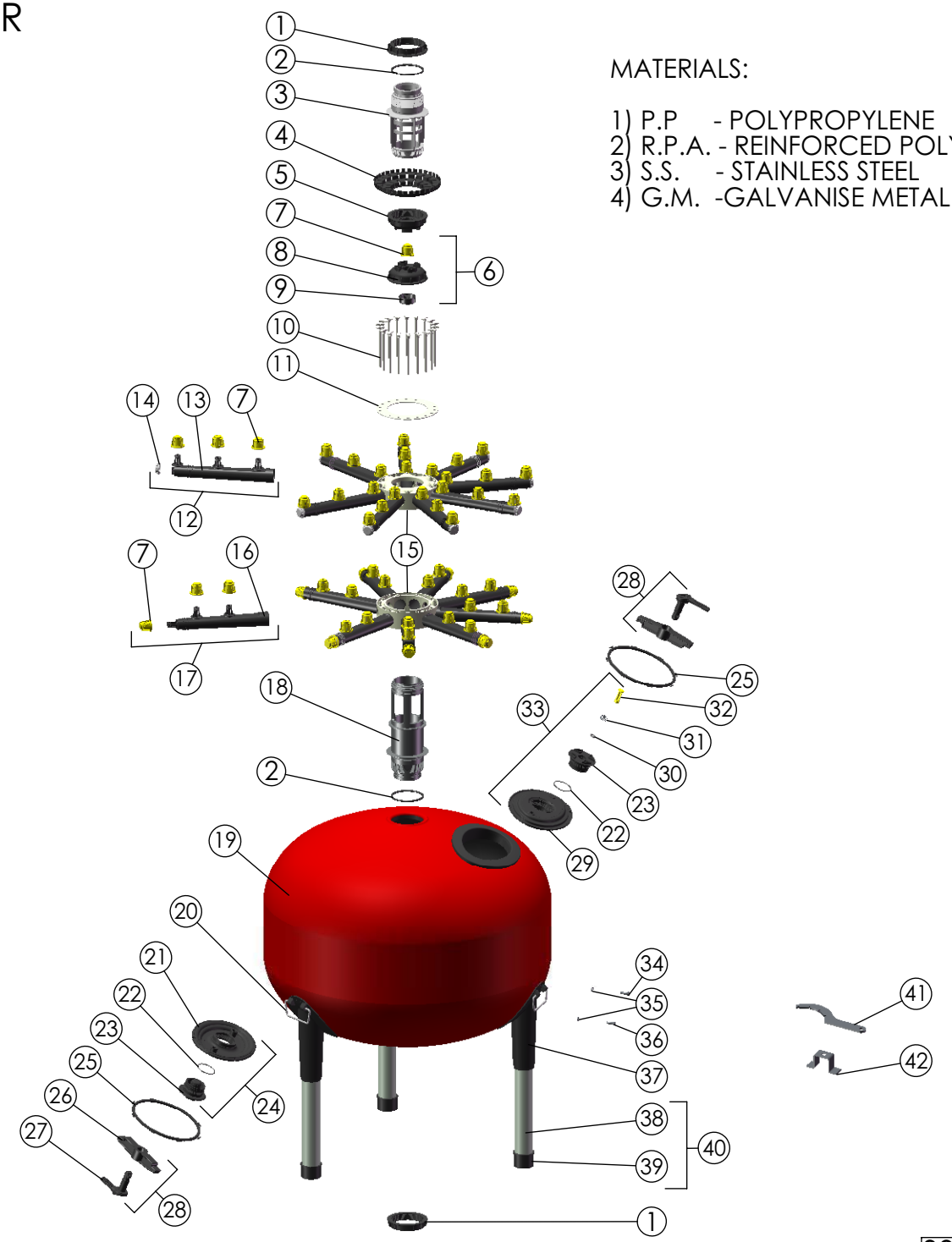
ARKAL A.G.F.- 48" PLASTIC MEDIA FILTER

Cat. no.: 1480 0481

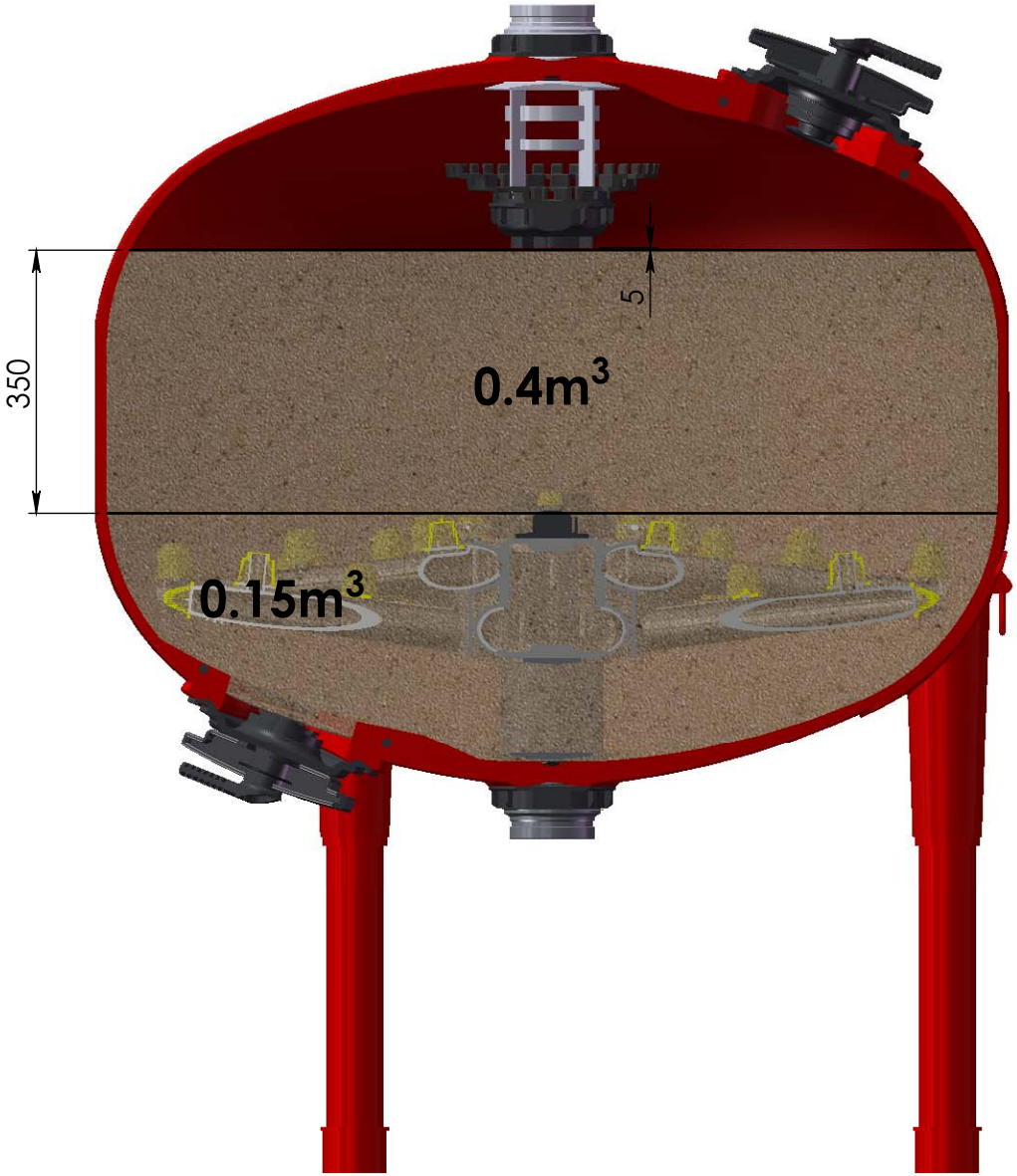
PARTS LIST

No:	DESCRIPTION	Cat. No.:	MATERIAL
1	LOCKING NUT	2820 0012	R.P.A.
2	SEAL 8*125	5006 0482	EPDM
3	INLET	2820 0014	R.P.P.
4	DISTRIBUTION PLATE	2820 0018	R.P.P.
5	UPPER SEALING NUT	2820 0010	R.P.A.
6	LOWER PLUG ASSEMBLE	2248 0058	---
7	MUSHROOM	2820 0030	P.P.
8	LOWER SEALING NUT	2200 2810	R.P.A.
9	SUPPORT FOR MUSHROOM	2200 2848	R.P.A.
10	PIN	2820 0028	P.B.T.
11	PIN WASHER HOLDER "FLIC"	5149 1001	P.P.
12	UPPER DIFFUSER COMPLETE	2248 0052	---
13	UPPER DIFFUSER	2820 0022	P.P.
14	END CUP	2820 0026	P.P.
15	DRUM	2820 0020	R.P.P.
16	LOWER DIFFUSER	2820 0024	P.P.
17	LOWER DIFFUSER COMPLETE	2248 0054	---
18	OUTLET	2820 0016	R.P.P.
19	FILTER BODY	5080 0480	---
20	HANDLE	5076 0248	S.S.
21	LOWER COVER	2820 0324	R.P.A.
22	"O" RING 76*4	5003 7604	EPDM
23	LOWER PLUG	2820 0340	R.P.A.
24	LOWER COVER COMPLETE	2248 0032	---
25	COVER SEAL	5005 0548	EPDM
26	BRIDGE	2820 0036	R.P.A.
27	TIGHTENING SCREW	2820 0038	R.P.A.
28	BRIDGE COMPLETE	2248 0056	---
29	UPPER COVER	2820 0322	R.P.A.
30	"O" RING 2*310	5003 2310	EPDM
31	SPRING	5044 0018	S.S.
32	VACUUM RELEASE	2820 0046	P.P.
33	UPPER COVER COMPLETE	2248 0022	---
34	W 3/8" *11/4" SCREW	5040 3830	S.S.
35	3/8" WASHER	5040 9138	S.S.
36	W 3/8" *11/2" SCREW	5040 3840	S.S.
37	LEG HOUSING	2820 0040	R.P.A.
38	LEG	5050 1400	---
39	BASE CUP	2820 0050	R.P.A.
40	LEGS COMPLETE	2248 0061	---
41	LOWER COVER RANGE	5076 0021	G.M.
42	LOCKING NUT RANGE	5076 0022	G.M.



MATERIALS:

1) P.P - POLYPROPYLENE
2) R.P.A. - REINFORCED POLYAMIDE
3) S.S. - STAINLESS STEEL
4) G.M. -GALVANISE METAL



0.55m³ = Volume of media, with reduction of the internal water collecting/distributing piping ("mushrooms") volume

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT				PAGE___OF___
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CHECKED	OMRY	13.04.09		
APPROVED	OMRY	13.04.09	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	MARINA	13.04.09		

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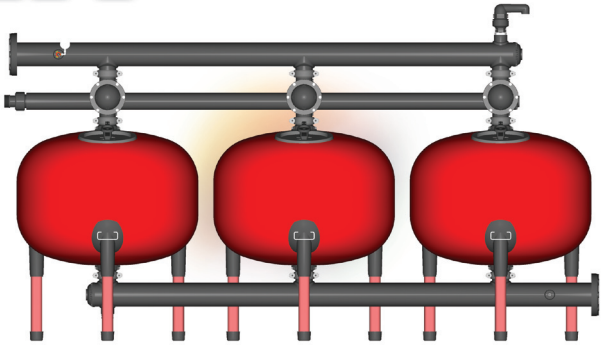
AGF BATTERY

All Plastic Media Filters



Features

- Corrosion free
- Special synthetic materials
- Unique under-drain "Mushroom" drainage system

Technical Data

Model		AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6		AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6
	METRIC						US					
Connection diameter	mm	160	160	225	225	225	inch	6	6	8	8	8
Filtration surface area	m^2	2.32	3.48	4.64	5.80	6.96	ft^2	25.00	37.50	50.00	62.50	75.00
Minimum backwash pressure	bar	2					psi	28				
Maximum pressure	bar	6					psi	85				
Backwash flow rate	m^3/h	40-60					gpm	176-264				
Maximum temp.	^{0} C	50					^{0} F	122				

Maximum Filtration Flow Rate / Water Quality

No. of units		AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6	AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6
Filtration Grade	Water Quality	m^3/h					gpm				
Media: Basalt media grade 1											
100-80 µ	Good	136	204	272	340	408	598	898	1197	1496	1795
	Average	102	153	204	255	306	449	673	898	1122	1346
	Poor	82	122	163	204	245	359	539	718	898	1077
	Very Poor	65	98	131	163	196	287	431	574	718	862
Media: Quartz media grade 1 for nominal depth filtration											
50-20 µ	Good	35	52	70	88	104	154	231	308	385	462
	Average	32	48	64	80	96	141	210	282	350	420
	Poor	26	39	52	65	78	114	171	229	285	342
	Very Poor	20	30	40	50	60	88	132	176	220	264
Media: AFM Media gradient for absolute depth filtration. Advantage in high organic load in raw water											
20-10 µ	Good	44	66	88	110	132	194	291	387	485	582
	Average	38	57	76	95	114	167	250	334	418	501
	Poor	32	48	64	80	96	141	210	282	350	420
	Very Poor	26	39	52	65	78	114	171	229	285	342

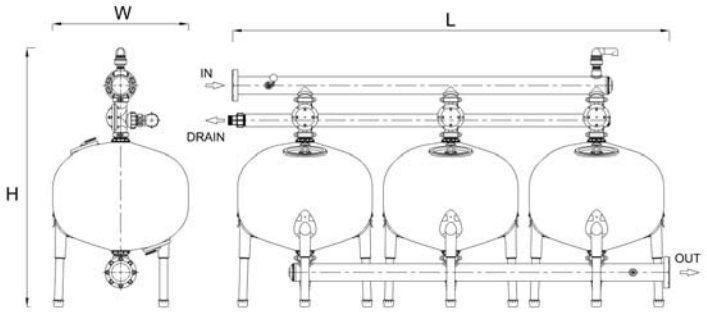
AGF BATTERY

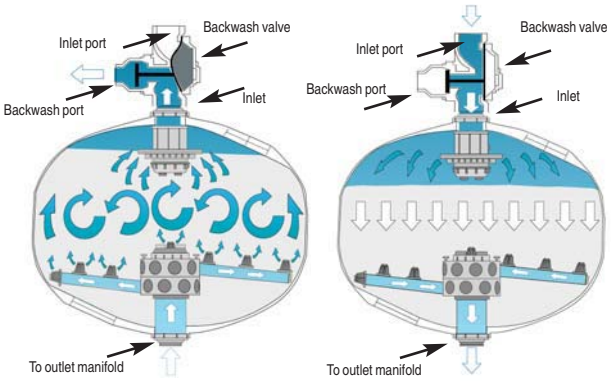
All Plastic Media Filters

Dimensions and Weights

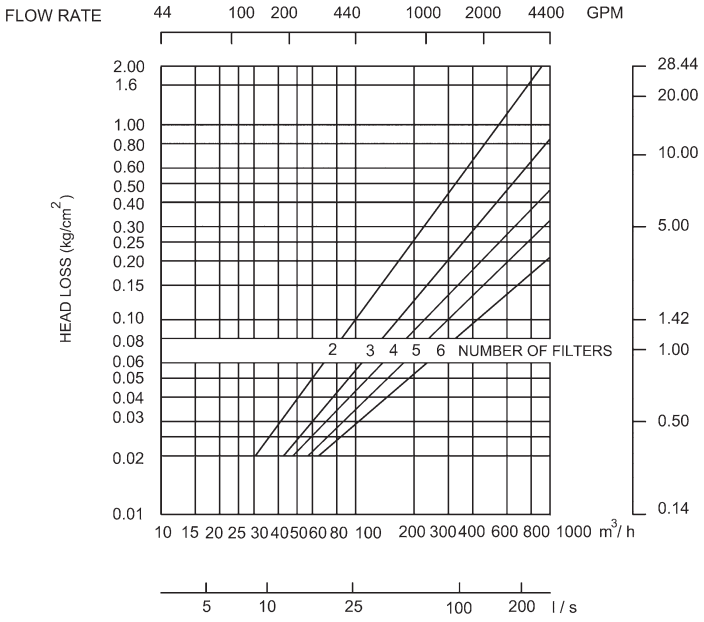
		AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6		AGF-48-2	AGF-48-3	AGF-48-4	AGF-48-5	AGF-48-6
D (inlet / outlet diameter)	**mm**	160	160	225	225	225	**inch**	6	6	8	8	8
H (height)	**mm**	1991	1991	2017	2017	2017	**inch**	78	78	79	79	79
A (Dist. between filters connect)	**mm**	2630	3950	5270	6590	7910	**inch**	104	155	207	259	311
W	**mm**	1227	1227	1227	1227	1227	**inch**	48	48	48	48	48
Approximate shipping weight (*)	**kg**	240	360	480	600	720	**lbs**	529	794	1058	1323	1587

(*) Weight of media not included





Head Loss Chart at, Clean State

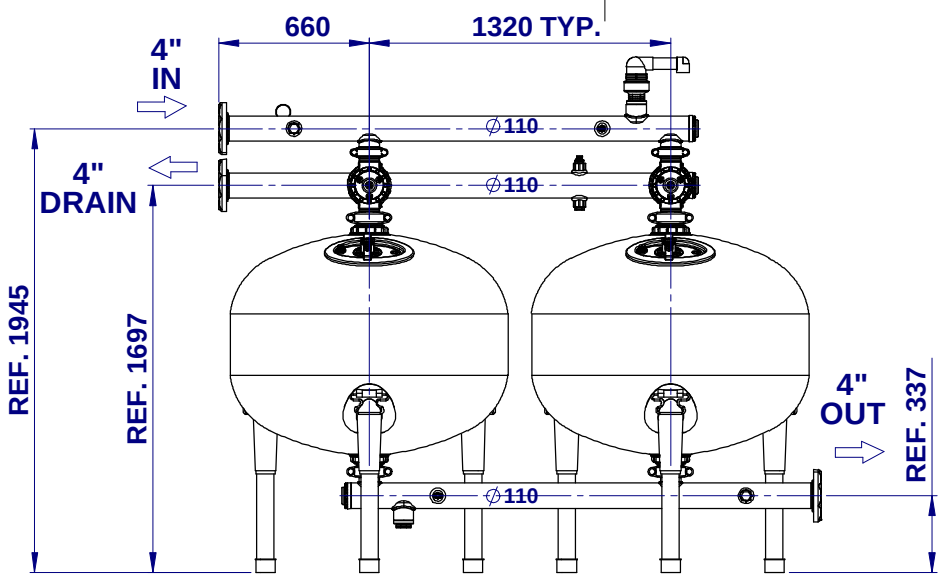


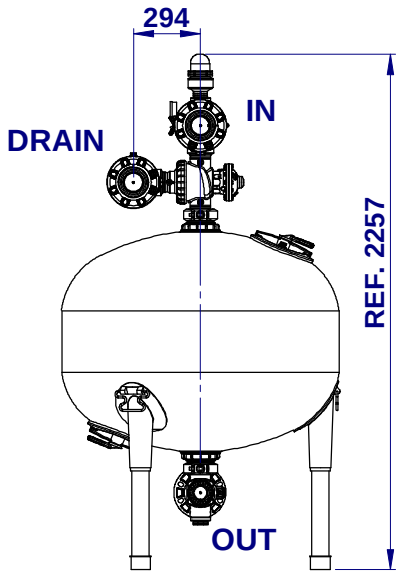
AGF Filter Batteries are available in:
Polymer materials and polypropylene manifolds

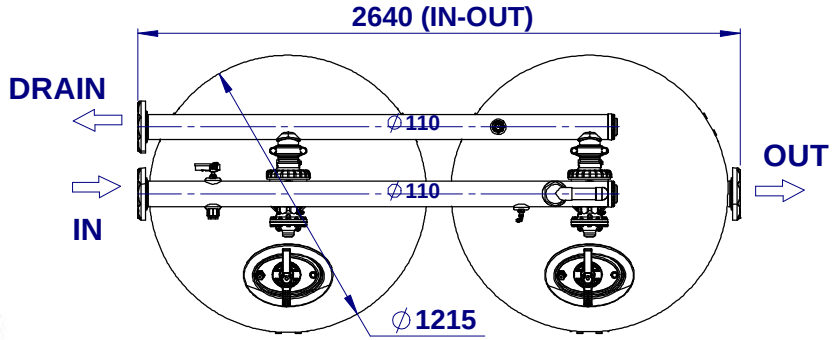
Drawings

AGF

Batteries







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL

FILTRATION SYSTEM

BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT
2x48" A.G.F. PASTIC BATTERY

PAGE _1_OF _5_

TITLE
Assemby drawing

CATALOGUE No:
1480 0480 6033
4546P0402U3
2266 1

SOLIDWORKS FILE CODE:
2x2x48" A.G.F. PLASTIC BATTERY

FILE CODE:
4546P0402U3 C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	08/06/09
CHECKED	NIKOLAY	09/06/09
APPROVED	YOEL	09/06/09
B.O.M.	OLEG	09/06/09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP:
DISK-2S

DRAWING:
5015

SHEET 1 OF 1

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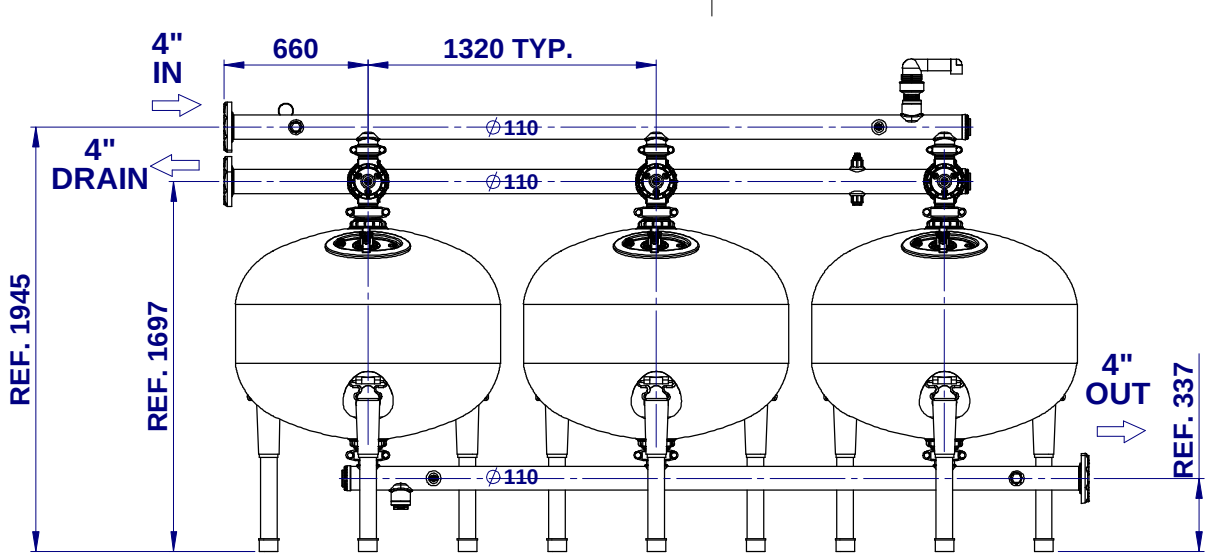

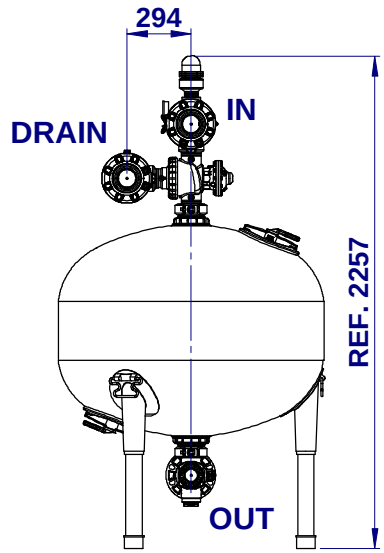

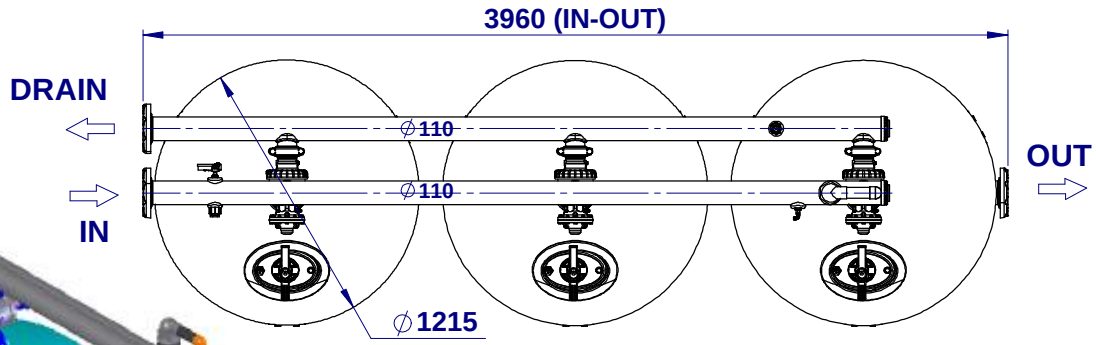

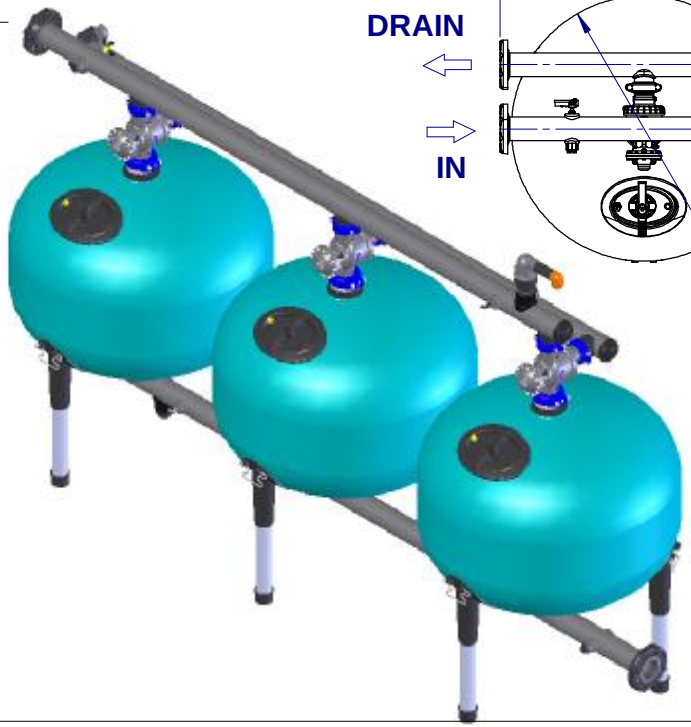

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL

FILTRATION SYSTEM
BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT
3x48" A.G.F. PLASTIC BATTERY

PAGE _1_OF _5_

TITLE
Assemby drawing

CATALOGUE No:
1480 0480 6033
4546P0403U3
2266 1___

SOLIDWORKS FILE CODE:
3x3x48" A.G.F. PLASTIC BATTERY

FILE CODE:
4546P0403U3 C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	09/06/09
CHECKED	NIKOLAY	09/06/09
APPROVED	YOEL	09/06/09
B.O.M.	OLEG	09/06/09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP:
DISK-2S

DRAWING:
5015

SHEET 1 OF 1

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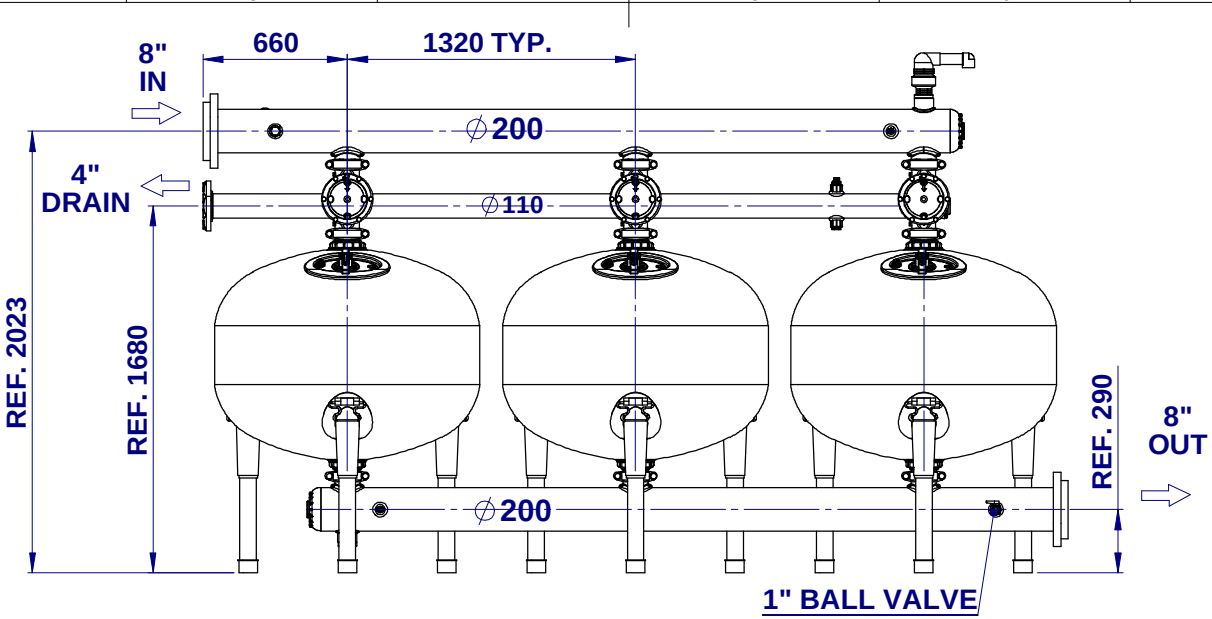

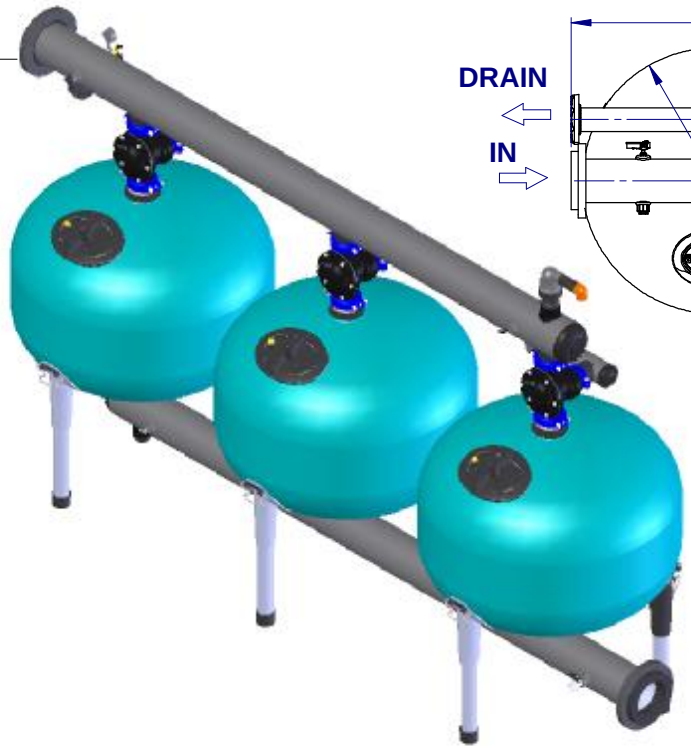

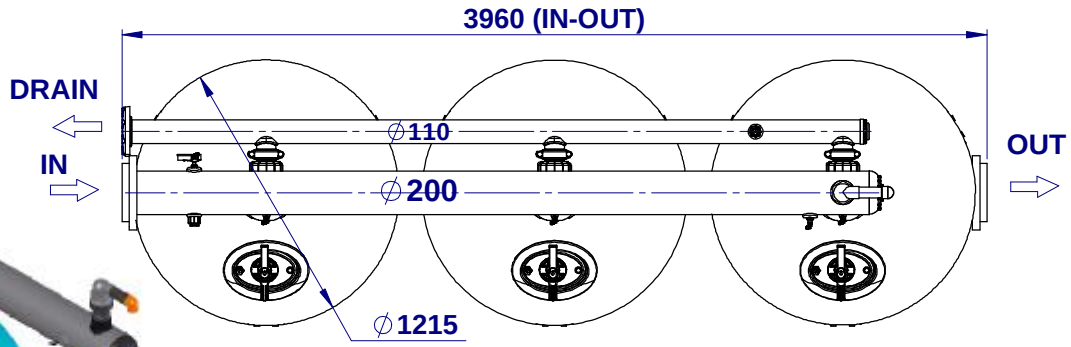

		CHINE STANDARD	
MODIFIC.	DATE	DESCRIPTION	SING

ARKAL

FILTRATION SYSTEM

BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT
3x48" A.G.F. PLASTIC BATTERY

PAGE _1_OF _5_

TITLE
Assembly drawing

CATALOGUE No:
1480 0480 6033
4647P0803D3CN
2266 1

SOLIDWORKS FILE CODE:
3x48" A.G.F. PLASTIC BATTERY

FILE CODE:
4647P0803D3CN C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	17/05/09
CHECKED	NIKOLAY	01/06/09
APPROVED	ROTEM	01/06/09
B.O.M.	OLEG	01/06/09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)

BACKUP:
DISK-2S

FILE CODE DRAWING OF MAN.
6647 0803D2CN

DRAWING:
5015

SHEET 1 OF 1

PATH-Z:\PROJECTS\PROJECTS\MASTERS\FILTERS\BATTARIES\AGF\200\

SW-Print:09/06/2009 16:46:23

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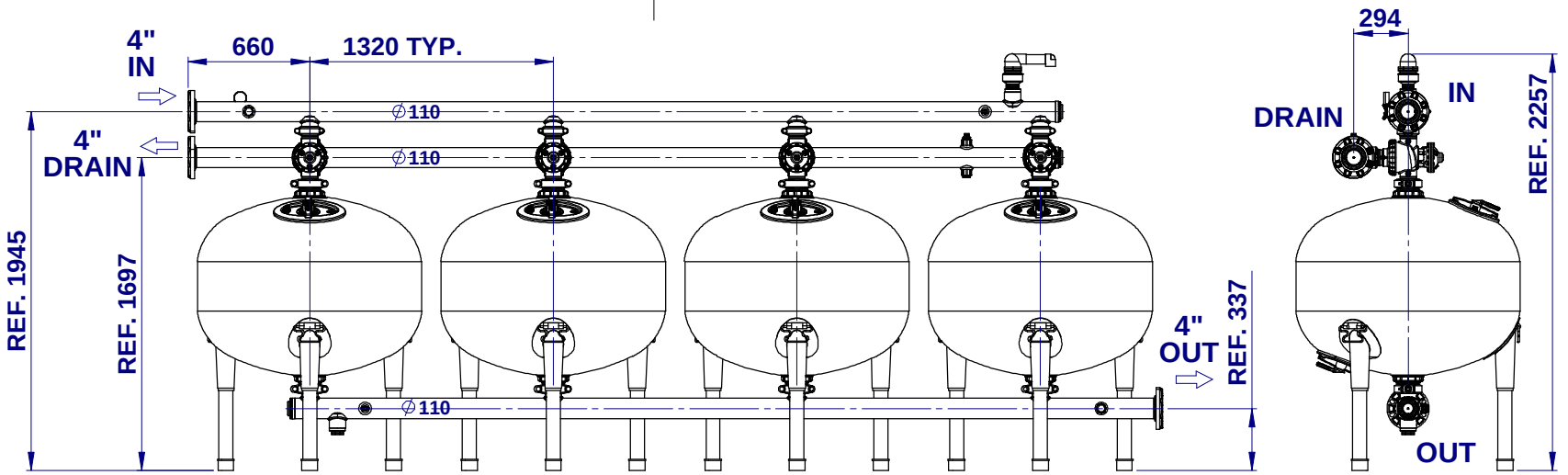

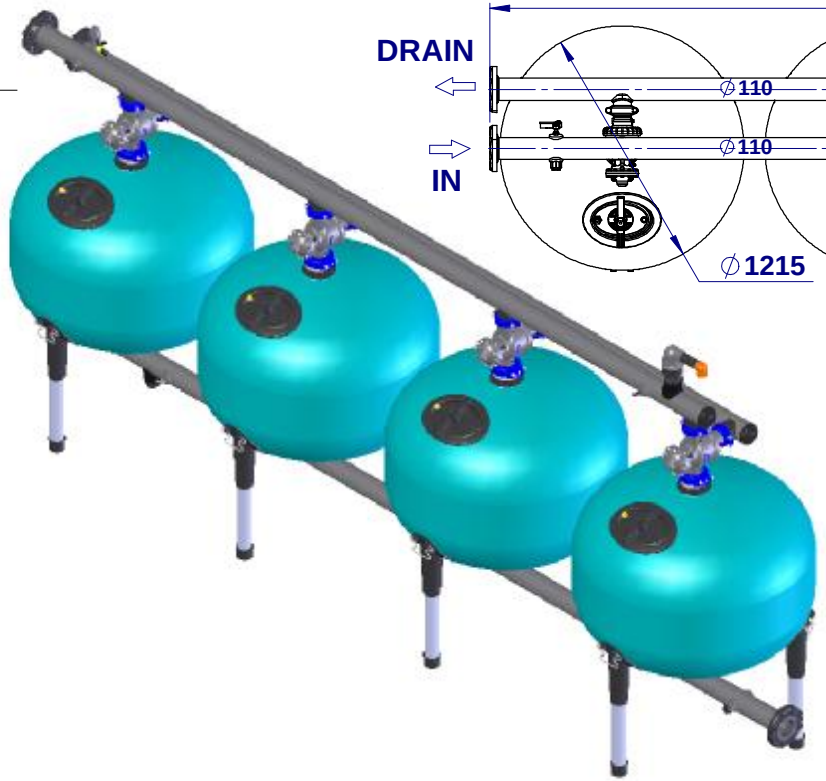

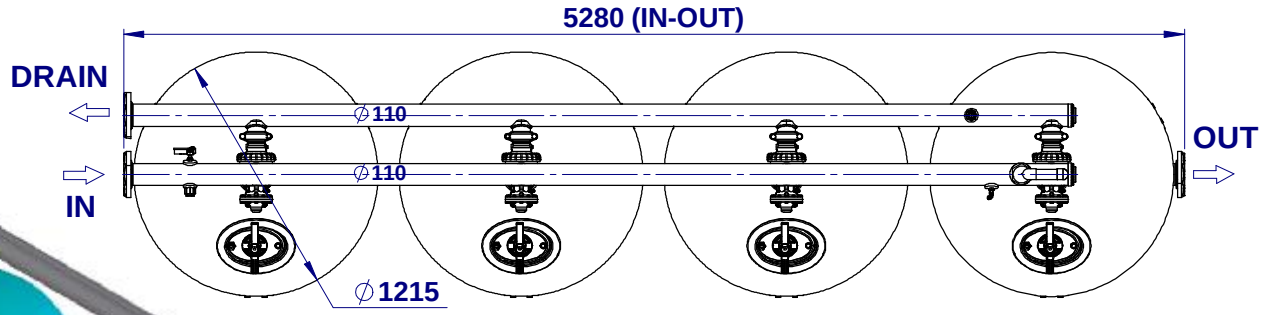

MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT
4x48" A.G.F. PLASTIC BATTERY

PAGE _1_OF _5_

TITLE
Assemby drawing

CATALOGUE No:
1480 0480 6033
4546P0404U3
2266 1

SOLIDWORKS FILE CODE:
4x4x48" A.G.F. PLASTIC BATTERY

FILE CODE:
4546P0404U3 C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	08/06/09
CHECKED	NIKOLAY	08/06/09
APPROVED	YOEL	08/06/09
B.O.M.	OLEG	08/06/09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP:
DISK-2S

DRAWING:
5015

PATH-Z:\PROJECTS\PROJECTS\MASTERS\FILTERS\BATTARIES\AGF\110\

SHEET 1 OF 1

SW-Print:10/06/2009 16:24:41

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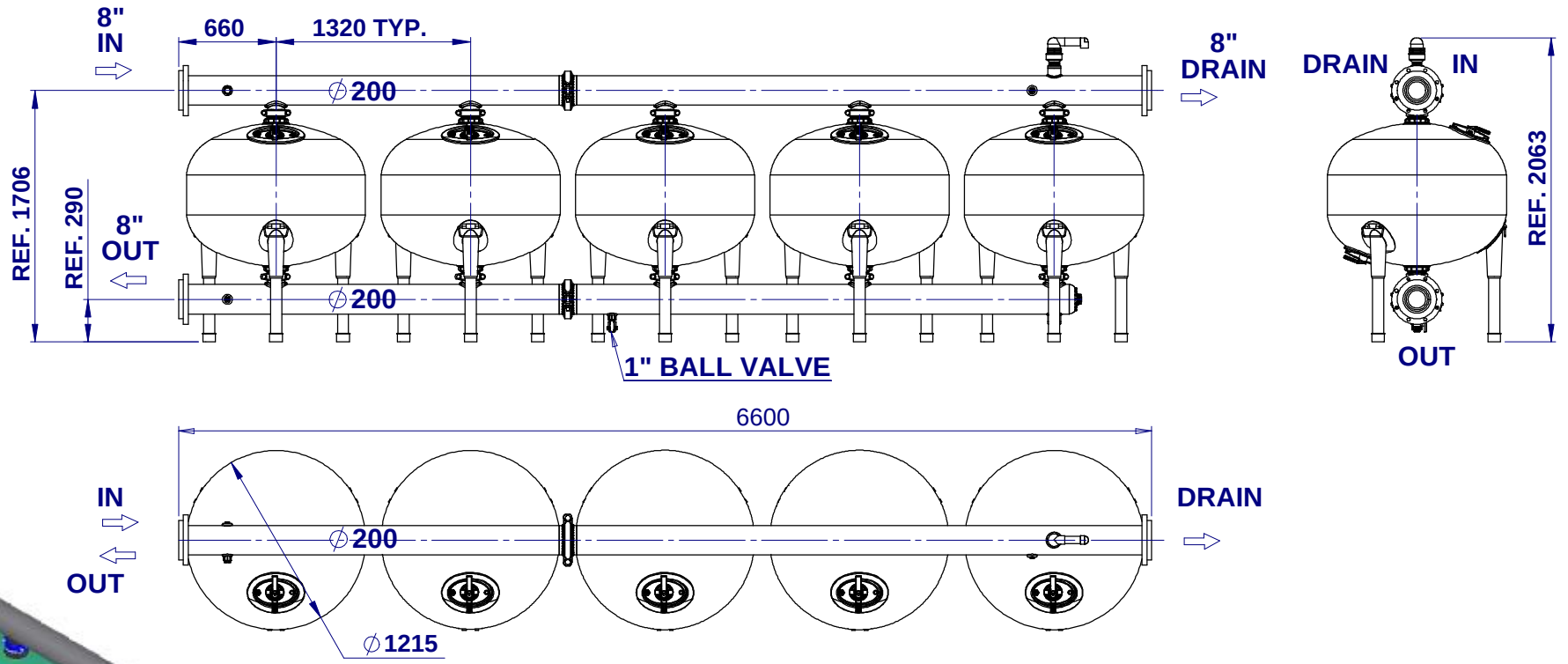
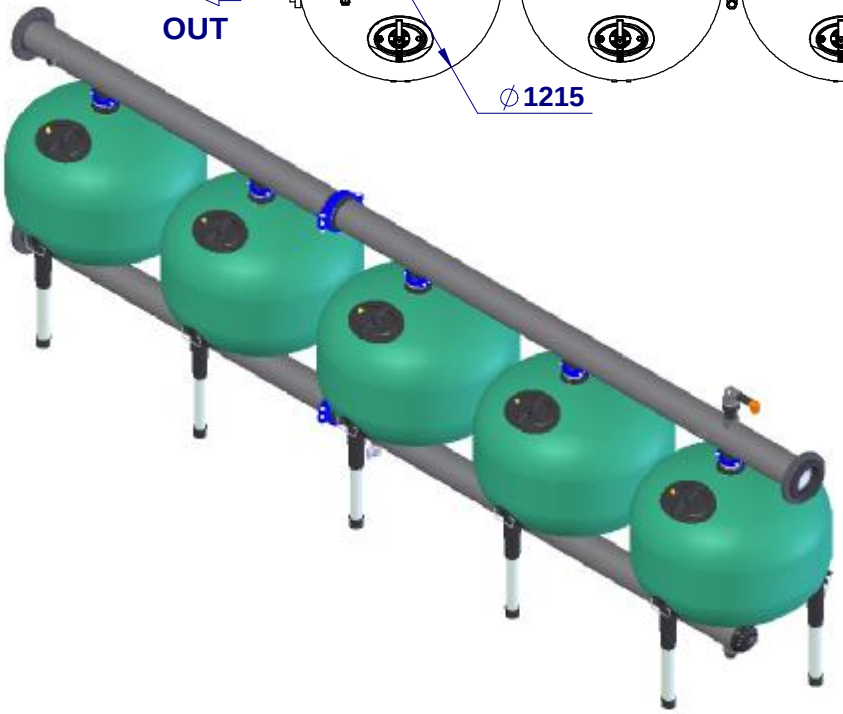




MODIFIC.	DATE	DESCRIPTION	SING

ARKAL

FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT
5x48" A.G.F. PLASTIC BATTERY

PAGE _1_OF _5_

TITLE
Assembly drawing

CATALOGUE No:
4647P0805D10008

SOLIDWORKS FILE CODE:
5x48" A.G.F. PLASTIC BATTERY

FILE CODE:
4647P0805D10008 C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	07/04/09
CHECKED	NIKOLAY	13/04/09
APPROVED	YOEL	12/04/09
B.O.M.	OLEG	13/04/09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP:
DISK-2S

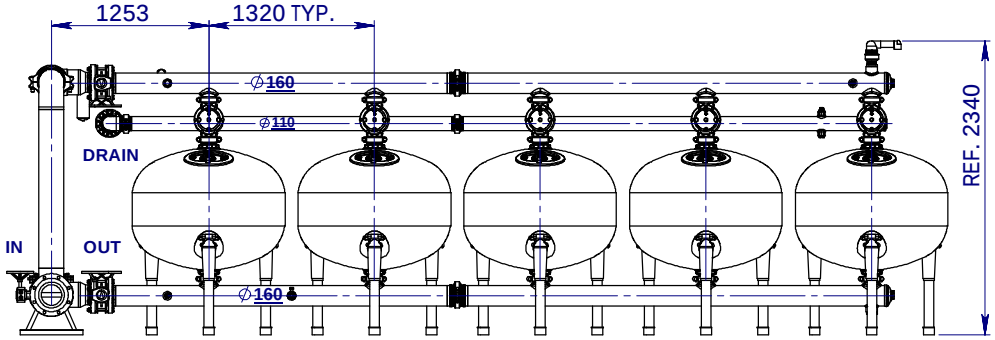
DRAWING:
5015

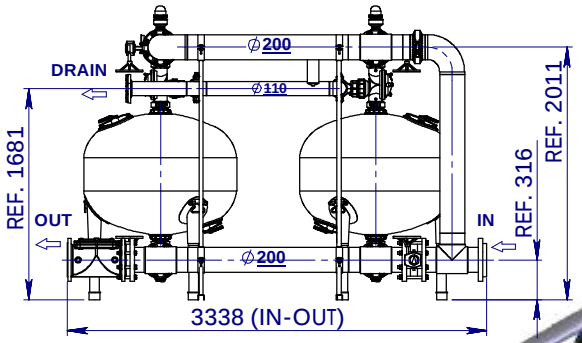
SW-Print:14/05/2009 10:07:30

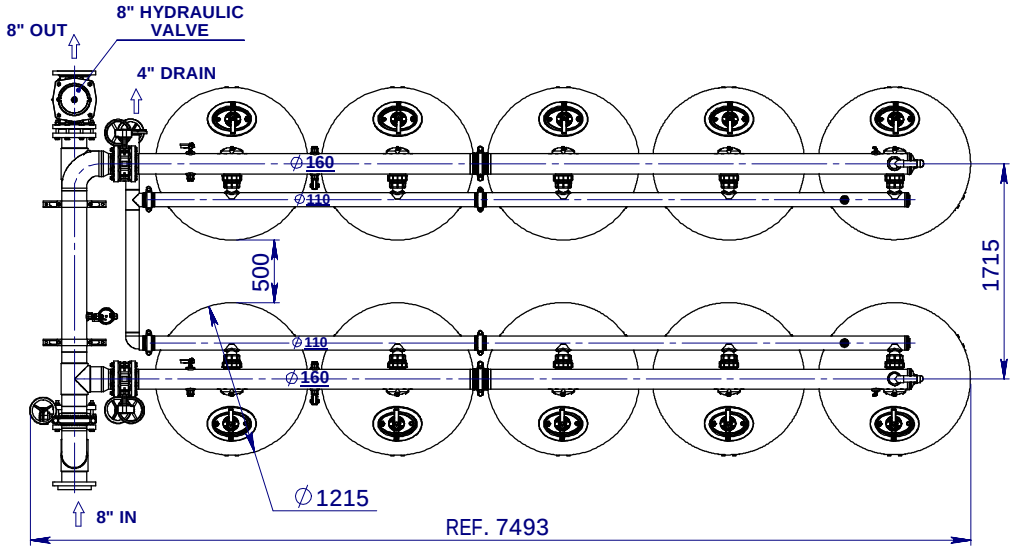
PATH-Z:\PROJECTS\PROJECTS\MASTERS\FILTERS\BATTARIES\AGF\200\

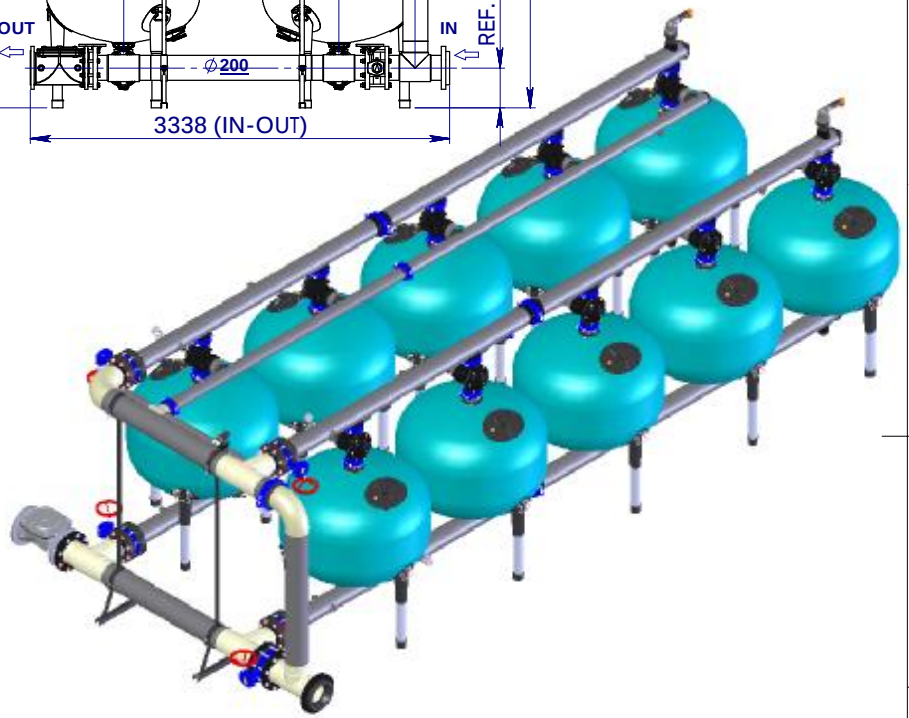
SHEET 1 OF 1

PDF created with pdfFactory trial version www.softwarelabs.com









MODIFIC.	DATE	DESCRIPTION	SING

ARKAL

FILTRATION SYSTEM

BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT
10x48" A.G.F. PLASTIC BATTERY

PAGE _1_OF _12_

TITLE
Assembly drawing

CATALOGUE No:
1480 0480 6033
4647 0810A30004
2266 1

SOLIDWORKS FILE CODE:

FILE CODE:
4647 0810A30004 C

MATERIAL:
-

	NAME	DATE
DRAWN	DMITRI	07/04/10
CHECKED	NIKOLAY	07/04/10
APPROVED	ZECA	07/04/10
B.O.M.	IRINA	18/04/10

FILE CODE DRAWINGS:
PALLET-283 (5201 5786)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.
6647 0810A20004

BACKUP:
DISK-2S

DRAWING:
5015

PATH-Z:\PROJECTS\PROJECTS\MASTERS\FILTERS\BATTARIES\AGF\160\SHONOT\

SHEET 1 OF 1

SW-Print:22/04/2010 09:07:56

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AGFM

48" Media Filters

Features

- Unique under drain diffusers
- Two large access ports

Technical Data

Connection diameter	4" grooved			
Filtration surface area	m^2	1.16	ft^2	12.48
Minimum backwash pressure	bar	2	psi	29
Maximum pressure	bar	8	psi	116
Backwash flow rate	m^3/h	45	gpm	198
Maximum temperature	^0C	60	^0F	140

Maximum Filtration Flow Rate / Water Quality

Filtration Grade	Water Quality	m^3/h	gpm
Media: Basalt media grade 1			
	Good	68	300
	Average	51	220
	Poor	41	180
	Very Poor	33	145
Media: Quartz media grade 1			
	Good	18	79
	Average	16	70
	Poor	13	57
	Very Poor	10	44
Media: AFM catalytic media grade 2			
	Good	22	97
	Average	19	79
	Poor	16	70
	Very Poor	13	57

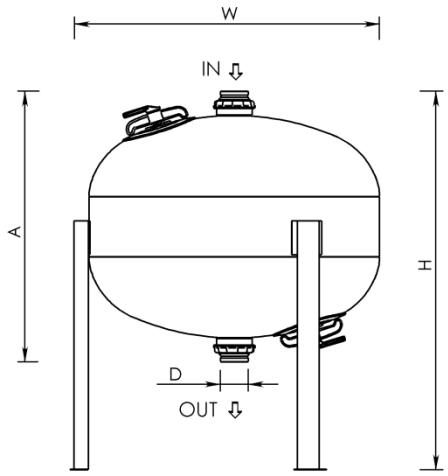
AGFM

48" Media Filters

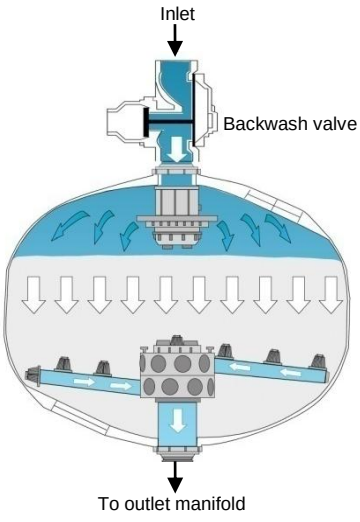
Dimensions and Weights

D - Inlet / outlet diameter	4" grooved			
H - Height	mm	1553	inch	61
A - Distance between filter connections	mm	1110	inch	$43^{23}/_{32}$
W - Diameter	mm	1227	inch	$48^{5}/_{16}$
Approximate shipping weight *	kg	168	lbs	370

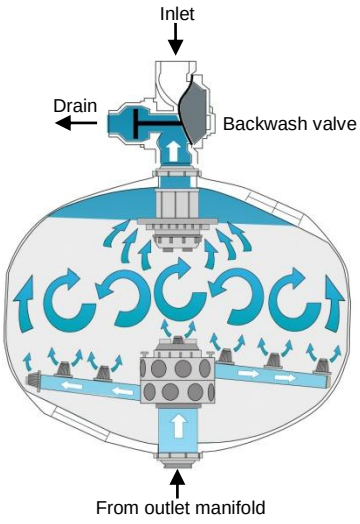
* Weight of media not included



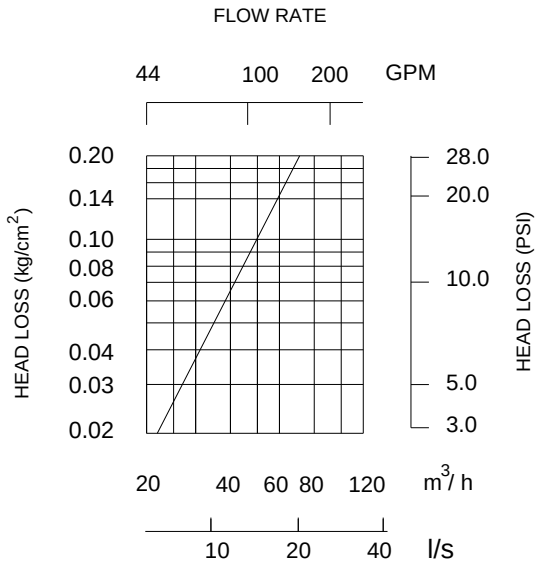
Filtration Mode



Backwash Mode

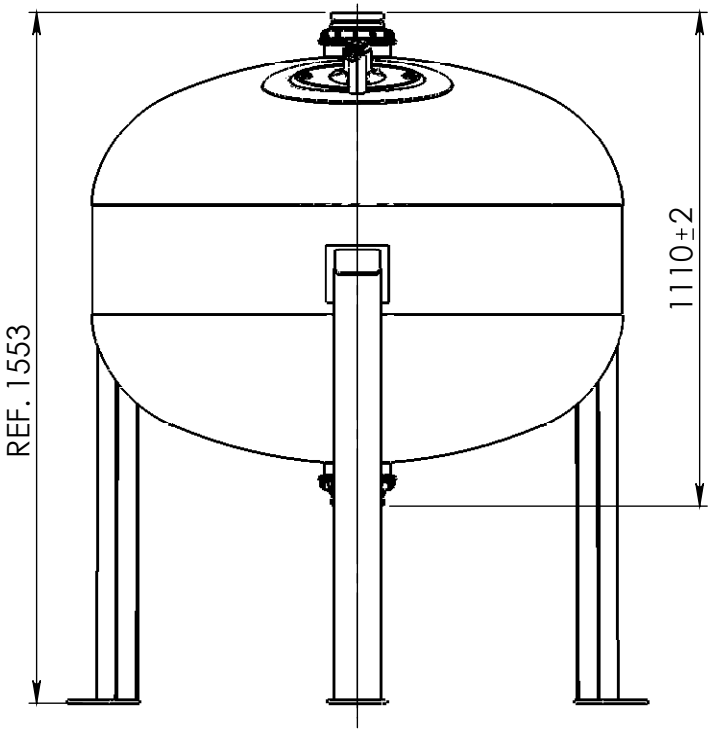


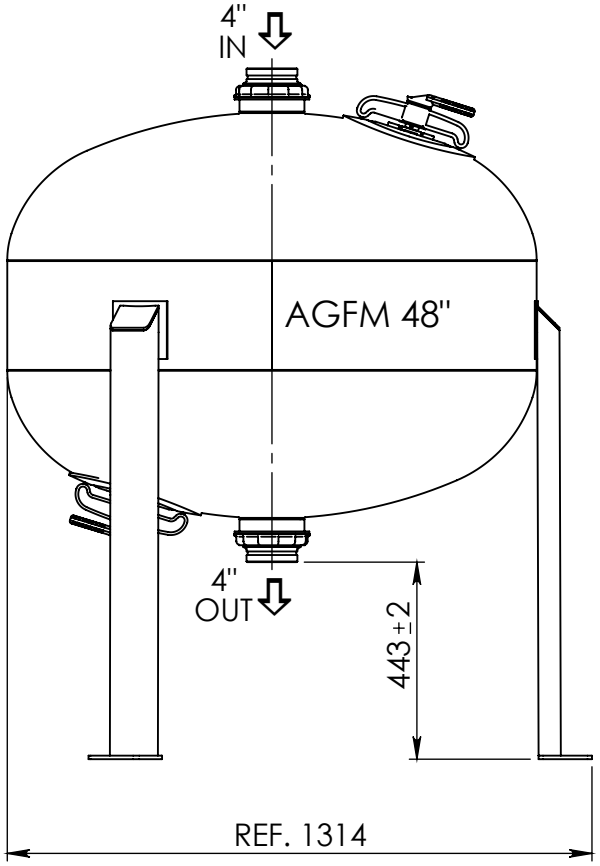
Headloss Chart, Clean State

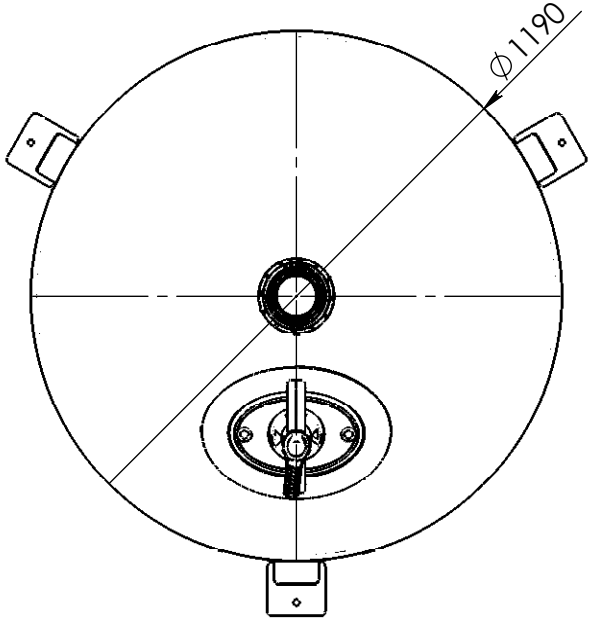


AGFM Filters are available in:

Polyester coated steel, Stainless steel







MODIFIC.	DATE	DESCRIPTION	SING

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 48" AGFM				PAGE___OF___
TITLE: ASSEMBLY DRAWING				CATALOGUE No: 1487 0480
SOLIDWORKS FILE CODE: 1487 0480C		FILE CODE: 1487 0480C		MATERIAL:
	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
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CHECKED	OMRY	22.12.08	TRIWALL-XXX (5201 XXXX)	
APPROVED	OMRY	22.12.08	FILE CODE DRAWING OF MAN.	DRAWING:
B.O.M.	IRINA	22.12.08		

PATH- \\Arkal-fs\drawings\MASTERS – SOLID\FILTERS COMPLETE\MEDIA FILTERS\48" AGF METAL\

SW-Print:22/01/2009

AGFM

36" Media Filters

Features

- Depth filtration
- Large access port
- Double bottom chamber
- Rubber coated metal legs
- Plastic covered sealing from the inside out
- Modular design

Technical Data

Connection diameter	3" grooved			
Filtration surface area	m^2	0.65	ft^2	0.7
Minimum backwash pressure	bar	2	psi	29
Maximum pressure	bar	8	psi	116
Backwash flow rate	m^3/h	54	gpm	238
Maximum temperature	^0C	60	^0F	140

Maximum Filtration Flow Rate / Water Quality

Filtration Grade	Water Quality	m^3/h	gpm
Media: Basalt media grade 1			
	Good	60	264
	Average	40	176
	Poor	30	132

AGFM

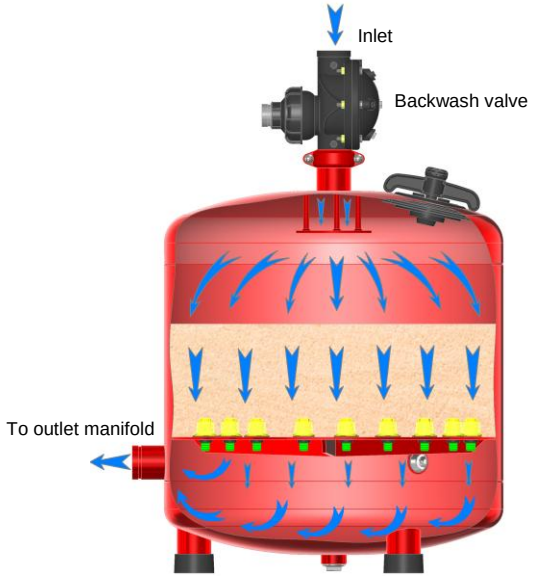
36" Media Filters

Dimensions and Weights

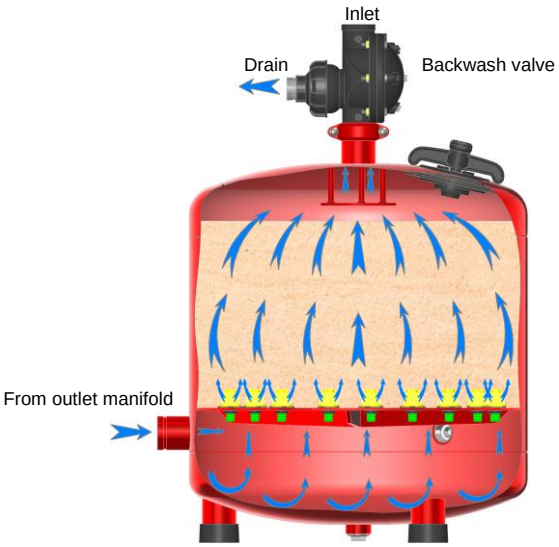
D - Inlet / outlet diameter	3" grooved			
H - Height	mm	1100	inch	43
A - Distance between filter connections	mm	535	inch	21
W - Diameter	mm	915	36	43.5
Approximate shipping weight *	kg	170	lbs	374

* Weight of media not included

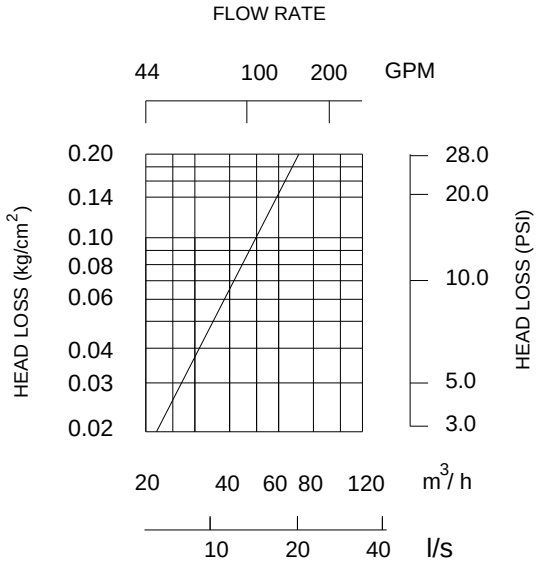
Filtration Mode



Backwash Mode



Headloss Chart, Clean State



AGFM Filters are available in:

Polyester coated steel

AGFM

36" Media Filters

Description

Sand media filters operate by separating the suspended materials in unfiltered water as it flows through a bed of media in a pressurized tank.

Due to the large volume and contact area between the water and the media/gravel particles, various physical forces are out into effect and act to retain the contaminating particles.

The efficiency of large particle is high as long as the gravel is kept clean.

Arkal media filter have double bottom chamber divided by welded reinforced steel pallet. The upper chamber contain the gravel media, the lower chamber is empty and collects the filtered water.

The pallet is covered by diffuser nozzles, which are plastic, slotted, conical units.

Filtration mode

During the filtration process, unfiltered water enters the media filter system via the inlet manifold. It is filtered by flowing through the media and discharged via the outlet manifold.

During filtration the inlet ports are open and the backwash ports are closed.

Water flows from the top. Over the diffuser, down through the media layers to the outlet through the diffuser nozzles, located in the bottom part of the filter.

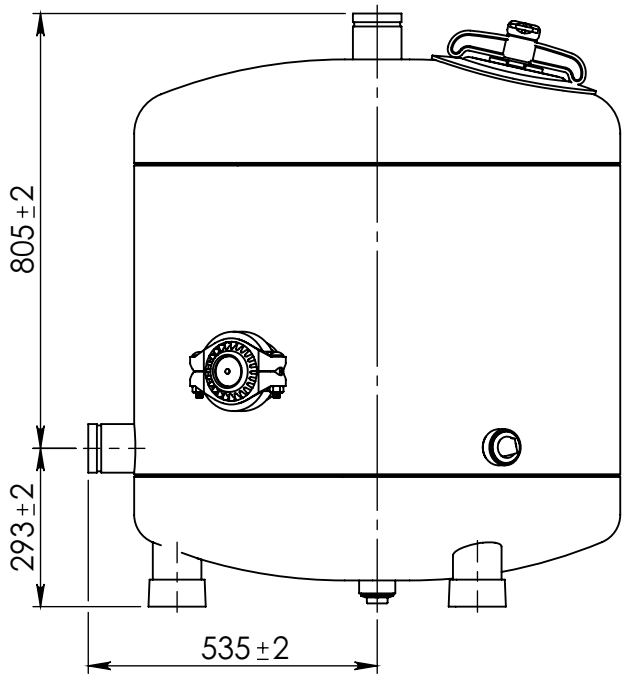
Backwash mode

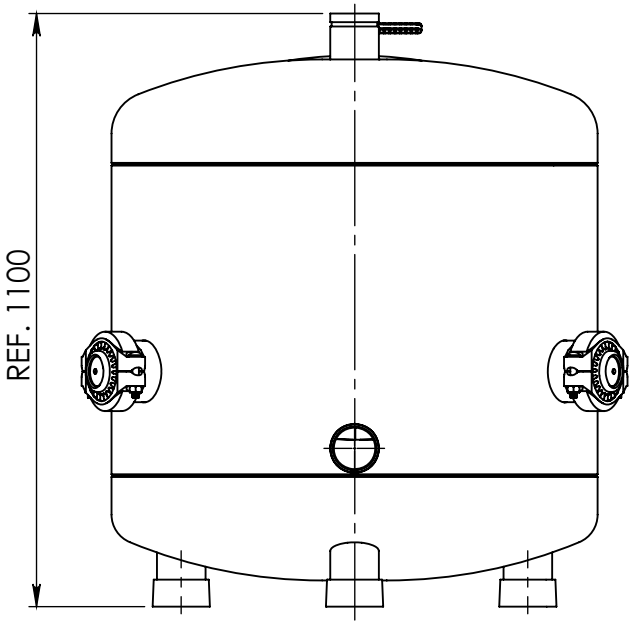
During the backwash process the inlet port closes and the backwash port opens, allowing reverse water flow into the filter.

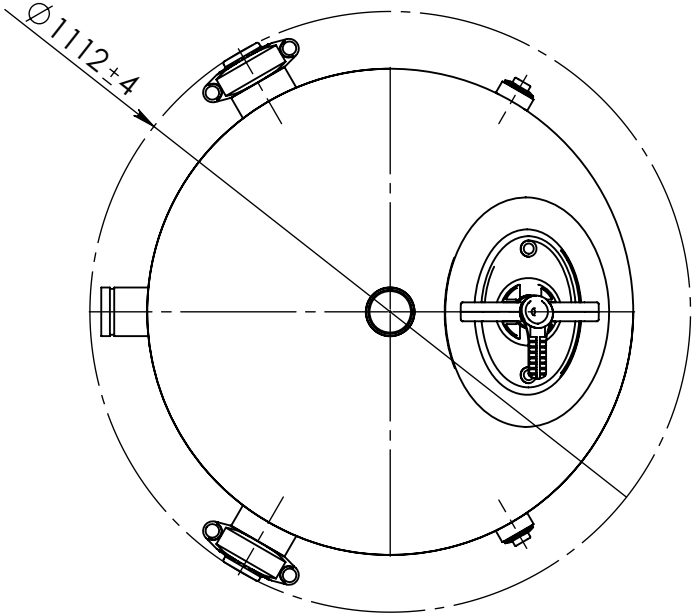
Filter pressurized water from the other filters now flows into the bottom of the filter, lifting the media and freeling the accumulated dirt and debris that is then flush out through the backwash valve and into the drain manifold.

If the backwash restriction valve adjusted properly, the debris will be flushed out of the water while the media, being of a higher bulk density than the debris will remain fludizides in the filter tank.

Only one filter at a time should backwash. The water that is being used to backwash one filter would have already passed through another filter or filters so that the backwash process is carried out with filtered water.







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: 36" ARKAL MEDIA FILTER

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1487 0360

PATH	FILE CODE	NAME	DATE	SIGNATURE
ARKAL CATALOG–PDF\FILTERS\MEDIA FILTERS\36"ARKAL MEDIA FILTER	1487 0360	MARINA	17/09/2008	MARINA

	NAME	DATE
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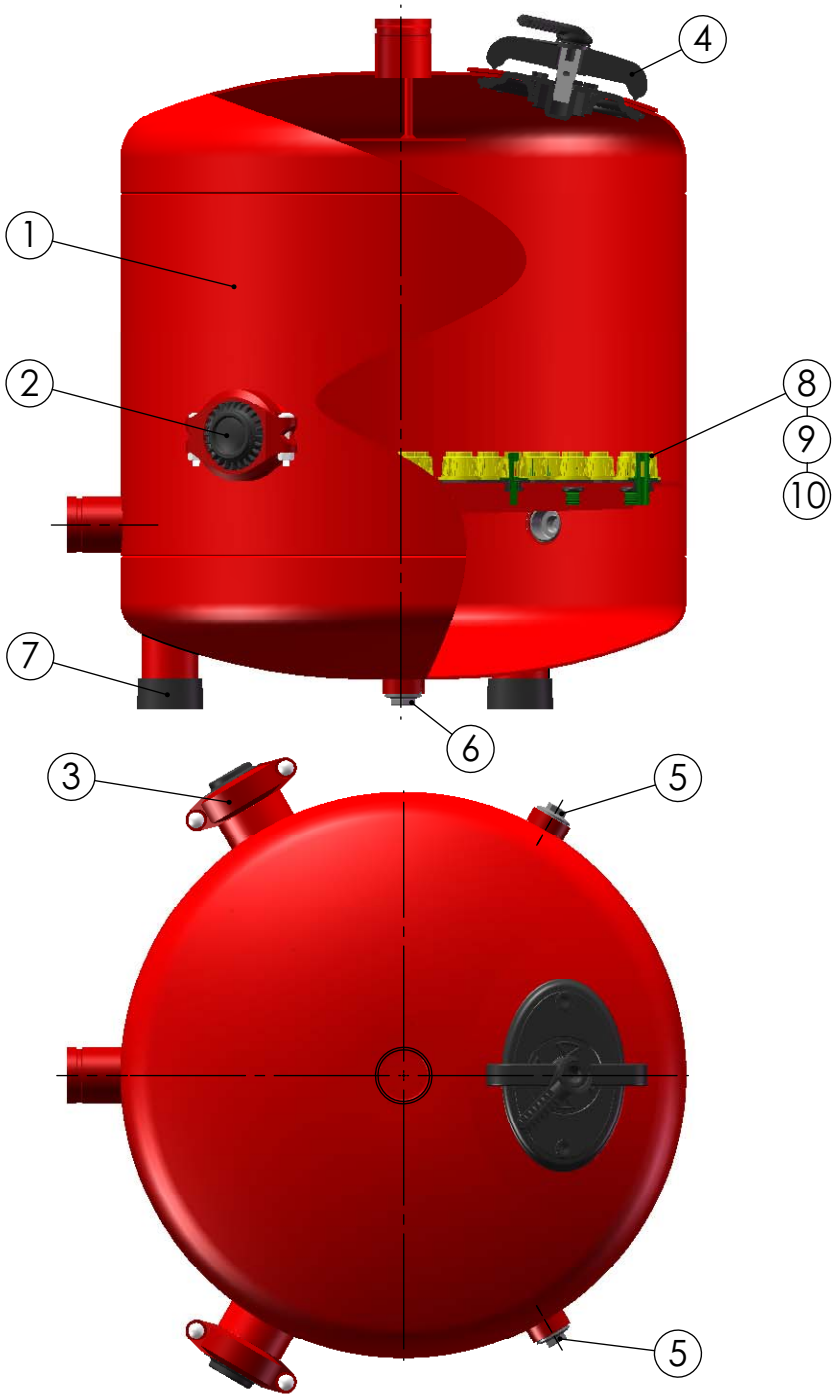
CHECKED	OMRY	17/09/2008
APPROVED	OMRY	17/09/2008

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N:



ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	36" FILTER BODY	5037 0061	1
2	4" VIC. CAP PL.	2530 0400	2
3	4" VIC. CONNECTOR	5032 0400	2
4	UPPER COVER	5003 7604	1
5	2" PLUG	5024 0200	2
6	2" PLUG	2253 0203	1
7	RABBER BASE FOR LEG	5005 1112	3
8	RABBER SEAT	5006 0023	39
9	MUSHROOM	2820 0030	39
10	BASE MUSHROOM	2820 0031	39

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 36" ARKAL MEDIA FILTER

TITLE: ASSEMBLY DRAWING

CATALOGUE No: 1487 0360

PATH	FILE CODE	NAME	DATE	SIGNATURE
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DRAWN	OLEG	11/02/2009
CHECKED	OMRY	11/02/2009
APPROVED	OMRY	11/02/2009

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-2S

DRAWER N:

36" Arkal Gravel Filter - Metal

Startup and Operation,
Maintenance and Troubleshooting

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

36" AGFM 9607 2002EN 03/10

1. Introduction

General

Arkal Filtration Systems congratulates you on purchasing the 36” Arkal Gravel Filter - Metal. All Arkal Filtration Systems are easy to install, use and service and do not require any special skills to operate them.

2. Safety Instructions

Prior to installation or handling of the filter, please read the Installation and Operation Instructions carefully.

1. Make sure filter is drained prior to service and / or maintenance.
2. Take precautions while lifting, transporting or installing the filter.
3. Installation of the filter should be performed so as to avoid direct water contact with the electronic control unit.
4. Confirm that filter weight, when full, does not exceed support construction limitations.
6. Prior to installation make sure that line pressure does not exceed filter’s operational pressure rating (8 bar).
7. Please note, that during normal operation the filter enters into backwash mode automatically, without prior warning.
8. Use only original parts when servicing the filter.
9. Arkal cannot accept responsibility for any changes or modifications to the equipment.

Special Note

Before opening the service ports, make sure that there is no system pressure in the filter.

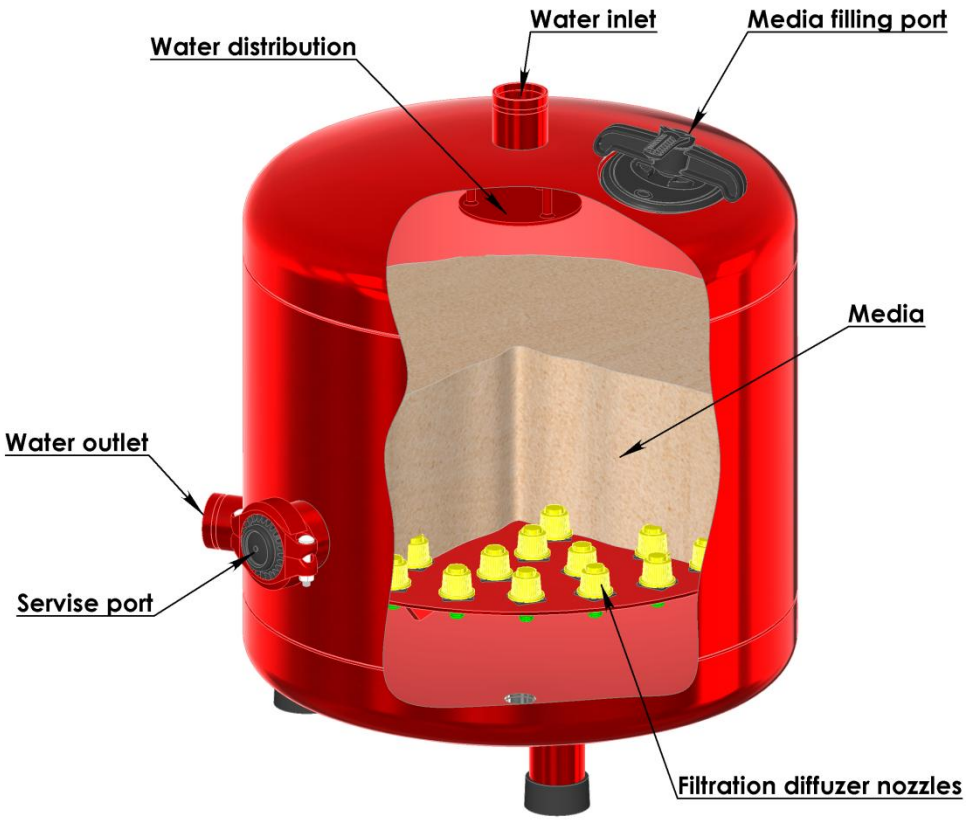
3. Description

Sand media filters operate by separating the materials suspended in unfiltered water as it flows through a bed of media in a pressurized tank.

Due to the large volume and contact area between the water and the media/gravel particles, various physical forces go into effect and act to retain the contaminating particles.

The efficiency of large particle is high as long as the gravel is kept clean.

Arkal media filters have a double bottom chamber divided by a welded reinforced steel plate. The upper chamber contains the gravel media, the lower chamber is empty and collects the filtered water. The plate is covered by diffuser nozzles, which are plastic, slotted, conical units.



4. Mode of Operation

Filtration mode

During the filtration process, unfiltered water enters the media filter system via the inlet manifold. It is filtered by flowing through the media and discharged via the outlet manifold.

During filtration the inlet ports are open and the backwash ports are closed.

Water flows from the top over the diffuser, down through the media layers to the outlet through the diffuser nozzles, located in the bottom part of the filter.

Backwash mode

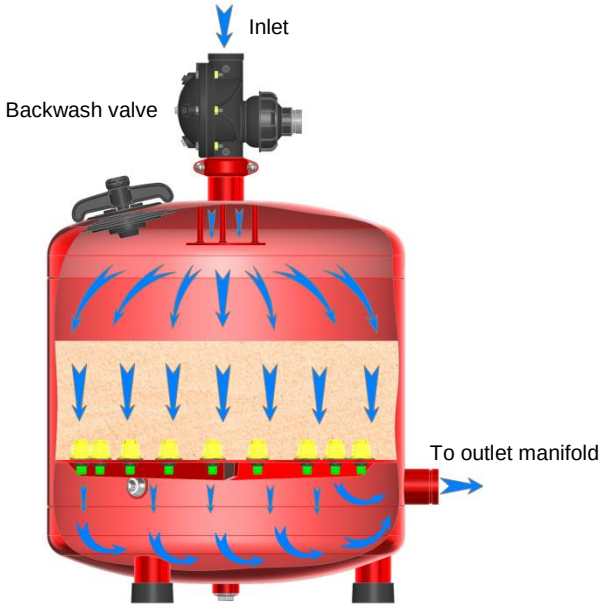
During the backwash process the inlet port closes and the backwash port opens, allowing reverse water flow into the filter.

Pressurized water from the other filters now flows into the bottom of the filter, lifting the media and freeling the acomulated dirt and debris which is then flushed out thrugh the backwash valve and into the drain manifold.

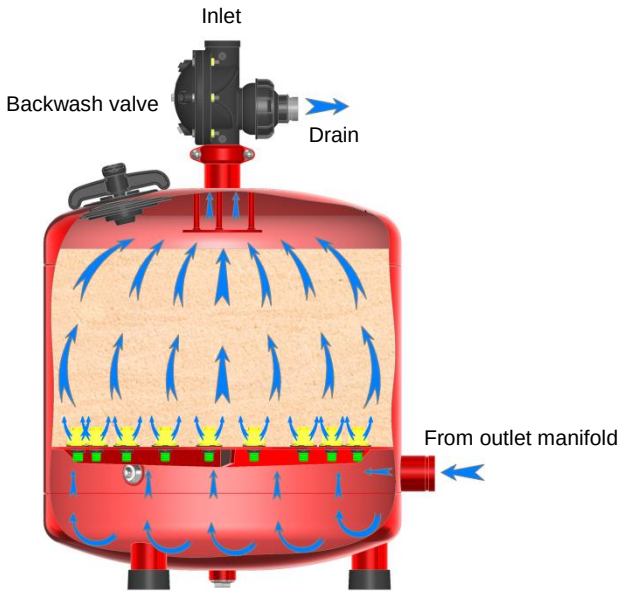
If the backwash restriction valve is adjusted properly, then the debris will be flushed out of the water while the media, being of a higher bulk density than the debris, will remain fluidized in the filter tank.

Only one filter at a time should backwashed. The water that is beind used to backwash one filter would have already passed through another filter or filters, so that the backwash process is carried out with filtered water.

Filtration Mode



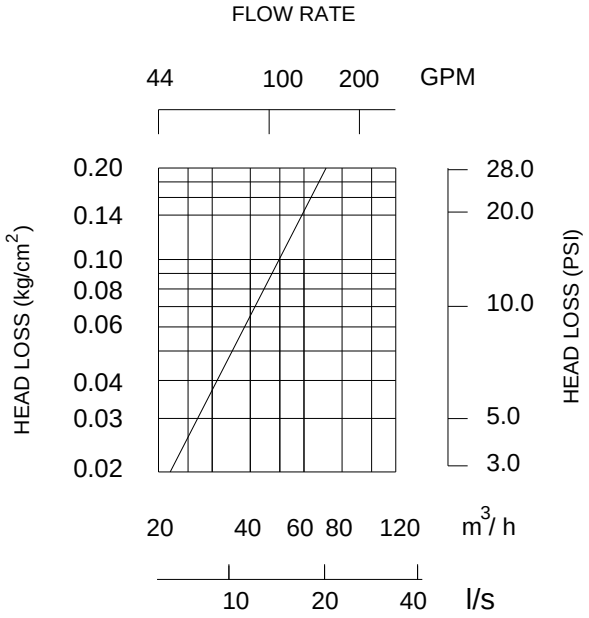
Backwash Mode



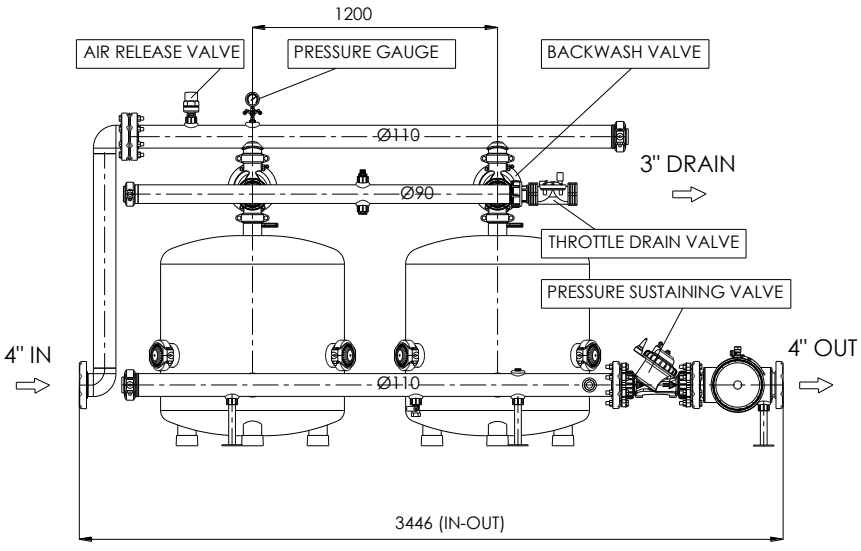
5. Technical Data

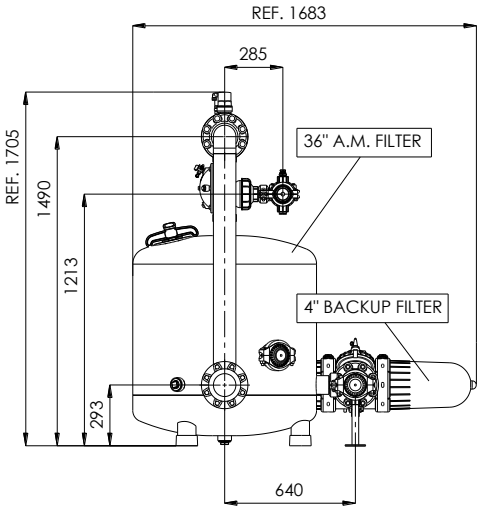
Connection diameter	3" grooved			
Filtration surface area	m^2	0.65	ft^2	0.7
Minimum backwash pressure	bar	2	psi	29
Maximum pressure	bar	8	psi	116
Backwash flow rate	m^3/h	54	gpm	238
Maximum temperature	^0C	60	^0F	140

6. Headloss Chart, Clean State



7. System Drawing





8. Operation and Startup

I. Installation

1. Remove from package, check contents.
2. Ensure correct orientation of inlet and outlet.
3. Connect the backwash pipe to the drain port.
4. Adding the sand media - recommendations:
   a. Use crushed basalt #1.
   b. The tank should be filled to approximately 250 mm (10") below the distributor plate (approximately 375kg).
5. Inspect the inside of the filters: after removing the upper access cover, and before adding any sand media to the filters, examine the bottom to make sure there are no foreign objects in the tanks and check the diffuser nozzles.
   a. Tighten the media filling port by hand.
   b. Tighten the 4" grooved connectors at the side service ports.
   c. Fill the tank with water, using working pressure to check it.
   d. Empty half of the water from the filter and then fill the tank with gravel through the top cover.
6. Check that the filter media filling port and the service port are closed correctly.

WARNING: the tank can only be moved when empty (no gravel or water inside).

II. Startup

1. Checklist

a. Make sure that all grooved couplers are tightened.
b. Make sure that all covers are in place and tightened.
c. Open field valves to allow water flow from filters to field.
d. Open the backwash manifold throttle valve to fully open.
e. Check backwash controller and solenoid operation (you should hear a clicking sound). After checking, set controller to OFF position.
f. Make sure that the distribution valve (on top of the pressure sustaining valve) is set to 'AUTO' position.

2. Startup

a. Open main valve supplying water to filters.
b. Check pressure gauge when system is over 25 meters of pressure; start backwash of the first filter by using the manual override on the solenoid.
c. Keep backwash on for at least 120 seconds, or until you can see clean water coming out of the backwash manifold. Repeat for each filter.
d. Start auto backwash with the controller after adjusting times.

***NOTE**: new sand contains contaminants and fine particles. After a few efficient backwash cycles, it should become clean.*

3. Adjustment

I. Adjust the pressure sustaining valve in order to get at least 2.5 bar on the upstream side; turn the nut on the pilot clockwise to increase the upstream pressure.

II. Adjust the restriction valve on the backwash manifold in order to allow only a trace of media to pass through.

III. Backwash controller adjustment:

1.	Backwash time……..	90-120	Seconds
2.	Dwell time between filters……..	30	Seconds
3.	Cycle time between backwashes……..	2-4	Hours
4.	Pressure differential (PD) adjustment over base line pressure loss…	5	meters

∗ *Only one filter should backwash at a time.*

4. Adjustment of the Backwash Restriction Valve

a. The flow to the backwash must be restricted in order to prevent the sand from being washed out with the dirty water. In the backwash mode, the sand is in a state of turbulent suspension with the water and debris. Proper adjustment of this valve will allow sufficient backwash flow, with only a trace of media being lost during backwash. A small loss of media is considered optimum.

b. Check to see if sand is being washed out with the backwash water. One method of doing this is to cup your hand and touch the bottom of the backwash stream as it exits the backwash manifold. If sand is present in the water, you will feel its grittiness in your hand. Or, even better, place a screen over the outlet of the backwash manifold and examine it for sand in the wash water (the use of a viewing tube is ideal – you can see it).

***NOTE**: new sand contains contaminants and fine particles. Fill the filter to overflowing with a garden hose to float off the majority of the fine particles. Also, backwash the filter 4-6 times in order to remove fine particles before adjusting the restriction valve.*

III. Backwash

1. When to Backwash

a. As debris builds up in the media filter, a pressure loss will develop across the filter. The dirtier the filter becomes, the greater the pressure loss. When the pressure loss reaches a critical limit of 5m the filter is dirty and in need of a backwash.

b. Check the pressure differential when your filters are clean, to get the Baseline Pressure Loss. As your filter operates, it will become dirty and the pressure loss will increase. When the pressure loss increases over the Baseline Pressure Loss for a clean filter by 5m, it is time to backwash the filter.

c. Automatic backwash controllers will sense the pressure loss and trigger a command, for the backwash sequence to start when necessary.

d. It is recommended to wash every 2-4 hours, regardless of pressure loss.

2. Backwash Pressure

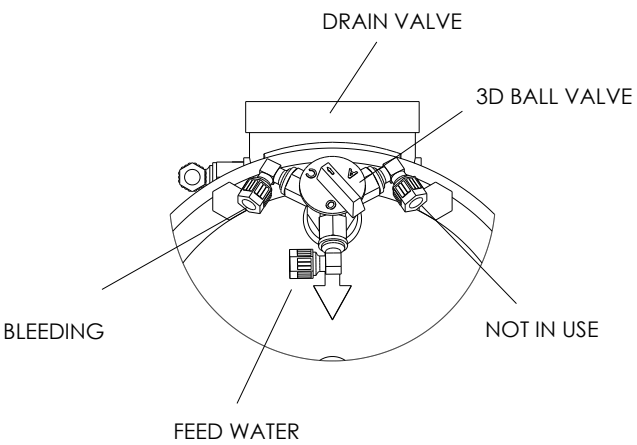
a. Filters must have both adequate pressure and water velocity for proper backwash. It is recommended that 36" gravel filters have a minimum of 25m/36psi of pressure during backwash.

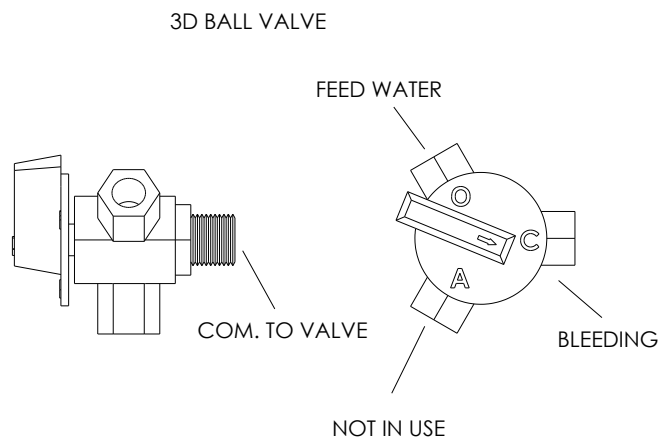
b. When the system consists of only two filters, the water pressure must be carefully considered. Backwashing requires that all the water flows through one filter to backwash the other filter. This can change the pressure drop through the one filter, resulting in inadequate pressure for the other filter – especially when using a pump with a steep cover.

c. If you feel you may have low pressure, or low flows, consult your dealer for recommendations. Generally, the addition of a pressure sustaining valve downstream of the filter station will solve the problem.

IV. Manual Backwash Operation

1. All backwash valves can be operated manually, even if provided with a solenoid for automatic operation by using the manual override on the solenoid.
   a. A three way valve (also called a "Sagiv") can be used on the backwash valve of each filter, allowing the system to be flushed manually.
   b. For manual operation, the handle should be facing the (o) Open position when the filter is in filtration mode (see figure 14). When backwashing, the handle should be turned to face the (c) Close position. This will open the backwash valve to the backwash manifold.
2. Backwashing should be continued until the water becomes clear. At this point the handle can be returned to the (o) Open position for normal irrigation. Backwashing normally requires 90 to 120 seconds.
3. Manual backwashing is activated by using the manual override of the solenoid.





V. Automatic backwash operation

1. The automatic backwash controller – general information:

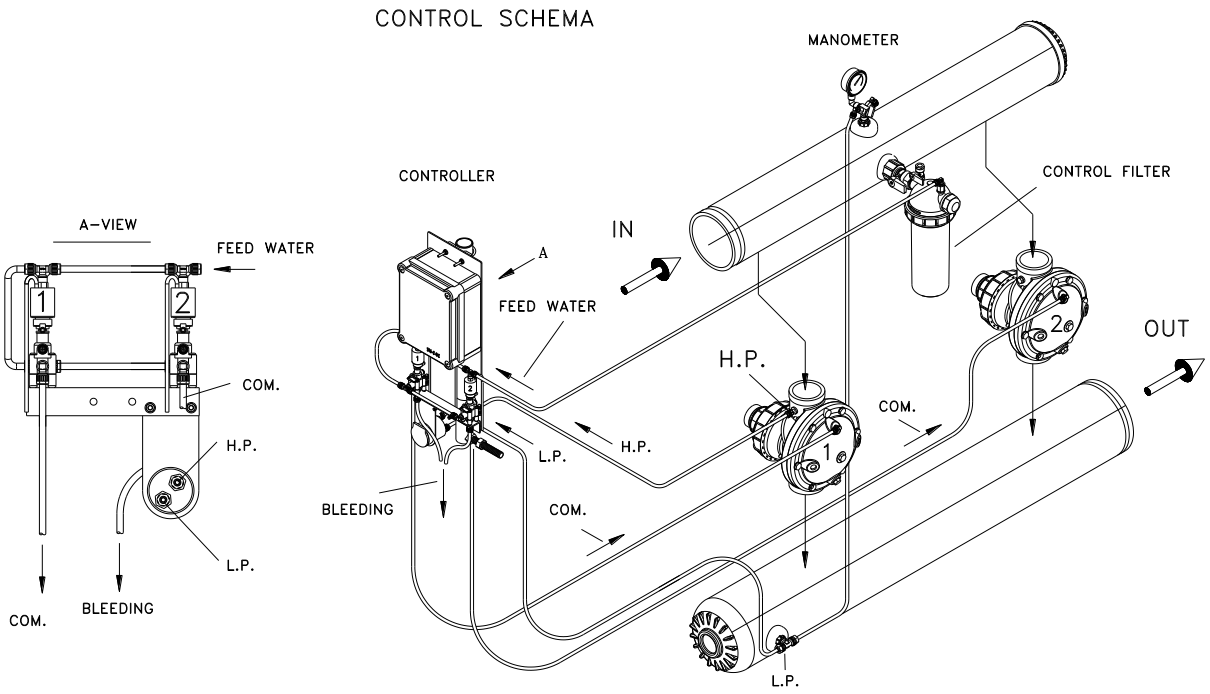
a. The automatic filter stations supplied by Arkal are shipped with a solenoid installed on the backwash valves. The controller for these valves must be ordered separately. Most filter backwash controllers will operate Arkal filtration systems. The backwash controllers which Arkal supplies come with their own instruction manuals for installation and operation. This instruction manual will detail the proper electrical connections to the solenoid and controller power source.

b. The controller can start a backwash cycle based on either time or pressure differential. Once the backwash cycle is initiated by the controller, each filter will backwash in sequence for a duration which can be set on the controller. Arkal recommends that pressure differential should be the primary activator of the backwash sequence, and that the controller's time clock should serve as backup for backwash at least every four hours.

We recommend backwashing at least once per irrigation.

2. Setting the pressure differential switch

The P.D. switch in the backwash controller reads the current pressure loss, and has an adjustable hand which determines the set-point for backwash cycle irrigation. With the filters clean, and in filtration mode, read the current pressure loss. This is the Baseline Pressure loss for clean filters. To establish a backwash set-point, add 5m to this baseline pressure loss, and set the adjustable hand to this set point. The filter system will now enter into a backwash cycle any time this pressure loss set-point is reached.



3. Setting the backwash time

This setting determines the duration of the backwash for each filter. This time should not be set for less than 1 minute. Generally speaking, 120 seconds is adequate even for very dirty water, and 90 seconds are adequate for moderately dirty to clean water. In low pressure applications, more time may be required. If over 90 seconds are required to perform a proper backwash, it may be that the filter is becoming excessively dirty between backwashes. When 90 seconds fail to provide a thorough backwash, decrease the pressure differential setting by 2 meters to decrease the time between backwashes.

4. Setting the periodic start

a. This setting establishes a time schedule for backwashing. The purpose of this function is to ensure that backwashing takes place even if there is a failure in the pressure differential switch. In this case, when no P.D. is detected, the filters will backwash periodically.

b. Typical periodic settings are:

Very dirty water	1 hour
Dirty water	2 hours
Moderately dirty to clean water	3 hours

c. To properly set the periodic start, you should observe the filter through several backwash cycle initiated by the pressure differential switch, marking the time it took between each backwash cycle. Multiply the amount of time between backwash cycles by 1.2 to get the proper periodic setting. For example: 90 minutes between backwash initiation cycles. Multiply 90 minutes x 1.2 = 108 minutes as the periodic setting.

It is common for open water sources to have different quantities of debris during the irrigation season, and it is important to adjust your backwash settings in response to this change. An example would be pond algae, which may be much heavier during certain times of the summer. Under these conditions, you should occasionally check and record the period of time between backwash cycles initiated by the pressure differential switch in order to reestablish the proper periodic start setting according to the process described in the paragraph above.

4. Dwell Time Setting

The dwell time is the period of time between the flushing of each filter in a given backwash cycle. This is needed in some systems, to enable the pump to recover pressure for backwashing the next filter. A normal setting is 20 to 60 seconds.

9. Maintenance

The check filter should be removed and cleaned every two weeks, or whenever the DP rises above the required limit.

I. Monthly Maintenance

Check the media level

1. Close the main valve supplying water to the filters.
2. Release the pressure from the battery by opening the exit manifold drain valve.
3. Make sure the pressure in the battery has been released by checking the indication on the pressure gauge.
4. Open the upper cover and check the sand level. Add media if required.
5. Open the main valve supplying water to the filters.

Check inlet /outlet pressures (∆p):

- In case the pressure differential is above 5m / 7 psi.
- Activate automatic backwash of the Media Filter battery.
- In the event that the pressure differential remains high, check for possible failures.

Check for leakages from the drain manifold:

In the event of leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance:

Check that the controller timing parameters are correctly adjusted and activate the automatic backwash cycle. In the event of backwash controller malfunction, check for possible failures.

Cleaning of the Command Filter:

Close the command filter inlet valve, release the pressure trapped in the command filter and remove the cover. Thoroughly clean the filtration element, reinstall the command filter element and cover and then open the inlet valve.

Cleaning of the Check Filter:

1. **Dismantling**
   a. Make sure that the water inlet is closed and the pressure released.
   b. Drain the filter through the drainage ball valve.
   c. Open the cover by pulling the safety pin and lifting the clamp lever.
   d. Remove the filter cover with a slight counter-clockwise rotation.
   e. Remove the filter element.
   f. Release the spine tightening nut.
   g. Rinse, using a high pressure water jet.

2. **Assembly**
   a. Close the spine tightening nut until the discs are tightly compressed.
   b. Position the filter element back in place.
   c. Place the filter cover on the filter body and secure it with a slight clockwise rotation.
   d. Secure the clamp onto the cover and close using the lever, insert the safety pin.

Winterization:

To protect the filter battery from possible damage during freezing temperatures (due to freezing of the water contained in the battery), drain all of the water from the media tanks, backwash valves, command filter, controller parts and PSV pilot.

Leave the drain valve open.

II. Replacing the Filter Media

Replace the gravel when the amount of debris (that cannot be backwashed) prevents proper functioning of the filter.

a. Close all the valves.
b. Open the top filling port.
c. Open the side service port gently and drain all the water.
d. Empty the gravel from the filter, through the side service port.
e. Rinse the interior of the filter and the "mushroom" diffusers.
f. Check the protective coating for damage and repair (if necessary).
g. Cover the side ports and tighten properly.
h. Fill the filter through the top filling port (see installation).
i. Check the flow limiting valve, or readjust the throttle valve (F) (see installation).

Open valves for normal operation (see operation instructions)

III. Maintenance Tips

1. Pump inlet should be 0.2 - 0.3m / 3 - 4 feet below the surface and a minimum of 0.8m / 2.5 feet off the bottom, to prevent intake of excess dirt when pumping from a ditch or a reservoir.
2. Add chlorine at least twice a year in order to control the growth of organisms in the filter. Apply 2 to 20 ppm according to the following directions:
   a. At the end of every irrigation season, add chlorine to the water in the filter for 30 minutes and allow it to set; backwash for at least 2 minutes; drain all the water from the filter, leaving it to dry; close the inlet and outlet valves.
   b. At the beginning of the irrigation season, fill the filter with water and add chlorine; let stand for 30 minutes; backwash for 2 minutes.

NOTE: additional applications of chlorine may be necessary in some areas.

CAUTION: chlorine is a dangerous chemical, therefore exercise appropriate caution when handling it. Observe all applicable government regulations. Contact a qualified chemical dealer for assistance.

3. The sand media will need replacing every few years as the sand grain edges become rounded out (sharp edges are essential for proper filtration).

10. Troubleshooting

Symptom: leaking around grooved couplings

Possible causes:

1. A pinched gasket
2. A torn or cracked gasket
3. Components are out of alignments

Solutions:

1. Remove the couplings and inspect the gasket; apply gasket lubrication to prevent pinching.
2. Replace the torn gasket.
3. Remove couplings and gaskets and inspect grooved fillings; fittings should join squarely, with no major gaps.

Symptom: leaking around the access ports

Possible causes:

1. Debris between the gasket and the seat
2. A torn or a cracked gasket
3. A cracked hatch cover

Solutions:

1. Remove the gasket and inspect it and the seat for any debris stuck inside or between them.
2. Inspect the gasket for any cracks or other damage; replace if necessary.
3. Inspect the hatch cover for cracks or damage; replace if cracked or defective in any way.

Symptom: leaking around the top hatch vent

Possible causes:

1. Torn or cracked o-ring
2. Damaged vent

Solutions:

1. Remove the hatch cover and inspect the gasket and seat for any debris.
2. Inspect the gasket for cracking or other damage; replace if necessary.

Symptom: one or several filters will not backwash

Possible causes:

1. Controller output problem
2. Solenoid wiring defective
3. Incorrect valve setting (on filters with optional selector valve)
4. Solenoids clogged or damaged

Solutions:

1. Check for correct controller output with multi-tester or, switch solenoid wires with another station to check for output signal.

2. Use an ohmmeter to verify wiring is intact; try to manually actuate the solenoid with the small knob at the base; turn 90° to open and return to close.
3. Verify that selector valve knob is pointed towards the solenoid.
4. Open solenoids and inspect internal parts for evidence of clogging.

   CAUTION: the solenoid contains a spring loaded plunger; open carefully to avoid losing this component.

Symptom: all filters in the station will not backwash

Possible causes:

1. Controller output problem
2. Insufficient downstream pressure for backwash
3. Hydraulic command system failure

Solutions

1. Check that the controller is on and programmed correctly; try to manually actuate the solenoids with the clock; in general, the solenoids will emit an audible click when actuated.
2. Backwash one tank by using the manual actuating screw on the base of the solenoid. Note the downstream pressure reading; if it falls below 25m/36psi, it may be necessary to adjust the pressure sustaining valves (on the outlet of the filter battery) to build sufficient backwash pressure.
3. Check that the isolation valve is in the ON position; remove one of the hydraulic tubes leading to the solenoids and verify that pressurized water is available; inspect the hydraulic command filter for contamination.

Symptom: filter station differential remains high after backwash

Possible causes:

1. Gauge error
2. Insufficient backwash pressure
3. Insufficient backwash flow
4. Excessive contamination of media

Solutions:

1. Check the gauge differential on the manifolds as opposed to the differential gauge in the controller; in case of a discrepancy, check the readings with a new gauge.
2. Make sure that the downstream pressure during backwash is at least 25m / 36psi. If not, it may be necessary to adjust the pressure sustaining valves (on the outlet of the filter battery) to build sufficient backwash pressure.
3. Check the backwash throttling valve setting; adjust according to the outlined procedures.
4. Open the hatch covers and inspect the media bed after a backwash.
5. Verify that the backwash line meets the outlined requirements.

Symptom: filter station differential increases rapidly during operation, especially at startup

Possible causes:

1. Excessive flow rate
2. Unusual concentration of contaminants

Solutions:

1. During system startup, throttle downstream flow to the design flow rate; use a manual valve or a pump control / sustaining valve.
2. Check the quality of the source water.

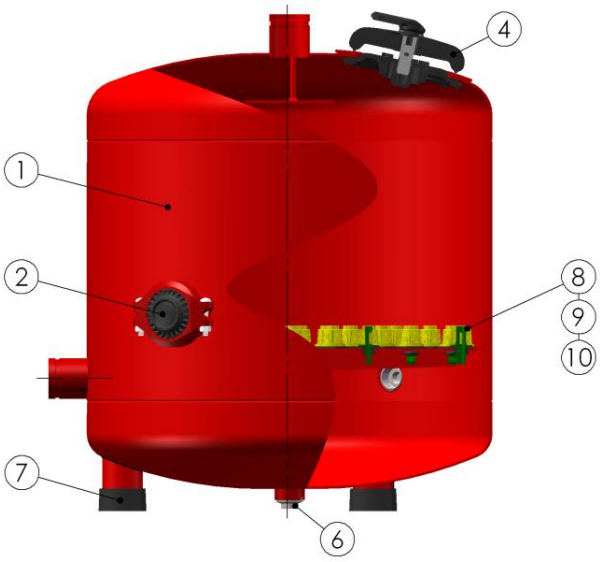
In case you do not find a satisfactory solution in these pages, please consult with your local Arkal products representative.

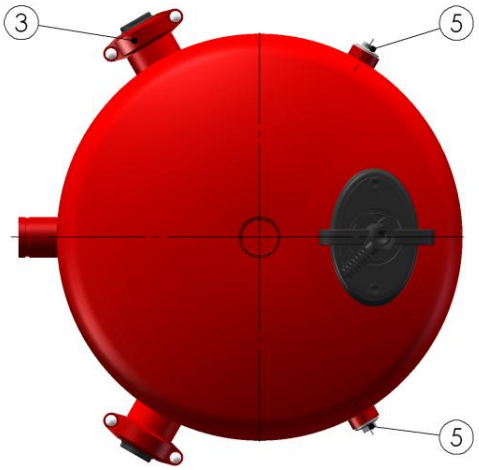
11. Construction Materials and Coatings

- Domes: thickness: 5mm
- Tank sleeve: thickness: 4mm
- Mushroom plate: thickness: 6mm
- Mushroom plate ribs: thickness: 6mm
- Zinc phosphate treatment
- Painting of the filter is done with a baked-on polyester powder of 70-130 microns (RAL 3001).

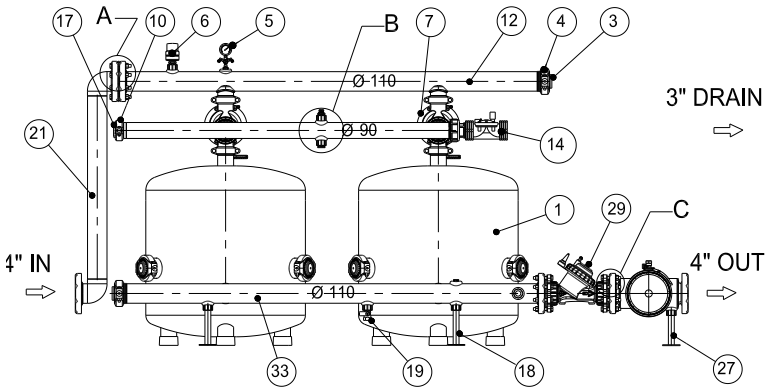
12. Spare Parts

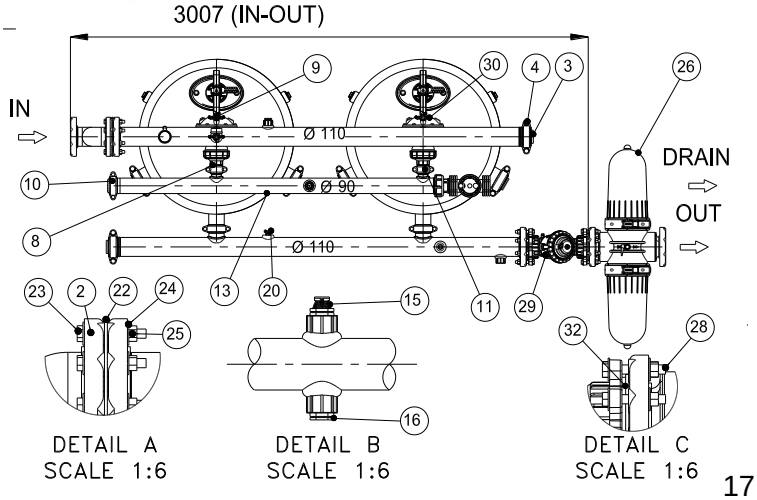
No.	Description	Catalog Number
1	36” Filter body	5037 0061
2	4” VIC cap plastic	2530 0400
3	4” VIC connector	5032 0400
4	Upper cover	5003 7604
5	2” Plug	5024 0200
6	2” Plug	2253 0203
7	Rubber base for leg	5005 1112
8	Rubber seat	5006 0023
9	Mushroom	2820 0030
10	Mushroom base	2820 0031





	Qty.	Cat. No.	Description
1	2	1487 0360	36" Arkal media filter
2	6	2253 0425	4" Flange complete
3	2	2530 0400	4" Cap
4	2	5032 0400	4" Red grooved connector
5	1	2254 02414	Pressure gauge complete
6	1	5048 0100	1" Air release valve
7	2	5060 4302	3"x2" Plaslite valve
8	2	2253 0508	2" M/F adaptor
9	2	5054 0034	¼" 3D ball valve
10	7	5032 0300	3" Red grooved connector
11	2	5032 0200	2" Red grooved connector
12	1	6647 0402V00036 IN	Inlet manifold
13	1	6647 0402TV2036 DR	Drain manifold
14	1	5060 4034	3" Bermad valve
15	1	2253 0512	Vacuum breaker
16	2	5019 0114	1" Plug
17	1	2530 0300	4" Cap
18	2	6134 03220	Black L=220mm support leg
19	1	5054 0016	1" Bell valve
20	1	5078 0028	8mmx8mmx¼" tee
21	1	6647 0402V00036 AN	"S" manifold for inlet
22	1	2507 0407	Plastic disc for 4" filter
23	8	2507 2010	⅝" L=110 bolt
24	48	5040 9011	⅝" Disc
25	24	5040 8010	⅝" Nut
26	1	1440 1500 _ _	4" Super leader filter
27	1	6134 03190	Black L=190mm support leg
28	16	5040 2009	⅝" L=100mm bolt
29	1	5062 0144	4" Bermad PS valve
30	8	5078 0034	8mmx¼" Tefen angle
31	2	5052 0002	¼" Finger filter
32	2	5005 1004	Plastic disc for 6" flange
33	1	6647 0402V00036_02 OUT	Outlet manifold





Limited Warranty

ARKAL FILTRATION SYSTEMS (“ARKAL FILTRATION SYSTEMS”) warrants to the original end user (“CUSTOMER”) who purchased ARKAL FILTRATION SYSTEMS products directly from Arkal or through one of its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, provide that such products are properly installed, used and maintained in accordance with ARKAL FILTRATION SYSTEMS instructions, written or verbal.

Should such products prove defective within one year from the original purchase date by the customer, and subject to receipt by ARKAL FILTRATION SYSTEMS or its authorized representative, of written notice thereof from the customer within 30 days of discovery of such defect or failure - ARKAL FILTRATION SYSTEMS will repair or replace, at its sole discretion, any item proven to be defective.

ARKAL FILTRATION SYSTEMS shall not be liable, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized ARKAL FILTRATION SYSTEMS representative.

This warranty does not extend to components, parts or raw materials used by ARKAL FILTRATION SYSTEMS but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty, nor to add any provisions to it not contained herein or to extend this warranty to anyone other than ARKAL FILTRATION SYSTEMS customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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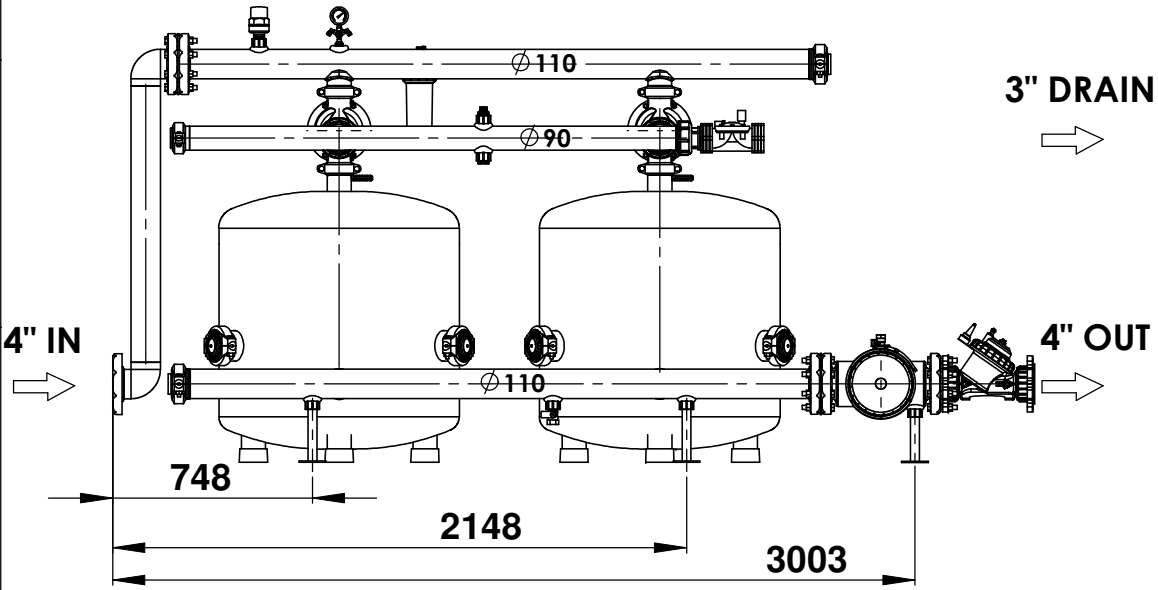
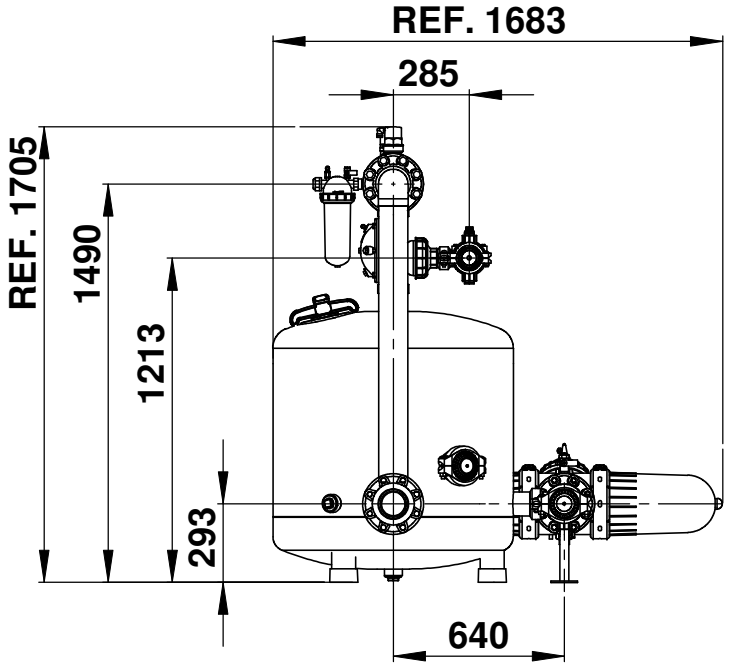
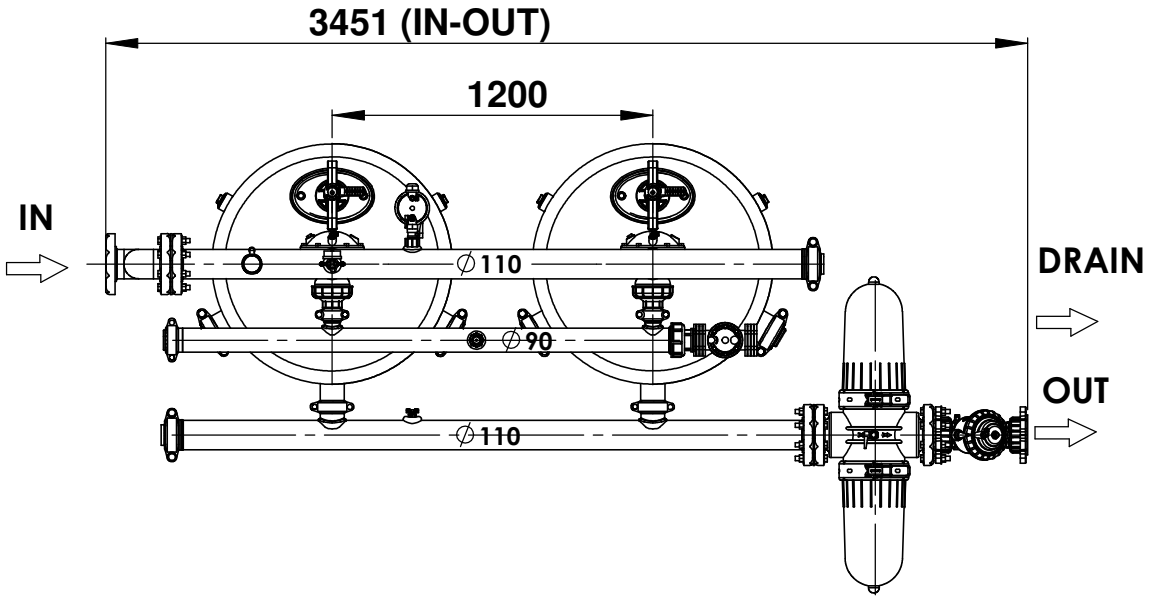
Drawings

Arkal Media Filters 36"







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BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT: 2*36" A.M. FILTERS PLASTIC BATTERY WITH HYDRAULIC CONTROL SYSTEM | PAGE 1_OF 4_

TITLE: ASSEMBLY DRAWING | CATALOGUE No: 4136 0402VUEBV

SOLIDWORKS FILE CODE: 2-36-110-L | FILE CODE: 4136 0402VUEBV C | MATERIAL:

	NAME	DATE	FILE CODE DRAWINGS:	BACKUP:
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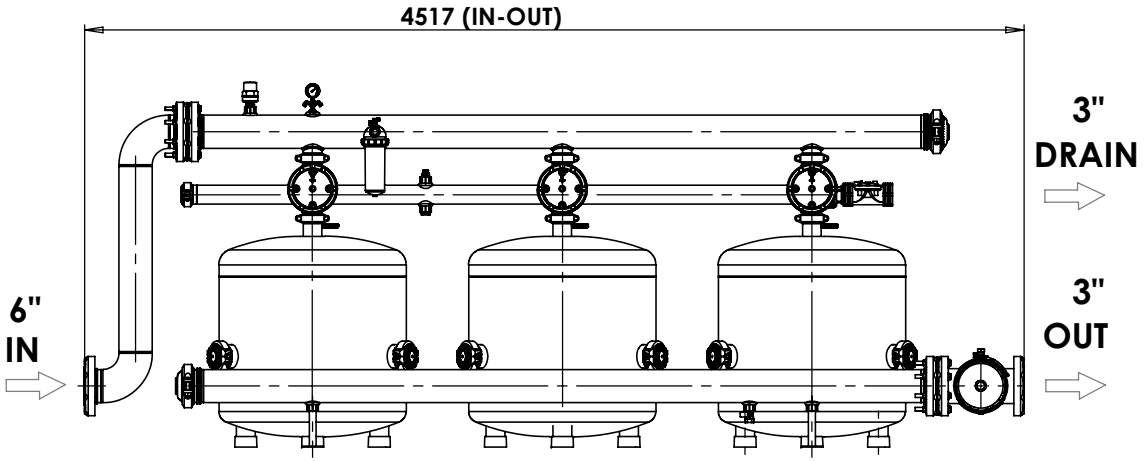
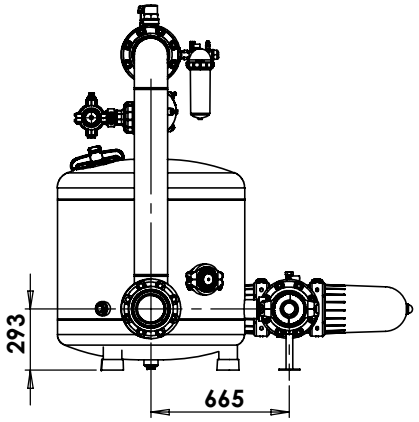
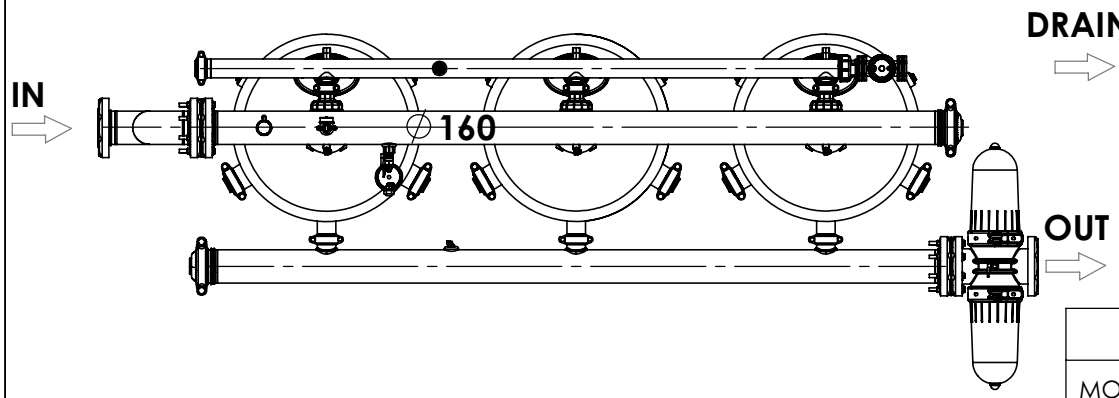
CHECKED	DEKEL	16/12/2009		
APPROVED	OMRY	16/12/2009	FILE CODE DRAWING OF MAN.	DRAWING: 5015
B.O.M.	IRINA	16/12/2009		

PATH-Z:\DRAWINGS ARKAL CATALOG-SOLID\BATTERIES\Media Filters\36 inch\2-36-110\

Wednesday, January 06, 2010 10:08:03 AM







MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
3*36" A.M. FILTERS PLASTIC BATTERY

PAGE_1_of _3_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
3-36-160-S

PATHBATTERIES/2INCH FILTERS
PLASTIC MANIFOLDS

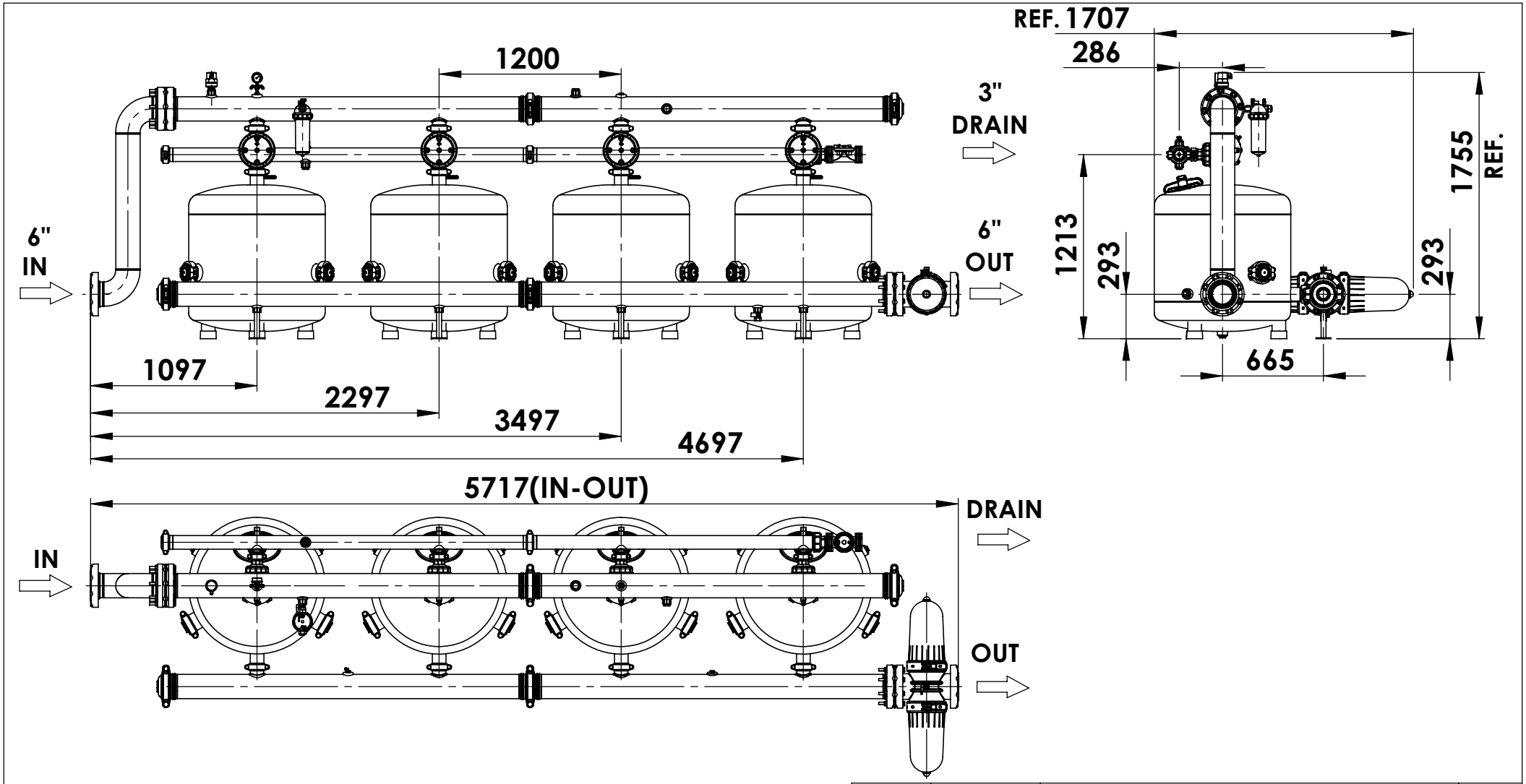
FILE CODE
3-36-160-S

	NAME	DATE
DRAWN	NIKOLAY	26/06/2008
CHECK.	NIKOLAY	26/06/2008
APPR.		26/06/2008

DATE
SIGNATURE

BACKUP:
DISK-2S

DRAWING No:
5015



MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT: 4*36" A.M. FILTERS PLASTIC BATTERY — PAGE 1 OF 5

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 4-36-160-S

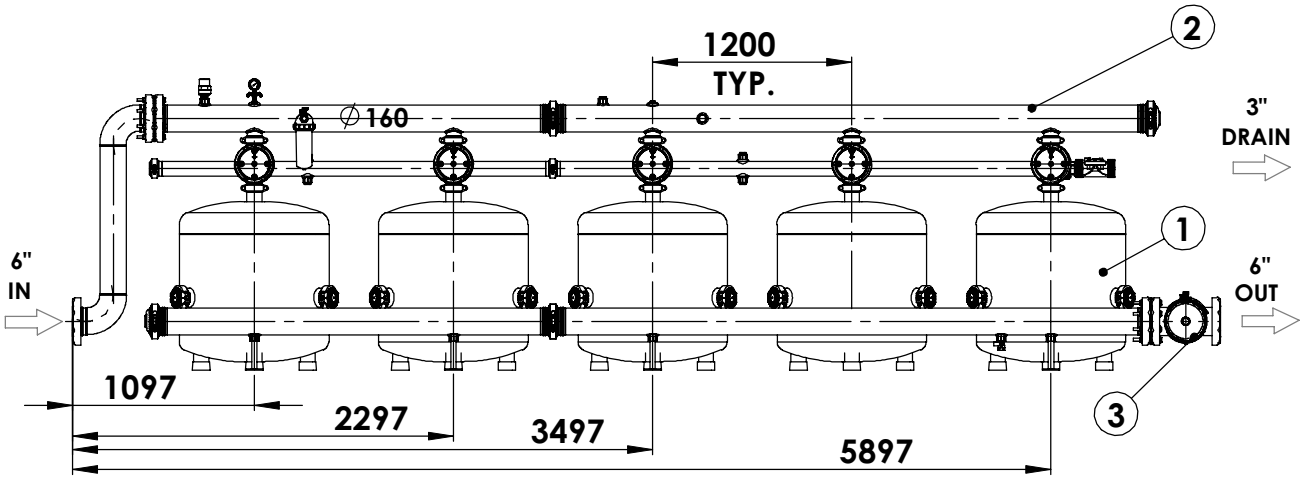
PATH BATTERIES\Media Filters\36 inch\ Manifolds\4–36–160 — FILE CODE: 4-36-160-S

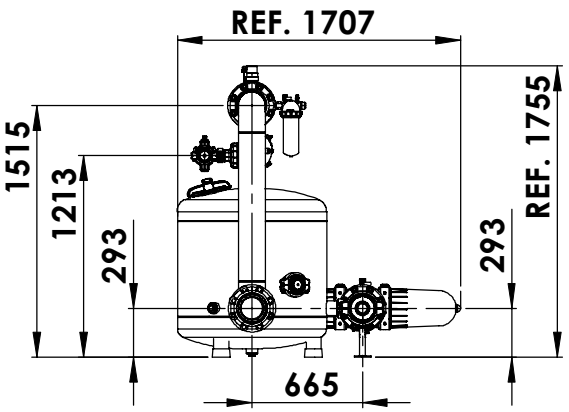
	NAME	DATE	SIGNATURE
DRAWN	HELEN	03/07/08	
CHECKED			
APPROVED			

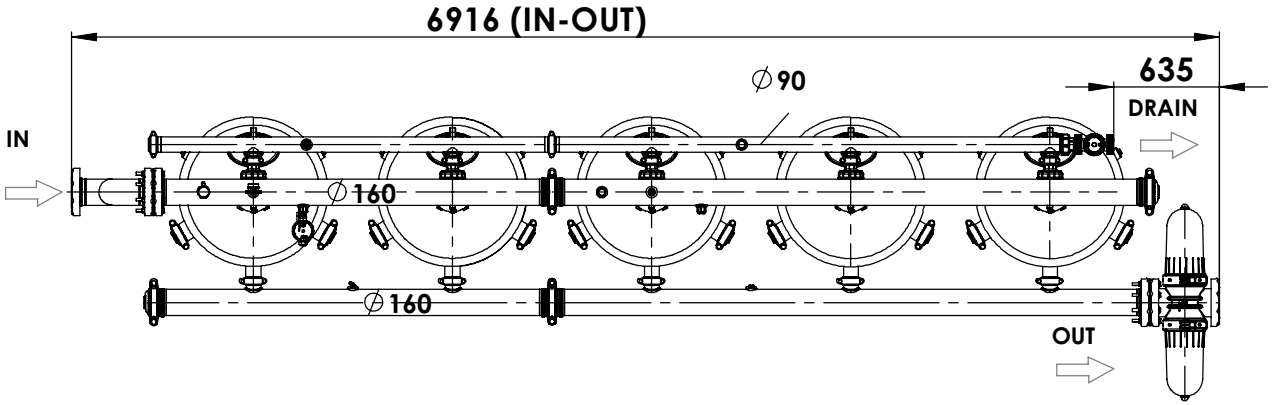
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK–2S

DRAWER N: 5015







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1	1487 0360	36" A.M. FILTER	5
2	4647 0605VU2136	SET MANIFOLDS COMPLETE	1
3	1460 5___	6" SUPER LEADER FILTER	1
4	1906 DC05G3BP	CONTROL SYSTEM	1

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
5*36" A.M. FILTERS PLASTIC BATTERY

PAGE_1_of _5_

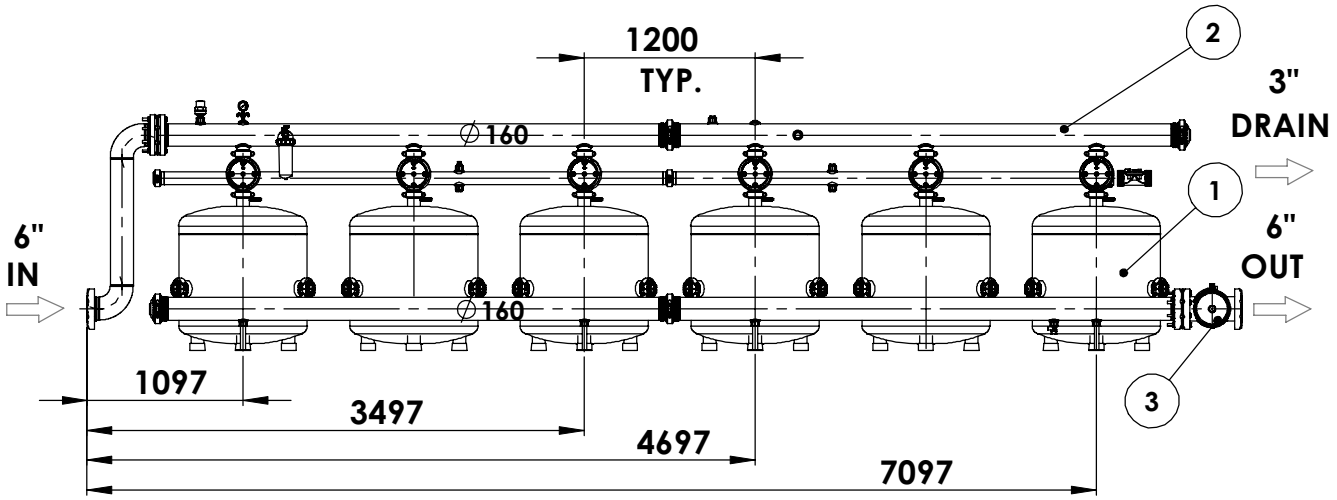
TITLE
ASSEMBLY DRAWING

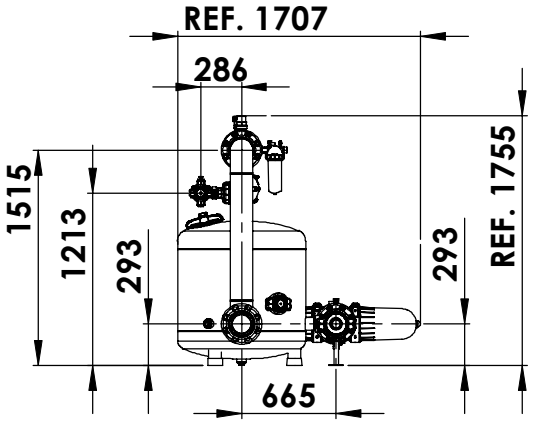
CATALOGUE No:
4136 0605VUEBV

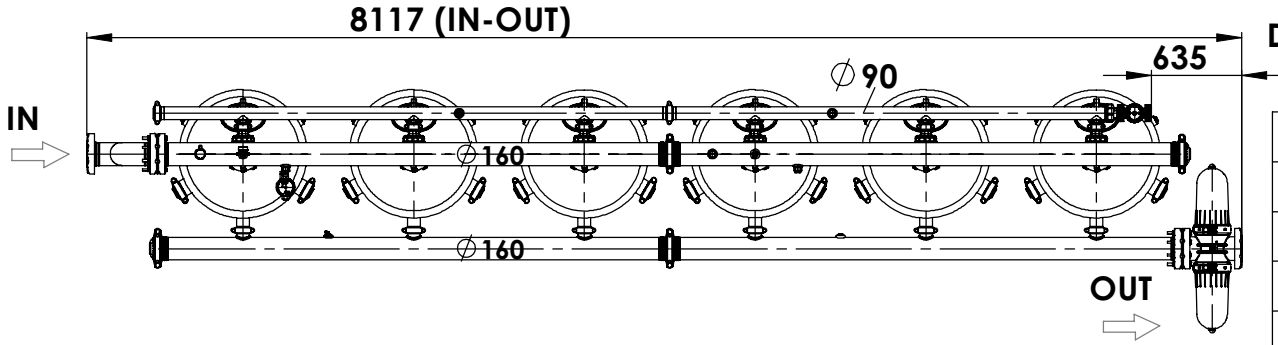
PATHBATTERIES/MEDIA FILTERS	FILE CODE	DATE	SIGNATURE
36inch/5-36-160	4136 0605VUEBV-S	09.07.08	

	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	NIKOLAY	11/07/2008	6647 0605V20136	DISK-2S
CHECK.	NIKOLAY	11/07/2008	SOLID WORKS FILE CODE:	DRAWING No:
APPR.		11/07/2008	5-36-160	5015

PDF created with pdfFactory trial version www.pdffactory.com







ITEM No:	Cat. No:	DESCRIPTION	Qty.
1	1487 0360	36" A.M. FILTER	6
2	4647 0606VU2136	SET MANIFOLDS COMPLETE	1
3	1460 5___	6" SUPER LEADER FILTER	1
4	1906 DC06G3BP	CONTROL SYSTEM	1

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
6*36" A.M. FILTERS PLASTIC BATTERY

PAGE_1_of _5_

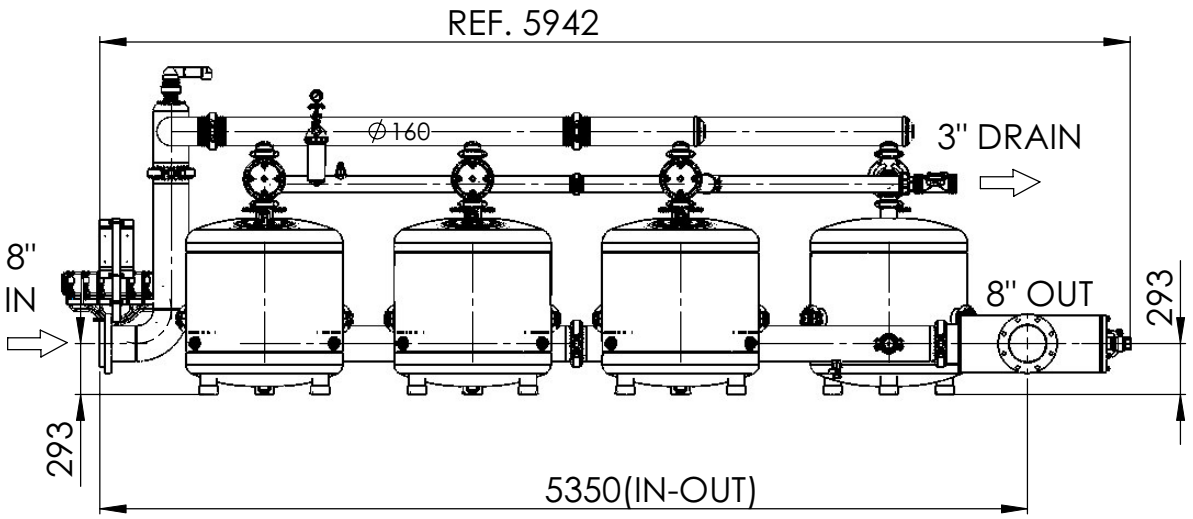
TITLE
ASSEMBLY DRAWING

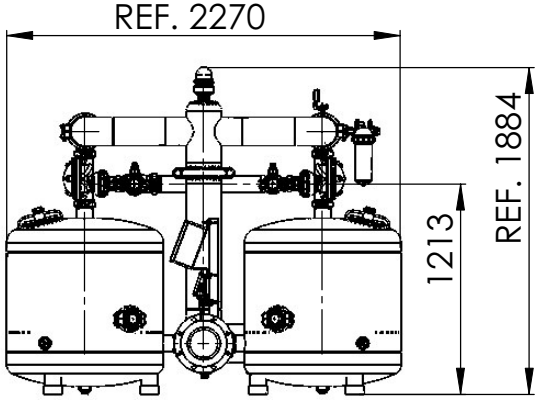
CATALOGUE No:
4136 0606VUEBV

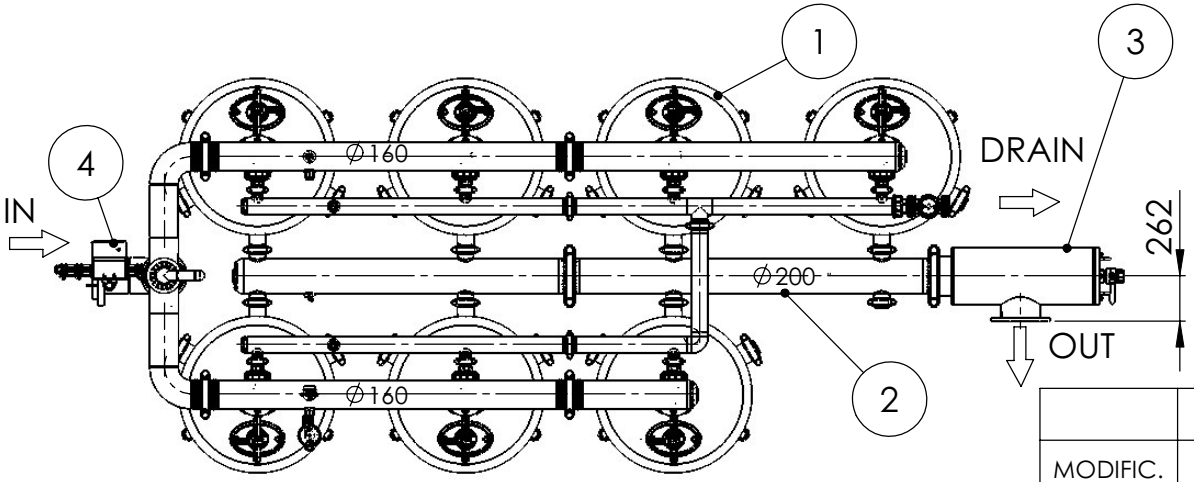
PATHBATTERIES/MEDIA FILTERS	FILE CODE	DATE	SIGNATURE
36inch/6-36-160	4136 0606VUEBV-S	09.07.08	

	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	NIKOLAY	11/07/2008	6647 0606V20136	DISK-2S
CHECK.	NIKOLAY	11/07/2008	SOLID WORKS FILE CODE:	DRAWING No:
APPR.		11/07/2008	6-36-160	5015

PDF created with pdfFactory trial version www.pdffactory.com







Item No:	Cat. No:	DESCRIPTION	Qty
1	1487 0360	36" AM FILTER	7
2	4547 0807D20036	SET MANIFOLDS COMPLETE	1
3	6R08 08DV7	8" AK-R08 SCREEN FILTER	1
4	1903 DC07G2BP	CONTROL SYSTEM	1

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
7*36" AMF FILTERS PLASTIC BATTERY

PAGE_1_of _24

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
4120 0113

PATHBATTERIES/MEDIA FILTERS	FILE CODE	DATE	SIGNATURE
36 inch	4120 0113		

	NAME	DATE	
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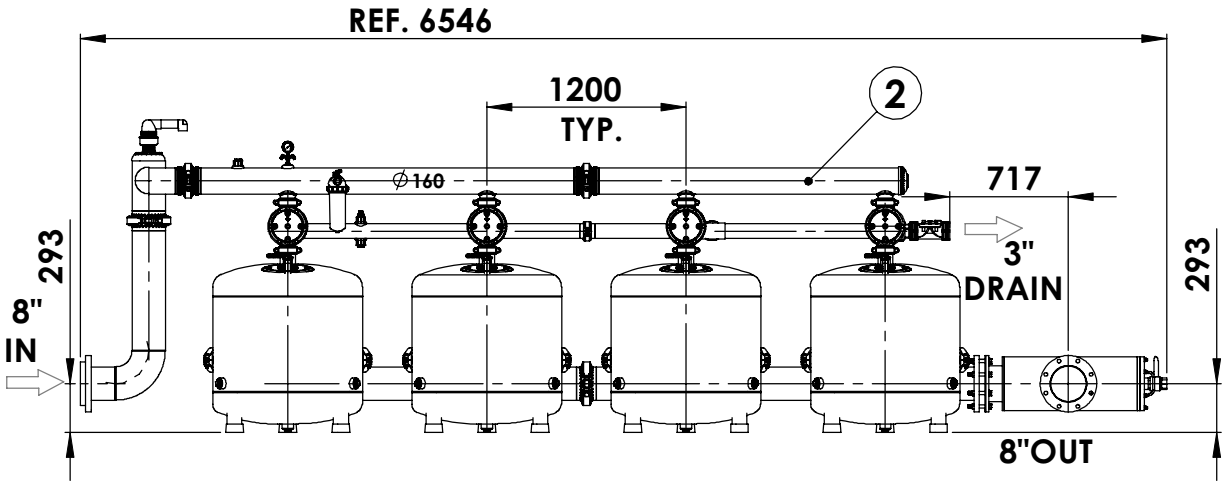
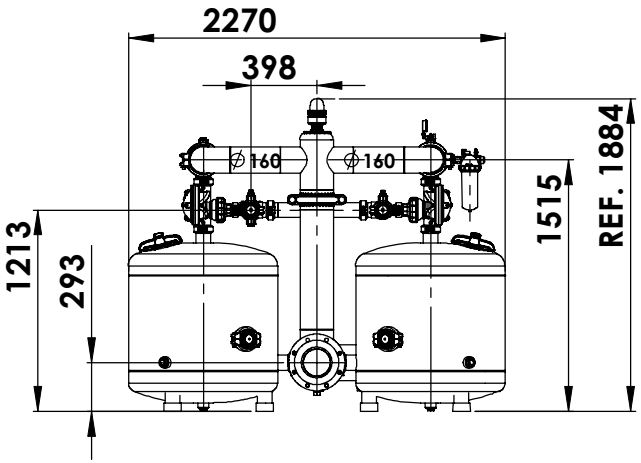
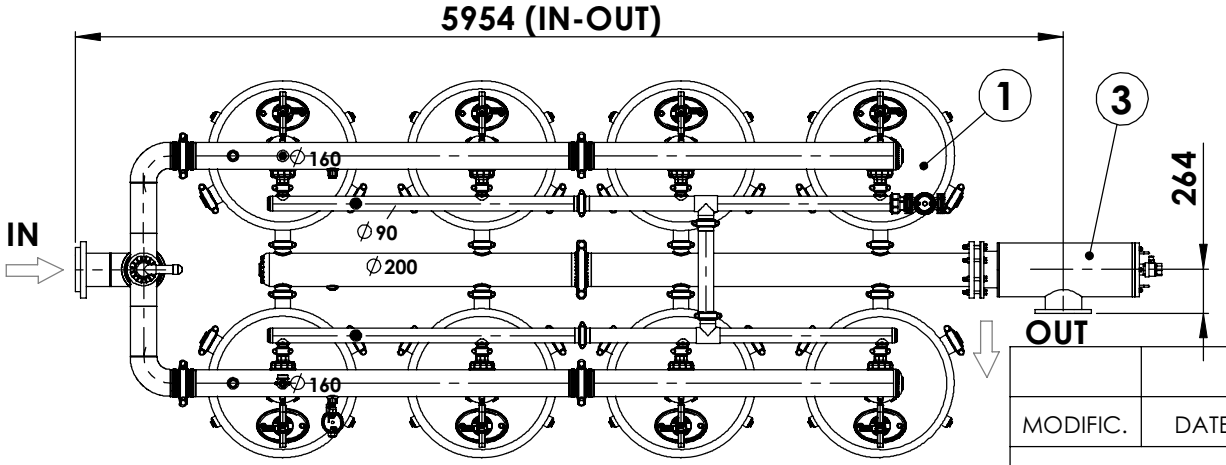
CHECK.		3/12/2008	DRAWING No: 5015A
APPR.		3/12/2008	







ITEM No:	Cat. No:	DESCRIPTION	Qty.
1	1487 0360	36" A.M. FILTER	8
2	4647 0808D0136	SET MANIFOLDS COMPLETE	1
3	6R08 08DV7	8" AK-R08SCREEN FILTER	1
4	1904 DC08G3BP	CONTROL SYSTEM	1

MODIFIC.	DATE	DESCRIPTION	SIGN.

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PROJECT
8*36" A.M. FILTERS PLASTIC BATTERY

PAGE_1_of _7_

TITLE
ASSEMBLY DRAWING

CATALOGUE No:
4136 0808D0EBV

PATHBATTERIES/MEDIA FILTERS 36inch/

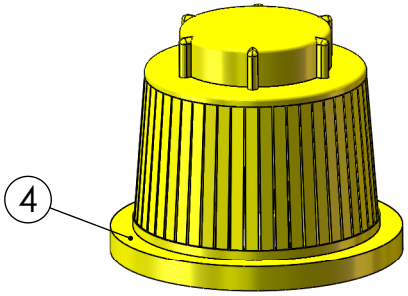
FILE CODE
4136 0808D0EBV-S

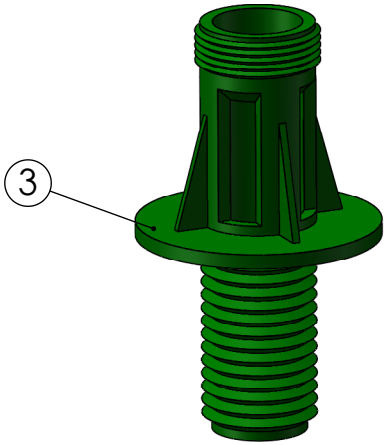
DATE

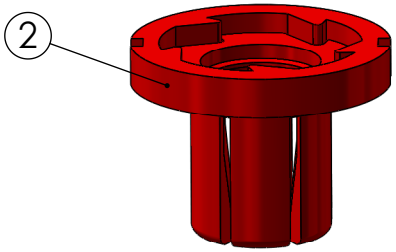
SIGNATURE

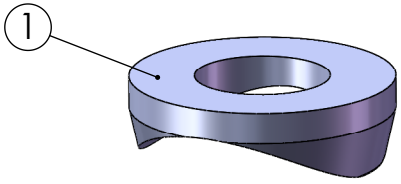
	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	NIKOLAY	11/07/2008	6647 0808D20136	DISK-2S
CHECK.	NIKOLAY	11/07/2008	SOLID WORKSFILE CODE :	DRAWING No:
APPR.		11/07/2008	8-36-200	5015

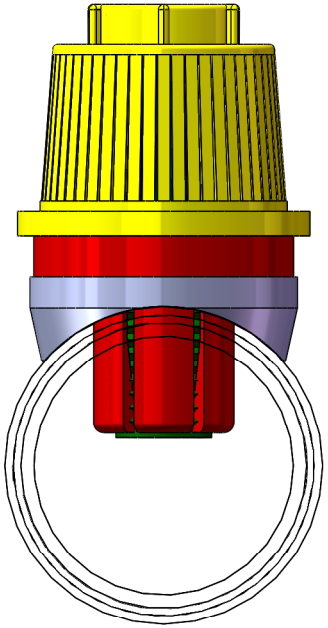
PDF created with pdfFactory trial version www.pdffactory.com











ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	5999 160131	ADAPTOR TMX-060 15/16W	1
2	5999 160127	EXPANDING BOLTS TS1 PP	1
3	2820 0031	MUSHROOM BASIS	1
4	2820 0030	MUSHROOM, AGF	1

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: ARKAL MEDIA FILTERS | PAGE___OF___

TITLE: MUSHROOM | CATALOGUE No:

SOLIDWORKS FILE CODE: | FILE CODE: | MATERIAL:

	NAME	DATE
DRAWN	OLEG	07.01.10
CHECKED	YARON	07.01.10
APPROVED	OMRY	07.01.10
B.O.M.	MARINA	07.01.10

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

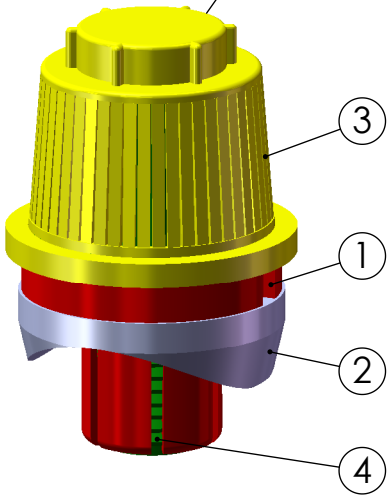
BACKUP: DISK-2S

DRAWING:

PATH- \\Arkal-fs\drawings\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\

SW-Print: 8/04/2010

ITEM NO.	DESCRIPTION	QTY	PART NUMBER
1	EXPANSION BOLT TS1 PP	1	5999 160127
2	ADAPTOR TMX-060 15/16w	1	5999 160131
3	MUSHROOM, AGF	1	2820 0030
4	MUSHROOM BASIS	1	2820 0031

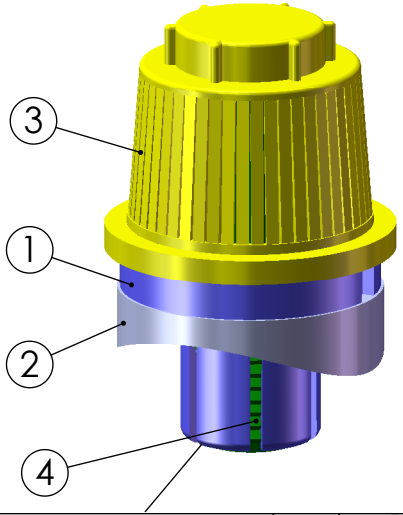


ASSEMBLY
FOR PIPE PP ∅63

2248 2063

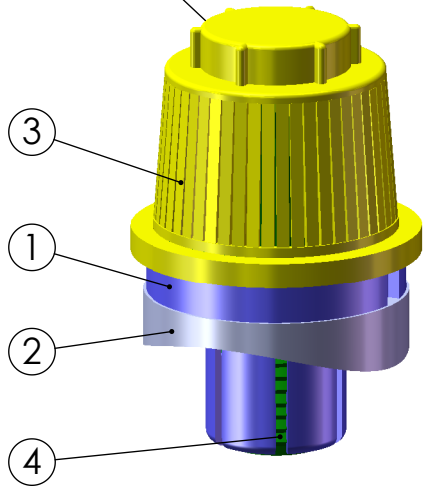
ASSEMBLY
FOR PIPE PP ∅ 90

2248 2090



ITEM NO.	DESCRIPTION	QTY	PART NUMBER
1	EXPANSION BOLT TS3	1	5999 160150
2	ADAPTOR TMX-060 15/16w	1	5999 160113
3	MUSHROOM, AGF	1	2820 0030
4	MUSHROOM BASIS	1	2820 0031

ITEM NO.	DESCRIPTION	QTY	PART NUMBER
1	EXPANSION BOLT TS3	1	5999 160150
2	ADAPTOR TM3-114 15/16W	1	5999 160149
3	MUSHROOM, AGF	1	2820 0030
4	MUSHROOM BASIS	1	2820 0031

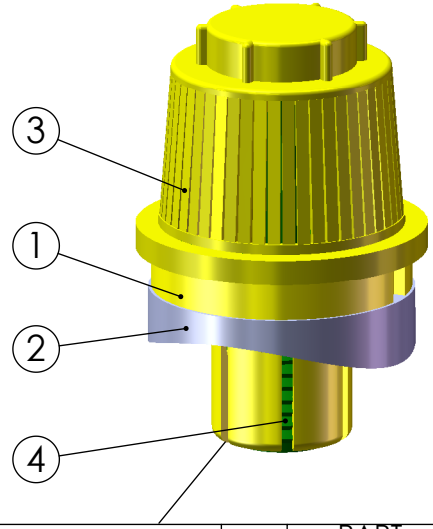


ASSEMBLY
FOR PIPE PP ∅110

2248 2110

ASSEMBLY
FOR PIPE PP ∅160

2248 2160



ITEM NO.	DESCRIPTION	QTY	PART NUMBER
1	EXPANSION BOLT TS4	1	5999 160151
2	ADAPTOR TM3-114 15/16W	1	5999 160149
3	MUSHROOM, AGF	1	2820 0030
4	MUSHROOM BASIS	1	2820 0031

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: ARKAL MEDIA FILTERS — PAGE___OF___

TITLE: ASSEMBLY MUSHROOM FOR PIPE P"P — CATALOGUE No:

SOLIDWORKS FILE CODE: MUSHROOM FOR MEDIA FILTER — FILE CODE: — MATERIAL:

	NAME	DATE
DRAWN	OLEG	12.03.09
CHECKED	OMRY	12.03.09
APPROVED	OMRY	12.03.09
B.O.M.	MARINA	12.03.09

FILE CODE DRAWINGS: PALLET-XXX (5200 XXXX) TRIWALL-XXX (5201 XXXX)

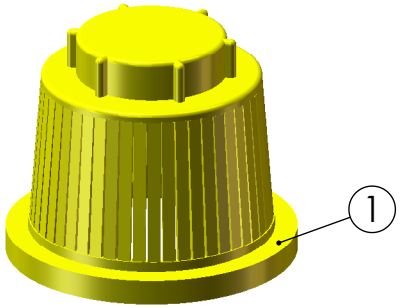
FILE CODE DRAWING OF MAN.

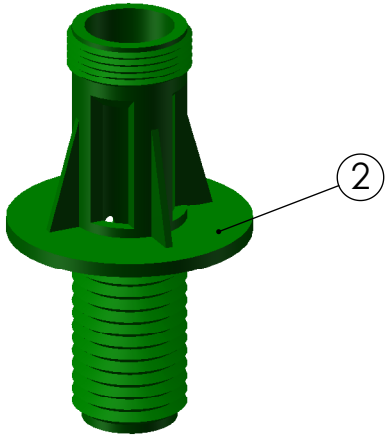
BACKUP: DISK-2S

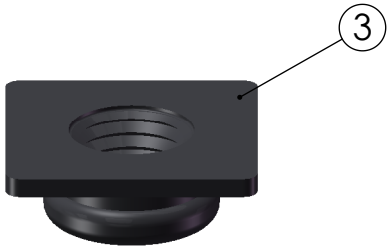
DRAWING:

SW-Print:25/04/2010

PATH- \\Arkal-fs\drawings\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\







ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2820 0030	MUSHROOM	1
2	2820 0031	BASE MUSHROOM	1
3	5006 0023	RUBBER SEAT	1

MODIFIC.	DATE	DESCRIPTION	SING

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PROJECT: ARKAL MEDIA FILTERS

PAGE___OF___

TITLE: ASSEMBLY MUSHROOM FOR PLATE 6mm

CATALOGUE No: 2248 2036

SOLIDWORKS FILE CODE: 2248 2036

FILE CODE: 2248 2036

MATERIAL:

	NAME	DATE
DRAWN	OLEG	13.05.09
CHECKED	OMRY	13.05.09
APPROVED	OMRY	13.05.09
B.O.M.	MARINA	13.05.09

FILE CODE DRAWINGS:
PALLET-XXX (5200 XXXX)
TRIWALL-XXX (5201 XXXX)
FILE CODE DRAWING OF MAN.

BACKUP: DISK-2S

DRAWING:

PATH- \\Arkal-fs\drawings\MASTERS – SOLID\PARTS FOR FILTERS\FILTER ELEMENTS\

SW-Print:22/04/2010

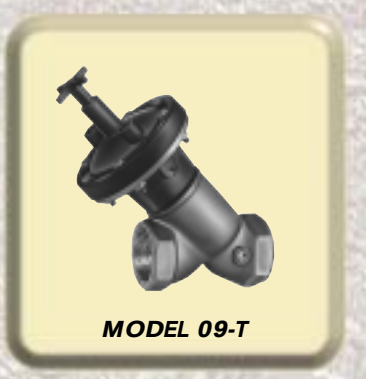
Accessories

Valves

Dorot Valves

"GALIL" RIGID-SEAL HYDRAULIC VALVES
MODELS 09, 09-AN, 09-T, 09-AN-T

MODEL 09



MODEL 09-T

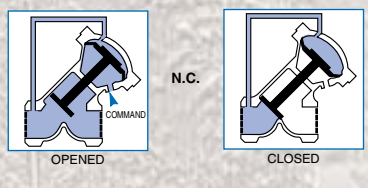
MODEL 09-AN

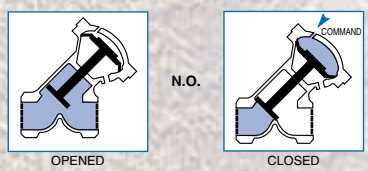
DESCRIPTION

The diaphragm actuated, rigid-seal, hydraulic valve is produced in two patterns:
1. Oblique Pattern (standard)
2. Angle Pattern (marked "AN").
The same actuator is used for both patterns.
"Normally open", "Normally closed", "Fail-safe" and "Throttling" versions are available.

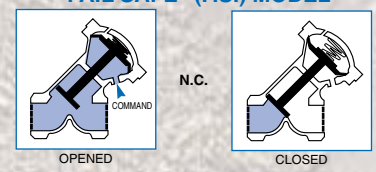
- *An external pipe connection converts the basic valve to the N.C. version.*
- *A spring, installed inside the actuator, creates a "fail-safe", version N.O. or N.C.*
- *A throttling device, limiting valve opening, is optional for all versions.*

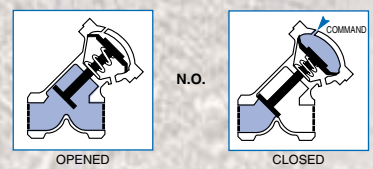
STANDARD MODEL



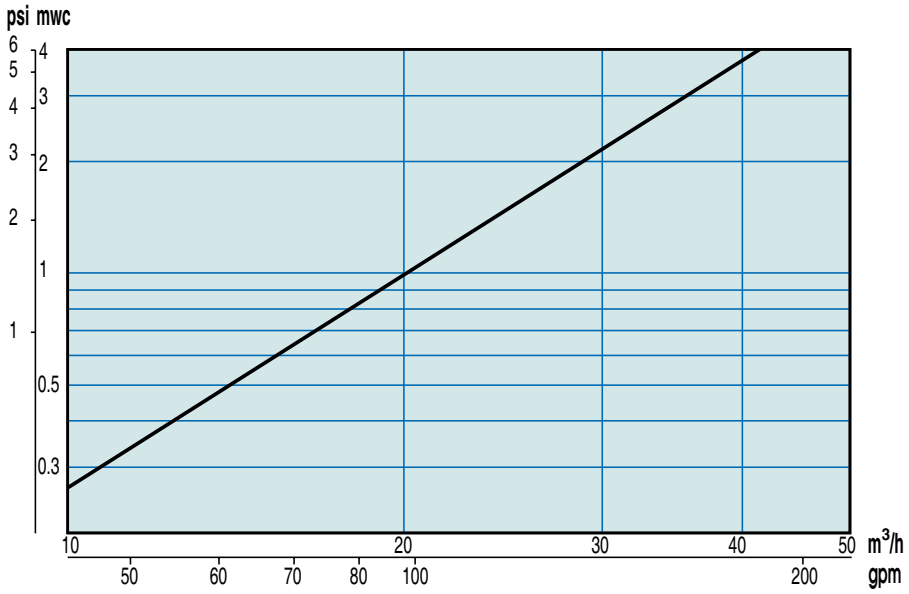


"FAIL SAFE" (F.S.) MODEL





HEADLOSS CHART



SPECIFICATIONS

MATERIALS

BODY ---------- BRASS
ACTUATOR HOUSING ---- CAST BRONZE
BONNET ---------- GLASS REINFORCED POLYAMIDE
DISCS ---------- BRASS
STEM ---------- SST
O-RINGS ---------- NBR RUBBER
SEAL ---------- NR RUBBER
DIAPHRAGM ---------- NR RUBBER
SPRING ---------- SST

FLOW FACTOR

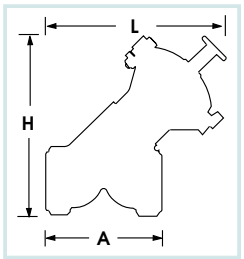
MODEL	Kv	Cv
09, 09-AN, 09-T, 09-AN-T	63	73

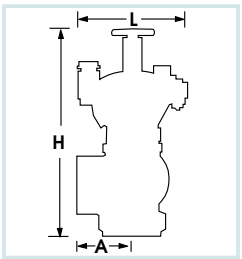
CONNECTIONS

THREADS ---------- FEMALE 50 mm ISO (BSP)
2 " ANSI (NPT)
BODY CONTROL BORE ---------- ¼ " NPT

DIMENSIONS

MODEL	A		L		H	
	mm	Inch	mm	Inch	mm	Inch
09	125	5	193	7 5/8	196	7 3/4
09-AN	66	2 5/8	130	5 1/8	192	7 5/8
09-T	132	5 1/4	219	8 5/8	235	9 1/4
09-AN-T	67	2 5/8	131	5 1/8	260	10 1/4



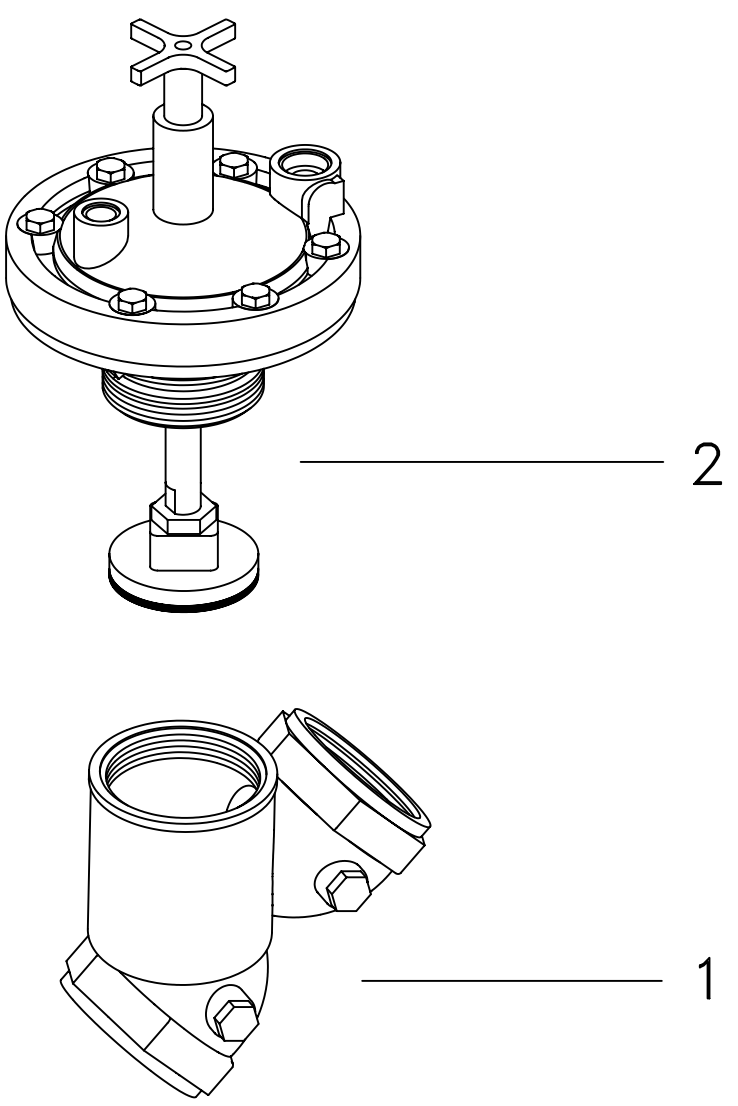


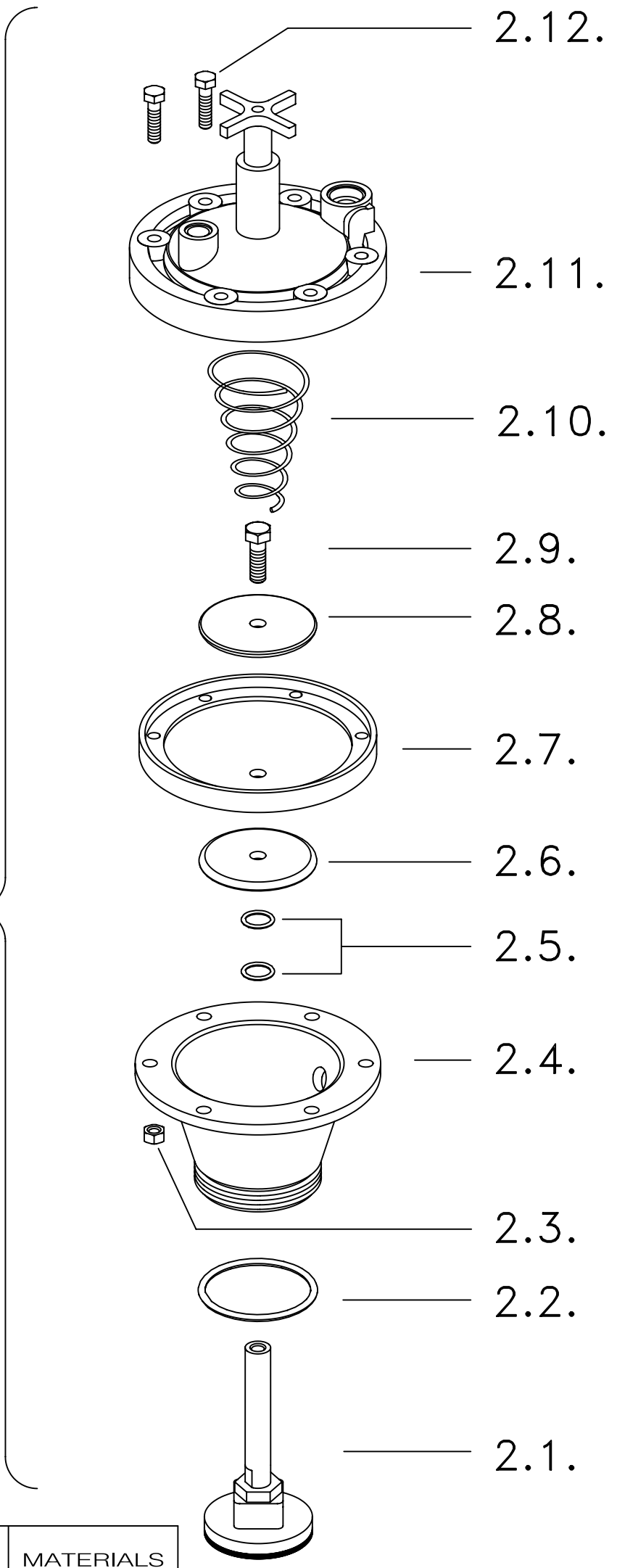
THE FACTORY RESERVES THE RIGHT TO MODIFY SPECIFICATIONS WITHOUT PRIOR NOTICE.

"DOROT" BACKWASH CONTROL VALVE

MODEL 09T-NC; Size 2" "GALIL" N.C.

ARKAL Cat. no.: 5060 0122





PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS
1.	5060 0122 01	VALVE BODY	BRASS
2.	5060 0012	ACTUATOR WITH COBER ASSEMBLY	
2.1.	5060 0122 201	SHAFT ASSEMBLY	
2.2.	5060 1211 406	ACTUATOR BODY "O" RING	N.R.
2.3.	5060 0122 203	NUT	S.S.
2.4	5060 0122 204	ACTUATOR BODY	BRASS
2.5.	5060 0122 205	"O-RING"	N.R.
2.6	5060 1211 409	LAWER DISC	BRASS
2.7.	5060 1211 410	DIAPHRAGM	N.R.
2.8.	5060 1211 411	UPPER DISC	BRASS
2.9.	5060 1211 412	BOLT	S.S.
2.10	5060 1211 413	SPRING	S.S.
2.11.	5060 0122 211	COVER	R.P.A.
2.12.	5060 0122 212	BOLTS	S.S.

MATERIALS:

R.P.A.-REINFORCED POLYAMIDE

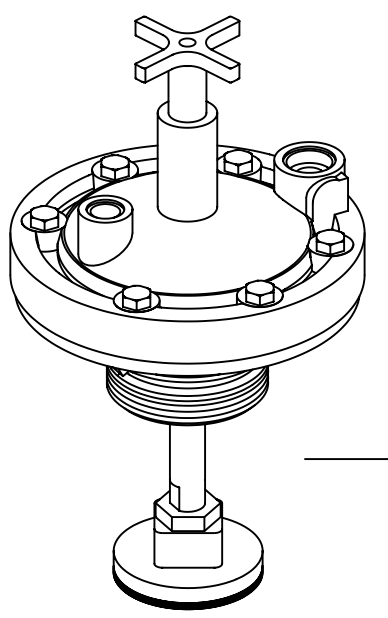
N.R. -NITRILE RUBBER

S.S. -STAINLESS STEEL

"DOROT" BACKWASH CONTROL VALVE

MODEL 09T-NO; Size 2" "GALIL" N.O.

ARKAL Cat. no.: 5060 0113



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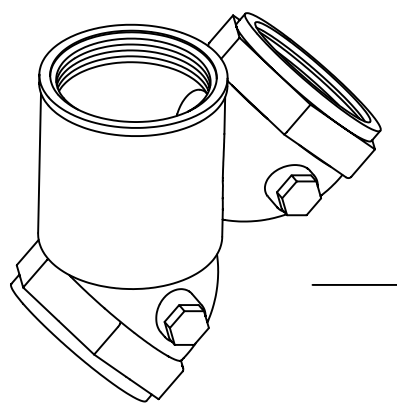

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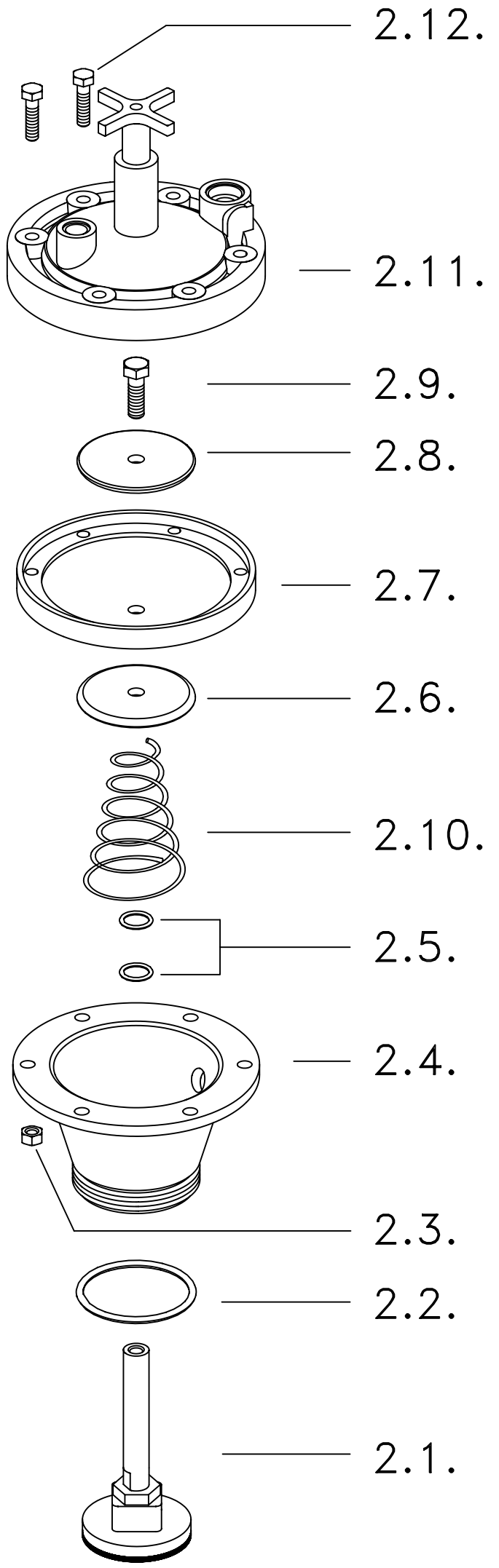

PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS	PRICE	DOROT Cat. No.
1.	5060 0122 01	VALVE BODY	BRASS		
2.	5060 0013	ACTUATOR WITH COBER ASSEMBLY			
2.1.	5060 0122 201	SHAFT ASSEMBLY			
2.2.	5060 1211 406	ACTUATOR BODY "O" RING	N.R.		
2.3.	5060 0122 203	NUT	S.S.		
2.4	5060 0122 204	ACTUATOR BODY	BRASS		
2.5.	5060 0122 205	"O-RING"	N.R.		
2.6	5060 1211 409	LAWER DISC	BRASS		
2.7.	5060 1211 410	DIAPHRAGM	N.R.		
2.8.	5060 1211 411	UPPER DISC	BRASS		
2.9.	5060 1211 412	BOLT	S.S.		
2.10	5060 1211 413	SPRING	S.S.		
2.11.	5060 0122 211	COVER	R.P.A.		
2.12.	5060 0122 212	BOLTS	S.S.		

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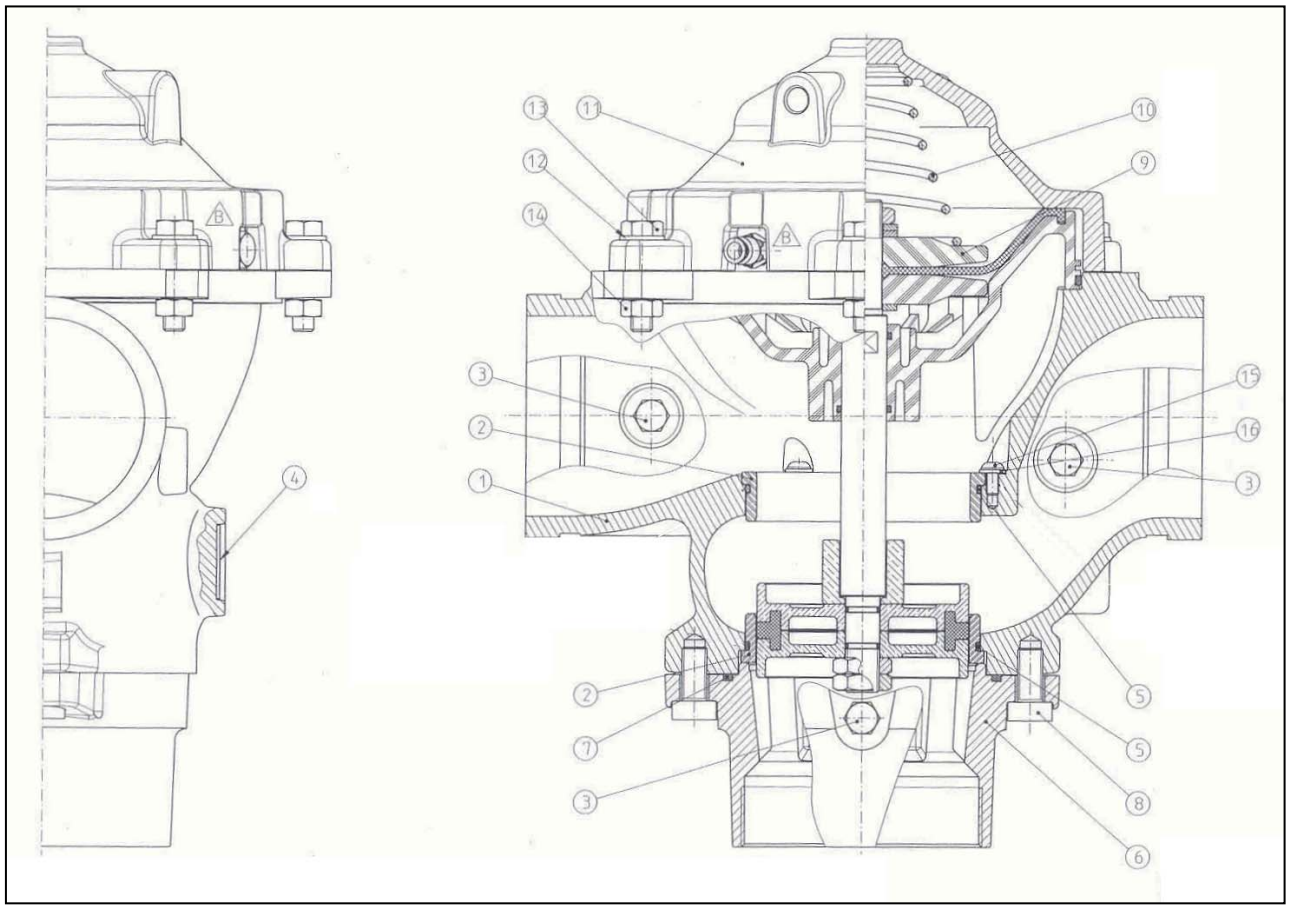
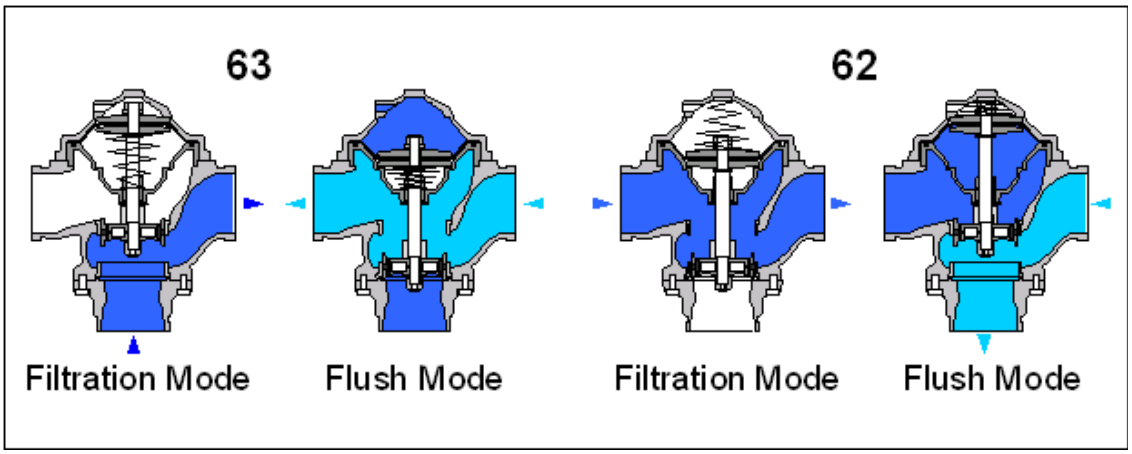
62,63 4" Back-flush Control Valves

Parts List



No.	Parts description	Materials (Option)	No.	Parts description	Materials (Option)
1	Coated body	Cast Iron	**9**	Valve SubAssy. (Cat. 632040620)	
2	Seat	SST	**10**	Spring #62	SST
3	Plug	PA	**11**	Coated Bonnet	Cast Iron
4	I.D. plate	Aluminum	**12**	Washer	SST
5	O-ring 9-587	NBR	**13**	Hex. Head Bolt	SST
6	Adapter	Cast Iron	**14**	Hexagon Nut	SST
7	O-ring 2-248	NBR	**15**	BTNHD Screw	SST
8	Hex.Soc.Head Bolt	SST	**16**	O-ring 2-262	NBR

Operation principle



Technical Data

Valve Installation

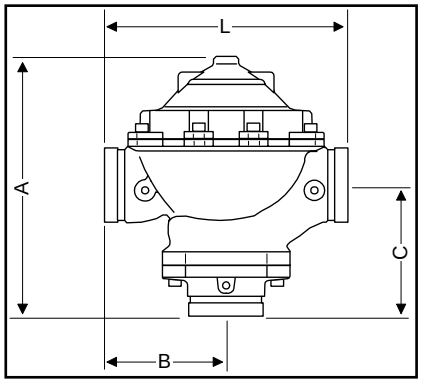
1. The valve is available in normal angle flow and strait flow models (63 and 62). Please refer to the arrow on the valve, to ensure proper inlet/outlet orientation.
2. Select one of the command ports in the bonnet (three ports are available) as a control port. The one that is located at the highest position on the valve is preferable (to avoid air pocket).
3. When using water as a command media, it is highly recommended that the diameter of the command tube should be a minimum of 8mm.

Specifications

Available valve sizes	4"X3", 4"X4"
Max. operating pressure	10 bar \ 145 psi Optional 12 bar \ 175 psi Optional model (62H / 63H) – 16 bar \ 230 psi
Minimum pressure for drip- tight sealing	0.4 bar.
Temperature range	0 - 60^0 C \ 0 - 140^0 F
End connections	Standard – grooved Optional for the 3" bottom port – threaded
Coating	Electro-statically applied, oven baked Polyester

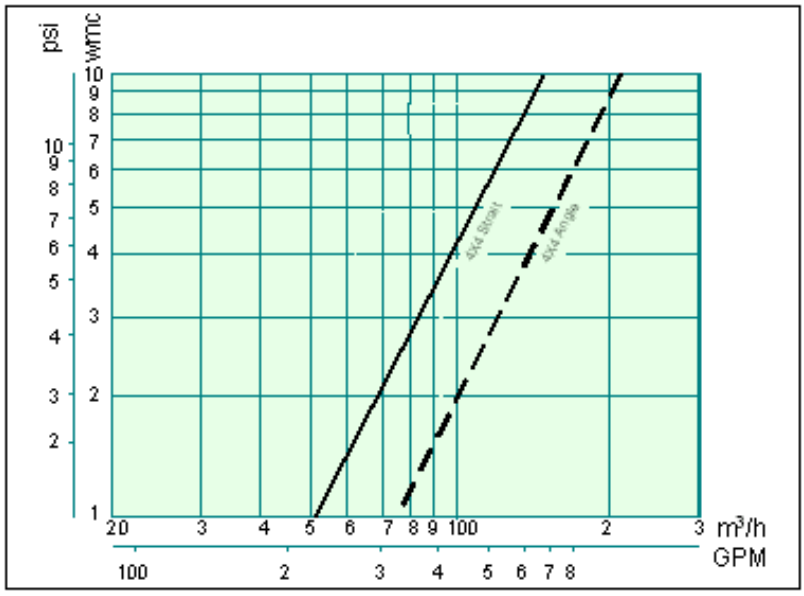
Dimensions and Weights

Diameter		4"X3"	4"X4"
L	[mm\Inch]	317 \ 12.5	317 \ 12.5
A		376 \ 14.8	376 \ 14.8
B		158 \ 6.2	158 \ 6.2
C		150 \ 5.9	150 \ 5.9
***Weight** [Kg/lb.]		21 \ 46.3	21 \ 46.3



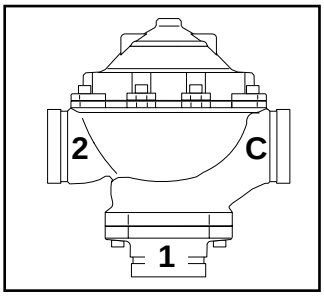
NOTE: Dimension 'C' is the same for grooved and threaded connection

Head Loss Chart



How To Order

Model	Ports 'C', '2' - diameter		Port '1' - diameter	Port '1' - connection type
62, 63 62H, 63H	4"(100 mm)		4"(100 mm), 3"(80mm)	V(grooved), T(threaded)
62	4	X	3	T



"DOROT"- FLUSHGAL BACKWASH CONTROL VALVE

63-MODEL Size 4"*4" ANGLE

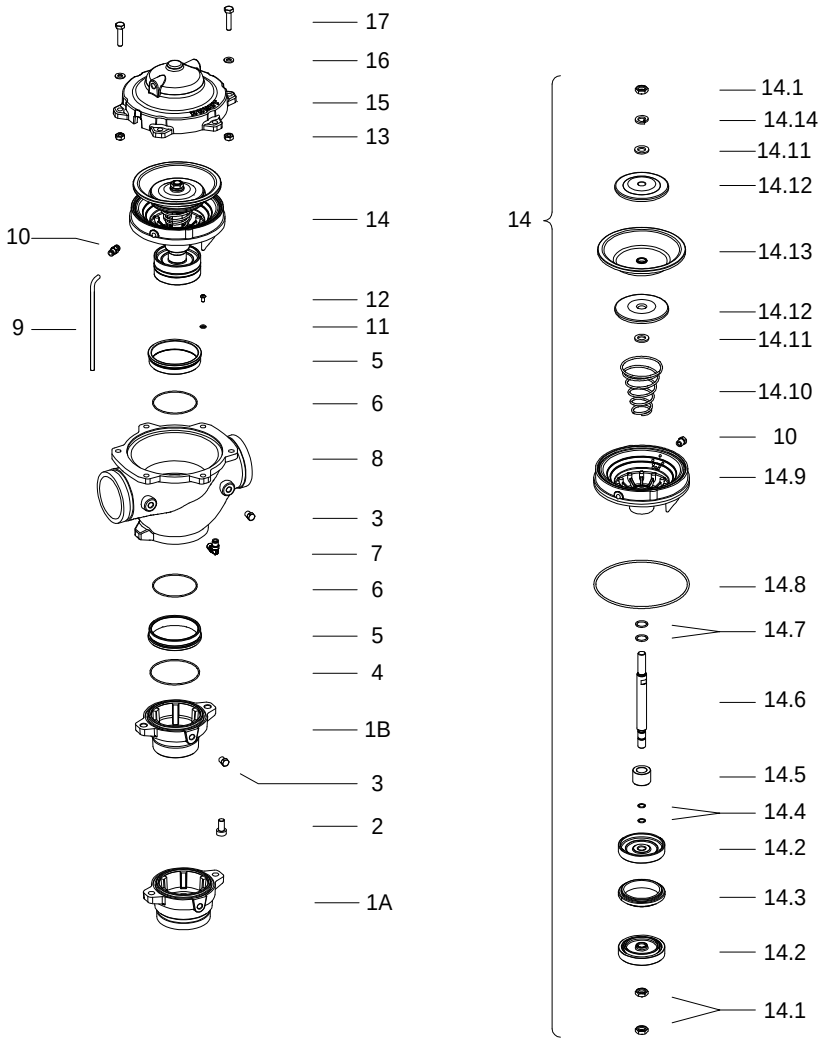
ARKAL Cat. no.: 5060 3414 (BLUE COLOR)

ARKAL Cat. no.: 5060 3414R (RED COLOR)

63-MODEL Size 4"*3" ANGLE

ARKAL Cat. no.: 5060 3413 (BLUE COLOR)

ARKAL Cat. no.: 5060 3413R (RED COLOR)



PARTS LIST

No:	ARKAL Cat. No:	PARTS DESCRIPTION	MATERIALS
1A	5060 3414 01A	4" ADAPTOR (BLUE COLOR)	C.I
1A	5060 3414R 01A	4" ADAPTOR (RED COLOR)	C.I
1B	5060 3413 01B	3" ADAPTOR (BLUE COLOR)	C.I
1B	5060 3413R 01B	3" ADAPTOR (RED COLOR)	C.I
2	5060 3414 02	BOLT	SS
3	5060 0005	PLUG	P.A.
4	5060 3414 04	"O"-RING 2-248	NBR
5	5060 3414 05	SEAT	S.S.
6	5060 3414 06	"O"-RING 9-587	NBR
7	5067 0084	ANGLE 8mm*1/4"	
8	5060 3414 10	BODY (BLUE COLOR)	C.I
8	5060 3414R 10	BODY (RED COLOR)	C.I
9	5050 0181	CONTROL PIPE	
10	5067 0165	CONNECTOR 8mm*1/4"	
11	5060 3414 11	WASHER	S.S.
12	5060 3414 12	BTNHD SCREW	S.S
13	5060 3414 13	NUT	S.S
14	5060 3414 14	ASSEMBLY	
14.1	5060 3414 141	NUT	S.S
14.2	5060 3414 142	SEAL DISK	BRASS
14.3	5060 3414 143	SEAL	N.R
14.4	5060 3414 144	"O"-RING 2-014	NBR
14.5	5060 3414 145	STOPPER	BRASS
14.6	5060 3414 146	SHAFT	S.S
14.7	5060 3414 147	"O"-RING 2-117	NBR
14.8	5060 3414 148	"O"-RING 2-264	NBR
14.9	5060 3414 149	BOTTON CHAMBER	R.P.A.*
14.10	5060 3414 1410	SPRING	S.S
14.11	5060 3414 1411	WASHER	S.S
14.12	5060 3414 1412	DISC	PDM
14.13	5060 3414 1413	DIAPHRAGM	N.R
14.14	5060 3414 1414	SPRING WASHER	S.S
15	5060 3414 15	BONNET (BLUE COLOR)	C.I.
15	5060 3414R 15	BONNET (RED COLOR)	C.I.
16	5060 3414 16	WASHER	S.S
17	5060 3414 17	BOLT	S.S

*- OPTIONAL (WITH PRESSURE UPPER 10bar)

MATERIALS:

C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL
P.A. -POLYAMIDE
NBR-NITRILE RUBBER
R.P.A. -REINFORCED POLYAMIDE

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NEW

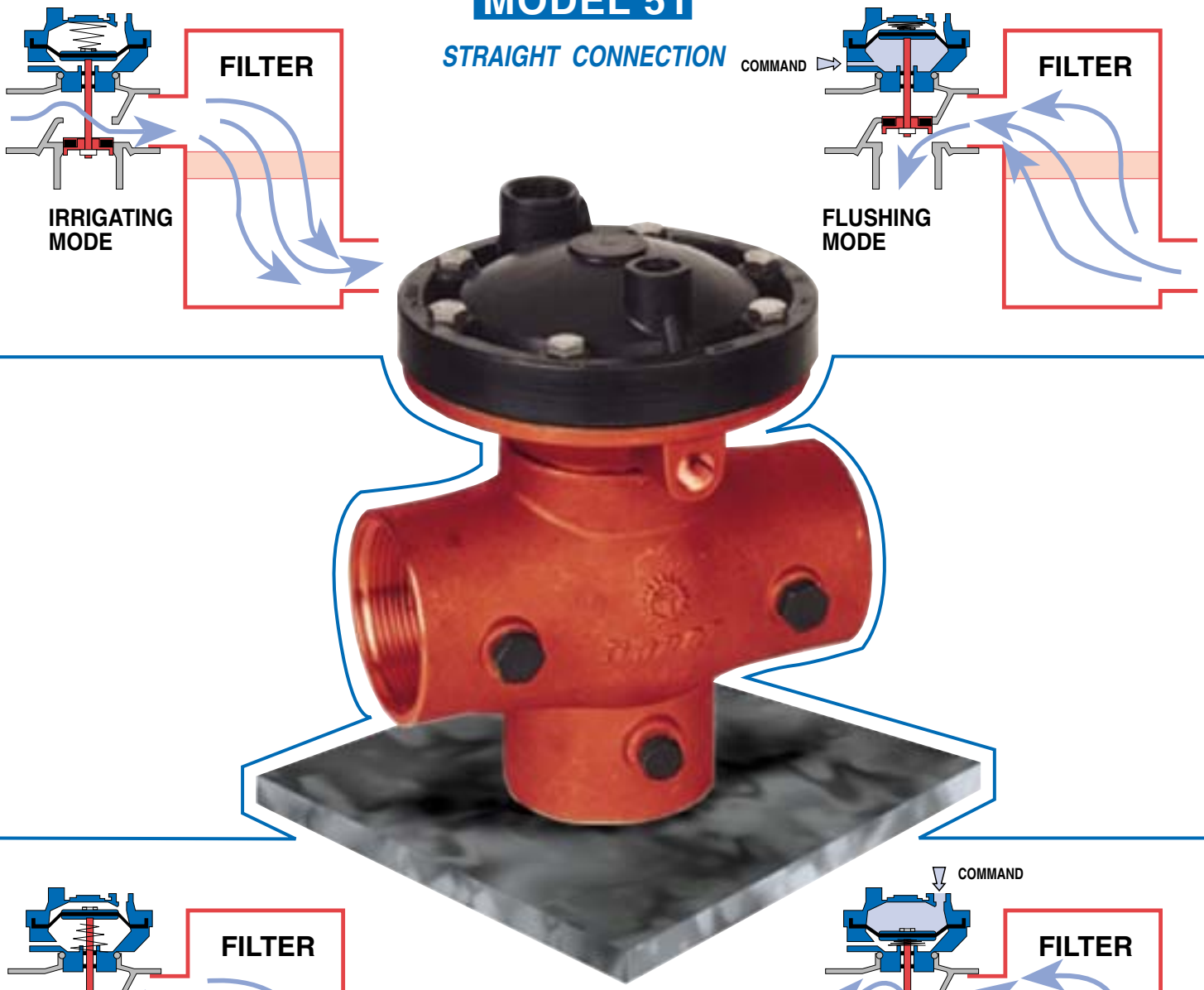
DOROT
CONTROL VALVES

FILTERS BACK-FLUSHING CONTROL VALVE

MODELS 51-2x2 (STRAIGHT), 52-2x2 (ANGLE CONNECTION)

MODEL 51

STRAIGHT CONNECTION



ANGLE CONNECTION

MODEL 52

FILTERS BACK-FLUSHING CONTROL VALVE

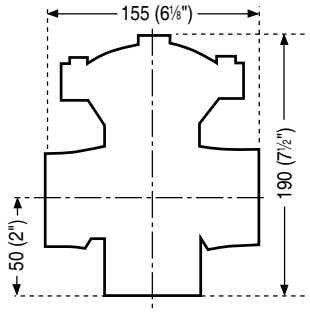
MODELS 51-2x2 (STRAIGHT), 52-2x2 (ANGLE CONNECTION)

Models 51 and 52 represent a new approach to automatic control of the back-flushing procedure in filters battery. The new valve is a result of long-time expertise in hydraulic valve design, vast field experience and high quality production.

MAIN FEATURES

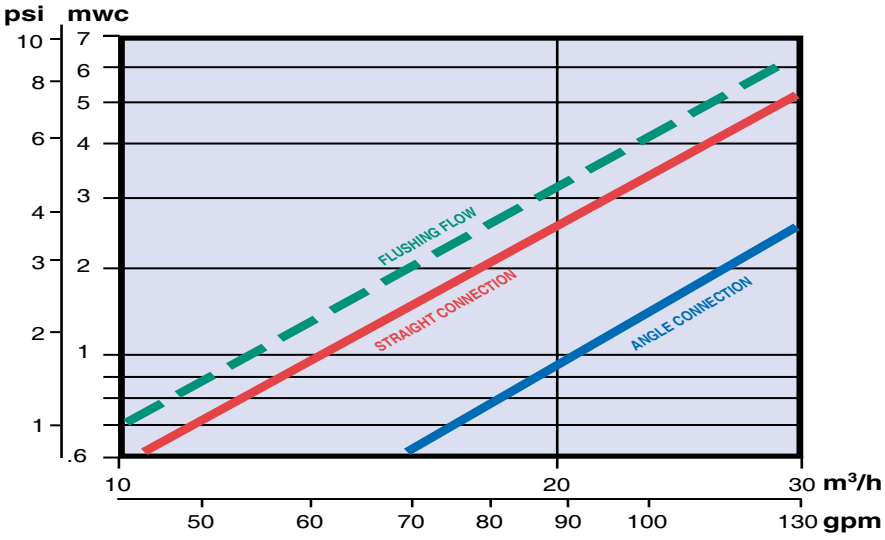
- Low head loss
- Extreme simplicity
- Fast alternation of flow directions
- Easy conversion (either way) of one model to the other, by the user.
- In-line maintenance, no more manifold dismantling
- Compact, economical structure
- High corrosion resistance by non-ferrous and SST components

DIMENSIONS:



HYDRAULIC PERFORMANCE

(Angle type/straight type Head loss, flushing flow as dictated by system pressure)



FLOW FACTORS:

MODEL	Kv	Cv
51	40	46
52	60	70
FLUSHING	35	40

The new models are made to control 15-25 m^3/h (65-110 gpm) filteration units

- Minimal operation pressure 15m (22 psi)
- Maximal operation pressure 100m (150 psi)

CONNECTIONS:

Threads, BSP or NPT standard. Victaulic adaptors 2" th -2" vic. are supplied on request.

CONTROL BORES: ¼" BSP

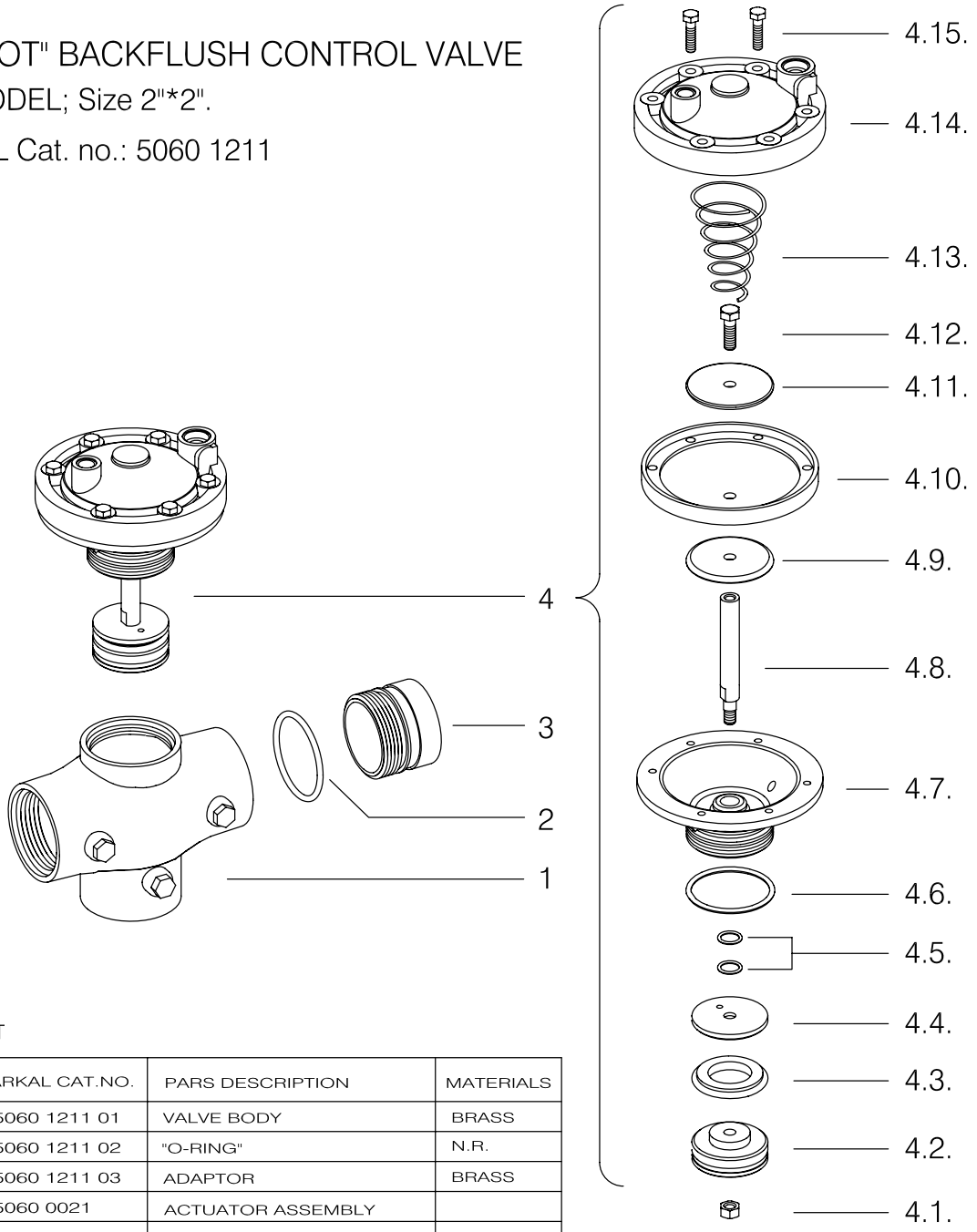
DOROT VALVE MANUFACTURERS

KIBBUTZ DOROT MOBILE POST HOF ASHKELON 79175 ISRAEL TEL. 972-7-6808900 FAX: 972-7-6808751

"DOROT" BACKFLUSH CONTROL VALVE

51-MODEL; Size 2"*2".

ARKAL Cat. no.: 5060 1211



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5060 1211 01	VALVE BODY	BRASS
2.	5060 1211 02	"O-RING"	N.R.
3.	5060 1211 03	ADAPTOR	BRASS
4.	5060 0021	ACTUATOR ASSEMBLY	
4.1.	5060 1211 401	NUT	S.S.
4.2.	5060 1211 402	SEAL BOWL	BRASS
4.3.	5060 1211 403	SEAL	N.R.
4.4.	5060 1211 404	SEAL DISC	BRASS
4.5.	5060 1211 405	"O-RING"	N.R.
4.6.	5060 1211 406	ACTUATOR BODY "O" RING	N.R.
4.7.	5060 1211 407	ACTUATOR BODY	BRASS
4.8	5060 1211 408	SHAFT	S.S.
4.9	5060 1211 409	LOWER DISC	BRASS
4.10	5060 1211 410	DIAPHRAGM 06	N.R.
4.11.	5060 1211 411	UPPER DISC	BRASS
4.12	5060 1211 412	BOLT	S.S.
4.13.	5060 1211 413	SPRING 52 FOR 2*2 BFV	S.S.
4.14.	5060 1211 414	COVER	R.P.A.
4.15.	5060 1211 415	BOLTS	S.S.

MATERIALS:

R.P.A.-REINFORCED POLYAMIDE

N.R. -NITRILE RUBBER

S.S. -STAINLESS STEEL

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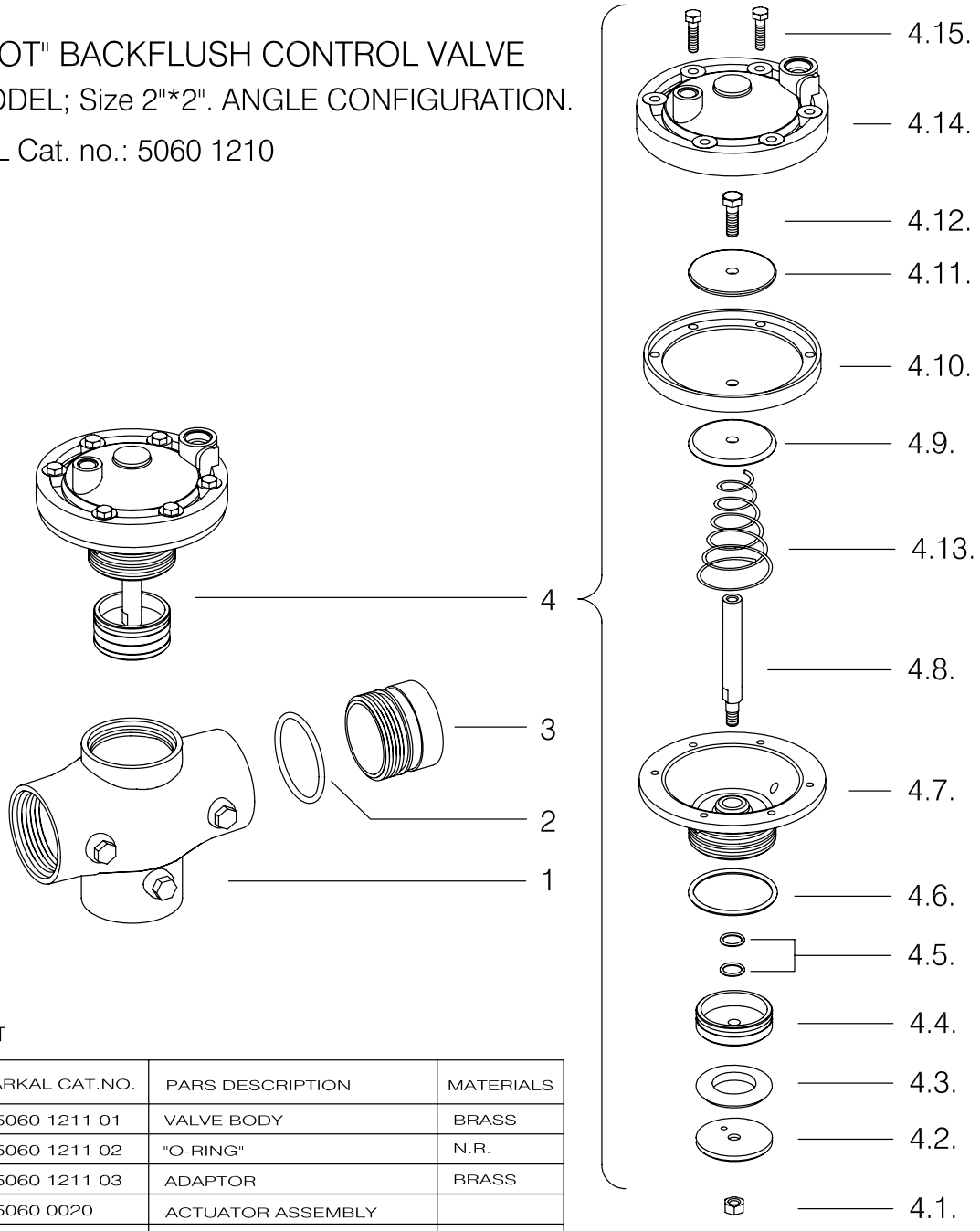
"DOROT" BACKFLUSH CONTROL VALVE

52-MODEL; Size 2"*2". ANGLE CONFIGURATION.

ARKAL Cat. no.: 5060 1210



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5060 1211 01	VALVE BODY	BRASS
2.	5060 1211 02	"O-RING"	N.R.
3.	5060 1211 03	ADAPTOR	BRASS
4.	5060 0020	ACTUATOR ASSEMBLY	
4.1.	5060 1211 401	NUT	S.S.
4.2.	5060 1211 404	SEAL DISC	BRASS
4.3.	5060 1211 403	SEAL	N.R.
4.4.	5060 1211 402	SEAL BOWL	BRASS
4.5.	5060 1211 405	"O-RING"	N.R.
4.6.	5060 1211 406	ACTUATOR BODY "O" RING	N.R.
4.7.	5060 1211 407	ACTUATOR BODY	BRASS
4.8	5060 1211 408	SHAFT	S.S.
4.9	5060 1211 409	LOWER DISC	BRASS
4.10	5060 1211 410	DIAPHRAGM 06	N.R.
4.11.	5060 1211 411	UPPER DISC	BRASS
4.12	5060 1211 412	BOLT	S.S.
4.13.	5060 1211 413	SPRING 52 FOR 2*2 BFV	S.S.
4.14.	5060 1211 414	COVER	R.P.A.
4.15.	5060 1211 415	BOLTS	S.S.

MATERIALS:

R.P.A.-REINFORCED POLYAMIDE

N.R. -NITRILE RUBBER

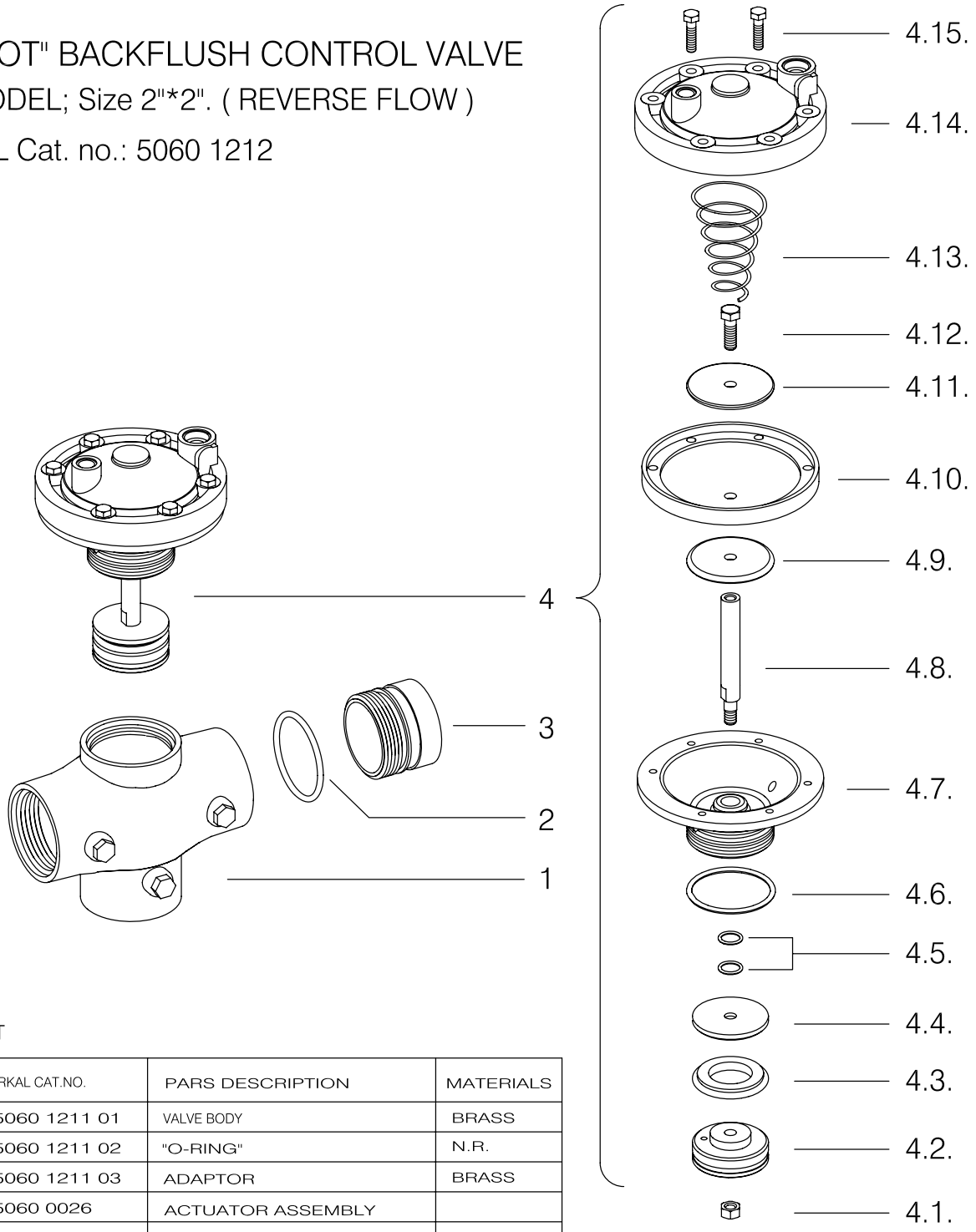
S.S. -STAINLESS STEEL

P:\PERSOMET\VALVES\DOROT\DOR2-52.DWG

"DOROT" BACKFLUSH CONTROL VALVE

51-MODEL; Size 2"*2". (REVERSE FLOW)

ARKAL Cat. no.: 5060 1212



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5060 1211 01	VALVE BODY	BRASS
2.	5060 1211 02	"O-RING"	N.R.
3.	5060 1211 03	ADAPTOR	BRASS
4.	5060 0026	ACTUATOR ASSEMBLY	
4.1.	5060 1211 401	NUT	S.S.
4.2.	5060 1212 402	SEAL BOWL	BRASS
4.3.	5060 1211 403	SEAL	N.R.
4.4.	5060 1212 404	SEAL DISC	BRASS
4.5.	5060 1211 405	"O-RING"	N.R.
4.6.	5060 1211 406	ACTUATOR BODY "O" RING	N.R.
4.7.	5060 1211 407	ACTUATOR BODY	BRASS
4.8	5060 1211 408	SHAFT	S.S.
4.9	5060 1211 409	LOWER DISC	BRASS
4.10	5060 1211 410	DIAPHRAGM 06	N.R.
4.11.	5060 1211 411	UPPER DISC	BRASS
4.12	5060 1211 412	BOLT	S.S.
4.13.	5060 1211 413	SPRING 52 FOR 2*2 BFV	S.S.
4.14.	5060 1211 414	COVER	R.P.A.
4.15.	5060 1211 415	BOLTS	S.S.

MATERIALS:

R.P.A.-REINFORCED POLYAMIDE

N.R. -NITRILE RUBBER

S.S. -STAINLESS STEEL

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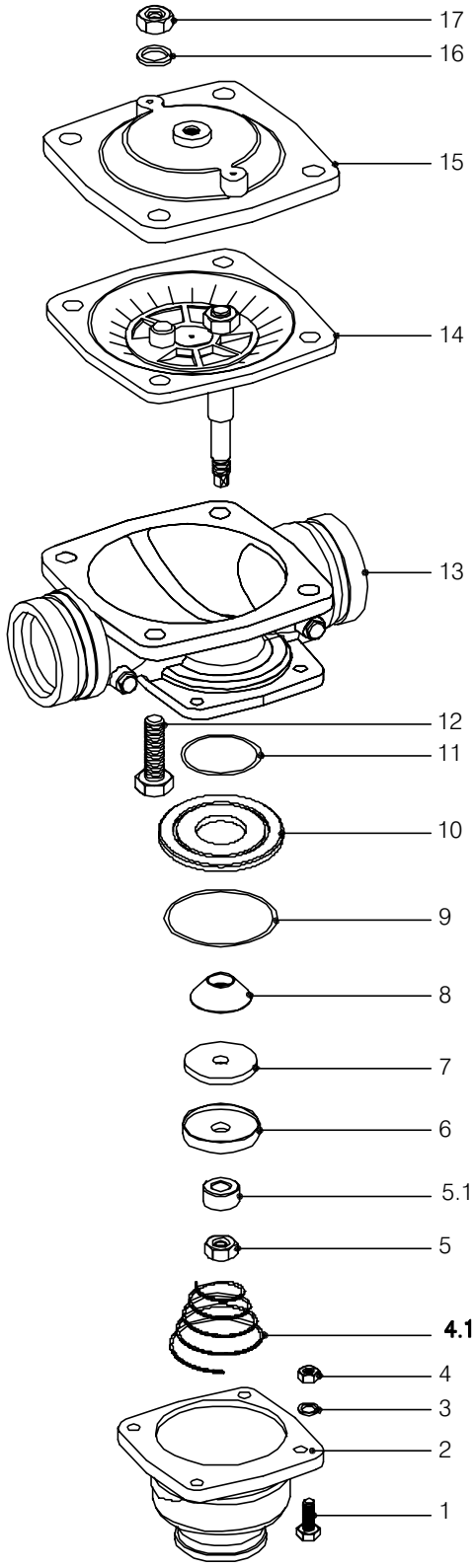
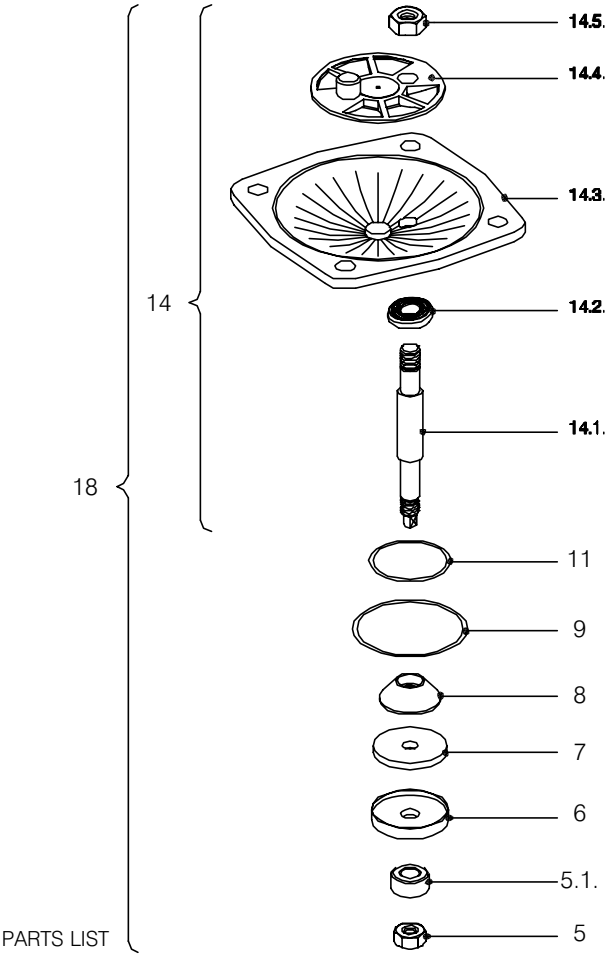
"DOROT"- FLUSHGAL BACKFLUSH CONTROL VALVE

58-MODEL Size 3"*2" A.K.

ARKAL Cat. no.: 5060 3211





PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS
1.	5060 3211 01	BOLT	G.S.
2.	5060 3211 02	THREADED ADAPTER	C.I.
3.	5060 3211 03	WASHER	G.S.
4.	5060 3211 04	NUT	G.S.
4.1.	5060 3214 02	SPRING	S.S.
5.	5060 3211 05	NUT	BRASS
5.1.	5060 3211 051	FIXING INSERT	BRASS
6.	5060 3211 06	SEAL BOWL	BRASS
7.	5060 3211 07	SEAL	BRASS
8.	5060 3211 08	GUIDE CONE	BRASS
9.	5060 3211 09	"O-RING"	N.R.
10.	5060 3211 10	SEAT	S.S.
11.	5060 3211 11	"O-RING"	N.R.
12.	5060 3211 12	BOLT	G.S.
13.	5060 3211 13	VICTAULIC BODY	C.I.
14.	5060 3211 14	DIAPHRAGM ASSEMBLY	
14.1.	5060 3211 141	STEM	S.S.
14.2.	5060 3211 142	SMALL DISK	BRASS
14.3.	5060 3211 143	DIAPHRAGM 6mm	N.R.
14.4.	5060 3211 144	LARGE DISK	BRASS
14.5.	5060 3211 145	NUT	S.S.
15.	5060 3211 15	BONNET	C.I.
16.	5060 3211 16	WASHER	G.S.
17.	5060 3211 17	NUT	G.S.
18.	5060 0032	VALVE KIT	

* - OPTIONAL

MATERIALS:

C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL
G.S. -GALVANIZE STEEL

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FEATURES

- Rust-proof and corrosion resistant to most commonly used chemicals.
- A sturdy body made of Reinforced Polyamide.
- Light-weight.
- Frictionless Position Exchange.
- Highly durable, and virtually maintenance free.
- Easy installation, requiring no expertise or special tools.

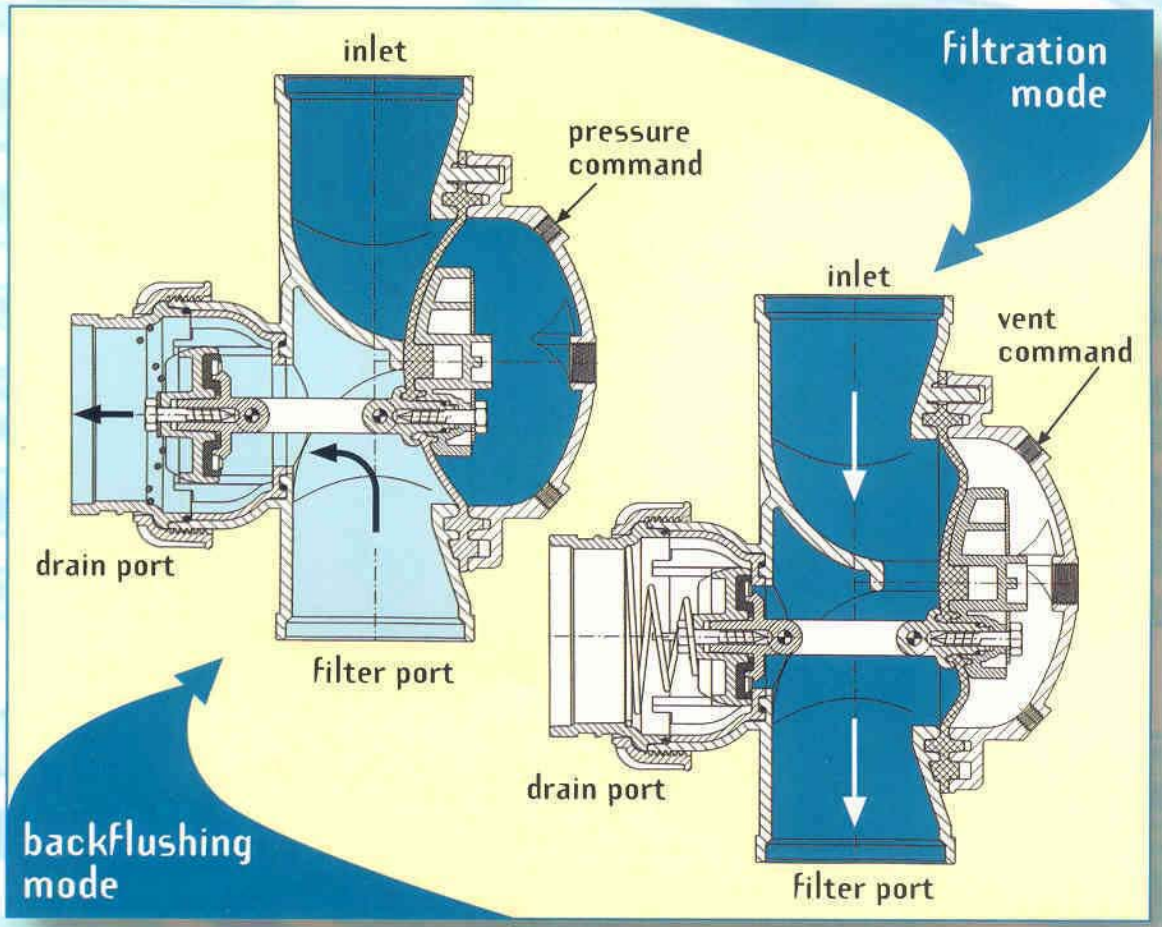
MODE OF OPERATION

- The PLASLITE® Backflushing Valve consists of two built-in units, the N.O. filter port and the N.C. drain port.
- Each port has its own valve seat, but they share a common stem and diaphragm.
- The valve operates as a mutually integrated unit. When one port is open, the other is closed, permitting the PLASLITE® Backflushing Valve to perform two modes of operation:

FILTRATION MODE: PLASLITE® permits flow from the inlet manifold through the filter, into the pipeline.

FLUSHING MODE: Closes the inlet manifold and opens the drain port, causing reverse flow through the filter, ejecting impurities via the drain port.

- Operation is initiated by an electric solenoid, hydraulic relay, or manually, by a 3-way selector.
- The backflushing valve is either controlled by water pressure or a pneumatic source.



TECHNICAL DATA

Valve Installation

1. Refer to the arrow on the valve, to ensure proper inlet/outlet orientation.
2. Select the command port (five ports are available) that is located at the higest position on the valve, to avoid air pockets.
3. When using water as a command source, it is highly recommended that the diameter of the command tube should be a minimum of 8 mm.

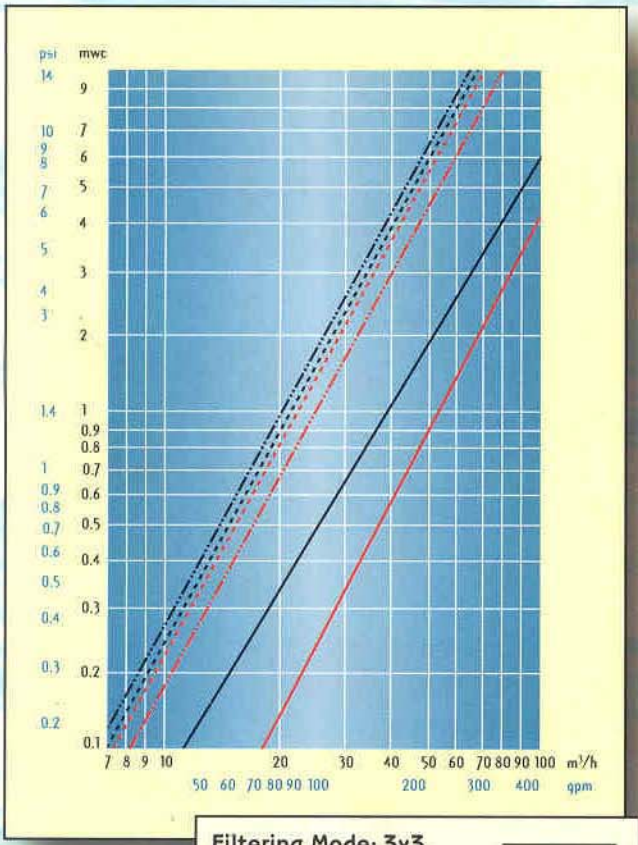
Specifications

Inlet/Outlet grooved (Victaulic) connection (sizes 3", 4")
Drain connection options grooved (Victaulic) (sizes 3", 4") and threaded (sizes 2", 3", B.S.P.T./ N.P.T.)
Max. operating temp. 160°F (70°C)
Model f1: operating pressure 1 - 6 bar 14-85 psi
Model f2: operating pressure 2 - 10 bar 28-140 psi
Model f3: for S.K.
Weight 9.2 lbs (4.200 kg)

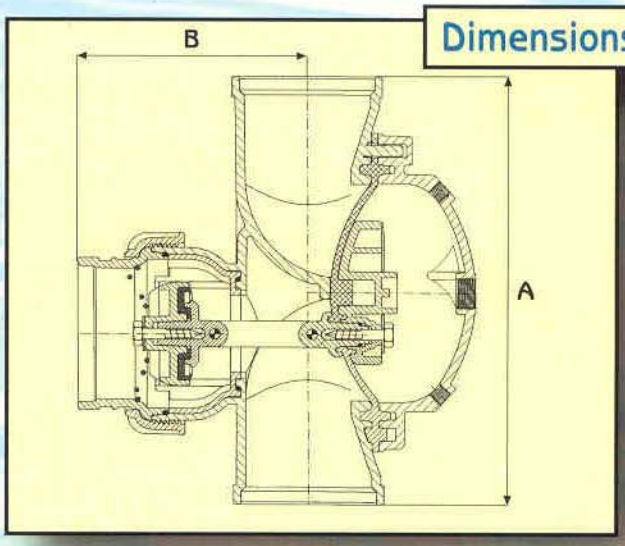
Materials:

Housing & cover	Reinforced polyamide
Lock, spring & screws	Stainless steel
Seals + diaphragms	E.P.D.M. - N.R.

Headloss chart



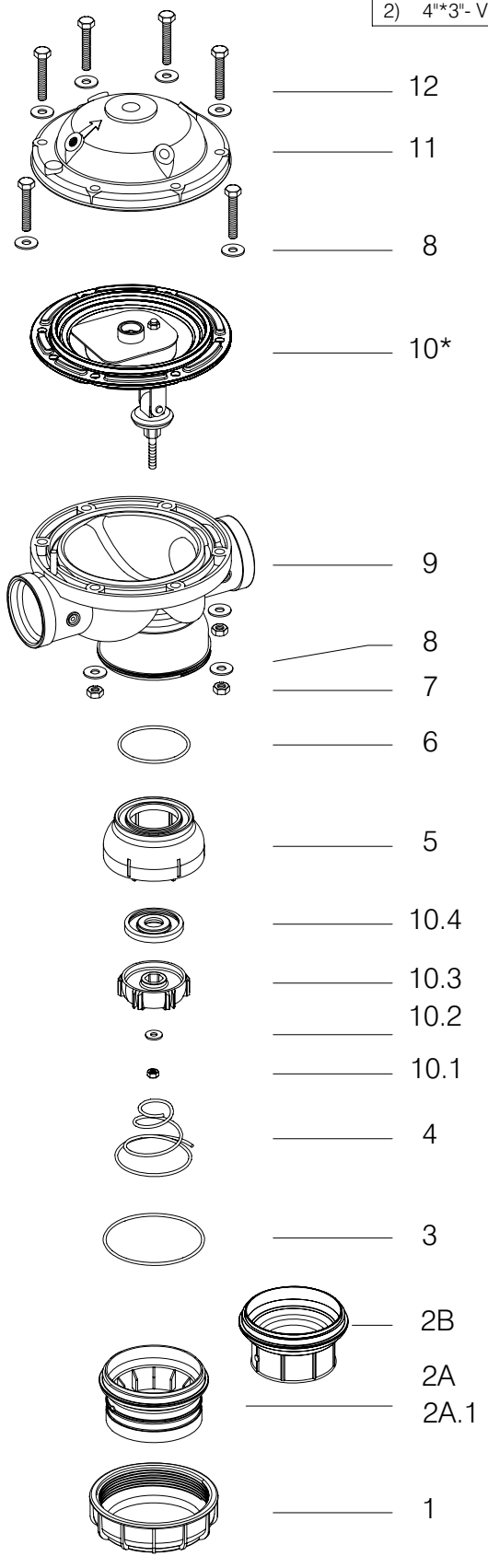
Dimensions

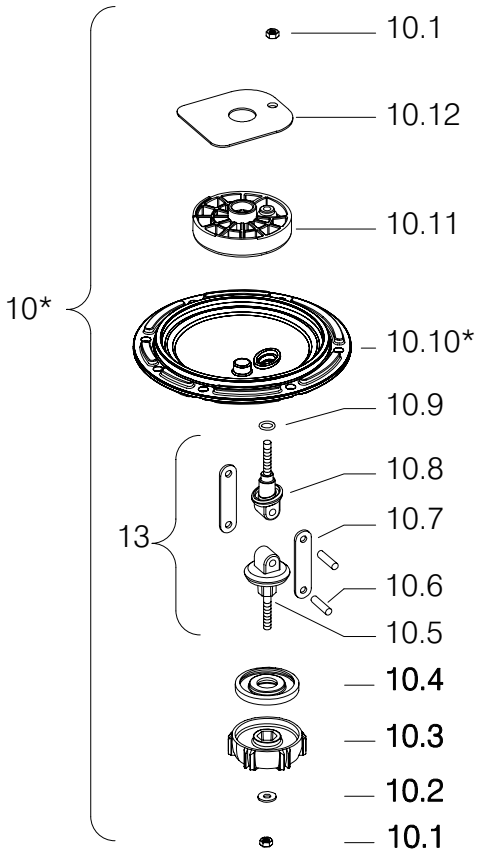


Inlet	Outlet	Drain	Measurments	
			A	B
4"	4"	4" VIC	317mm 12 1/2 "	175mm 6 7/8"
4"	4"	3" VIC	317mm 12 1/2 "	175mm 6 7/8"
4"	4"	3" TH	317mm 12 1/2 "	177mm 6 15/16 "
3"	3"	3" VIC	287mm 11 5/16"	163mm 6 7/16"
3"	3"	3" TH	287mm 11 5/16"	165mm 6 1/2 "
3"	3"	2" TH	287mm 11 5/16"	167mm 6 9/16"

"PLASLITE"-BACKFLUSH CONTROL VALVE

SIZE:	MODEL: F1 (LOW PRESURE)	MODEL: F2 (S.K.)
1) 4"*4"- VICTAULIC ENDS	ARKAL Cat. No.:5060 4424	ARKAL Cat. No.:5060 5424
2) 4"*3"- VIC.-THREAD. ENDS	ARKAL Cat. No.:5060 4403	ARKAL Cat. No.:5060 5403





MATERIALS:
S.S. - STAINLESS STEEL
R.P.A.- REINFORCED POLYAMID
N.R. - NITRILE RUBBER

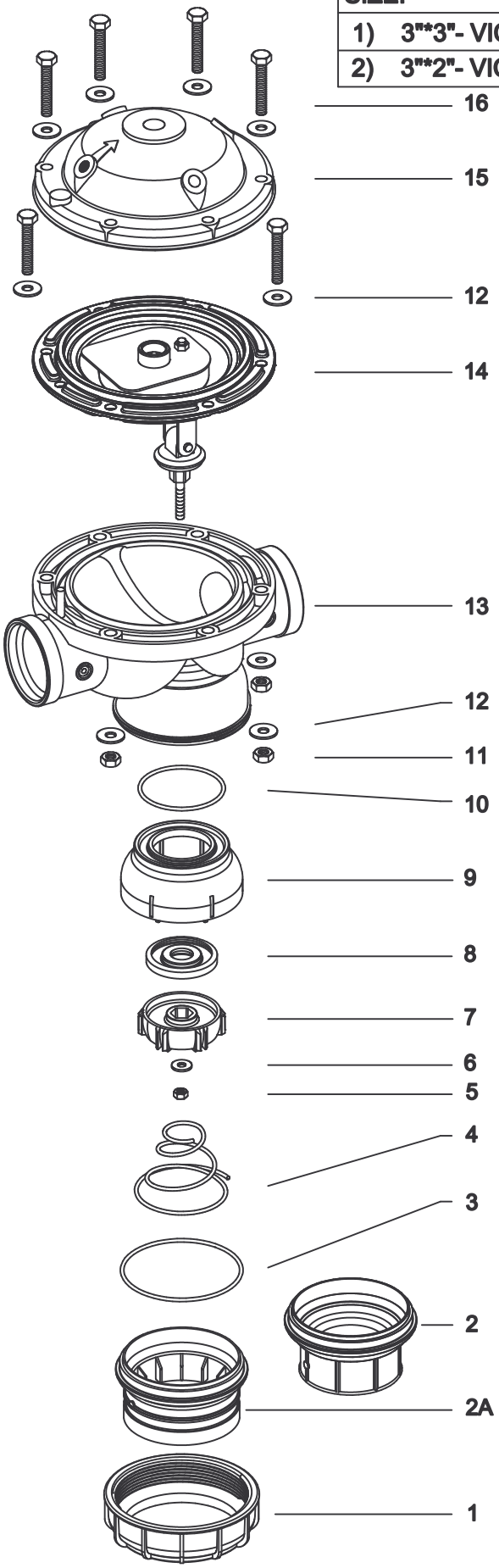
FUNDAMENTAL VERSION

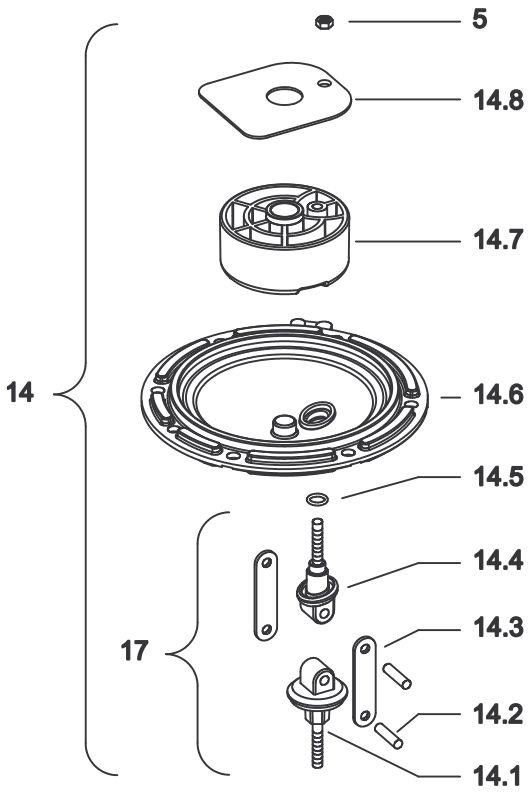
PARTS LIST

No:	ARKAL Cat. No.:	PARTS DESCRIPTION	MATERIALS
1	2506 0410	LOCKING NUT	R.P.A.
2A	5060 4424 02A	VICTAULIC ADAPTER 4"	R.P.A.
2A.1	5060 4424 02A1	VICTAULIC ADAPTER 3"	R.P.A.
2B	5060 4424 02B	TREADED ADAPTER 3"	R.P.A.
3	5003 2246	2-246 "O"-RING	E.P.D.M.
4	5060 4424 04	SPRING 11	S.S.
5	5060 4424 09	SEAT	R.P.A.
6	5003 2235	2-235 "O" RING	E.P.D.M.
7	5060 4424 11	M10 NUT	BRASS
8	5060 4424 12	M10*2 DISC	S.S.
9	5060 4424 13	VALVE BODY	R.P.A.
10*	5060 6424VK	VALVE KIT (LOW PRESSURE)	NATURAL
	5060 7424VK	VALVE KIT (S.K.)	NATURAL
10.1	5060 4424 05	M8 NUT	S.S.
10.2	5060 4424 06	DISC	S.S.
10.3	5060 4424 07	SEAL DISC	R.P.A.
10.4	5060 4424 08	SEAL	N.R.
10.5	5060 4424 141	LOWER CONNECTOR	R.P.A.
10.6	5060 4424 142	CONNECTOR PIN	S.S.
10.7	5060 4424 143	SHAFT	S.S.
10.8	5060 4424 144	UPPER CONNECTOR	R.P.A.
10.9	5060 4424 145	2-112 "O" RING	E.P.D.M.
10.10*	5060 4424 146	DIAFRAGM (LOW PRESSURE)	NATURAL
	5060 5424 146	DIAFRAGM (S.K.)	NATURAL
10.11	5060 4424 147	UPPER DISC	R.P.A.
10.12	5060 4424 148	STOPPER DISC	S.S.
11	5060 4424 15	BONNET	R.P.A.
12	5060 4424 16	M10*60 BOLT	S.S.
13	5060 4424 17	SHAFT COMPLETE	

"PLASLITE"-BACKFLUSH CONTROL VALVE FOR S.K. FILTER

SIZE:	MODEL: F2
1) 3"*3"- VICTAULIC ENDS	ARKAL Cat. No.:5060 5323
2) 3"*2"- VIC.-THREAD. ENDS	ARKAL Cat. No.:5060 5302





PARTS LIST

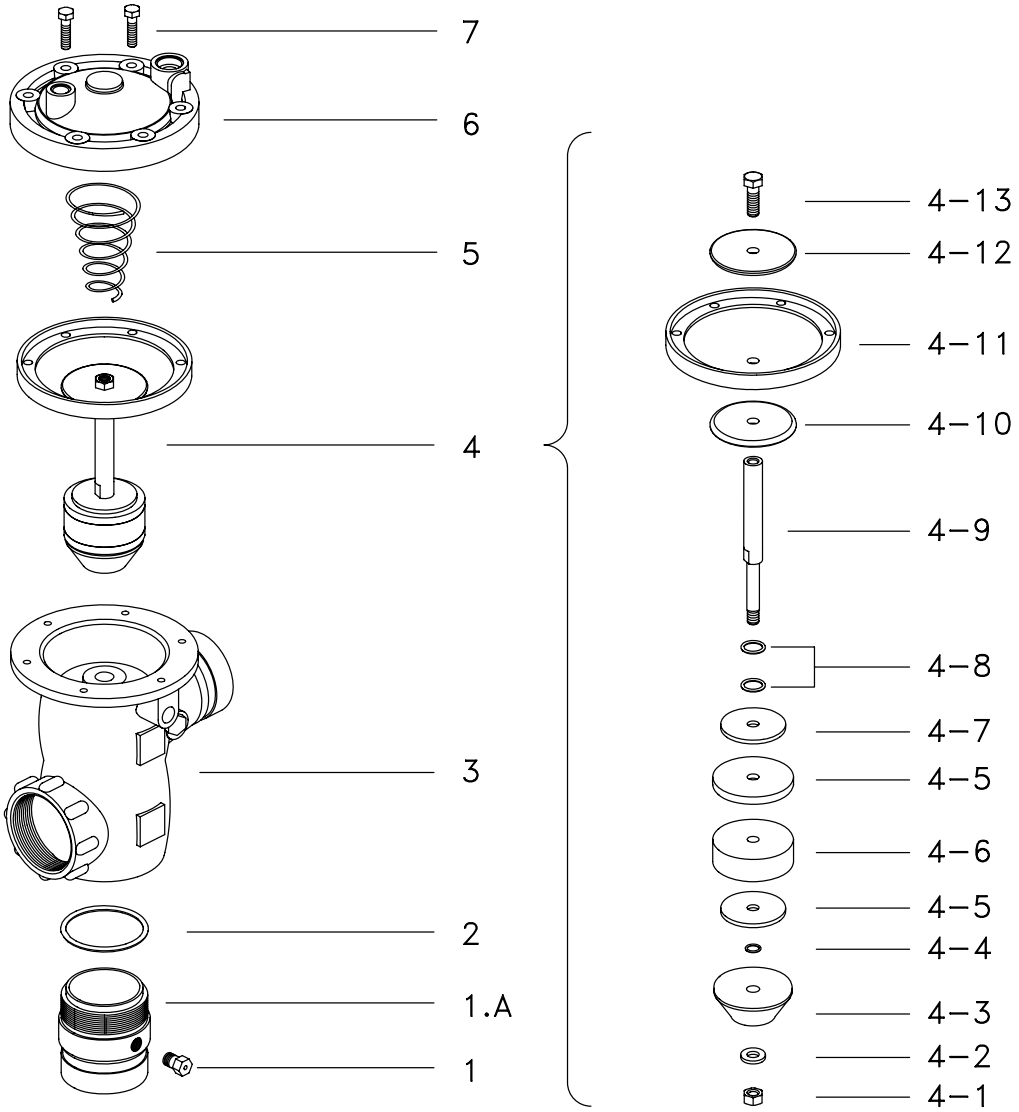
No:	ARKAL CAT. No.	PARTS DESCRIPTION	MATERIALS
1.	2506 0410	LOCKING NUT	R.P.A.
2.	5060 5302 02	TREADED ADAPTER 2"	R.P.A.
2A.	5060 4424 02A1	VICTAULIC ADAPTER 3"	R.P.A.
3.	5003 2246	2-246 "O"-RING	E.P.D.M.
4.	5060 4424 04	SPRING 11	S.S.
5.	5060 4424 05	M8 NUT	S.S.
6.	5060 4424 06	DISC	S.S.
7.	5060 4424 07	SEAL DISC	R.P.A.
8.	5060 4424 08	SEAL	N.R.
9.	5060 4424 09	SEAT	R.P.A.
10.	5003 2235	2-235 "O" RING	E.P.D.M.
11.	5060 4424 11	M10 NUT	BRASS
12.	5060 4424 12	M10*2 DISC	S.S.
13.	5060 5302 13	VALVE BODY	R.P.A.
14.	5060 7323	DIAPHRAGM ASSEMBLY	NATURAL
14.1	5060 4424 141	LOWER CONNECTOR	R.P.A.
14.2	5060 4424 142	CONNECTOR PIN	S.S.
14.3	5060 5303 143	SHAFT	S.S.
14.4	5060 4424 144	UPPER CONNECTOR	R.P.A.
14.5	5060 4424 145	2-112 "O" RING	E.P.D.M.
14.6	5060 5424 146	DIAFRAGM	NATURAL
14.7		UPPER DISC	R.P.A.
14.8	5060 4424 148	STOPPER DISC	S.S.
15.	5060 4424 15	BONNET	R.P.A.
16.	5060 4424 16	M10*60 BOLT	S.S.
17.	5060 5302 17	SHAFT COMPLETE	

MATERIALS:
S.S. - STAINLESS STEEL
R.P.A.- REINFORCED POLYAMID
N.R. - NITRILE RUBBER

"DOROT" BACKWASH CONTROL VALVE

MODEL-56; Size 2"*1 1/2".

ARKAL Cat. no.: 5060 1221



PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS
1.	5060 1220 01	VACUUM BREAKER	BRASS
1.A	5060 1220 01A	ADAPTOR	BRASS
2.	5060 1211 02	"O-RING"	N.R.
3.	5060 1221 03	VALVE BODY	BRASS
4.	5060 0024	ACTUATOR WITH COBER ASSEMBLY	
4-1.	5060 1211 401	NUT	S.S.
4-2.	5060 1220 402	WASHER	S.S.
4-3.	5060 1220 403	CONE	BRASS
4-4.	5060 1220 404	"O-RING"	N.R.
4-5.	5060 1220 405	SEAL	N.R.
4-6.	5060 1220 406	SEAL BODY	BRASS
4-7.	5060 1220 407	DISC	BRASS
4-8.	5060 1220 408	"O-RING"	N.R.
4-9.	5060 1220 409	STEM	S.S.
4-10.	5060 1211 409	LAWER DIAPHRAGM DISC	BRASS
4-11.	5060 1211 410	DIAPHRAGM 06	N.R.
4-12.	5060 1211 411	UPPER DIAPHRAGM DISC	BRASS
4-13.	5060 1211 412	BOLT	S.S.
5.	5060 1211 413	SPRING 52 FOR 2*2 BFV	S.S.
6.	5060 1211 414	COVER	R.P.A.
7.	5060 1211 414	BOLTS	S.S.

MATERIALS:
R.P.A.-REINFORCED POLYAMIDE
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL

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25-300

Hydraulic Relay

The **25-300** is a Hydraulic pilot valve, designed to control large- diameter hydraulic valves in irrigation and filtration systems.
The relay is controlled by hydraulic signals from a remote location. It activates the valve locally, accelerating the reaction to the remote signal.

Features

- Extremely large water passages enable fast response.
- Tough and durable construction.
- High- grade materials.
- Internal trim designed for easy disassembly and maintenance, by removing the bonnet and pulling out trim (as a cassette).

Technical Specifications

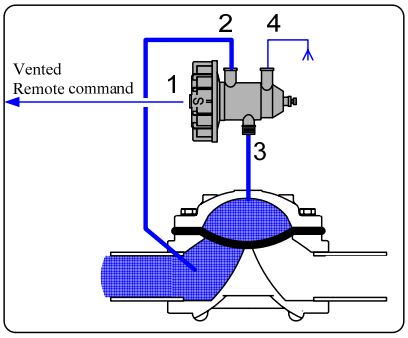
	SI	US
Operating pressure range:	**1-10 bar**	**15-150 PSI**
Temperature range:	**0-60°C**	**32-140°F**
Control ports	**3/8"**	
Command port	**1/8"**	
Kv / Cv ports 2-3	**1585** (LPH @ dP=1 BAR)	**1.85** (GPM @ δP=1 PSI)
Kv / Cv ports 4-3	**1675** (LPH @ dP=1 BAR)	**1.96** (GPM @ δP=1 PSI)
Normally Open Command / line pressures ratio	**0.75**	
Normally Closed Command / line pressures ratio	**0.33**	

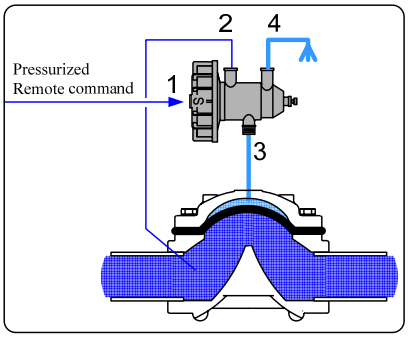
25-300

Hydraulic Relay

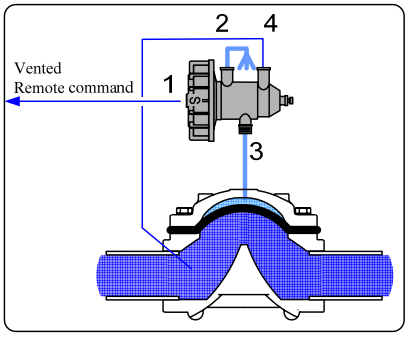
Connection diagrams

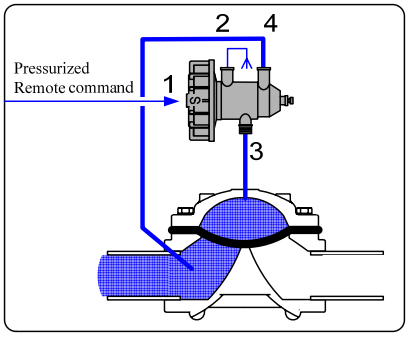
Normally closed Hydraulic valve



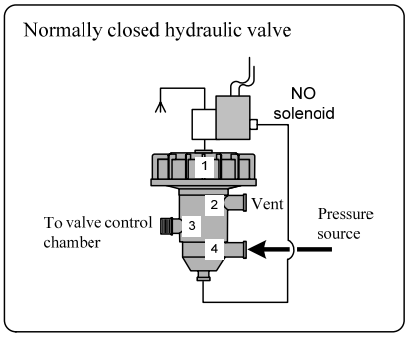


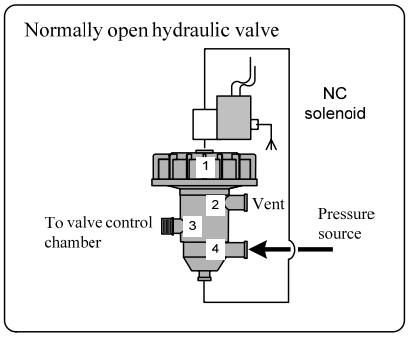
Normally Open Hydraulic valve





Accelerated Electric activation

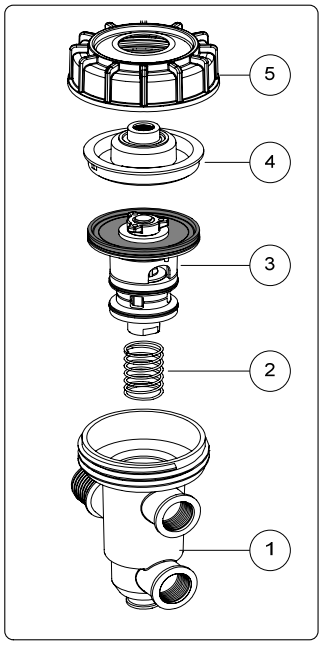




Parts and Materials

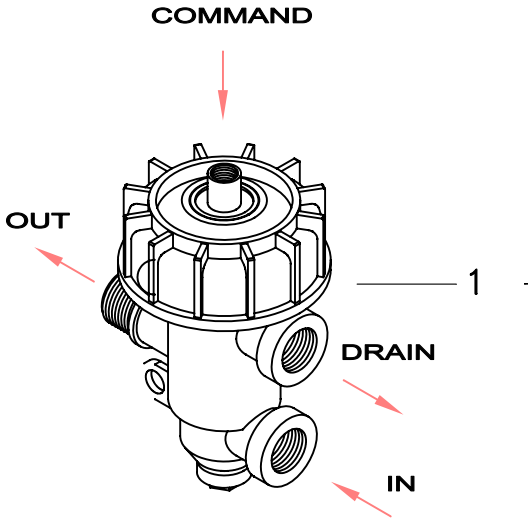
No.	Description	Materials
1	Body	GRP
2	Spring	SST
3	Diaphragm kit	GRP, NBR & PBT
4	Diaphragm seat	GRP
5	Bonnet	GRP

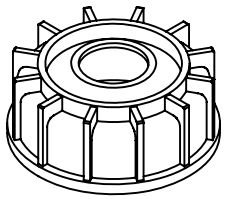
GRP - *Glass Reinforced Polyamide ("Nylon")*
PBT - *Polybutylene Terephthalate*
SST - *Stainless steel*
NBR - *Nitrile rubber*



"DOROT" PLASTIC BOOSTER VALVE

ARKAL Cat. no.: 5060 0009

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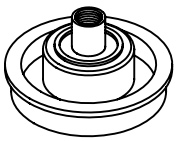
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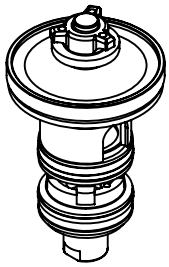
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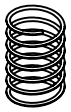
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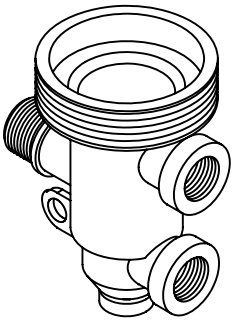
1.2

1.1

PARTS LIST

No:	ARKAL Cat. No:	PARS DESCRIPTION	MATERIALS
1.	5060 0009	BOOSTER VALVE	
1.1	5060 0005	1/4" PLUG	
1.2	5060 0009 120	BODY	GRP
1.3	5060 0009 130	N17 SPRING	SST
1.4	5060 0009 140	DIAFRAGM KIT	GRP,NBR & PBT
1.5	5060 0009 150	BONNET	GRP
1.6	5060 0009 160	LOCKING NUT	GRP

MATERIALS:

GRP - GLASSRE INFORSED POLYAMIDE ("NY LON")
PBT - POLYBUTYLENE TEREPHTHALATE
SST - STAINLESS STEEL
NBR - NITRILERU BBER

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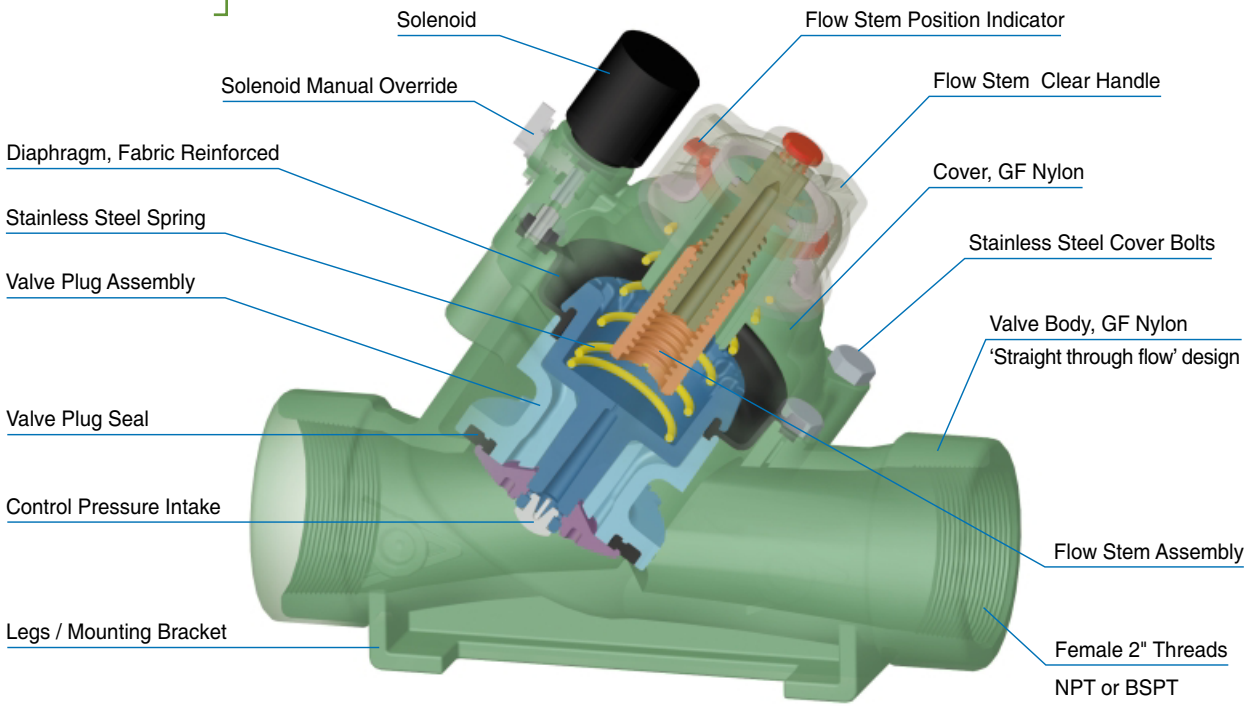
Bermad Valves

100 Series, Plastic Hydraulic Control Valves

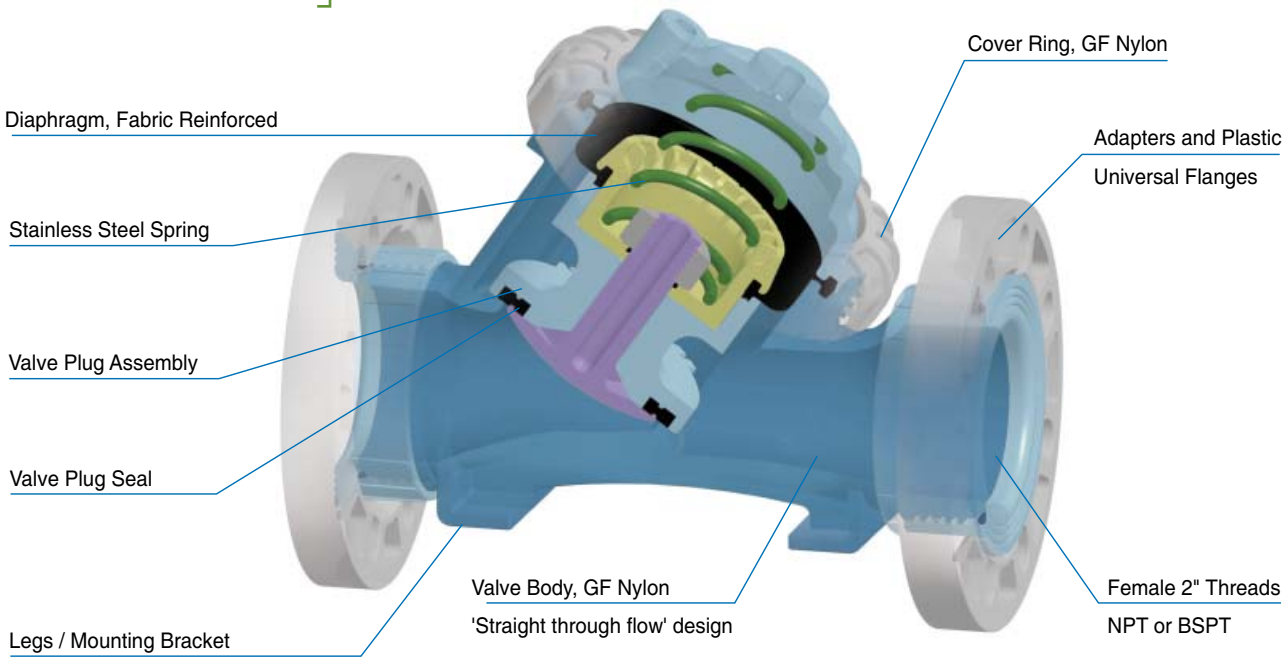
- **Durable Industrial grade** valve design and construction uses Glass-filled Nylon material to **meet rough service conditions.**
- **Ultra-high flow capacity** with a minimal pressure loss.
- **Valve design for service on a wide range of pressure and flow conditions,** from dripping to maximum flow conditions.
- Positive guided valve plug provides **accurate motion and smooth regulation.** Avoids chattering and slamming closed.
- Simple design with few parts guarantees **easy and simple service.**
- **Versatile end connection** allows mix of different sizes and connection types. Female Threads, Flanged or PVC 'Slip-on' Glue or grooved adapter.

Product Description and Features

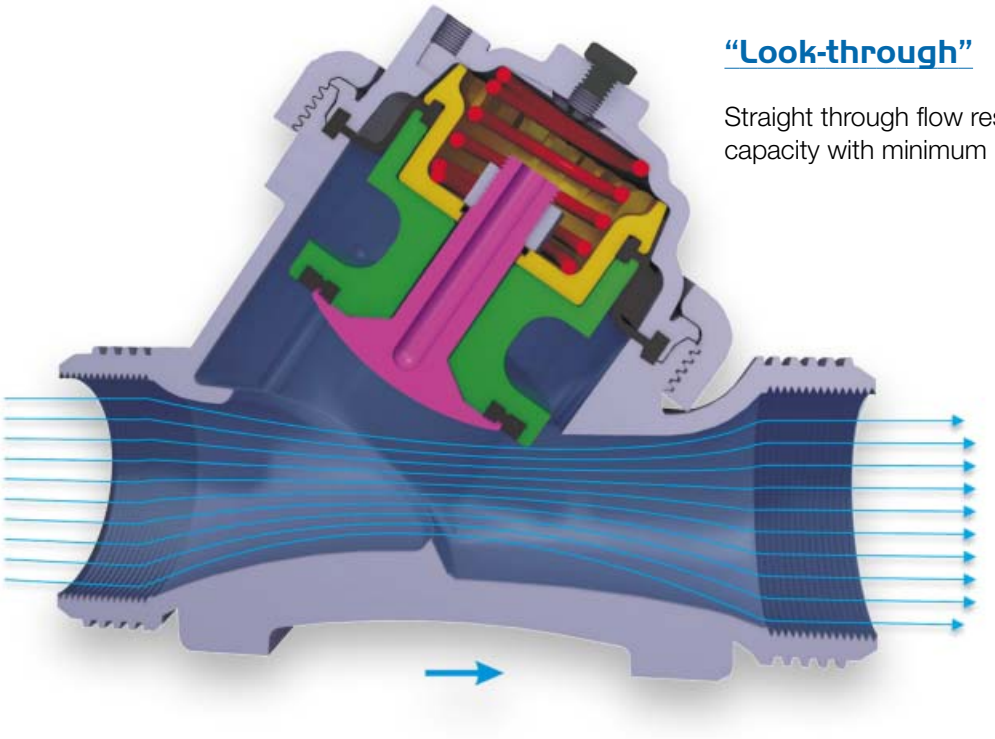
100 Series sizes: 2" ; 3" [50 ; 80]



100 Series sizes: 3"L ; 4" [80L ; 100]



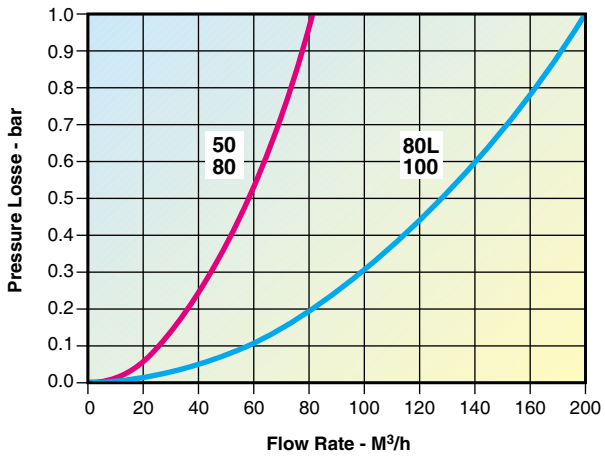
Technical information



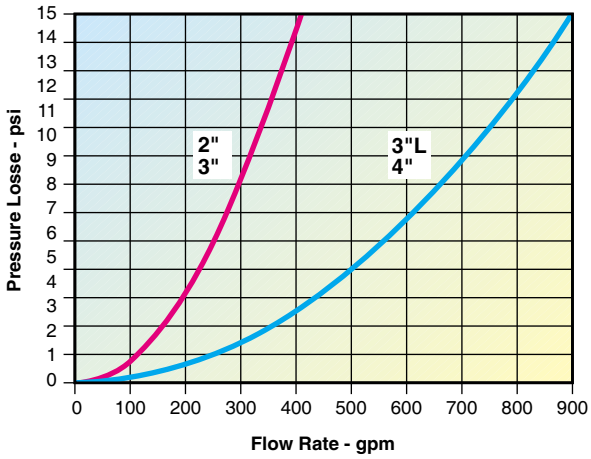
"Look-through"

Straight through flow results in ultra-high flow capacity with minimum pressure loss.

100 Series DN, 50-80 ; 80L-100
Flow Charts (SI)



100 Series 2"- 3" ; 3"L- 4"
Flow Charts (US)



Dimensions and Weight

Size in (DN)	2" (50)		3" (80)		3" (80)		3"L (80)		3"L (80)		4" (100)	
End connections	Threaded		Threaded		Flanged		Threaded		Flanged		Flanged	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
Length	230	9.06	298	11.73	308	12.13	300	11.81	310	12.20	350	13.78
Height	185	7.28	195	7.68	240	9.45	240	9.45	280	11.02	290	11.42
Height (Electric)	205	8.07	215	8.46	260	10.24	-	-	-	-	-	-
h - Center to Bottom	43	1.69	53	2.09	100	3.94	53	2.09	100	3.94	110	4.33
Weight	1.3 kg	2.8 lb	1.6 kg	3.6 lb	2.6 kg	5.6 lb	2.9 kg	6.4 lb	3.8 kg	8.4 lb	4.5 kg	9.9 lb

Technical Specifications

- **Sizes:** 2", 3", 4" (DN 50, 80, 100)
- **Ends connections:** NPT ; BSPT female threads
- **Pressure ratings:** ISO PN 10 ; ANSI #125 ; JIS 10K
- **Working pressure range:** 0.5-10bar ; 7-150 psi
- **Temperature:** Water up to 80°C ; 180°F

Materials:

Body, Cover, Valve Plug – Glass Filled Nylon
Diaphragm - NBR [Buna–N], Nylon fabric reinforced
Seals, Cover bolts - Stainless Steel
Spring - Stainless steel

Tender Specifications

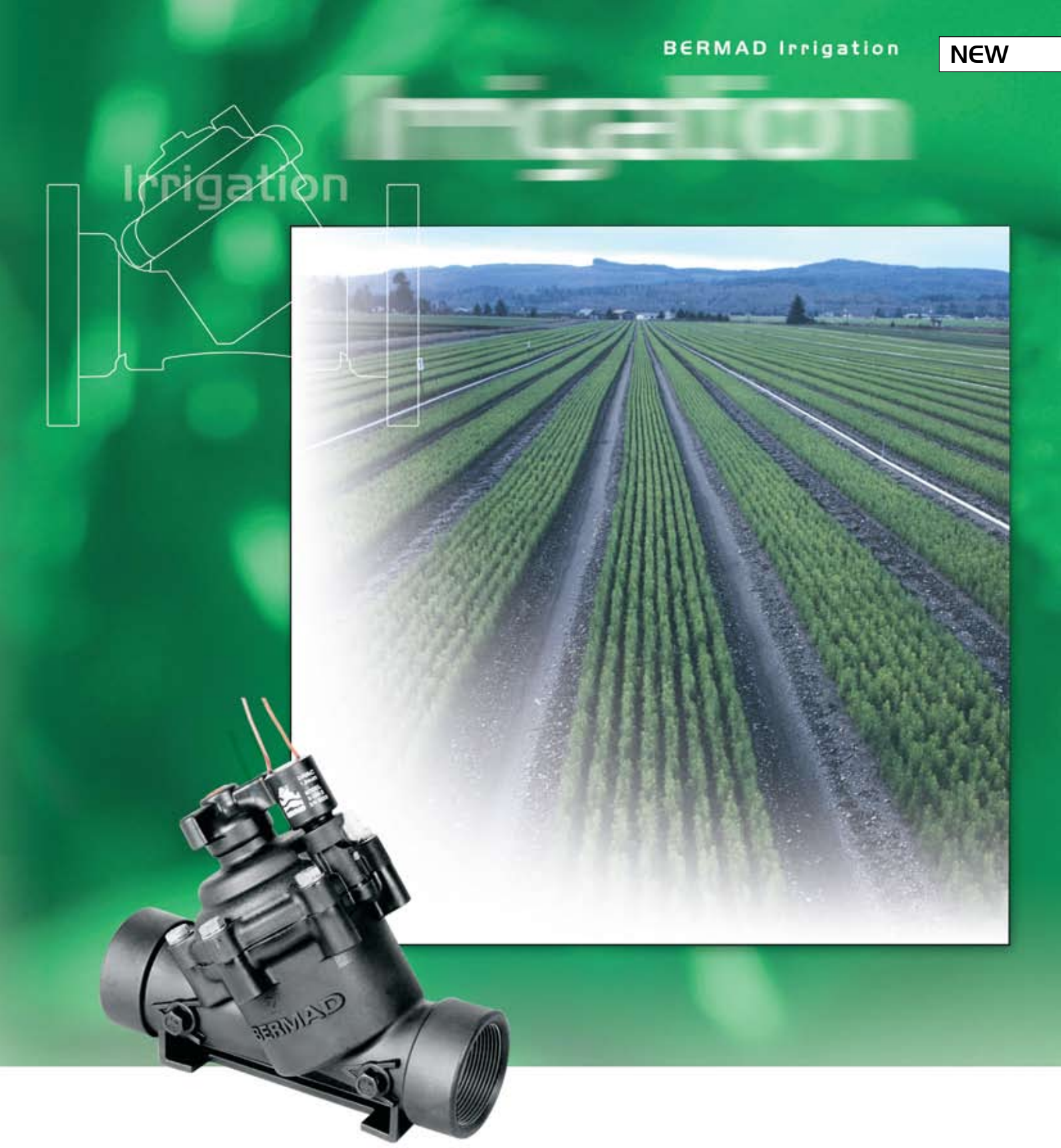
- The control valve have a 'Y' pattern body and be hydraulically actuated with a Semi-Roll type diaphragm.
- The 'Y' valve body will allow a significant 'Look through' from end to end.
- Valve sizes:
  2"- 3" = 90 Kv [103 Cv]
  3"L - 4" = 200 Kv [Cv 230]
- Construction material for Body Cover and Valve plug Assy, Glass Filled Nylon
- The diaphragm shall not be the sealing surface.
- The valve will have replaceable Diaphragm and Valve plug seal
- Nylon fabric reinforced Diaphragm

Optional End Connections

Threaded | **Plastic flanges** | **Combination end connections** | **Metal "Corona" type flanges**

BERMAD Irrigation

NEW



BERMAD Irrigation

100 Series - hYflow High Performance Valves

Water Control Solutions

BERMAD

100 Series hYflow

High Performance Plastic Hydraulic Control Valves

Features and Benefits

- **Durable industrial grade** valve design and construction uses glass-filled Nylon material to **meet rough service conditions.**
- **Ultra-high flow capacity** with minimal pressure loss.
- **Designed for service on a wide range of pressure and flow conditions,** from dripping to maximum flow .
- Simple design with few parts **guarantees easy in-line inspection and service.**
- Positive guided valve plug provides **accurate motion and smooth regulation.** Avoids chattering and slamming closed.
- **Versatile end connections** allow mix of different sizes and connection types. Female thread, Flanged or PVC 'Slip-on' Glue or Grooved adapter (as add-on option).
- **Articulated flange connections isolate** the valve from line bending and pressure stresses

IR-100 hYflow

The BERMAD IR-100 hYflow basic model diaphragm actuated, hydraulically operated valve is at the leading edge of control valve design. It combines simple and reliable construction with superior performance, while at the same time being virtually free of the typical limitations associated with standard control valves.
BERMAD's automatic water control valves are designed for vertical or horizontal installation and are available in sizes of 1½", 2", 2"L, 2½", 3", 3"L, 4" & 6" DN: 40, 50, 50L, 65, 80, 80L, 100 & 150.

The IR-100 hYflow model, made from industrial durable glass-filled nylon, is engineered to meet rough service conditions with high chemical and cavitation resistance.

The hYflow 'Y' valve body design includes a full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or shafts.
Its unitized Flexible Super Travel (FST) diaphragm and guided plug provide a significantly 'look through' passage from end to end resulting in ultra-high flow capacity with minimal pressure loss.

The combination of a long travel guided valve plug, peripherally supported diaphragm, and replaceable valve seal provides:

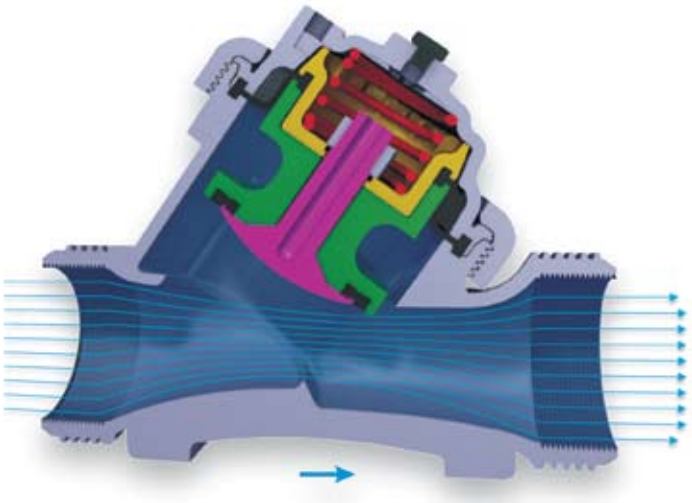
- No chattering or slamming closed
- Accurate and stable regulation with smooth motion
- Low operating pressure requirements
- No diaphragm erosion and distortion
- Diaphragm and spring fully meet the valve's operating pressure range requirements
- No UV and frozen effect
- Chemical resistant

Designed for service under a wide range of pressure and flow conditions, from dripping to maximum flow,
the IR-100 hYflow excels at being a user-friendly
control valve:

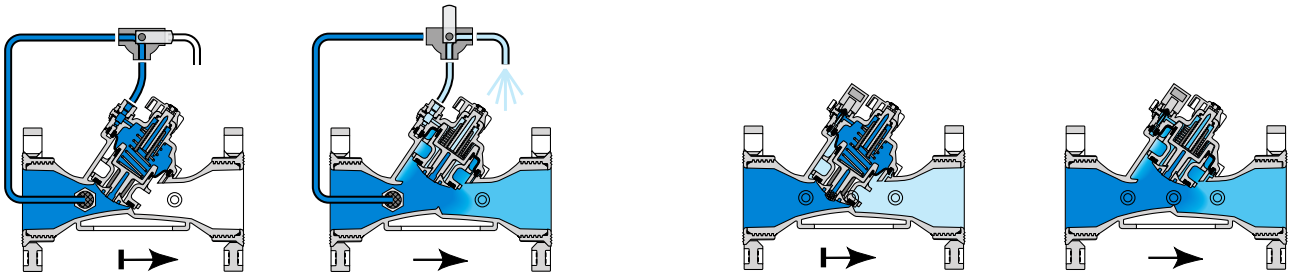
- Simple design with few parts guarantees easy in-line inspection and service.
- Adaptable on-site to a wide range of end connection types and sizes.
- Articulated flange connections isolate the valve from pipeline bending and pressure stresses.

"Look-through Design"

Straight through flow results in ultra-high flow capacity with minimum pressure loss



On-Off Modes



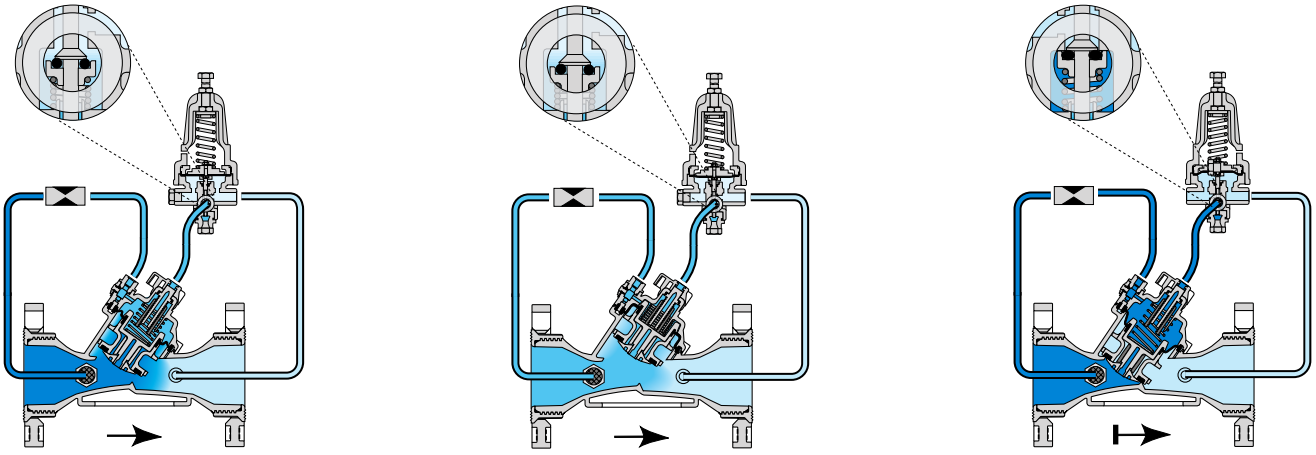
3-Way Control

Line pressure applied to the control chamber of the valve creates a hydraulic force that moves the valve to the closed position and provides drip tight sealing. Discharging pressure from the control chamber to the atmosphere causes the line pressure under the plug to open the valve.

2-Way Internal Control

Line pressure enters the control chamber through the internal restriction. The closed solenoid causes pressure to accumulate in the control chamber, thereby shutting the valve. Opening the Solenoid releases more flow from the control chamber than the restriction can allow in. This causes pressure in the control chamber to drop, allowing the valve to open.

2-Way Modulating Modes (Pressure Reducing Pilot)



2-Way Internal Control

Line pressure enters the control chamber through the internal restriction. The closed solenoid causes pressure to accumulate in the control chamber, thereby shutting the valve. Opening the Solenoid releases more flow from the control chamber than the restriction can allow in. This causes pressure in the control chamber to drop, allowing the valve to open.

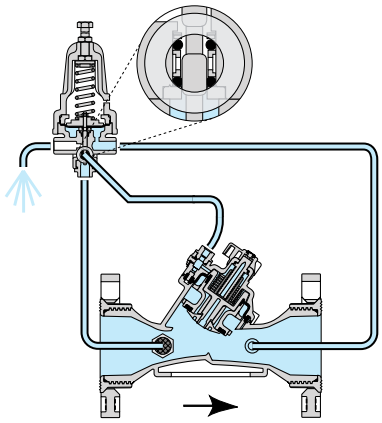
Modulating to Open

The pilot modulates open when it senses a pressure drop, releasing more flow from the control chamber than the restriction can allow in. This causes the accumulated pressure in the control chamber to drop and the valve modulates open.

Zero Flow Position

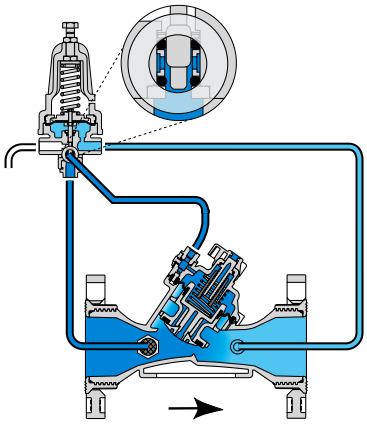
When demand drops to zero, downstream pressure begins to rise as the flow enters a closed line. The pilot closes, initiating the valve's irreversible closing process, eventually causing it to seal drip tight.

3-Way Control Modes (Pressure Reducing)



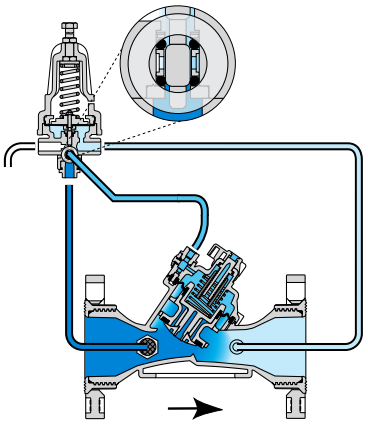
Fully Open Position

When upstream pressure drops, the pilot blocks the supply pressure port and opens the drain port, venting the control chamber to the atmosphere. This fully opens the valve, minimizing head loss.



Modulating to Close

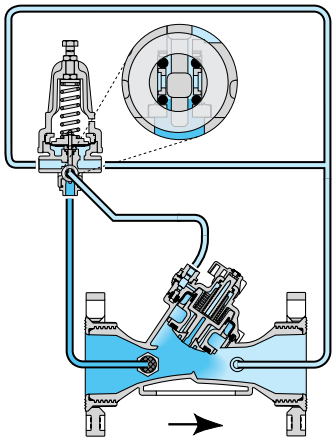
The pilot switches upon pressure rise, blocking the drain port and opening the supply pressure port. This pressurizes the control chamber, forcing the valve to modulate closed.



Locked Position

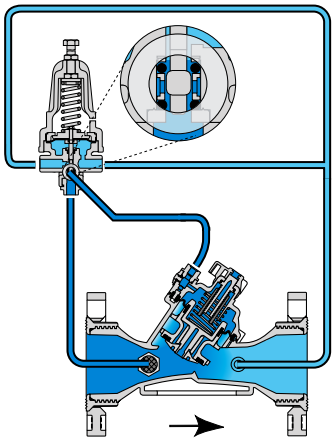
When sensed pressure is equal to setting, the pilot blocks both the drain and the supply pressure ports. This locks the pressure in the control chamber, freezing valve opening in its last position until conditions change.

3/2-Way Control Modes (Pressure Reducing)



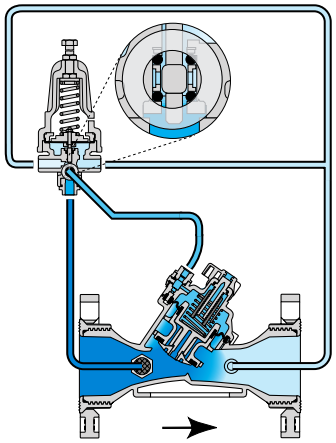
Modulating to Open

When pressure drops, the pilot restricts the flow path through the supply pressure port, and widens the flow path through the drain port. This releases more flow from the control chamber than can be allowed in, thereby causing the valve to modulate open.



Modulating to Close

Upon pressure rise, the pilot widens the flow path through the supply pressure port, and restricts the flow path through the drain port. This allows more flow into the control chamber than can be released, thereby pressurizing it and forcing the valve to modulate closed.



Stable Conditions

As long as flow and pressure conditions are constant, the pilot freezes the control chamber inlet and outlet flow ratio. This keeps the valve opening rate constant, allowing the valve to react “on-line” to any anticipated changes in supply and/or demand conditions.

[1] Cover Ring

The cover ring fastens valve cover to body, stiffening and strengthening the valve body, enabling simple maintenance. A cover ring key is available.

[2] Pilot Adaptor

The pilot adaptor allows us to connect the mini-pilot valve or the Galit hydraulic relay to the valve body.

[3] Valve Cover

The cover's strong construction meets rough service conditions. Optional cover types (3"; DN80 and smaller valves) are capable of accepting a Flow Stem, a Flow Stem + Position Indicator, and a 2-Way Solenoid (2W-N1 Electric Type).

[4] Auxiliary Closing Spring

One single high grade stainless steel spring provides a wide operation range, ensuring low opening pressure and secured closing.

[5] Plug Assembly

The unitized Flexible Super Travel (FST) plug assembly combines a long travel guided valve plug, peripherally supported diaphragm, and replaceable diaphragm and valve seal. The diaphragm fully meets the valve's operating pressure range requirements.

[5.1] Diaphragm Holder
[5.2] Diaphragm
[5.3] Plug
[5.4] Plug Seal

[6] hYflow 'Y' Valve Body

Glass-filled nylon construction meets rough service conditions with high chemical and cavitation resistance.
End-to-end "look-through" design and full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or shafts, enables ultra-high flow capacity with minimal pressure loss.

[7] End Connections

Adaptable on-site to a wide range of end connection types and sizes:

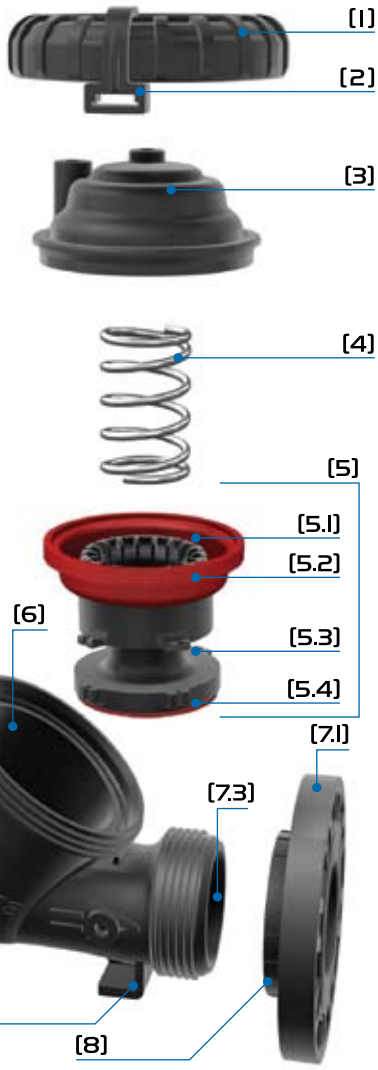
[7.1] Flanges: Plastic or metal "Corona" with elongated slots enable meeting diverse flange standards ISO, ANSI and JIS.
[7.2] Flange adaptor external thread
[7.3] Internal threads

[8] Flange Adapter

Articulated flange connections isolate the valve from line bending and pressure stresses.

[9] Valve Legs

Stabilize the valve and serve also as mounting brackets.



Valve Configurations

Y Pattern

Available in all sizes

Angle Pattern

Available in 3” & 3”L
DN: 80 & 80L

T Pattern

Available in 3”
DN: 80

Dual T Pattern

Available in 3”
DN: 80

End Connection Options

6”; DN 150 “Boxer” - Flanged

6”; DN 150 “Boxer” - Grooved (Vic)

BSP.T; NPT Female Thread
1½”, 2”L & 3”L;
DN; 40, 50L & 80L

BSP.F Male Thread,
(for PVC Adapters)
2”, 2½”; DN; 50 & 65

BSP.T; NPT Female Thread
2” & 3”; DN; 50 & 80

Union PVC Adaptor
2”, 2½”; DN: 50 & 65

Plastic Flange
3” & 4”; DN: 80 & 100

Metal Flange
3” & 4”; DN: 80 & 100

PVC Adaptor
1½”, 2” & 3”
DN: 40, 50 & 80

hYflow Basic Hydraulic Valve, Model 105-Z

Model 105-Z, is a hydraulically self-operated, diaphragm-actuated valve, which uses the hydraulic force of the existing line pressure, or any external hydraulic command (water or air), to open and close. Recommended for all On\Off applications, Model 105-Z is particularly suitable for agricultural irrigation heads, and filter stations.

hYflow Electric Valve, Model 110-2W-N

Model 110-2W-N, is a hydraulically self-operated, diaphragm-actuated, solenoid-controlled valve. The valve opens fully and closes drip-tight in response to an electric signal, which causes the solenoid to open or close the valve's internal hydraulic loop. It operates with a variety of solenoid voltage ranges: 24VAC, 24VDC or 9VDC, 12VDC-latch. Recommended for all electric On\Off applications, Model 110-2W-N is particularly suitable for turf irrigation heads and commercial green house irrigation. The Model 110-2W-N also features a manual override.

hYflow Pressure Reducing Valve, Model 120-bZ

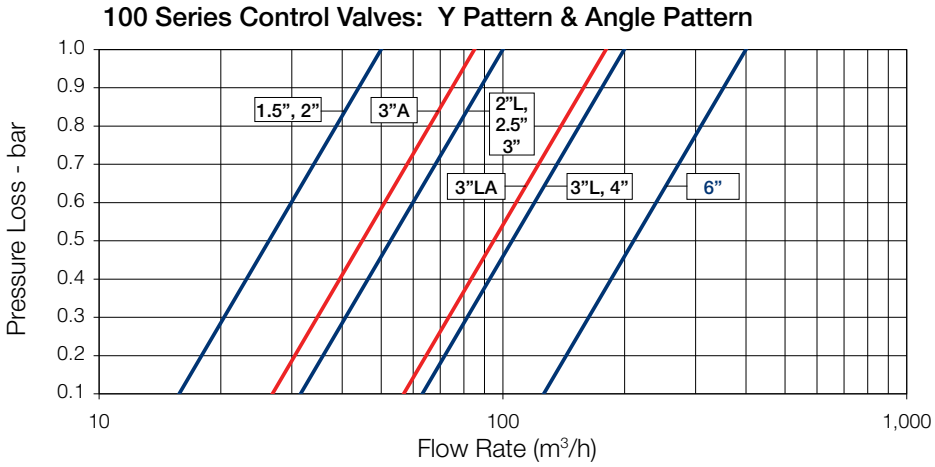
Model 120-bZ, is a hydraulically self-operated, diaphragm-actuated control valve, which uses the hydraulic force of the line pressure to reduce higher upstream pressure to lower constant downstream pressure regardless of fluctuating demand or varying upstream pressure. The pilot continuously senses the downstream valve pressure and controls the valve's opening and closing rate accordingly, by increasing or decreasing the flow from the valve control chamber to downstream.
The quick and accurate response of Model 120-bZ prevents line fill-up surges and pressure peaks, which can be damaging, especially to thin wall irrigation schemes. The unique hYflow design makes the Model 120-bZ the best and most cost-effective solution for agricultural irrigation heads in large and medium scale blocks, where flow is high and upstream pressure is liable to drop very low.

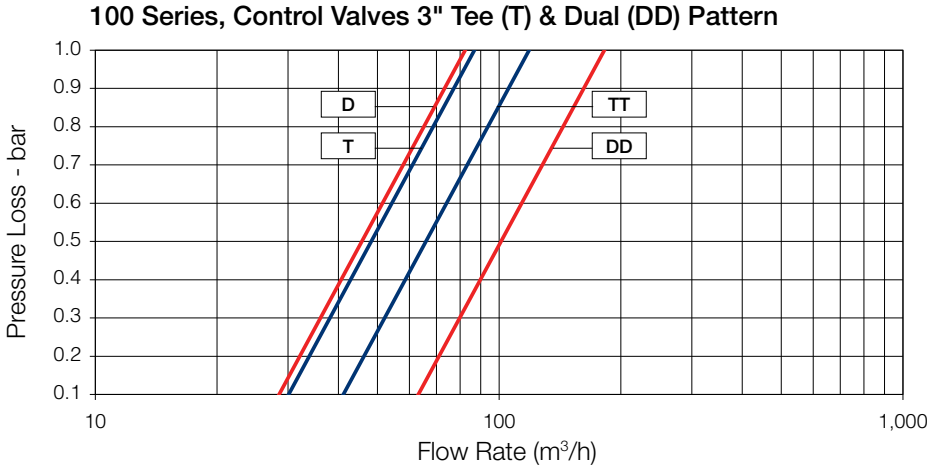
hYflow Electric Pressure Reducing Valve, Model 120-55-bZ

Model 120-55-bZ, is a hydraulically self-operated, diaphragm-actuated control valve which uses the hydraulic force of the line pressure to reduce higher upstream pressure to lower constant downstream pressure, regardless of fluctuating demand or varying upstream pressure. The added solenoid enables the opening and shut-off of the valve by an irrigation controller. Pressure reducing performance of the Model 120-55-bZ is similar to that of the Model 120-bZ, thus providing protection for the irrigation equipment whenever the valve opens and throughout the irrigation cycle. Model 120-55-bZ operates with a variety of solenoid voltage ranges:
24VAC, 24VDC or 9VDC, 12VDC-latch.

Flow Stems on all DN: 40, 50, 50L, 65, 80 and 80L models are available upon request

Flow Chart - Metric





Flow Properties

Sizes DN	40	50	50L	65	80	80	80	80	80	80	80L	80L	100	150
Pattern	Y	Y	Y	Y	Y	A	T	T	D	D	Y	A	Y	Y
							One side	Two sides	One side	Two sides				
KV	50	50	100	100	100	85	95	130	90	200	200	190	200	400

Technical Specifications

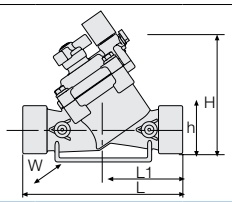
Available Patterns & Sizes:
DN: 40, 50, 50L, 65, 80, 80L, 100 &150
Available End Connections:
Threaded: Female BSP-T/NPT DN: 40, 50, 50L, 80 & 80L
Male BSP-F DN: 50, 65
Flanged: DN: 80, 80L, 100 & 150
Plastic or metal "Corona" with elongated slots enable meeting diverse flange standards ISO PN10, ANSI 125, JIS 10K

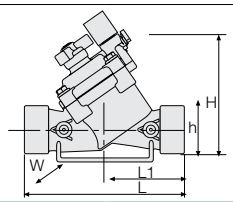
Pressure Rating: 10 bar
Operating Pressure Range: 0.5-10 bar
Temperature Range: Water up to 80°C
Standard Materials:

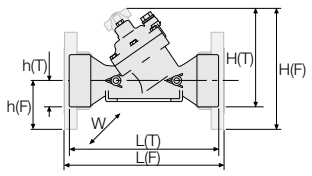
- Body, Cover and Plug: Glass-Filled Nylon
- Diaphragm: NBR [Buna–N], Nylon Fabric Reinforced
- Seals: NBR [Buna–N]
- Spring: Stainless Steel
- Cover bolts DN: 40, 50, 50L, 65 & 80

Dimensions & Weights - Metric

NEW

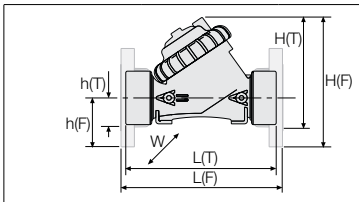


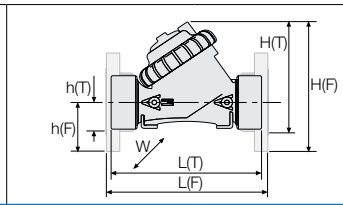


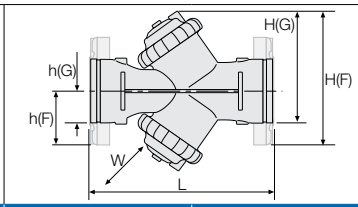


Sizes DN	40	50	50	50L	65	80		
Pattern	Y	Y	Y	Y	Y	Y	Y	Y
Ends Connections	Rc 1 1/2 (BSP.T)	G 2 (BSP.F)	Rc 2 (BSP.T)	Rc 2 (BSP.T)	G 2 1/2 (BSP.F)	Rc 2 (BSP.T)	Universal Flanges	
	1 1/2" NPT	Male	2" NPT	2" NPT	Male	3" NPT	Metal	Plastic
L (mm)	200	200	200	230	230	298	308	308
H (mm)	156	156	156	170	170	180	240	240
h (mm)	40	40	40	40	40	50	100	100
W (mm)	97	97	97	135	135	190	100	100
CCDV (LIT)	0.15	0.15	0.15	0.2	0.2	0.2	0.2	0.2
Weight (Kg)	0.8	0.8	0.8	1.35	1.4	1.6	4.4	2.5

CCDV = Control Chamber Displacement Volume



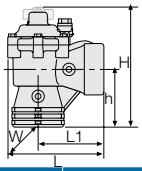


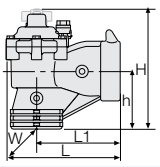


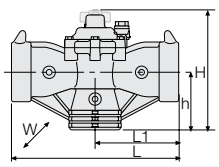
Sizes DN	80 L			100		150	150
Pattern	Y	Y	Y	Y	Y	Y "Boxer"	Y "Boxer"
Ends Connections	Rc 3 (BSP.T)	Universal Flanges		Universal Flanges		Grooved endes	Universal Flanges
	3" NPT	Metal	Plastic	Metal	Plastic	150 (Vic)	150 Plastic
L (mm)	298	310	310	350	350	480	480
H (mm)	240	280	280	294	290	195	285
h (mm)	60	100	100	112	112	100	145
W (mm)	190	100	100	115	115	385	385
CCDV (LIT)	0.7	0.7	0.7	0.7	0.7	2x0.7	2x0.7
Weight (Kg)	3	5.9	4	7.6	4.9	8.8	12.8

CCDV = Control Chamber Displacement Volume *Reinforced Plastic Flanges

NEW







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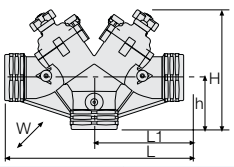


Sizes DN	80L	80	80	80	80	80
Pattern	Angle	Angle	Angle "Horns"	T "Horns"	DUAL' "Horns"	DUAL
Ends Connections	Rc 3 (BSP.T)	Rc 3 (BSP.T)	Rc 3 (BSP.T)	Rc 3 (BSP.T)	Rc 3 (BSP.T)	Rc 3 (BSP.T)
	3" NPT	3" NPT	3" NPT	3" NPT	3" NPT	3" NPT
L (mm)	235	187	220	325	400	400
H (mm)	290	235	235	235	270	270
h (mm)	145	117	117	117	115	115
W (mm)	170	135	135	135	135	135
CCDV (LIT)	0.7	0.2	0.2	0.2	2x0.2	2x0.2
Weight (Kg)	2.8	1.6	1.7	2.1	3.2	3.2

Irrigation Control Head - Filtration System

Pressure Reducing & Sustaining Separating Valves and quick Pressure Relief Valves

Irrigation Control Head - Filtration System

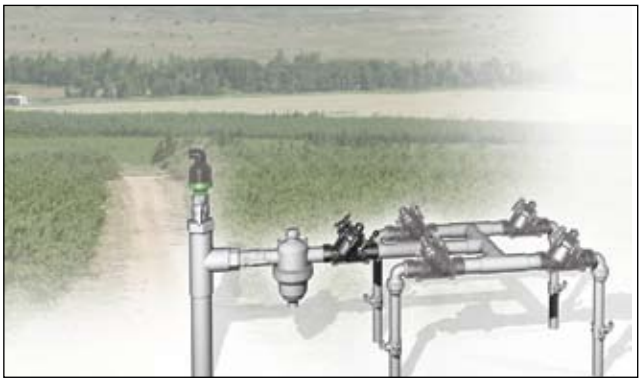
Pressure Sustaining Separating Valves

Sub-Main Control - Distribution System

Pressure Reducing Valves with Relief Override

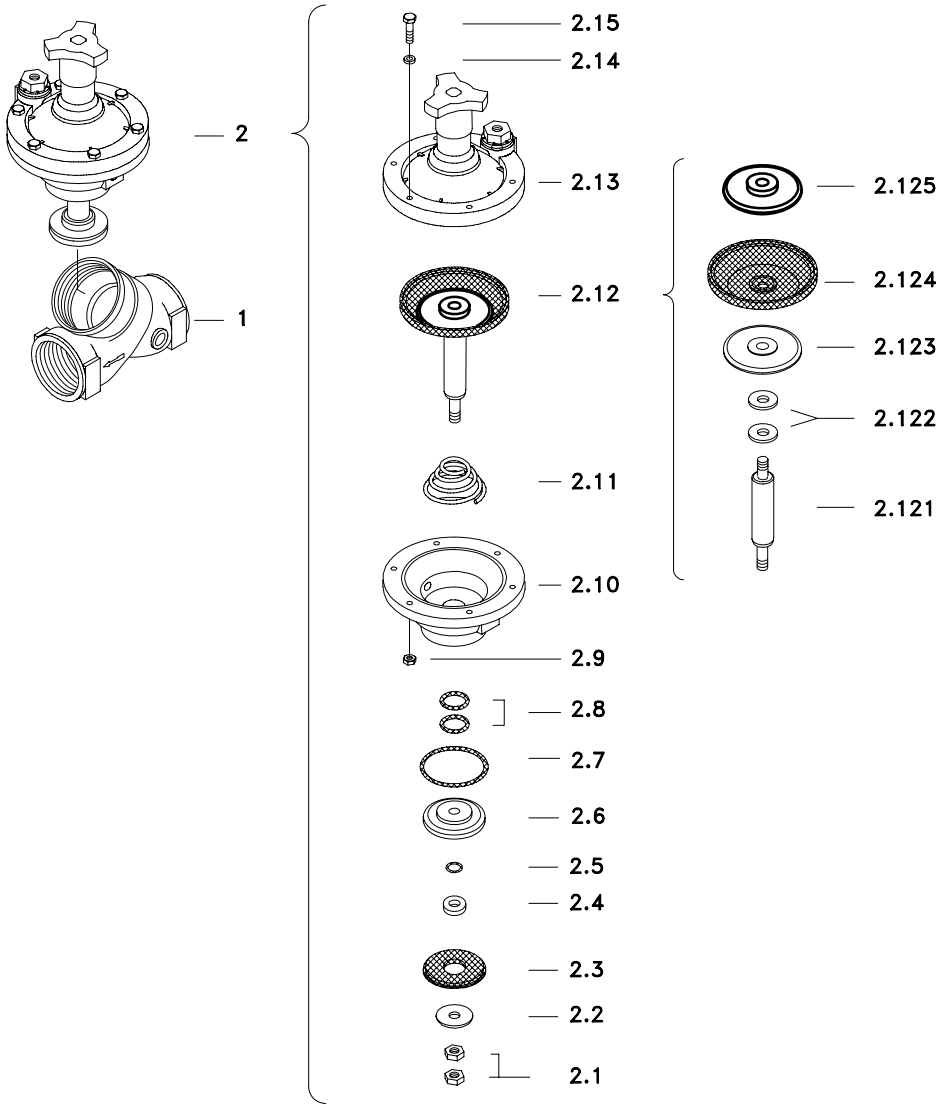
Sub-Main Control - Distribution System

Normally Closed Pressure Reducing & Sustaining Main Valve and four Solenoid Controlled Valves



Bermad
300 series

"BERMAD" CONTROL VALVE
WW–300–K DOUBLE CHAMBER
300 Series; Size 2"*2" N.O.
ARKAL Cat: No: 5062 0022



PARTS LIST

No:	ARKAL Cat. No:	PARTS DESCRIPTION	MATERIALS
1.	5062 0022 01	"Y" BODY	BRASS
2.	5062 0014	ACTUATOR WITH COVER ASSEMBLY	
2.1	5062 0022 215	NUT	AISI 304
2.2	5062 0022 214	SEAL DISC WASHER	AISI 304
2.3	5062 0022 213	SEAL	
2.4	5062 0022 217	STOPPER WASHER	AISI 303
2.5	5062 0022 216	"O-RING"	N.B.R.
2.6	5062 0022 209	SEAL DISC	BRASS
2.7	5062 0022 208	"O-RING"	BUNA N
2.8	5062 1237 110	"O-RING"	N.B.R.
2.9	5062 0022 207	NUT	G.S.
2.10	5062 0022 206	SEPARATOR PARTITION	R.P.A.
2.11	5062 3222 115	CONIC SPRING	AISI 302
2.12	5062 0022 02	SHAFT ASSEMBLY	
2.121	5062 0022 210	SHAFT	S.S.
2.122	5062 0224 215	DISC	BRASS
2.123	5062 0022 205	UPPER DISC	BRASS
2.124	5062 0022 204	DIAPHRAGM 6M	N.R.
2.125	5062 0022 203	SUPPORTING DISK	BRASS
2.13	5062 0022 202	COVER ASSEMBLY	
2.14	5062 3222 117	DISK	AISI 304
2.15	5062 0022 201	BOLT	G.S.

MATERIALS:
R.P.A. - REINFORCED POLYAMIDE
N.R. - NATURAL RUBBER
S.S. - STAINLESS STEEL
G.S. - GALVANIZED STEEL
N.B.R.- NITRILE RUBBER

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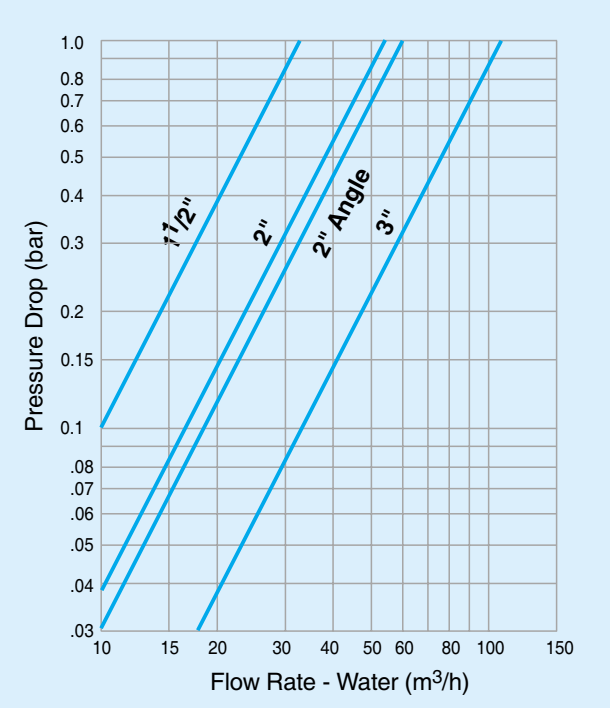
TECHNICAL DATA

Specifications

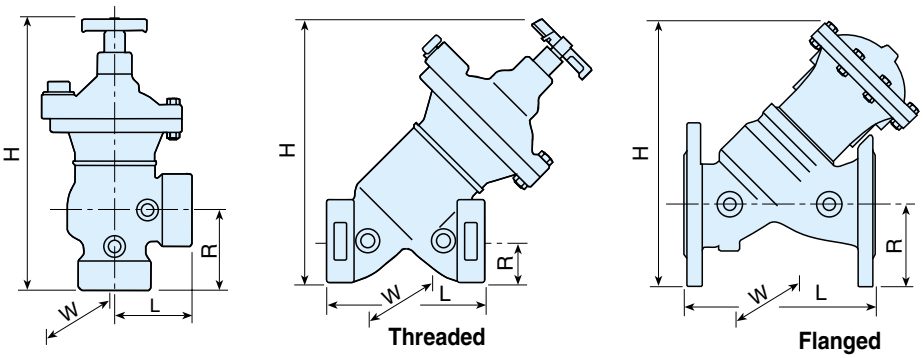
- **Valve Configuration:**
  Y-pattern and angle
- **Sizes:**
  Y – Y-pattern: 1 1/2", 2" & 3"
  A – Angle: 2"
- **End Connections:**
  – 1 1/2" & 2": threaded NPT/BSP
  – 3": female threaded NPT/BS or flanged to ISO/BS-D/ANSI
- **Operating Pressure Range:**
  0.7-10 bar (10-150 psi)
- **Temperature Range:**
  Water up to 80° C (180°F)
- **Materials:**
  Body: (1 1/2" & 2") Brass,
  (3") Polyester-coated Cast Iron
  Actuator: Plastic, Brass and Stainless Steel
  Diaphragm: Nylon-fabric, Reinforced Natural Rubber
  Seals: Buna-N and NR

Pilot Valves and Control Accessories: refer to PC Series

Flow Chart



Dimensions and Weights



Size	1 1/2"	2"	2" Angle	3"	3"
L (mm)	112	124	71	210	235
H (mm)	175	215	256	275	325
Width (mm)	105	125	135	160	200
R (mm)	30	40	75	58	98
Weight (kg)	1.25	2.0	2.25	7.4	14.7

TYPICAL APPLICATIONS

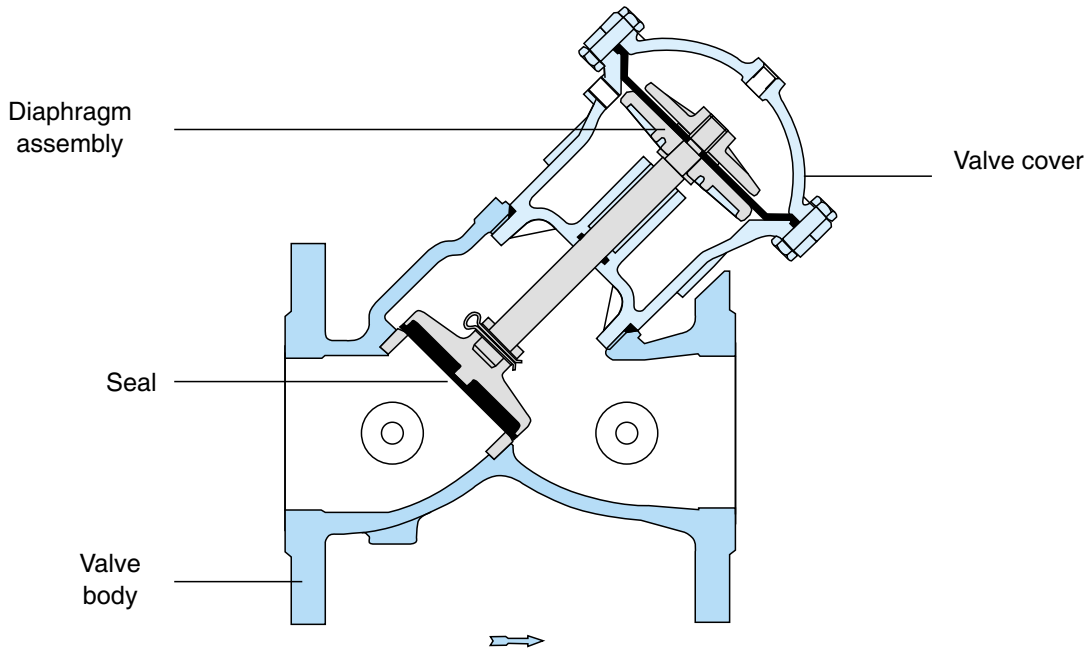
Model 300
Hydraulic Control Valve
Model 300 is a hydraulically operated control valve, requiring a pressure command to close.

Model 310
Electric Control Valve
Model 310 has a 3-way solenoid pilot valve with manual override. The valve is N.C. (normally closed), requiring electrical energy to open.

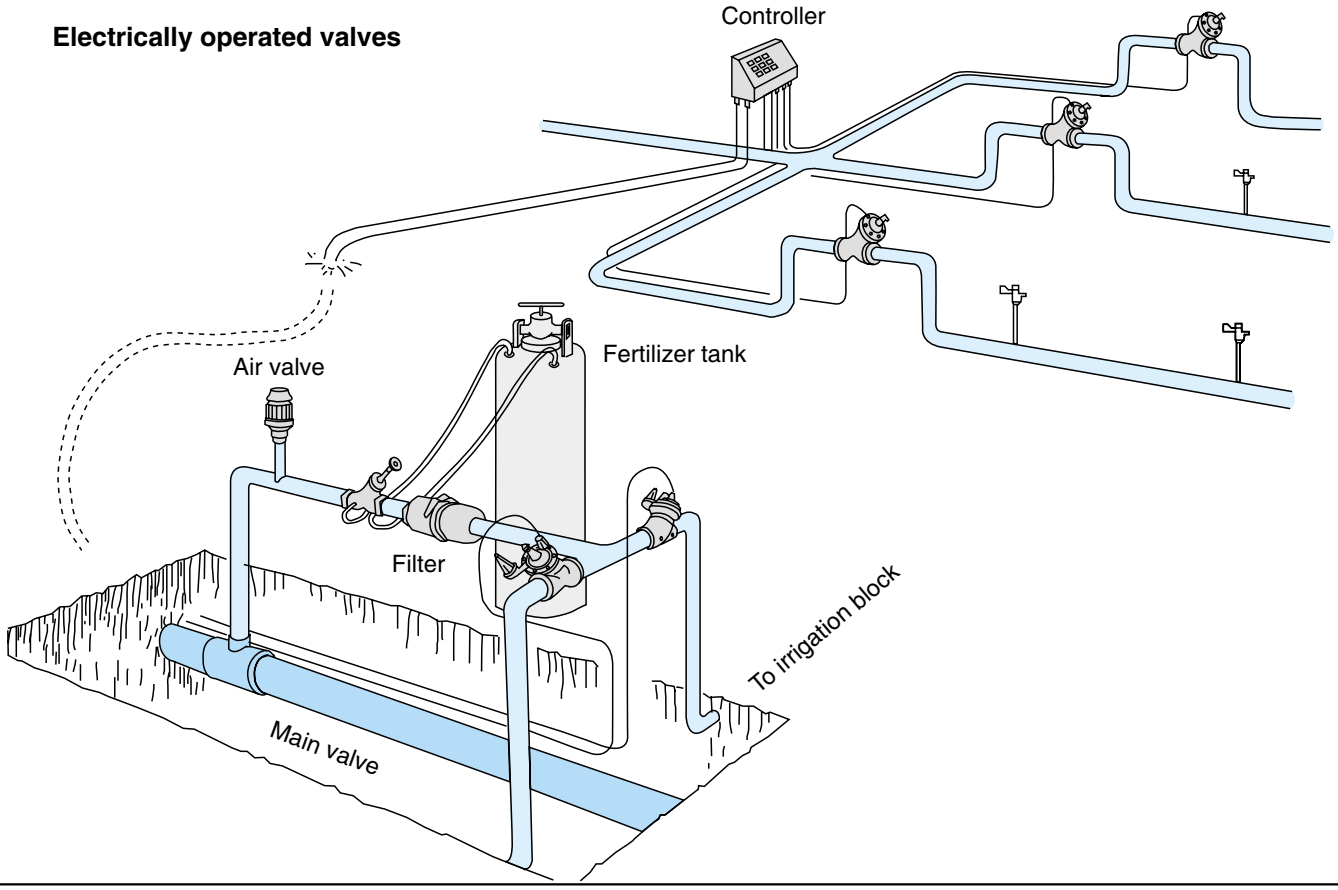
Model 320
Pressure Reducing Control Valve
Model 320 reduces high upstream pressure to lower set downstream pressure.

Model 320-55
Pressure Reducing and Electric Control Valve
Model 320-55 combines Model 320 with electric remote control.

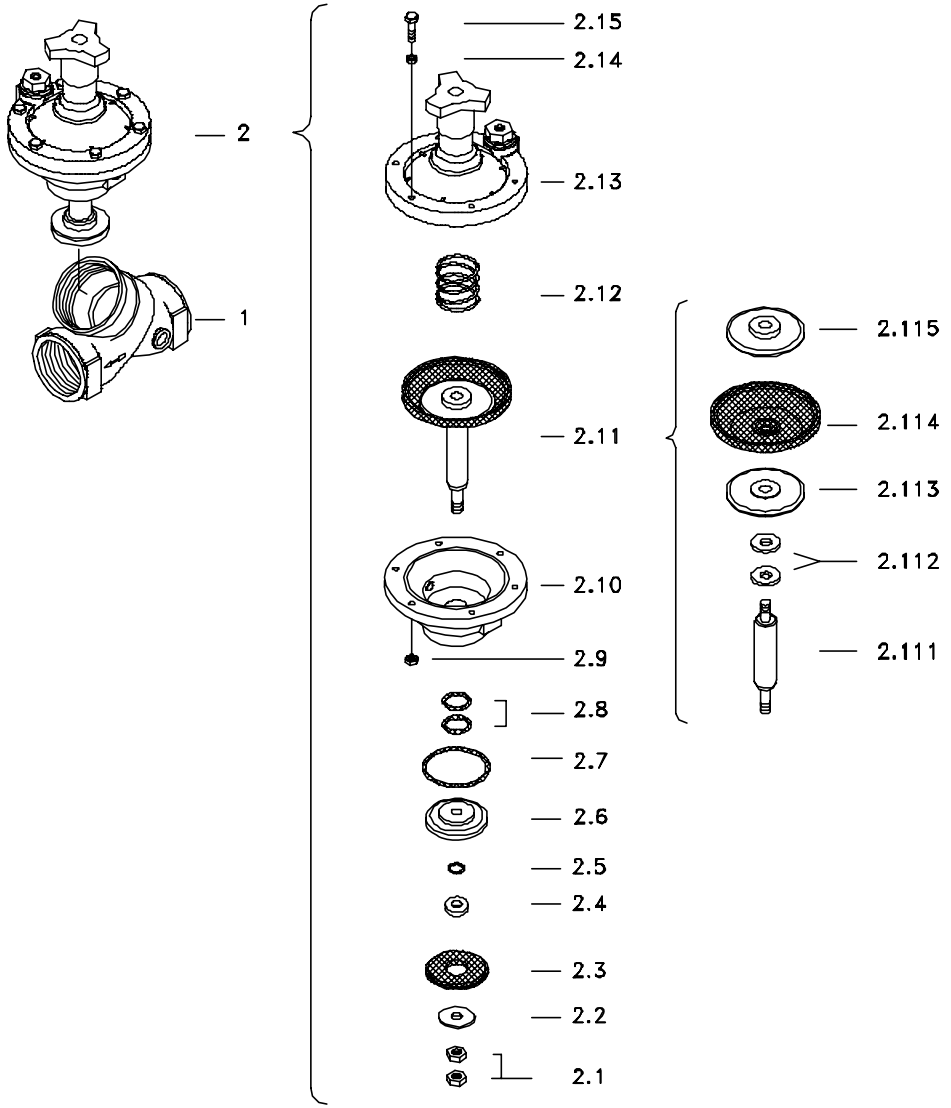
VALVE ASSEMBLY



TYPICAL APPLICATIONS



"BERMAD" CONTROL VALVE
WW-300-K DOUBLE CHAMBER
300 Series; Size 2"*2" N.C.
ARKAL Cat: No: 5062 0020



PARTS LIST

No:	ARKAL Cat. No:	PARTS DESCRIPTION	MATERIALS
1.	5062 0022 01	"Y" BODY	BRASS
2.	5062 0016	ACTUATOR WITH COVER ASSEMBLY	
2.1	5062 0022 215	NUT	AISI 304
2.2	5062 0022 214	SEAL DISC WASHER	AISI 304
2.3	5062 0022 213	SEAL	
2.4	5062 0022 217	STOPPER WASHER	AISI 303
2.5	5062 0022 216	"O-RING"	N.B.R.
2.6	5062 0022 209	SEAL DISC	BRASS
2.7	5062 0022 208	"O-RING"	BUNA N
2.8	5062 1237 110	"O-RING"	N.B.R.
2.9	5062 0022 207	NUT	G.S.
2.10	5062 0022 206	SEPARATOR PARTITION	R.P.A.
2.11	5062 0022 02	SHAFT ASSEMBLY	
2.111	5062 0022 210	SHAFT	S.S.
2.112	5062 0022 2122	DISC	BRASS
2.113	5062 0022 205	UPPER DISC	BRASS
2.114	5062 0022 204	DIAPHRAGM 6M	N.R.
2.115	5062 0022 203	SUPPORTING DISK	BRASS
2.12	5062 3219 06	SPRING	AISI 302
2.13	5062 0022 202	COVER ASSEMBLY	
2.14	5062 0022 220	DISK	AISI 304
2.15	5062 0022 201	BOLT	G.S.

MATERIALS:
R.P.A. - REINFORCED POLYAMIDE
N.R. - NATURAL RUBBER
S.S. - STAINLESS STEEL
G.S. - GALVANIZED STEEL
N.B.R.- NITRILE RUBBER

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Angle Flow

Straight Flow

Filter Backwash Hydraulic BERMAD Valve, 2x2 Plastic

IR-2x2-350-P

The BERMAD Model IR-2x2-350-P is a compact 3-port valve, in a T configuration, constructed from reinforced plastic. It is a double chambered, hydraulically operated, and diaphragm actuated valve, designed for automatic backwashing of filters with 2" inlet and outlet ports. In response to a pressure rise command, its diaphragm actuated plug assembly closes the supply port drip tight, while opening the backwash port. The valve's short travel guarantees smooth flow direction changes, conserves water supply, prevents filter site flooding, and eliminates mixing of supply and waste water. The BERMAD Model IR-2x2-350-P is available in Angle flow (A) and Straight flow (S) configurations.

Angle Flow

Straight Flow

Filter Backwash Hydraulic BERMAD Valve, 2x2 Metal Body

IR-2x2-350-R

This 2x2 Filter Backwash Hydraulic Valve features a metal body, providing rigid construction.
It is available in Angle flow (A) and Straight flow (S) configurations.

Angle Flow

Straight Flow

Filter Backwash Hydraulic BERMAD Valve, 3x3 Plastic

IR-3x3-350-P

This Double Chambered, Filter Backwash Hydraulic Valve suits filters with 3" Inlet and outlet Ports. It is available in Angle flow (A) and Straight flow (S) configurations.

Angle Flow

Straight Flow

Filter Backwash Hydraulic BERMAD Valve, 3x3 Metal Body

IR-3x3-350-I

This 3x3 Filter Backwash Hydraulic Valve features a metal body, providing rigid construction.
It is available in Angle flow (A) and Straight flow (S) configurations.

Filter Backwash Hydraulic Valve

2X2 Plastic

IR-2x2-350-P

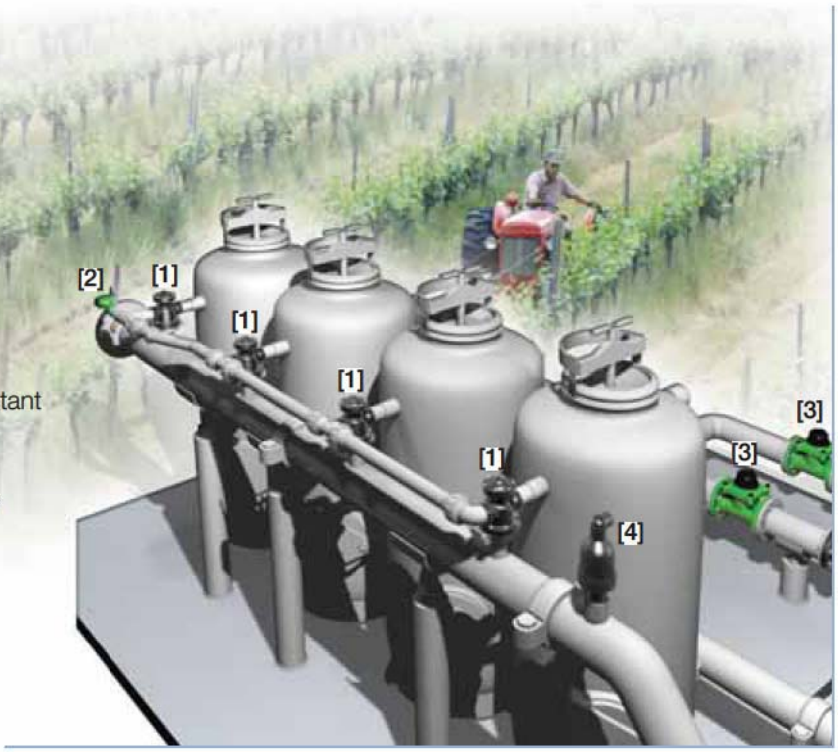
Angle Flow

Straight Flow

The BERMAD Model IR-2x2-350-P is a compact 3-port valve, in a T configuration. It is double chambered, hydraulically operated, and diaphragm actuated. Designed for automatic backwashing of filtration systems, the BERMAD Model IR-2x2-350-P is available in Angle flow (A) and Straight flow (S) configurations.

Features and Benefits

- Line Pressure Driven
- Double Chambered Design
  - Wide application range
  - Requires low actuation pressure
  - Protected diaphragm
- Dynamic Sealing
  - Seals at very low pressure
  - Prevents seal friction and erosion
- Engineered Plastic Valve Design
  - Highly durable, chemical and cavitation resistant
- Short Valve Travel
  - Smooth changes of flow direction
  - Eliminates mixing of supply and waste water
- User- Friendly
  - Can be installed in various orientations
  - Simple in-line inspection and service

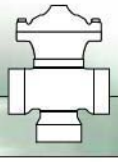


Typical Applications

- Automatic Backwash of Filter Batteries
  - Gravel Filters
  - Disc Filters
  - Screen Filters
- Single Filter Autonomic Backwash System
- Angled or Straight Installations

[1] BERMAD Model IR-2x2-350-A-P allows flow into the filter, switches closed upon pressure rise command blocking inlet to filter and enables backwash flow from the filter.
[2] BERMAD Backwash Flow Control Valve Model IR-470-beKU
[3] BERMAD Water meter Model WPH
[4] BERMAD Air Valve Model ARA-A-P-P

BERMAD Irrigation

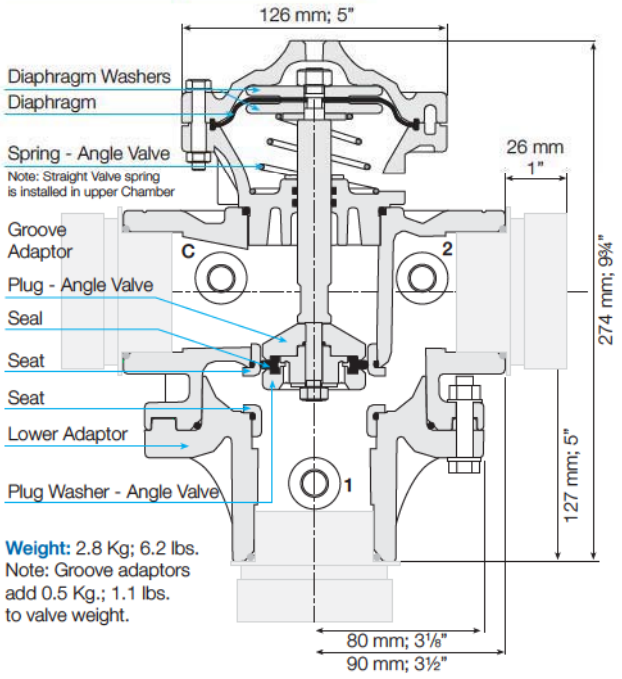


IR-2x2-350-P

350 Series
Filter Stations

For full technical details, refer to Engineering Section.

Technical Specifications



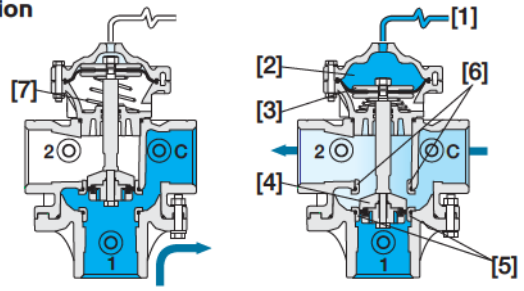
Weight: 2.8 Kg; 6.2 lbs.
Note: Groove adaptors add 0.5 Kg.; 1.1 lbs. to valve weight.

Hydraulic Data

Angle Flow	Filtartion 1⇒C	Backwash C⇒2	$\Delta P=\left(\frac{Q}{Kv}\right)^2$
	Kv=52 Cv=60	Kv=48 Cv=56	Kv = m³/h @ ΔP of 1 bar Q= m³/h ΔP = bar
Straight Flow	Filtartion 2⇒C	Backwash C⇒1	$\Delta P=\left(\frac{Q}{Cv}\right)^2$
	Kv=46 Cv=53	Kv=60 Cv=70	Cv = gpm @ ΔP of 1 psi Q= gpm ΔP = psi **Cv = 1.155 KV**

Operation

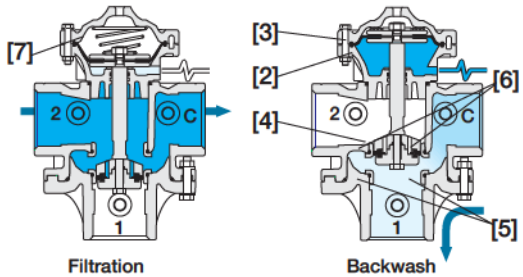
Angle Flow



Filtration Backwash

A Hydraulic Command **[1]**, which pressurizes the Upper Control Chamber **[2]**, forces the Diaphragm **[3]** actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

Straight Flow



Filtration Backwash

A Hydraulic Command **[1]**, which pressurizes the Lower Control Chamber **[2]**, forces the Diaphragm [3] actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

Technical Data

Control Chamber Displacment Volume: 0.13 liter; 0.04 gallon
Operating Pressure: 0.7-10 bar; 10-145 psi
External Operating Pressure: 85%-100% of operating pressure
Maximum Temperature: 65°C;150°F
End Connections: Threaded, Grooved (with adaptors)
Flow Patterns:
Angled Flow, Reverse Angled Flow, Straight Flow, Reverse Straight Flow

Materials

Valve Body, Separating Partition & Lower Adaptor:
Polyamide 6 – 30GF Black
Cover: Polyamide 6 – 30GF
Angle Flow: Black
Straight Flow: Gray
Diaphragm: NR-AL52 Nylon Fabric Reinforced
Seats, Diaphragm Washers: Brass
Plug, Plug Washer: Acetal Copolymer Black
Stopper Disk: PVC-U
Seal, O-Rings: NBR
Spring: Stainless Steel AISI 302
Shaft: Stainless Steel AISI 303
External Bolts, Studs, Nuts & Disks: Stainless Steel

How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide.)

Sector	Size	Primary Feature	Additional Feature	Pattern/ Flow Option	Construction Materials	Drain Connections	End Connections	Additonal Attributes	Coating	Voltage & Position	Tubing & Fittings
IR	2X2	350	00	A	P	P	VI	-	UC	00	PP

Primary Feature		Pattern/ Flow Option		Construction Materials		End Connections		Coating	
Angle Flow	A	Threaded BSP	P	Grooved ANSI C 606-81	VI	Uncoated	UC		
Straight Flow	S	Threaded NPT	N	BSP	BP				
Straigh & Reverse Flow	S-O	Grooved	V	NPT	NP				
Angle & Reverse Flow	A-O								

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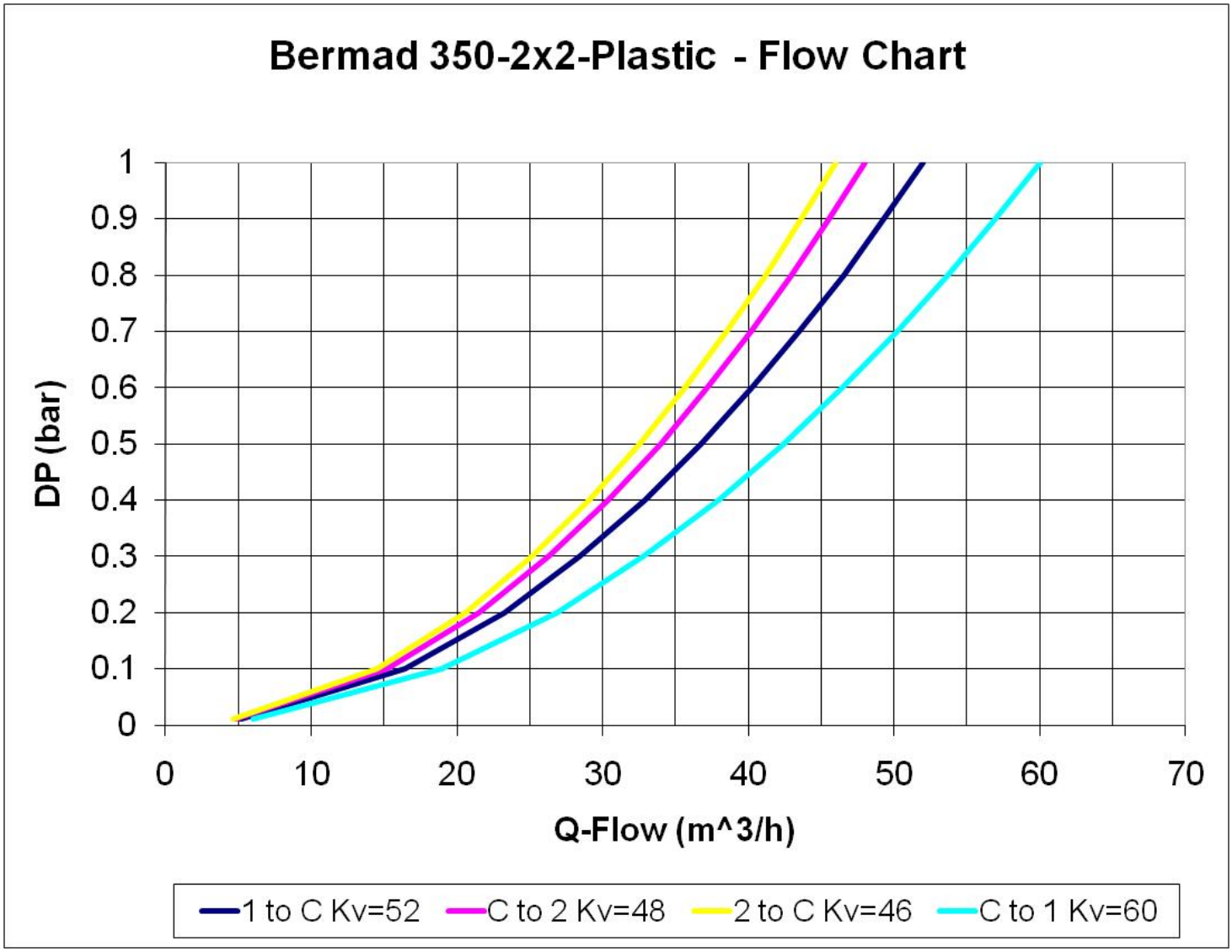
Bermad 350-2x2-Plastic



Edited by: R.L. 4/10/09	Approved by: R.L.	Item No.:	Notes:

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Spare Parts 350 series 2" Valves

"BERMAD" BACKFLUSH CONTROL VALVE

350 SERIES; Size 2"*2".

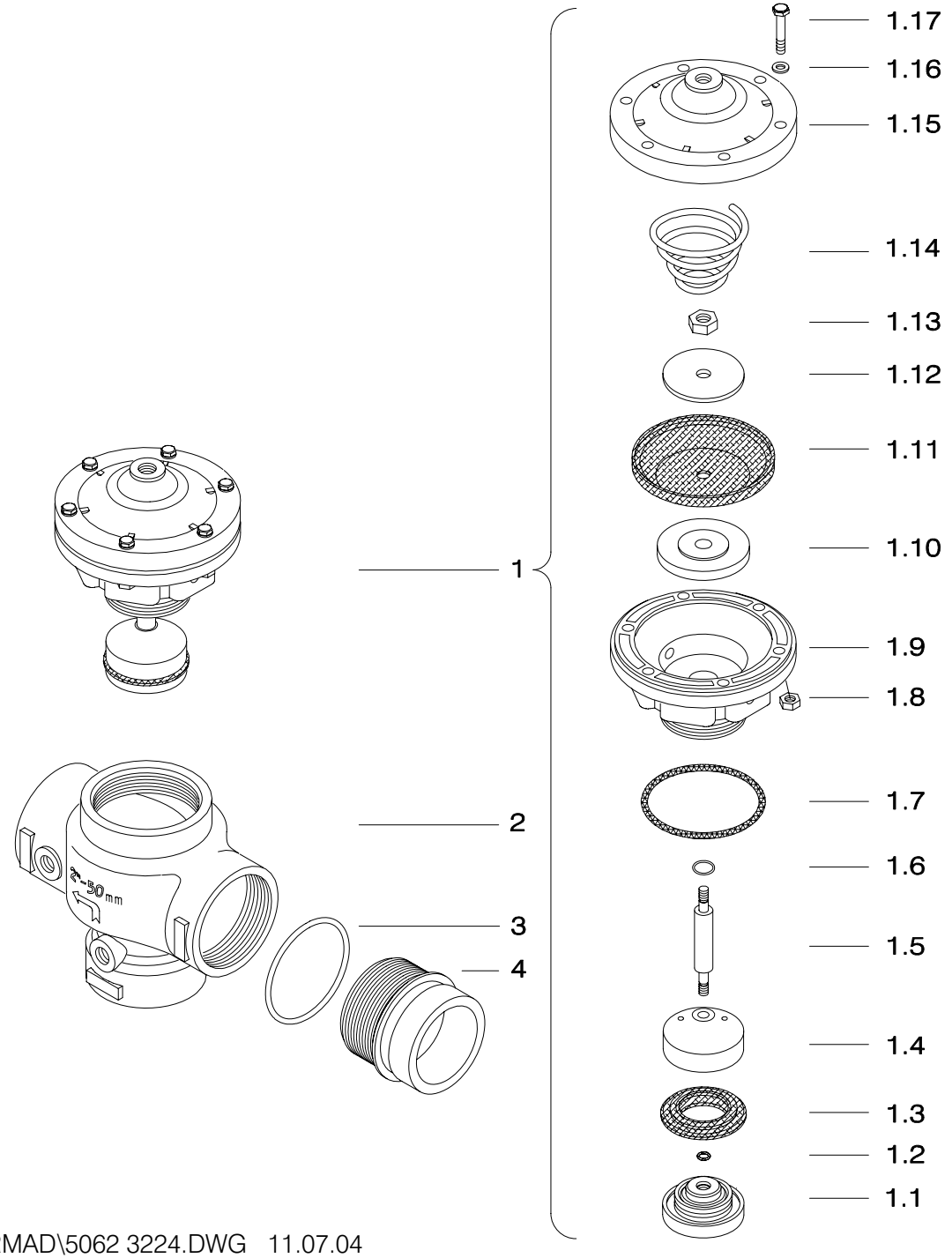
ARKAL Cat. no.: 5062 3224 REVERSE FLOW (RED COLOR)

PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS
1.	5062 3222 01	INTERNAL ASSEMBLY	
1.1.	5062 3222 101	PLUG'S WASHER	ACETAL
1.2.	5062 3222 102	"O-RING"	N.B.R.
1.3.	5062 3222 103	SEAL	EPDM
1.4.	5062 3222 104	PLUG	S.S.T.316
1.5.	5062 3222 105	SHAFT	S.S.T.303
1.6.	5062 3222 106	"O-RING"	N.B.R.
1.7.	5062 3222 107	"O-RING"	N.B.R.
1.8.	5062 3222 108	NUT	ZC
1.9.	5062 3222 109	SEPARATION PARTITION	R.P.A.
1.10.	5062 3222 110	SUPPORTING DISC	BRASS
1.11.	5062 3222 111	DIAFRAGM	N.R.
1.12.	5062 3222 110	DISC	BRASS
1.13.	5062 3222 113	NUT	ZC
1.15.	5062 3222 115	SPRING	S.S.T.304
1.15.	5062 3224 116	BLACK COVER	R.P.A.
1.16.	5062 3222 117	WASHER	S.S.T.316
1.17.	5062 3222 117	BOLTS	ZC
2.	5062 3222 04	THREADED BODY	C.I.
3.	5062 1222 02	"O-RING"	EPDM
4.	5062 1222 03	2" THR.-VIC. ADAPTER	R.P.A.

MATERIALS:

C.I. - CAST-IRON
N.R. - NUTURAL RUBBER
S.S. - STAINLESS STEEL
N.B.R. - NITRILE RUBBER
ZC -ZINC NICKEL COATED



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PLASTIC BACKWASH FILTER VALVE – DOUBLE CHAMBER

350 Series; Size 2"*2"

ARKAL Cat. No: 5062 0226WS REVERSE FLOW (SEA WATER)

PARTS LIST

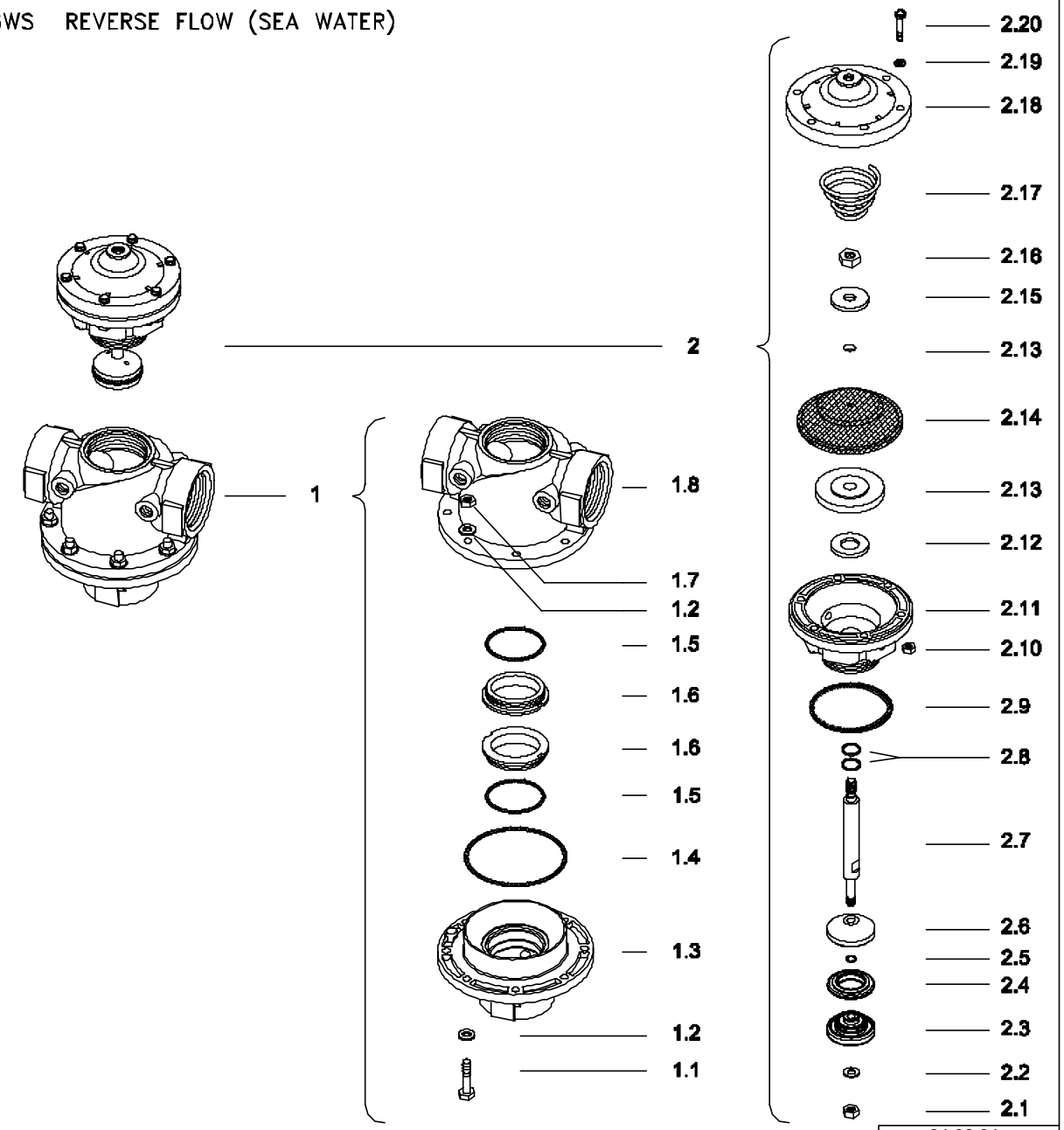
No:	ARKAL Cat. No:	PARS DESCRIPTION	MATERIALS
1.	5062 0224 01	ASSEMBLY BODY	
1.1	5062 0224 11	BOLT	AISI 316
1.2	5062 0224 12	WASHER	AISI 316
1.3	5062 0224 13	LOWER ADAPTER	R.P.A.
1.4	5062 0224 14	"O- RING"	N.B.R.
1.5	5062 1222 02	"O- RING"	N.B.R.
1.6	5062 0224 16	LOWER/UPPER SEAT	AISI 316
1.7	5062 1237 114	NUT	AISI 316
1.8	5062 0224 18	BODY	R.P.A.
2	5062 0224 02	ACTUATOR ASSEMBLY	
2.1	5062 0224 21	NUT	AISI 316
2.2	5062 0224 22	WASHER	AISI 316
2.3	5062 0226 23	PLUG'S WASHER	ACETAL
2.4	5062 0224 24	SEAL	N.B.R.
2.5	5062 1231 302	"O" RING	N.B.R.
2.6	5062 0226 26	PLUG	ACETAL
2.7	5062 0224 27	SHAFT	AISI 316
2.8	5062 1237 110	"O" RING	N.B.R.
2.9	5062 0022 208	"O" RING	N.B.R.
2.10	5062 3222 108	NUT	AISI 316
2.11	5062 3222 109	SEPARATION PARTITION	R.P.A.
2.12	5062 0224 212	SPRING WASHER	AISI 316
2.13	5062 0022 205	DISK	AISI 316
2.14	5062 3222 111	DIAPHRAGM	NR-AL52
2.15	5062 0224 215	STOPPER DISK	PVC-U
2.16	5062 3222 113	NUT	AISI 316
2.17	5062 3222 115	SPRING	AISI 316
2.18	5062 3224 116	BLACK COVER	R.P.A.
2.19	5062 3222 117	WASHER	AEGP 316
2.20	5062 3222 118	BOLT	AISI 316

MATERIALS:

R.P.A. - REINFORCED POLYAMIDE

N.B.R. - NITRILE RUBBER

AISI 316 - STAINLESS STEEL



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PLASTIC BACKWASH FILTER VALVE – DOUBLE CHAMBER

350 Series; Size 2"*2"

ARKAL Cat. No: 5062 0224WS STRAIGHT FLOW (SEA WATER)

PARTS LIST

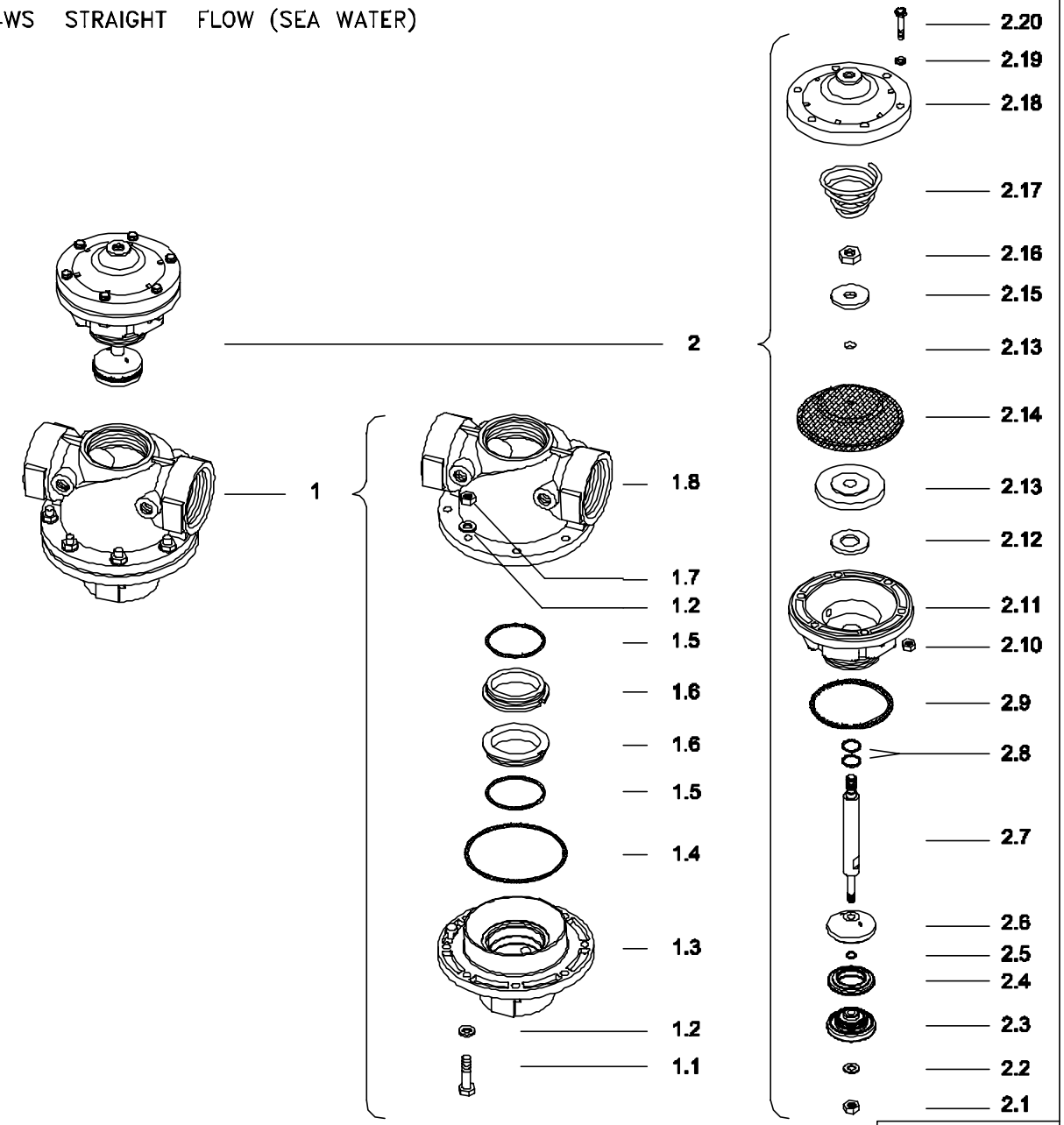
No:	ARKAL Cat. No:	PARS DESCRIPTION	MATERIALS
1.	5062 0224 01	ASSEMBLY BODY	
1.1	5062 0224 11	BOLT	AISI 316
1.2	5062 0224 12	WASHER	AISI 316
1.3	5062 0224 13	LOWER ADAPTER	R.P.A.
1.4	5062 0224 14	"O- RING"	N.B.R.
1.5	5062 1222 02	"O- RING"	N.B.R.
1.6	5062 0224 16	LOWER/UPPER SEAT	AISI 316
1.7	5062 1237 114	NUT	AISI 316
1.8	5062 0224 18	BODY	R.P.A.
2	5062 0224 02	ACTUATOR ASSEMBLY	
2.1	5062 0224 21	NUT	AISI 316
2.2	5062 0224 22	WASHER	AISI 316
2.3	5062 0224 23	PLUG'S WASHER	ACETAL
2.4	5062 0224 24	SEAL	N.B.R.
2.5	5062 1231 302	"O" RING	N.B.R.
2.6	5062 0224 26	PLUG	ACETAL
2.7	5062 0224 27	SHAFT	AISI 316
2.8	5062 1237 110	"O" RING	N.B.R.
2.9	5062 0022 208	"O" RING	N.B.R.
2.10	5062 3222 108	NUT	AISI 316
2.11	5062 3222 109	SEPARATION PARTITION	R.P.A.
2.12	5062 0224 212	SPRING WASHER	AISI 316
2.13	5062 0022 205	DISK	AISI 316
2.14	5062 3222 111	DIAPHRAGM	NR-AL52
2.15	5062 0224 215	STOPPER DISK	PVC-U
2.16	5062 3222 113	NUT	AISI 316
2.17	5062 3222 115	SPRING	AISI 316
2.18	5062 3222 116	GREY COVER	R.P.A.
2.19	5062 3222 117	WASHER	AEGP 316
2.20	5062 3222 118	BOLT	AISI 316

MATERIALS:

R.P.A. - REINFORCED POLYAMIDE

N.B.R. - NITRILE RUBBER

AISI 316 - STAINLESS STEEL



30.06.04

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PLASTIC BACKWASH FILTER VALVE – DOUBLE CHAMBER

350 Series; Size 2"*2"

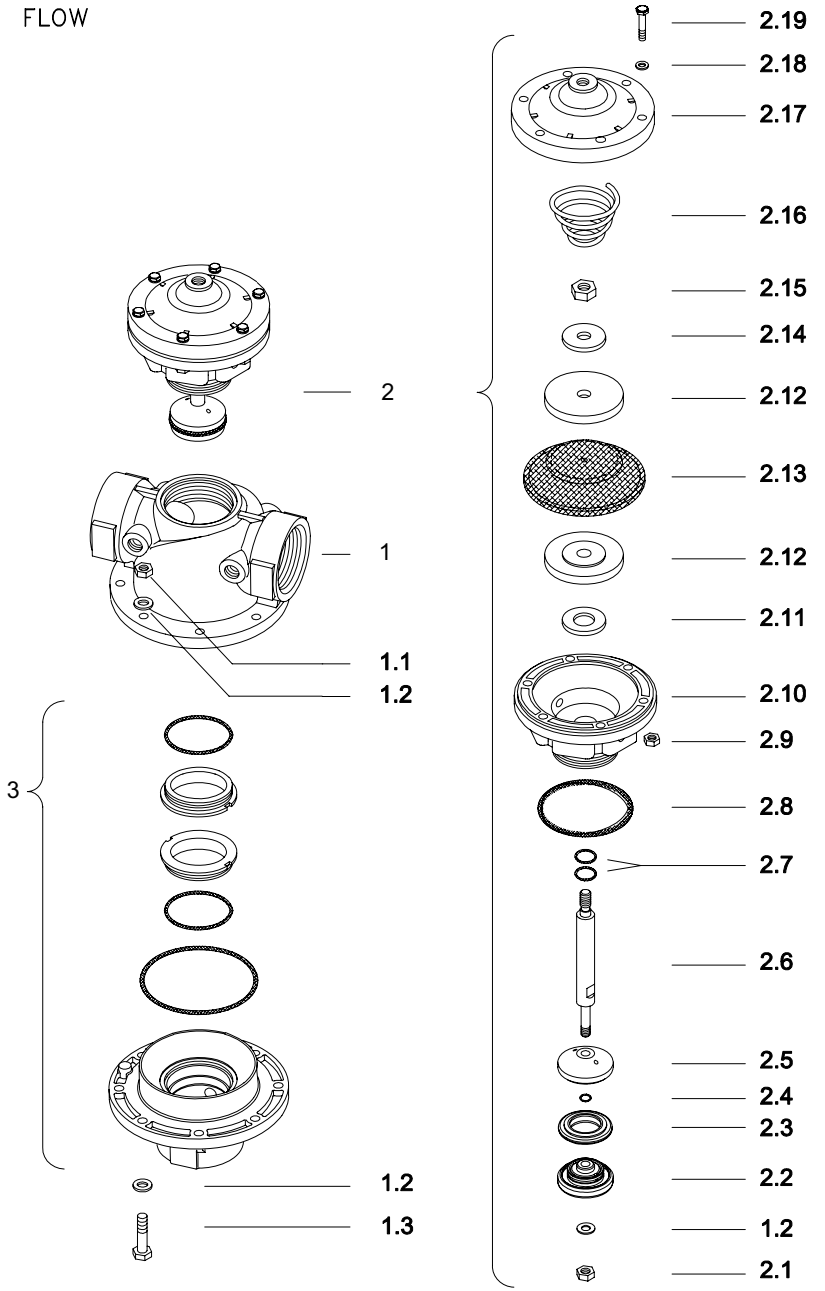
ARKAL Cat. No: 5062 0224 STRAIGHT FLOW

PARTS LIST

No:	ARKAL Cat. No.:	PARS DESCRIPTION	MATERIALS
1.	5062 0224 01	BODY	R.P.A.
1.1	5062 1237 114	NUT	AISI 316
1.2	5062 1231 05	WASHER	M8 DIN 125A ZNC
1.3	5062 0224 01	BOLT	M8 DIN 931 ZNC
2.	5062 0224 02	ACTUATOR ASSEMBLY	
2.1	5062 0224 61	NUT	AISI 316
2.2	5062 0224 62	PLUG'S WASHER	ACETAL
2.3	5062 0224 63	SEAL	N.B.R.
2.4	5062 3232 102	"O" RING	N.B.R.
2.5	5062 0224 65	PLUG	ACETAL
2.6	5062 0224 66	SHAFT	AISI 303
2.7	5062 1237 110	"O" RING	N.B.R.
2.8	5062 0022 208	"O" RING	N.B.R.
2.9	5062 0022 207	NUT	M6 DIN 934 ZNC
2.10	5062 3222 109	SEPARATION PARTITION	R.P.A.
2.11	5062 0022 205	SPRING WASHER	BRASS
2.12	5062 0224 612	DISK	BRASS
2.13	5062 3222 111	DIAPHRAGM	NR-AL52
2.14	5062 0224 614	STOPPER DISK	PVC-U
2.15	5062 3222 113	NUT	AISI 316
2.16	5062 3222 115	SPRING	AISI 302
2.17	5062 3222 116	GREY COVER	R.P.A.
2.18	5062 3222 117	WASHER	AEGP 316
2.19	5062 3222 114	BOLT	M6 DIN 933 ZNC
3.	5062 0224 03	ASSEMBLY LOWER ADAPTER	

MATERIALS:

R.P.A. - REINFORCED POLYAMIDE
M8 DIN 931 ZNC - STEEL
M8 DIN 125A ZNC - STEEL
N.B.R. - NITRILE RUBBER
AISI 316 - STAINLESS STEEL
AISI 304 - STAINLESS STEEL
M8 DIN 125A ZNC - STEEL
M6 DIN 934 ZNC - STEEL



31.10.04

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Filter Backwash Hydraulic Valve

3x3 Plastic

IR-3x3-350-P

Angle Flow

Straight Flow

The BERMAD Model IR-3x3-350-P is a compact 3-port valve, in a T configuration. It is double chambered, hydraulically operated, and diaphragm actuated. Designed for automatic backwashing of filtration systems, the BERMAD Model IR-3x3-350-P is available in Angle flow (A) and Straight flow (S) configurations.

Features and Benefits

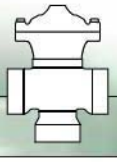
- Line Pressure Driven
- Double Chambered Design
  - Wide application range
  - Requires low actuation pressure
  - Protected diaphragm
- Dynamic Sealing
  - Seals at very low pressure
  - Prevents seal friction and erosion
- Engineered Plastic Valve Design
  - Highly durable, chemical and cavitation resistant
- Short Valve Travel
  - Smooth changes of flow direction
  - Eliminates mixing of supply and waste water
- User- Friendly
  - Can be installed in various orientations
  - Simple in-line inspection and service

Typical Applications

- Automatic Backwash of Filter Batteries
  - Gravel Filters
  - Sand Filters
  - Disk Filters
  - Screen Filters
- Single Filter Autonomic Backwash System
- Angled or Straight Installations

[1] BERMAD Model IR-3x3-350-S-P allows flow into the filter, switches closed upon pressure rise command blocking inlet to filter and enables backwash flow from the filter.
[2] BERMAD Hydrompter Model IR-900-M0
[3] BERMAD Air Valve Model ARA-A-I-P

BERMAD Irrigation

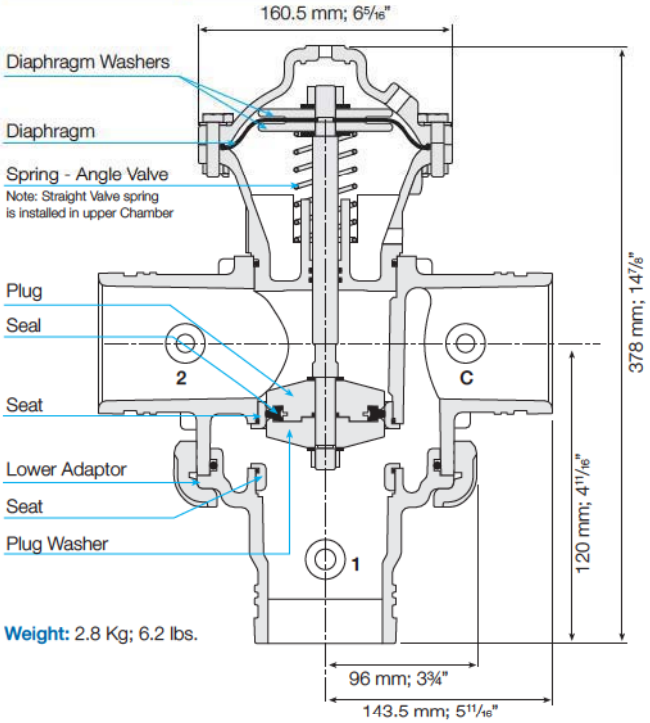


IR-3x3-350-P

350 Series
Filter Stations

For full technical details, refer to Engineering Section.

Technical Specifications



Weight: 2.8 Kg; 6.2 lbs.

Technical Data

Control Chamber Displacment Volume: 0.34 liter; 0.09 gallon
Operating Pressure: 0.7-10 bar; 10-145 psi
External Operating Pressure: 85%-100% of operating pressure
Maximum Temperature: 65°C;150°F
End Connections: Grooved
Flow Patterns:
Angled Flow, Reverse Angled Flow, Straight Flow, Reverse Straight Flow

Materials

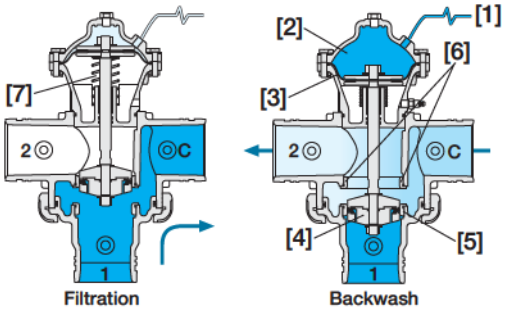
Valve Body, Separating Partition & Lower Adaptor:
Polyamide 6 – 30GF Black
Cover: Polyamide 6 – 30GF
Angle Flow – Black
Straight Flow – Gray
Diaphragm: NR-AL52 Nylon Fabric Reinforced
Seats, Diaphragm Washers: Brass
Plug, Plug Washer: Acetal Copolymer Black
Stopper Disk: PVC-U
Seal, O-Rings: NBR
Spring: Stainless Steel AISI 302
Shaft: Stainless Steel AISI 303
External Bolts, Studs, Nuts & Disks: Stainless Steel

Hydraulic Data

	Filtartion 1⇒C	Backwash C⇒2	
Angle Flow			$\Delta P=\left(\frac{Q}{Kv}\right)^2$
	Kv=110 Cv=127	Kv=100 Cv=115	Kv = m³/h @ ΔP of 1 bar Q= m³/h ΔP = bar
	Filtartion 2⇒C	**Backwash C⇒1**	
Straight Flow			$\Delta P=\left(\frac{Q}{Cv}\right)^2$
	Kv=93 Cv=107	Kv=122 Cv=141	Cv = gpm @ ΔP of 1 psi Q= gpm ΔP = psi **Cv = 1.155 KV**

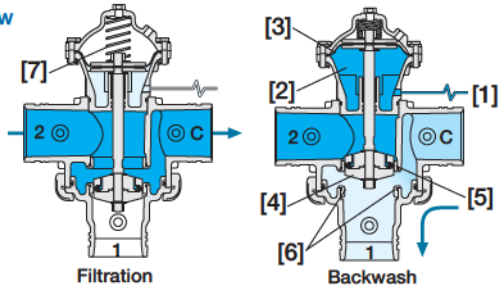
Operation

Angle Flow



A Hydraulic Command **[1]**, which pressurizes the Upper Control Chamber **[2]**, forces the Diaphragm **[3]** actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

Straight Flow



A Hydraulic Command **[1]**, which pressurizes the Lower Control Chamber **[2]**, forces the Diaphragm **[3]** actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide.)

Sector	Size	Primary Feature	Additional Feature	Pattern/ Flow Option	Construction Materials	Drain Connections	End Connections	Additonal Attributes	Coating	Voltage & Position	Tubing & Fittings
IR	3X3	350	00	S	P	V	VI	-	UC	00	PP

Angle Flow	A	Grooved	V	Grooved ANCI C606-81	V1	Uncoated	UC	Plastic Tubing & Fillings	PP		
Straight Flow	S										
Straigh & Reverse Flow	S-O										
Angle & Reverse Flow	A-O										

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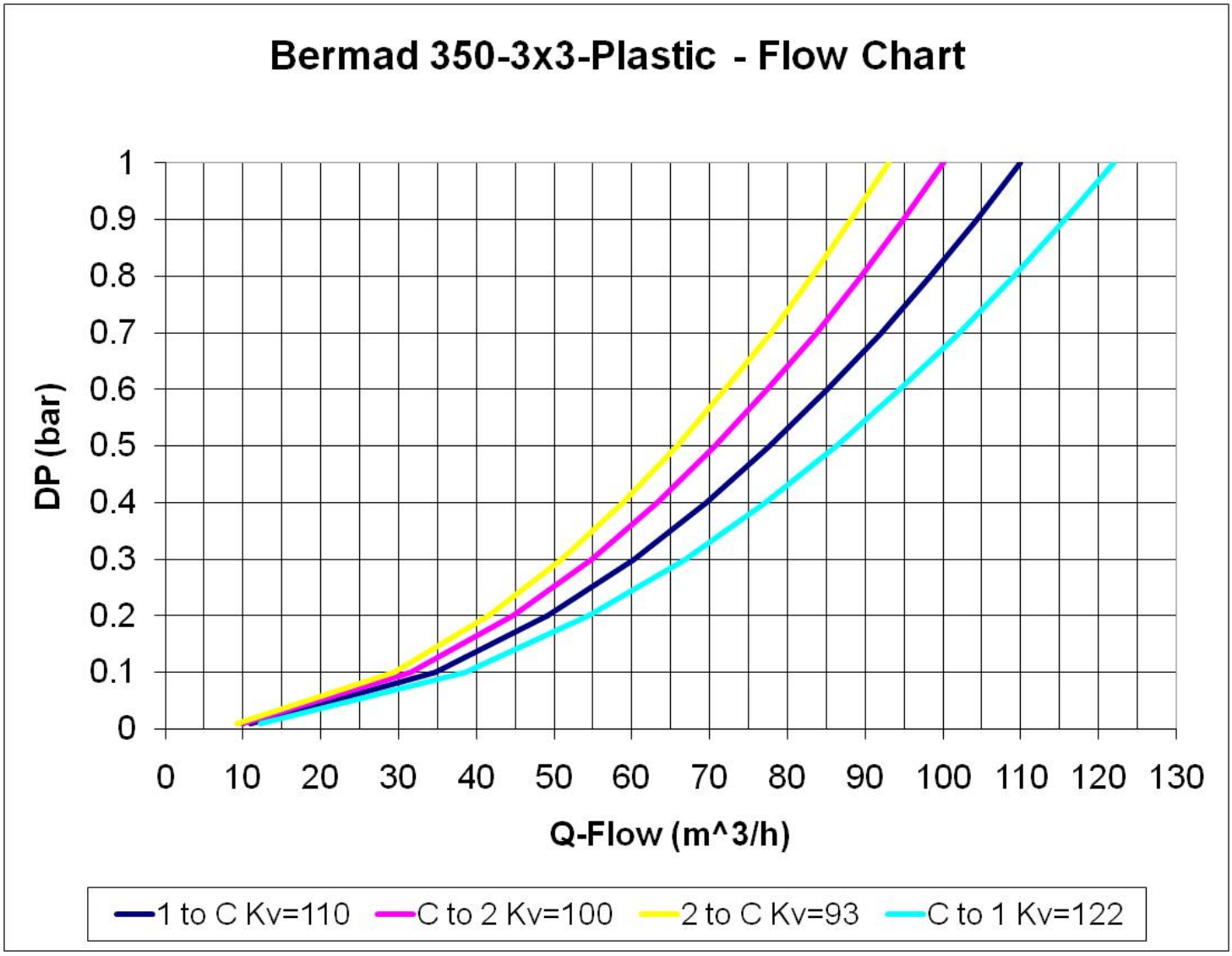
Bermad 350-3x3-Plastic



Edited by: R.L. 4/10/09	Approved by: R.L.	Item No.:	Notes:

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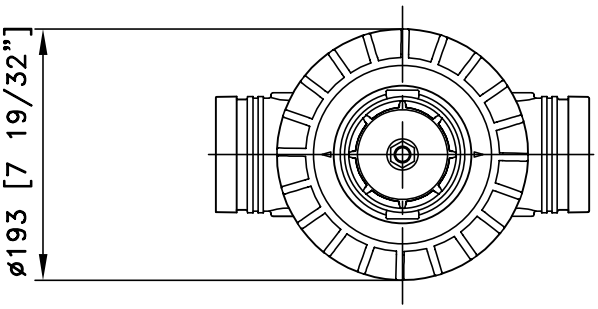
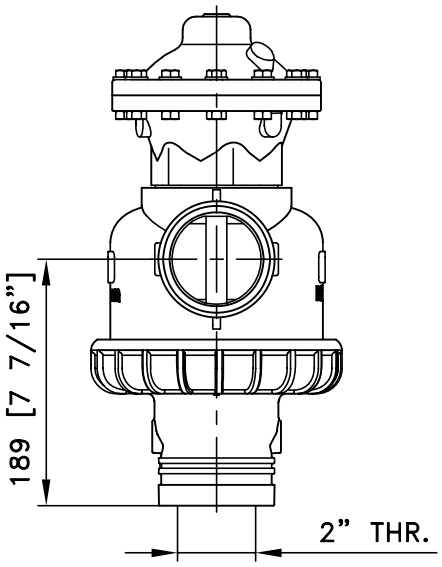
Spare Parts 350 series 3" Valves

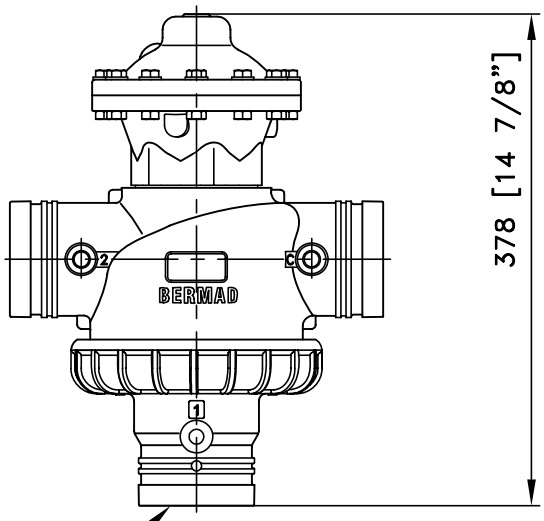
BACKUP VIEW



SIDE VIEW

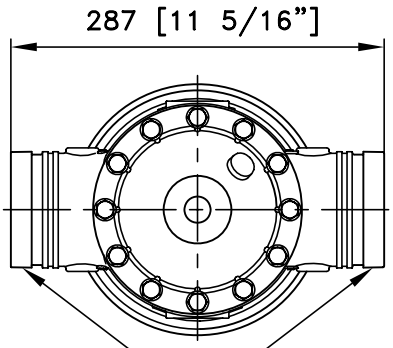


FRONT VIEW



3" VICTAULIC END

TOP VIEW



3" VICTAULIC ENDS

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3"*3" "BERMAD" PLASTIC BACK WASH VALVE — PAGE 1 OF 2

TITLE: ASSEMBLY DRAWING — CATALOGUE No: 5062 1247

PATH:	FILE CODE	NAME	DATE	SIGNATURE
MASTERS\VALVES\STANDARD	5062 1247-ASS	IRINA	22.10.06	ORLY

	NAME	DATE
DRAWN	NIKOLAY	22.10.06
CHECKED	OMRY	22.10.06
APPROVED		

FILE CODE DRAWING OF MANIFOLD: — BACKUP:

VIEWS: FRONT,TOP,SIDE & BACKUP — DRAWER N: 36

"BERMAD" BACKWASH PLASTIC VALVE

350 SERIES; Size 3"*3" VICTAULIC ENDS

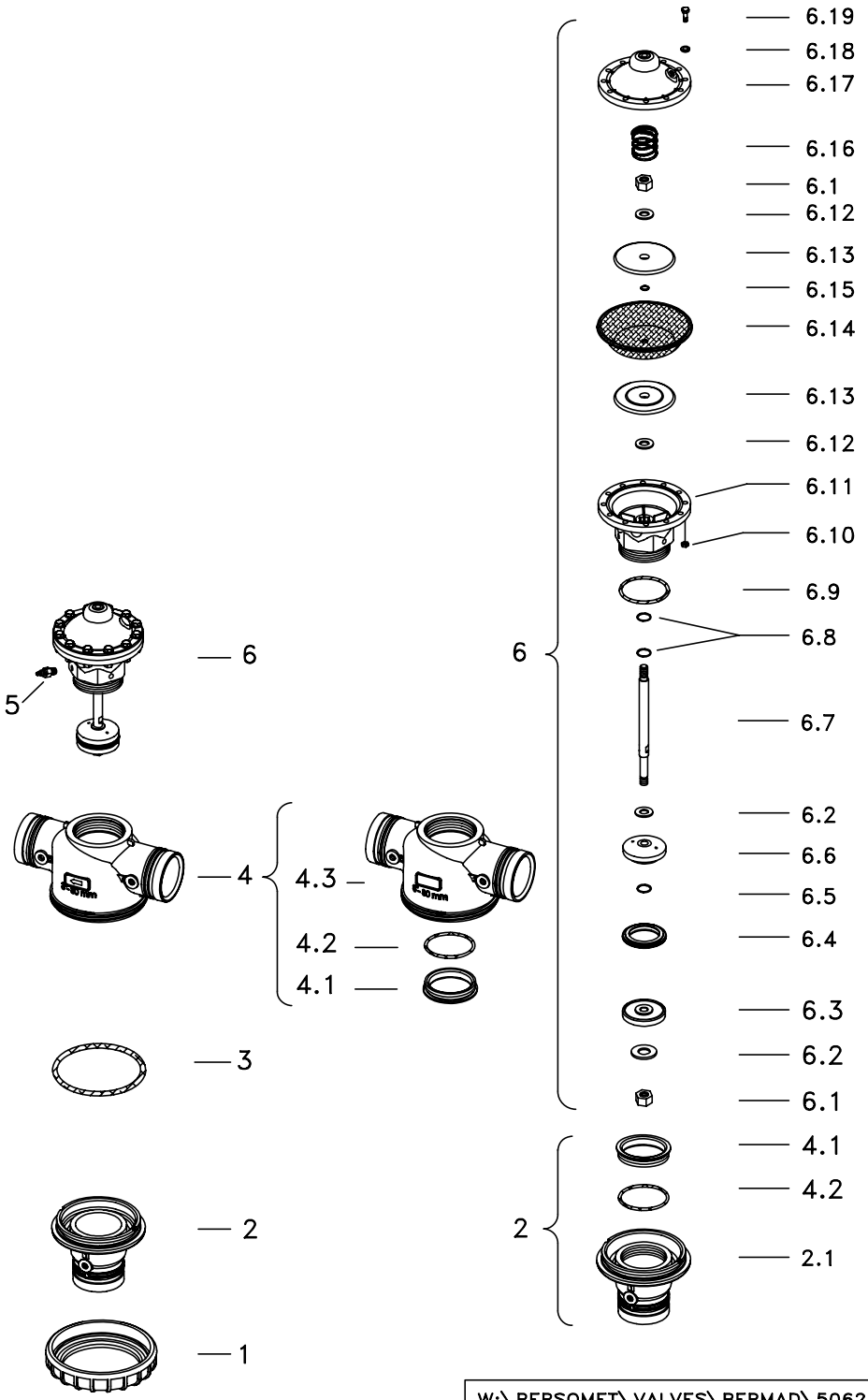
ARKAL Cat. no.: 5062 1247 STRAIGHT FLOW

PARTS LIST

No:	ARKAL Cat. No.:	PARS DESCRIPTION	MAT.
1.	5062 1247 01	COVER RING	RPA
2.	5062 1247 02	LOWER ADAPTER ASSEMBLY	
2.1	5062 1247 201	LOWER ADAPTER	RPA
3.	5062 1247 03	"O" RING 2-356	NBR
4.	5062 1247 04	BODY ASSEMBLY	
4.1	5062 1247 401	SEAT	304 SS
4.2	5062 1247 402	"O" RING 2-152	NBR
4.3	5062 1247 403	BODY	RPA
5.	5062 1917	STRAIGHT CONNECTOR 1/8"*8mm	ACETAL
6.	5062 1247 06	ACTUATOR ASSEMBLY	
6.1	5062 1237 101	1/2" NUT	316 SS
6.2	5062 1237 106	DISK M12	303 SS
6.3	5062 1247 603	SEAL WASHER	ACETAL
6.4	5062 1231 303	DINAMIC SEAL	NBR
6.5	5062 4340 302	"O" RING 2-112	NBR
6.6	5062 1247 606	PLUG	ACETAL
6.7	5062 1247 607	SHAFT	303 SS
6.8	5062 1237 110	"O" RING 5-617	NBR
6.9	5062 1237 113	"O" RING 2-236	NBR
6.10	5062 1237 114	M8 NUT	316 SS
6.11	5062 1247 608	SEPARATING PARTITION	RPA
6.12	5062 1247 609	SPRING WASHER	BRASS
6.13	5062 1237 116	DIAFRAGM WASHER	BRASS
6.14	5062 1237 117	DIAFRAGM	NR
6.15	5062 1247 610	"0" RING	NBR
6.16	5062 1247 409	WASHER INTERNAL SPRING	302 SS
6.17	5062 1237 120	GREY COVER-STRAINGHT FLOW	RPA
6.18	5062 1231 05	DISK M8	304 SS
6.19	5062 1237 122	M8*35 BOLT	304 SS

MATERIALS:

N.R. - NATURAL RUBBER
N.B.R. - NITRILE RUBBER
AISI 303 - STAINLESS STEEL
R.P.A. - REINFORCED POLYAMIDE



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Filter Backwash Hydraulic Valve

3X3 Metal Body

IR-3x3-350-I

Angle Flow

Straight Flow

The BERMAD Model IR-3x3-350-I is a compact 3-port valve, in a T configuration. It is double chambered, hydraulically operated, and diaphragm actuated. Designed for automatic backwashing of filtration systems, the BERMAD Model IR-3x3-350-I is available in Angle flow (A) and Straight flow (S) configurations.

Features and Benefits

- Line Pressure Driven
- Double Chambered Design
  - Wide application range
  - Requires low actuation pressure
  - Protected diaphragm
- Dynamic Sealing
  - Seals at very low pressure
  - Prevents seal friction and erosion
- Cast Iron Body
  - Rigid construction, high stress resistance
- Short Valve Travel
  - Smooth changes of flow direction
  - Eliminates mixing of supply and waste water
- User- Friendly
  - Can be installed in various orientations
  - Simple in-line inspection and service

Typical Applications

- Automatic Backwash of Filter Batteries
  - Gravel Filters
  - Sand Filters
  - Disk Filters
  - Screen Filters
- Single Filter Autonomic Backwash System
- Angled or Straight Installations

[1] BERMAD Model IR-3x3-350-S-I allows flow into the filter, and switches closed upon pressure rise command, thereby blocking inlet to filter and enabling backwash flow from the filter.
[2] BERMAD Hydrometer Model IR-900-M0
[3] BERMAD Air Valve Model ARC-A-I-P

BERMAD Irrigation

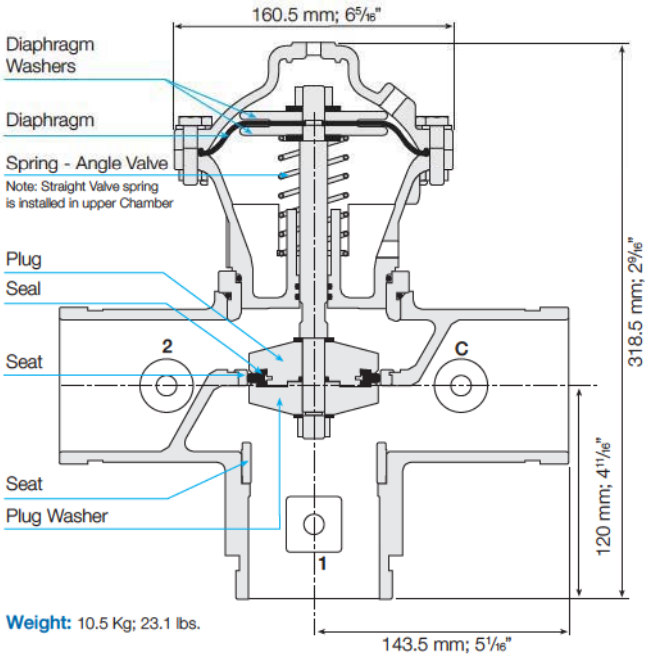
IR-3x3-350-I

350 Series

Filter Stations

For full technical details, refer to Engineering Section.

Technical Specifications



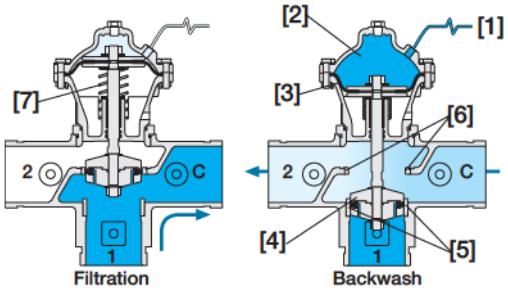
Weight: 10.5 Kg; 23.1 lbs.

Hydraulic Data

Angle Flow	Filtartion 1⇒C		Backwash C⇒2		$\Delta P=\left(\frac{Q}{Kv}\right)^2$ Kv = m³/h @ ΔP of 1 bar Q= m³/h ΔP = bar
	Kv=108	Cv=125	Kv=79	Cv=91	
Straight Flow	Filtartion 2⇒C		Backwash C⇒1		$\Delta P=\left(\frac{Q}{Cv}\right)^2$ Cv = gpm @ ΔP of 1 psi Q= gpm ΔP = psi
	Kv=71	Cv=82	Kv=70	Cv=81	**Cv = 1.155 KV**

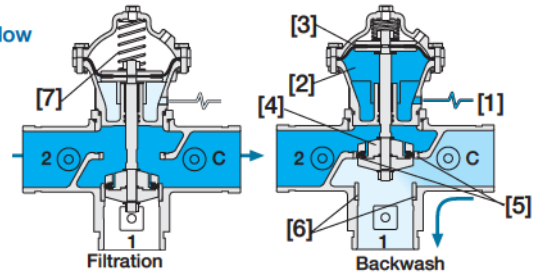
Operation

Angle Flow



A Hydraulic Command **[1]**, which pressurizes the Upper Control Chamber **[2]**, forces the Diaphragm **[3]** actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

Straight Flow



A Hydraulic Command **[1]**, which pressurizes the Lower Control Chamber **[2]**, forces the Diaphragm **[3]** actuated Plug Assembly **[4]** to move towards the Supply Port Seat **[5]**, eventually sealing it drip tight. This allows flow from the filter through the Drain Port Seat **[6]**. Venting the upper control chamber causes the line pressure, together with the Spring **[7]** force, to move the Valve back to filtration mode.

Technical Data

Control Chamber Displacment Volume: 0.34 liter; 0.09 gallon
Operating Pressure: 0.7-10 bar; 10-145 psi
External Operating Pressure: 85%-100% of operating pressure
Maximum Temperature: 65°C;150°F
End Connections: Grooved
Flow Patterns:
Angled Flow, Reverse Angled Flow, Straight Flow, Reverse Straight Flow

Materials

Valve Body: Cast Iron
Separating Partition: Polyamide 6 – 30GF Black
Cover: Polyamide 6 – 30GF
Angle Flow – Black
Straight Flow – Gray
Diaphragm: NR-AL52 Nylon Fabric Reinforced
Seats, Diaphragm Washers: Brass
Plug, Plug Washer: Acetal Copolymer Black
Stopper Disk: PVC-U
Seal, O-Rings: NBR
Spring: Stainless Steel AISI 302
Shaft: Stainless Steel AISI 303
External Bolts, Studs, Nuts & Disks: Stainless Steel

How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide.)

Sector	Size	Primary Feature	Additional Feature	Pattern/ Flow Option	Construction Materials	Drain Connections	End Connections	Additonal Attributes	Coating	Voltage & Position	Tubing & Fittings
IR	3X3	350	00	S	I	V	VI	-	PG	00	PP

Angle Flow	A	Grooved	V	Grooved ANSI C 606-81	VI	Polyester Green RAL 6017	PG	Plastic Tubing & Fittings	PP
Straight Flow	S					Polyester Blue RAL 5010	PB	Plastic Tubing & Brass Fittings	PB
Straigh & Reverse Flow	S-O					Polyester Red RAL 3000	PR		
Angle & Reverse Flow	A-O								

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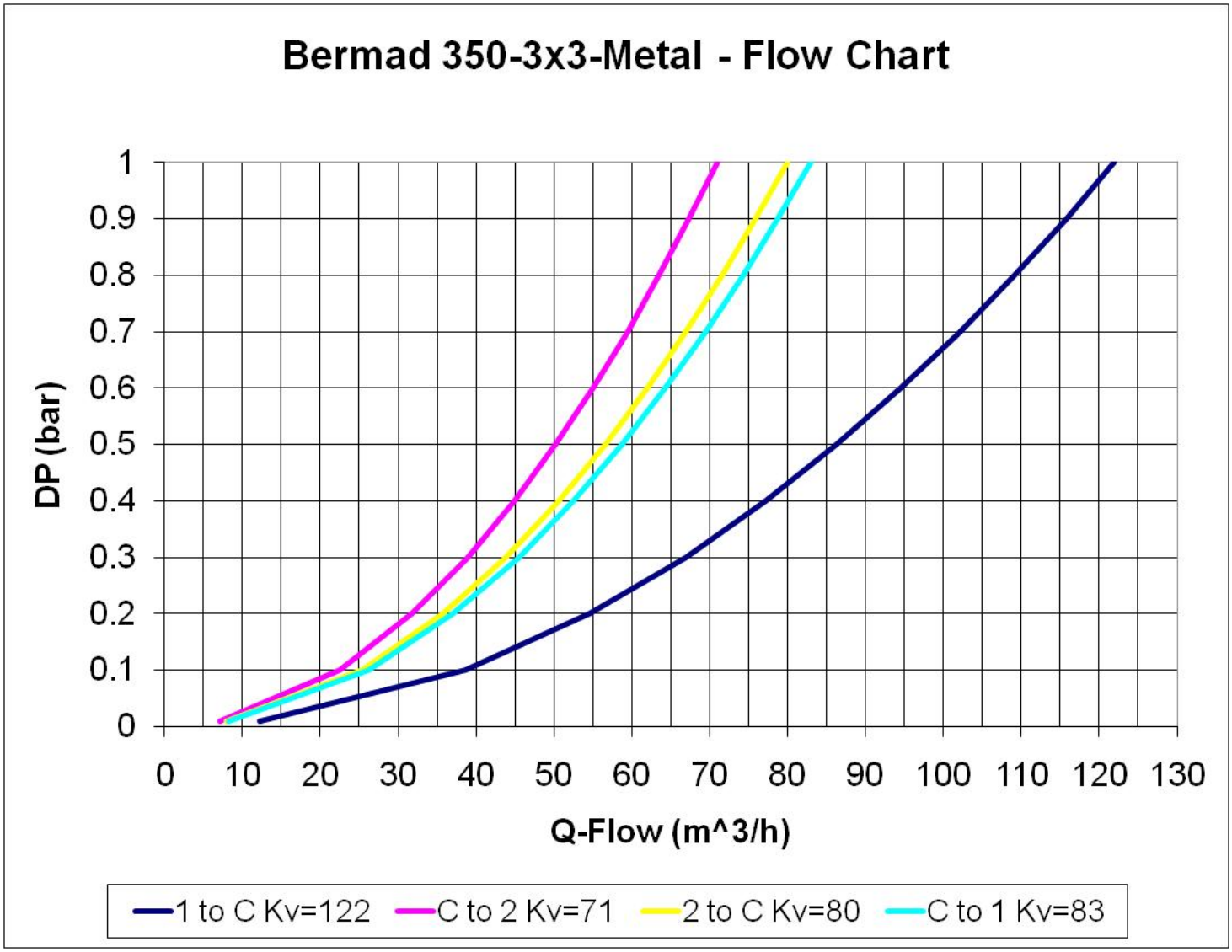
Bermad 350-3x3-Metal



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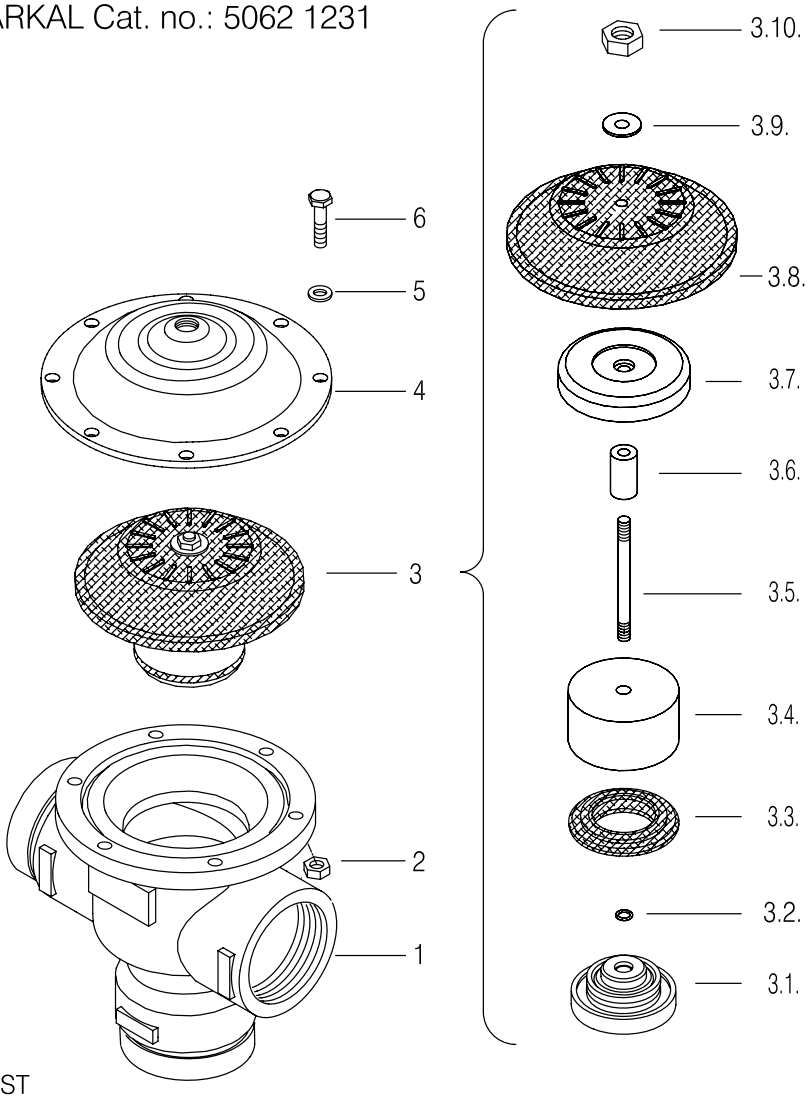
Spare Parts 350 series 3" Valves

"BERMAD" BACKFLUSH CONTROL VALVE

350 SERIES; Size 3"*2".

ARKAL Cat. no.: 5062 1231



PARTS LIST

NO.	ARKAL CAT.NO.	PARTS DESCRIPTION	MATERIALS
1.	5062 1231 01	VICTAULIC- THREADED BODY	C.I.
2.	5062 1231 02	NUT	S.S.
3.	5062 4012	INTERNAL ASSEMBLY	
3.1.	5062 1231 301	PLUG WASHER	BRASS
3.2.	5062 1231 302	"O-RING"	N.R.
3.3.	5062 1231 303	SEAL	N.R.
3.4.	5062 1231 304	PLUG	DELERIN
3.5.	5062 1231 305	SHAFT	S.S.
3.6.	5062 1231 306	SPACER	BRASS
3.7.	5062 1231 307	WASHER	BRASS
3.8.	5062 1231 308	DIAPHRAGM	N.R.
3.9.	5062 1231 309	DISC	BRASS
3.10.	5062 1231 310	NUT	S.S.
4.	5062 1231 04	COVER	STEEL
5.	5062 1231 05	WASHER	S.S.
6.	5062 1231 06	BOLT	S.S.

MATERIALS:

C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL

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"BERMAD" BACKWASH VALVE DOUBLE CHAMBER

350 SERIES; Size 3"*3" VICTAULIC ENDS

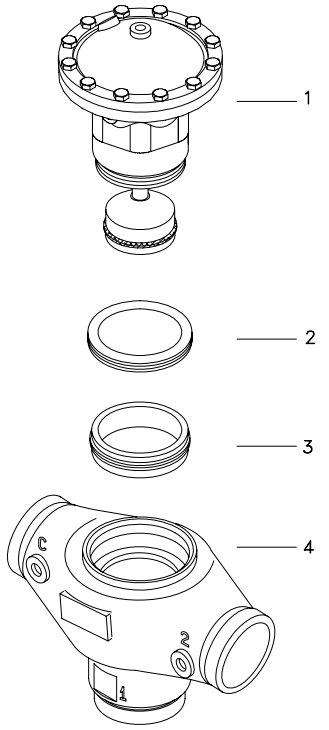
ARKAL Cat. no.: 5062 1237 STRAIGHT FLOW

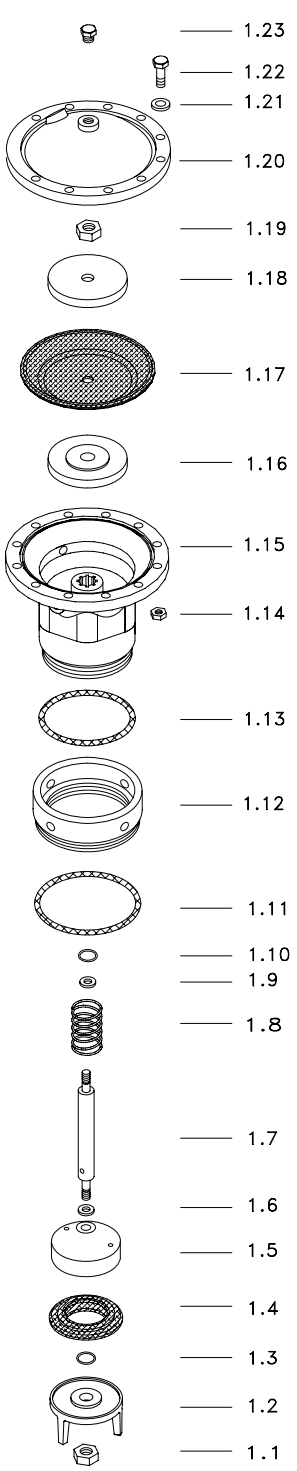
PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 1237 01	ACTUATOR ASSEMBLY	
1.1	5062 1237 101	NUT	AISI 316
1.2	5062 1237 102	LOWER GUIDE	BRONZE
1.3	5062 1237 103	"O-RING"	N.B.R.
1.4	5062 1237 104	SEAL	N.B.R.
1.5	5062 1237 105	PLUG	ACETAL
1.6	5062 1237 106	DISC	AISI 303
1.7	5062 1237 107	SHAFT	AISI 303
1.8	5062 1237 108	CLOSING SPRING	AISI 302
1.9	5062 1237 109	DISC	AISI 316
1.10	5062 1237 110	"O-RING"	N.B.R.
1.11	5062 1238 111	"O-RING"	N.B.R.
1.12	5062 1237 112	REDUCTION NUT	BRONZE
1.13	5062 1237 113	"O-RING"	N.B.R.
1.14	5062 1237 114	NUT	STEEL 8.8.ZC
1.15	5062 1237 115	SEPARATION PARTITION	NYLON 6
1.16	5062 1237 116	DISC	BRASS
1.17	5062 1237 117	DIAFRAGM	N.R.
1.18	5062 1237 116	DISC	BRASS
1.19	5062 1237 119	NUT	AISI 316
1.20	5062 1237 120	COVER GREY	NYLON 6
1.21	5062 1237 121	DISC	AISI 304
1.22	5062 1237 122	BOLTS	STEEL 8.8.ZC
1.23	5062 1237 123	1/8" NPT PLUG	PLASTIC
2.	5062 1237 02	UPPER SEAT	BRONZE
3.	5062 1237 03	LOWER SEAT	BRONZE
4.	5062 1237 04	BODY	C.I.

MATERIALS:

N.R. - NATURAL RUBBER
N.B.R. - NITRILE RUBBER
AISI 303 - STAINLESS STEEL
STEEL 8.8.ZC - ZINC COBALT
C.I. - CAST IRON





E:\PERSOMET\VALVES\BERMAD\5062 1237.DWG FUNDAMENTAL VERSION

"BERMAD" BACKWASH VALVE DOUBLE CHAMBER

350 SERIES; Size 3"*3" VICTAULIC ENDS

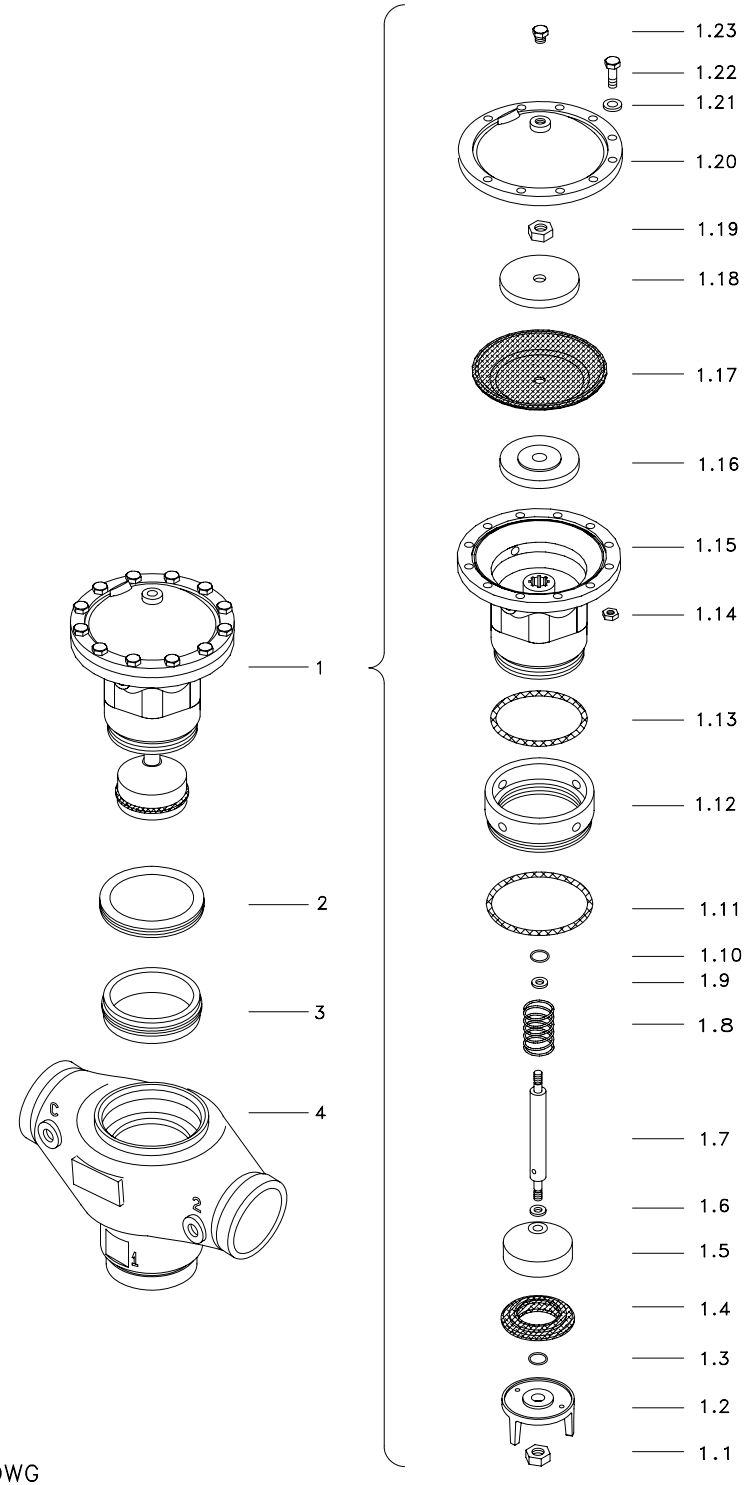
ARKAL Cat. no.: 5062 1238 STRAIGHT REVERSE FLOW

PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 1238 01	ACTUATOR ASSEMBLY	
1.1	5062 1237 101	NUT	AISI 316
1.2	5062 1238 102	LOWER GUIDE	BRONZE
1.3	5062 1237 103	"O-RING"	N.B.R.
1.4	5062 1237 104	SEAL	N.B.R.
1.5	5062 1238 105	PLUG	ACETAL C.
1.6	5062 1237 106	DISC	AISI 303
1.7	5062 1237 107	SHAFT	AISI 303
1.8	5062 1237 108	CLOSING SPRING	AISI 302
1.9	5062 1237 109	DISC	AISI 316
1.10	5062 1237 110	"O-RING"	N.B.R.
1.11	5062 1238 111	"O-RING"	N.B.R.
1.12	5062 1237 112	REDUCTION NUT	BRONZE
1.13	5062 1237 113	"O-RING"	N.B.R.
1.14	5062 1237 114	NUT	STEEL 8.8.ZC
1.15	5062 1237 115	SEPARATION PARTITION	NYLON 6
1.16	5062 1237 116	DISC	BRASS
1.17	5062 1237 117	DIAFRAGM	N.R.
1.18	5062 1237 116	DISC	BRASS
1.19	5062 1237 119	NUT	AISI 316
1.20	5062 1237 120	COVER GREY	NILON 6
1.21	5062 1237 121	DISC	AISI 304
1.22	5062 1237 122	BOLTS	STEEL 8.8.ZC
1.23	5062 1237 123	1/8" NPT PLUG	PLASTIC
2.	5062 1237 02	UPPER SEAT	BRONZE
3.	5062 1237 03	LOWER SEAT	BRONZE
4.	5062 1237 04	BODY	C.I.

MATERIALS:

N.R. - NATURAL RUBBER
N.B.R. - NITRILE RUBBER
AISI 303 - STAINLESS STEEL
STEEL 8.8.ZC - ZINC COBALT
C.I. - CAST IRON



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"BERMAD" BACKWASH VALVE DOUBLE CHAMBER

350 SERIES; Size 3"*3" VICTAULIC ENDS

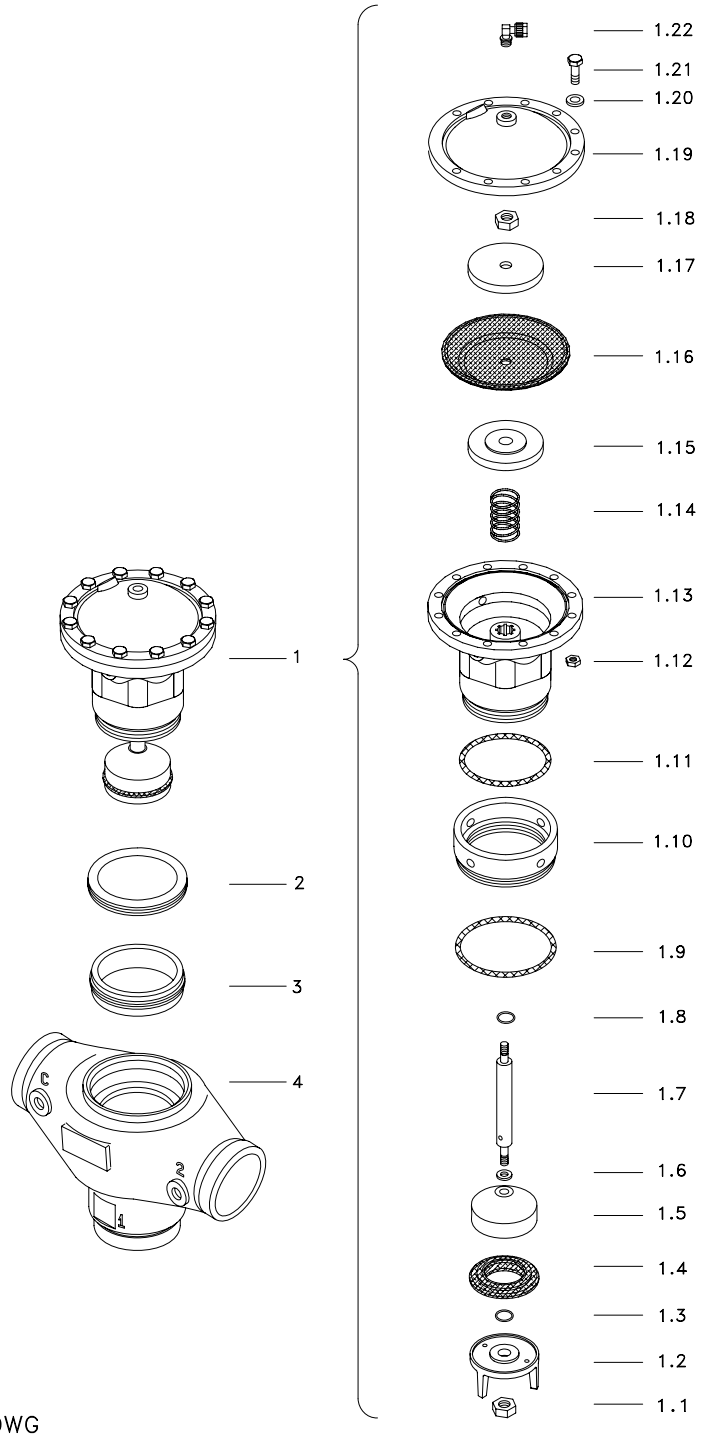
ARKAL Cat. no.: 5062 1239 ANGLE FLOW

PARTS LIST

No:	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 1239 01	ACTUATOR ASSEMBLY	
1.1	5062 1237 101	NUT	AISI 316
1.2	5062 1238 102	LOWER GUIDE	BRONZE
1.3	5062 1237 103	"O-RING"	N.B.R.
1.4	5062 1237 104	SEAL	N.B.R.
1.5	5062 1238 105	PLUG	ACETAL C.
1.6	5062 1237 106	DISC	AISI 303
1.7	5062 1237 107	SHAFT	AISI 303
1.8	5062 1237 110	"O-RING"	N.B.R.
1.9	5062 1238 111	"O-RING"	N.B.R.
1.10	5062 1237 112	REDUCTION NUT	BRONZE
1.11	5062 1237 113	"O-RING"	N.B.R.
1.12	5062 1237 114	NUT	STEEL 8.8.ZC
1.13	5062 1237 115	SEPARATION PARTITION	NYLON 6
1.14	5062 1239 108	CLOSING SPRING	AISI 302
1.15	5062 1237 116	DISC	BRASS
1.16	5062 1237 117	DIAFRAGM	N.R.
1.17	5062 1237 116	DISC	BRASS
1.18	5062 1237 119	NUT	AISI 316
1.19	5062 1239 120	COVER BLACK	NYLON 6
1.20	5062 1237 121	DISC	AISI 304
1.21	5062 1237 122	BOLTS	STEEL 8.8.ZC
1.22	5078 0034	1/8"*8mm "TEFEN" ANGLE	PLASTIC
2.	5062 1237 02	UPPER SEAT	BRONZE
3.	5062 1237 03	LOWER SEAT	BRONZE
4.	5062 1237 04	BODY	C.I.

MATERIALS:

N.R. - NATURAL RUBBER
N.B.R. - NITRILE RUBBER
AISI 303 - STAINLESS STEEL
STEEL 8.8.ZC - ZINC COBALT
C.I. - CAST IRON



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Filter Backwash Hydraulic BERMAD Valve, 4x3 Metal

IR-4x3-350-A-I

The BERMAD Model IR-4x3-350-A-I is a compact 3-port valve, in a T configuration. It is a hydraulically operated and diaphragm actuated valve, designed for automatic backwashing of filters with 4" inlet and outlet ports. In response to a pressure rise command, its diaphragm actuated plug assembly closes the supply port drip tight, while opening the backwash port. The valve's short travel guarantees smooth flow direction changes, conserves water supply, prevents filter site flooding, and eliminates mixing of supply and waste water. The valve's metal construction ensures a rigid, damage resistant valve.

Filter Backwash Hydraulic BERMAD Valve, 4x4 Metal

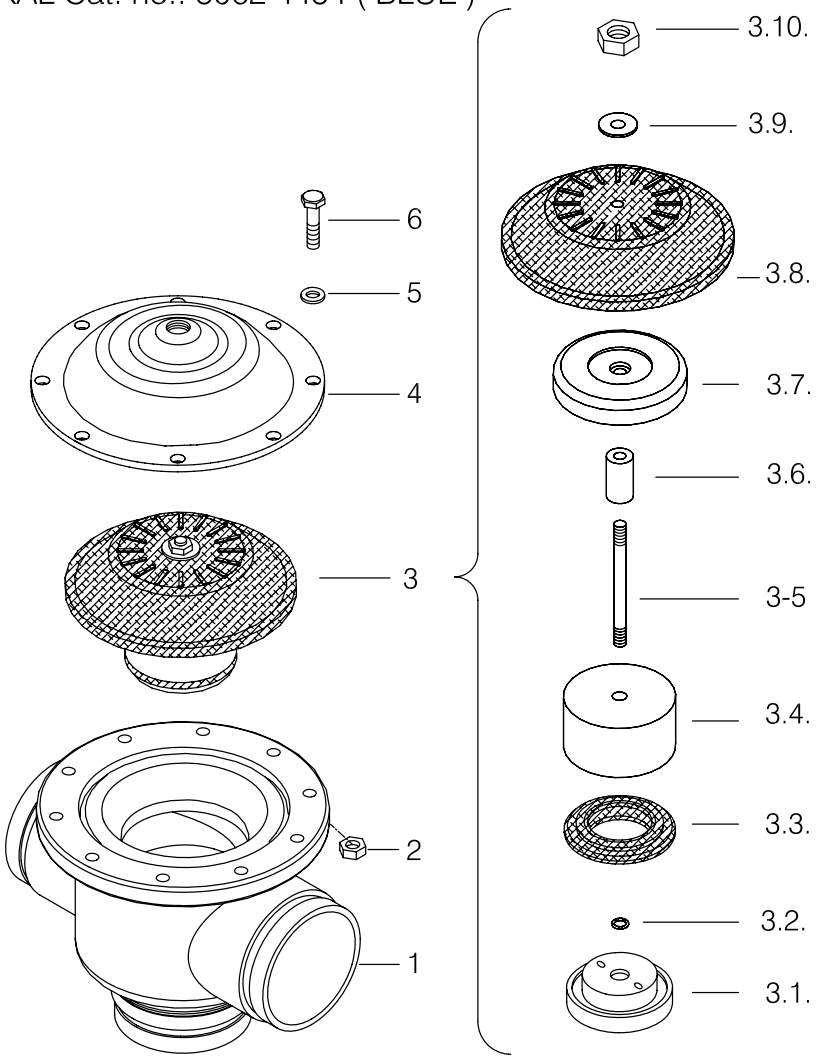
IR-4x4-350-A-I

This Filter Backwash Hydraulic Valve suits filters with 4" inlet and outlet ports and high backwash flow requirements.

"BERMAD" BACKFLUSH CONTROL VALVE

350 SERIES; Size 4"*4"; ANGLE FLOW.

ARKAL Cat. no.: 5062 4454 (BLUE)



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 4454 01	VICTAULIC BODY	C.I.
2.	5062 4340 02	NUT	S.S.
3.	5062 4013	INTERNAL ASSEMBLY	
3.1.	5062 4340 301	PLUG WASHER	BRASS
3.2.	5062 4340 302	"O-RING"	N.R.
3.3.	5062 4340 303	SEAL	N.R.
3.4.	5062 4340 304	PLUG	DELERIN
3.5.	5062 4340 305	SHAFT	S.S.
3.6.	5062 4340 306	SPACER	BRASS
3.7.	5062 4340 307	DIAPHRAGM WASHER	BRASS
3.8.	5062 4340 308	DIAPHRAGM	N.R.
3.9.	5062 4340 309	DISC	BRASS
3.10.	5062 4340 310	NUT	S.S.
4.	5062 4340 04	COVER	STEEL
5.	5062 4340 05	WASHER	S.S.
6.	5062 4340 06	BOLT	S.S.

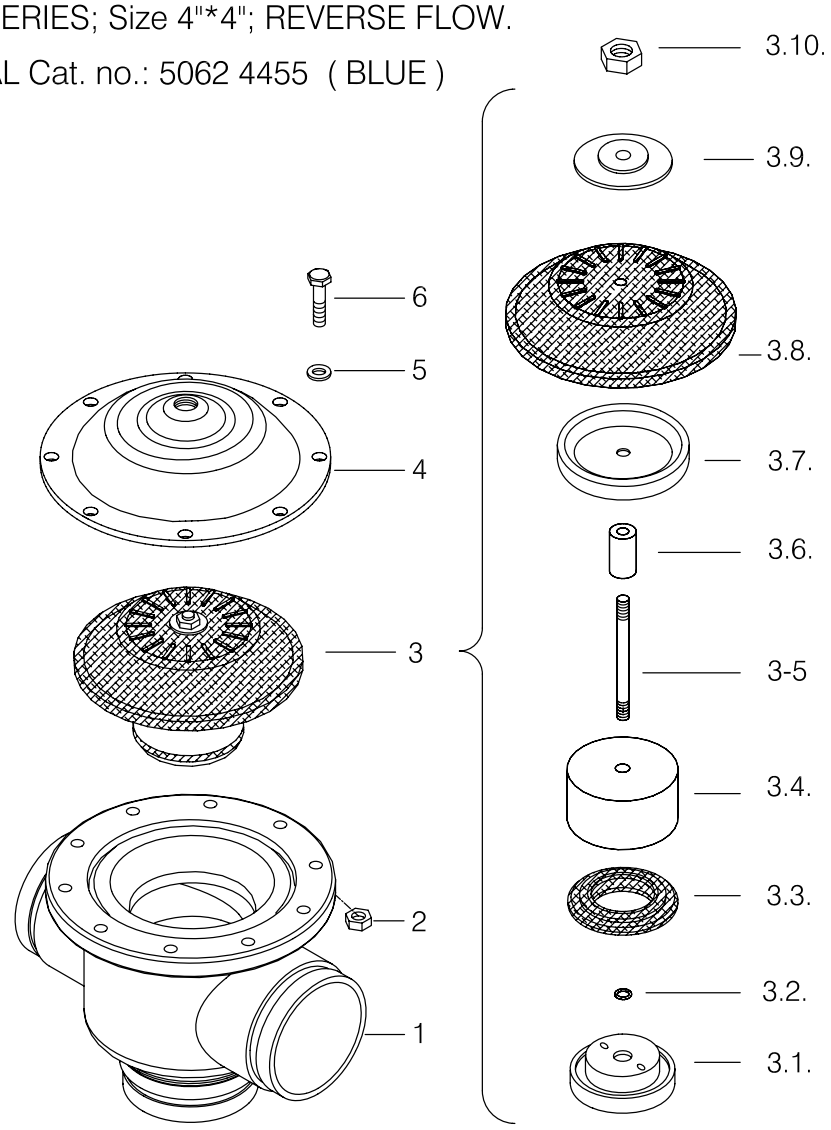
MATERIALS:

C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL

"BERMAD" BACKFLUSH CONTROL VALVE

350 SERIES; Size 4"*4"; REVERSE FLOW.

ARKAL Cat. no.: 5062 4455 (BLUE)



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 4454 01	VICTAULIC BODY	C.I.
2.	5062 4340 02	NUT	S.S.
3.	5062 4015	INTERNAL ASSEMBLY	
3.1.	5062 4340 301	PLUG WASHER	BRASS
3.2.	5062 4340 302	"O-RING"	N.R.
3.3.	5062 4340 303	SEAL	N.R.
3.4.	5062 4455 304	PLUG	DELERIN
3.5.	5062 4340 305	SHAFT	S.S.
3.6.	5062 4340 306	SPACER	BRASS
3.7.	5062 4455 307	DIAPHRAGM WASHER	BRASS
3.8.	5062 4340 308	DIAPHRAGM	N.R.
3.9.	5062 4455 309	DISC	BRASS
3.10.	5062 4340 310	NUT	S.S.
4.	5062 4340 04	COVER	STEEL
5.	5062 4340 05	WASHER	S.S.
6.	5062 4340 06	BOLT	S.S.

MATERIALS:

C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL

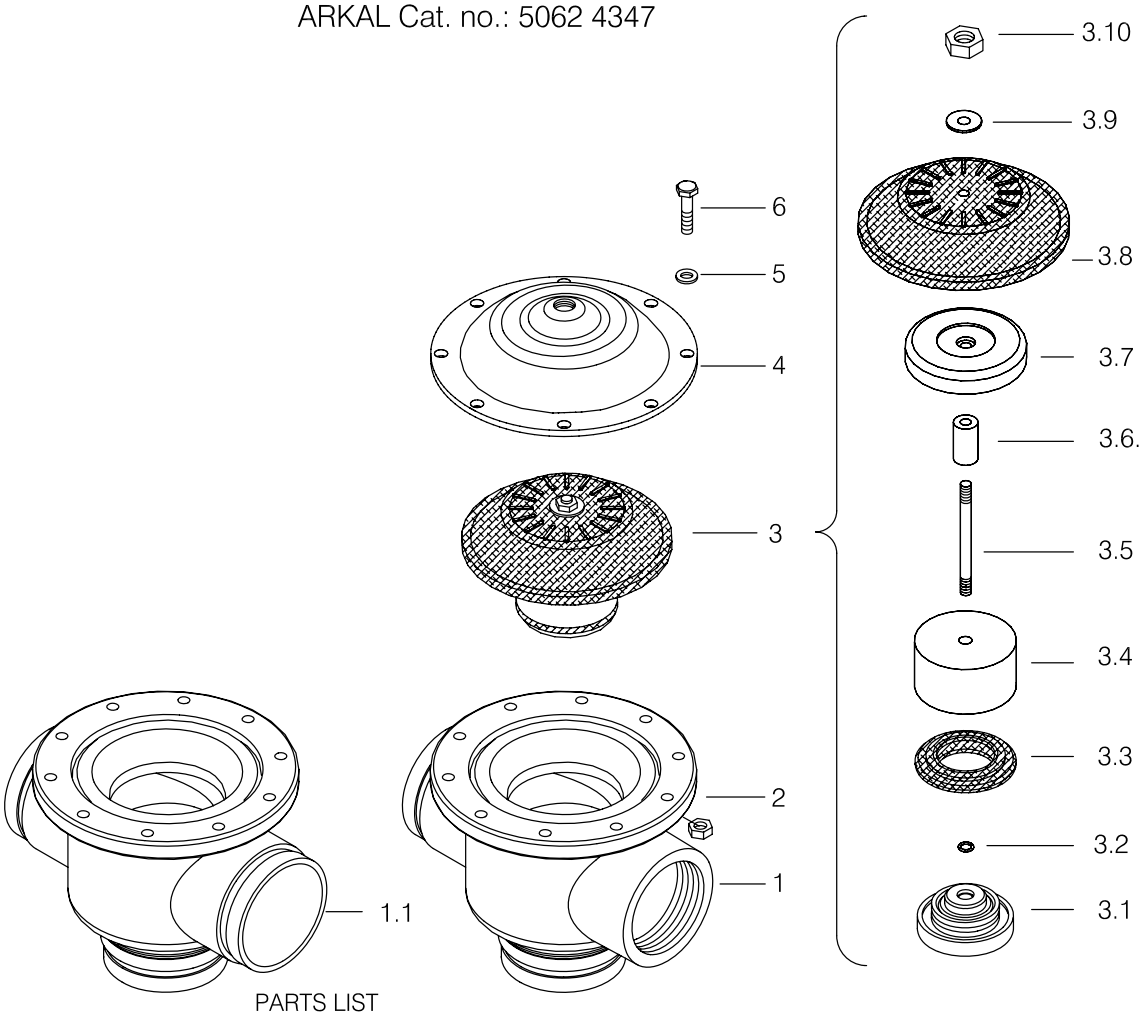
"BERMAD" BACKFLUSH CONTROL VALVE

350 SERIES; Size 4"*3" VIC.- THRAED ENDS

ARKAL Cat. no.: 5062 4340

350 SERIES; Size 4"*4" VICTAULIC ENDS

ARKAL Cat. no.: 5062 4347



PARTS LIST

NO.	ARKAL CAT.NO.	PARS DESCRIPTION	MATERIALS
1.	5062 4340 01	VICTAULIC- THREADED BODY	C.I.
1.1.	5062 4347 01	VICTAULIC- VICTAULIC BODY	C.I.
2.	5062 4340 02	NUT	S.S.
3.	5062 4013	INTERNAL ASSEMBLY	
3.1.	5062 4340 301	PLUG WASHER	BRASS
3.2.	5062 4340 302	"O-RING"	N.R.
3.3.	5062 4340 303	SEAL	N.R.
3.4.	5062 4340 304	PLUG	DELERIN
3.5.	5062 4340 305	SHAFT	S.S.
3.6.	5062 4340 306	SPACER	BRASS
3.7.	5062 4340 307	DIAPHRAGM WASHER	BRASS
3.8.	5062 4340 308	DIAPHRAGM	N.R.
3.9.	5062 4340 309	DISC	BRASS
3.10.	5062 4340 310	NUT	S.S.
4.	5062 4340 04	COVER	STEEL
5.	5062 4340 05	WASHER	S.S.
6.	5062 4340 06	BOLT	S.S.

MATERIALS:

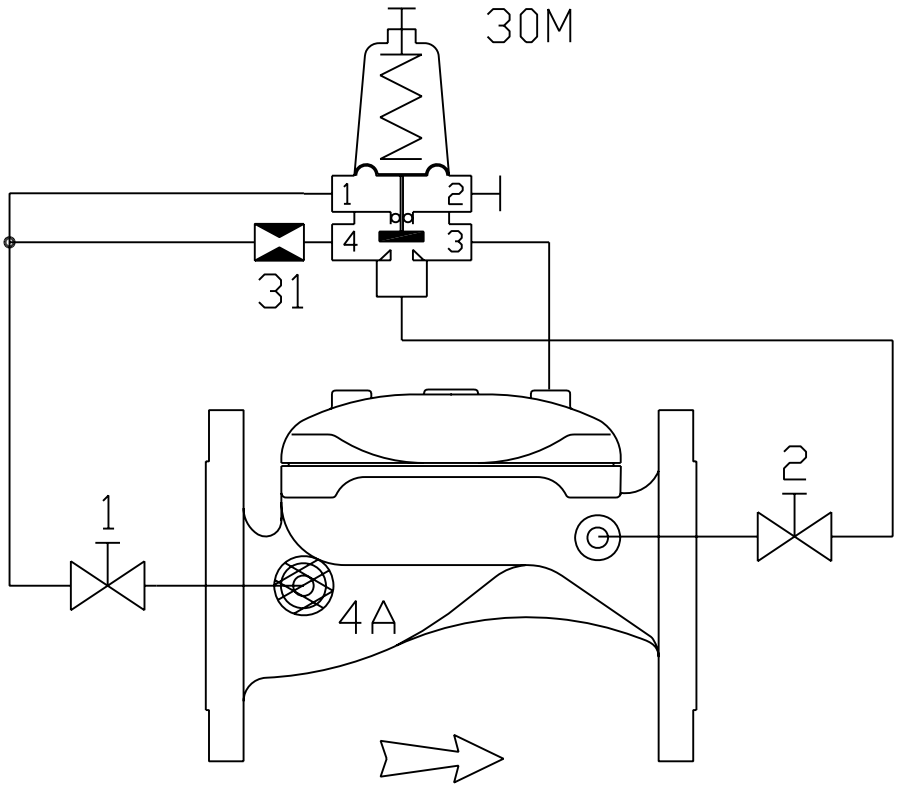
C.I. -CAST-IRON
N.R. -NITRILE RUBBER
S.S. -STAINLESS STEEL

SCO-1-V.DOC BER4-43R.DWG

Application Engineering Department

CONTROL VALVES BERMAD

Control Loop Drawing & Information



PARTS LIST

1	2W Cock Valve
2	2W Cock Valve
4A	In-Line Filter
31	Restriction Orifice
30M	2W PS Mini Pilot - (Metal)

MODEL: IR-430 SIZE: 2" - 4"

Pressure Sustaining Valve

COSTUMER: .

PROJECT: Special Application

ID NO: D400_0000336- 26/02/2004

STATUS: Released

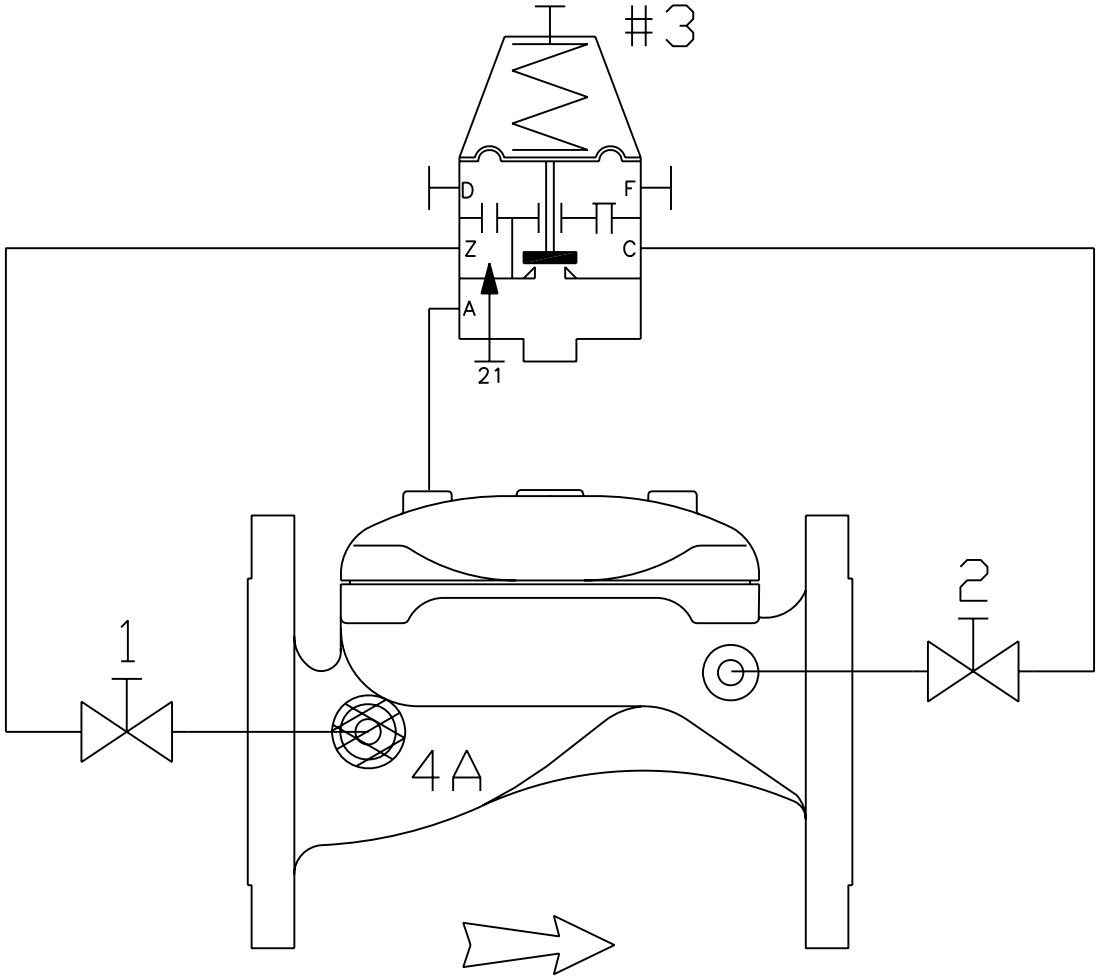
DESIGN: micha 26/02/2004

COMMENTS:

Application Engineering Department

CONTROL VALVES BERMAD

Control Loop Drawing & Information



PARTS LIST

1	2W Cock Valve
2	2W Cock Valve
4A	In-Line Filter
#3	2W P.S. Pilot

MODEL: IR-430 SIZE: 6" - 12"

Pressure Sustaining Valve

COSTUMER: .

PROJECT:

ID NO: D400_0000097-b 10/01/2002

STATUS: Released

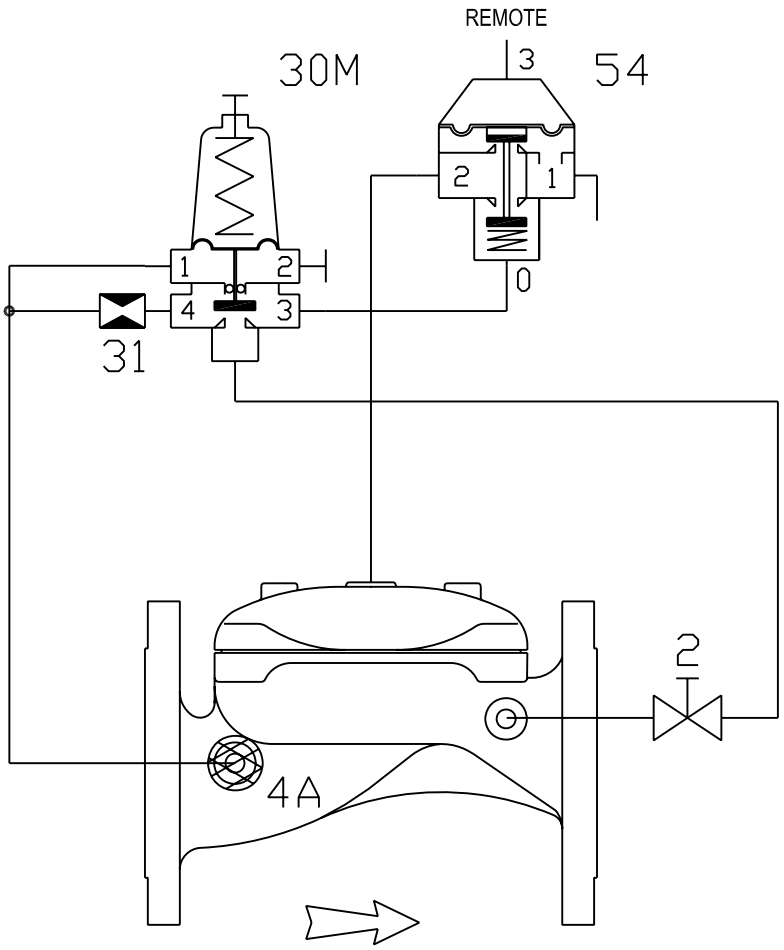
DESIGN: 18/05/2001 18/05/2001

COMMENTS:

Application Engineering Department

CONTROL VALVES BERMAD

Control Loop Drawing & Information



PARTS LIST

2	2W Cock Valve
4A	In-Line Filter
31	Restriction Orifice
30M	2W PS Mini Pilot - (Metal)
54	3W Hydraulic Valve (w/bottom spring)

MODEL: IR-430-09-R SIZE: 2" - 4"

Pressure Sustaining Valve
Automatic Regulation Override

COSTUMER: .

PROJECT:

ID NO: D400_0000361- 25/05/2004

STATUS: Released

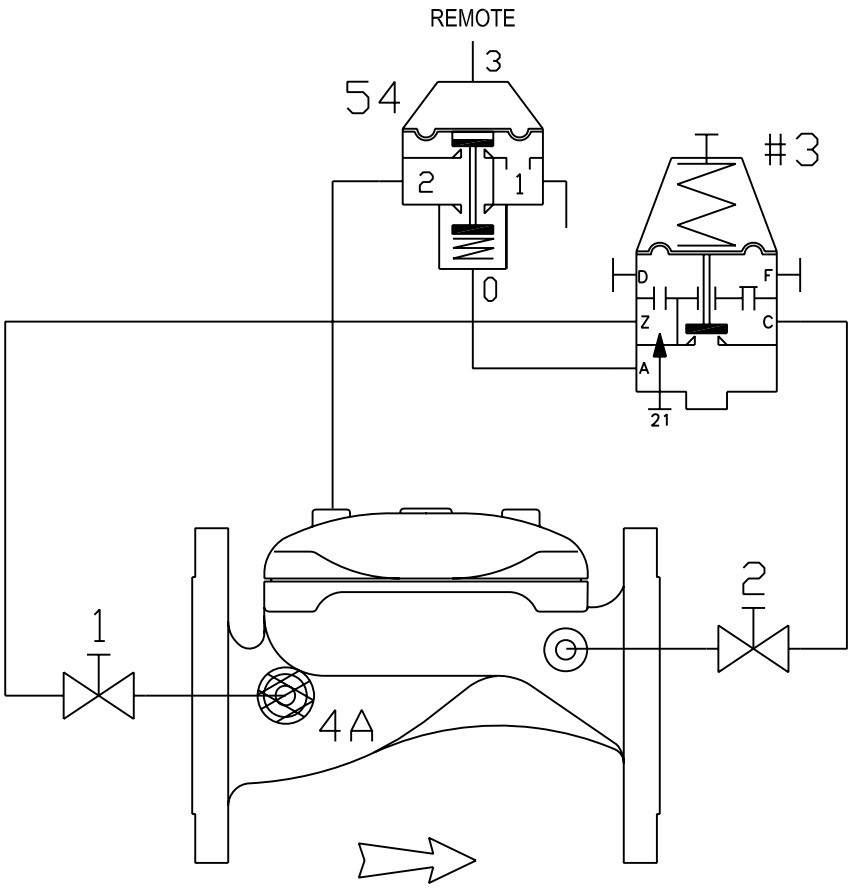
DESIGN: micha 25/05/2004

COMMENTS:

Application Engineering Department

CONTROL VALVES BERMAD

Control Loop Drawing & Information



PARTS LIST

1	2W Cock Valve
2	2W Cock Valve
4A	In-Line Filter
#3	2W P.S. Pilot
54	3W Hydraulic Valve (w/bottom spring)

MODEL: IR-430-09 SIZE: 6" - 12"

Pressure Sustaining Valve
Automatic Regulation Override

COSTUMER: .

PROJECT:

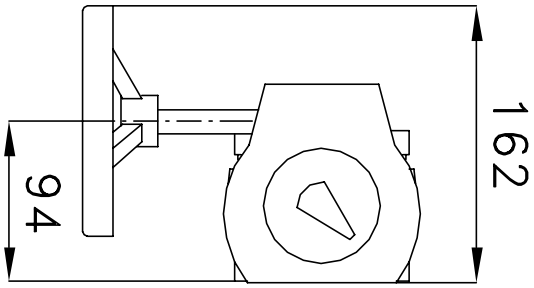
ID NO: D400_0000362- 25/05/2004

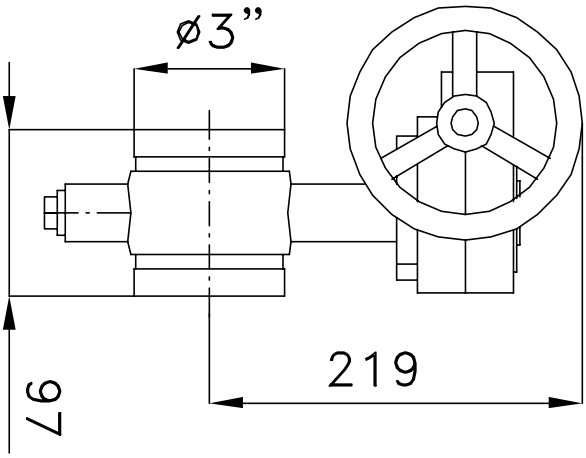
STATUS: Released

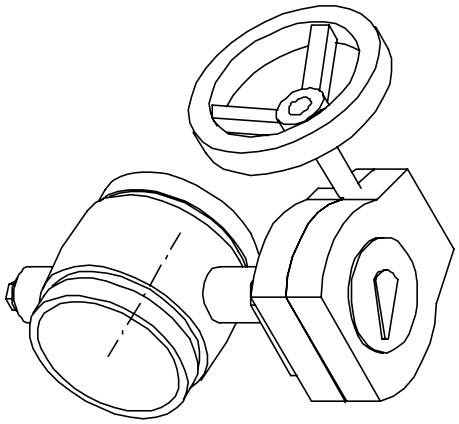
DESIGN: micha 25/05/2004

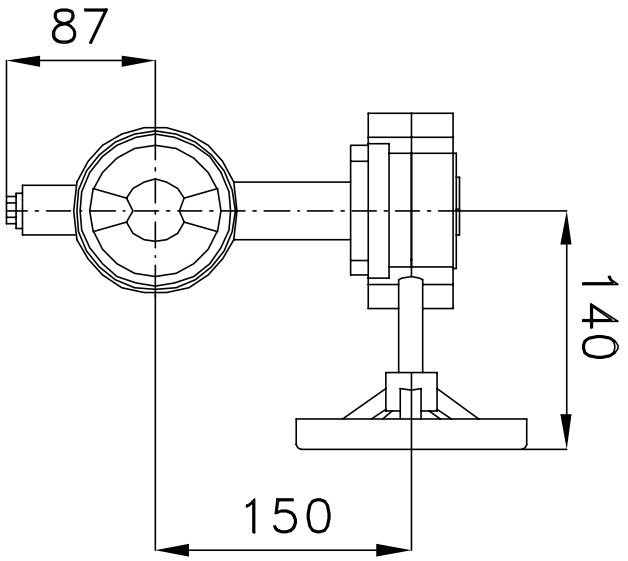
COMMENTS:

Hakohav Valves





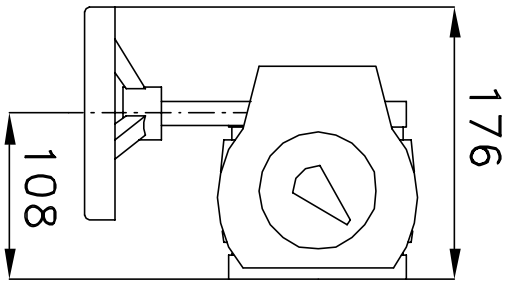


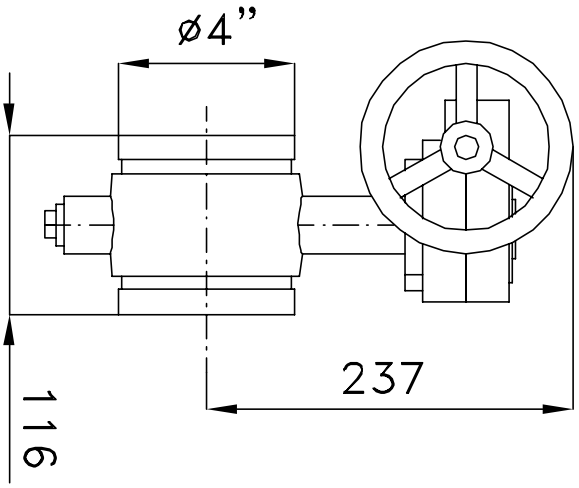


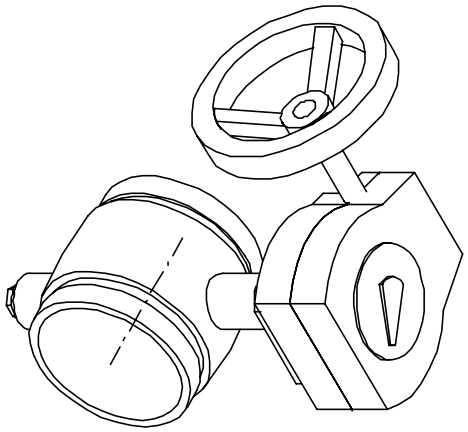
MODIFIC.	DATE	DESCRIPTION	SIGN.

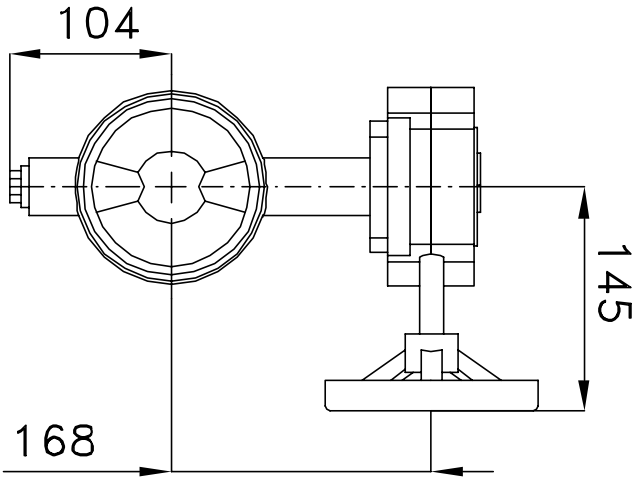
ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3" "HAKOHAV" VICTAULIC "BUTTERFLY" VALVE						PAGE 1 OF 1
TITLE: ASSEMBLY DRAWING						CATALOGUE No: 5063 1301
PATH: MASTERS\VALVES			FILE CODE: 5063 1301	NAME: IRINA	DATE: 05.01.04	SIGNATURE: IRINA
	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:			BACKUP:
DRAWN	Nikolay	05.01.04				
CHECKED	OMRY	02.12.03	VIEW: FRONT,TOP,SIDE & ISO			DRAWER N: 36
APPROVED						







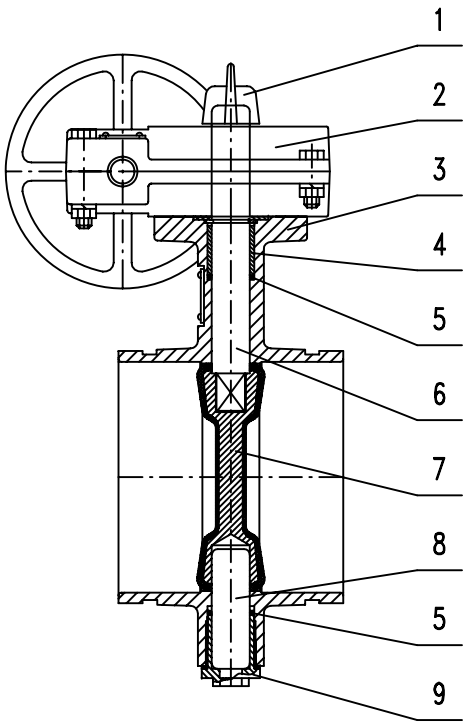


MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 4" "HAKOHAV" VICTAULIC "BUTTERFLY" VALVE						PAGE 1 OF 1
TITLE: ASSEMBLY DRAWING						CATALOGUE No: 5063 1401
PATH MASTERS\VALVES			FILE CODE 5063 1401	NAME IRINA	DATE 05.01.04	SIGNATURE IRINA
	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:			BACKUP:
DRAWN	Nikolay	05.01.04				
CHECKED	OMRY	02.12.03	VIEW: FRONT,TOP,SIDE & ISO			DRAWER N: 36
APPROVED						

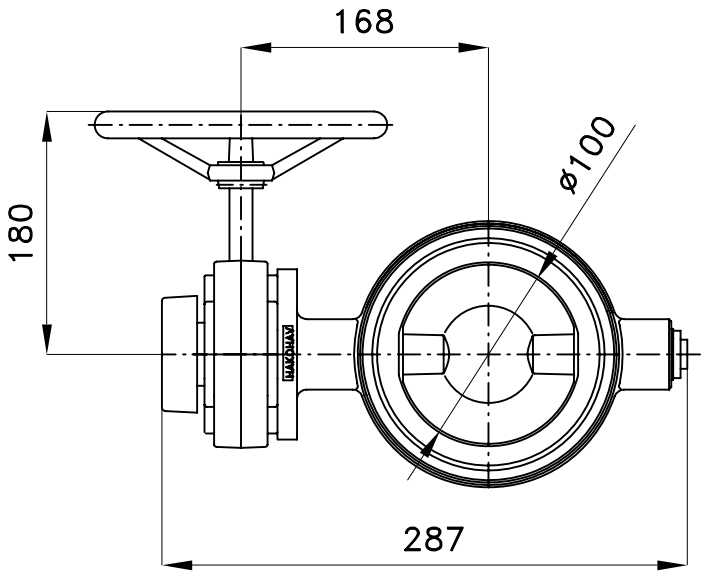
175 PSI NON SHOCK COLD WATER

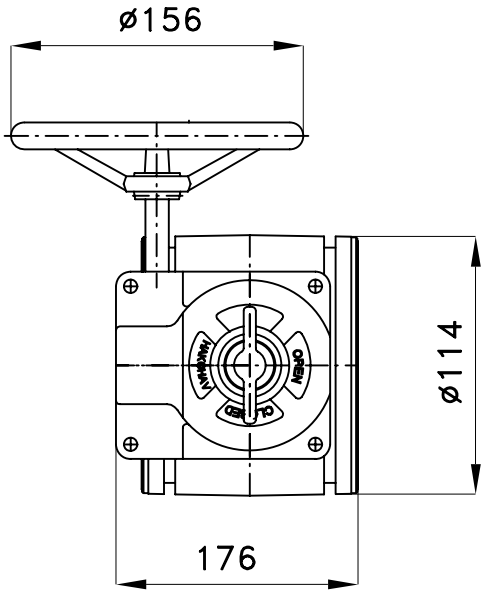


UL LISTED FM APPROVED

PARTS LIST & SPECIFICATIONS

	PART	SPECIFICATION
1.	INDICATOR	CAST IRON
2.	WORM GEAR ACTUATOR	CAST IRON AND STEEL
3.	BODY	DUCTILE IRON ASTM A-536
4.	BUSHING	BRONZE
5.	O-RING	NBR
6.	UPPER SHAFT	STAINLESS STEEL ASTM A-582 GRADE 416
7.	DISC	BRASS ASTM B-124/NBR COATING
8.	LOWER SHAFT	STAINLESS STEEL ASTM A-582 GRADE 416
9.	BUSHING PLUG	BRONZE





MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6755140
FAX. 972-4-6751333
ISRAEL

PROJECT "HAKOHAV" 4" GROOVED "BUTTERFLY" VALVE TYPE 109F — PAGE 1 OF 1

TITLE ASSEMBLY DRAWING — CATALOGUE No: 5063 1405

PATH MASTERS\VALVES	FILE CODE	NAME	DATE	SIGNATURE
	5063 1405	IRINA	28.07.03	IRINA

	NAME	DATE	ASSEMBLY DRAWING FILE CODE:	BACKUP:
DRAWN	MAYA	28.07.03		
CHECKED	OMRY	28.07.03	ASSEMBLY DRAWING FILE CODE:	DRAWER N: 36
APPROVED				

Habonim Valves

BULLETIN F-900

BUTTERFLY VALVES

117 SERIES

HABONIM
Industrial Valves & Actuators

DEDICATED TO INNOVATION

BUTTERFLY VALVES

Habonim has been a market leader in quarter turn valves and actuators for over 40 years. We continually improve our line by introducing new products and enhancing existing designs.

Habonim's new line of resilient seated butterfly valves, 117 series, provides the necessary reliability, backed by Habonim's manufacturing facilities.

The valve's special long neck permits optimum heat insulation without restricting valve actuation, which makes it an ideal choice for industrial utility applications.

A precision disc profile provides bubble-tight shut-off in both flow directions, assures minimum torque and longer seat life.

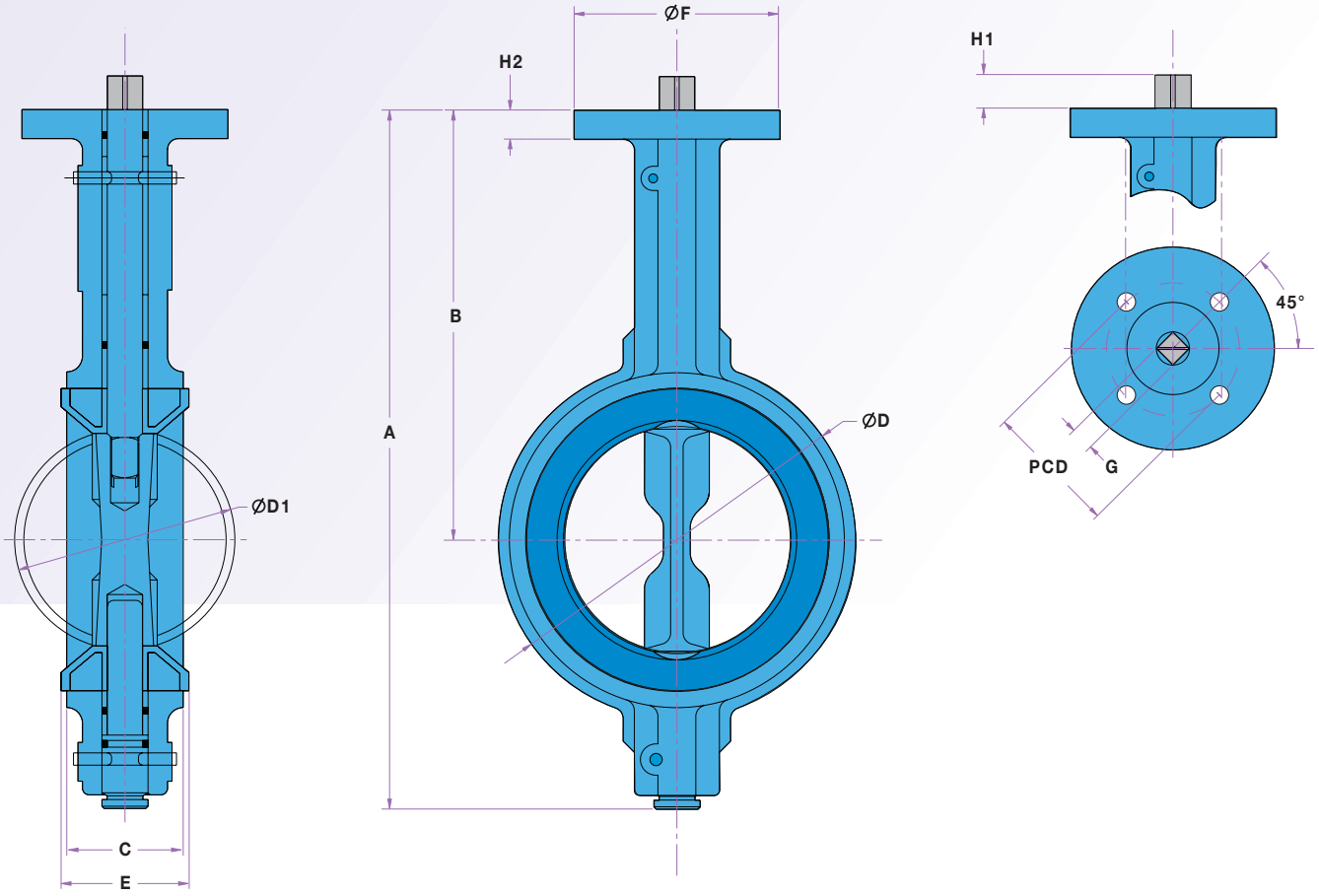
A dual shaft packing in the high neck profile guarantees a long lasting valve for actuation and control as well as isolating the handle and actuator from the flowing media.

The valve top mounting flange conforming to ISO 5211, accommodates direct mounting of all types of actuators: electric, pneumatic, gear operators and handles.

Features

- Wafer style valve design for ANSI 150 and DIN PN16 standard flanges.
- Long valve neck permits optimum heat insulation without restricting valve actuation.
- Actuator mounting to DIN/ISO 5211.
- Gas-tight seal in the seats, conforming to DIN 3230, part 3, leakage rate 1.
- Body - epoxy coating 200 microns as standard.
- EPDM* seat (standard) vulcanized to a back up ring (Black Nitrile, Hypalon, and Neoprene seats are also available upon request).
- A split shaft pin-less design up to 12" valve size.
- Temperature range of -20 C° (-4 F°) and up to +120 C° (+248 F°).
- Face to Face according to ISO 5752, DIN 3202 part 3, K1.

Valve Dimensions 2”-24”

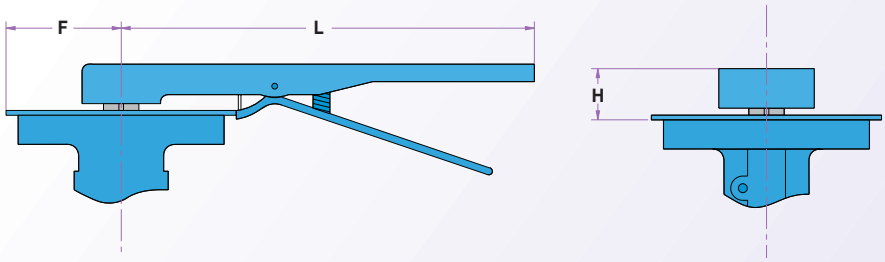


Size (in)	DN (mm)	A	B	C	D	D1	E	F	PCD	G +/-0.05	H1	H2	Weight (kg)
2”	50	241	161	42.0	95	52.9	45.0	90	F07	10.92	11	12	2.5
2½”	65	271	161	44.7	115	64.5	47.0	90	F07	10.92	11	13	3.2
3”	80	285	161	45.2	138	78.9	49.0	90	F07	10.92	11	13	3.6
4”	100	314	200	52.1	158	104.4	54.0	90	F07	13.92	14	13	4.9
5”	125	340	213	54.4	190	123.5	56.0	90	F07	16.92	17	13	7.0
6”	150	440	226	55.8	210	156.1	58.0	90	F07	16.92	17	13	7.8
8”	200	440	260	60.6	268	202.7	62.5	125	F10	21.92	22	13	13.2
10”	250	464	292	66.6	320	250.7	70.0	150	F12	26.92	27	13	19.0
12”	300	579	337	76.5	370	301.9	79.5	150	F12	26.92	27	20	32.5
14”	350	640	368	76.5	436	334.2	79.5	175	F12	35.92	36	22	42.5
16”	400	720	400	86.5	488	387.5	90.0	210	F16	45.92	46	22	52.0
18”	450	780	422	105.6	539	438.4	109.0	210	F16	45.92	46	27	87.0
20”	500	852	480	131.8	593	489.0	135.0	210	F16	45.92	46	27	98.0
24”	600	1033	562	152.0	816	592.7	156.0	210	F16	45.92	46	36	133.0

Dimensions in mm

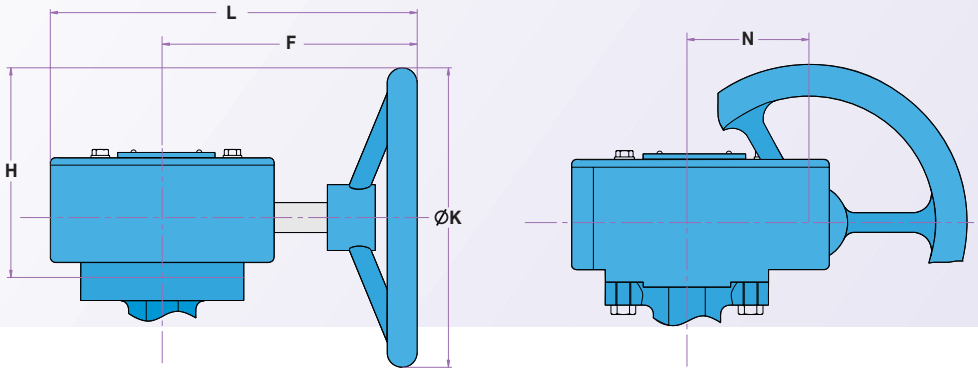
Actuation

Hand Lever



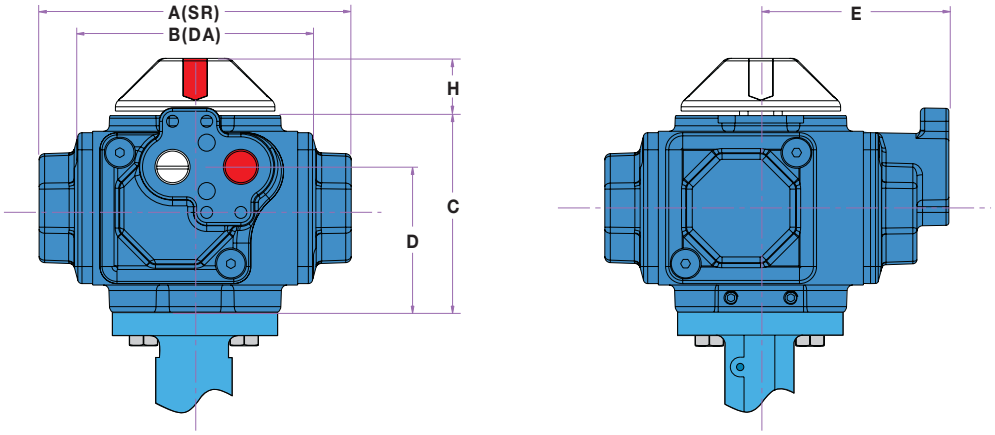
Size (in)	DN (mm)	F	H	L
2”-6”	50-150	51.5	32	270
8”-12”	200-300	75.0	50	360

Worm Gear



Size (in)	DN (mm)	F	H	L	N	ØK
3”-6”	80-150	173.5	111	226	45.0	150
8”-10”	200-250	237.0	193	313	63.0	300
12"-14"	300-350	225.0	189	307	80.0	300
16"-18”	400-450	292.0	265	422	120.0	400
20"-24"	500-600	341.5	221	478	121.5	400

Pneumatic



Actuator Size	Dimensions (mm)						Weight (kg)	
	A (SR)	B(DA)	C	D	H	E	DA	SR
C20	131	102	80.5	61.5	20	77.2	1.9	1.5
C25	161	132	97.0	76.5	20	90.0	3.5	2.8
C30	186	151	116.0	93.4	20	105.0	5.0	4.4
C35	222	182	135.0	102.0	20	114.0	9.0	7.1
C45	269	221	164.0	136.0	20	111.0	15.0	11.0
C60	360	285	218.0	180.0	30	141.0	35.0	26.0
C75	437	342	270.0	223.0	30	166.0	64.0	51.0

Torque Table

Size (in)	DN (mm)	Operating Pressure - bar (psi)		
		6 (87)	10 (145)	16 (232)
2”	50	5.5	6.0	7.5
2½”	65	6.2	8.7	11.0
3”	80	12.8	13.0	16.5
4”	100	29.0	31.0	35.8
5”	125	47.0	51.0	53.0
6”	150	78.0	85.0	95.0
8”	200	107.0	118.0	160.0
10”	250	215.0	239.0	297.0
12”	300	330.0	387.0	415.0
14”	350	540.0	610.0	700.0
16”	400	620.0	750.0	850.0
18”	450	1246.0	1518.0	1787.0
20”	500	1639.0	2025.0	2288.0
24”	600	2519.0	3166.0	3711.0

* The values specified are based on a breakaway torque in a liquid and lubricant media
* To ensure absolute reliability of operation in service, It is highly recommended by Habonim that a safety factor is added to the torques specified
* Dry gases / high viscous media x 1.2
* Powdery media (non-lubricant) x 1.3

Compact II Actuator Sizing

Size	Fail Close - Spring Return Actuator bar (psi)			Fail Open - Spring Return Actuator bar (psi)			Double Acting Actuator bar (psi)		
	4 (58)	5 (72)	6 (87)	4 (58)	5 (72)	6 (87)	4 (58)	5 (72)	6 (87)
2”	C20-2C	C20-2C	C20-3	C20-2A2B	C20-2A2B	C20-2C	C20-D/A	C20-D/A	C20-D/A
2½”	C20-2C	C20-2C	C20-3	C25-2A2B	C20-2A2B	C20-2C	C20-D/A	C20-D/A	C20-D/A
3”	C20-2C	C20-2C	C20-3	C25-2A2B	C25-2A2B	C25-2C	C20-D/A	C20-D/A	C20-D/A
4”	C30-2C	C30-2C	C30-3	C30-2A2B	C30-2A2B	C30-2C	C25-D/A	C25-D/A	C20-D/A
5”	C35-2C	C35-2C	C35-3	C35-2A2B	C35-2A2B	C30-2C	C30-D/A	C25-D/A	C25-D/A
6”	C45-2C	C45-2C	C35-3	C45-2A2B	C35-2A2B	C35-2C	C35-D/A	C30-D/A	C30-D/A
8”	C45-2C	C45-2C	C45-3	C60-2A2B	C45-2A2B	C45-2C	C35-D/A	C35-D/A	C35-D/A
10”	C60-2C	C60-2C	C60-3	C60-2A2B	C60-2A2B	C60-2C	C45-D/A	C45-D/A	C45-D/A
12”	C75-2C	C75-2C	C75-3	C75-2A2B	C60-2A2B	C60-2C	C60-D/A	C60-D/A	C45-D/A
14”	○	○	C75-3	○	C75-2A2B	C75-2C	C60-D/A	C60-D/A	C60-D/A
16”	○	○	○	○	○	C75-2C	C75-D/A	C60-D/A	C60-D/A
18”	○	○	○	○	○	○	C75-D/A	C75-D/A	C75-D/A
20”	○	○	○	○	○	○	○	C75-D/A	C75-D/A
24”	○	○	○	○	○	○	○	○	○

Mounting Pattern: Direct Direct + Insert Bracket ○ Please contact Habonim team

Sizing is based on a wet media at differential pressure of 10 bar

Cv Values

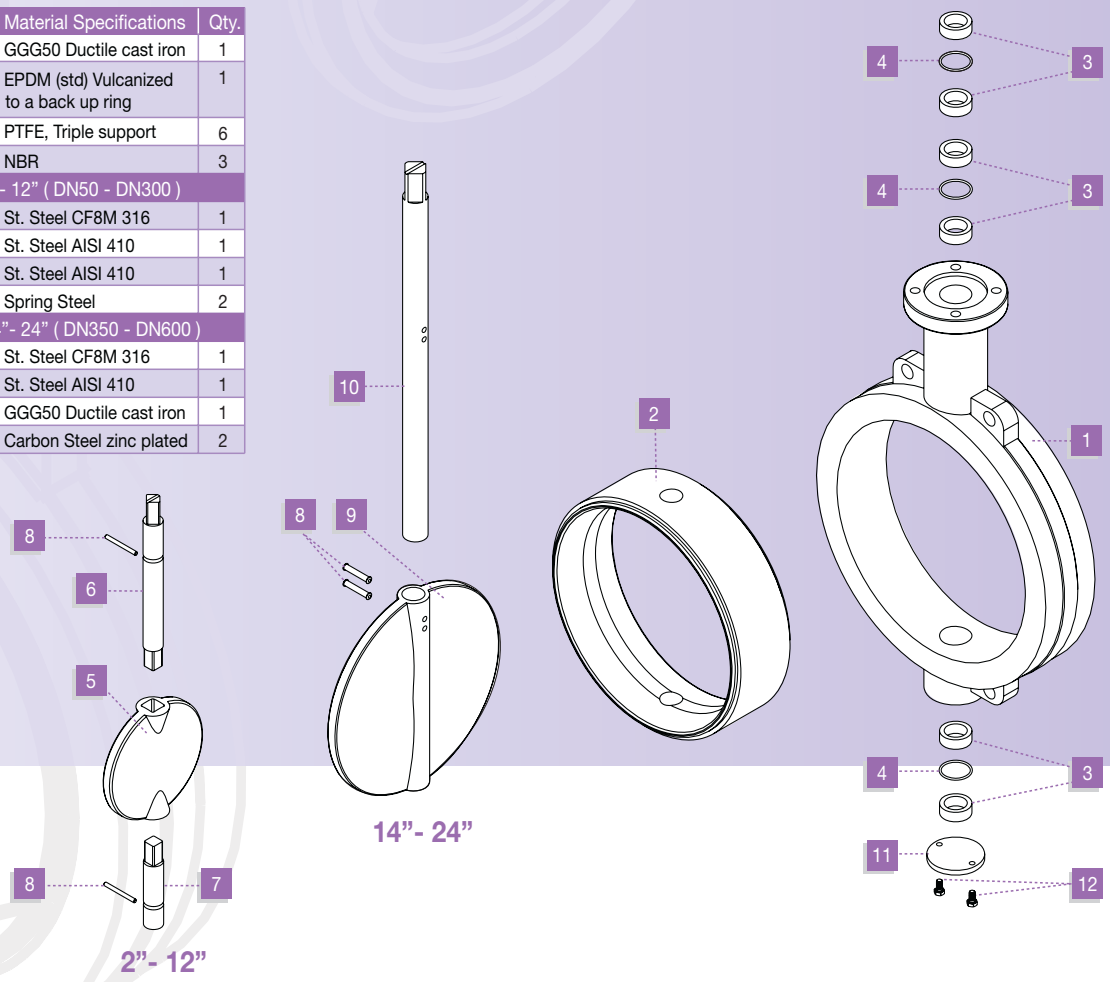
Size (in)	DN (mm)	Flow at Various Disc Angles							
		20°	30°	40°	50°	60°	70°	80°	90°
2”	50	5	12	24	45	64	90	125	135
2½”	65	8	20	37	65	98	144	204	220
3”	80	12	22	39	70	116	183	275	302
4”	100	17	36	78	139	230	364	546	600
5”	125	29	61	133	237	392	620	930	1,022
6”	150	45	95	205	366	605	958	1,437	1,579
8”	200	89	188	408	727	1,202	1,903	2,854	3,136
10”	250	151	320	694	1,237	2,047	3,240	4,859	5,340
12”	300	234	495	1,072	1,911	3,162	5,005	7,507	8,250
14”	350	338	715	1,549	2,761	4,568	7,230	10,844	11,917
16”	400	464	983	2,130	3,797	6,282	9,942	14,913	16,388
18”	450	615	1,302	2,822	5,028	8,320	13,168	19,752	21,705
20”	500	791	1,674	3,628	6,465	10,698	16,931	25,396	27,908
24”	600	1,222	2,587	5,605	9,989	16,528	26,157	39,236	43,116

BUTTERFLY VALVES

117 Series

Material Of Construction

Item	Description	Material Specifications	Qty.
1	Body	GGG50 Ductile cast iron	1
2	Seat	EPDM (std) Vulcanized to a back up ring	1
3	Bushing	PTFE, Triple support	6
4	O- Ring Seal	NBR	3
Split Shaft Design: 2”- 12” (DN50 - DN300)			
5	Disc	St. Steel CF8M 316	1
6	Shaft (upper)	St. Steel AISI 410	1
7	Shaft (bottom)	St. Steel AISI 410	1
8	Split Pin	Spring Steel	2
Split Shaft Design: 14”- 24” (DN350 - DN600)			
9	Disc	St. Steel CF8M 316	1
10	Shaft	St. Steel AISI 410	1
11	End Cover	GGG50 Ductile cast iron	1
12	Bolts	Carbon Steel zinc plated	2



How to order HABONIM Butterfly Valves Identification Code

1 2	1 1 7	D	1	E	1	S	4	2
Size	Series	Body Material	Body Coating	Seat	Shaft	Disc Material	Actuator	Flange Std.

Size
2”- 24”
DN 50 - 600

Body Material	
D	Ductile iron *

Body Coating	
1	Epoxy *

Seat	
E	EPDM *
I	Black nitril
H	Hypalon
O	Neoprene

Shaft	
1	St. St. 410 *

Disc Material	
S	St. St. 316 (CF8M) *
W	Wortite

Actuator	
1	Bare shaft
2	Lever operator
3	Gear operator
4	Stem extension

Flange Std.	
1	ISO
2	ANSI

* Standard

In accordance with our policy to strive for continuous improvement of the product, we reserve the right to alter the dimensions, technical data and information included in this catalogue when required

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w w w . h a b o n i m . c o m

ISSUE H-01/06

A.R.I.
Air Valves

DG-10 PN 10
D-040 PN 16

Agriculture

Combination Air Valve "Barak"

Description

The combination air valve has the features of both an air release valve and an air & vacuum valve.

The air release component of the combination air valve was designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component was designed to automatically discharge or intake large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

Applications

- Pump stations: after the pump and after the check valve.
- Head system.
- At the end of lines and at the end of a sub main.
- On strainers and filters.

Operation

The air & vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and intakes air into the system at high flow rates during its drainage and at water column separation.

High velocity air should not blow the float shut. Water will lift the float and cause sealing of the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will re-enter the systems, reducing down-surges and cavitations.

The smooth release of air prevents pressure surges and other destructive phenomena.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air re-entry is essential to efficiently drain the system.

The automatic small orifice air release component releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following destructive phenomena:

- Obstruction to effective flow and hydraulic conductivity of the system along with a throttling effect similar to a partially closed valve. In extreme cases this will cause complete flow stoppage.
- Accelerate cavitation damages.
- High-pressure surges.
- Accelerate corrosion.
- Danger of a high-energy burst of compressed air.

As the system starts to fill, the valve functions according to the following stages:

1. Entrapped air is released by the valve
2. Liquid enters the valve, lifting the float which rolls the flexible rolling seal to its sealing position.
3. Entrapped air, which accumulates at peaks along the system (where combination air valves should be installed), rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, rolling the flexible rolling seal away from the smaller orifice, the smaller orifice opens and the accumulated air is released.
5. Liquid penetrates into the valve and the float rises rolling the flexible rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. Both orifices will be immediately unplugged and the float drops away.
2. Air is re-entered into the system.

Main Features

- Working pressure range: **DG-10** 0.1-10 bar. **D-040** 0.2-16 bar
- Testing pressure: **DG-10** 16 bar. **D-040** 25 bar.
- Working Temperature: 60^0 C.
- Maximum short-term temperature: 90^0 C.
- The body is made of high strength composite materials and all operating parts are made of specially selected corrosion-resistant materials.
- The larger than usual orifice enables it to release air at higher flow rates than other automatic air release valves of its kind.
- The enlarged orifice with its self-cleaning mechanism dramatically reduces obstruction due to debris.
- The valve's rolling seal mechanism design is less sensitive to different pressures than a direct float seal, thus enabling a one-size orifice for a wide pressure range (from 0.2 up to 16 bar).
- Light, simple and reliable structure.
- Due to its light weight, the valve may be installed on plastic piping systems, as well as other light weight piping.

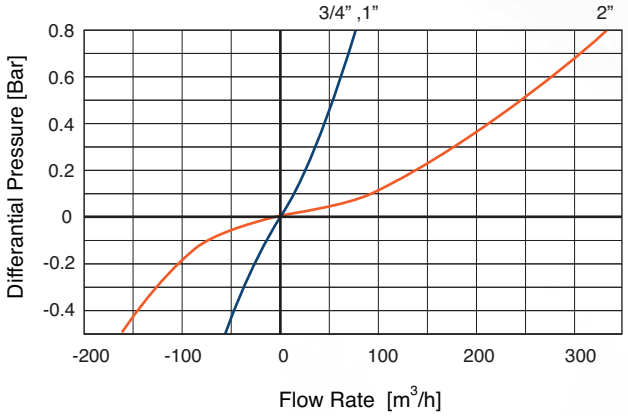
Valve Selection

The air valve is available:

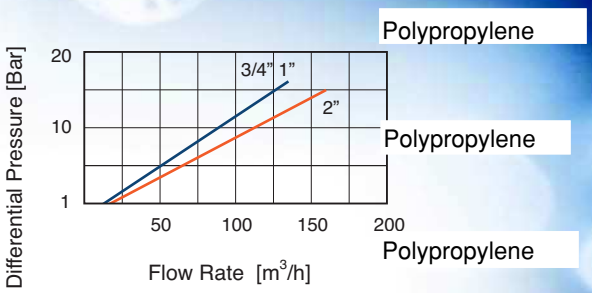
- With 3/4", 1", 2" male BSPT/NPT connections.
- With a ball valve tap BSPT/NPT male connection upon request.
- The valve is available with a one-way check valve.

When ordering, please specify valve type according to the maximum working pressure of the line.

AIR AND VACUUM FLOW RATE

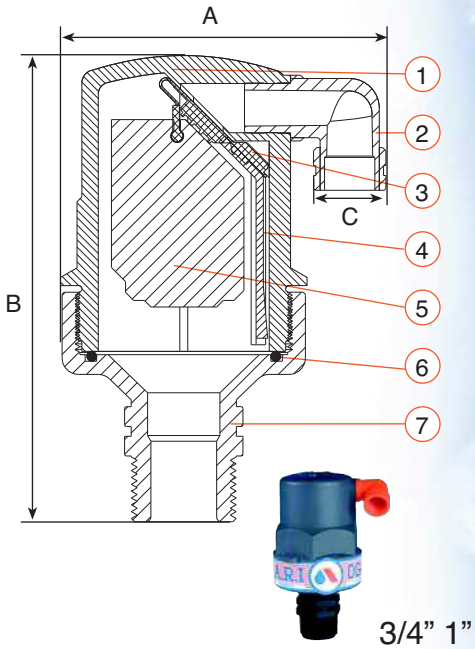


AUTOMATIC AIR DISCHARGE



DIMENSIONS AND WEIGHTS

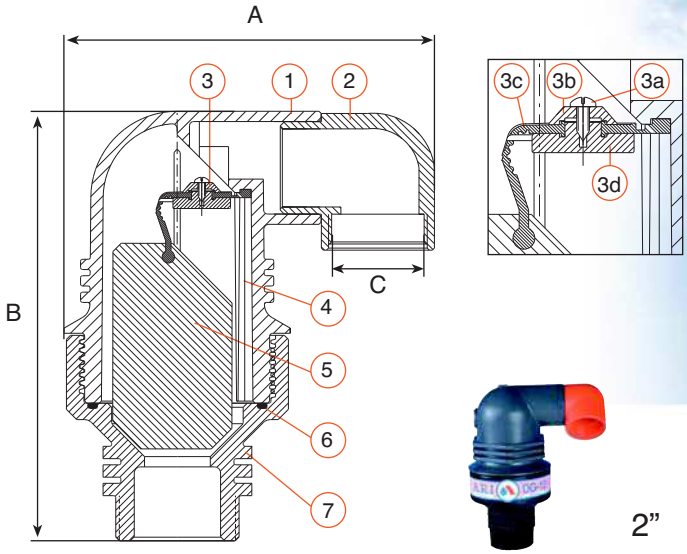
Model	Dimensions mm			Weight	Orifice Area mm²	
	A	B	C	Kg.	Auto.	A / V
1 , 3/4	100	143	3/8 BSP	0.33	7.8	100
2	180	209	1 1/2 BSP	1.1	12	804



3/4" 1"

PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Body	Reinforced Nylon
2.	Drainage Outlet	Polypropylene
3.	Seal Plug Assembly	
3a.	Screws	Stainless Steel
3b.	Plug Cover	Reinforced Nylon
3c.	Rolling Seal	E.P.D.M.
3d.	Plug	Reinforced Nylon
4.	Clamping Stem	Reinforced Nylon
5.	Float	Foamed Polypropylene
6.	O-Ring	BUNA-N
7.	Base	Reinforced Nylon
Optional		
	Ball valve	Brass ASTM B124



2"

A.R.I. FLOW CONTROL ACCESSORIES Ltd. reserves the right to make product changes without prior notice. To insure receiving updated information on parts specifications, please call the export dept. at the A.R.I. factory. A.R.I. FLOW CONTROL ACCESSORIES Ltd. shall not be held liable for any errors. All rights reserved.

S-050 PN 16

WATER SUPPLY

S-050-C PN 16

S-052 PN 25

AUTOMATIC AIR RELEASE VALVE "SEGEV" PATE.PEND

Description

The Automatic Continuous Acting Air Release valve ("High pressure") discharges accumulated air from the system while it is under pressure. This revolutionary valve is the result of development based on many years of experience.
The Automatic Continuous Acting Air Release valve is the first of its kind in the world. In spite of its compact and light weight structure, it has a 12mm^2 orifice that enables it to discharge air at high flow rates and is not exposed to obstruction by debris.

Operation

The Automatic Continuous Acting Air Release valve, releases entrapped air from pressurized systems.
Pockets of accumulated air may cause the following destructive phenomena:

- Impediment of effective flow and hydraulic conductivity of the system along with a throttling effect as would a partially closed valve. In extreme cases this will cause complete flow stoppage.
- Accelerate cavitation damages.
- High pressure surges.
- Accelerate corrosion of metal parts.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

The valve functions while the system is under pressure, according to the following stages:
1. Liquid fills the system and enters the valve.
2. The float rises and rolls the rubber sealing band to its sealing position.
3. Entrapped air, which accumulates at peaks along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, peeling the rolling seal the orifice opens, and the accumulated air is released.
5. Liquid reenters the valve and the float rises, rolling the rubber sealing band to its sealing position.

Note: Automatic Continuous Acting Air Release valves are designed to release air as it accumulates at peaks of pressurized systems. They are not normally recommended for vacuum protection to valve large volumes of air, because of the inherently small orifices. For this purpose kinetic air valves have much larger orifices.
However Automatic Continuous Acting valves will permit air to re-enter under vacuum conditions. If this is not desirable specify Vacuum check valves.

Main Features

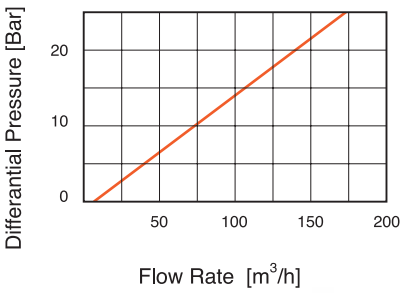
- Working pressure range: 0.2-16 bar. Testing pressure: 25 bar
- Maximum working temperature 90^o C.
- The larger than usual orifice enables it to discharge air at higher flow rates than other Automatic Continuous Acting Air Release valves of its kind.
- The enlarged orifice is not exposed to obstruction by debris.
- The valve's design Rolling Seal Mechanism, is less sensitive to pressure differentials than a direct float seal. It accomplishes a comparably large, orifice for a wide pressure range (up to 16 bar).
- Light weight, simple and reliable structure.
- The body is made of high strength plastic, and all operating parts are made of specially selected corrosion resistant materials.
- A drainage outlet enables removal of excess fluids.

Valve Selection

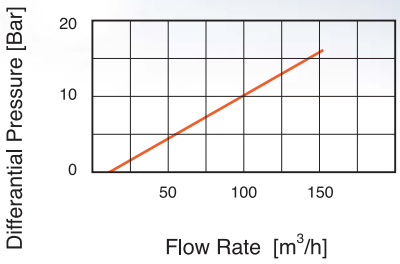
- Available in male threaded sizes: 1/2", 3/4", 1" - BSP / NPT
- Vacuum check valve - The valve is available as a valve that will only release air from the system and will not admit air to the system when negative pressure conditions occur. This characteristic is obtained by adding a check valve to the air outlet.

AIR AND VACUUM FLOW RATE

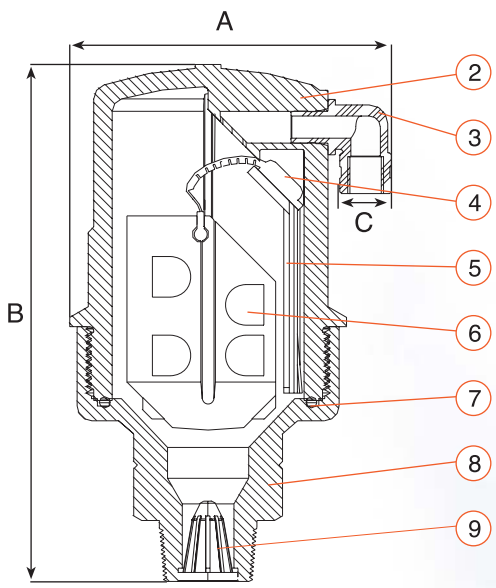
S-052



S-050, S-050-C



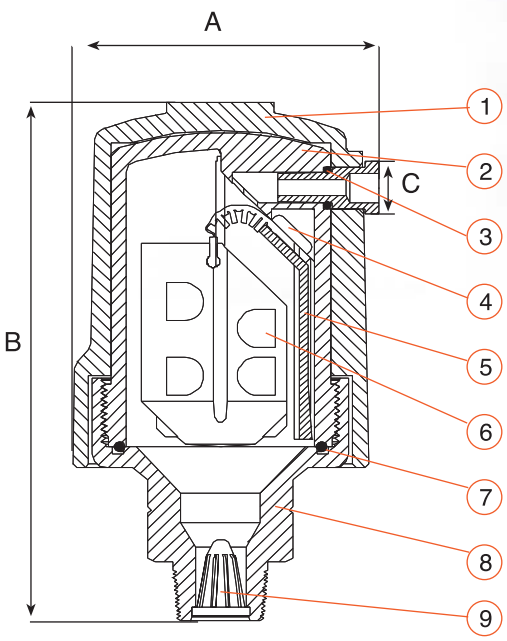
S-050



DIMENSIONS AND WEIGHT

Model	Dimensions mm A	B	internal C	externa	Weight Kg.	Orifice Are mm²
S-050 P	87	140	1/8"	18	0.3	12
S-050 B	87	140	1/8"	18	0.65	12
S-050-C	85	148	1/8"	15	1.65	12
S-052	85	148	1/8"	15	1.65	9

S-050-C, S-052



PARTS LIST AND SPECIFICATION

No.	Part		Material
1.	Cover	16 bar	Cast Steel ASTM A-48 CL35B
		25 bar	Sphero Nodular ASTM A-536-60-40-18
2.	Body		Reinforts Nylon
3.	Drainage Outlet	S-050	Polypropylene
		S-050-C/S-052	Brass ASTM B-124
4.	Rolling Seal		E.P.D.M.
5.	Clamping Stem		Reinforts Nylon
6.	Float		Foamed Polypropylene
7.	O-Ring		BUNA-N
8.	Base	S-050	Reinforts Nylon / Brass ASTM B-124
		S-050-C/S-052	Brass ASTM B-124
9.	Strainer		Nylon

S-050 PP AUTOMATIC AIR RELEASE VALVE "SEGEV" *PAT. PEND*

Lightweight, small dimensions, simple and reliable structure.

The body is made of high strength plastic, and all operating parts are made of specially selected corrosion resistant materials.

A.R.I patent, Rolling Seal Mechanism:

- Dramatically reduces the possibility of obstruction by debris.
- Discharges high air flow rates upto 160 m^3/h.
- One size orifice for a wide pressure range (up to 10 bar).
- Self cleaning mechanism.

Working pressure range: 0.2-10 bar (3-150 psi).

Available in 1/2" (15mm), 3/4" (20mm), 1" (25mm) BSPT/NPT threaded.

Option

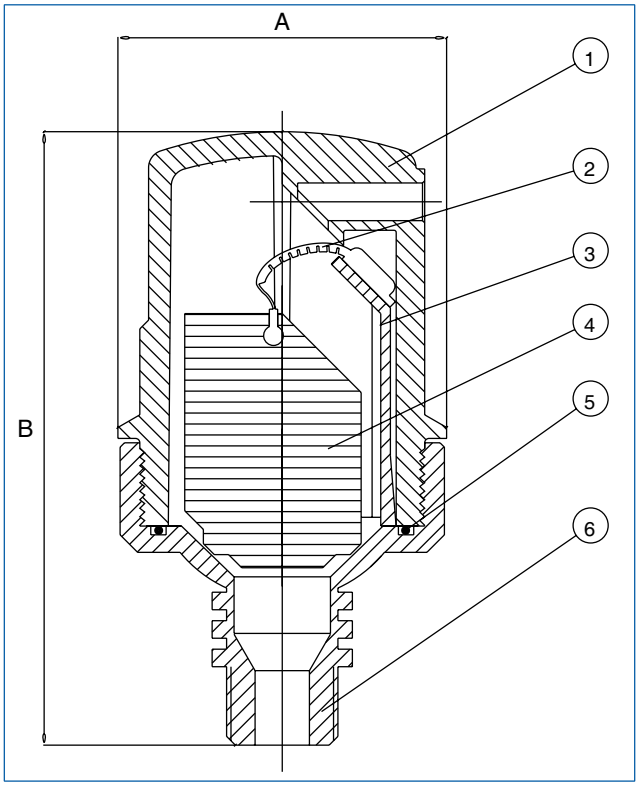
S-050-V: vacuum check. Available as a valve that will only release air from the system and will not admit air to the system in vacuum condition.

Ordering

Upon ordering, please specify: model, size, working pressure, threads standard and type of liquid.

ECS050PP2002

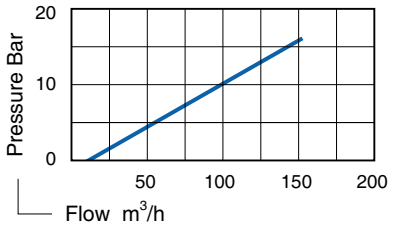
A.R.I **Flow Control Accessories**
Kfar Charuv, 12932 Israel Tel. 972-4-6761988 Fax. 972-4-6763402 http://arivalves.com



PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Body	Reinforced Polypropylene
2.	Rolling Seal	Rubber E.P.D.M
3.	Clamping Stem	Reinforced Nylon
4.	Float	Blue Foamed Polypropylene
5.	O-Ring	BUNA-N
6.	Base	Reinforced Polypropylene or Brass ASTM B124

AUTOMATIC AIR DISCHARGE CHART



DIMENSIONS AND WEIGHTS

Nominal Size	A	B	Weight Kg
15mm 20mm 25mm	75	140	0.3 PP Base
1/2", 3/4", 1"			0.65 Brass Base

*** Orifice size Area: 12mm²**

Control

Tal Gil

FILTRON FT1+DP 3W (DC)

- The “FILTRON FT1+DP 3W” is a backflusing controller for a single station automatic filter.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor).
- The unit activates 3 wired 12v DC latching solenoid.
- For convenience, the controller can be powered either by 6v DC or 12v DC.
- The system will detect problems of endless looping if after 7 consecutive cycles, the DP sensor keeps demanding the start of a new cycle.

Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing duration is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			**FLUSHING DURATION**		
1 – ON 0 - OFF	**S1** **1 2 3 4**	**meaning**	1 – ON 0 - OFF	**S2** **1 2 3 4**	**meaning**
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	8 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	10 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	12 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	16 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	20 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	25 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	30 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	45 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	1 min.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	3 min.
14	1 0 1 1	24 hours	14	1 0 1 1	4 min.
15	0 1 1 1	72 hours	15	0 1 1 1	5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	6 min.

Installing the DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table. As long as the pressure difference is lower than the set point there is no flushing request signal generated, but when the pressure difference is higher, it will trigger a flushing cycle within 5 seconds.

Position No.	S3 (1-ON ; 0-OFF) 1 2 3 4	Set-point	
		Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

The function of the Jumpers JP1,JP7,JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.
JP7 – For selection of the powering mode 6v or 12 v.
JP8 – Enables or disables detection of “endless looping” problems. When the upper pin of the jumper is free, the detection is enabled.
JP9 – Immediate or delayed reaction to the DP signal. When the upper pin of the jumper is free, then the reaction to the flushing request signal of the DP will trigger the next cycle after 5 seconds, otherwise it will be immediate.

Summary of the beeping sound indications

1 beep every 15 sec- normal operation

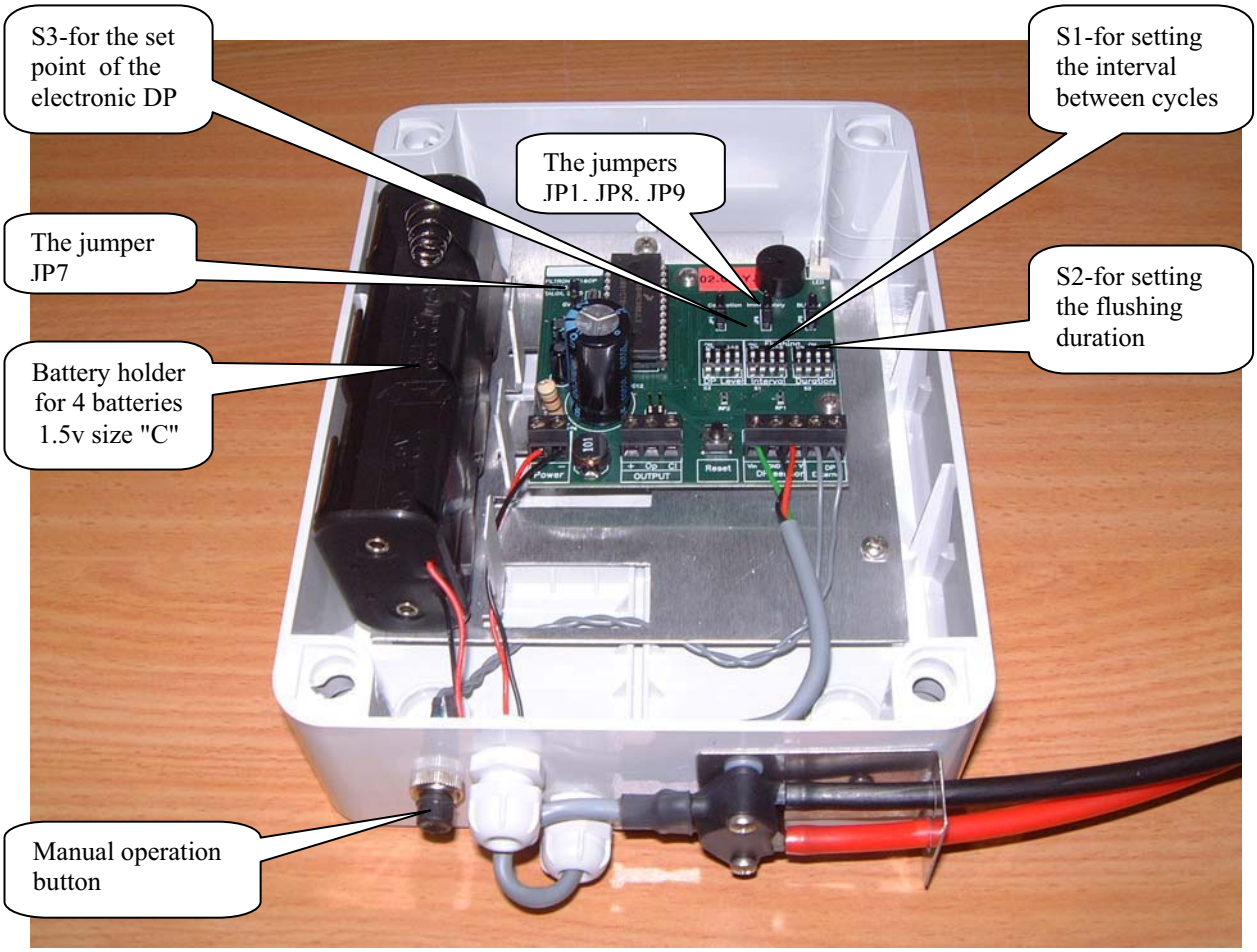
2 beeps every 15 sec- endless looping problem detected

3 beeps every 15 sec- low battery

6 beeps on power up or after RESET – indicates being in calibration mode. Usually this should not happen but since it did, it means that the position of JP1 has been set to calibration mode (right side pin free) the process must be completed as follows: make sure that the pressure difference sensed by the electronic DP is zero (if necessary, disconnect the red and black command tubes), and push the RESET button. Change the position of JP1 back to its normal position with the left side pin free and push the RESET button again.

How to handle endless looping problems

When the system reports of “endless looping problem” by 2 beeps every 15 sec, it means that the flushing request signal keeps arriving from the active DP sensor. In this case the system stops referring to the sensor and continues flushing based on the defined interval between cycles. The cause of the problem must first be detected and removed, and then push the RESET button to signal the controller that the problem was solved.



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T H E F I L T R O N 3.6

U S E R ' S M A N U A L

2 0 0 0

Ver 3.6

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I N T R O D U C T I O N

WHAT IS THE FILTRON?

As a member of the ABSOLUTE family of controllers manufactured by TALGIL, The FILTRON is a very powerful and easy to use machine specially designed for automatic filters flushing control

- Available in DC or AC models.
- Reading: 1 differential pressurstat,
  1 water meter,
  1 low pressure detector.
- User defined configuration includes:
  main valve yes/no,
  delay valve yes/no,
  water meter yes/no,
  alarm yes/no,
  the number of stations.
- All parameters are user definable, namely:
  flushing cycle,
  flushing time,
  dwell time,
  differential pressurstat delay,
  the number of successive operations considered as faulty operation,
  master valve delay.
- Solenoid test mode.
- Start flushing according to time interval.
- Start flushing according to pressure difference.
- Start flushing according to volume measured by water meter.
- Manual start/stop of flushing sequence.
- Real time activity display.
- Full activity monitoring includes:
  number of manual activations,
  number of time based activations,
  number of differential pressurstat activations,
  number of volumetric activations.
- Water meter accumulation.
- Detecting and eliminating circular endless repetitions.
- Automatic pause on low pressure.
- Activating alarm if necessary.

THE DC AND AC MODELS

The FILTRON is available both in DC and AC models. The two models differ in the energy sources and in the type of solenoids used.

The DC model is powered from a 12v ALKALINE battery and it activates 12v DC latching solenoids. The DC model has very low power consumption.

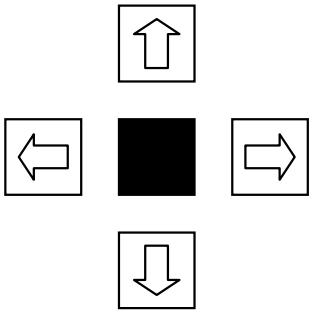
The AC model of the FILTRON is powered from a power supply unit, which supplies 24v AC both for the controller and for the solenoids.

The AC model depends on the 24v AC for solenoids activation therefore when there is a power down situation, no activation will take place. There will be no loss of information due to power down.

In general the DC and AC models are similar and there are only a few differences. We shall point out the differences when applicable.

USING THE KEY BOARD

The FILTRON is equipped with a keyboard of 5 buttons as shown in the following drawing:



The central key is the <ENTER> and the others are called arrows, there are horizontal arrows and vertical arrows.

The <ENTER> key is used for:

"Entering" into the screen in order to change some values in it.
Confirmation after inserting a numerical value.
Answering positively where there is a yes/no question.

The arrows are used for:

Movement between screens.
Changing numerical values in the following way:

The upper arrow increases the value by 1.
The lower arrow decreases the value by 1.
The right arrow shifts the digits to the right.
The left arrow shifts the digits to the left.

SPECIAL CASE: Pushing the two horizontal arrows simultaneously will bring us into the "PLC definition" mode in which the configuration is defined by specifying the various devices connected to the FILTRON.

THE START UP

The start up process consists of the following steps:

1. Connecting the energy source.
2. Configuration process (PLC definition).
3. Connecting the input/output devices.
4. Testing solenoids
5. Defining the flushing program parameters.

1. CONNECTING THE ENERGY SOURCE

As in any electronic device, the FILTRON won't work without a proper energy source. In the case of the DC model it will be a 12v Alkaline battery and in the case of the AC model it will be 24v AC generated from the mains.

Connect the energy source as described in the drawings in paragraph 3 under the labels "DC BOARD CONNECTIONS" and "AC BOARD CONNECTIONS". Notice that in the case of the DC energy sources the (+) and the (-) cords are not to be interchanged.

As a result of the energy source connection you will see the following introductory screen:

THE FILTRON
TALGIL ver.3.6

Failing to get the display indicates a wrong connection of the energy source or the display flat cable.

2. CONFIGURATION PROCESS (PLC definition).

During the configuration process the system's structure and the appropriate parameters are defined.

You should be prepared to answer the following questions:

1. Does the unit control a master valve?
2. Is there a delay valve included?
3. How many flushing stations are going to be activated?
4. Do you intend to use a water meter to flush volumetrically?
5. Do you want an alarm activation in case of malfunction?

To start the configuration process you have to press both of the horizontal arrows simultaneously. As a result, the following display will be shown:

1 2 3 4 5 6 7 8 W.METER
F F F F F M V A PLC

"F" – stands for flushing valves (outputs 1-5)
"M" – stands for Master valve (output 6)
"V" – stands for delay valve (output 7)
"A" – stands for Alarm (output 8)

The screen shows the previous configuration. In order to re-configure the FILTRON to suit your case, you have to execute the PLC definition as described below.

Notice that configuration changes are not allowed during the flushing process. Trying to do so will result in the following display:

FLUSHING ACTIVE PLEASE WAIT!!

To start the PLC definition process you need to push the right arrow. The following screen will be displayed:

FOR NEW PLC PRESS <ENTER>

Pressing the <ENTER> key will reveal the following screen:

NO. OF FILTERS 5

Use the "UP" arrow to set the proper number of filters in your case and press <ENTER>.

In the following steps you will be asked to define whether or not your system is intended to control a master valve, a delay valve, an alarm and to read a water meter. A positive answer is given by pressing the <ENTER> key and a negative by any of the arrows.

FOR MASTER VALVE PRESS <ENTER>

FOR DELAY VALVE PRESS <ENTER>

FOR ALARM PRESS <ENTER>

FOR WATER PRESS <ENTER>

When the configuration process is complete, a screen will be displayed to show the order of connection of the solenoids of the various valves to the terminal board.

Pressing the <ENTER> once more will bring you to the main screen.

3. CONNECTING THE INPUT/OUTPUT DEVICES

The FILTRON recognizes 3 types of devices:

DIFFERENTIAL PRESSURSTAT - which measures the pressure difference (DP) between the inlet and outlet of the filters indicating a need for flushing whenever the difference, rises above a preset value.

LOW PRESSURE SENSOR - which detects low-pressure situations (LP) during which the

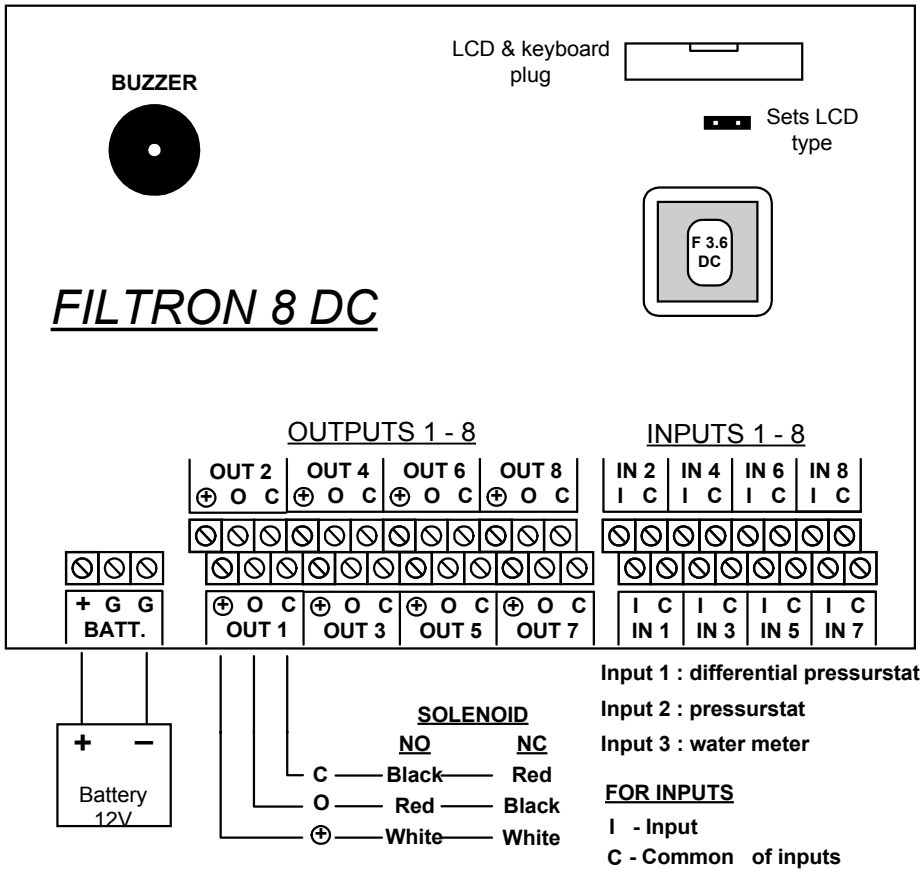
flushing would not be effective therefore it halted. This can also be used for synchronizing the flushing with the irrigation start.

WATER METER - which measures the volumes of water (WM) flowing through the filters, enabling to define the flushing sequence volumetrically

Each of the input devices has its own connection point on the terminal board:
The DP when exists is always connected to input No 1. (IN1)
The LP when exists is always connected to input No 2. (IN2)
The WM when exists is always connected to input no 3. (IN3)

There are some differences between the AC and DC models in the way the I/O devices are connected to the boards. The following drawings show the differences:

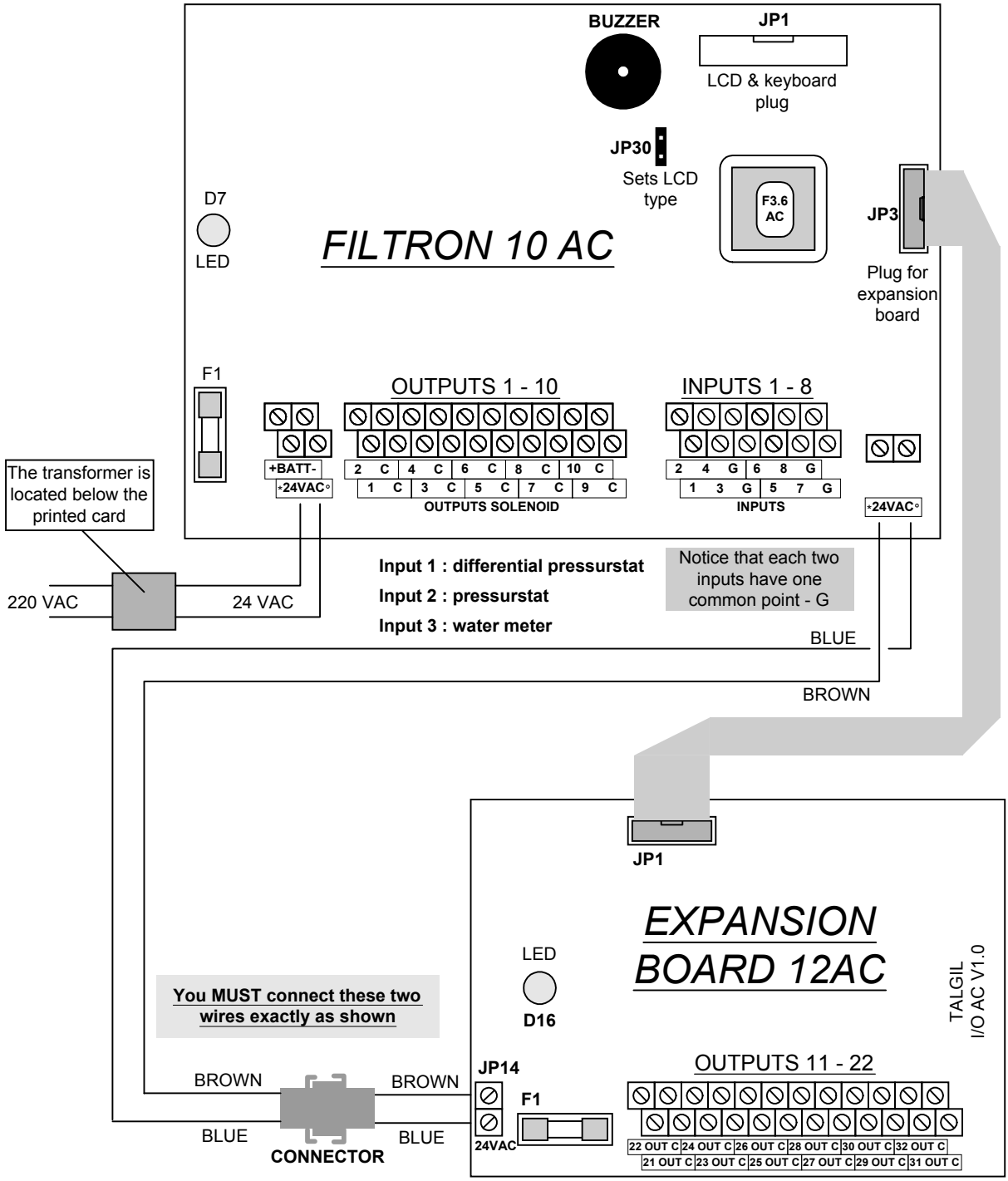
D.C. BOARD CONNECTIONS



Each DC solenoid has three wires and each output connection on the terminal board has three positions marked (+, O, C). The white wire will always be connected to the (+), the red wire will usually go to the (O) and the black one to the (C). In case of a normally closed valve the red and the black wires should change positions.

A.C. BOARD CONNECTIONS

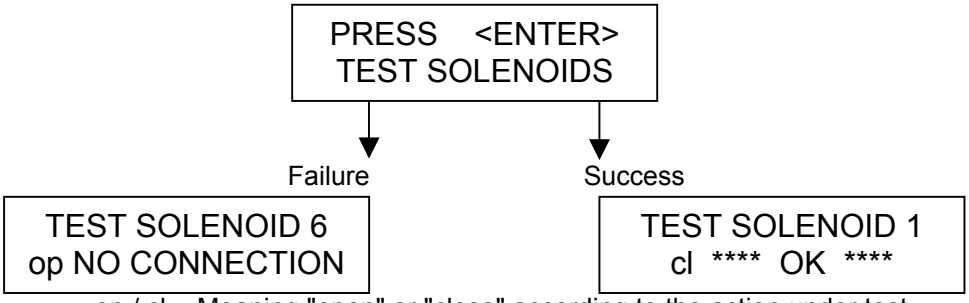
The following wiring diagram describes the AC board's power and I/O connections, to that we added the description of the wiring for an expansion card, which can be added to expand the number of outputs. Special attention has to be paid to the connection of the 24v AC to the expansion card, although we are talking about AC, the polarity is important.



Each AC solenoid has two wires and each output connection on the AC terminal board has two positions, one marked by an ordinal number and the other marked (C). The order of connection of the two wires of the solenoid makes no difference as long as the proper solenoid is connected to the proper output location.

4. TESTING SOLENOIDS

The FILTRON is capable of testing out the solenoids. In the DC model each solenoid is tested for opening and closing. The machine will automatically test the 8 stations sequentially. Press the <ENTER> key to start the process.



op / cl - Meaning "open" or "close" according to the action under test.

When you get a "no connection" message, please check out the board connections. If you find no problem there, try to replace the solenoids.

In the AC model the solenoids are tested against being short-circuited. When a short-circuit is detected, the solenoid is marked SHORTED and it will not be activated until the FILTRON is informed that the problem is solved. The first screen to the right of the Introductory screen will notify us about the short-circuited solenoids and the same screen is used for declaring the end of the problem, just push the <ENTER> key. The solenoids of the AC model are continuously tested whenever activated.

5. DEFINING THE FLUSHING PROGRAM PARAMETERS

In the following steps you are going to define the parameters which will dictate the flushing process. You will have to answer the following questions:

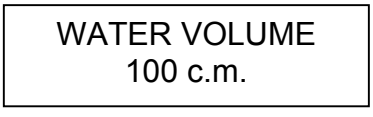
1. When using a water meter, after how many cubic meters to flush?
2. If you are using a water meter, what is its volume/pulse ratio?
3. What will be the flushing cycle time (expressed in minutes)?
4. What will be the dwell time in seconds?
5. If your system includes a delay valve, what will be the valve delay time (in seconds)?
6. What will be the desired flushing time of a station (in seconds)?
7. What should be the reaction delay to the change of the D.P status?
8. The number of consecutive cycles to be considered a faulty circular activity?

Setting the flushing cycle

The flushing cycle can be expressed in terms of time and/or volumetric units. The first event to occur will cause the start of a flushing sequence and will reset both the volumetric and the time based counters. Flushing sequence caused by the D.P. (DIFFERENTIAL PRESSURSTAT) will also reset both of the counters.

The possibility to express a volumetric flushing cycle depends on the existence of a water meter. When no water meter has been declared, the screens dealing with the water volume and the water meter ratio will not be displayed.

The following screen should be used to express the flushing cycle in volumetric units:



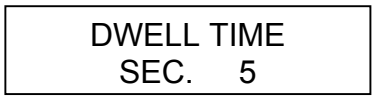
Meaning that flushing will take place after each 100 cubic meters measured by the water meter. The range is 1-999 c.m.

The water meters **volume / pulse ratio** is defined in the following screen. The fraction represents the volume measured by each pulse of the meter. The range is 1-1000/100 c.m.

When using time units, the flushing cycle defines the interval between successive flushing sequences and it is measured in minutes (1-9999). If a flushing sequence was started for any reason, the count down to the next cycle is reset. Setting the Cycle to zero means that the backflushing will not be time based but will depend on the D.P. only. The screen used for setting the flushing cycle looks like the following:

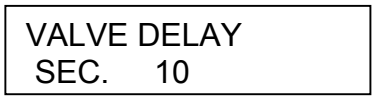
Setting the dwell time

The dwell time is the delay measured between flushings of two successive stations. It is measured in seconds (1-99).



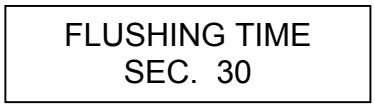
Setting the valve delay

When a delay valve exists in the system, you need to define the delay between the actions of the flushing valve and the delay valve. The range is 1-99 seconds. If the configuration does not include such a valve the following screen won't appear:



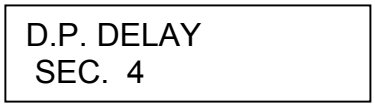
Setting the flushing time

The flushing time defines the period of time during which the flushing valve is kept open. The range is 2-240 seconds.



The differential pressurstat (D.P.)

If the system contains a D.P. then the following two parameters must be defined. The first parameter defines the delay needed for the D.P. to stabilize. This time is measured in seconds (2-30) and it is set in the following screen:



The second parameter defines the circular looping limit. The looping may by caused by the D.P. remaining constantly "ON", causing an endless flushing loop. The circulation limit (0-9) is set via the following screen:

D.P. FAULT NO.OF FALSE FLUSHES 4

If "0" is selected, the looping detection mechanism is suppressed.

When the limit is exceeded, the FILTRON will stop flushing by DP and continue flushing by time or volume. If an alarm has been defined, it will be activated. The following screen will be displayed:

DP.FAULT RELEASE BY <ENTER>

To resume normal operation, simply press the <ENTER> key.

The master delay

The delay between the master valve and the first flushing valve is called master delay and it is defined in seconds (0-99) in the following screen:

MASTER DELAY SEC. 5

PROCESS MONITORING AND MANUAL ACTIONS

The main screen

The main screen supplies on line information about the current status of the system, therefore its appearance varies according to the actual situation.

During the count down between flushing cycles it will have the following form:

TO NEXT DP-Off START 83:21 min

We are informed about the time left to next cycle, which is 83 minutes and 21 seconds, and the current reading of the D.P. which is "Off".

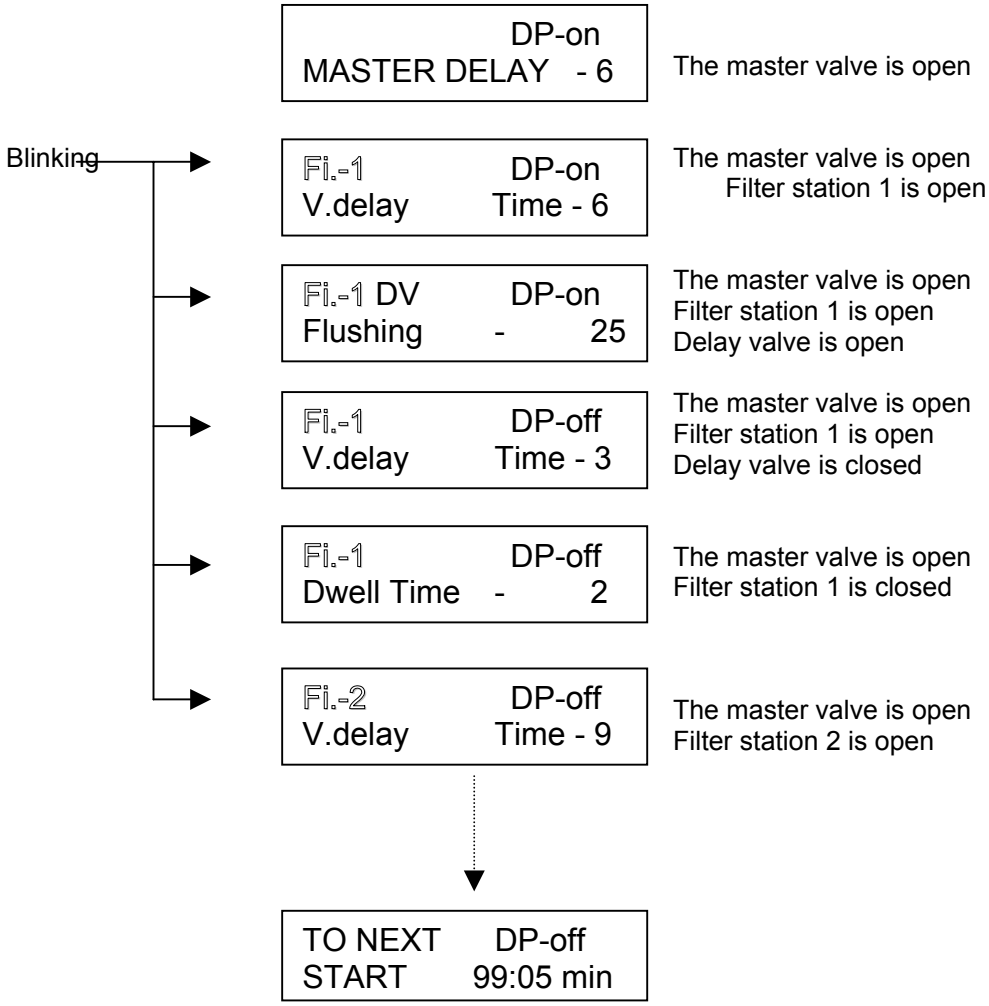
When a water meter has been declared you would probably like to see how much water will pass through the water meter until the next cycle. To obtain this information press the lower arrow that and the following screen will supply the requested information:

CURRENT FLOW-128 LEFT VOLUME - 23

Both of the counters, the volumetric and the time based, are counting backwards. The first to reach the 0 count will cause the start of a flushing cycle during which the second counter is also cleared.

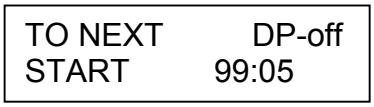
During the flushing sequence the main screen displays the various stages of the process. The following example shows the way the main screen will look like when the starting cause was the D.P.

When the reading of the D.P. changes, the "Off" will be replaced by "On" and after the "D.P. Delay" the flushing cycle will start.



When the master valve and/or the delay valve are not declared, the relevant screens will not be displayed.

When the flushing cycle is in progress, no configuration changes and no solenoid tests are allowed. Trying to execute one of the actions will result in the following message:



Manual start/stop

To manually start a flushing cycle you need to reach the following screen, which is located to the right of the main screen.

MANUAL START <ENTER>

Pressing the <ENTER> key will start the flushing cycle immediately.

While the flushing sequence is in progress it can be stopped manually by using the same screen which will now appear as follows:

MANUAL STOP <ENTER>

Various counters

The FILTRON counts the various flushing cycles. The results are displayed in the following way:

DP – 156	Ti – 10
Ma – 2	Vo - 16

Water accumulation

When a water meter is defined, the water accumulation is displayed in a screen, which appears to the right of the counter's screen.

WATER ACCUM. 120 c. m.

Clearing accumulators

To clear the counters above, you have to reach the following screen and then press the central <Enter> key.

ERASE ACCUM. <ENTER>

Checking the battery level

The battery level can be observed via the following screen:

BATTERY VOLTAGE 12.58 volt

The computer itself checks the battery level once an hour. When the voltage drops bellow 10 volts you receive the following warning:

WARNING!! LOW BATTERY

When the voltage drops bellow 9 volts the FILTRON stops all activities and displays the following:

CLOSED!! – REPLACE BATTERY

Manual pause

If for any reason you want the FILTRON to remain idle for some time, you may cause a manual halt.

MANUAL PAUSE <ENTER>

All activations including manual activations will be inhibited, trying to activate the flushing sequence will result in the following display:

RELEASE MANUAL PAUSE FIRST!!

The manual pause is not allowed when the flushing process is in progress. As long as the system is in "pause" the buzzer keeps sounding to remind you that the system is halted and it is the responsibility of the user to free it from the "MANUAL PAUSE" condition.

To release the system from "pause" the same screen is to be used:

MANUAL PAUSE RELEASE <ENTER>

To resume normal operation press the >ENTER< key once again.

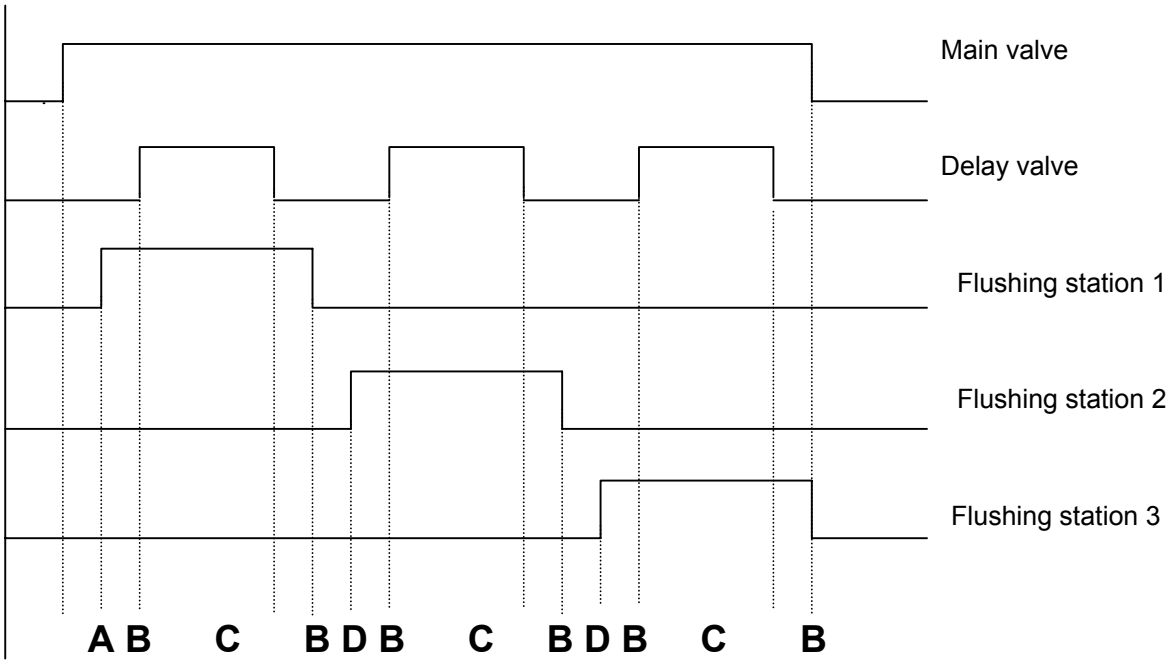
Low pressure halt

When a low-pressure sensor is used it has to be connected to input no. 2 (IN2). When the contact of the sensor becomes closed (for 1 minute at least), it will stop the activity of the FILTRON. The following message will be displayed:

PAUSE SENSOR HALT

The FILTRON will remain halted until the contact becomes open again.

TIMING DIAGRAM



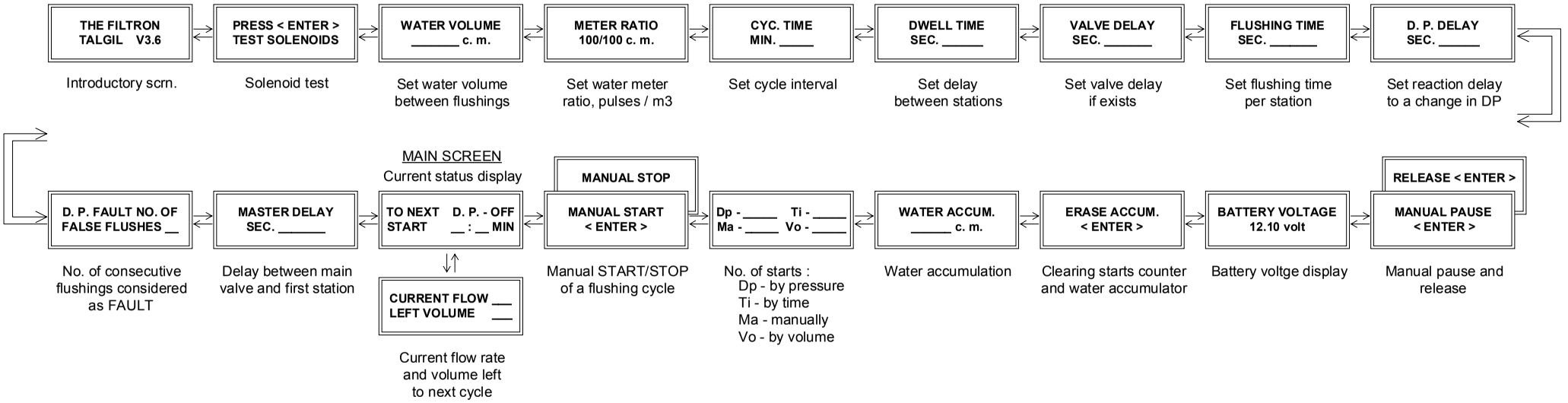
A - MASTER DELAY

B - VALVE DELAY

C - FLUSHING TIME

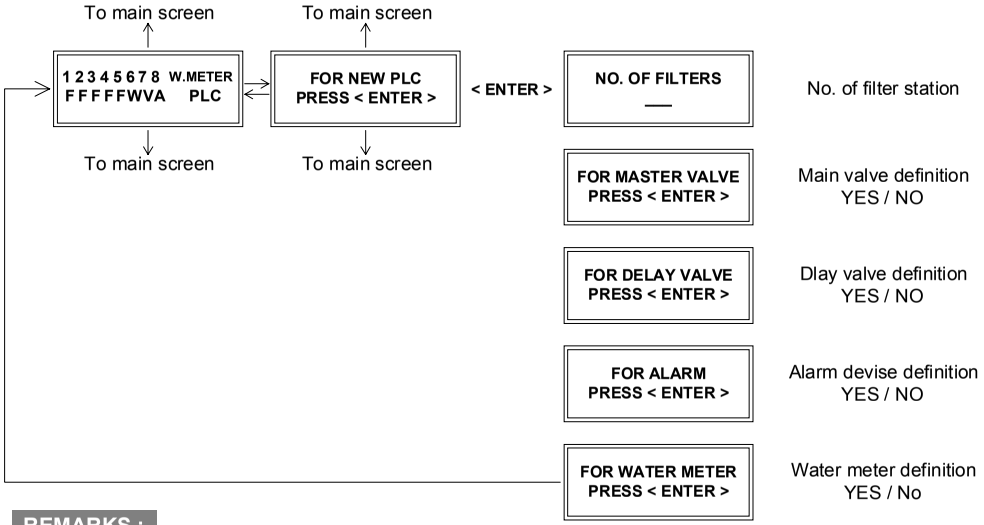
D - DWELL TIME

FILTRON 3.6 - FULL SCREEN DIAGRAM



PLC DEFINITION

To enter PLC definition press simultaneosly the two horizontal arrow keys



REMARKS :

The screens dealing with water meter, main valve and delay valve will not appear unless defined in PLC. The MAIN SCREEN appearence will change according to the current status. DP = on means existing pressure difference, DP = off means no pressure difference.

POP-UP SCREENS FOR SPECIAL SITUATIONS

Low battery. The FILTRON will continue funtioning. Prepare to replace battery.	WARNING !! BATTERY LOW
The battery voltage is below 9 volts. The FILTRON is halted. Replace battery.	CLOSED !! REPLACE BATTERY
Wating caused by a low pressure sensor.	PAUSE SENSOR HALT
Waiting caused by exceeding the limit of consecutive starts caused by the DP.	D.P. FAULT RELEASE BY < ENTER >
Whenever a range limit is exceeded, the range limit will be displayed.	RANGE ERROR !!! ___ ___
When trying to start a manual sequence during manual pause condition.	RELEASE MANUAL PAUSE FIRST !!
When trying to do PLC changes when the flushing process is in progress.	FLASHING ACTIVE PLEASE WAIT !!

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FAX: 972-4-8775949
E-mail: talgil33@netvision.net.il

THE FILTRON AC
(Ver. 3.7)

U S E R ' S M A N U A L

2 0 0 3

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I N T R O D U C T I O N

ABOUT THE FILTRON AC (Ver. 3.7)

The FILTRON AC (Ver. 3.7) AC is a modern backflushing controller which is capable of directly reading an analog electronic pressure differential sensor, therefore there is no need for any external DP sensor for triggering the backflush cycles. The electronic DP is a highly accurate and very reliable sensor.

- Reading: 1 analog electronic Differential Pressure gauge.
  1 water meter,
  1 low pressure detector.

- User defined configuration includes:
  main valve yes/no,
  delay valve yes/no,
  water meter yes/no,
  alarm yes/no,
  the number of stations.

- All parameters are user definable, namely:
  flushing cycle,
  flushing time,
  dwell time,
  differential pressurstat delay,
  the number of successive operations considered as faulty operation,
  master valve delay.

- Solenoid test mode.

- Start flushing according to time interval.

- Start flushing according to pressure difference.

- Start flushing according to volume measured by water meter.

- Manual start/stop of flushing sequence.

- Real time activity display.

- Accumulating number of activations as:
  number of manual activations,
  number of time based activations,
  number of differential pressurstat activations,
  number of volumetric activations.

- Water meter accumulation.

- Detecting and eliminating circular endless repetitions.

- Automatic pause on low pressure.

- Activating alarm if necessary.

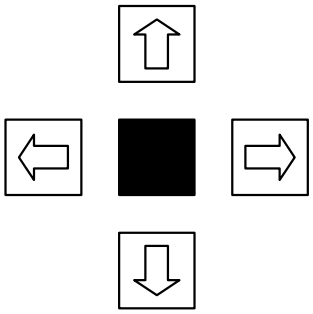
POWERING AND POWER FAILURE

The FILTRON AC (Ver. 3.7) is an AC controller, it is powered from the mains (220v or 110v depending on the model) and by a built in transformer the voltage is reduced to 24v AC which are used by the system for the solenoids activation.

Since AC controllers depend on the 24v AC without which solenoids can not be activated, when there is a power down situation, no activation will take place. However there is no danger of losing any of the defined parameters, all of them are burnt into a nonvolatile memory.

USING THE KEY BOARD

The FILTRON is equipped with a keyboard of 5 buttons as shown in the following drawing:



The central key is the <ENTER> and the others are called arrows, there are horizontal arrows and vertical arrows.

The <ENTER> key is used for:

"Entering" into the screen in order to change some values in it.
Confirmation after inserting a numerical value.
Answering positively where there is a yes/no question.

The arrows are used for:

Movement between screens.
Changing numerical values in the following way:

The upper arrow increases the value by 1.
The lower arrow decreases the value by 1.
The right arrow shifts the digits to the right.
The left arrow shifts the digits to the left.

SPECIAL CASE: Pushing the two horizontal arrows simultaneously will bring up the "PLC definition" mode in which the system configuration is defined.

THE START UP

The start up process consists of the following steps:

1. Connecting the energy source.
2. Configuration process (PLC definition).
3. Connecting the input/output devices.
4. Testing solenoids
5. Defining the flushing program parameters.

1. CONNECTING THE ENERGY SOURCE

When the unit is connected to the power source, it responds immediately by showing an introductory screen as follows:

THE FILTRON
TALGIL ver.3.7

If the screen does not show up check the power cord, check the plug point of the energy source, check the fuse and check the flat cable connecting between the display and the main board.

2. CONFIGURATION PROCESS (PLC definition).

You should be prepared to answer the following questions:

1. Does the unit control a master valve?
2. Is there a delay valve included?
3. How many flushing stations are going to be activated?
4. Do you intend to use a water meter to flush volumetrically?
5. Do you want an alarm activation in case of malfunction?

To start the configuration process you have to press simultaneously the two horizontal arrows. As a result, the following display will be shown:

P L C F : 1 - 7 W . M
M : 8 V : 9 A:10

"F" – stands for flushing valves (outputs 1-7)
"M" – stands for Master valve (output 8)
"V" – stands for delay valve (output 9)
"A" – stands for Alarm (output 10)
"W.M" – stands for Water Meter

The screen shows the currently existing configuration. In order to re-configure the FILTRON to suit your case, you have to execute the PLC definition as described below.

Notice that configuration changes are not allowed during the flushing process. Trying to do so will result in the following display:

FLUSHING ACTIVE
PLEASE WAIT!!

To start a new PLC definition you need to push the right arrow. The following screen will be displayed:

FOR NEW PLC
PRESS <ENTER>

Pressing the <ENTER> key will reveal the following screen:

NO. OF FILTERS
7

Use the "UP" arrow to set the proper number of filters existing in your case and press <ENTER>.

In the following steps you will be asked to define whether or not your system is intended to control a master valve, a delay valve, an alarm and to read a water meter. A positive answer is given by pressing the <ENTER> key and a negative by pressing any of the other keys.

FOR MASTER VALVE PRESS <ENTER>

FOR DELAY VALVE PRESS <ENTER>

FOR ALARM PRESS <ENTER>

FOR WATER METER PRESS <ENTER>

The next screen after defining the existence of a water meter, is asking whether a calibration of the analog DP sensor is needed. It is recommended at the first use to execute the calibration process. The password that will start the calibration process is “247”. For executing the calibration you must make sure that the pressure difference between the high pressure sensing point (red tube) and the low pressure sensing point (black tube) is zero. The best thing is to leave them both disconnected during the calibration process. With the tubes disconnected, push the ENTER key and insert the code “247”.

TO CALIBRATE ENTER PASSWORD

The calibration is immediate, and when it is over, a screen will be displayed showing the result of the new PLC definition which will dictate the order of connection of the various valves to the terminal board.

Pressing the <ENTER> once more will bring you again to the main screen.

3. CONNECTING THE INPUT/OUTPUT DEVICES

The FILTRON recognizes 3 types of devices:

DIFFERENTIAL PRESSURSTAT - measures the pressure difference (DP) between the inlet and outlet of the filters. The RED tube should be connected to the inlet and the BLACK tube to the outlet. The pressure difference between these two points will be measured, and when exceeding the limit, will cause the execution of a backflush cycle.

LOW PRESSURE SENSOR - detects low-pressure situations (LP) during which the flushing would not be effective, therefore it is halted. This can also be used for synchronizing the flushing with the irrigation start.

WATER METER - measures the volumes of water (WM) flowing through the filters, enabling to define the flushing sequence volumetrically

Each of the input devices has its own connection point on the terminal board:

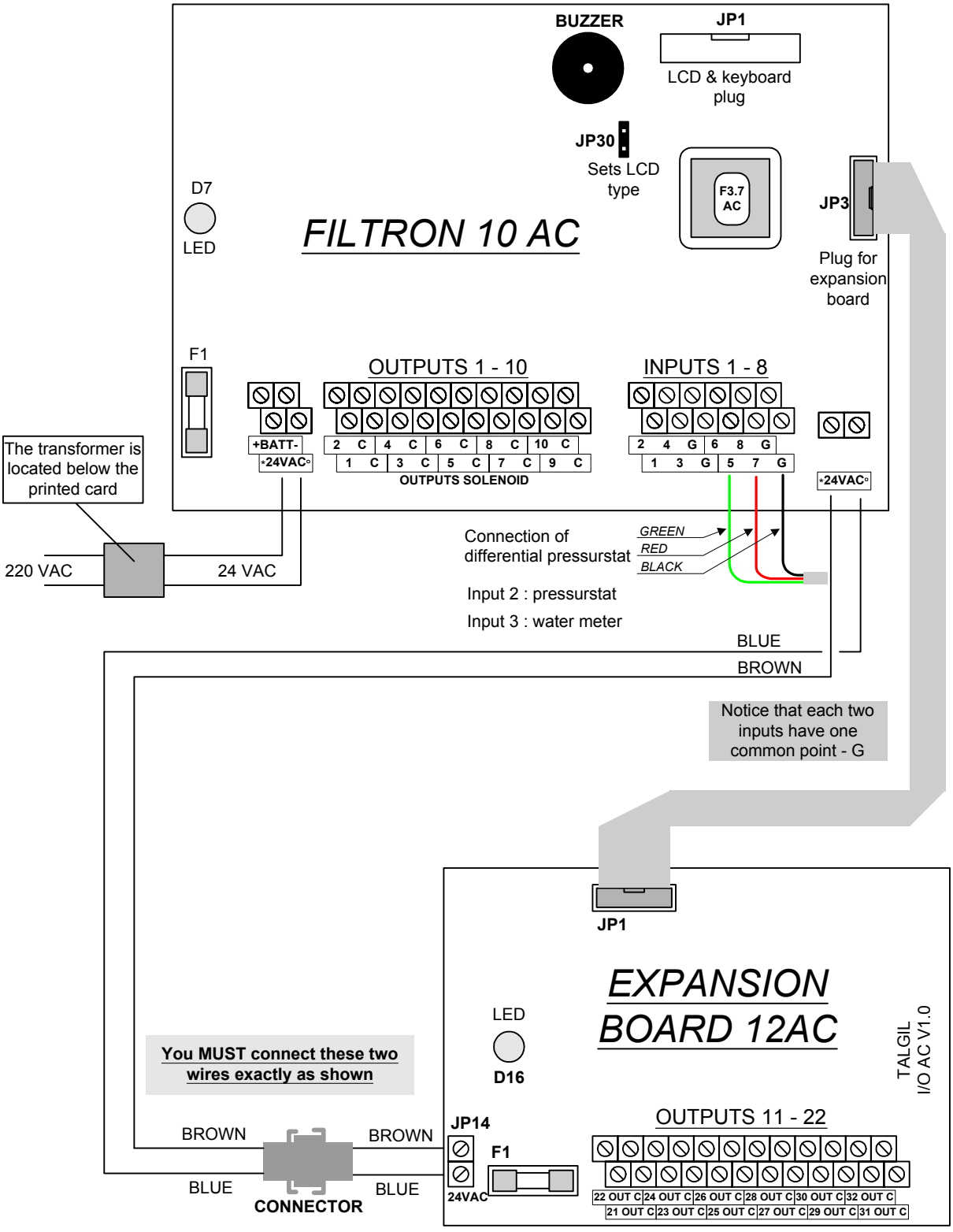
The analog DP comes already connected as shown in the picture below

The LP when existing should always be connected to input No 2. (IN2)

The WM when existing should always be connected to input no 3. (IN3)

BOARD CONNECTIONS

The following wiring diagram describes the AC board's power and I/O connections, to that we added the description of the wiring for an expansion card, which can be added to expand the number of outputs. Special attention has to be paid to the connection of the 24v AC to the expansion card, although we are talking about AC, the polarity is important.



Each AC solenoid has two wires and each output connection on the AC terminal board has two positions, one marked by an ordinal number and the other marked (C). The order of connection of the two wires of the solenoid makes no difference as long as the proper solenoid is connected to the proper output location.

4. TESTING SOLENOIDS

The FILTRON is capable of testing out the solenoids. The machine will automatically test the 8 stations sequentially. Press the <ENTER> key to start the process.

PRESS <ENTER>
TEST SOLENOIDS

The solenoids are tested against being short-circuited. When a short-circuit is detected, the solenoid is marked SHORTED and it will not be activated until the FILTRON is informed that the problem is solved. The first screen to the right of the Introductory screen will notify us about the short-circuited solenoids and the same screen is used for declaring the end of the problem, just push the <ENTER> key. The solenoids of the AC model are continuously tested whenever activated.

5. DEFINING THE FLUSHING PROGRAM PARAMETERS

In the following steps you are going to define the parameters which will dictate the flushing process. You will have to answer the following questions:

1. When using a water meter, after how many cubic meters to flush?
2. If you are using a water meter, what is its volume/pulse ratio?
3. What will be the flushing cycle time (expressed in minutes)?
4. What will be the dwell time in seconds?
5. If your system includes a delay valve, what will be the valve delay time (in seconds)?
6. What will be the desired flushing time of a station (in seconds)?
7. What should be the reaction delay to the change of the D.P status?
8. The number of consecutive cycles to be considered a faulty circular activity?
9. When controlling a main valve, what will be the delay between the main valve and the stations?

Setting the flushing cycle

The flushing cycle can be expressed in terms of time and/or volumetric units. The first event to occur will cause the start of a flushing sequence and will reset both the volumetric and the time based counters. Flushing sequence caused by the D.P. (DIFFERENTIAL PRESSURSTAT) will also reset both of the counters.

The possibility to express a volumetric flushing cycle depends on the existence of a water meter. When no water meter has been declared, the screens dealing with the water volume and the water meter ratio will not be displayed.

The following screen should be used to express the flushing cycle in volumetric units:

WATER VOLUME
100 c.m.

Meaning that flushing will take place after each 100 cubic meters measured by the water meter. The range is 1-999 c.m.

The water meters **volume / pulse ratio** is defined in the following screen. The fraction represents the volume measured by each pulse of the meter. The range is 1-1000/100 c.m.

METER RATIO 10/100 c.m.

When using time units, the flushing cycle defines the interval between successive flushing sequences and it is measured in minutes (1-9999). If a flushing sequence was started for any reason, the count down to the next cycle is reset. Setting the Cycle to zero means that the backflushing will not be time based but will depend on the D.P. only. The screen used for setting the flushing cycle looks like the following:

CYC. TIME MIN 100

Setting the dwell time

The dwell time is the delay measured between flushings of two successive stations. It is measured in seconds (1-99).

DWELL TIME SEC. 5

Setting the valve delay

When a delay valve exists in the system, you need to define the delay between the actions of the flushing valve and the delay valve. The range is 1-99 seconds. If the configuration does not include such a valve the following screen won't appear:

VALVE DELAY SEC. 10

Setting the flushing time

The flushing time defines the period of time during which the flushing valve is kept open. The range is 2-240 seconds.

FLUSHING TIME SEC. 30

The differential pressurstat (D.P.)

If the system contains a D.P. then the following two parameters must be defined. The first parameter defines the delay needed for the D.P. to stabilize. This time is measured in seconds (2-30) and it is set in the following screen:

D.P. DELAY SEC. 4

The second parameter defines the circular looping limit. The looping may by caused by the D.P. remaining constantly "ON", causing an endless flushing loop. The circulation limit (0-9) is set via the following screen:

D.P. FAULT NO.OF FALSE FLUSHES 4

If "0" is selected, the looping detection mechanism is suppressed.

When the limit is exceeded, the FILTRON will stop flushing by DP and continue flushing by time or volume. If an alarm has been defined, it will be activated. The following screen will be displayed:

DP.FAULT RELEASE BY <ENTER>

To resume normal operation, simply press the <ENTER> key.

The master delay

The delay between the master valve and the first flushing valve is called master delay and it is defined in seconds (0-99) in the following screen:

MASTER DELAY SEC. 5

The DP set point screen

By the set-point we mean the pressure difference that when reached, it will cause the start of a flushing cycle. The screen shown below is the rightmost. The unit "m" stands for meters, 10m=1bar.

Pressure Limit **5 m**

PROCESS MONITORING AND MANUAL ACTIONS

The main screen

The main screen supplies on line information about the current status of the system, therefore its appearance varies according to the actual situation.

During the count down between flushing cycles it will have the following form:

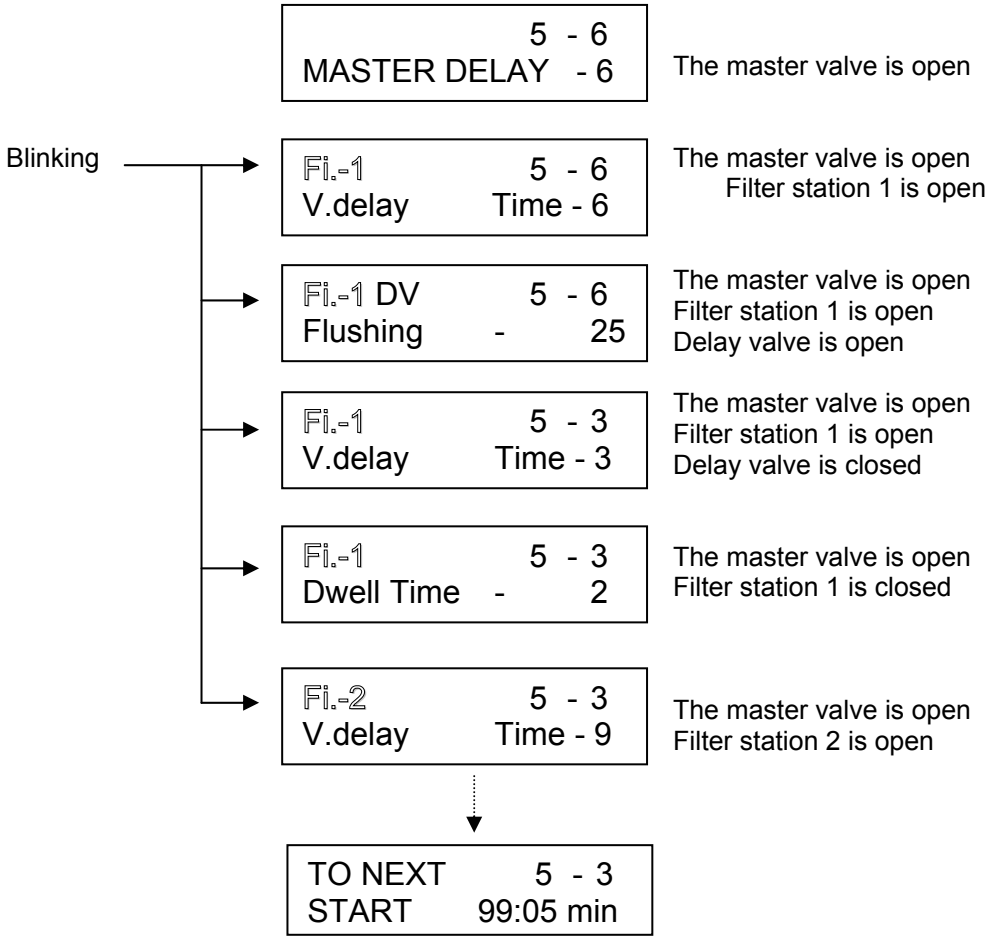
TO NEXT 5 - 3 START 83:21 min

In the first row at the right corner we can see two numbers, showing the DP set point **5** (on the left) versus the current reading of the DP **3** (on the right) expressed in meters of pressure. We are informed about the time left to next cycle, which is 83 minutes and 21 seconds.

When a water meter has been declared you would probably like to see how much water will pass through the water meter until the next cycle. To obtain this information press the lower arrow that and the following screen will supply the requested information:

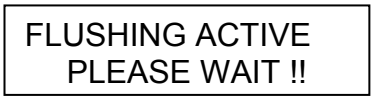
Both of the counters, the volumetric and the time based, are counting backwards. The first to reach the 0 count will cause the start of a flushing cycle during which the second counter is also cleared.

During the flushing sequence the main screen displays the various stages of the process.



When the master valve and/or the delay valve are not declared, the relevant screens will not be displayed.

When the flushing cycle is in progress, no configuration changes and no solenoid tests are allowed. Trying to execute one of the actions will result in the following message:



Manual start/stop

To manually start a flushing cycle you need to reach the following screen, which is located to the right of the main screen.

MANUAL START <ENTER>

Pressing the <ENTER> key will start the flushing cycle immediately.

While the flushing sequence is in progress it can be stopped manually by using the same screen which will now appear as follows:

MANUAL STOP <ENTER>

Various counters

The FILTRON counts the various flushing cycles. The results are displayed in the following way:

DP – 156	Ti – 10
Ma – 2	Vo - 16

Water accumulation

When a water meter is defined, the water accumulation is displayed in a screen, which appears to the right of the counter's screen.

WATER ACCUM. 120 c. m.

Clearing accumulators

To clear the counters above, you have to reach the following screen and then press the central <Enter> key.

ERASE ACCUM. <ENTER>

Manual pause

If for any reason you want the FILTRON to remain idle for some time, you may cause a manual halt.

MANUAL PAUSE <ENTER>

All activations including manual activations will be inhibited. Trying to activate the flushing sequence will result in the following display:

RELEASE MANUAL PAUSE FIRST!!

The manual pause is not allowed when the flushing process is in progress. As long as the system is in "pause" the buzzer keeps sounding to remind you that the system is halted and it is the responsibility of the user to free it from the "MANUAL PAUSE" condition.

To release the system from "pause" the same screen is to be used:

MANUAL PAUSE RELEASE <ENTER>

To resume normal operation press the >ENTER< key once again.

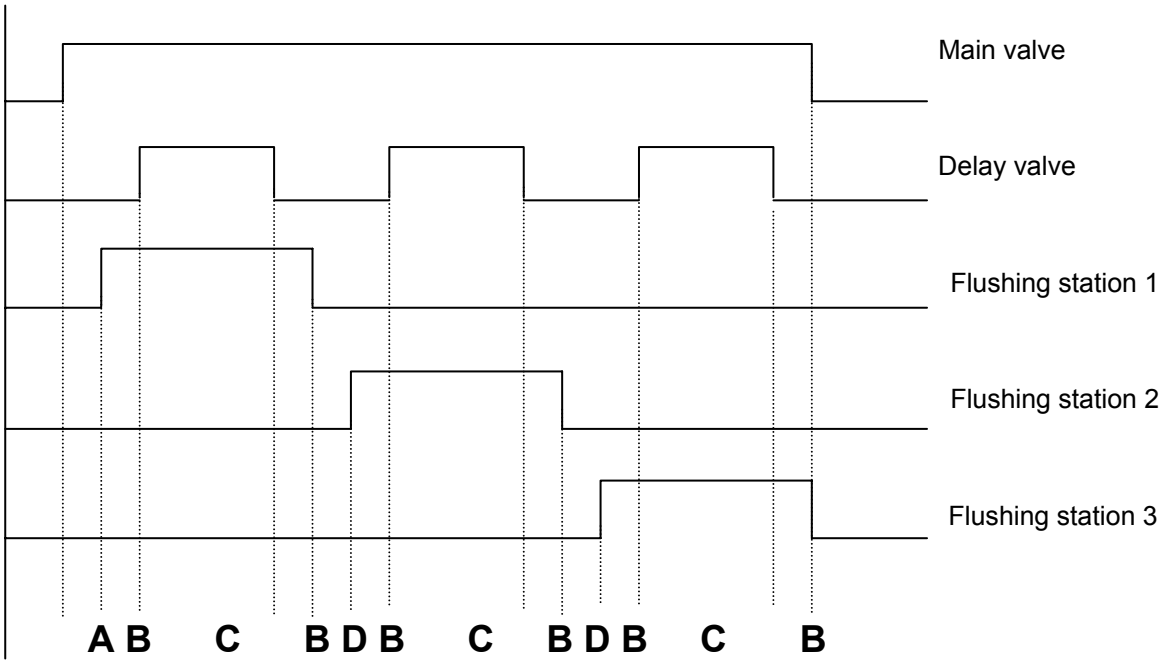
Low pressure halt

When a low-pressure sensor is used it has to be connected to input no. 2 (IN2). When the contact of the sensor becomes closed (for 1 minute at least), it will stop the activity of the FILTRON. The following message will be displayed:

PAUSE SENSOR HALT

The FILTRON will remain halted until the contact becomes open again.

TIMING DIAGRAM



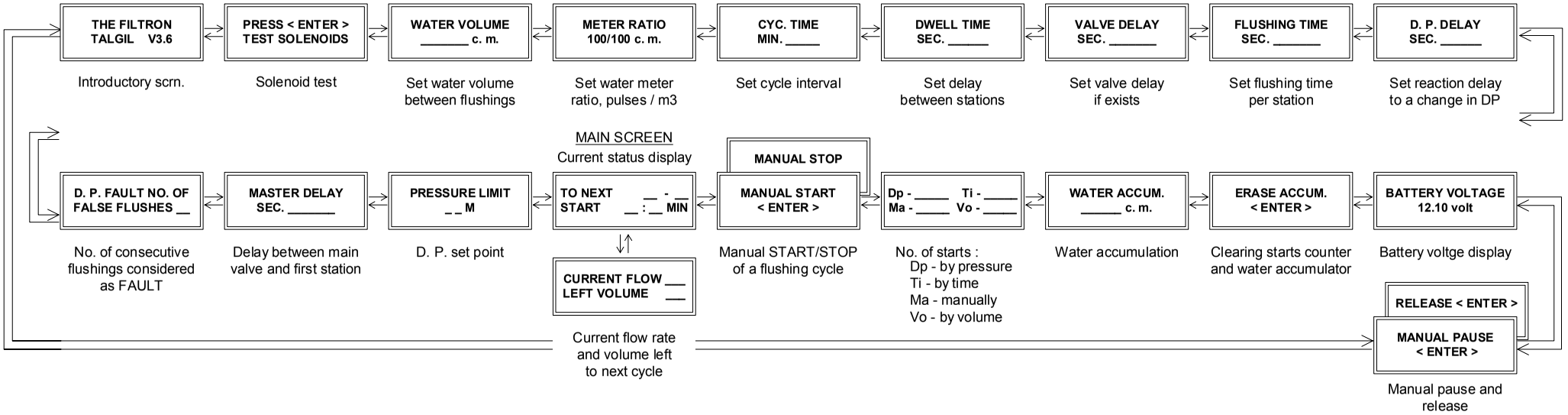
A - MASTER DELAY

B - VALVE DELAY

C - FLUSHING TIME

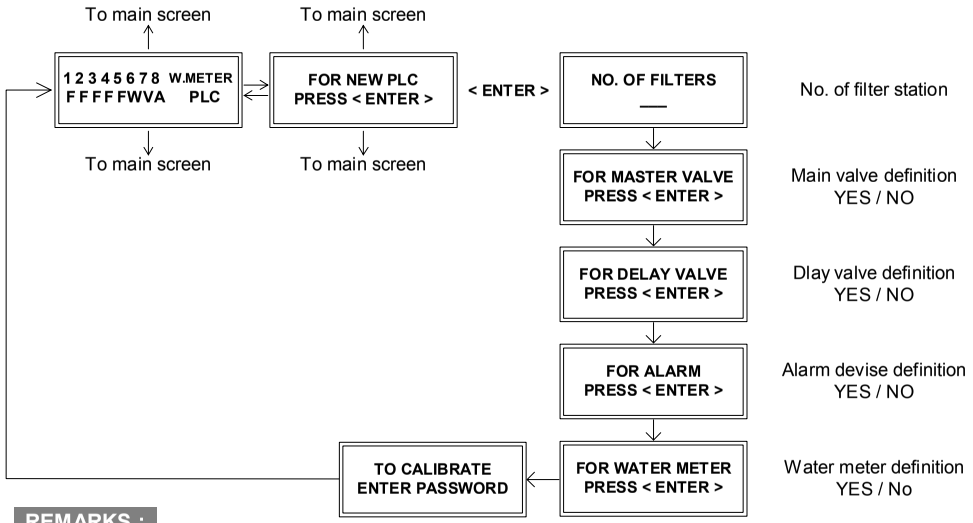
D - DWELL TIME

FILTRON 3.7 - FULL SCREEN DIAGRAM



PLC DEFINITION

To enter PLC definition press simultaneosly the two horizontal arrow keys



REMARKS :

The screens dealing with water meter, main valve and delay valve will not appear unless defined in PLC. The MAIN SCREEN appearence will change according to the current status. DP = on means existing pressure difference, DP = off means no pressure difference.

POP-UP SCREENS FOR SPECIAL SITUATIONS

Low battery. The FILTRON will continue funtioning. Prepare to replace battery.	WARNING !! BATTERY LOW
The battery voltage is below 9 volts. The FILTRON is halted. Replace battery.	CLOSED !! REPLACE BATTERY
Wating caused by a low pressure sensor.	PAUSE SENSOR HALT
Waiting caused by exceeding the limit of consecutive starts caused by the DP.	D.P. FAULT RELEASE BY < ENTER >
Whenever a range limit is exceeded, the range limit will be displayed.	RANGE ERROR !!! ___ ___
When trying to start a manual sequence during manual pause condition.	RELEASE MANUAL PAUSE FIRST !!
When trying to do PLC changes when the flushing process is in progress.	FLASHING ACTIVE PLEASE WAIT !!

ARKAL FILTRATION SYSTEMS

FILTRON 246

THE BACKFLUSHING CONTROLLER

The **FILTRON 246** is a very friendly backflushing controller designed and manufactured by **TALGIL** to meet the demands for a low cost easy to use controller.

The **FILTRON 246** exists in 3 sizes - with 2. 4 or 6 stations. **DC** and **AC** versions are available. The **DC** versions are powered by a 12V alkaline battery. The **AC** versions include transformer for 24V.

The program selection is made by two **ROTARY SWITCHES** and an internal **DIP-SWITCH** enables to set the rarely changing parameters. An optional counter can be requested to count the number of backflushing cycles.

LIST OF FEATURES

- **DC** or **AC** versions available
- Flushing triggered by Pressure Difference only
- Flushing triggered by Pressure Difference and/or time intervals
- User selectable parameters include:
  - mode of operation: **Manual**, **DP** only, **DP** with time override
  - flushing cycle
  - flushing time
  - dwell time
  - differential pressurstat delay (response time to **DP**)
  - number of consecutive backflush cycles caused by faulty **DP** that will be considered circular endless looping.
- Optional activation counter
- Detecting and eliminating circular endless looping

THE BACKFLUSHING CONTROLLER – FILTRON 246

The **FILTRON 246** is a very friendly backflushing controller designed and manufactured by **TALGIL** to meet the demands for a low cost easy to use controller.

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  - differential pressurstat delay (response time to **DP**)
  - number of consecutive backflush cycles caused by faulty **DP** that will be considered circular endless looping.
- Detecting and eliminating circular endless looping

PROGRAM SELECTION

The two rotary switches on the front panel are used for selecting the desired backflushing program. The right switch selects the **FLUSHING MODE** and the left switch selects the **FLUSHING TIME PER STATION.**

FLUSHING TIME PER STATION		FLUSHIG MODE	
180 SEC		OFF	
140 SEC	10 SEC	24 HOUR	DP
120 SEC	15 SEC	12 HOUR	MANUAL
60 SEC	20 SEC	6 HOUR	10MIN
60 SEC	25 SEC	3 HOUR	25 MIN
50 SEC	30 SEC	2 HOUR	40 MIN
40SEC		1 HOUR	

- When the right switch points to the **OFF** position the controller is switched off and no flushing will take place. The internal buzzer keeps sounding every 4 seconds to indicate that the controller is energized.

- When the right switch points to the **DP** position the controller will start backflushing only when the pressure differential indication is received

- When the right switch points to **MANUAL** position a single flushing cycle is initiated.

- In all the other positions of the right switch, the controller will flush according to the specified cycle or upon detection of the pressure differential signal, the one which occurs first.

- Changing the position of each of the switches will sound the buzzer.

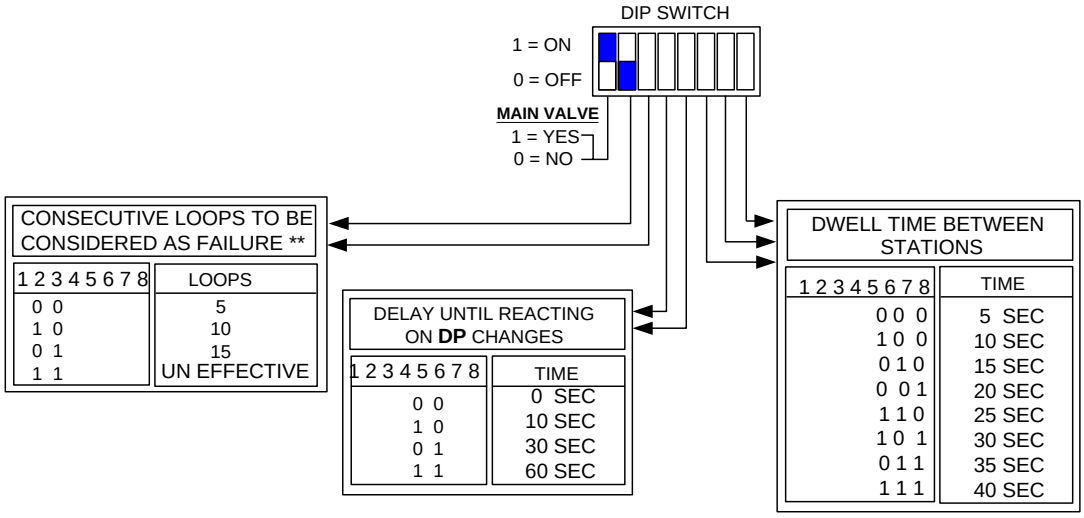
The right switch will make a longer beep at the **OFF** position and at the left switch the longer beep will be at the **10 SEC** position. The longer beep helps to adjust the knobs.

HOW TO READJUST THE KNOBS OF THE ROTARY SWITCHES IN CASE THEY GET LOOSE?

1. Keep turning the rotary switch clockwise until you hear the longer beep.
2. At the right switch, fasten the knob with the arrow pointing on **OFF**.
3. At the left switch, fasten the knob with the arrow pointing on **10 SEC**.

SETTING THE CONSTANT PARAMETERS

Three constant parameters can be set by the internal **DIP-SWITCH**, the following chart describes which of the switches is responsible for each parameter and what are the options. The **DIP-SWITCH** is located at the bottom right corner of the electronic board.



When the **DP signal would not stop, then after the specified number of consecutive back flushing cycles it will be considered a failure. An alarm sound will indicate the failure and there will be no more backflushing by **DP** until the **DP** signal is stopped and the right rotary switch turned OFF and back to its normal position. If the selected flushing mode included time override, the time based cycles will continue uninterruptedly with the selected interval.

MAIN VALVE

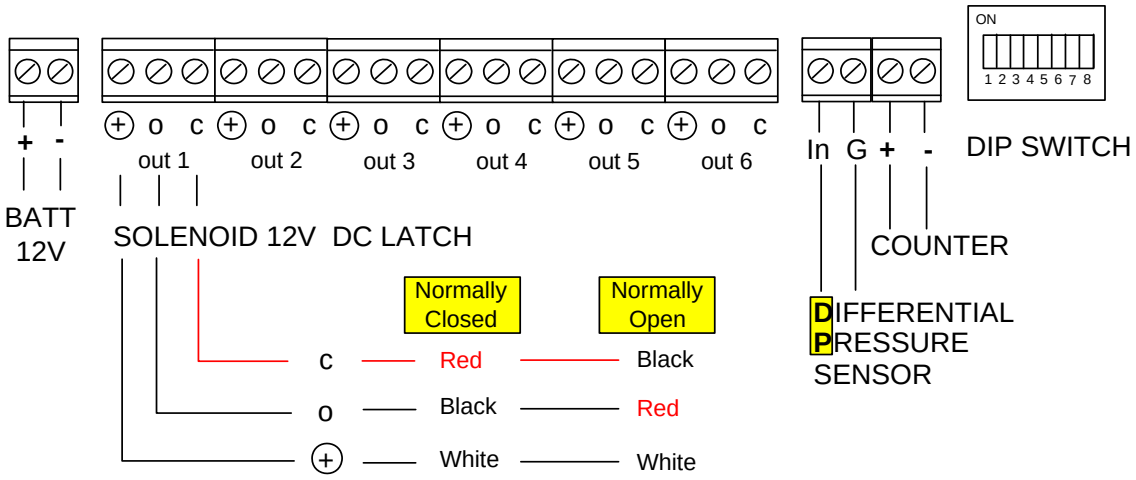
The unit can control a downstream main valve which is off while flushing to increase pressure. When such a main valve is incorporated in the system, **DIP SWITCH** No. 1 will be **ON**, otherwise it will remain **OFF**. The main valve will be connected to output No. 2 in **FILTRON 2**. to out No. 4 in **FILTRON 4** or to output No. 6 in **FILTRON 6**.

TECHNICAL DATA

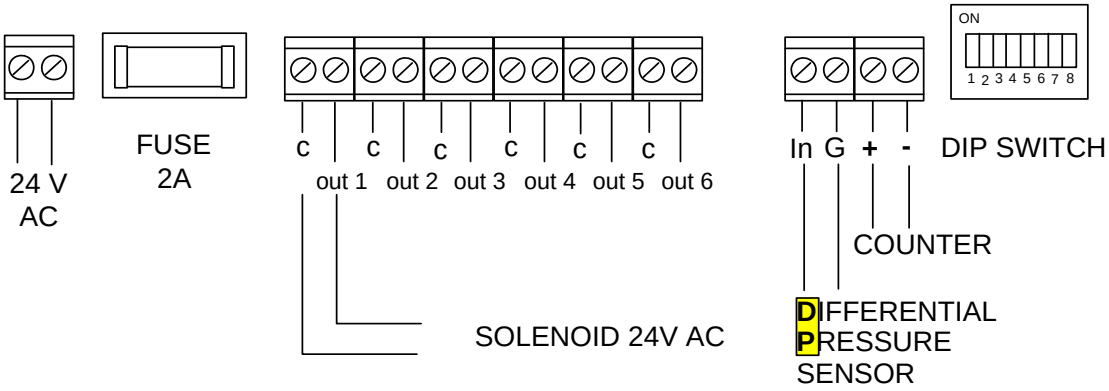
POWER SOURCES : FOR AC MODELS - 220V/50Hz OR 115/60Hz TRANSFORMED INTO 24VAC. MAXIMUM POWER 25W.

FOR DC MODELS - 12V 6Ah. DRY ALKALINE BATTERY.

CONNECTION BOARD (DC MODEL)



CONNECTION BOARD (AC MODEL)



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FILTRON 246 + DP BUILT IN

The FILTRON 246 backflushing controller designed and manufactured by TALGIL to meet the demands of a low cost easy to use controller.

The FILTRON 246 exists in 3 sizes - with 2, 4 or 6 stations. DC and AC versions are available. The DC versions are powered by a 12v Alkaline battery. The AC versions include built-in transformer of 24v.

The program selection is done by two ROTARY SWITCHES and an internal DIP-SWITCH that enables setting some rarely changing parameters. Optionally an external counter can be added to count the number of backflushing cycles.

New models are now available with a built-in electronic Pressure Differential sensor (DP) that enhances the accuracy and the reliability of the control system.

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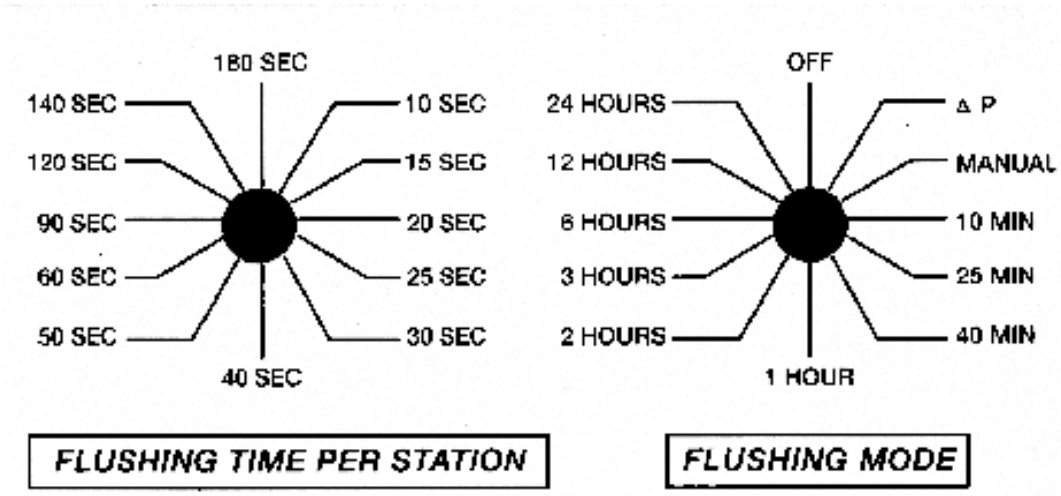
LIST OF FEATURES

- DC or AC versions available
- Flushing triggered by Pressure Difference only
- Flushing triggered by Pressure Difference and/or time intervals
- User selectable parameters include:
  - mode of operation: Manual, DP only, DP with time override
  - flushing cycle
  - flushing time
  - dwell time
  - differential pressurstat response time.
  - number of consecutive backflush cycles caused by faulty DP that will be considered circular endless looping.
- Built-in electronic DP sensor
- A special test button for initiating immediate test cycles
- Optional activation counter
- Detecting and eliminating circular endless looping

PROGRAM SELECTION

There are two rotary switches on the front panel, the right switch selects the FLUSHING MODE and the left switch selects the FLUSHING TIME PER STATION.



- When the right switch is in the OFF position the controller is switched off and no flushing will take place. The internal buzzer keeps sounding every 4 seconds to indicate that the controller is energized.
- When the right switch points to the DP position, backflushing will only take place when the pressure differential indication is received.
- When the right switch is on MANUAL position, a single flushing cycle is initiated.
- In all other positions of the right switch, the controller will flush according to the specified cycle or upon detection of the pressure differential signal, the event that occurs first.
- Changing the position of any of the switches makes the buzzer sound. The right switch will make a longer beep when passing through the OFF position and the left switch will make a longer beep when passing the 10 SEC position. The longer beep helps readjusting the position of knobs when needed.

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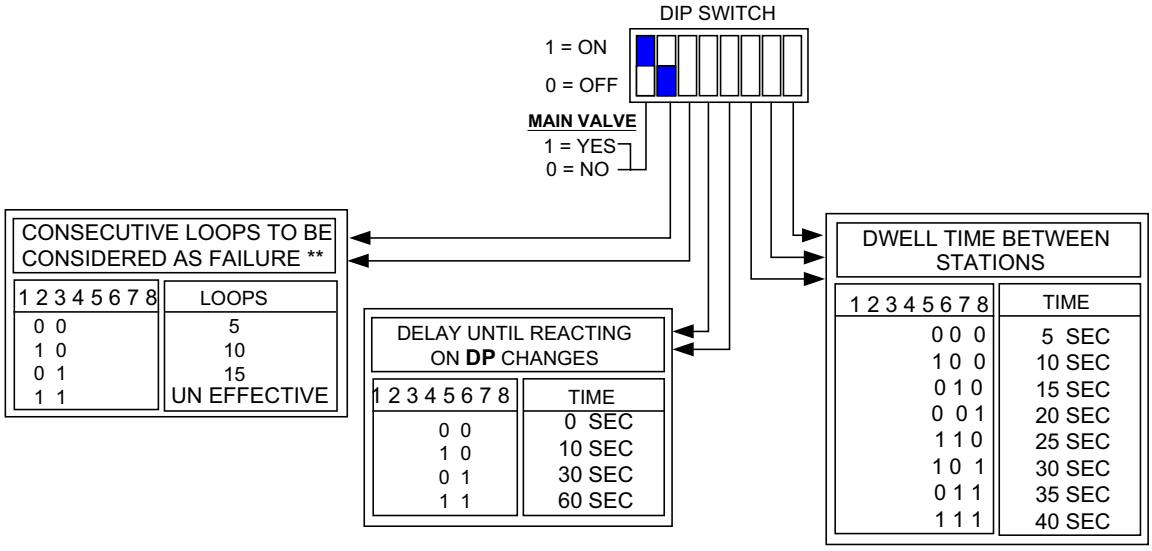
ADJUSTING THE POSITION OF THE ROTARY SWITCHES KNOBS

1. Keep turning the rotary switch clockwise until you hear the longer beep.
2. At the right switch, fasten the knob with the arrow pointing on OFF.
3. At the left switch, fasten the knob with the arrow pointing on 10 SEC.

SETTING THE CONSTANT PARAMETERS

At the bottom right corner of the main PCB board there is a block of DIP-SWITCHES used for setting some constant parameters. The following drawing which appears also on the internal side of the controller's cover, describes how to set the parameters using the DIP-SWITCHES.



When the DP signal keeps arriving after executing the specified number of consecutive back flushing cycles, it will be considered a failure of endless looping. An alarm sound will indicate the failure and the DP signal will be ignored. If the selected flushing mode includes time override, the time based cycles will continue uninterruptedly with the selected interval.
To recover normal operation when the endless DP signaling stops, the right rotary switch has to be rotated to OFF position and back to its normal position.

MAIN VALVE

The unit can control a downstream main valve which is turned off while flushing to increase pressure. When such a main valve is incorporated in the system, DIP SWITCH No. 1 will be set ON, otherwise it will remain OFF. The main valve will be connected to output No.2 in FILT'RON 2, to output No. 4 in FILTRON 4 and to output No. 6 in FILTRON 6.

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SETTING THE DP SENSOR

The DP sensor is connected to the hydraulic system by two command tubes. A red command tube upstream the filter and a black command tube downstream the filter. The PCB that controls the DP sensor is separate from the main board. On this PCB another block of DIP-SWITCHES can be found (S1), these switches are used for setting the reaction point of the DP as indicated in the table below.

	S1 (1=ON ; 0=OFF)	Reaction pressure difference	
	1 2 3 4	Atm.	psi
00	0 0 0 0	The unit is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

THE LEDS INDICATION

There are two LEDS on the DP control board. The green LED is indicating that the DP signal is ON (contact closed). It will be lighting also when the test button is pushed.

The red LED acts as described in the following table:

The red LED behavior	The indication
The LED is OFF	The unit is not active
A short blink every 5 seconds	Normal operation & battery level above 9.5 v
3 fast blinks every 5 seconds	Operating with low battery, less than 9 v

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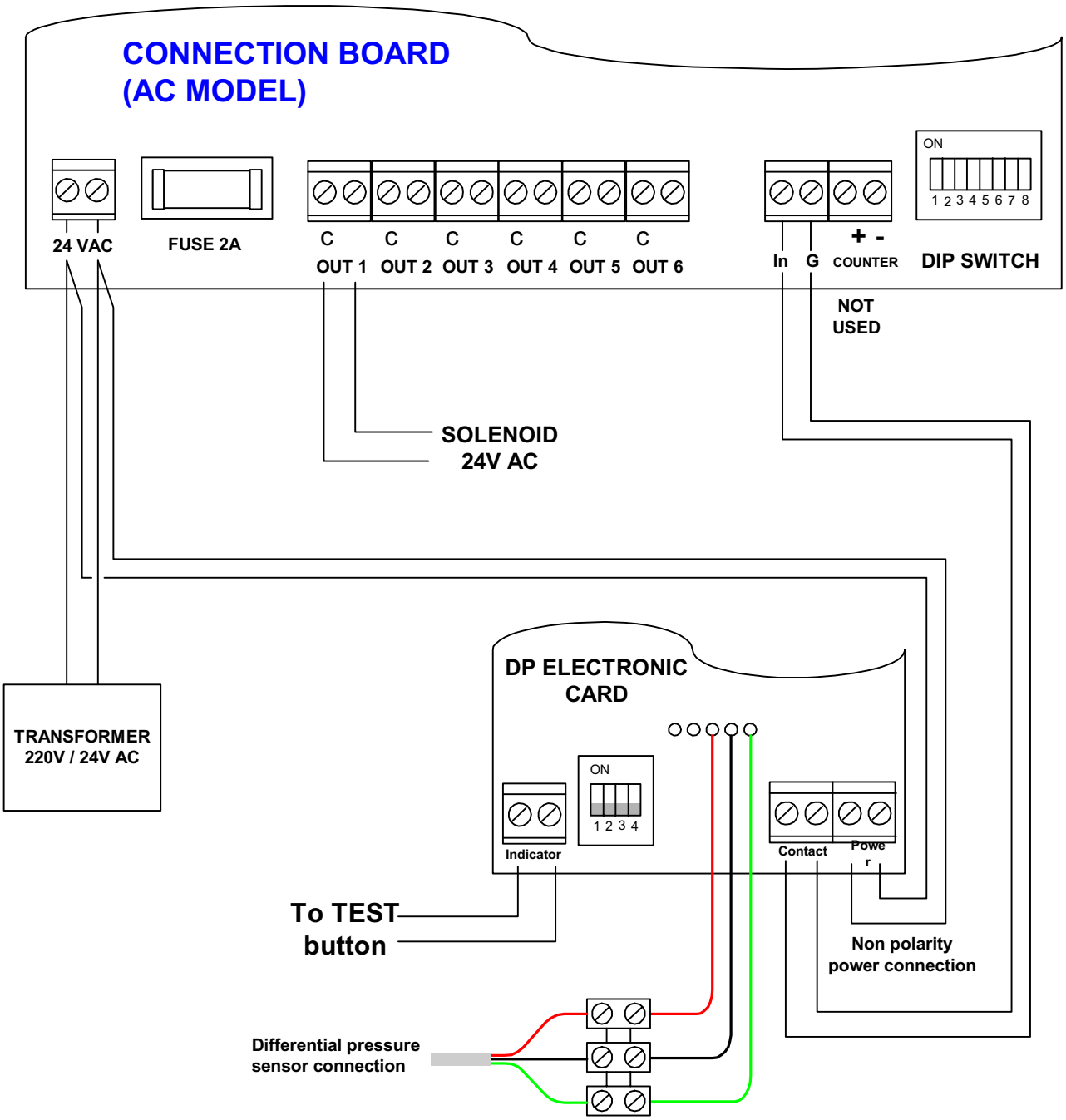
THE TEST BUTTON

Pushing the test button initiates a test cycle. A DP signal is generated (green LED is ON) and when sensed by the main board a flushing cycle is executed testing all the system's components.

TECHNICAL DATA

POWER SOURCES: FOR AC MODELS - 22OV/50HZ OR 115/60HZ TRANSFORMED INTO 24V. MAXIMUM POWER 25W.

FOR DC MODELS - 12 V 6AH. DRY ALKALINE BATTERY.



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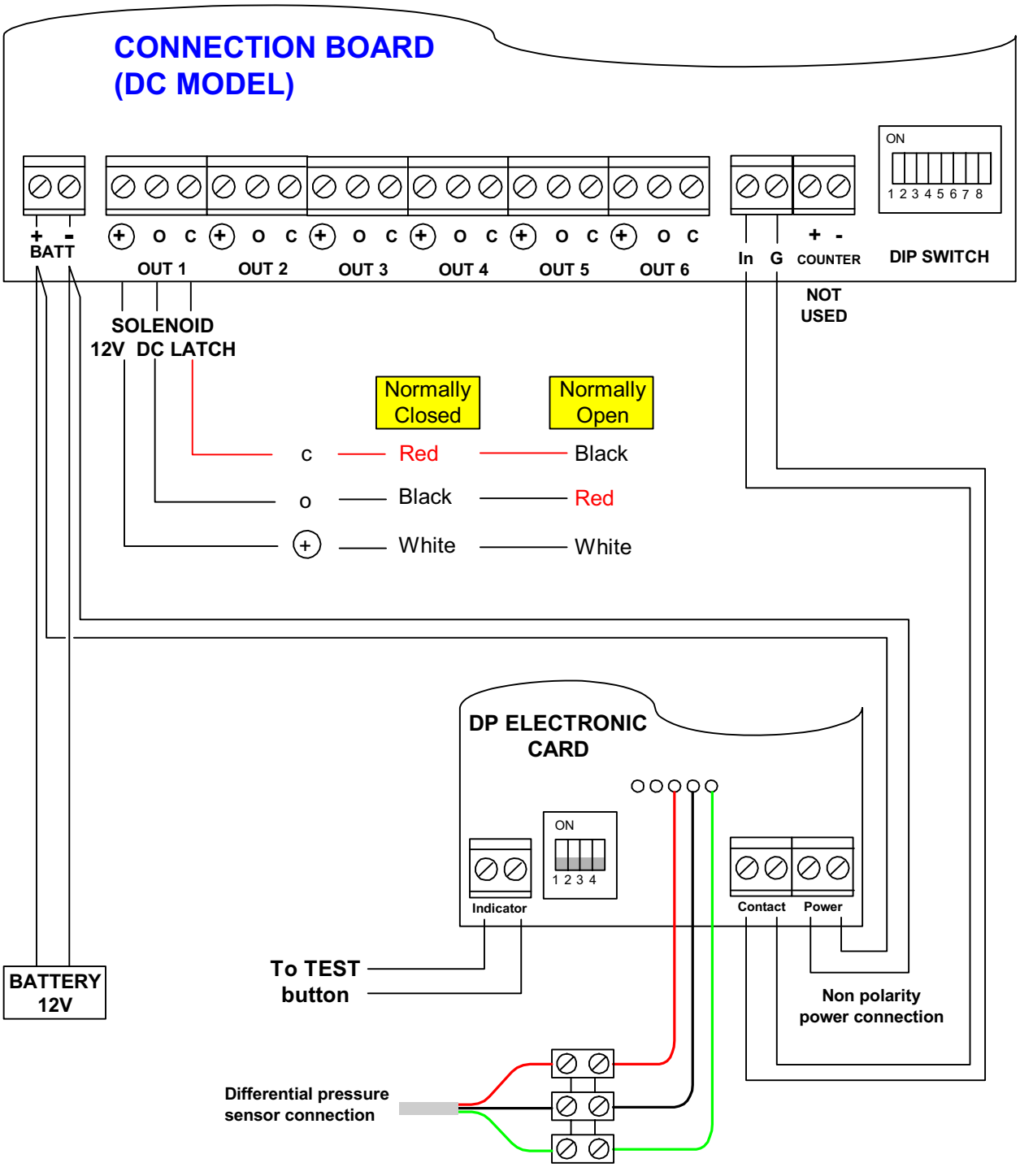

ARKAL FILTRATION SYSTEMS

FILTRON MULTI-FLEX 20/32 AC

****

USER'S MANUAL

****

VERSIONS 1.02 - 1.05

October 1998

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INTRODUCTION

GENERAL

The FILTRON MULTI-FLEX 20/32AC is a computerized controller designed for controlling the process of back flushing multiple filtering batteries. It has been designed to supply the needed flexibility in order to be suitable for use in various configurations. The FILTRON MULTI-FLEX 20 AC is capable of driving 20 outputs while the FILTRON MULTI-FLEX 32AC which actually is an expansion of the former one drives 32 outputs.

The FILTRON MULTI-FLEX 20/32AC is capable of controlling several filtering batteries, working in combination or independently. The flushing process can be triggered by pressure differential and/or by time intervals to give the best results for various conditions. Each battery may have its own time setting defined by the user. Manual interference is supported to allow maintenance and checking. Extensive on line information enables easy process inspection. The system detects and eliminates faulty operation and an alarm can be fired to attract users attention when a problem occures.

TECHNICAL DATA

POWER SUPPLY: 24v AC transformed from the mains, surge protected.

OUTPUTS: up to 20/32 solenoids/relays of 24v which can be defined as:

- flushing valves
- main valves
- delay valves
- alarm

INPUTS: up to 8 dry contacts for sensing:

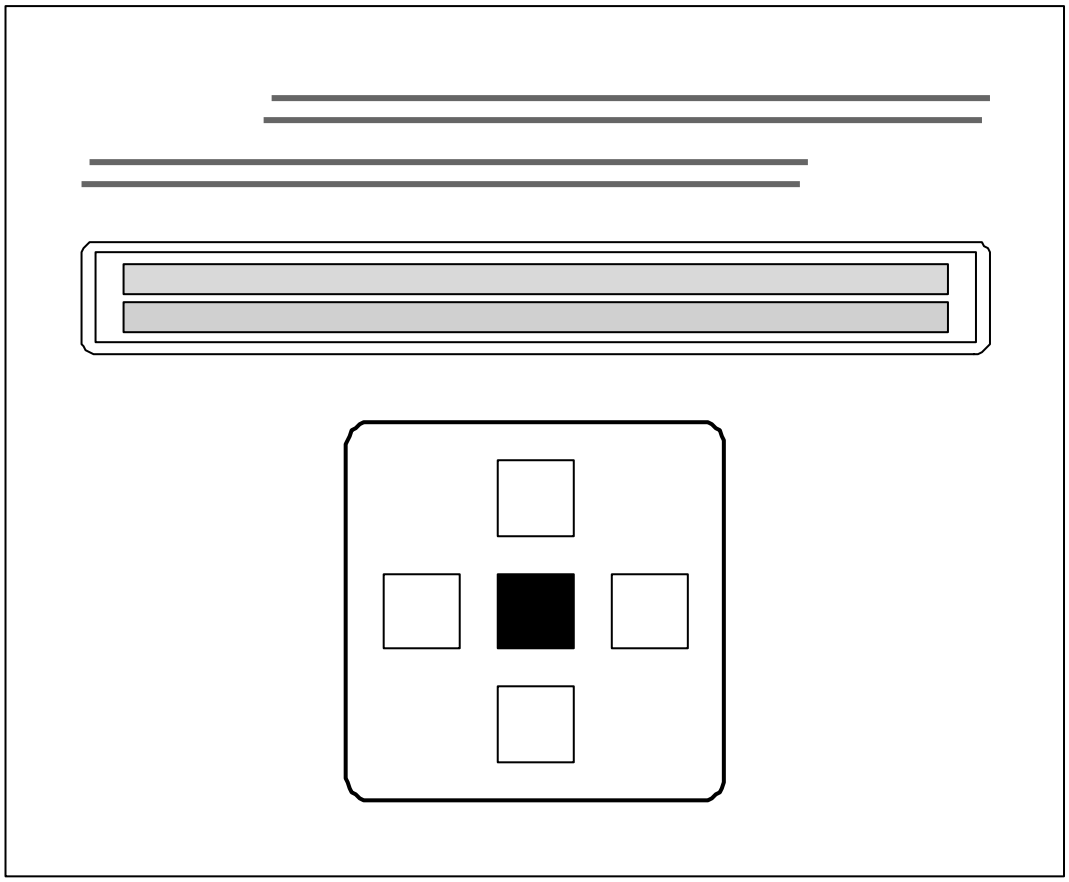
- pressure differential
- low pressure

PROTECTION AGAINST:

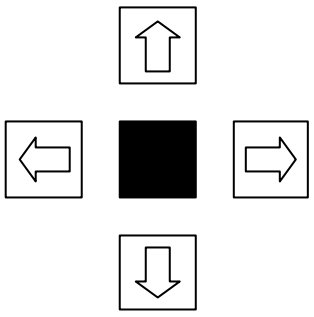
- low pressure
- no power
- short circuited outputs
- faulty pressure differential sensors

THE CONTROL PANEL

The control panel of the FILTRON consists of a key board with 5 keys and an alphanumeric LCD display with 2 rows of 40 characters.



The central key is called the <ENTER> key and the others are called ARROW KEYS. The right and the left keys are the HORIZONTAL ARROWS and the upper and lower keys are the VERTICAL ARROWS.



HOW IS THE <ENTER> KEY USED ?

The <ENTER> key has several functions:

1. Switching between DATA DISPLAY and DATA ENTRY modes.
2. Telling the computer to accept the currently inserted data.
3. Moving from one field to another during DATA ENTRY mode.

The DATA ENTRY mode recognizable by the blinking cursor☎¦) which appears on the screen. During DATA ENTRY mode you may alter the data displayed and move the cursor between fields on the screen. Keep hitting the <ENTER> key and you will "jump out" of DATA ENTRY mode. During DATA DISPLAY

mode the cursor is hidden and you can move from one screen to another seeing information without being able to change it.

HOW ARE THE ARROW KEYS USED ?

The arrow keys also have several functions:

1. Moving from one screen to another during DATA DISPLAY mode.
2. Setting values in numerical fields during DATA ENTRY mode.
3. Changing selections in fields marked by (*) during DATA ENTRY mode.

While being in DATA DISPLAY mode, the arrow keys enable the movement from screen to screen. Horizontal movement is accomplished by the horizontal arrows and vertical movement by the vertical arrows but only while being in the MAIN MENU (explained later). Vertical arrows are also used for changing the ordinal numbers of items that the current screen refers to.

While being in DATA ENTRY mode in a field which allows for selection between several items (generally marked by "*") or in a field in which a value can be set ON or OFF, the vertical arrows are used for the selection or the toggling.

In a numerical field when we want to change a numerical value the arrows function as follows:

The upper arrow increments the value by 1.
The lower arrow decrements the value by 1.
The left arrow moves the digits to the left (multiplying by 10).
The right arrow moves the digits to the right (dividing by 10).

THE MAIN MENU

The information handled by the FILTRON is divided into subjects. The screens of each subject occupy a row in a table like structure. The leftmost screen in each row is an introduction screen displaying the name and the version of the controller. The next screen to the right belongs to the MAIN MENU. It contains the subject name and a double headed arrow (==>>). To "enter" into the subject you have to follow the arrow. Changing subjects can only be done while being in one of the MAIN MENU screens by use of the vertical arrows. The full layout of the FILTRON screens can be found at the end of this manual.

Constants ==>>	Serves the definition of the various constants and the description of the hydraulic network structure.
Filtration ==>>	Deals with the definition and monitoring of the filter flushing process.
System ==>>	Supplies on line information about failures encountered in the system and enables to cancel them.
Report ==>>	Supplies detailed chronological report of events and failures.
Alarm ==>>	Serves the alarming system. Enables definition of the alarm causes and the way of operation of the alarming system.

IMPORTANT REMARK

For your convenience, to help you out in case you are lost we suggest to keep hitting the LEFT ARROW, eventually you will land at the "Filtration ==>>" screen in the MAIN MENU which is the most frequently used subject.

INITIAL STEPS

The initial start up consists of the following steps

- Connecting the energy sources.
- Definition of the network to be controlled.
- Connection of the various input/output devi ces.
- Definition of the system's constants.

CONNECTING THE ENERGY SOURCES

The FILTRON MULTI-FLEX 20/32AC is powered by two sources. The main energy source is 24v AC transformed from the mains. This energy is used both for the internal electronics and for the solenoids activation as well. A 12v rechargeable battery serves as the secondary energy source whose main task is to keep the FILTRON alive during AC power failures.

Connecting any of the energy sources will bring the machine to life but for solenoids activation the 24v AC is necessary. The first screen displayed will be the following one:

When you start up the FILTRON after being disconnected from its power sources you must clear the RAM (Random Access Memory) which probably is full of rubbish.

Entering the password 565 will start the clearing process at the end of which the FILTRON will be ready for starting the network definition.

NETWORK DEFINITION

The network definition process is actually a sequence of questions asked by the FILTRON and answered by the user. At the conclusion of the process the FILTRON is familiar with the devices it has to control and it displays the defined network in a series of screens showing the outputs and inputs of the network as a whole and per each filter battery separately. Those screens should be used as the reference for the connection of the various accessories to the connection panel.

Once the network definition has be completed, it is burned into the nonvolatile memory of the controller in which it is kept until a change is required.
The process of the network definition starts with the following screen:

For network changes **type <ENTER>**

- Follow the order and push the <ENTER> key.
- The process will start only after entering the password 139. This deliberately put obstacle eliminates unintended network changes.

Enter password 139 **“ “ 0**

- After entering the password 139, a full memory deletion takes place including the EEPROM in which the former network definition is kept.

NOTICE THAT :

- Network changes are not allowed as long as any output is active.
- The network definition is "burnt" into the EEPROM in which it will remain unchanged even when the controller is completely disconnected from its power sources.

The following table describes the questions asked during the network definition process:

	THE QUESTION	THE EXPLANATION
1.	FILTRON type: * 20 outputs	Use the vertical arrows to select the correct FILTRON type according to the number of outputs 20 or 32.
2.	To define pressure-gauge yes: ENTER no: = = >	If you intend to use a pressurstat to halt the process when detecting low pressure situation, hit the <ENTER> key otherwise use the right arrow.
3.	To define filter battery 1 yes: ENTER no: = = >	A positive answer to this question starts the definition of a new battery. When there are no more batteries to define, hit the right arrow.
	Num. of stations in battery 1 (1-31) 5	How many stations are included in the first battery? The numbers in brackets express the range of possibilities.
	Valve delay in battery 1 yes: ENTER no: = = >	If the system utilizes an air valve which has to be opened after a delay this has to be a positive answer.
	Main valve in battery 1 yes: ENTER no: = = >	If the system has a main valve which has to be opened (or closed) during the flushing process , this has to be a positive answer.
	Dif. pressurstat for filter battery 1 yes: ENTER no: = = >	When the current battery contains a pressure differential sensor or it is the leading battery in a system containing one common D.P. sensor the answer will be positive.

Now the process is repeated for the next battery from step No. 3 until there are no more filter batteries left to be defined.

	To define alarm yes: ENTER no: = = >	When an alarming device ought to used the answer will be yes.

REMARKS

1. If you made a mistake during the network definition process you have to carry on, finish the process and restart from the very beginning.
2. During the network definition process the FILTRON keeps calculating and displaying the number of inputs/outputs left unallocated.

The result of the network definition step is the NETWORK DISPLAY which actually describes the defined devices as allocated to the connection board. The outputs are displayed first and by pushing the <ENTER> key you may see the inputs' allocation.

1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0	**OUTPUTS**
F F F F F * V F F F F F * V C C C C A V	**NETWORK**

The example above shows 20 outputs (first row) and their allocated function (second row).

OUTPUTS	**INPUTS**
F – Flushing valve.	D - Differential pressurstat.
* – Delay valve.	P - Pressure gauge.
A – Alarm.	
V – Main Valve	
C – Unallocated outputs	

Using the <ENTER> key will replace the "OUTPUTS" display with the "INPUTS" display which shows the allocated inputs.

1 2 3 4 5 6 7 8	**INPUTS**
D P	**NETWORK**

The NETWORK DISPLAY of the outputs and inputs is not only a schematic way of showing the defined devices but it also describes the order of connection of the devices to the connection board. In the example, Flushing valves 1 through 6 are connected to the first six positions on the connection board followed by the Delay valve which is connected to position 7, Etc.

To get a section of the NETWORK DISPLAY showing only the devices per a single battery use the VERTICAL ARROWS.

CONNECTION INSTRUCTIONS

The order of connection to the terminal board is dictated by the NETWORK DISPLAY (see the previous paragraph). The following schematic diagrams describe the connections boards both for the FILTRON 20AC and for the FILTRON 32 AC.

Before starting to connect the input / output devices to the terminal board notice the following remarks:

DIGITAL INPUTS IN GENERAL

The digital inputs which can be used with the FILTRON controllers have to be of dry contact type. Each digital input is connected to the terminal board by two wires, the polarity of which is of no importance. All the inputs on the terminal board have one common point marked GND.

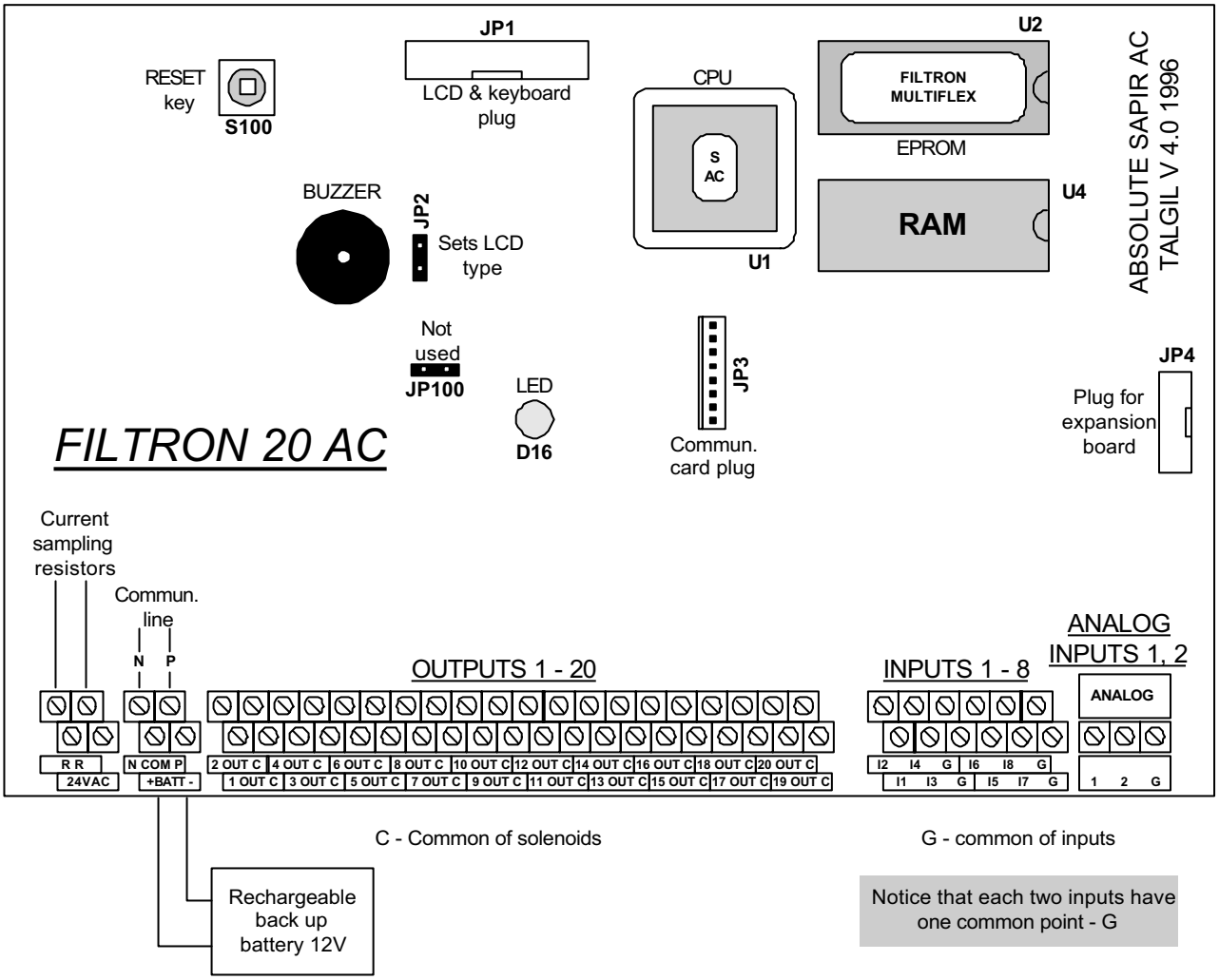
CONNECTING A PRESSURSTAT

When using a pressurstat to indicate low pressure situations, the pressurstat has to be installed before the main valves so that it should be able to sense the pressure even when the main valves are closed.

CONNECTING AC SOLENOIDS

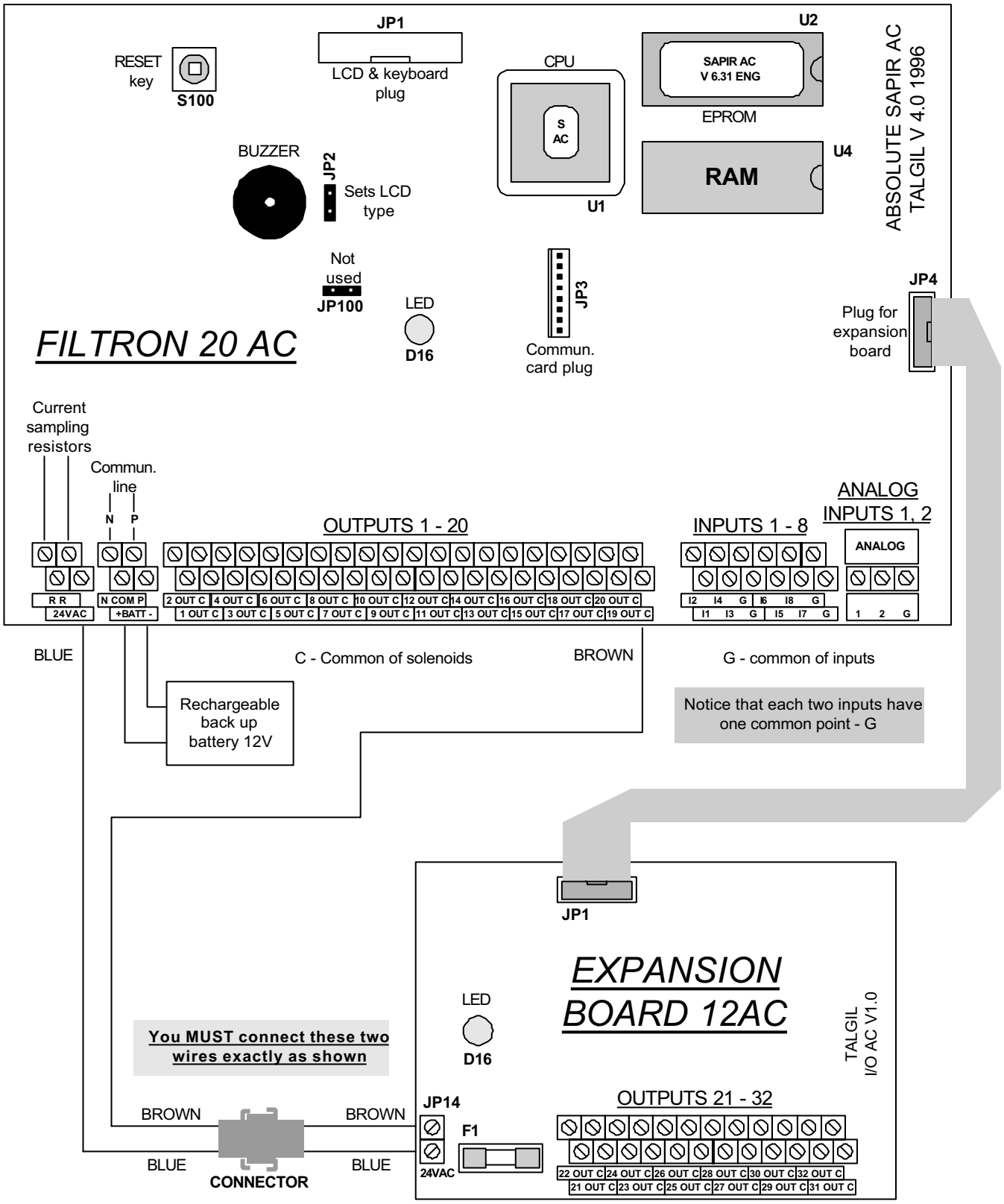
AC solenoids are connected by two wires whose polarity is of no importance.

FILTRON MULTI-FLEX 20 AC



FILTRON MULTI-FLEX 32 AC

The FILTRON 32 AC is a result of expansion of the FILTRON 20 AC by an expansion card of 12 outputs. The way of connection is described in the following diagram. Special attention has to be paid to the connection of the 24v AC to the expansion card, although we are talking about AC, the polarity is important.


JP1
LCD & keyboard plug
RESET key
S100
CPU
U2
SAPIR AC V 6.31 ENG
EPROM
ABSOLUTE SAPIR AC
TALGIL V 4.0 1996
BUZZER
JP2
Sets LCD type
S AC
U1
RAM
U4
Not used
JP100
LED
D16
JP3
Commun. card plug
JP4
Plug for expansion board
FILTRON 20 AC
Current sampling resistors
Commun. line
N
P
OUTPUTS 1 - 20
INPUTS 1 - 8
ANALOG INPUTS 1, 2
ANALOG
R R
24VAC
N COM P
+BATT -
2 OUT C
4 OUT C
6 OUT C
8 OUT C
10 OUT C
12 OUT C
14 OUT C
16 OUT C
18 OUT C
20 OUT C
1 OUT C
3 OUT C
5 OUT C
7 OUT C
9 OUT C
11 OUT C
13 OUT C
15 OUT C
17 OUT C
19 OUT C
I2 I4 G I6 I8 G
I1 I3 G I5 I7 G
1 2 G
BLUE
C - Common of solenoids
BROWN
G - common of inputs
Notice that each two inputs have one common point - G
Rechargeable back up battery 12V
JP1
EXPANSION BOARD 12AC
LED
D16
TALGIL I/O AC V1.0
You MUST connect these two wires exactly as shown
JP14
F1
24VAC
OUTPUTS 21 - 32
22 OUT C
24 OUT C
26 OUT C
28 OUT C
30 OUT C
32 OUT C
21 OUT C
23 OUT C
25 OUT C
27 OUT C
29 OUT C
31 OUT C
BROWN
BROWN
BLUE
BLUE
CONNECTOR

CONSTANTS

When the network definition is completed some constant parameters have to be defined. The constant parameters are those that do not vary frequently.

The first item is the current time setting which includes the current day of the week. The current time is expressed in terms of a 24 hours clock and the day of the week has to be between 1 and 7.

The second constant item is the reaction delay of the low pressure sensor. This is true only when the low pressure sensor is defined, otherwise the screens dealing with low pressure will be hidden. The "Low pressure reaction delay" is expressed in minutes.

CONCURRENT OUTPUTS (OR / AND)

Starting from version 1.05, a new feature has been added: the unallocated outputs can be programmed to work concurrently with any of the allocated ones. Those outputs are marked by a "C" in the NETWORK DISPLAY. There are two possibilities of concurrent action: the concurrent OR and the concurrent AND. When the concurrent OR is chosen, the unallocated output will be active as long as any of its allocated counterparts are active. In the following example the unallocated output No. 19 is marked to work concurrently with output 7 OR output 14, as long as outputs 7 or 14 are open output 19 will be open too.

When the concurrent AND is chosen, the unallocated output will be active only if all of its allocated counterparts are active.

FILTRATION

FILTRATION is the general name used for all the data and the information included in the control screens involved with the process of the back flushing. Naturally this is the most popular subject that the user of the FILTRON deals with. Included in this subject there are informative screens, data entry screens and process control screens. The order of the screens in the FILTRATION row was dictated by the frequency of use of the screens by the user. The first two screens supply information about the current activity of the system and allow manual interference with the current status. The following screens are used for definition of various timing parameters. The last two screens contain activity counters and activation mode settings.

The following explanation doesn't necessarily follow the order of the screens of the FILTRATION row but it is rather given in a logical order of their use.

DEFINING THE FLUSHING PROCESS PARAMETERS

The parameters that govern the flushing process are the followings

1. The INTERVAL BETWEEN FLUSHING cycles.
2. The FLUSHING DURATION per station including the time before the Delay valve opening and the time after closing the Delay valve.
3. The DWELL TIME between stations.
4. The D.P. DELAY between the moment of sensing the pressure differential and the moment of reaction.
5. The LOOPING LIMIT which is the number of consecutive flushing cycles that when exceeded it is considered faulty endless operation.
6. The behavior of the main valve regarding the order of opening/closing relatively to the stations, before/after or without delay.
7. The DELAY BETWEEN BATTERIES when flushed in sequence.

The FILTRON MULTI-FLEX can handle the flushing process of the various batteries in different ways. Batteries can be operated individually or they can be grouped together, to work in a sequential manner where one of the batteries leads the sequence and therefore it is called the LEADING BATTERY. When the sequential operation is selected, the LEADING BATTERY will be the one which has been defined with the D.P. sensor and only this battery will get a definition of the INTERVAL BETWEEN FLUSHING CYCLES. The other batteries must not get an interval definition but instead they should be defined to follow one another.

SETTING THE INTERVAL BETWEEN FLUSHING CYCLES

The screen for setting the INTERVAL BETWEEN CYCLES will be the third in the FILTRATION row but it will appear only when the battery selected is the Leading battery.

Battery 1			
Between flushings	**(hour:min)**	**–**	**01:00**

SETTING THE FLUSHING DURATION PER STATION

The flushing duration per stations has to be set for each battery separately. For the Leading battery you will use the fourth screen in the FILTRATION row and for the others it will be the third one. When a delay valve (air valve) is incorporated in the system, the flushing time per station is divided into three: The time before opening the delay valve, the time the delay valve is open and the time after closing the delay valve. The controller will calculate and display the total flushing time per station as shown in the following screen:

Battery 1		**Total flushing time**	**– 37 sec**
Before – 25 sec	**Open**	**– 7 sec**	**After – 5 sec**

SETTING THE DWELL TIME

The DWELL TIME is the time between the moment of closing one station and the moment of opening the next one. Use the fifth screen in the FILTRATION row for the Leading battery or the fourth for the others, select the desired battery and set the desired value.

Battery 1	**Dwell time**	**– 5 sec**

SETTING THE D.P. DELAY AND THE LOOPING LIMIT

The D.P. DELAY is the time allowed between the moment of sensing the pressure differential and the moment of reaction. The looping limit is the number of consecutive flushing cycles forced by the D.P. sensor after which the sensor is considered faulty and the looping process is stopped. the explanation about the HANDLING FAULTS below.
Screen No. 6 in the FILTRATION row is used for setting the above parameters. This screen will appear only when the battery selected is a Leading battery.

Battery 1	**D. P. delay**	**– 5 sec**
	Looping limit	**– 5**

THE MAIN VALVE BEHAVIOR

The main valve of a filter battery can be opened before/after the stations with a certain delay or without any delay.

SETTING THE ORDER OF FLUSHING AND THE DELAY BETWEEN BATTERIES

Setting the order of flushing means to appoint one battery as the leading battery and telling the others which follows which. When the batteries have to be operated independently and do not have to be grouped to work in a sequence, each battery will be considered a leading battery. A leading battery gets a definition of the INTERVAL BETWEEN CYCLES and it has to be told that its backflushing is triggered either by time or by D.P. For the other batteries the back flushing is triggered by the termination of their predecessor and for those the DELAY BETWEEN BATTERIES has to be defined. The following screen is used for both of the cases, use the VERTICAL ARROWS to select the right triggering mode for each battery and set the DELAY BETWEEN BATTERIES when requested.

Battery 1	*** Active**
*** Start by time AND/OR by D. P.**	

Battery 2	*** Active**
*** Start after battery 1**	**Wait – 10 sec**

The Asterisk (*) indicates the fact that a selection has to be made by use of the VERTICAL ARROWS.

DECLARING BATTERIES NOT ACTIVE

A battery can be set NOT ACTIVE when desired and in that case it will be skipped over during the flushing process. A message will be produced each time that a NOT ACTIVE battery is skipped over telling that the battery has been VIRTUALLY ACTIVATED. Use the screen of the previous paragraph to toggle batteries ACTIVE and NOT ACTIVE.

GETTING INFORMATION

A lot of information is obtainable about the flushing process. On line information allows for close inspection of the flushing process and historical information is available for studying the long term behavior of the system.

WHO IS CURRENTLY FLUSHING ?

To find out which of the stations in which of the batteries is currently flushing you need to go to the first screen in the FILTRATION row. The screen has the following form:

Outputs	**1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0**
OR	**– – – – – F * V – – – – – – – – – – – –**

In the example, the (F) under number 6 indicates station number six being flushed, the asterisk (*) under number 7 indicates that the delay valve is open and the (V) under number 8 says that the main valve is open.

FOLLOWING THE FLUSHING PROCESS

To get real time information during the flushing process you need to select the second screen in the FILTRATION row. This screen shows per each battery the current status. For the Leading battery also the status of the D.P. and the time left until next flushing is displayed. You may find it having the following forms:

Battery 1	**Wait for start**
Until next start - 00:05:35	**D. P. - OFF**

Battery 1	**Filter - 1 (6)**	**Flush. 24**
Until next start - 00:05:35		**D. P. - ON**

The currently flushing filter is no 1 in battery 1 which incorporates 6 filters, there are 24 seconds left for this station.

The D.P. may have one out of three statuses :

D.P. – OFF - No pressure differential indication
D.P. – ON - Currently existing pressure differential indication
D.P. – PAUSE - Pressure differential indication suppressed

THE ACTIVITY COUNTERS

These counters count the number of times each battery has been activated by time, by D.P., after another battery or manually.

Battery 1 started	**Manually - 2**
By D. P.	**By time - 51**

Battery 2 started	**Manually - 1**
	After 1 - 51

THE CHRONOLOGICAL EVENTS REPORT

A detailed report of events is supplied to enable the user to know not only what happened but also when did it happen. There is a separation between general messages and fault reports. The user may choose to see reports per each battery separately or a concentrated report for all the batteries. When there are both fault messages and general messages the fault messages will be displayed first in a separate table. The first message to be displayed will always be the most recent one and by using the Up arrow the rest of the messages can be scanned.

HANDLING FAULTS

The FILTRON MULTI-FLEX 20/32 AC is capable of detecting several types of faults:

- Low pressure in the water supply system
- Endless looping caused by faulty D.P. indication
- No AC power
- Short circuited output

LOW PRESSURE IN THE WATER SUPPLY SYSTEM

In order to detect low pressure in the supply system a pressure sensor has to be defined and installed with the system. When low pressure is detected the following things happen:

1. The active stations are shut down and the process is halted
2. A fault message is produced
3. A special register starts counting the low pressure time
4. Alarm is sounded if previously requested.

When the pressure returns to normal, operation resumes.

ENDLESS LOOPING CAUSED BY FAULTY D.P. INDICATION

When the number of consecutive flushing cycles forced by the D.P. sensor exceeds the LOOPING LIMIT, the sensor is considered faulty and the looping process is stopped. The following actions will take place:

1. The active stations are shut down and the process is halted
2. A fault message is produced
3. Alarm is sounded if previously requested.

To resolve the problem the D.P. sensor's contact has to be released.

NO AC POWER

When the FILTRON senses a power failure although it is equipped with a backup battery it is unable to continue the flushing process because the solenoids need a constant supply of 24v AC which is missing. therefore the followings will happen:

1. The active stations are shut down and the process is halted
2. A fault message is produced

The operation resumes right after the supply returns to normal.

SHORT CIRCUITED OUTPUT

When the FILTRON senses a short circuited output it will disconnect that output from the power source, mark it as "SHORT CIRCUITED" a small "s" will appear in the ACTIVE OUTPUTS display below the faulty output and a proper message will be produced. The controller will keep that output out of the process until it will be informed that the problem is solved. The way of doing it is by entering the first screen in the subject called SYSTEM where the status of the SHORT CIRCUIT is displayed and by hitting the ENTER key twice the FILTRON will Know that there are no more faults.

ALARM

The alarm is an option that may be defined in the FILTRON MULTI-FLEX 20/32 AC. When this option is used the user has to define how he wants the alarm to sound either continuously or 20 seconds ON each 10 minutes.
The user will also have to decide when he wants the alarm sounded, the options are :

1. When detecting low pressure in the water supply system
2. When detecting endless looping caused by faulty D.P. indication

The subject of the alarm will not appear in the main menu unless it has been defined during NETWORK DEFINITION.

The output used for alarm activation will be designated by the letter (A). By connecting a RELAY to the output allocated to alarm activation, various types of alarming devices may be activated.

MANUAL INTERVENTIONS

MANUALLY STARTING AND STOPPING THE FLUSHING PROCESS

The second screen in the FILTRATION row in which the status of the selected battery is displayed can also be used for manually starting or stopping a flushing process. By using the VERTICAL ARROWS the desired battery is selected and then the ENTER key reveals the options "To start" or "To stop" (the one which is relevant). Hitting the ENTER key once more will carry out the command. If the selected battery to be started is a Leading battery the other batteries will follow in sequence but if the selected battery is not a Leading one then only the selected battery will be flushed. Only one battery can be flushed at any time.

Stopping the currently being flushed battery will cut the sequence and other batteries programmed to follow will not be flushed during the current sequence.

PREVENTING A BATTERY FROM BEING FLUSHED

A selected battery can be prevented from being flushed by declaring it NOT ACTIVE. In the screen in which the starting mode is selected, a desired battery can be declared NOT ACTIVE and while being in that status it will be skipped over during the flushing process. A Leading battery as well as any other battery can also be declared NOT ACTIVE.

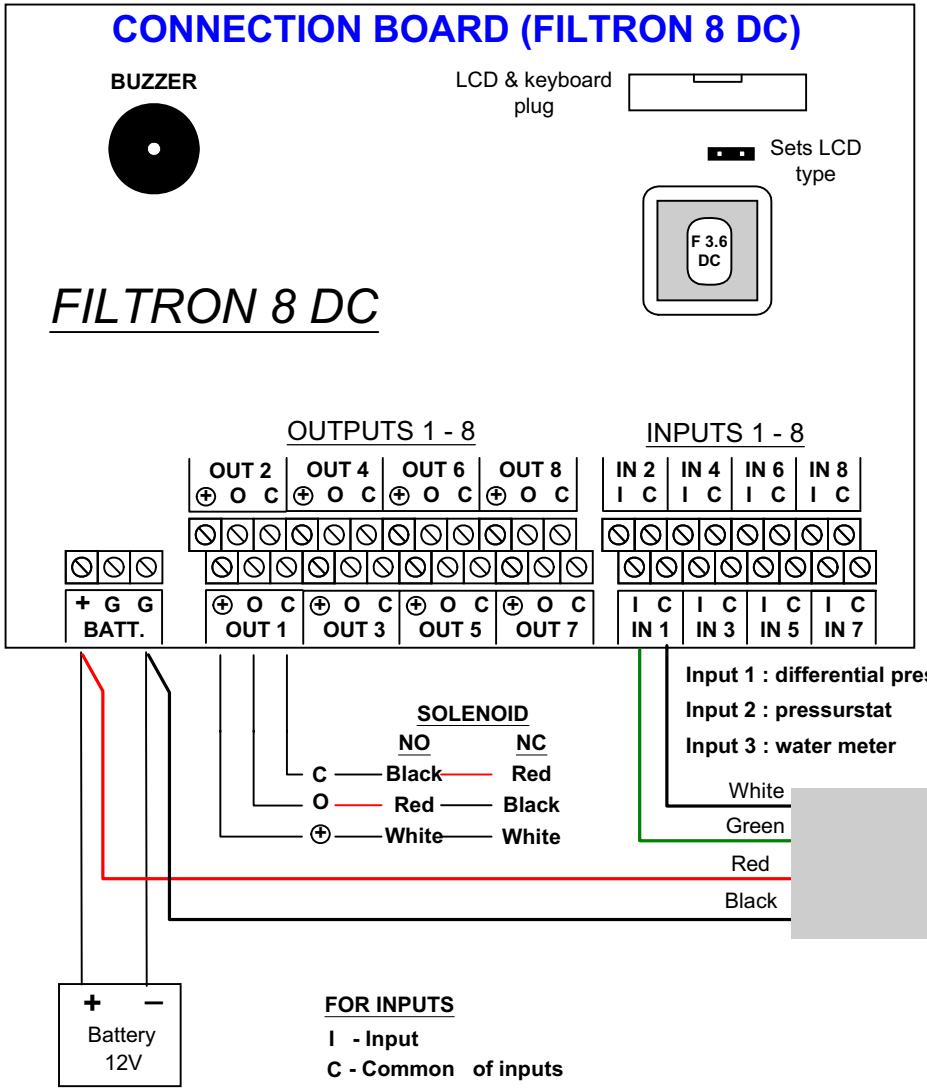
GENERAL SYSTEM FREEZE

To cause a general freeze of the system as a whole, select the subject called SYSTEM, the second screen to the right will ask you if you want "to cause a general system freeze". To answer this question positively hit the ENTER key and all the activity of the controller will be halted until being freed via the same screen.

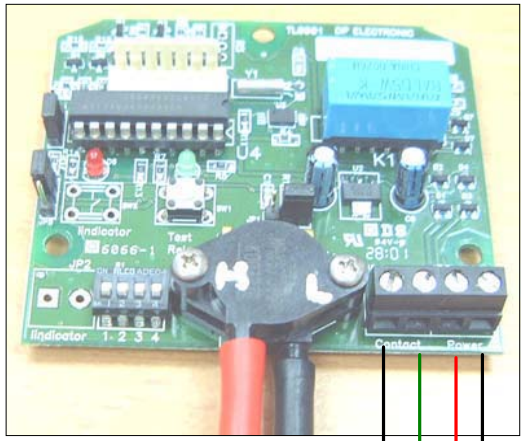
Connection Diagrams

CONNECTION DIAGRAMM FILTRON 8 DC AND DP ELECTRONIC

FILTRON 8 DC FP1801

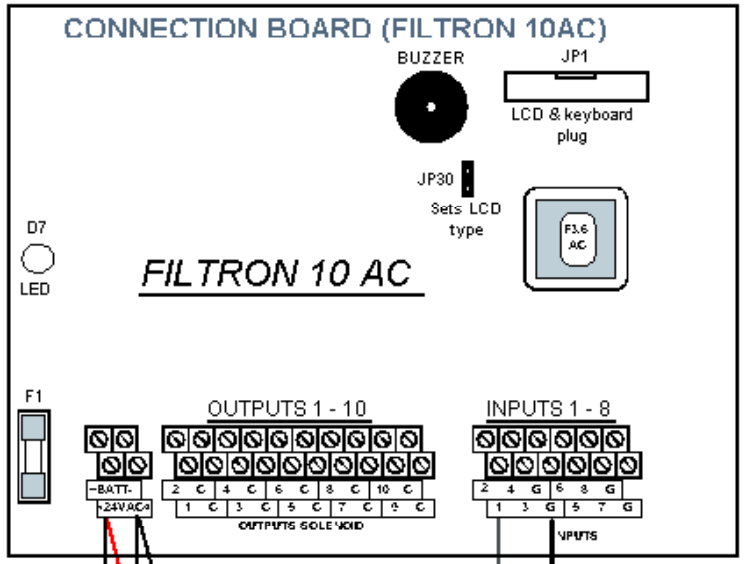


DP Electronic DP0002

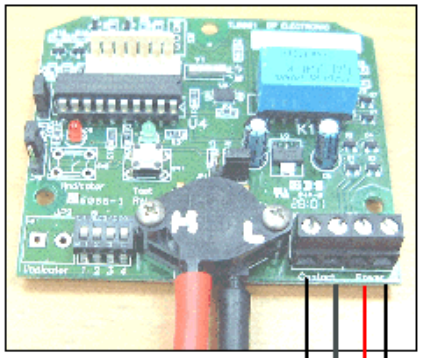


CONNECTION DIAGRAMM FILTRON 10 AC AND DP ELECTRONIC

FILTRON 10 AC FP2101



DP Electronic DP0002



Notice that each two inputs have one common point - G

Input 1 : differential pressurstat
Input 2 : pressurstat
Input 3 : water meter

DP ELECTRONIC CARD

White
Green
Red
Black

White
Green
Red
Black

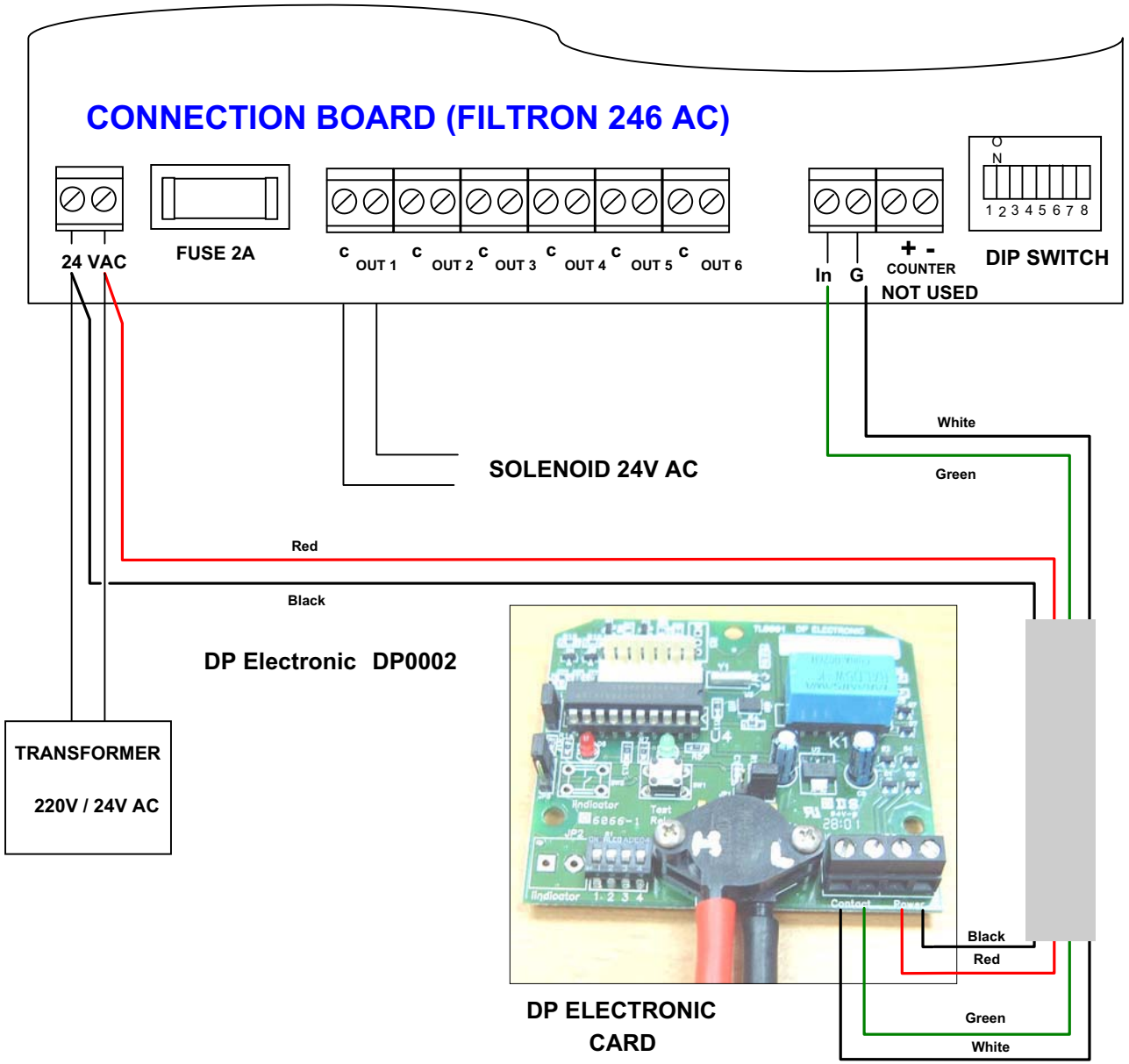
Transformer 220/24V AC

CONNECTION DIAGRAMM FILTRON 246 AC AND DP ELECTRONIC

FILTRON 246 - 2 AC FP2120

FILTRON 246 - 4AC FP2140

FILTRON 246 - 6 AC FP2160



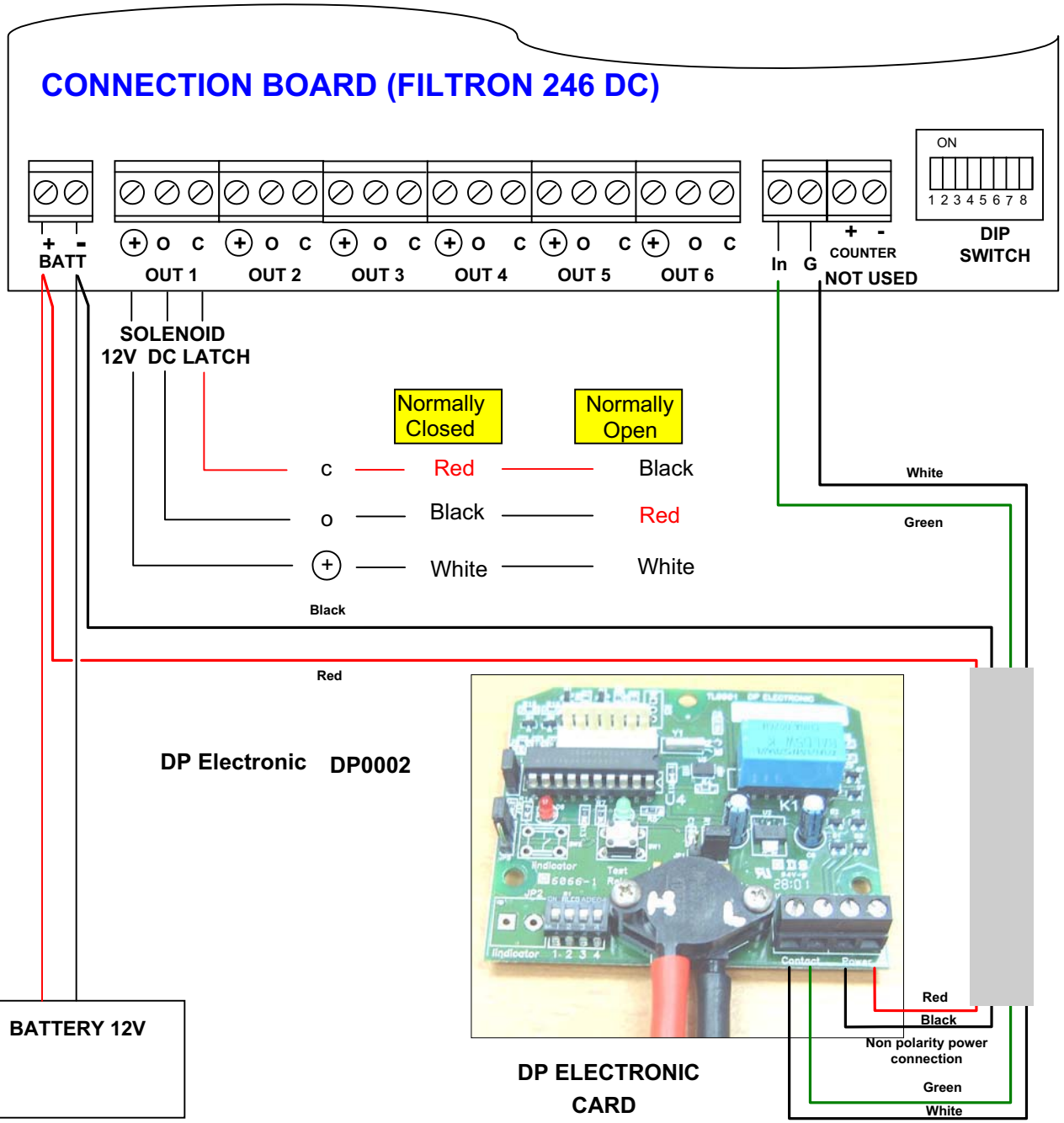
CONNECTION DIAGRAMM FILTRON 246 DC AND DP ELECTRONIC

FILTRON 246 - 2 DC FP1140

FILTRON 246 - 4DC FP1140

FILTRON 246 - DAC FP1160

CONNECTION BOARD (FILTRON 246 DC)



Solenoids

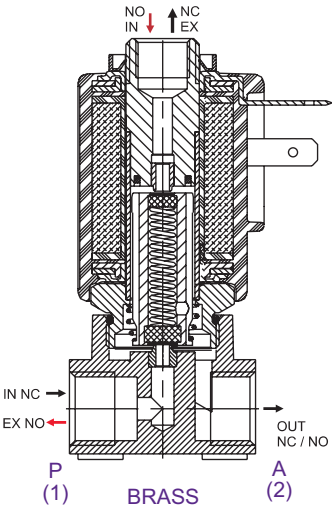
GEM-SOL Direct Operated 1/8", 1/4" 3/2Way NC, NO

General Description

GEM-SOL 3/2 way NC or NO solenoid valves are recommended for heavy duty applications where high performance is required.
They can be used for industrial and irrigation control and automation systems.
These valves are suitable to work with air, water and oil; please consult with us if you need the valves to work with other fluids.

Notes

- Valves are inspected at general pressures of 12 bar or less (see table). Valves for higher pressures are available.
- ADC valves are suitable to work only with AC 8W or DC 10W coils.
- Latch valves are available upon request.
- To order valves manufactured to your specific requirements, please contact our technical sales department.



Technical Specifications

Function:	3/2 way NC & NO
Ports size:	1/8" and 1/4" BSP & NPT
Orifice:	See table
Kv:	See table
Pressure range:	See table
Temperature range:	Fluid: max 80°C
	Ambient: -10°C to 50°C
Manual Override:	Plastic, brass screw or brass finger knob
	St.st for St.st valves
Materials :	**Main valve :**
	Mazak, Brass
	or Stainless steel 303
	Solenoid Operator:
	Stainless steel 300 & 400 series
	Seals:
	NBR, Viton, EPDM or Kalrez
Weight (with coil):	248 gr for Mazak valve
Media:	Air, water, oil
Coil voltage:	All Baccara coils voltages ±10%
	AC 8W, 5.5W and 2.5W &
	DC 10W, 5.5 and 3.5W
	Protection class IP65 with connector

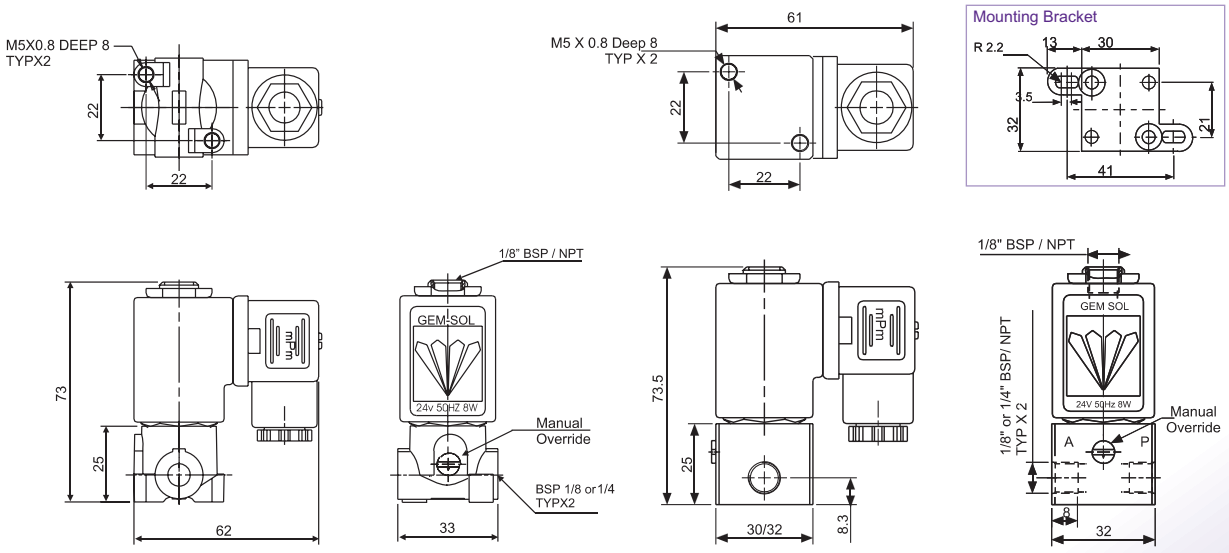
Max.Pressure (bar) 3W NC Table

Coil Current/Power	Orifice 0.8	1.2	1.6	2.0	2.4	3.0
ADC	23	20	15	10	8	5.5
AC/8W DC/10W	35	30	17	14	10	6
AC/5.5W	23	20	15	10	8	5.5
AC/2.5W DC/5.5W DC/3.5W	20	16	10	9	5	4
Flow factor Kv(Lmin)	0.6	1.1	1.7	2.5	3.5	4.5

Max.Pressure (bar) 3W NO Table

Coil Current/Power	Orifice 0.8	1.2	1.6	2.0	2.4	3.0
ADC	25	20	15	11	8	6
AC/8W DC/10W	30	22	17	12	10	7
AC/5.5W DC/5.5W	25	20	15	11	8	6
AC/2.5W DC/3.5W	20	18	12	8	6	4
Flow factor Kv(Lmin)	0.6	1	1.4	2.2	3.0	3.5

Dimensions



BRASS

MAZAK/St.St.

NOTE: Stainless steel valves are made of □ 32.

BACCARA

GALIT Pilot Operated solenoid valve 3/2 Way NC, NO

General Description

GALIT Pilot operated 3/2 Way NC, NO solenoid valves were specially designed to control medium and large valves. These valves are controlled by various options of AC, DC and Latch G75 coils. Although being compact, the valves enable large flow pass.

Notes

- Minimum pilot pressure of 1 bar is required.

How to Order

Example : GALIT - 101

Is a GALIT Pilot operated 1/8" BSP, 24V AC valve.

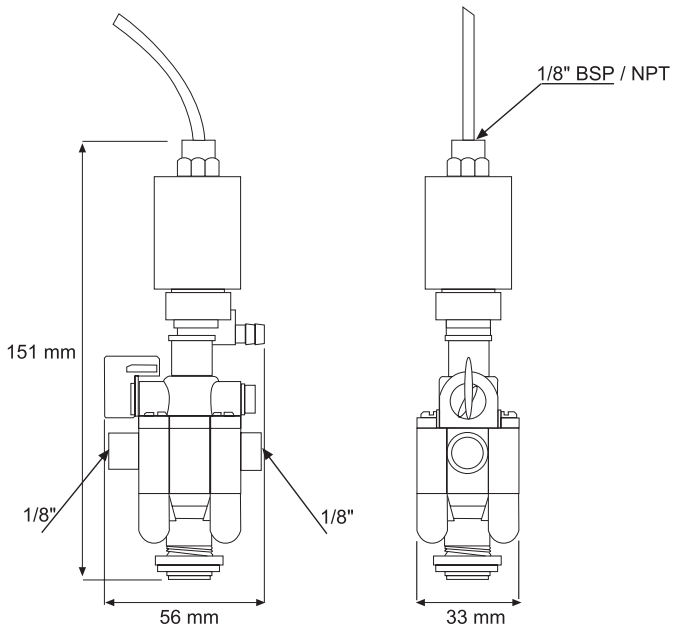
GALIT –	Port		Voltage		Wires *	
	1/8"BSP	10	24VAC	1	two	null
	1/8"NPT	11	9-12 Latch(4Ω)	2	three	a
			12VAC	3		
			12VDC	4		
			24VDC	5		
			24Latch(23Ω)	6		
			110VAC	7		
			6 Latch (4Ω)	B		
			12 Latch (9Ω)	C		
			16 Latch (12Ω)	D		

*For latch only

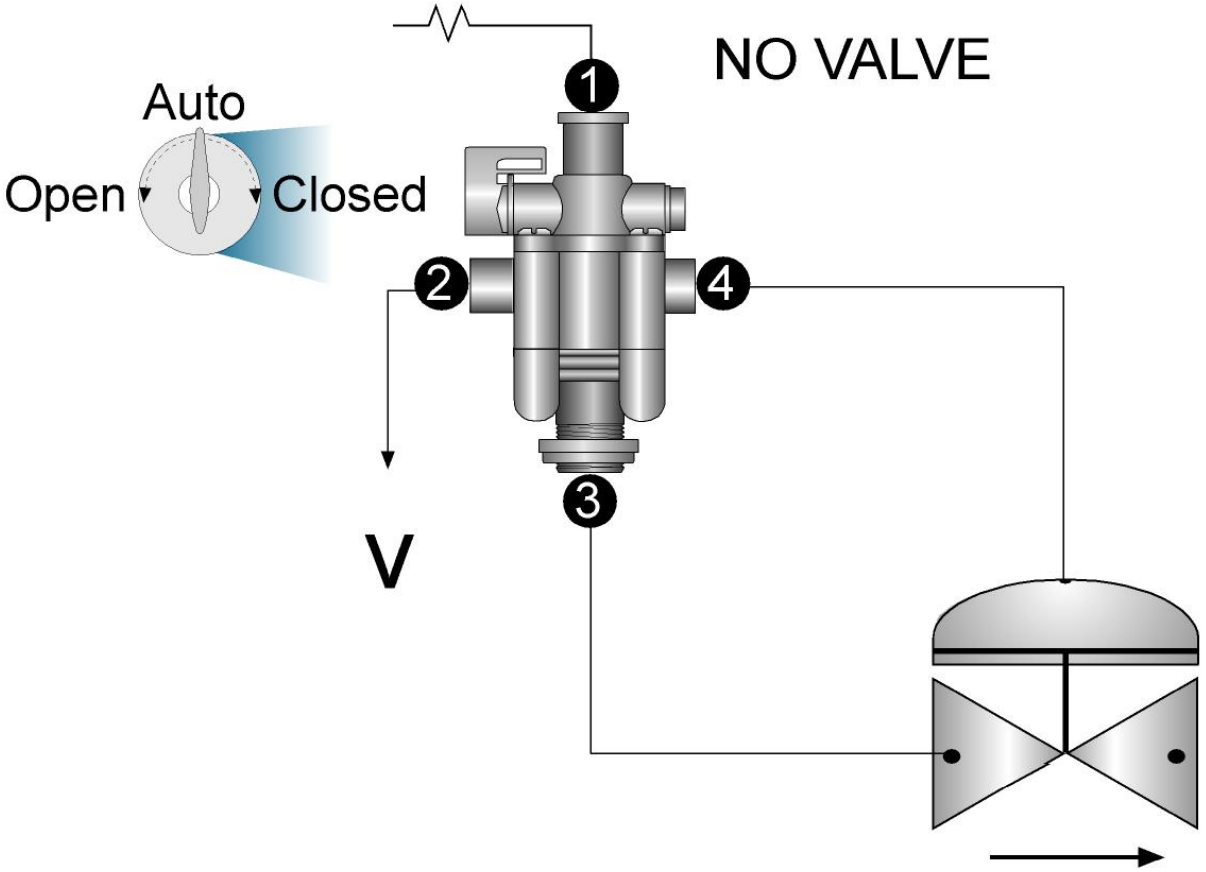
Technical Specifications

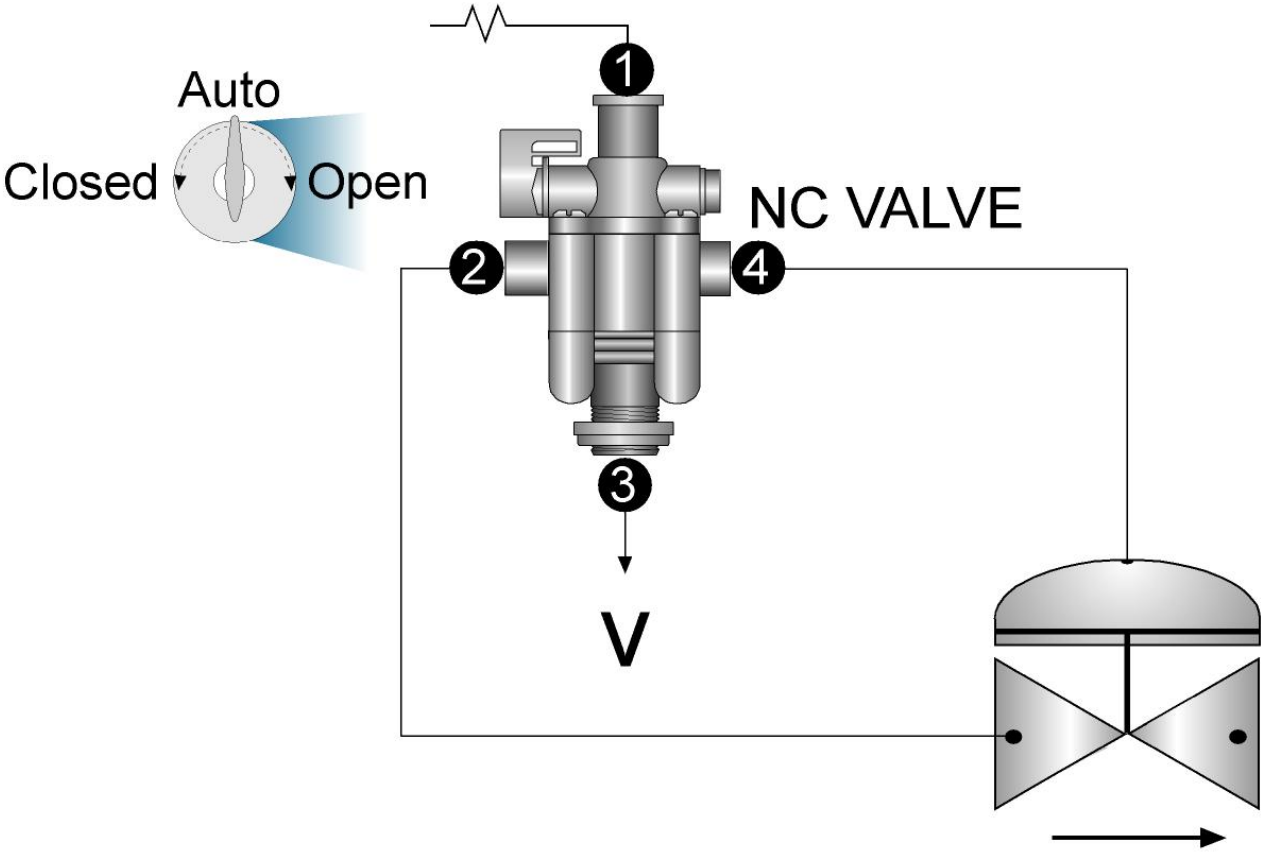
Functions:	3/2 Way NC or NO
Ports size:	1/8" BSP or NPT
Orifice:	5mm
Pressure range:	1 - 10 bar
Temperature range:	Ambient : -10^{O} - 50^{O} C
	Fluid : 5^{O} - 50^{O}
Materials:	**Main Valve:**
	Reinforced Nylon
	Seals:
	NBR
	Solenoid:
	See solenoid specifications
Media:	Water
Coil Voltage:	All G75 coil voltages
	Protection class IP66

Dimensions



Galit


NO VALVE
Auto
Open
Closed
1
2
3
4
V


Auto
Closed
Open
NC VALVE
1
2
3
4
V

Dry Magnetic Latch Solenoid with Isolating Membrane & Hydraulic Base 3-Way, 12VDC Latch, 2- Leads

S-982-3W

The BERMAD Model S-982-3W actuator is neutralized from water damage by a membrane, which hermetically isolates it from the water. It can control valves independently or in combination with other control circuit accessories. The hydraulic base features a manual override and consists of a bracket for attaching to the valve or to a solenoid manifold.

Electrical Data:

Voltage Range: 12-50 VDC
Coil Resistance: 4.2Ω
Pulse Width: 20-100 mSec.
Required Capacitor: 4700µF
Operation Modes (electrical connections):
+ Red & - Black: Solenoid vents
+ Black & - Red: Solenoid pressurizes

Pressure & Flow Data:

Operating Pressure Range: 0-10 bar
Base Orifice Diameter: 2.2 mm
Base Flow Factor:
Pressure port Kv = 0.12 m^3/h @ 1 bar ΔP
Cv = 0.14 GPM @1 psi ΔP
Exhaust port Kv = 0.14 m^3/h @ 1 bar ΔP
Cv = 0.16 GPM @1 psi ΔP

Connections:
1- Vent **2-** Valve Control Chamber **3-** Pressure

Dry Magnetic Latch Solenoid with Isolating Membrane & Hydraulic Base 3-Way, 12VDC Latch, 3- Leads

S-985-3W

The BERMAD Model S-985-3W actuator is neutralized from water damage by a membrane, which hermetically isolates it from the water. It can control valves independently or in combination with other control circuit accessories. The hydraulic base features a manual override and consists of a bracket for attaching to the valve or to a solenoid manifold.

Electrical Data:

Voltage Range: 12-50 VDC
Coil Resistance: 2 Coils - 4.2Ω On; 7.5Ω Off
Pulse Width: 20-100 mSec.
Required Capacitor: 4700µF
Operation Modes (electrical connections):
+ White: Fixed Common
- Red: Solenoid vents
- Black: Solenoid pressurizes

Pressure & Flow Data:

Operating Pressure Range: 0-10 bar
Base Orifice Diameter: 2.2 mm
Base Flow Factor:
Pressure port Kv = 0.12 m^3/h @ 1 bar ΔP
Cv = 0.14 GPM @1 psi ΔP
Exhaust port Kv = 0.14 m^3/h @ 1 bar ΔP
Cv = 0.16 GPM @1 psi ΔP

Connections:
1- Vent **2-** Valve Control Chamber **3-** Pressure

Solenoid Valve for Remote Terminal Unit (RTU)

BERMAD's Solenoid Valve for Remote Terminal Unit (RTU) is a solenoid pilot valve controller used in remote control irrigation via radio or cable. It is a battery operated, self-contained unit, suitable for use in irrigation applications with a master radio control system.

Note: RTU units can be purchased only through Motorola® irrigation control department.

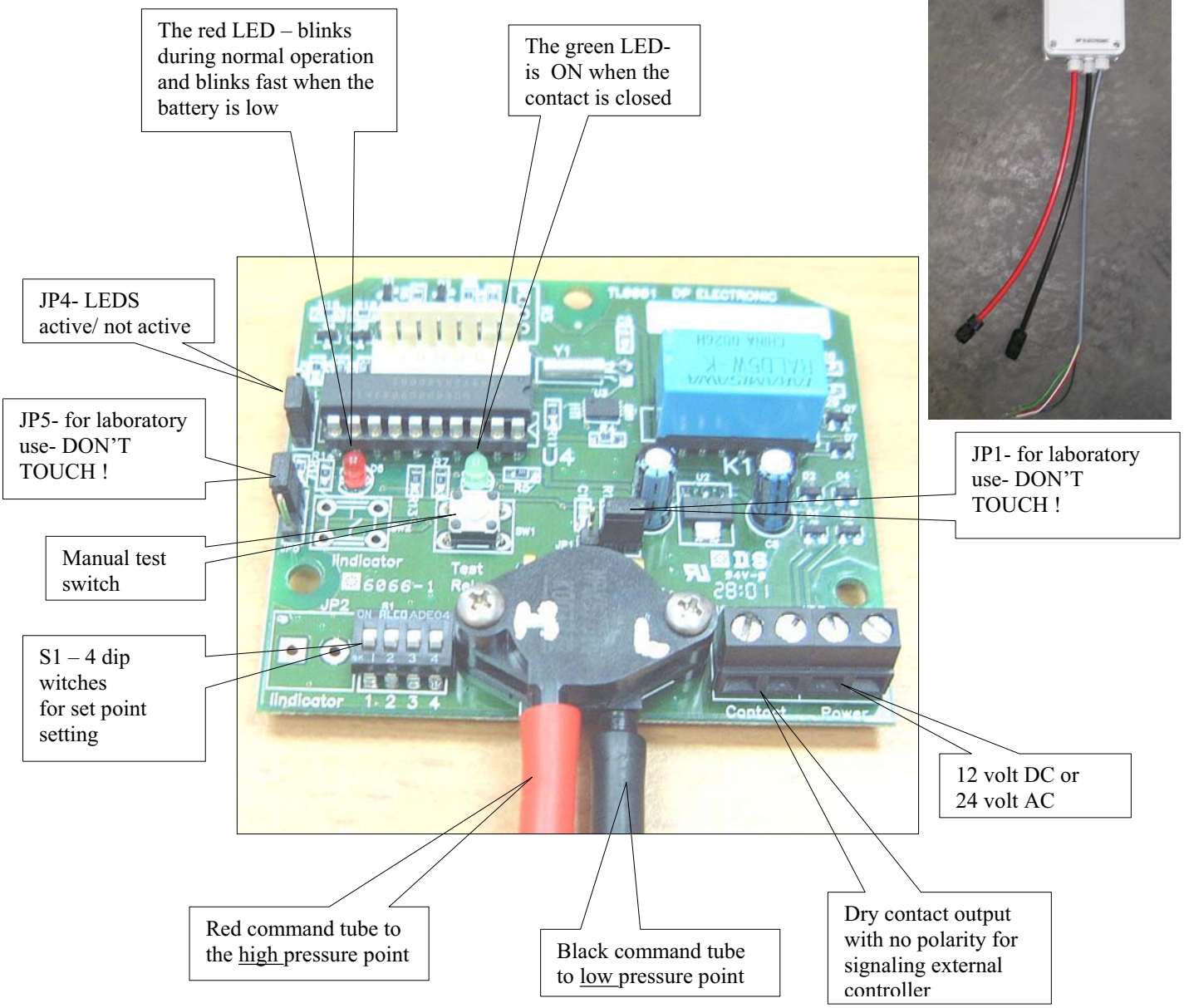
For further details please contact: IRRInet.marketing@motorola.com

Differential Pressure Gauge

TALGIL COMPUTING & CONTROL LTD.
P.O.B. 775 Kiryat Motzkin 26119
Tel : 972-4-8775948 Fax : 972-4-8775949
E-mail : talgil33@netvision.net.il

Digital Differential Pressure Sensor

The digital differential pressure sensor DP measures the pressure difference between two points and when the difference exceeds a predefined set-point it reacts by closing a dry contact output. The unit is meant to be used with backwashing systems of automatic filters, it is highly accurate and low power consuming.



Starting Up

The electronic board contains 4 dip-switches (S1) which serve for starting up the system and selecting the reaction set-point. When all the 4 switches are in OFF position (pointing down) the unit is not active. When there is at least one switch ON (pointing up) the unit is active. The active state is indicated by the blinking of the red LED, a short blink each 5 seconds.

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Reaction set-point setting

The state of the 4 dip-switches S1 defines the pressure difference at which the unit will react by closing its dry contact output, this point is known as the reaction set-point. As long as the pressure difference stays above the defined set point the contact remains closed. The following table shows the connection between the position of S1 and the pressure difference associated with each setting,

Position No.	S1 (1-ON ; 0-OFF) 1 2 3 4	Reaction pressure difference	
		Atm.	psi
00	0 0 0 0	The unit is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

The red LED indications

The LED behavior	Indicated state
The LED is OFF	The unit is not active
A short blink every 5 seconds	Normal operation & battery level above 9.5 v
3 fast blinks every 5 seconds	Operating with low battery, less than 9 v

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Testing the dry contact operation

The electronic board contains a “test switch” that when pushed will cause the dry contact to be closed for 5 seconds. As usually, the closing of the contact will be indicated by lighting the green LED.

Remarks

- It is necessary to use a filter between the high pressure point and the RED command tube to eliminate blocking the command tube by the unfiltered water.
- For energy saving purposes the pressure difference is checked every 15 seconds. Then 16 samples are taken continuously, the average of these samples is considered as the current pressure difference reading.
- For energy saving purposes the position of JP4 can be changed so that the middle pin will be connected to the upper pin (instead of to the lower pin). As a result of this, the LED indications will be stopped.
- The user is not permitted to touch any of the jumpers except for JP4 ! Any change in the position of the jumpers may disturb the operation of the unit. The correct jumpers setting is as shown in the picture above.
- When the battery voltage drops bellow 6.5 volts the dry contact is opened regardless of the pressure difference and the unit turns itself OFF.

United Electric Differential Pressure Switch Gauge, Type: 2414945 N.O.

Specifications:

A. Case: Reinforced Polyester.
B. Cover: Stainless Steel.
C. Pressure connections: Polysulphone 8mm threaded marked high/low.
D. An accurate indicator gauge and adjustable BAR limit switch.
E. Mounting: panel mounting.
F. Signal connection cord.

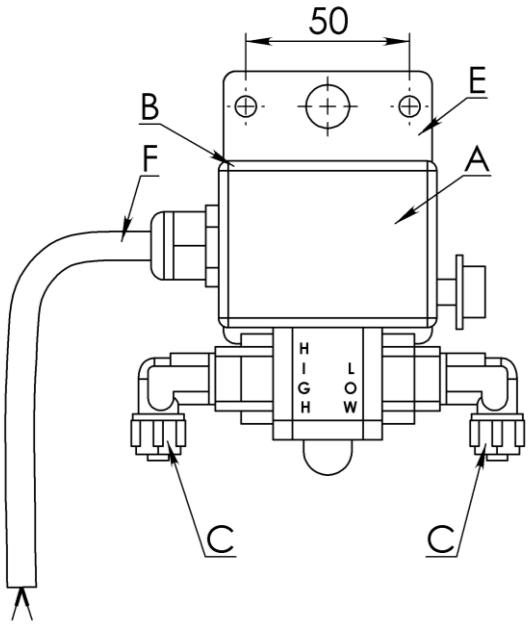
Installation:

1. Ensure correct orientation! Stainless steel covers facing upwards.
2. Connect signal cord to the controller. +/- is insignificant.
3. Connect pressure lines to correct ports. Inlet water to high pressure port and outlet water to low pressure port.
4. Adjust the PSI limit switch (0.5 BAR is recommended).

* You may simulate activation of P/D switch by disconnecting the low pressure line only!

Note: do not exceed differential or static pressure of 10 BAR.

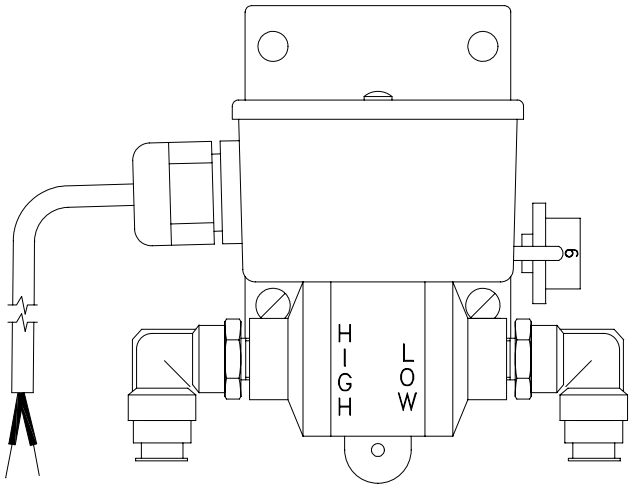
* 1 BAR = 14 PSI

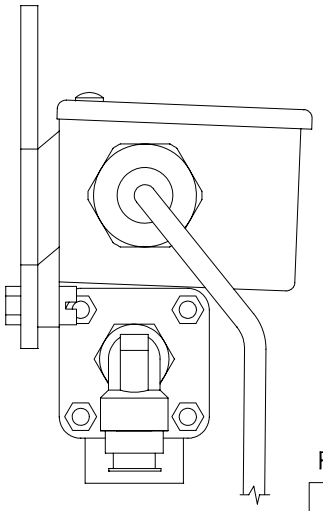


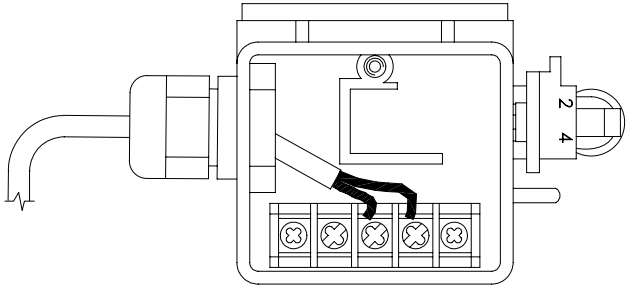
Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

ARKAL FILTRATION SYSTEMS

9605 7UNEN 04/2010







NC NO COM.

PART LIST

No:	DESCRIPTION	QTY
1.	PRESOSTAT DIFFERENTIAL UNITED ELEC.CONTROL CO.	1
2.	MOUNTING PLATE	1
3.	CONNECTING WIRES	1
4.	6mm*1/4" "BACCARA"	2

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL אדקל
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-6-6775140
FAX. 972-6-6775461
ISRAEL

PROJECT: BATTERY CONTROL SYSTEM — PAGE 1 OF 2

TITLE: PRESOSTAT UNITED — CATALOGUE No: 1900 0019

PATH MASTERS\OTHERS\PICOOD\FILTRON\ — FILE CODE: PRES-3 — DRAW.STATUS — VERSION No:

	NAME	DATE
DRAW	Nikolai	11.02.99
CHECKED		
APPROVED		

VIEW — BACKUP: DISK-6

ASSEMBLY DRAWING FILE CODE: — DRAWER N: 38

BACCARA

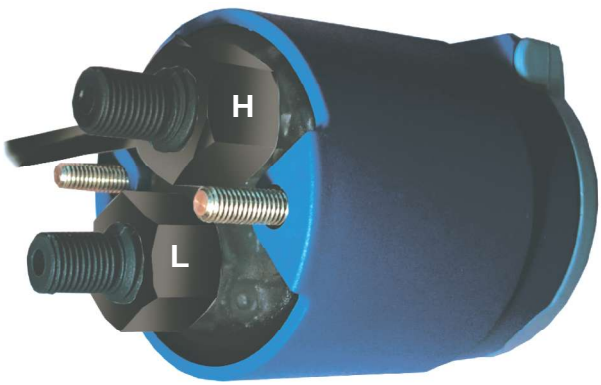
Digital Differential Pressure Gauge Switch (D.D.P.G.S.)

General Description

The Baccara Digital Differential Pressure Gauge Switch combines a gauge and a switch in one unit, which allows the user to program a wide range of monitoring and switching parameters to suit specific applications. It is specially designed for filter flushing systems. With its LCD display, user friendly interface for setting the working parameters and the IP66 environmental protection, this unit gives a reliable and easy to use solution for automatic filters. With the aid of the latch solenoid driver it is possible to upgrade a simple manual filter to an automatic one.

Note

- See instruction manual for further information
- ”H” pressure must be higher than ”L” pressure.
- Maximum ”H” pressure 200 psi/14 bar.
- This unit can be used as a manometer up to 99 psi or 7 bar.
- Please consult our technical sales department for special applications.



Technical Specifications

Mechanical specifications

- 2” (inch) 52mm diameter
- Operating temperature - 10^{0} to 60^{0}C
- Dust and water tight to IP66
- Outdoor UV protection
- Front panel cover protection
- Max. “H” pressure 200 PSI/14 BAR
- “H” pressure ≥ “L” pressure

Electrical specifications

- Power supply 9 - 24 VDC or 12-24VAC
- Low power detect
- Dry contact (N.O.) 0.5A at 24VAC
- Internal memory to retain “Set-up Data” at power down.

Mounting

- 2 ft/60 cm cable + 4 wires
- RED + BLK - power supply
- GRN / WHT N.O. contact
- Pressure ports 1/8” BSP/NPT (male)
- Mark “H” pressure port on housing

Programmable Settings

- Manual Operation
- PSI or BAR display
- Time interval between pressure measurements
- Contact closed time
- Zero calibration

Display

The LCD display shows the actual Differential Pressure (DIF) and the pressure differential trigger setting (SET) continuously when power is connected. When the switch contacts are closed, this is indicated by displaying **On**.

Display resolution:
1 PSI in the range 0-99psi.
0.1 BAR in the range 0.0-7.0 BAR.

Digital Differential Pressure Gauge Switch

USER GUIDE

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Getting Started

Description

The Baccara Digital Differential Pressure Gauge Switch combines a gauge and a switch in one unit, which allows the user to program a wide range of monitoring and switching parameters to suit specific applications.

Display

- The LCD display shows the actual Differential Pressure (DIF) and the pressure differential trigger setting (SET) continuously when power is connected. When the switch contacts are closed, this is indicated by displaying “On”.
- Display resolution:
  1 PSI in the range 0-99psi
  0.1 BAR in the range 0.0-7.0 BAR

Mechanical

- 2 inch (52 mm) diameter
- Operating temperature -10° C to 60° C
- Dust and water tight according to IP 66 specifications
- Outdoor UV protection
- Front panel cover protection
- Maximum “H” pressure 200 PSI / 14 BAR
- “H” pressure ≥ “L” press

Electrical

- Power supply 9-24 VDC or 12-24 VAC
- Low power indication: LO P on display
- Dry contact (N.O.) 0.5 A at 24 VAC
- Internal memory retains settings when power is not supplied.

Mounting

- 2 ft /60 cm. 4 wire cable
- Red (+) and Black (-) to power supply
- Green and White to N.O. contacts
- Pressure ports 1/8” BSP /NPT male
- “H” pressure port marked on housing

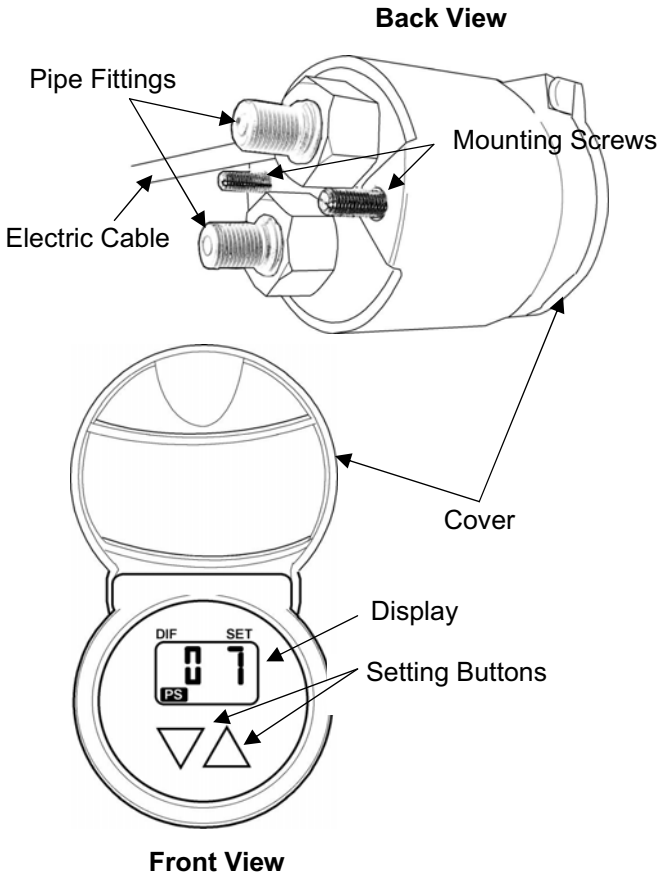
Programmable Settings

- Manual operation
- PSI or BAR display
- Time interval between pressure measurements
- Contact closed time
- Zero calibration

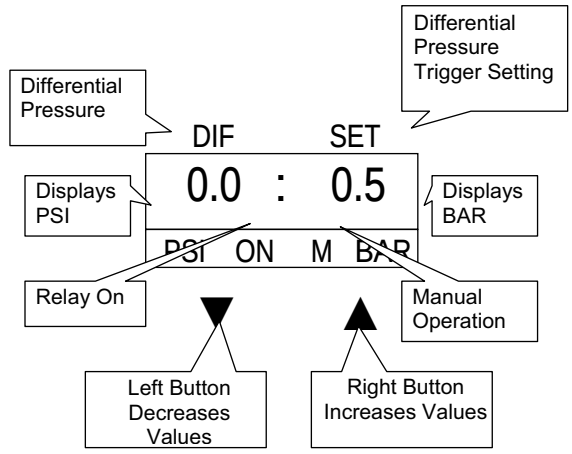
Default Factory Settings

- Units of measurement: PSI
- Differential pressure trigger (SET): 7 PSI
- Time interval between measurements: 25 seconds
- Contact closed time: A

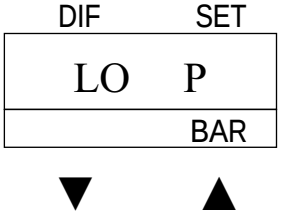
Parts Identification



Display



Low Power Display

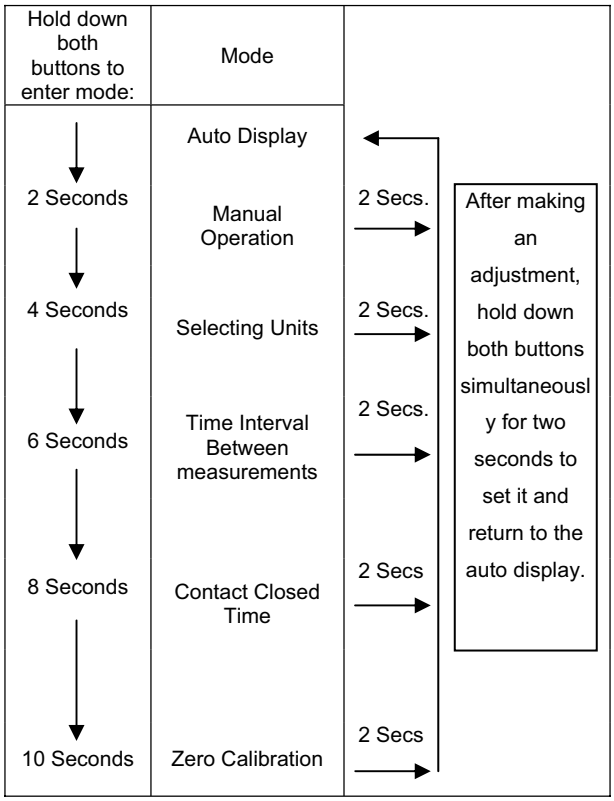


Programming

General - Using the Arrow Buttons

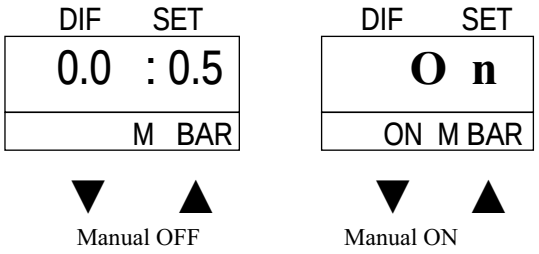
- To enter settings press and hold both buttons simultaneously.
- Use the left button ▼ for decreasing settings, selecting BAR measurements, and for turning off the device in the Manual mode.
- Use the right button ▲ for increasing settings, selecting PSI measurements, and for turning on the device in the Manual mode.
- After making an adjustment, holding the two buttons at the same time for 2 seconds, sets the adjustment and returns the display to the auto display.
- If the buttons are not held down for the full 2 seconds, until the auto display appears, no changes are made to the previous settings.
- When making an adjustment, if the buttons are not pressed for 30 seconds, the auto display appears and no changes are made to the previous settings.

Flow Chart for Settings



Manual Operation

1. Press both buttons for 2 seconds until the letter M flashes and the word “ON” appears.
2. Select ON or OFF. The left button ▼ selects OFF. The right button ▲ selects ON.
3. Hold the two buttons simultaneously for 2 seconds to set the selection. If you selected manual ON, M and ON will appear on the display. If you selected manual OFF only the M appears in the bottom row of the display.

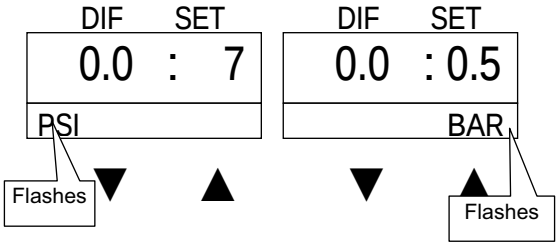


Manual Operation ON time

- If you selected A (t = A) as the contact closed time setting, the contacts will close and remain closed until the third pressure differential pressure measurement takes place, then will open or close according to the pressure differential.
- If you selected contact closed time “t” as a specific time in seconds, for example 10 seconds, then the contacts will close for 10 seconds.

Selecting Units of Measure

1. Press the two buttons simultaneously for 4 seconds until PSI or BAR flashes.

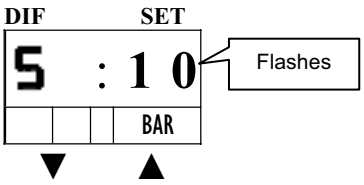


etting Readings in PSI **Setting Readings in BAR**

2. Press ▲ to switch from PSI to BAR.
3. Press ▼ to switch from BAR to PSI.
4. Set the selection by pressing on the two buttons simultaneously for 2 seconds.

Time Interval between Measurements

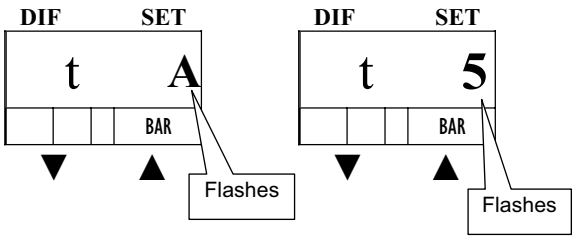
The device checks pressure differential every few seconds. This interval may be set by the user. The longer the interval is between measurements, the lower the power consumption and the greater the battery life. The time interval may be set for any value from 0.5 to 99 seconds (0.5 appears as A). Press the two buttons simultaneously for 6 seconds, until the following display appears:



1. Using the buttons, add or subtract time until you reach the desired time interval selection. In this example, 10 seconds has been selected.
2. Set by holding the two buttons down simultaneously for 2 seconds, until the display returns to the basic screen.

Contact Closing Time

1. When the pressure differential is greater than or equal to the setting (DIF ≥ SET) the switch contacts are closed for the period of time “t” in seconds. This closed time may be set as follows: A, or any value from 1 to 99 seconds. A=closed time depending on the interval between measurements “S”and is explained in the chart which follows these steps.
2. Press the two buttons simultaneously for 8 seconds until one of the following appears on the display:

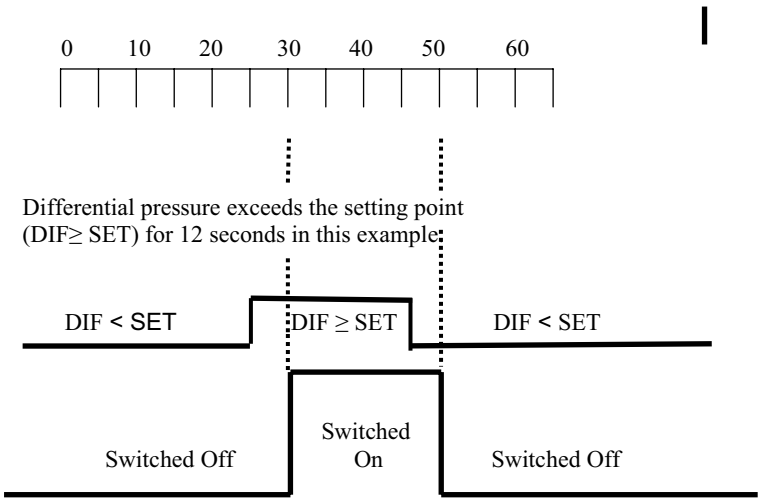


3. Use the buttons to adjust the time or to select A: ▼ to decrease, ▲ to increase.
4. Press the two buttons simultaneously for 2 seconds until the basic display appears, to set the selection.

Contact Closed Time = A

The below diagram shows how the relay “ON” time is dependent upon the interval time setting when the contact closing time is set to “A” (t = A):

For example, the interval between measurements “s” is set at 10 seconds.

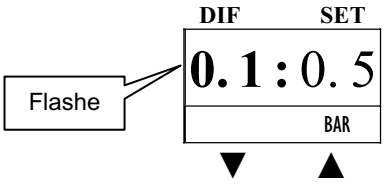


The relay is switched ON only when the gauge “knows” that a differential pressure change has taken place, and will not be switched ON or OFF between measuring samples, which in this case results in an ON time of 20 seconds.

Zero Calibration Set

The pressure sensor should read zero when the pressure differential is zero. To check the calibration, remove the two pipe fittings from H and L. The pressure reading when the fittings are open to the atmosphere and there is no pressure differential between them should be “0”. If not, set the reading to “0” as follows:

1. Press the two buttons at the same time and hold for 10 seconds until the following display appears:



The pressure differential reading (here 0.1 BAR) flashes.

2. Press the two buttons at the same time for 2 seconds until the auto display appears and will now show 0.0.

Contact and Service Information

Guarantee

Baccara products are guaranteed to be free from defects in material and workmanship for a period of one year from the date of delivery.

This guarantee does not apply where equipment is not used and installed strictly in accordance with *Baccara* specifications and the User Guide. Neither does it apply to failures caused by lightning strikes or damage due to freezing temperatures or mechanical causes. *Baccara* is not liable for indirect, incidental or consequential damage in connection with the use of equipment.

To receive guarantee benefits, customers should return defective units along with the receipt to the nearest *Baccara* distributor.

Baccara reserves the right to alter, modify or redesign its products, pricing and guarantee at all times without creating any liability for the obsolescence of customer inventory of such parts or products.

This manufacturer guarantee policy may apply differently in different countries.

Contact Information

FACTORY AND HEAD OFFICE
Baccara Automation Control
Kvutzat Geva, 18915, Israel
Tel: 972 4 6535 960
Fax: 972 4 6531 445
E-mail: baccara@netvision.net.il
Web Site: www.baccara.co.il

Arkal M-90/M-91 Backwash controller

Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Arkal M-91 Backwash controller

The Arkal M-91 Controller is based on PLC (Programmable Logical Controller) made by Unitronics.

Controller properties

Analogue Inlets :

- 1 to the differential pressure transmitter (transmitter attached to the controller).
- 1 for pulse water meter.

Digital Outlets:

- 6 outlets to backwash valves.
- 1 outlet to the main or downstream valves. (Option)
- 1 outlet to the backwash pump in cases of external source backwash. (Option)
- 1 failure alert. (Option)

Digital Inlets:

- 1 differential pressure gauge inlets that allow more than one system to be controlled by one controller, or to operate one system with under various regimes. (Option)
- 1 water pressure gauge inlets - both filtration and backwash water volumes can be monitored. (Option)
- 1 low-pressure monitor inlet. (Option)

Communication:

Connection to the controller can be based on RS232 with a communication cable or GSM modem.

Backwash initiation by differential pressure, by time or by water quantity.

Report builder: Allows the operator to analyze system function.

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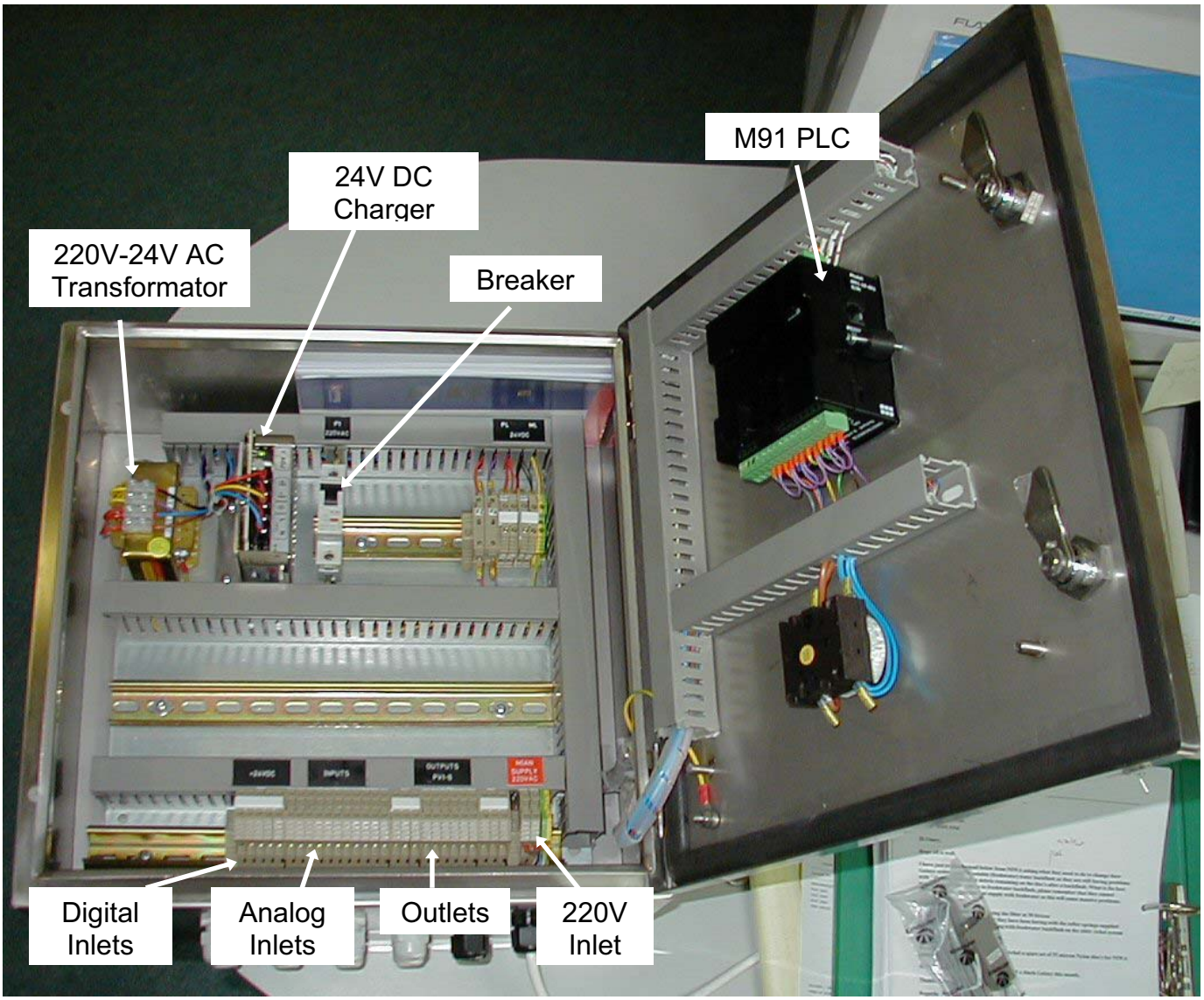
Email: filters@arkal.com Web: www.arkal-filters.com



Kibbutz Bet-Zera 15135, ISRAEL Tel: +972-4-6775140 Fax: +972-4-6775461
Email: filters@arkal.com Web: www.arkal-filters.com

Operation Keys.

Start :	Press and hold	0
Pause:	Press and hold	2
Release Pause:	Press and hold	2
Stop:	Press and hold	1

Program Keys:

Return to Main Menu: A R K A L

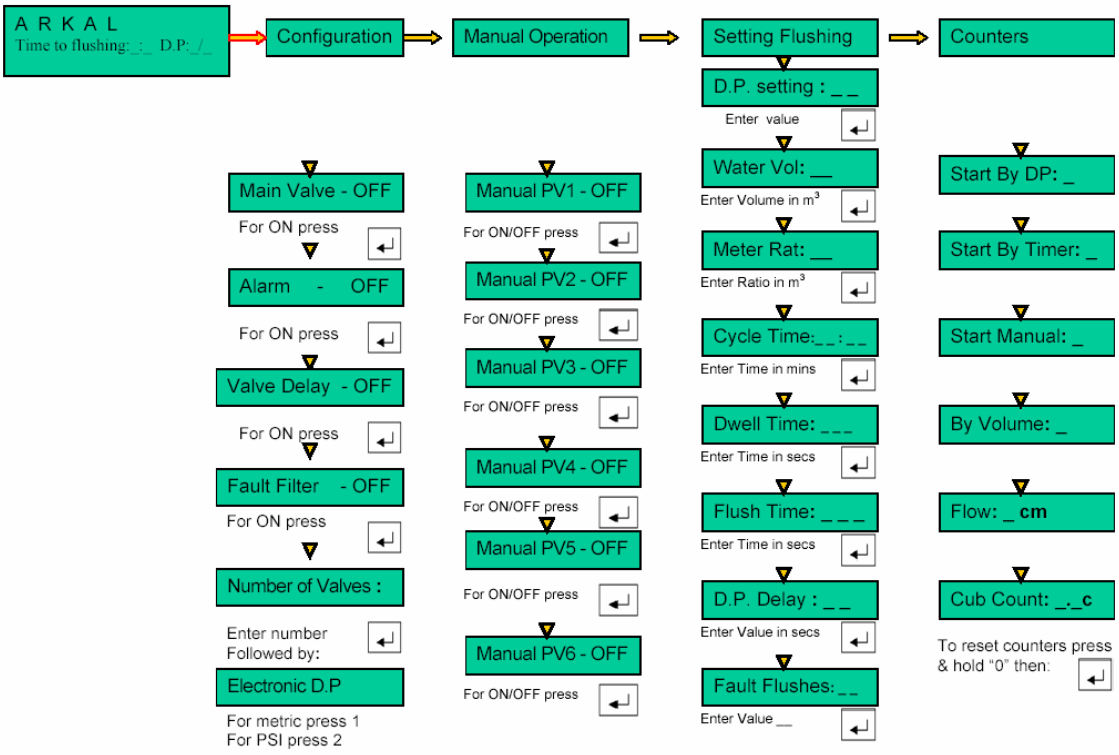
Select Secondary Menu: Configuration → or ←

(or other)

Select Item: Main Valve - OFF ▼ or ▲

(or other)

Confirm input: ↵



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Email: filters@arkal.com Web: www.arkal-filters.com

Communication Between a Laptop and a Unitronics M90 & M91 Controller

1. Connect the communication cord between the controller and the USB connection on the computer.
2. Activate the Unitronics program on the computer.
3. Enter library – LADDER U91.
4. Activate file –LADDER U91.
5. Wait for the program to start.
6. In the row "tasks", go into "CONTROLLER".
7. Open order – "UPLOAD".
8. Activate – "UPLOAD".
9. Press "YES" in window.
10. Press "NO" in window.
11. Wait – the program is loading.
12. Open the "PROJECT".
13. "SAVE AS" – choose name for the program.
14. Enter "ON LINE" mode by pressing on the blue glasses.
15. Exit by pressing on the glasses again.

Comments:

1. Transferring software from controller to computer – "UPLOAD".
2. Transferring software from computer to controller – "DOWNLOAD".

Good Luck

Jazz™ Micro-OPLC™

Much more than a "smart relay". Full function PLC & HMI, with up to 40 onboard I/Os, all in one device

Article Number	JZ10-11-R10	JZ10-11-T10	JZ10-11-R16	JZ10-11-T17	JZ10-11-R31	JZ10-11-T40	JZ10-11-UN20[1] (New!)	JZ10-11-UA24[1] (New!)	JZ10-11-PT15[1]
I/O									
Inputs	6 Digital	6 Digital	6 Digital 2 Digital/Analog 2 Analog	6 Digital 2 Digital/Analog 2 Analog	16 Digital 2 Digital/Analog 2 Analog	16 Digital 2 Digital/Analog 2 Analog	9 Digital 2 Digital/Analog 1 Analog 1 PT100/ Thermocouple	9 Digital 2 Digital/Analog 2 Analog 2 PT100/ Thermocouple	3 Digital 3 Digital/Analog 3 PT1000/NI1000
Outputs	4 Relay	4 Transistor	6 Relay	7 Transistor	11 Relay	20 Transistor	5 Relay 2 Transistor	5 Relay 2 Transistor 2 Analog	5 Relay 1 Transistor
Including High-speed & PWM	2 HSI	2 HSI	2 HSI	2 HSI	2 HSI	2 HSI	1 HSI & 2 PWM	1 HSI & 2 PWM	1 HSI & 1 HSO
Program									
Ladder Code Memory	24K (virtual)								
Operands	256 coils, 256 registers, 64 timers								
Operator Panel									
Type	STN LCD								
Display Size	2 lines x 16 characters								
Keypad									
Number of Keys	16 keys, 10 of which are user-labeled								
General									
Power Supply	24VDC								
Battery Back-up	10 years typical at 25°C, battery back-up for all memory sections and real-time clock (RTC)								
Environment	IP65/NEMA4X (from panel, when mounted)								
Clock (RTC)	Real-time clock functions (date and time)								

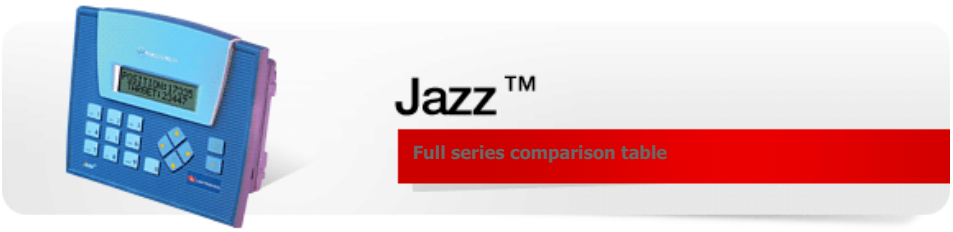
Add-on modules[2] & accessories

Programming Kit	COM port kit	Program Cloner module	Keypad slide kit
Programming Add-on port (isolated) + software CD Article No.: JZ-PRG	RS232/RS485 Add-on port (isolated) Article No.: JZ-RS4	Copy applications from PLC to PLC Article No.: MJ20-MEM1	Customize the Jazz keypad to your application Article No.: MJ20-JZ-SL1

CE/UL

[1] JZ10-11-UN20, JZ10-11-UA24, JZ10-11-PT15 are not UL certified yet.

[2] In order to download applications and enable communications, install Jazz™ with an add-on module containing a COM port.



SERIES OVERVIEW

Jazz™ : micro PLC with text-based HMI

Series Overview Add-on Modules Specifications

Special Features Software Communication

Replace that "smart relay" with a real PLC—for the same low price.
Jazz™ is a full-function Programmable Logic Controller with onboard I/Os and a built-in Operator Panel. Jazz™ is specifically designed to control small machines, and to perform simple-to-medium automation tasks. Compact and economical, Jazz™ enables you to use a low-budget unit without compromising on features and technology.

Jazz™ offers the flexibility of Ladder programming (24K Ladder code, virtual), on-board I/O configurations (some models with direct temperature inputs), communication options such as GSM/SMS, Remote Access, and MODBUS networking. The Jazz™ HMI application enables you to design up to 60 text screens, using up to 64 HMI variables for the display of time, date, and real-time system data. Jazz™ programming is as easy as it gets—build Ladder Logic control applications using click-and-drop elements…and create your HMI application in the same simple environment.

Our PLC/HMI integrated devices:

- save our customers' programming time, wiring, and cabinet space.
- cut budget by reducing requirements for additional hardware
- prevent you from wasting time setting up Panel-PLC communication

JZ10-11-R10 JZ10-11-T10 **JZ10-11-R16** JZ10-11-T17
JZ10-11-R31 JZ10-11-T40 JZ10-11-UA24 JZ10-11-UN20
JZ10-11-PT15

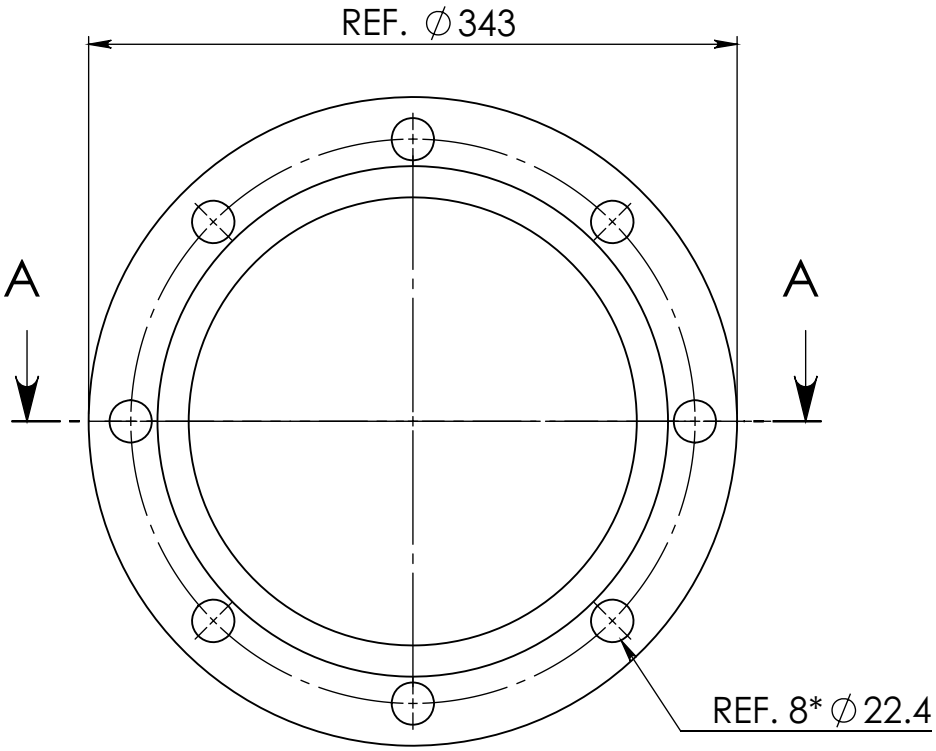
JZ10-11-R16

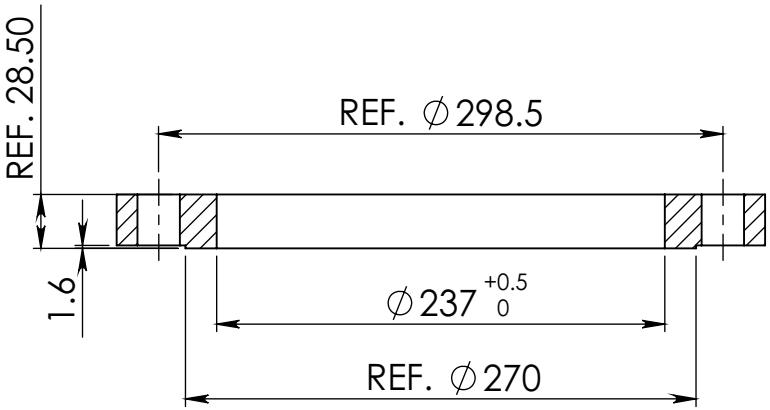
- 6 Digital Inputs including 2 inputs which can function as either high-speed counters, or as normal digital inputs
- 2 Digital/Analog Inputs
- 2 Analog inputs
- 6 Relay Outputs
- 2 Lines x 16 characters, STN LCD, LED backlight HMI Displays
- 24 VDC power supply

Specifications

Flanges Sizes

ASA PN10 Flanges





SECTION A-A

MODIFIC.	DATE		
		BLACK COLOR	SIGN.

ARKAL
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FILTRATION SYSTEMS
BET–ZERA 15135
TEL. 972–4–6775140
FAX. 972–4–6775461
ISRAEL

PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 8" ASA

CATALOGUE No: 5030 0805

PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 0805	NAME	DATE	SIGNATURE
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	NAME	DATE
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CHECKED	OMRY	03/02/2009
APPROVED	OMRY	03/02/2009

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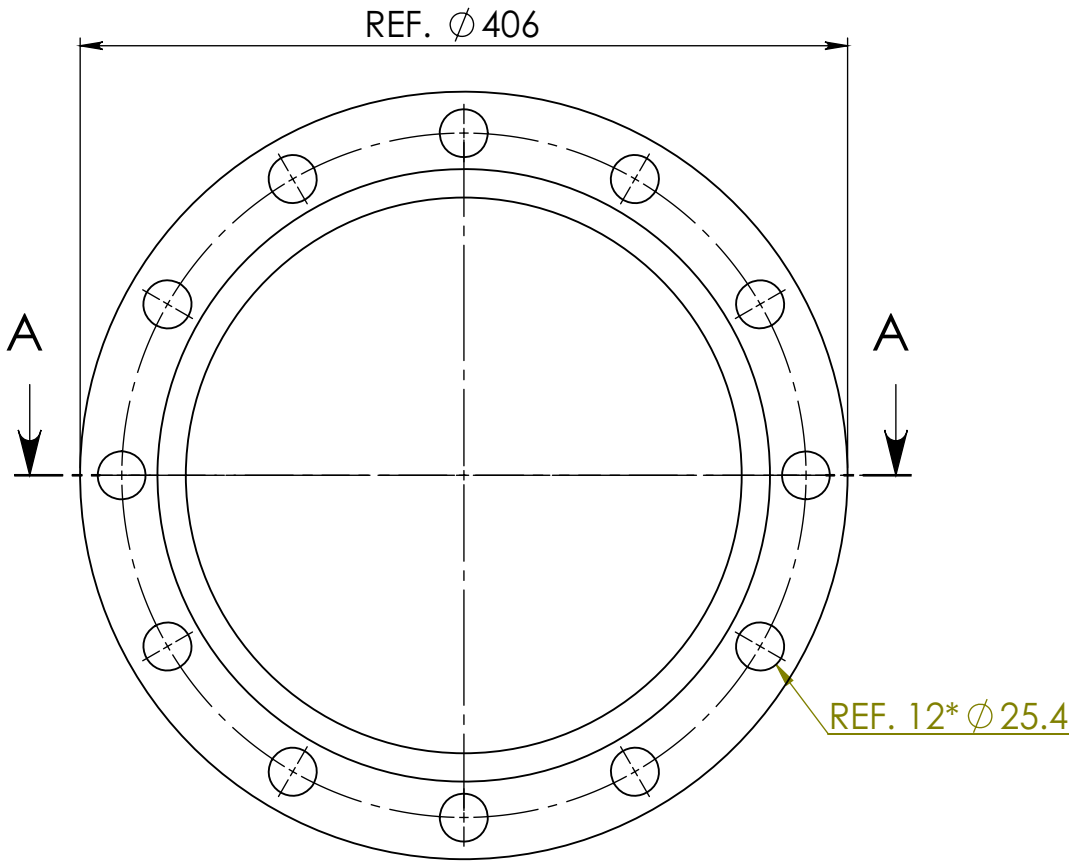
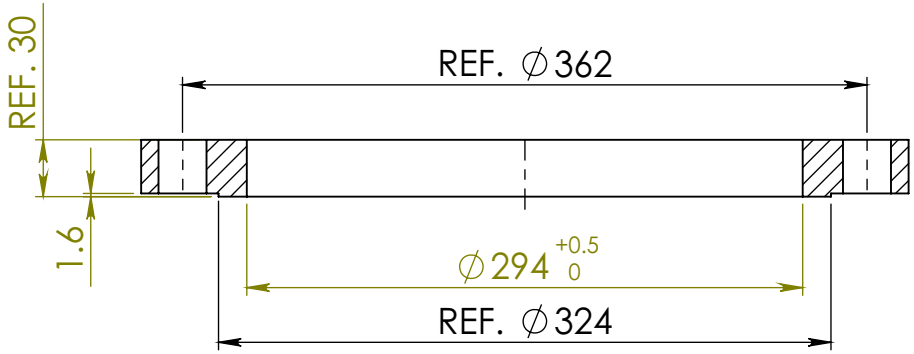
BACKUP: DISK–S1

DRAWER N:





SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 10" ASA

CATALOGUE No: 5030 1005

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
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APPROVED	OMRY	03/02/2009

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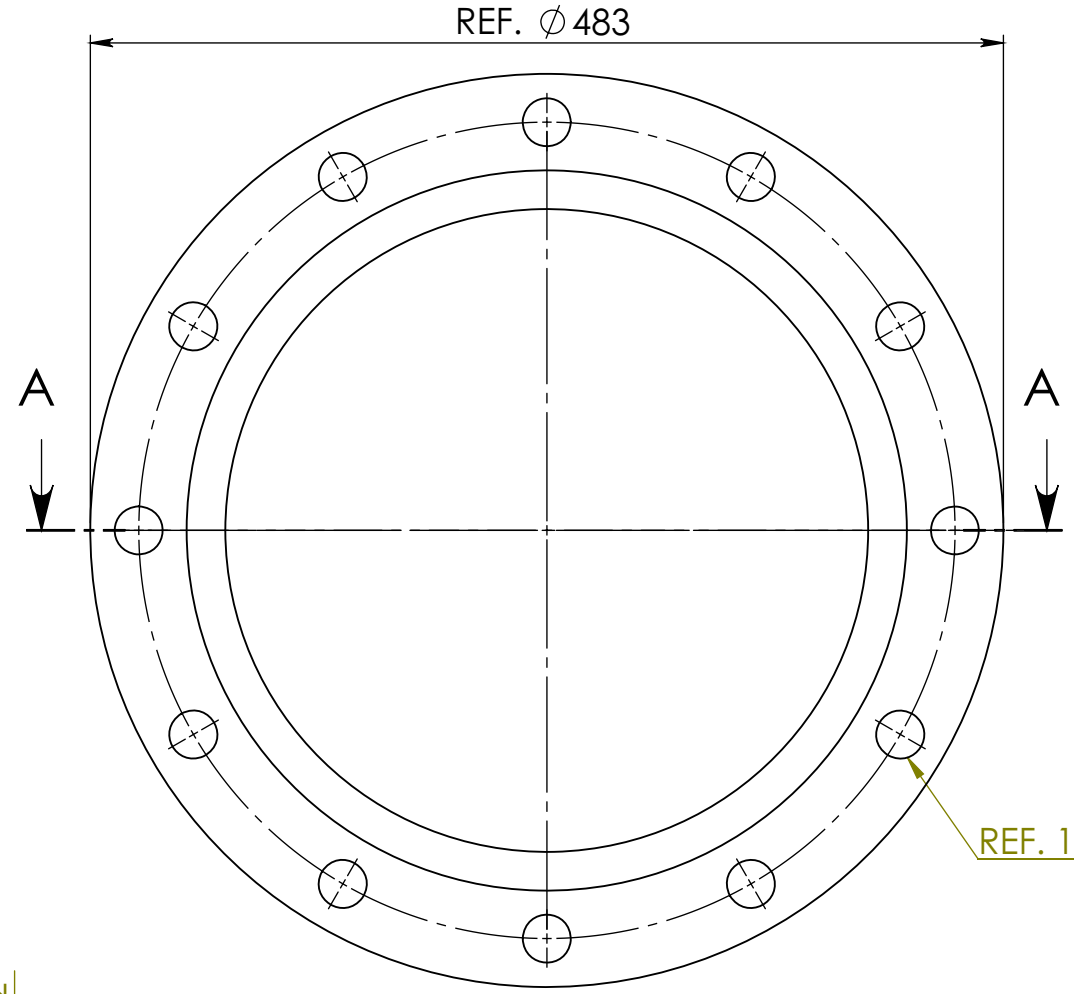

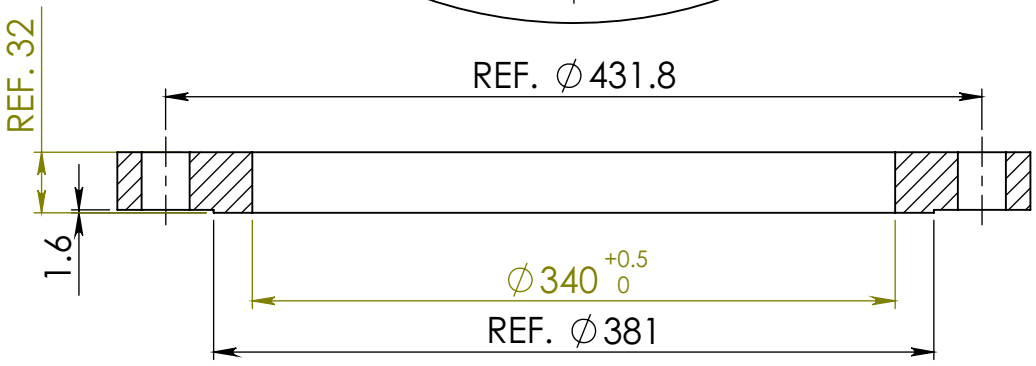

SECTION A-A

MODIFIC.	DATE		BLACK COLOR	SIGN.

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PROJECT	FILTERS PLASTIC BATTERIES		PAGE_1__OF_1__
TITLE	FLANGE 12" ASA		CATALOGUE No: 5030 1205
PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 1205	NAME MARINA	DATE 03/02/2009 / SIGNATURE

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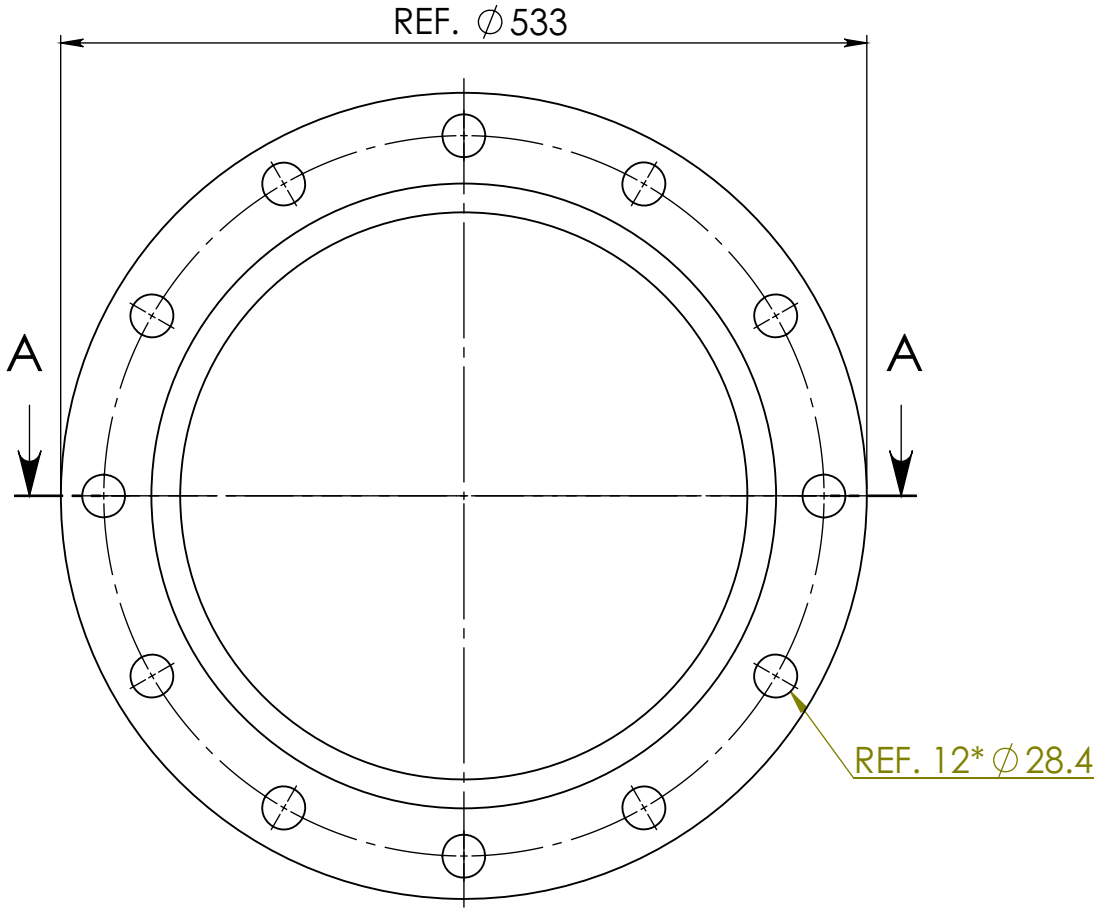

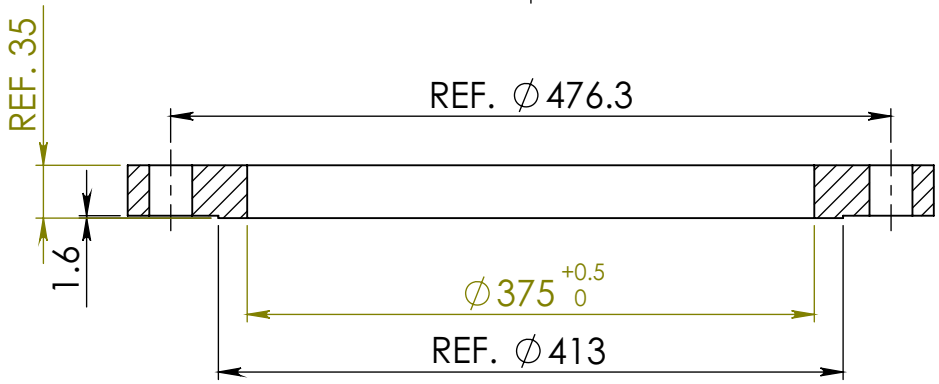

SECTION A-A

MODIFIC.	DATE		BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 14" ASA

CATALOGUE No: 5030 1405

PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE	NAME	DATE	SIGNATURE
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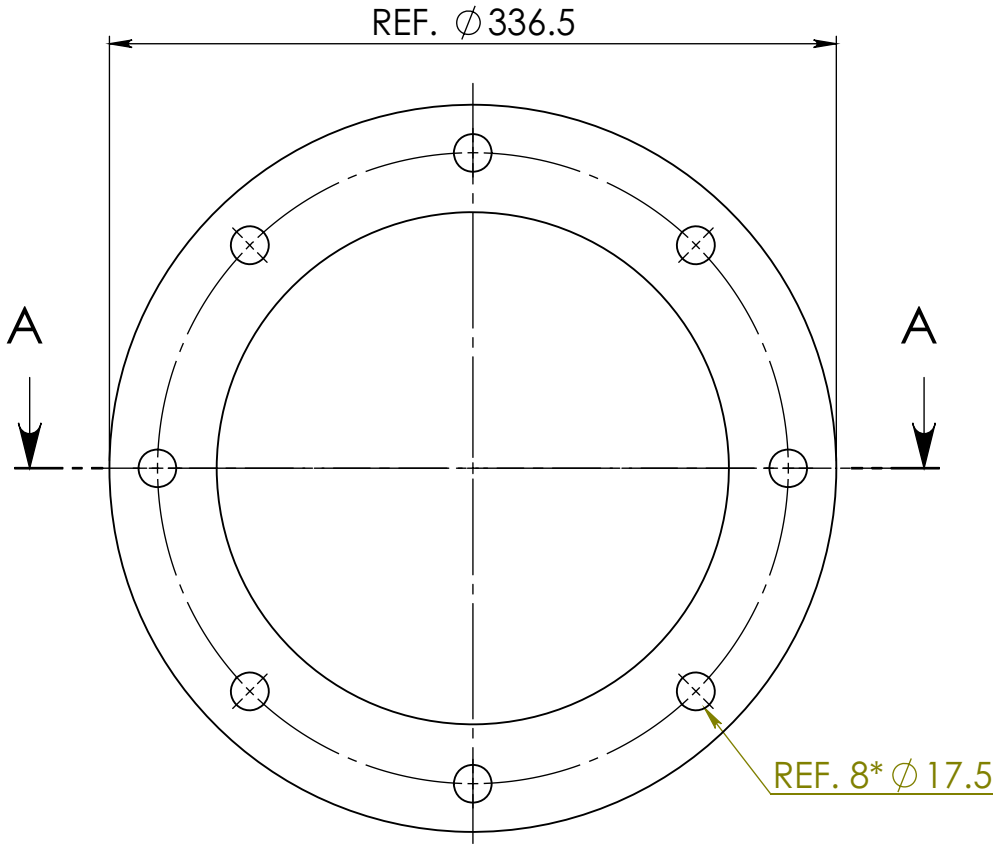
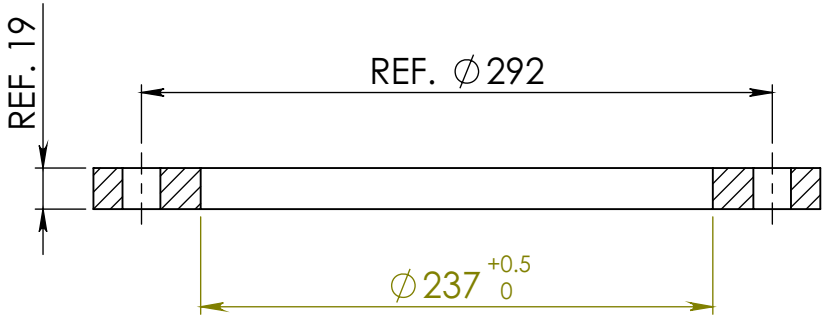
APPROVED	OMRY	03/02/2009		

BSTD PN10 Flanges





SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 8" BSTD

CATALOGUE No: 5030 0807

PATH	FILE CODE	NAME	DATE	SIGNATURE
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	NAME	DATE
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APPROVED	OMRY	03/02/2009

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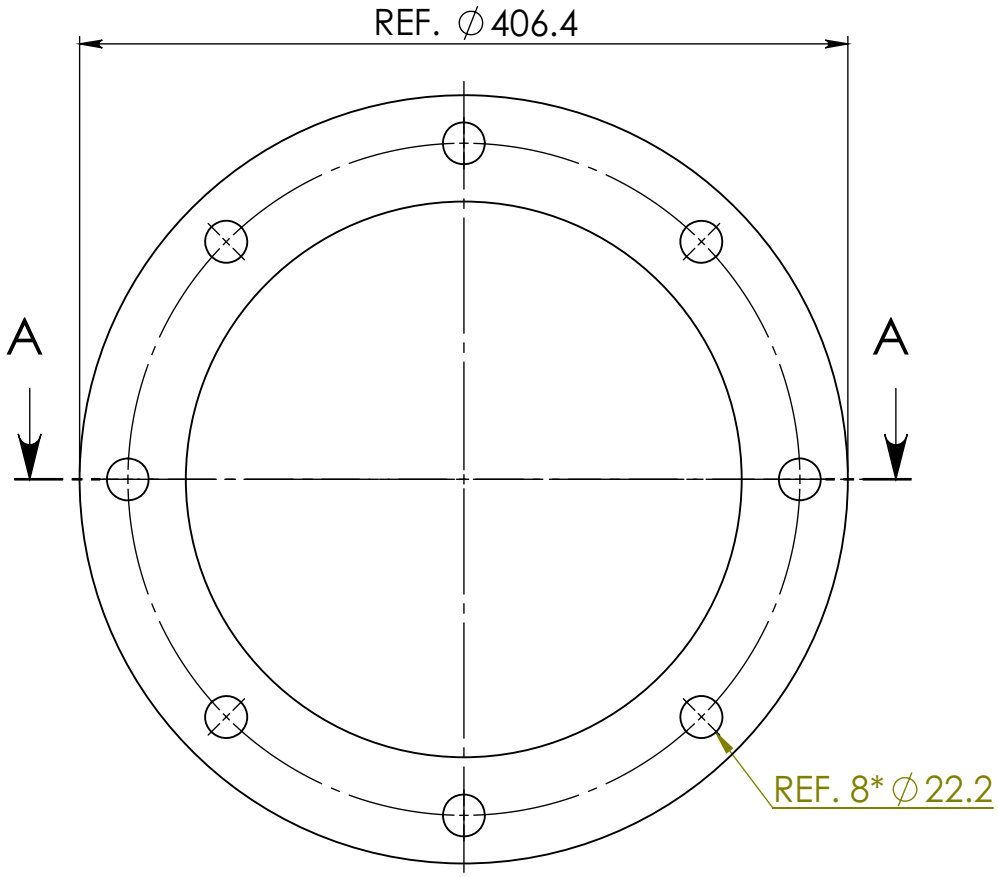

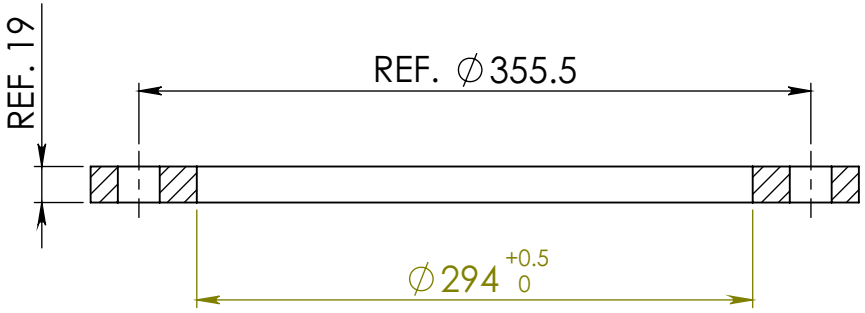

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT	FILTERS PLASTIC BATTERIES		PAGE_1__OF_1__
TITLE	FLANGE 10" BSTD		CATALOGUE No: 5030 1007

PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 1007	NAME	DATE	SIGNATURE
		MARINA	03/02/2009	

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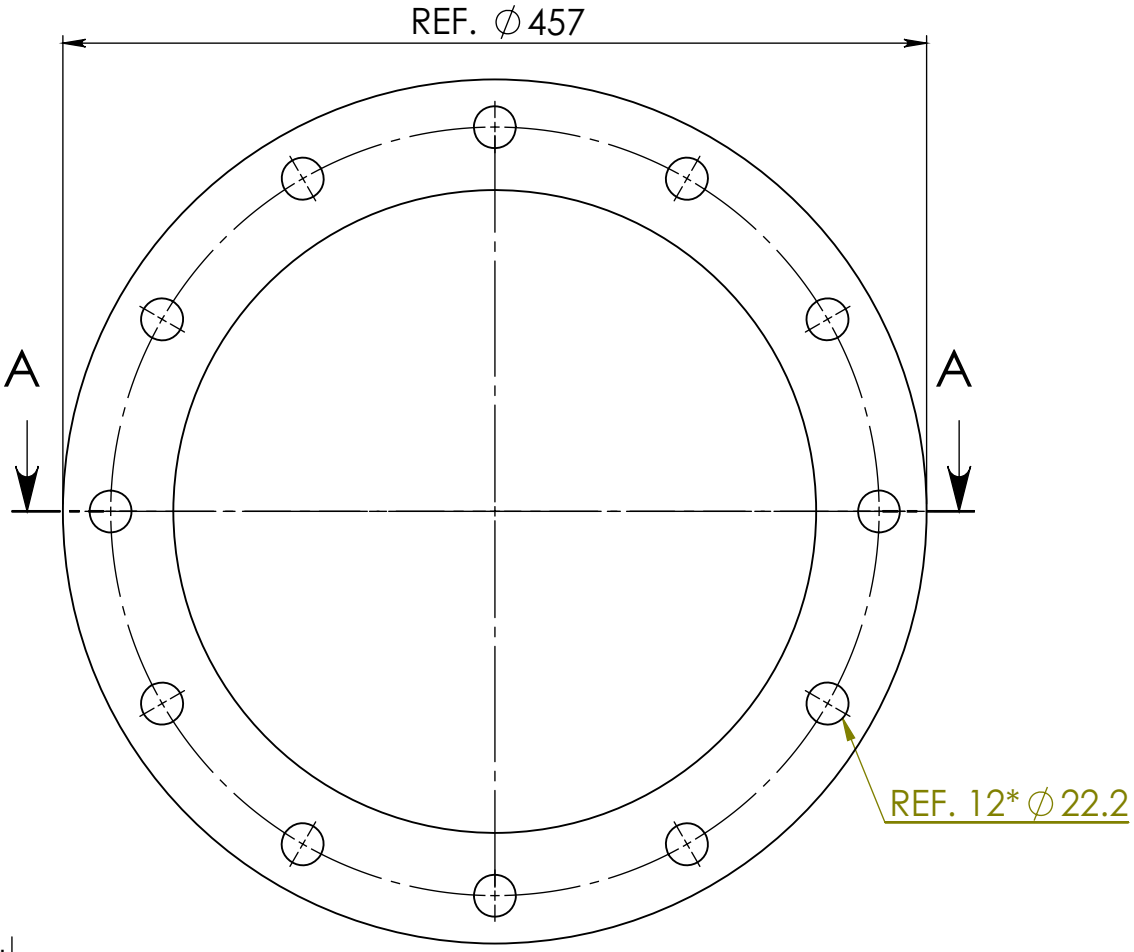
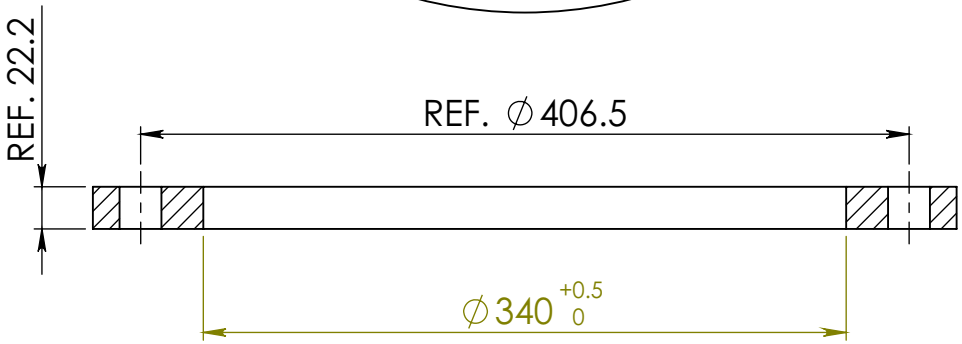
APPROVED	OMRY	03/02/2009		





SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT	FILTERS PLASTIC BATTERIES
TITLE	FLANGE 12" BSTD
CATALOGUE No:	5030 1207
PAGE	1 OF 1

PATH	FILE CODE	NAME	DATE	SIGNATURE
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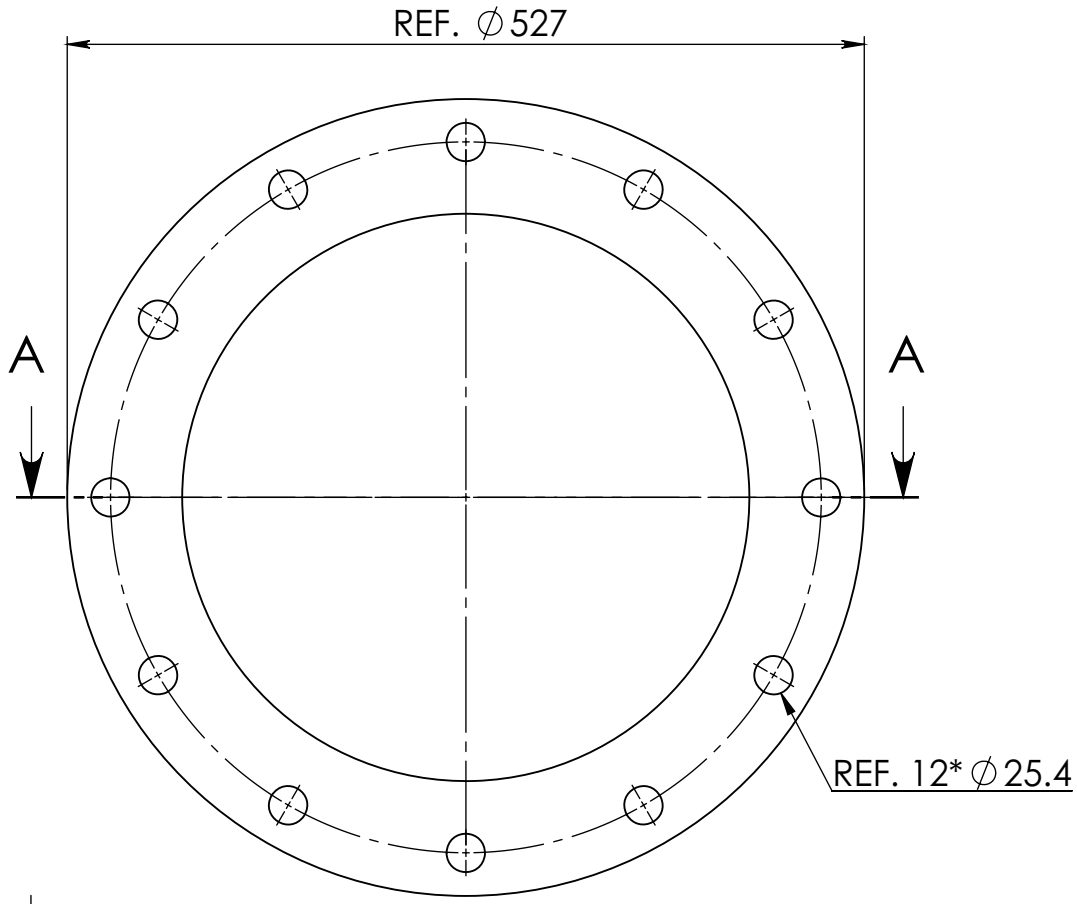

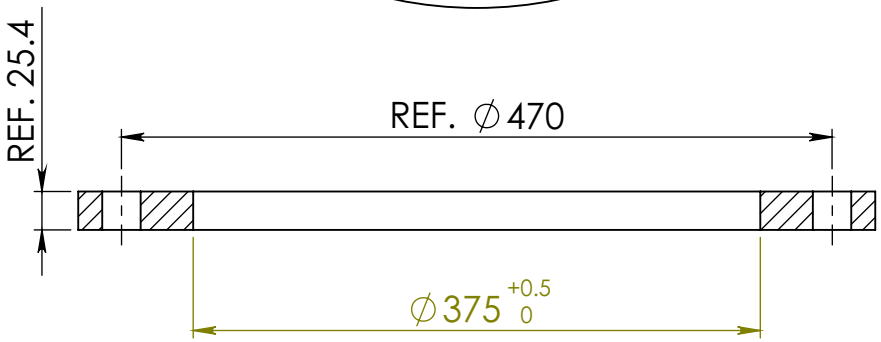

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 14" BSTD

CATALOGUE No: 5030 1407

PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 1407	NAME	DATE	SIGNATURE
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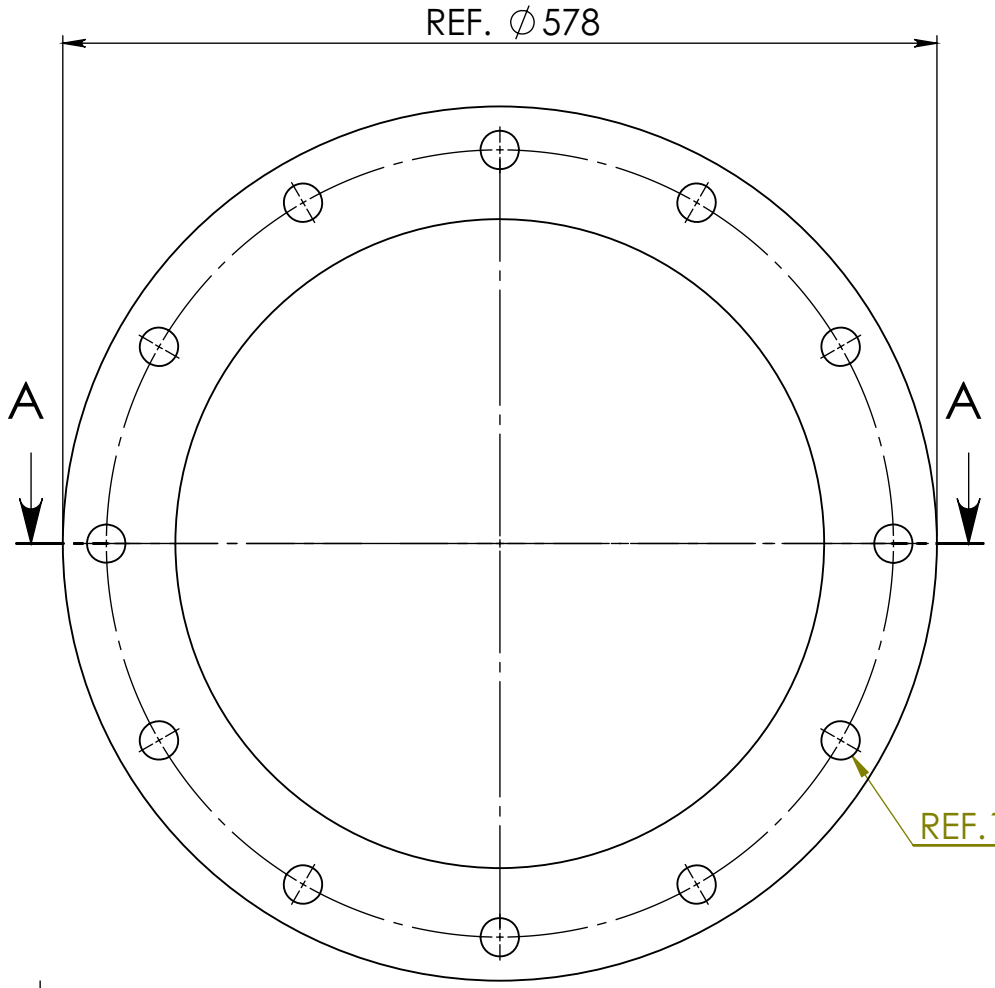

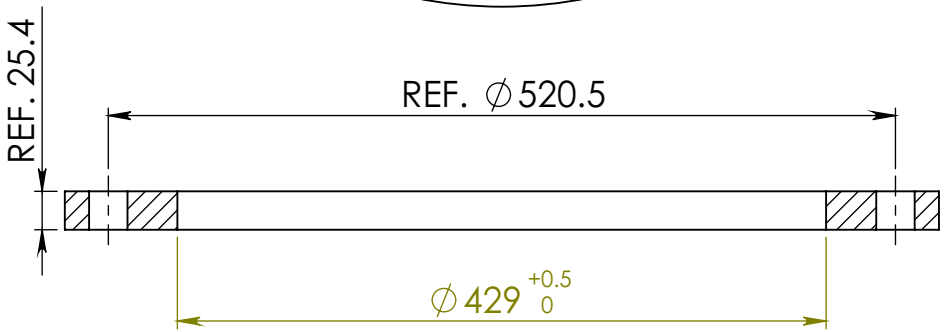

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES — PAGE 1 OF 1

TITLE: FLANGE 16" BSTD — CATALOGUE No: 5030 1607

PATH: Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES — FILE CODE: 5030 1607

	NAME	DATE	SIGNATURE
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CHECKED	OMRY	04/02/2009	
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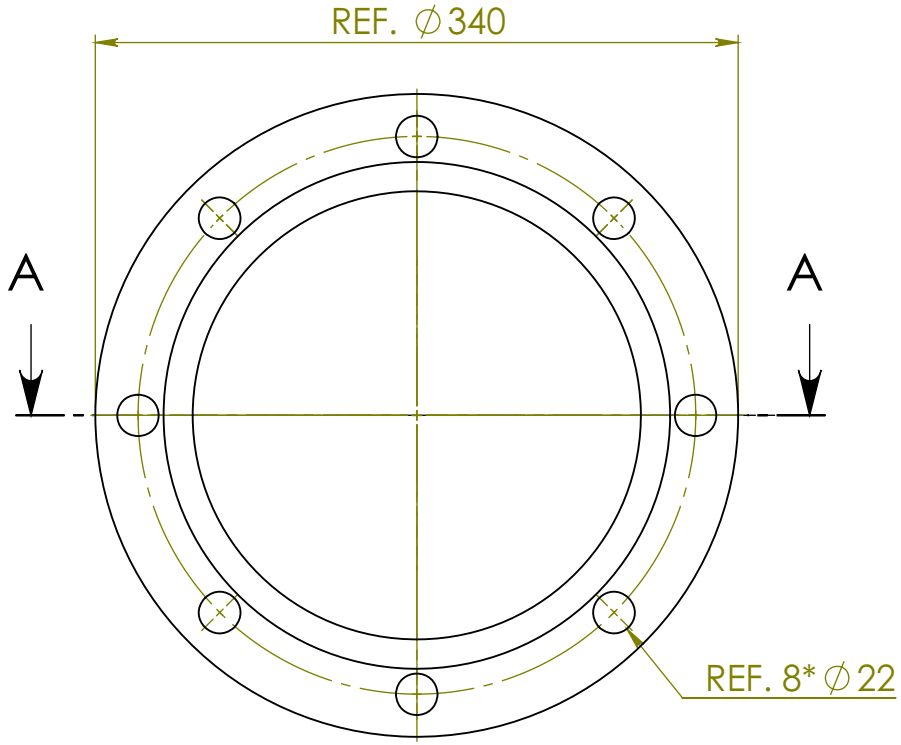
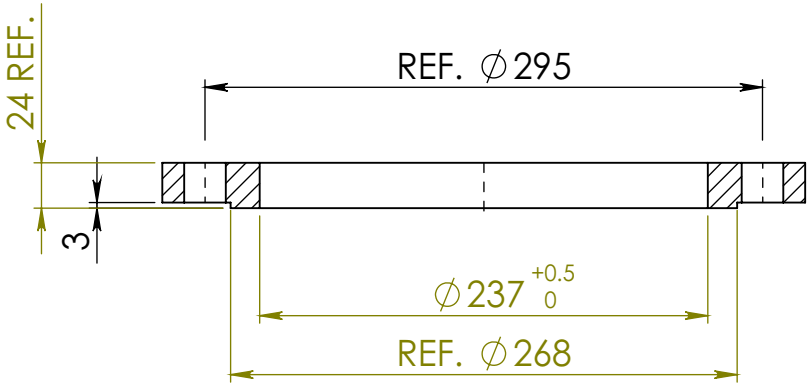
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-S1

DRAWER N:

DIN PN10 Flanges





SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 8" DIN

CATALOGUE No: 5030 0809

PATH	FILE CODE	NAME	DATE	SIGNATURE
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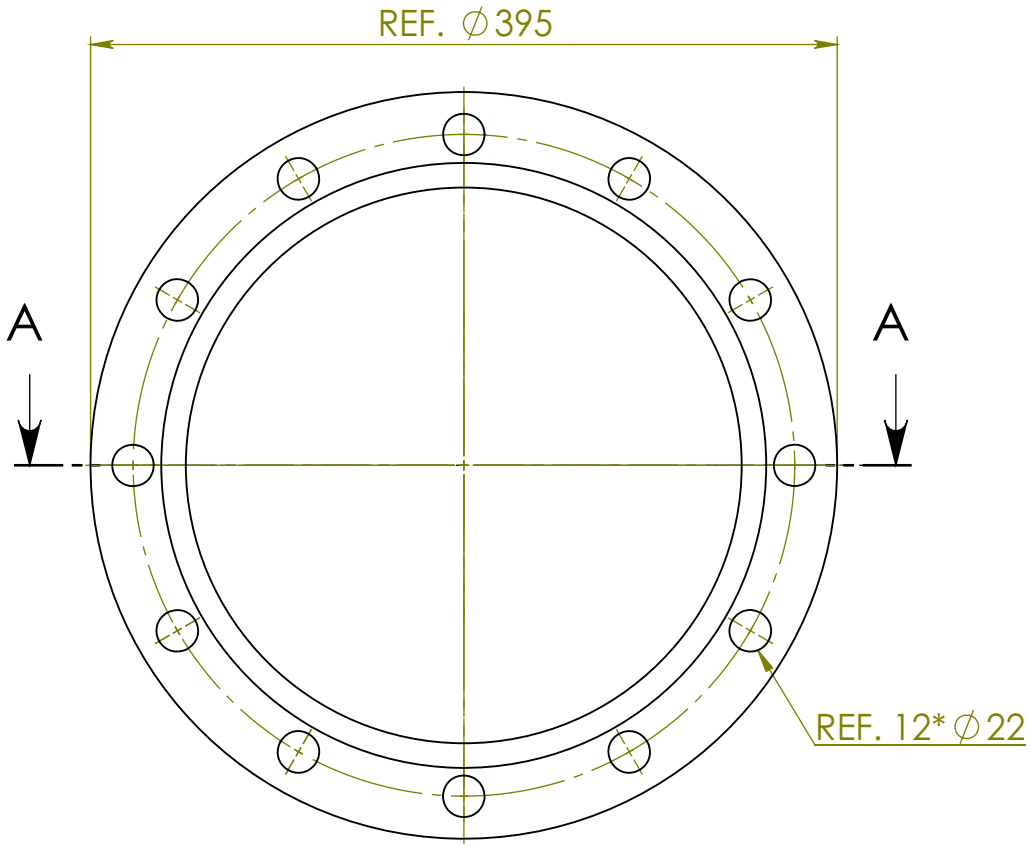

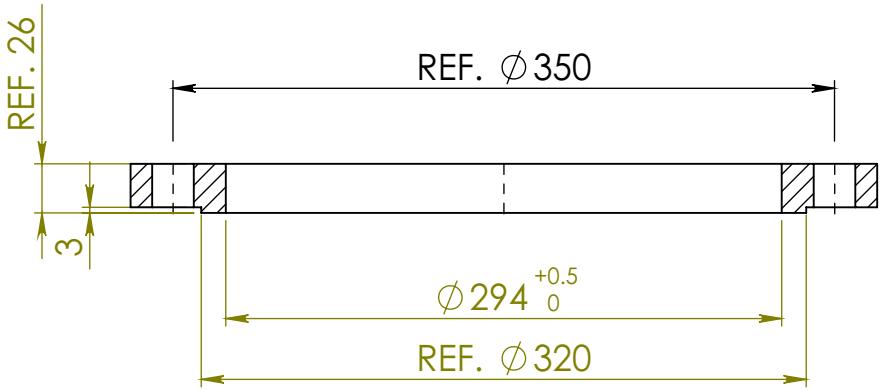

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 10" DIN

CATALOGUE No: 5030 1009

PATH	FILE CODE	NAME	DATE	SIGNATURE
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FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-S1

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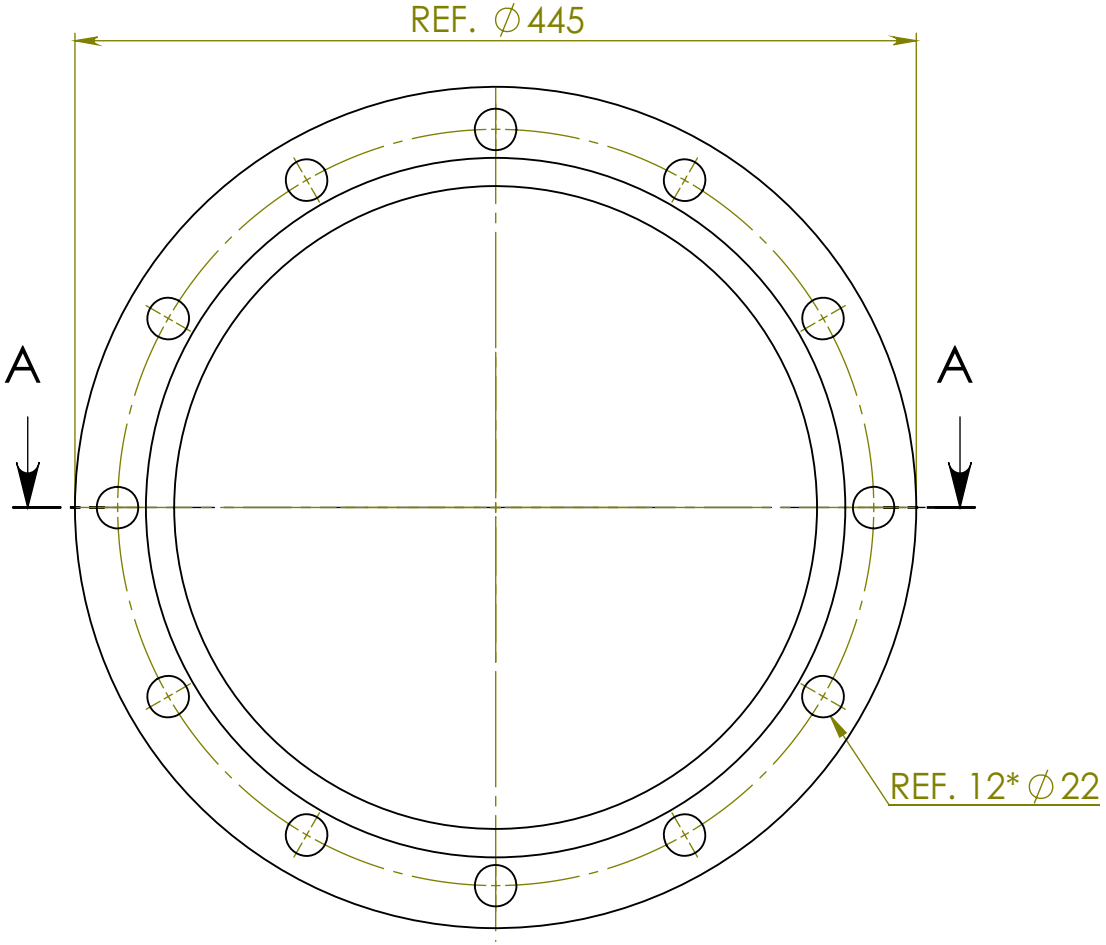

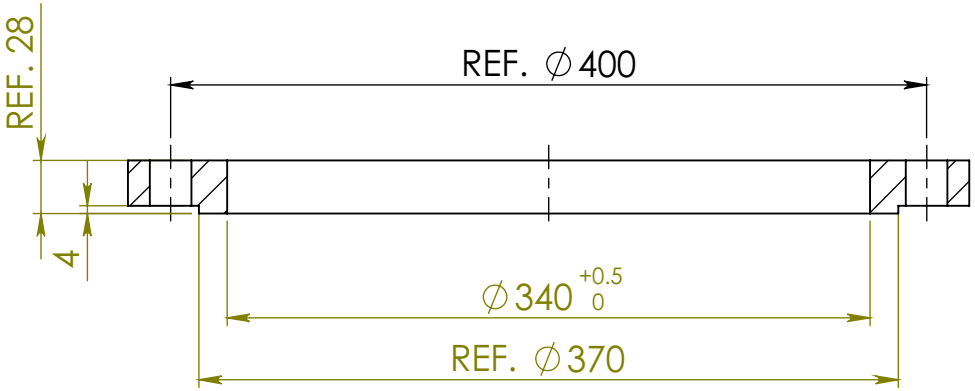

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 12" DIN

CATALOGUE No: 5030 1209

PATH	FILE CODE	NAME	DATE	SIGNATURE
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APPROVED	OMRY	03/02/2009

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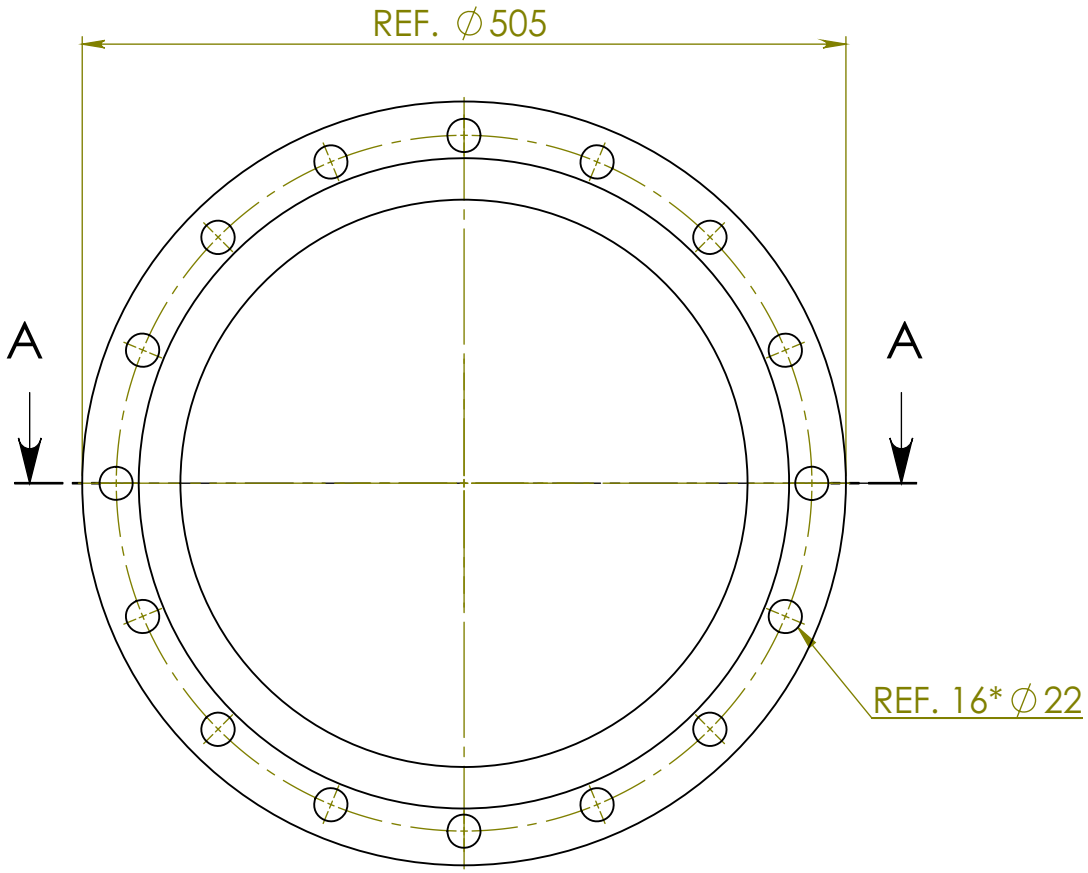

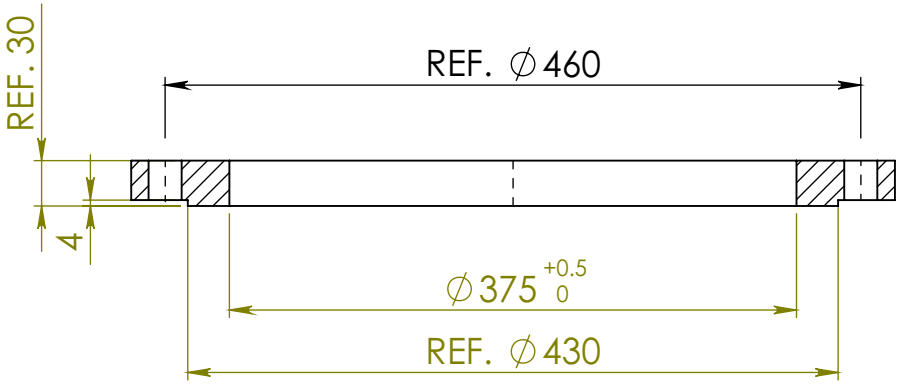

SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

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PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 14" DIN

CATALOGUE No: 5030 1409

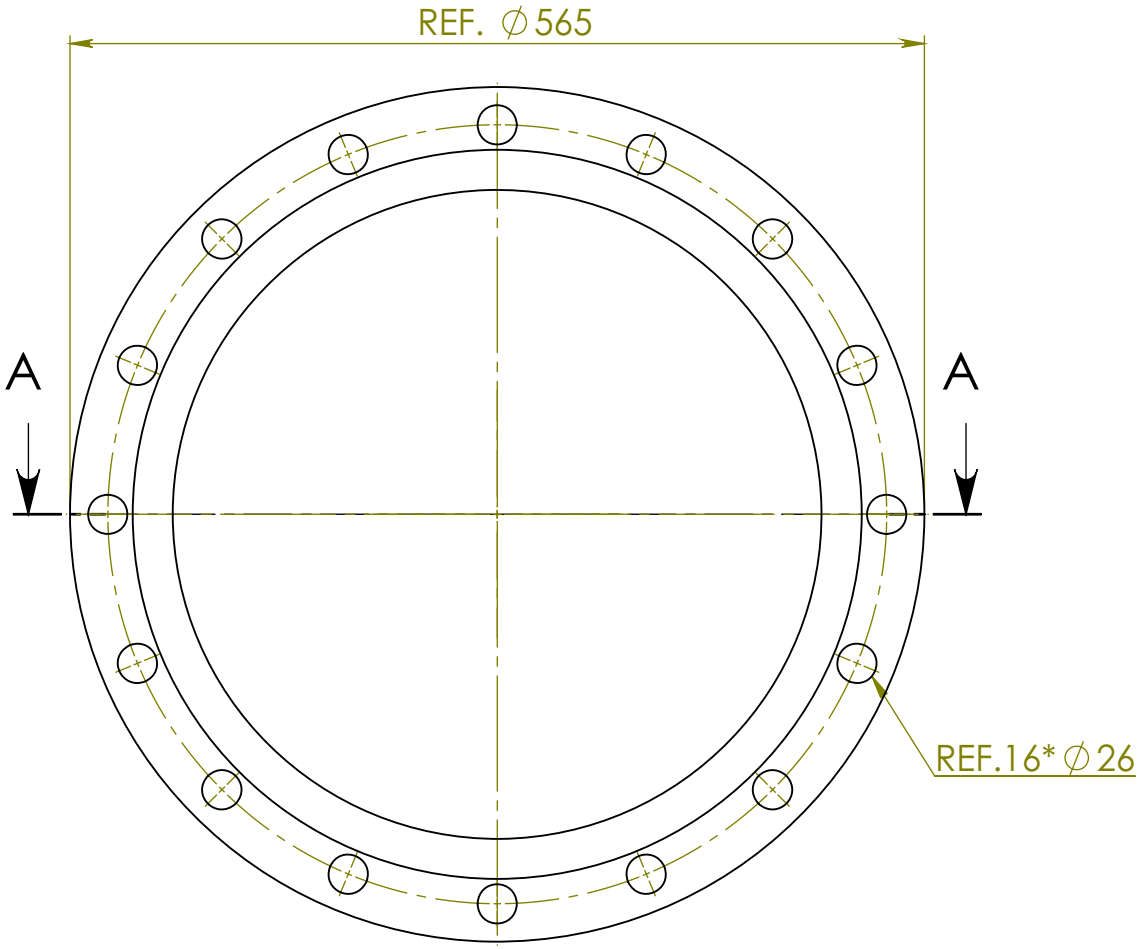
PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 1409	NAME	DATE	SIGNATURE
		MARINA	03/02/2009	

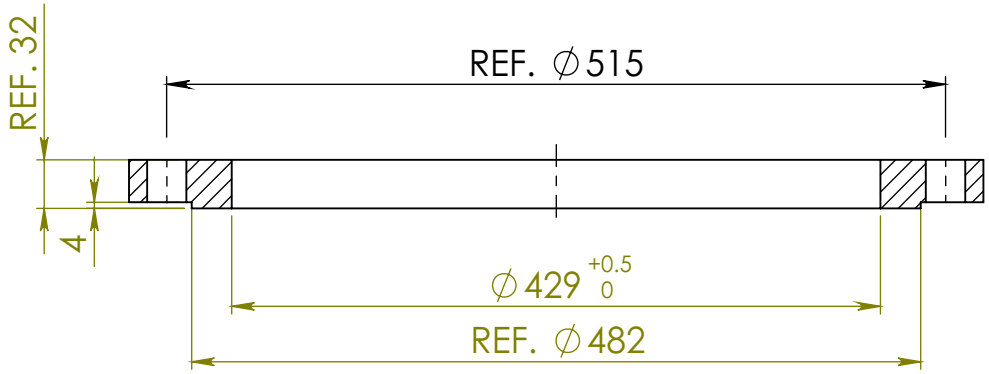
	NAME	DATE
DRAWN	ELENA	03/02/2009
CHECKED	OMRY	03/02/2009
APPROVED	OMRY	03/02/2009

FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-S1

DRAWER N:





SECTION A-A

MODIFIC.	DATE	PN-10	BLACK COLOR	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: FILTERS PLASTIC BATTERIES

PAGE_1__OF_1__

TITLE: FLANGE 16" DIN

CATALOGUE No: 5030 1609

PATH Solid\CATALOGE\MASTERS\MANIFOLDS\FLANGES	FILE CODE 5030 1609	NAME	DATE	SIGNATURE
		MARINA	03/02/2009	

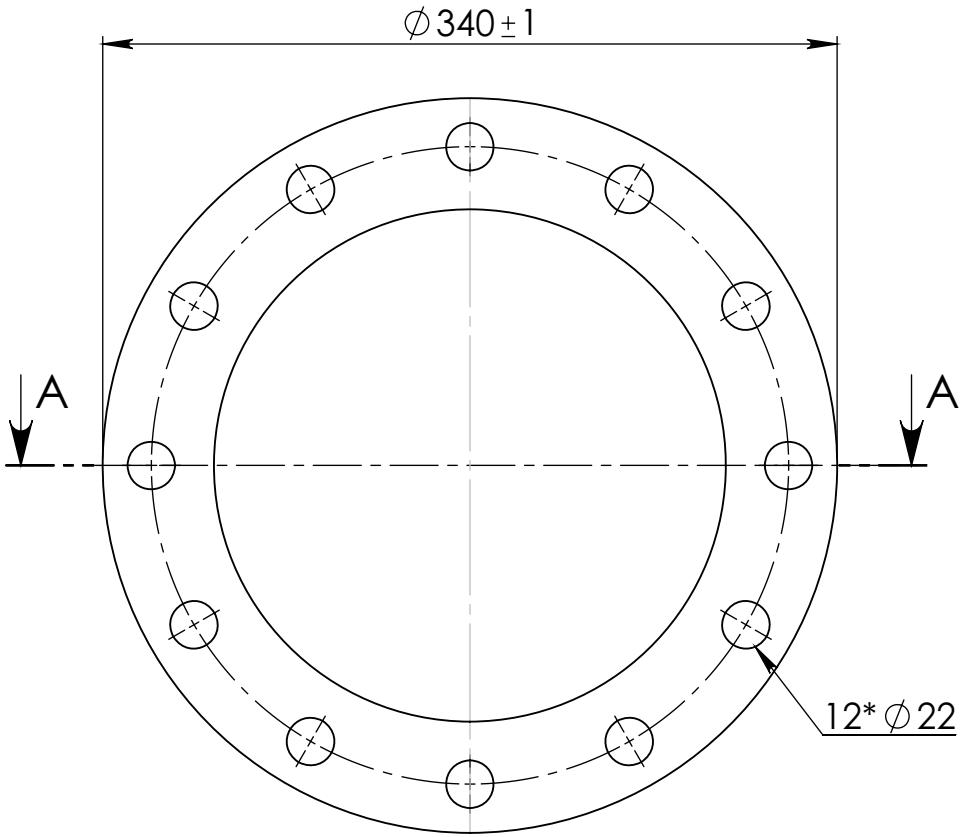
	NAME	DATE
DRAWN	ELENA	03/02/2009
CHECKED	OMRY	03/02/2009
APPROVED	OMRY	03/02/2009

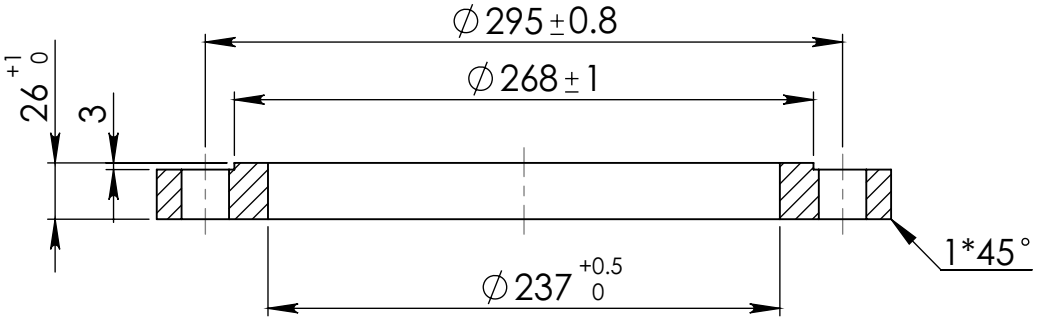
FILE CODE DRAWING OF MANIFOLD:

BACKUP: DISK-S1

DRAWER N:

DIN PN16 Flanges





SECTION A-A

MODIFIC.	DATE	PN16	BLACK COLOR	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT	FILTERS PLASTIC BATTERIES			PAGE_1_OF_1_
TITLE	FLANGE 8" DIN			CATALOGUE No: 5030 0819
PATH	PARTS\FLANGES	FILE CODE 5030 0819	NAME MARINA	DATE 03/02/2009

	NAME	DATE	MATERIAL:	BACKUP:
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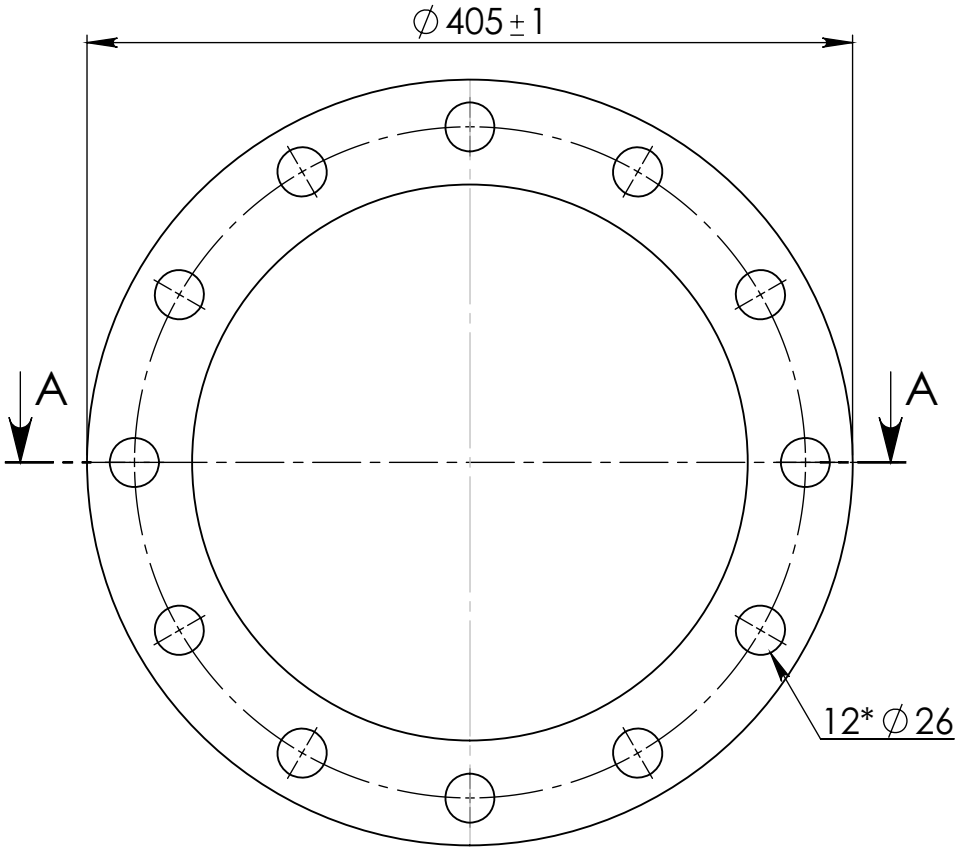
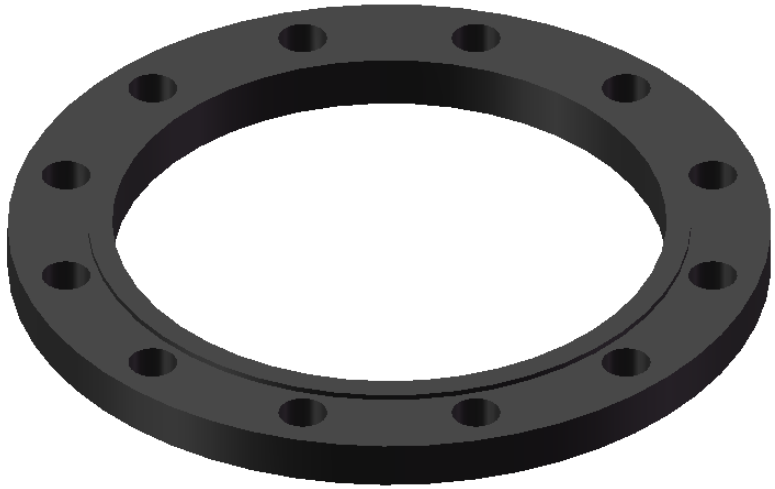
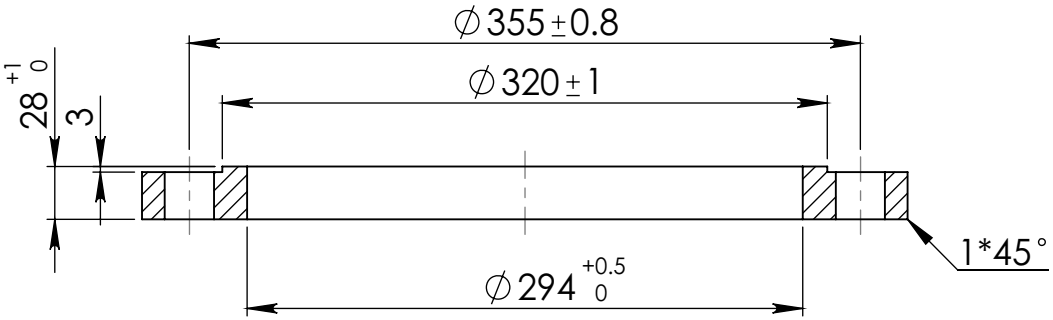
CHECKED	OMRY	03/02/2009		DRAWER N:
APPROVED	OMRY	03/02/2009		







SECTION A-A

MODIFIC.	DATE	PN16	BLACK COLOR	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
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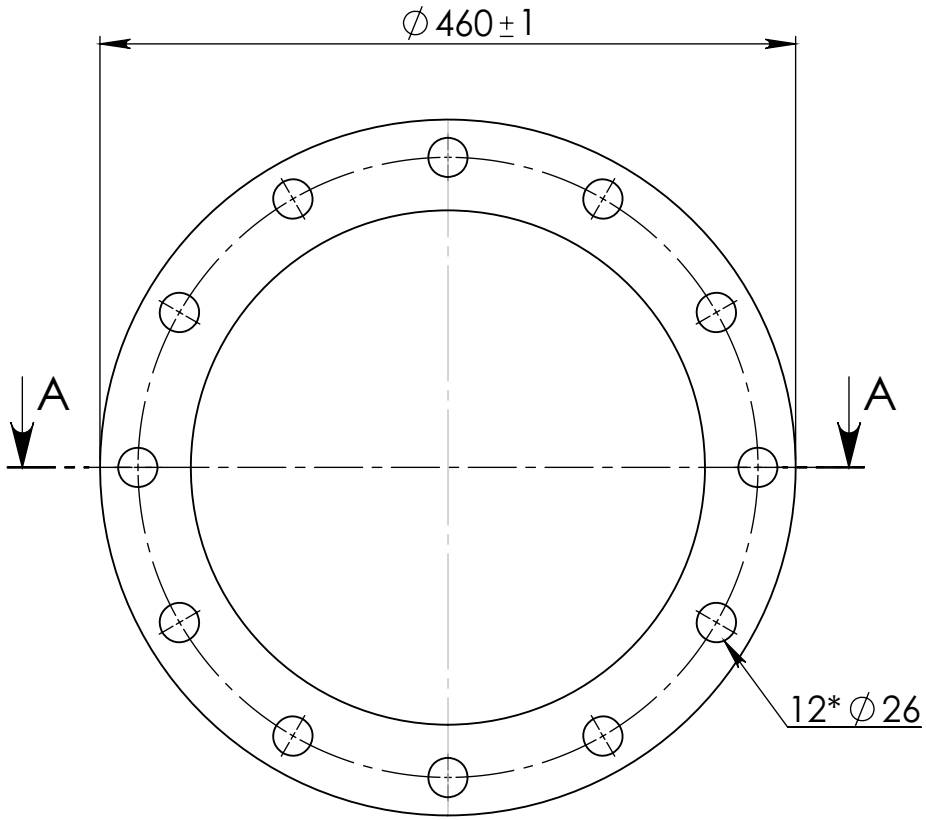
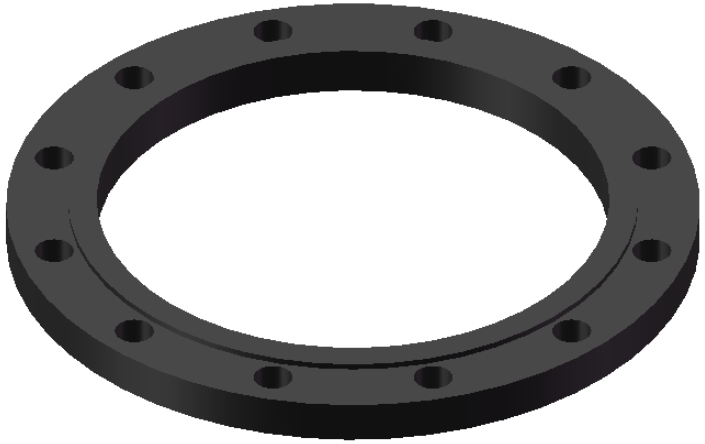
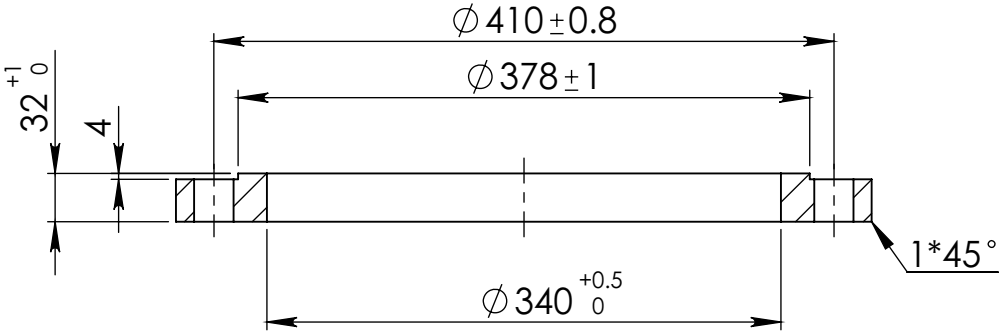
FAX. 972-4-6775461
ISRAEL

PROJECT: FILTERS PLASTIC BATTERIES				PAGE_1_OF_1_
TITLE: FLANGE 10" DIN				CATALOGUE No: 5030 1017
PATH: PARTS\FLANGES	FILE CODE: 5030 1017	NAME: MARINA	DATE: 03/02/2009	SIGNATURE:

	NAME	DATE	MATERIAL:	BACKUP:
DRAWN	ELENA	03/02/2009	ST 37	DISK-1S
CHECKED	OMRY	03/02/2009		DRAWER N:
APPROVED	OMRY	03/02/2009		







SECTION A-A

MODIFIC.	DATE	PN16	BLACK COLOR	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET–ZERA 15135
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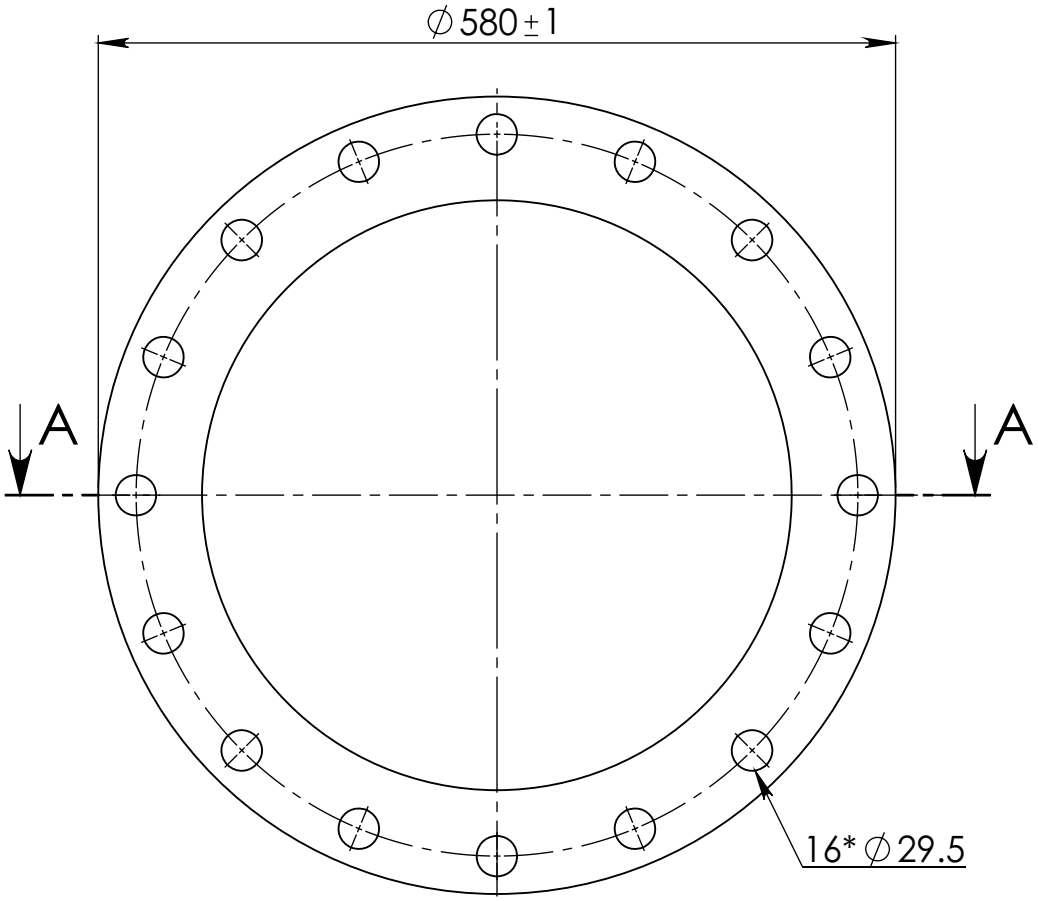
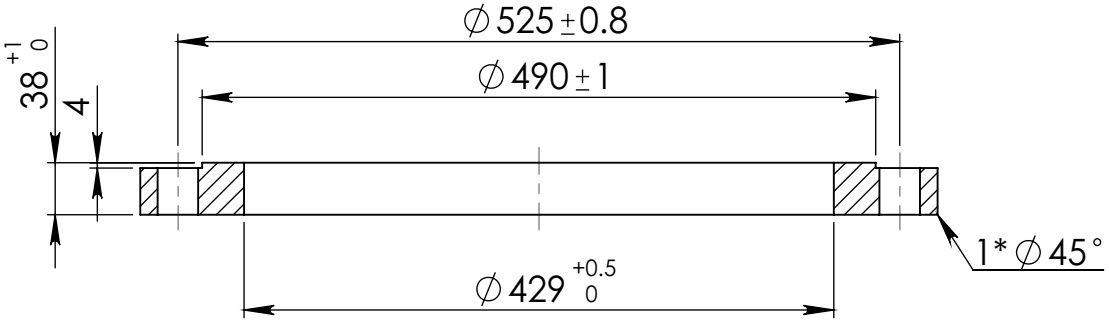
PROJECT	FILTERS PLASTIC BATTERIES			PAGE_1_OF_1_
TITLE	FLANGE 12" DIN			CATALOGUE No: 5030 1217
PATH	PARTS\FLANGES	FILE CODE 5030 1217	NAME MARINA	DATE 03/02/2009

	NAME	DATE	MATERIAL:	BACKUP:
DRAWN	ELENA	03/02/2009	ST 37	DISK–1S
CHECKED	OMRY	03/02/2009		DRAWER N:
APPROVED	OMRY	03/02/2009		





SECTION A-A

MODIFIC.	DATE	PN16	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
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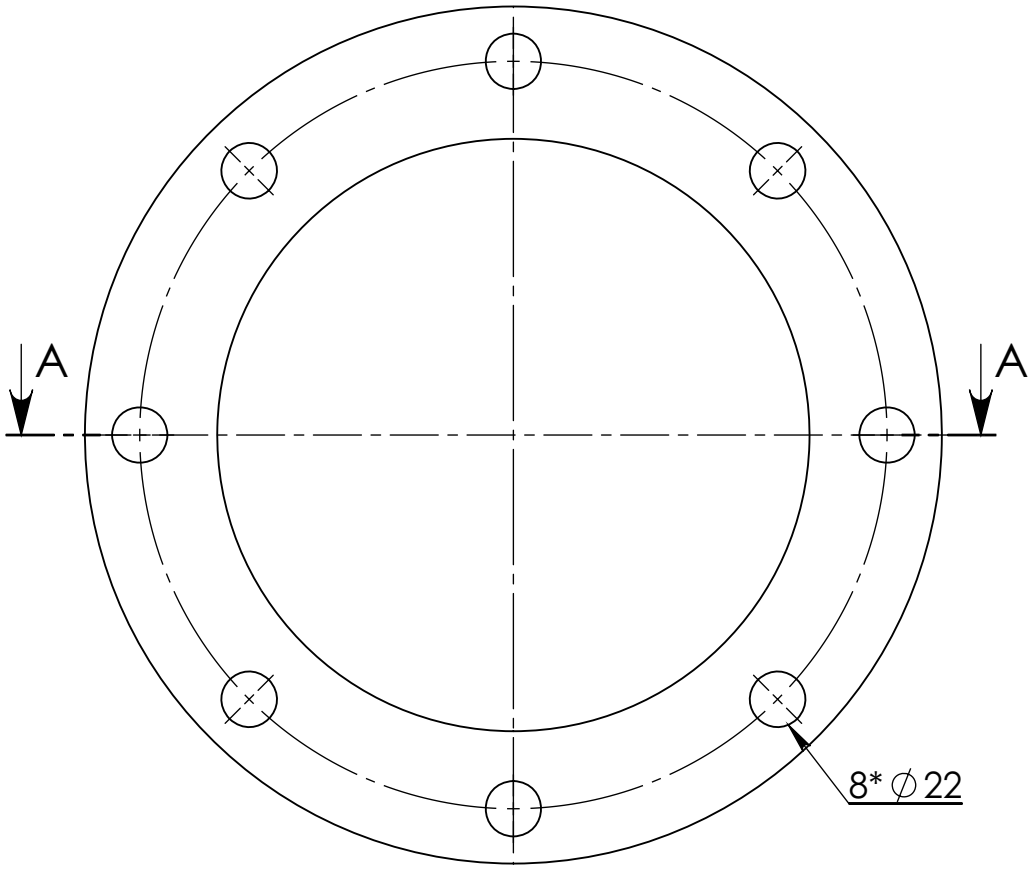
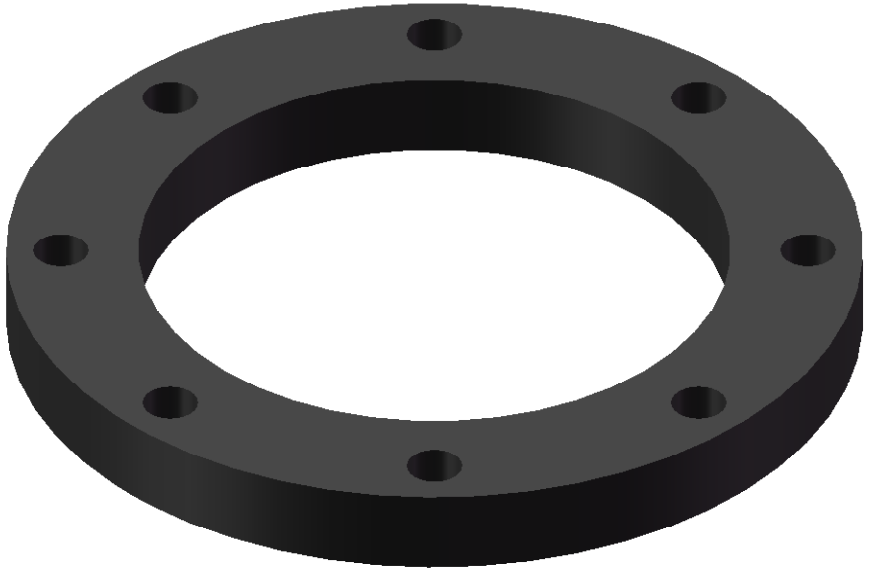
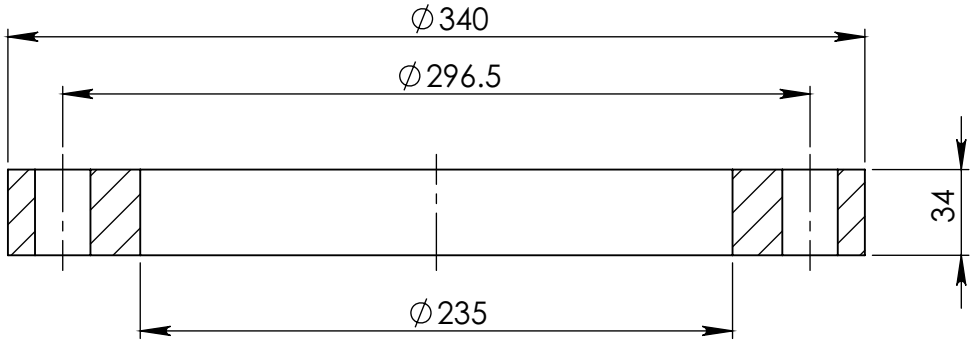
PROJECT	FILTERS PLASTIC BATTERIES		PAGE_1_OF_1_
TITLE	FLANGE 16" DIN		CATALOGUE No: 5030 0618M
PATH	PARTS\FLANGES	FILE CODE 5030 0618M	NAME MARINA / DATE 03/02/2009 / SIGNATURE

	NAME	DATE	MATERIAL:	BACKUP:
DRAWN	ELENA	03/02/2009	ST 37	DISK-1S
CHECKED	OMRY	03/02/2009		DRAWER N:
APPROVED	OMRY	03/02/2009		

DIN PN10 Plastic Flanges







SECTION A-A

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
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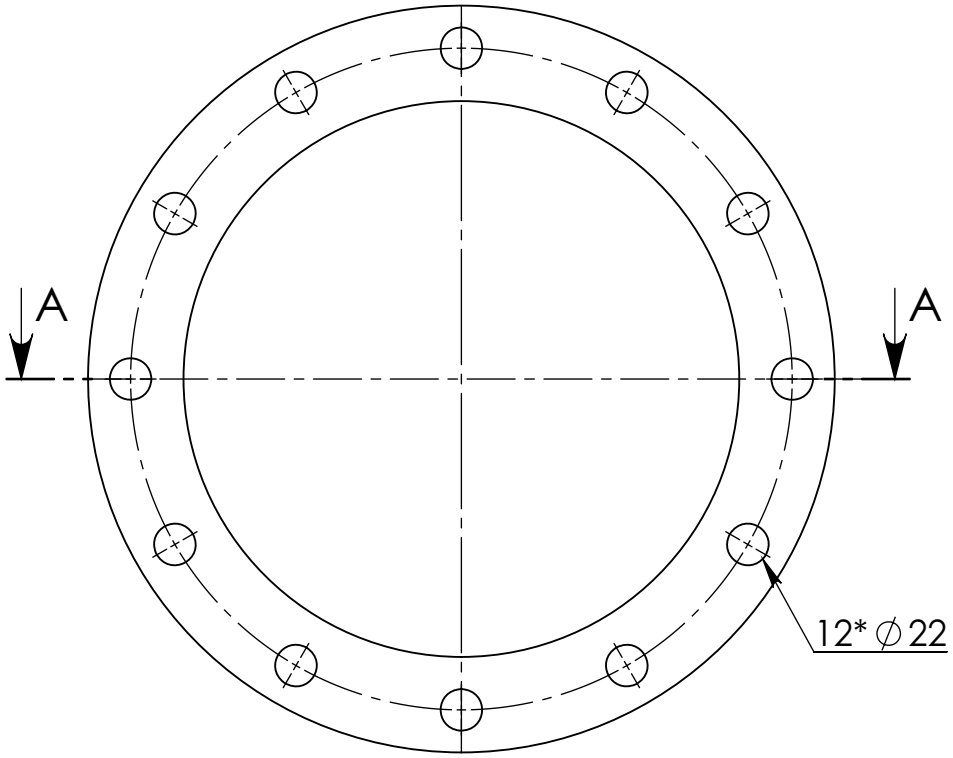
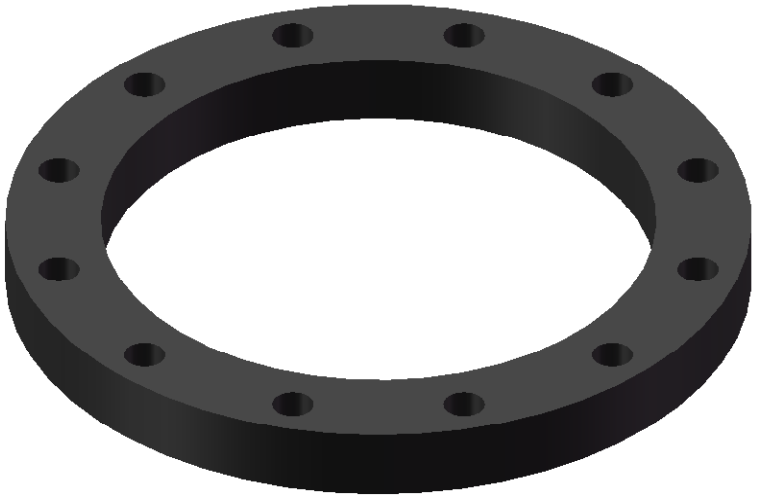
PROJECT				PAGE_1_OF_1_
TITLE: 8''/200 V-FLANGE DIN/ASA150				CATALOGUE No: 5020 3681
PATH: MASTERS – SOLID\ PARTS FOR MANIFOLDS\ FLANGES	FILE CODE: 5020 3681	NAME: MARINA	DATE: 07/09/2008	SIGNATURE

	NAME	DATE	MATERIAL:	BACKUP:
DRAWN	ELENA	07/09/2008	PLASTIC	DISK-1S
CHECKED	OMRY	07/09/2008		DRAWER N:
APPROVED	OMRY	07/09/2008		





SECTION A-A

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
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ISRAEL

PROJECT

PAGE_1_OF_1_

TITLE: 10"/280 V-FLANGE DIN PN10

CATALOGUE No: 5020 3682

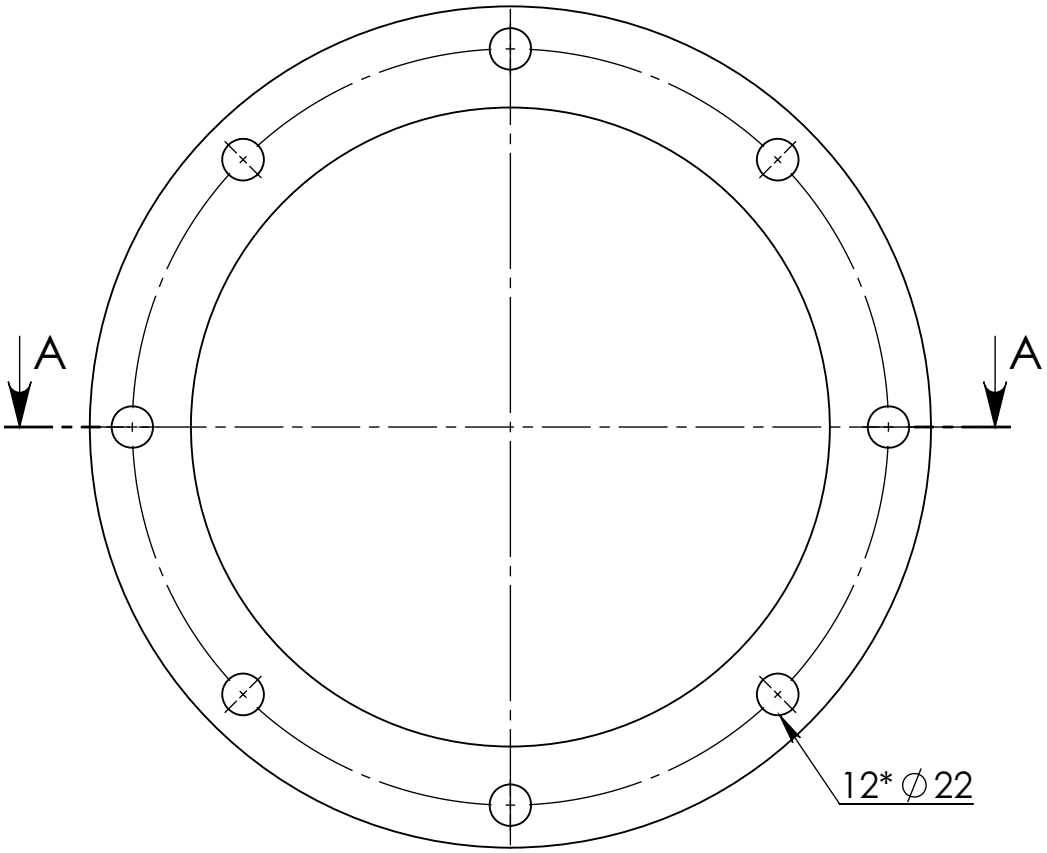
PATH	FILE CODE	NAME	DATE	SIGNATURE
MASTERS – SOLID\ PARTS FOR MANIFOLDS\FLANGES	5020 3682	MARINA	20/01/2008	

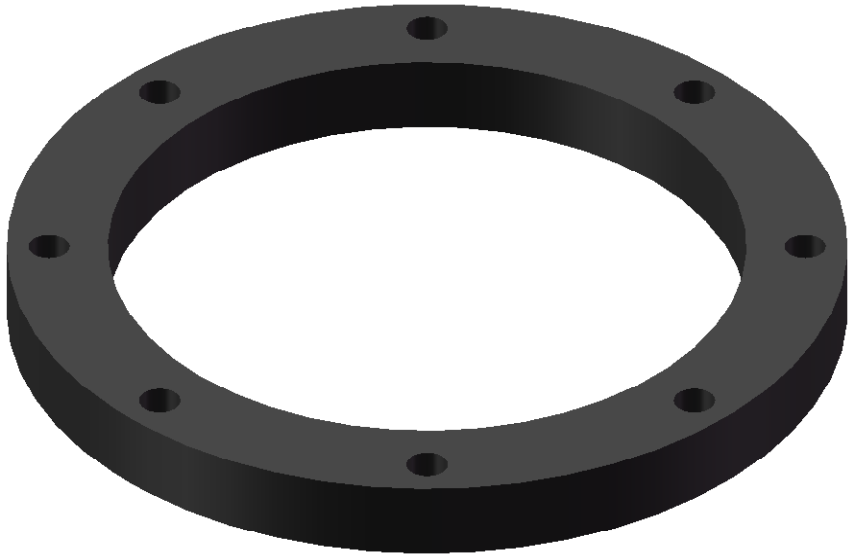
	NAME	DATE
DRAWN	ELENA	20/01/2008
CHECKED	OMRY	20/01/2008
APPROVED	OMRY	20/01/2008

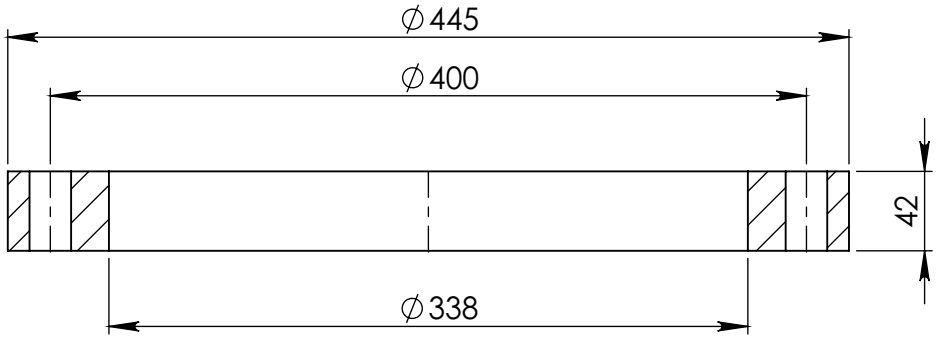
MATERIAL: PLASTIC

BACKUP: DISK-1S

DRAWER N:







SECTION A-A

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT

PAGE_1_OF_1_

TITLE: 12"/315 V-FLANGE DIN PN10

CATALOGUE No: 5020 3685

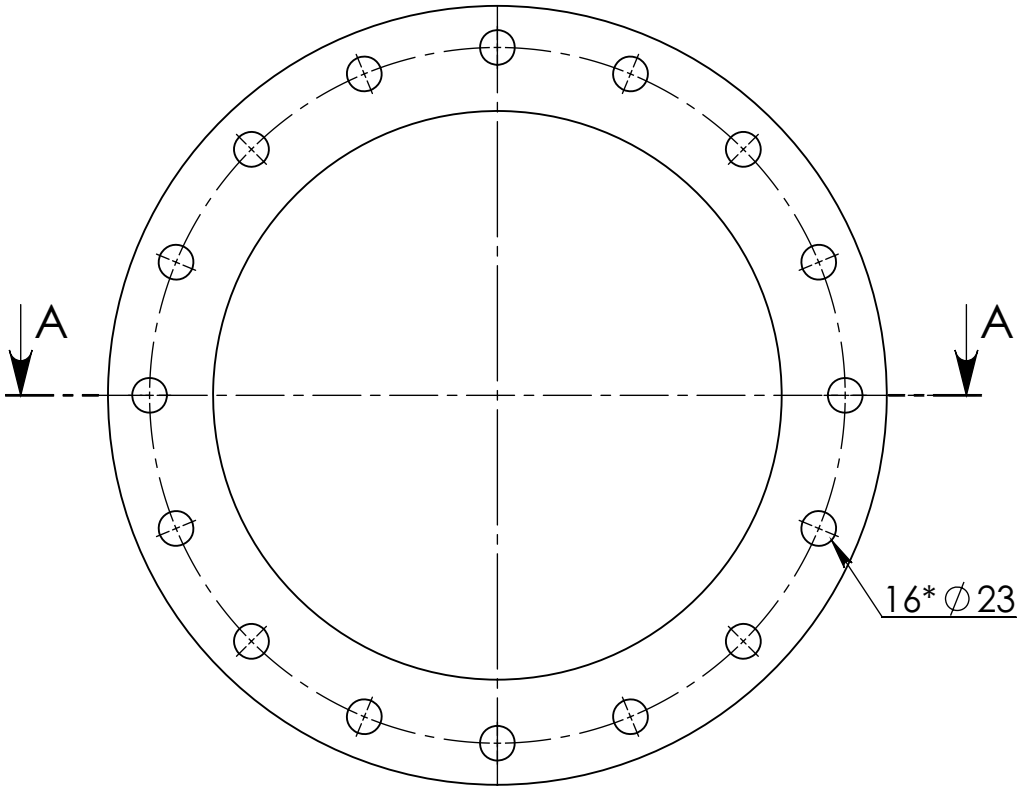
PATH	FILE CODE	NAME	DATE	SIGNATURE
MASTERS – SOLID\ PARTS FOR MANIFOLDS\FLANGES	5020 3685	MARINA	20/01/2008	

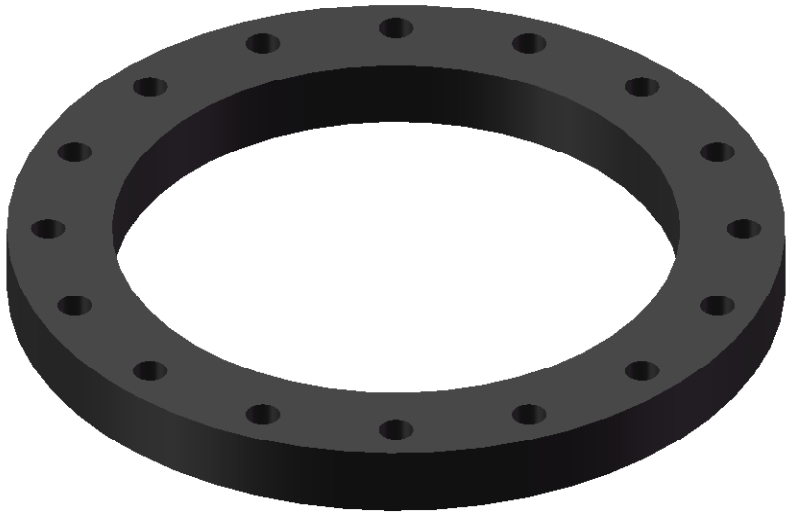
	NAME	DATE
DRAWN	ELENA	20/01/2008
CHECKED	OMRY	20/01/2008
APPROVED	OMRY	20/01/2008

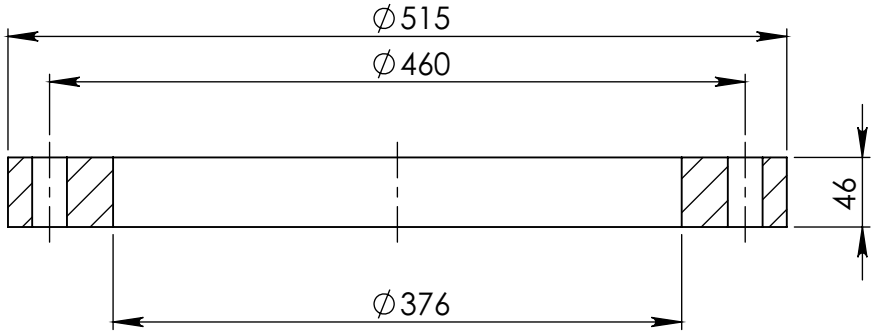
MATERIAL: PLASTIC

BACKUP: DISK-1S

DRAWER N:







SECTION A-A

MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEMS
BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT			PAGE_1_OF_1_
TITLE: 14"/355 V-FLANGE DIN PN10			CATALOGUE No: 5020 3686
PATH: MASTERS – SOLID\ PARTS FOR MANIFOLDS\FLANGES	FILE CODE: 5020 3686	NAME: MARINA	DATE: 20/01/2008

	NAME	DATE	MATERIAL:	BACKUP:
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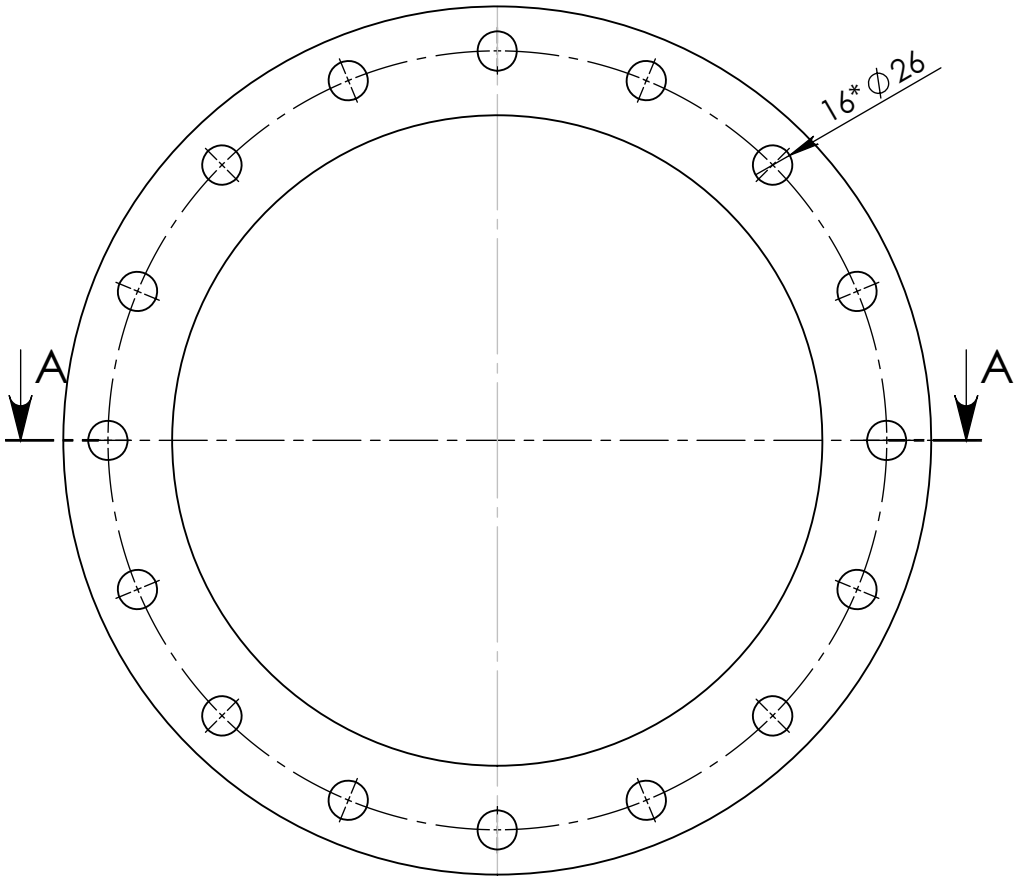
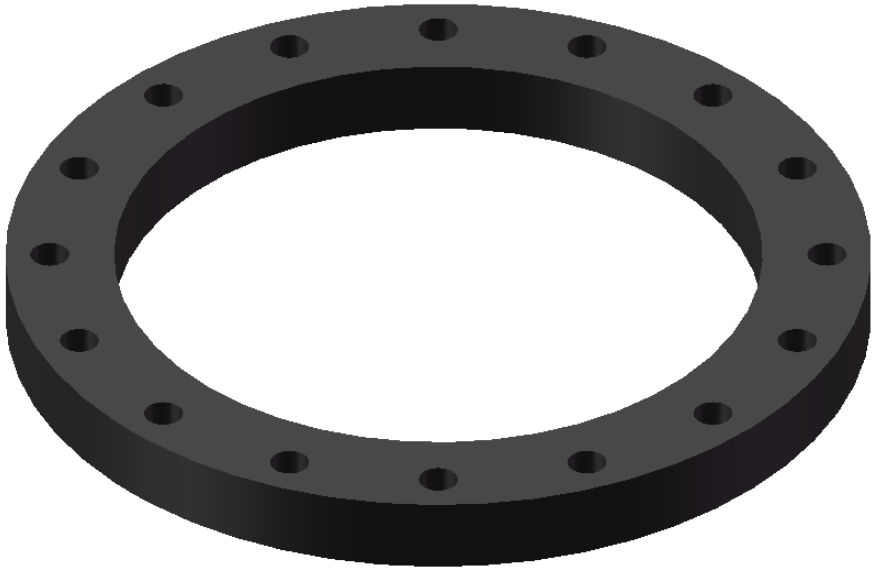
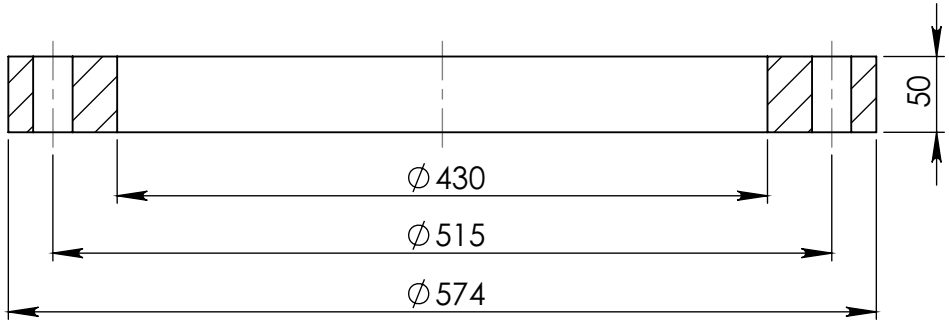
CHECKED	OMRY	20/01/2008		DRAWER N:
APPROVED	OMRY	20/01/2008		







MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL

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FILTRATION SYSTEMS
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FAX. 972–4–6775461
ISRAEL

PROJECT

PAGE_1_OF_1_

TITLE: 16"/400 V-FLANGE DIN PN10

CATALOGUE No: 5020 3684

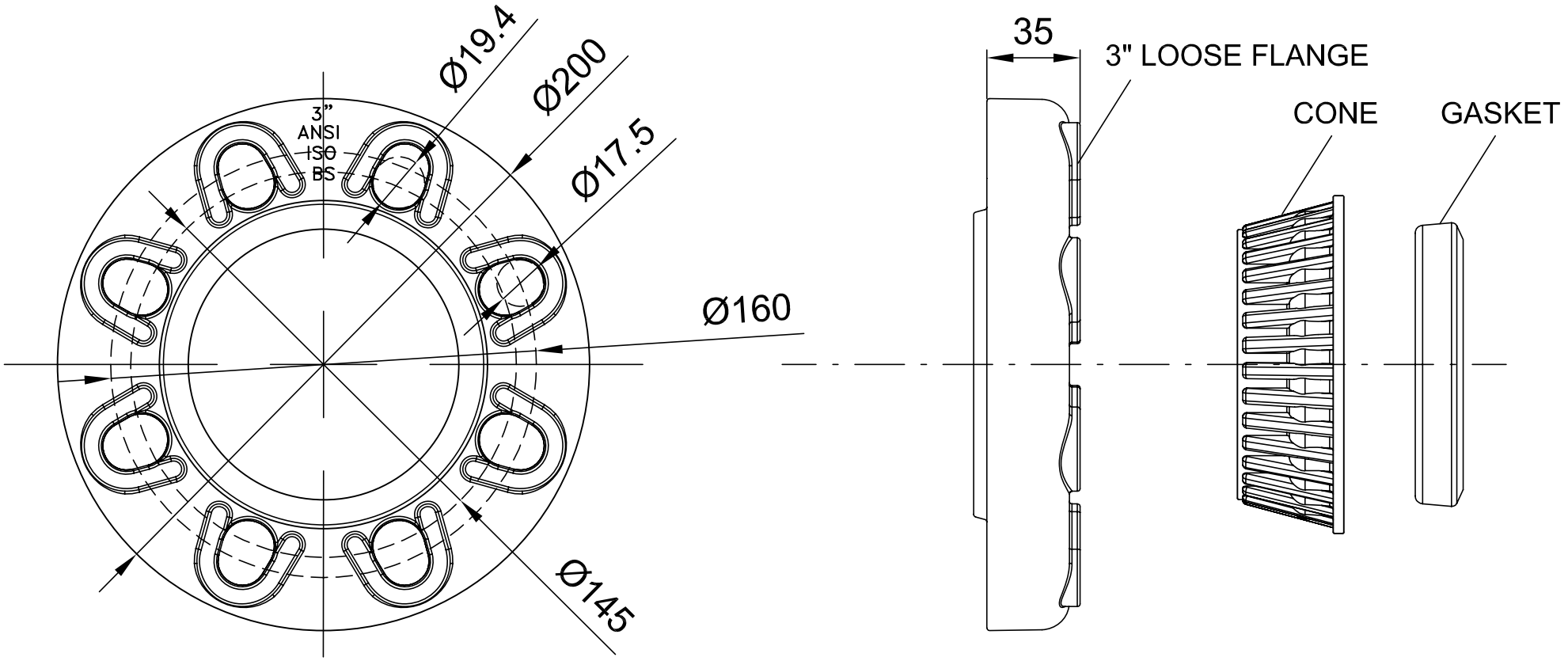
PATH	FILE CODE	NAME	DATE	SIGNATURE
MASTERS – SOLID\ PARTS FOR MANIFOLDS\FLANGES	5020 3684	IRINA	21/12/2008	IRINA

	NAME	DATE
DRAWN	HELEN	21/12/2008
CHECKED	OMRY	21/12/2008
APPROVED	OMRY	21/12/2008

MATERIAL: PLASTIC

BACKUP: DISK–2S

DRAWER N:



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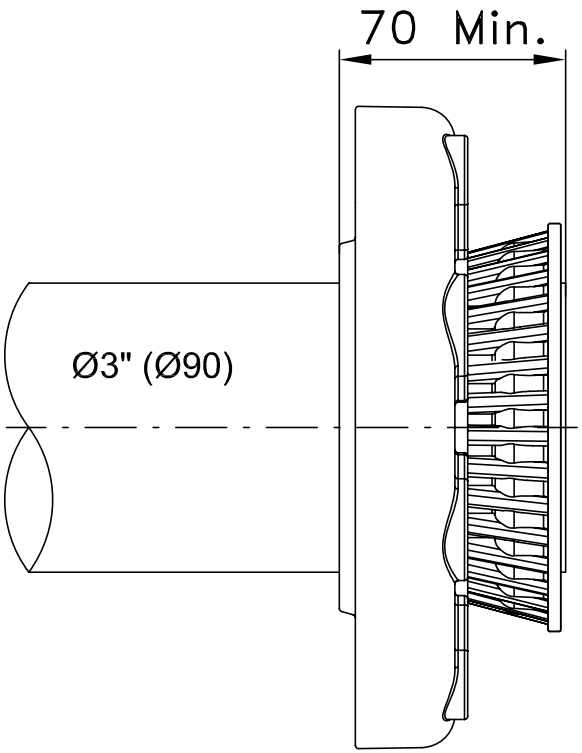
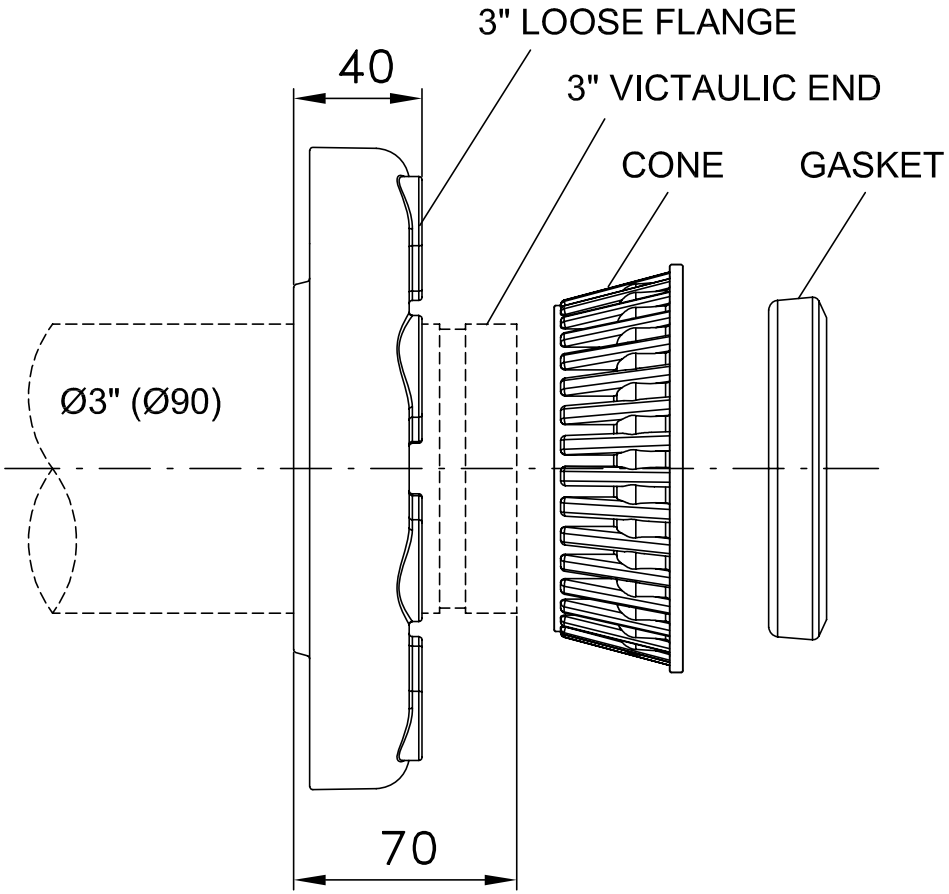
ARKAL FILTRATION SYSTEMS

3" -A.K. FLANGE -BS,ISO,ANSI Cat. No: 2253 0325

- PATENT-PENDING
- PN-10
- STANDARD MATERIALS:
  - Flange-RPA-(Reinforced Polyamid)
  - Cone Ring-POM-(Polyacetal)
  - Gasket-EPDM
- (Other materials are available)

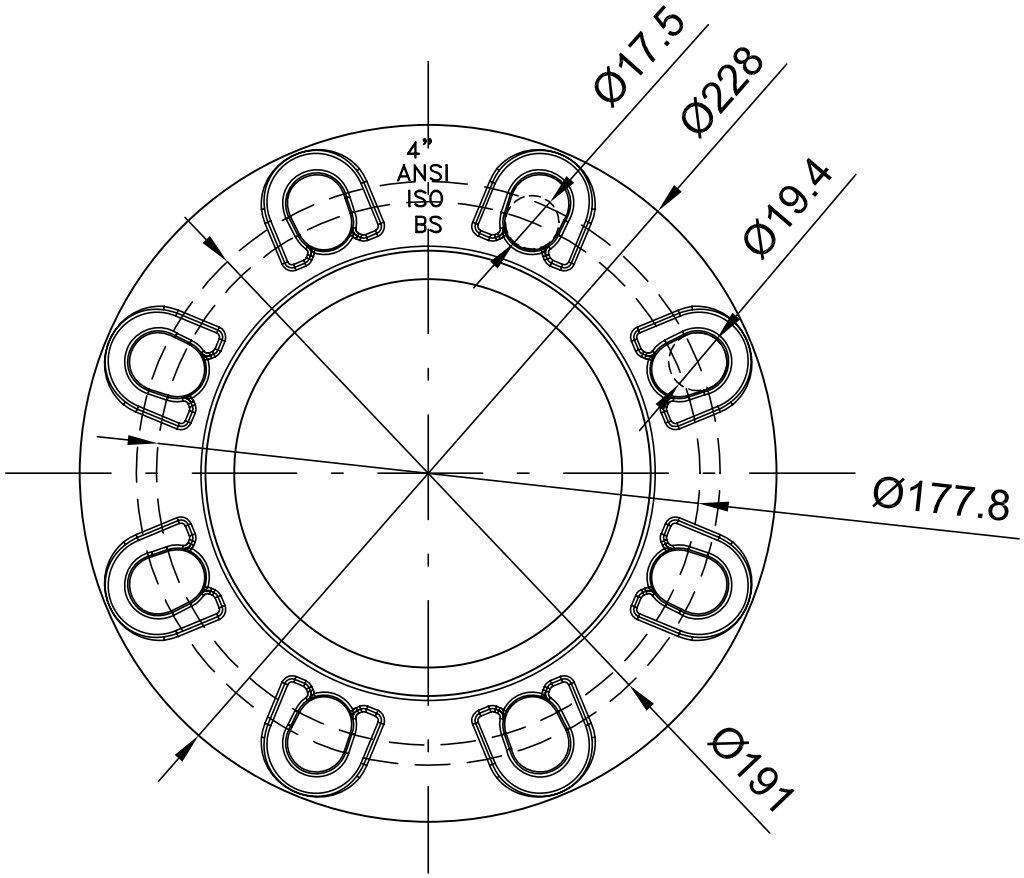


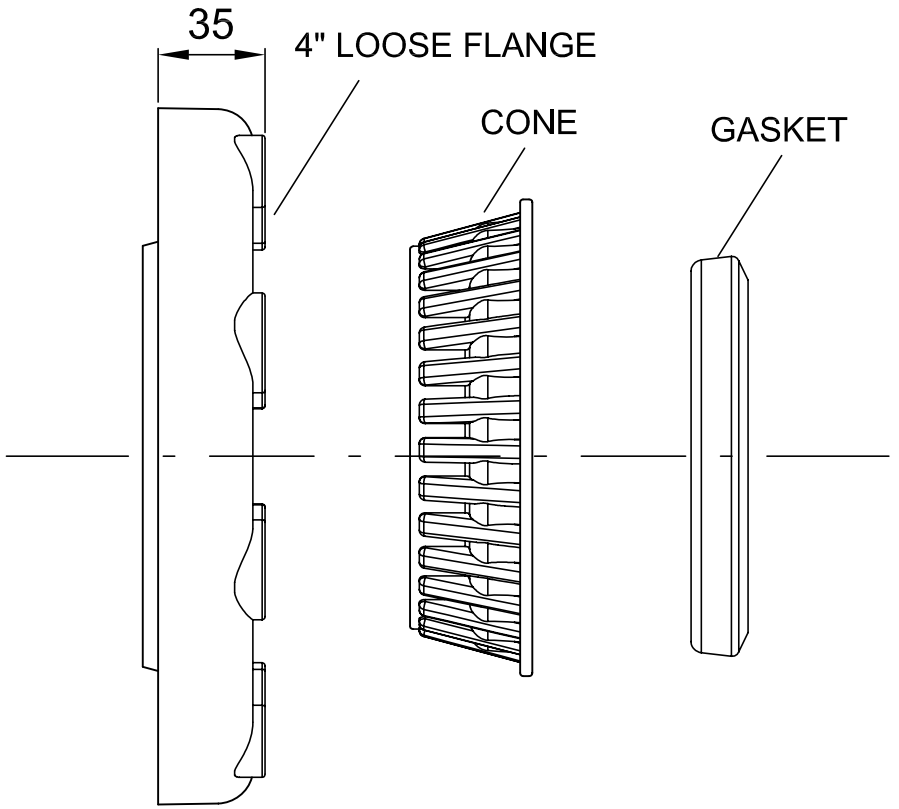


MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PROJECT: 3" -A.K. FLANGE (BS,ISO,ANSI STANDARD)				PAGE 1 OF 1
TITLE: ASSEMBLY THIS FLANGE				CATALOGUE No: 2253 0325
PATH MASTERS\OTHERS FLANGES\Q-FLANGES	FILE CODE: 2253 0325-A	DRAW. NAME		VERSION No:
	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	Nikolay	26.09.05		
CHECKED	ROY	26.09.05	VIEW: FRONT VIEWS	DRAWER N: 36A
APPROVED				



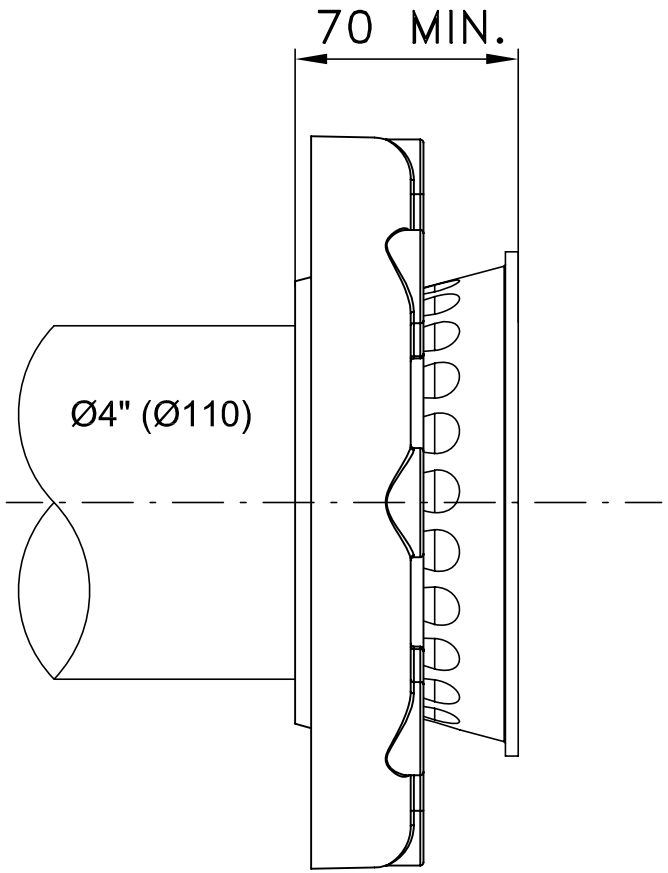


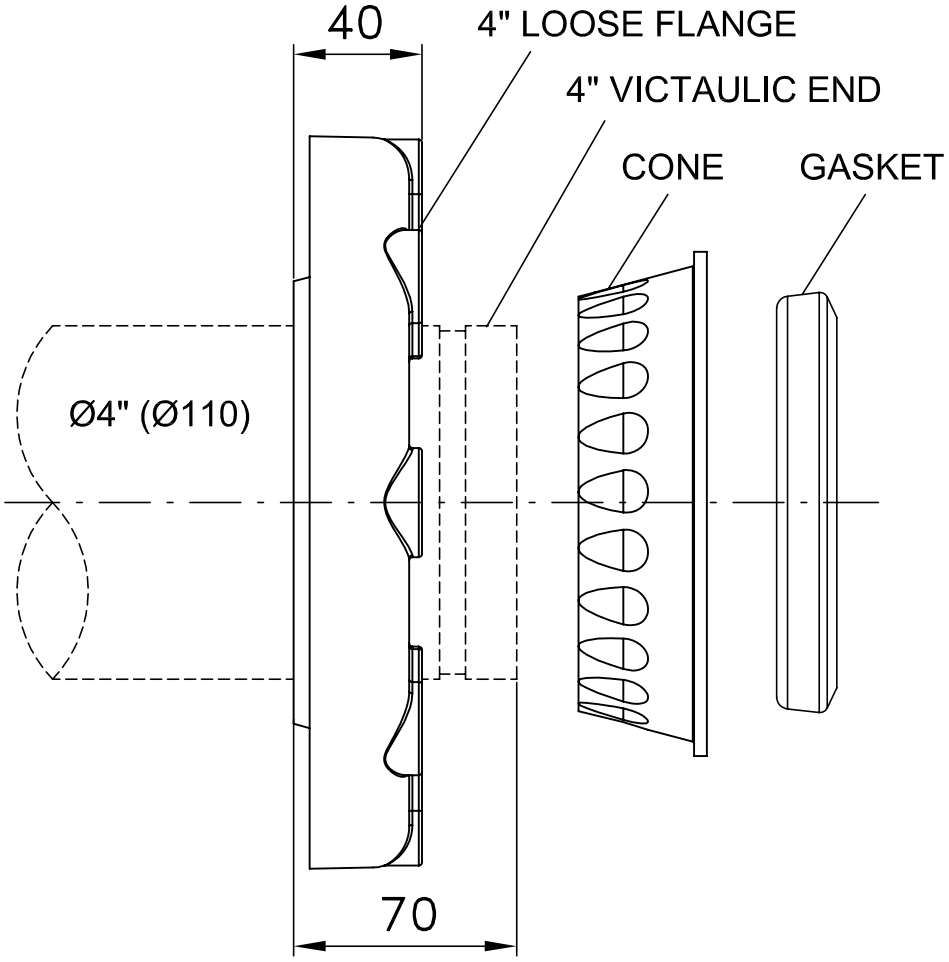
ARKAL FILTRATION SYSTEMS

4" -A.K. FLANGE -BS,ISO,ANSI Cat. No: 2253 0425

- PATENT-PENDING
- PN-10
- STANDARD MATERIALS:
  - Flange-RPA-(Reinforced Polyamid)
  - Cone Ring-POM-(Polyacetal)
  - Gasket-EPDM
- (Others materials are available)

W:\PERSOMET\2253 04225.DWG





MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
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FAX. 972-4-6775461
ISRAEL

PROJECT: 4" -A.K. FLANGE (BS,ISO,ANSI STANDARD) | PAGE 1 OF 1

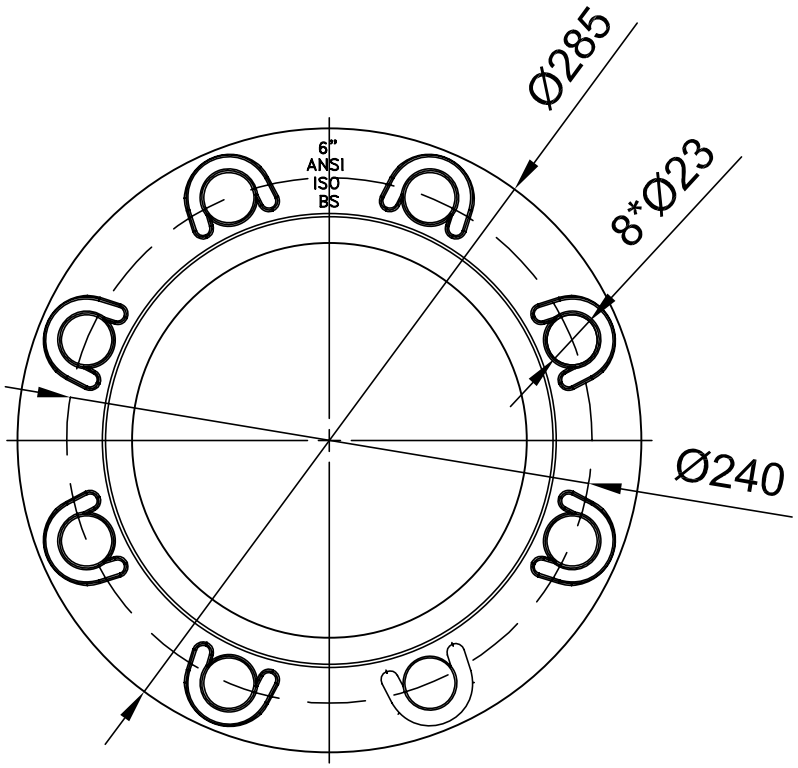
TITLE: ASSEMBLY THIS FLANGE | CATALOGUE No: 2253 0425

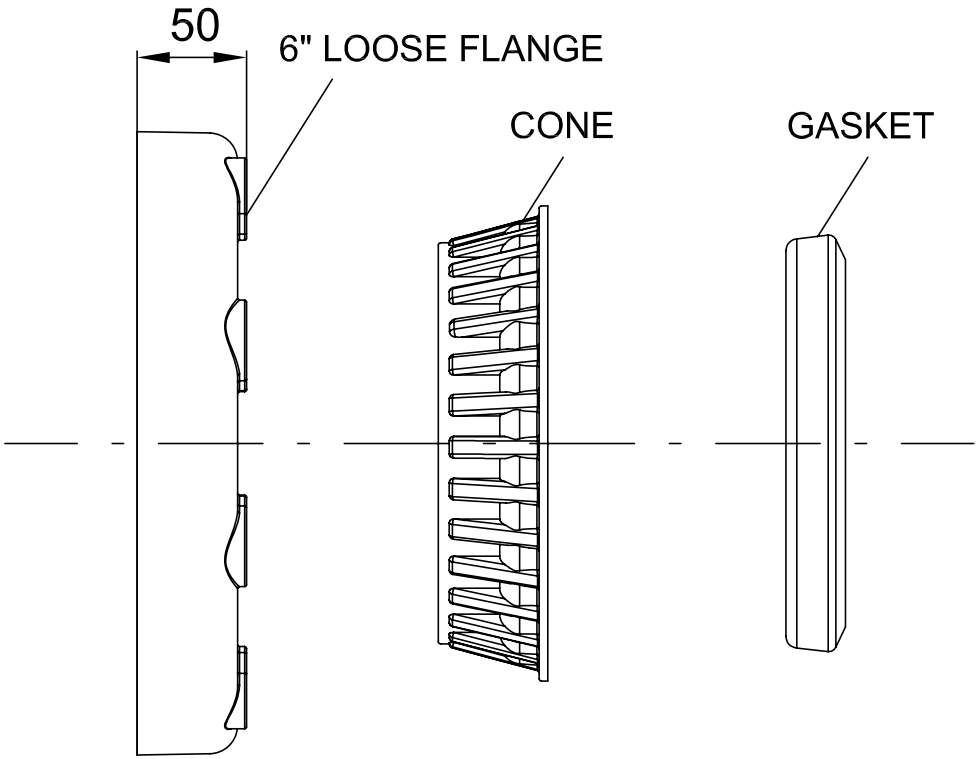
PATH MASTERS\OTHERS FLANGES\Q-FLANGES | FILE CODE 2253 0425-A | DRAW. NAME | VERSION No:

	NAME	DATE
DRAWN	Nikolay	26.09.05
CHECKED	ROY	26.09.05
APPROVED		

FILE CODE DRAWING OF MANIFOLD: | BACKUP:

VIEW: FRONT VIEWS | DRAWER N: 36A





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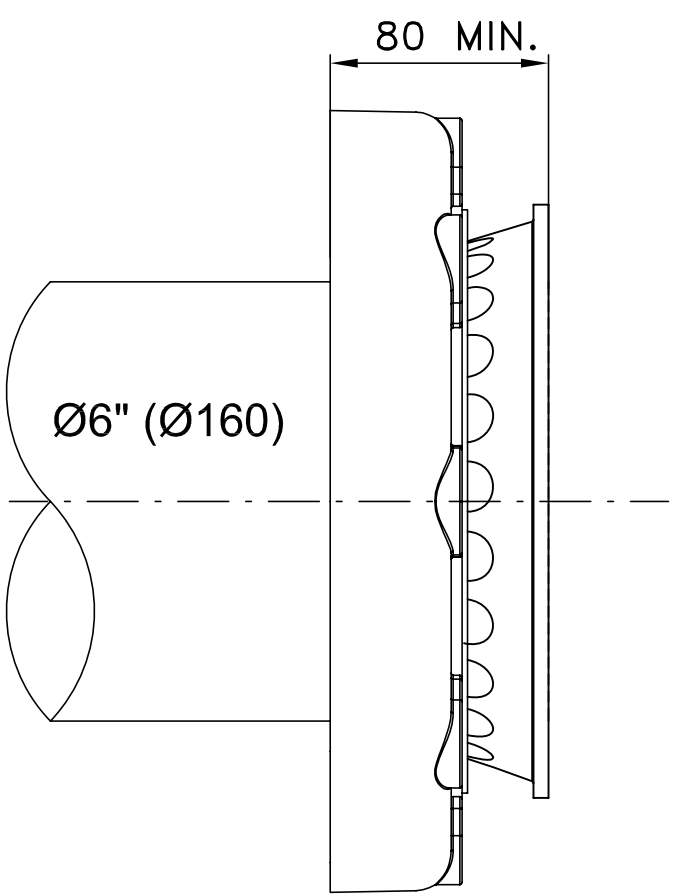
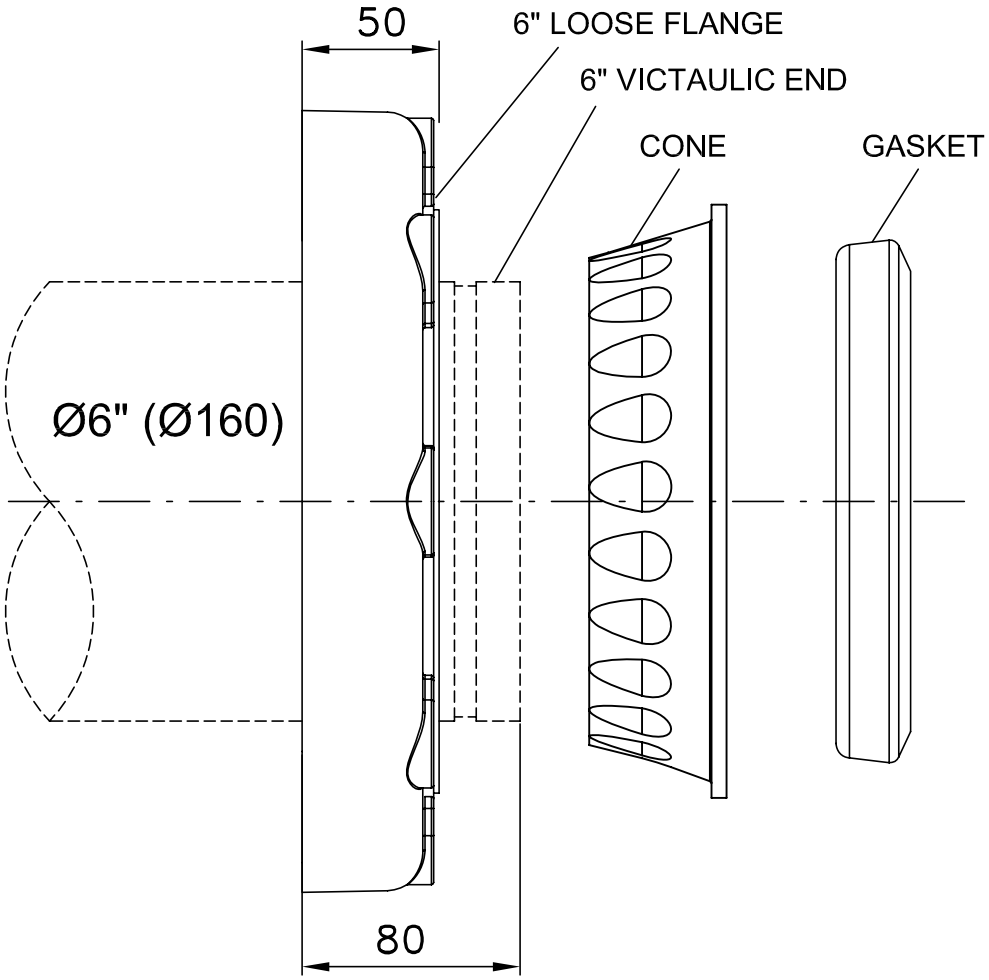
ARKAL FILTRATION SYSTEMS

6" -A.K. FLANGE -BS,ISO,ANSI Cat. No: 2253 0625

- PATENT-PENDING
- PN-10
- STANDARD MATERIALS:
  - Flange-RPA-(Reinforced Polyamid)
  - Cone Ring-POM-(Polyacetal)
  - Gasket-EPDM
- (Others materials are available)





MODIFIC.	DATE	DESCRIPTION	SIGN.

ARKAL
ARKAL
FILTRATION SYSTEM
BET-ZERA 15135
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ISRAEL

PROJECT: 6" -A.K. FLANGE (BS,ISO,ANSI STANDARD)			PAGE 1 OF 1
TITLE: ASSEMBLY THIS FLANGE			CATALOGUE No: 2253 0625
PATH MASTERS\OTHERS FLANGES\Q-FLANGES	FILE CODE: 2253 0625-A	DRAW. NAME	VERSION No:

	NAME	DATE	FILE CODE DRAWING OF MANIFOLD:	BACKUP:
DRAWN	Nikolay	26.09.05		
CHECKED	ROY	26.09.05	VIEW: FRONT VIEWS	DRAWER N: 36A
APPROVED				

General Chemical Resistance

MATERIAL	RESISTANCE	MAXIMUM PERMISSIBLE TEMPERATURE (WATER)	
		Constant	Short Term
Polyvinyl Chloride (PVC, UPVC)	Resistance to most solutions of acids, alkalis and salts and organic compounds miscible with water. Not resistant to aromatic and chlorinated hydrocarbons.	60°C 140°F	60°C 140°F
Chlorinated Polyvinyl Chloride (CPVC)	Can be used similarly to PVC but at increased temperatures.	90°C 195°F	110°C 230°F
Polypropylene (PP)	Resistant to water solutions of acids, alkalis and salts as well as to a large number of organic solvents. Unsuitable for concentrated oxidizing acids.	60°C 140°F	80°C 175°F
Polyvinylidene (PVDF)	Resistant to acids, solutions of salts, aliphatic, aromatic and chlorinated hydrocarbons, alcohols and halogens. Conditionally suitable for ketones, esters, ethers organic bases and alkaline solutions.	90°C 195°F	110°C 230°F
Polytetrafluroethylene (PTFE)	Resistant to all chemicals list in chart*.	140°C 285°F	150°C 300°F
Nitrile Rubber (Buna-N)	Good resistance to oil and gasoline. Unsuitable for oxidizing agents.	90°C 195°F	120°C 250°F
Butyl Rubber Ethylene Propylend Rubber (EPDM, EPR)	Good resistance to ozone and weather. Especially suitable for aggressive chemicals. Unsuitable for oils and fats.	90°C 195°F	120°C 250°F
Chloroprene Rubber (Neoprene®)	Chemical resistance very similar to that of PVC and between that of Nitrile and Butyl rubber.	80°C 175°F	110°C 230°F
Fluorine Rubber (Viton®)	The best chemical resistance to solvents of all elastomers.	150°C 300°F	200°C 390°F

The Chemical Resistance of Polypropylene

The following chart rates the chemical resistance of pro-fax according to the following code:

A **Negligible Effect**: Pro-fax should be suitable for all applications where these environmental conditions exist.

B **Limited Absorption or Attack:** Pro-fax should be suitable for most applications, but user is advised to make his/her own tests to determine the suitability of pro-fax in the particular environment.

C **Extensive Absorption and/or Rapid Permeation:** Pro-fax should be suitable for applications where only inermittent service is involved, or where the swelling produced has no detrimental effect on the part. User should make his/her own test to determine the suitability of pro-fax in the particular environment.

D **Extensive Attack**: The specimen dissolves or disintegrates, pro-fax is not recommended.

* May produce cracking in material under stress

		Temperature ^{o}C		
Environment	Concentration %	20 ^{o}	60 ^{o}	100 ^{o}
Acetic Acid (Glacial)	97	A	B (80 ^{o}C)	-----
Acetic Acid	50	A	A (80 ^{o}C)	-----
Acetic Acid	40	A	-----	-----
Acetic Acid	10	A	A	-----
Acetone	100	A	A	-----
Acetophenone	100	B	B	-----
Acriflavine (2% solution in $H^2$0)	2	A	A (80 ^{o}C)	-----
Acrylic Emulsions		A	A	-----
Aluminum Chloride		A	A	-----
Aluminum Fluoride		A	A	-----
Aluminum Sulfate		A	A	-----
Alums (All Types)		A	A	-----
Ammonia Gas (Dry)		A	A	-----
Ammonia (Aqueous)	30	A	-----	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Ammonium Carbonate	Satd.	A	A	-----
Ammonium Chloride	Satd.	A	A	-----
Ammonium Fluoride	20	A	A	-----
Ammonium Hydroxide	10	A	A	-----
Ammonium Metaphosphate	Satd.	A	A	-----
Ammonium Nitrate	Satd.	A	A	-----
Ammonium Persulfate	Satd.	A	A	-----
Ammonium Sulfate	Satd.	A	A	-----
Ammonium Sulfide	Satd.	A	A	-----
Ammonium Thiocyanate	Satd.	A	A	-----
Amyl Acetate	100	B	C	-----
Amyl Alcohol	100	A	B	-----
Amyl Chloride	100	C	C	-----
Aniline	100	A	A	-----
Anisole	100	B	B	-----
Antimony Chloride		A	A	-----
Aqua Regia	*	B	B	-----
Aviation Fuel (115/145 Octane)	100	B	C	-----
Aviation Turbine Fuel	100	B	C	-----
Barium	Satd.	A	A	-----
Barium	Satd.	A	A	-----
Barium		A	A	-----
Barium	Satd.	A	A	-----
Barium	Satd.	A	A	-----
Beer		A	A	-----
Benzene	100	B	C	C
Benzoic Acid		A	A	-----
Benzyl Alcohol		A	A (80° C)	-----
Bismuth Carbonate	Satd.	A	A	-----
Borax		A	A	-----
Boric Acid		A	A	-----
Brine	Satd.	A	A	-----
Bromine-Liquid	100	D	-----	-----
Bromine Water	*	C	------	-----
Butyl Acetate	100	-----	C	C
Butyl Alcohol	100	A	-----	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Calcium Carbonate	Satd.	A	A	-----
Calcium Chlorate	Satd.	A	A	-----
Calcium Chloride	50	A	A	-----
Calcium Hydroxide		A	A	-----
Calcium Hypochlorite Bleach	20	A	A	-----
Calcium Nitrate		A	A	-----
Calcium Phosphate	50	A	-----	-----
Calcium Sulfate		A	A	-----
Calcium Sulfite		A	A	-----
Carbon Dioxide (Dry)			A	-----
Carbon Dioxide (Wet)			A	-----
Carbon Disulfide	100	B	C	-----
Carbon Monoxide			A	-----
Carbon Tetrachloride	100	C	C	C
Carbonic Acid		A	A	-----
Castor Oil		A	-----	-----
Cetyl Alcohol	100	A	------	-----
Chlorine (Gas)	100	D	D	-----
Chlorobenzene	100	C	C	-----
Chloroform	100	C	D	D
Chlorosulfonic Acid	100	D	D	D
Chrome Alum		A	A	-----
Chromic/Sulfuric Acid		D	D	-----
Chromic Acid	80 *	A	-----	-----
Chromic Acid	50 *	A	A	-----
Chromic Acid	10 *	A	A	-----
Cider		A	A	-----
Citric Acid	10			-----
Copper Chloride	Satd.			-----
Copper Cyanide	Satd.			-----
Copper Nitrate	Satd.			-----
Copper Fluoride	Satd.			-----
Copper Sulfate	Satd.			-----
Cottonseed Oil				-----
Cuprous Chloride	Satd.			-----
Cyclohexanol	100		B	-----
Cyclohexanone	100	B	C	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Decalin	100	C	C	C
Detergents	2	A	A	A
Developers (Photographic)		A	A	-----
Dibutyl Phthalate	100	A	B	D
Dichloroethylene	100	A	-----	-----
Diethanolamine	100	A	A	-----
Diisooctyl Phtalate	100	A	A	-----
Emulsifiers		A	A	-----
Ethyl Acetate	100	B	B	-----
Ethyl Alcohol	96	A	A	A (80° C)
Ethylene Glycol		A	A	-----
Ethanolamine	100	A	A	-----
Ethyl Ether	100	B	-----	-----
Ethyl Chloride	100	C	C	-----
Ethylene Dichloride	100	B	-----	-----
Ethylene Oxide	100	B	-----	-----
Fatty Acids	100	A	A	-----
Ferric Chloride	Satd.	A	A	-----
Ferric Nitrate	Satd.	A	A	-----
Ferric Sulfate	Satd.	A	A	-----
Ferrous Chloride	Satd.	A	A	-----
Ferrous Sulfate	Satd.	A	A	-----
Fluosilicic Acid		A	A	-----
Formaldehyde	40	A	A	-----
Formic Acid	100	A	-----	-----
Formic Acid	10	A	A	-----
Fructose		A	A	-----
Fruit Juices		A	A	-----
Furfural	100	C	C	-----
Gasoline	100	B	C	C
Gas Liquor		C	-----	-----
Gear Box Oil	100	A	B	-----
Gelatin		A	A	-----
Glucose	20	A	A	-----
Glycerin	100	A	A	A
Glycol		A	A	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Hexane	100	A	B	-----
Hydrobromic Acid	50 *	A	A	-----
Hydrochloric Acid	30 *	A	B	D
Hydrochloric Acid	20	A	A (80° C)	-----
Hydrochloric Acid	10	A	A (80° C)	B
Hydrochloric Acid	2	A	A	A
Hydrofluoric Acid	*	B	D (80° C)	-----
Hydrofluoric Acid	40 *	A	-----	-----
50 – 50 HCl – HNO3	60 *	A	A (40° C)	-----
Hydrogen Peroxide	30	A	-----	D
Hydrogen Peroxide	10	A	B	-----
Hydrogen Peroxide	3	A	-----	-----
Hydrogen Chloride Gas (Dry)	100	A	A	-----
Hydrogen Sulfide		A	A	-----
Hydroquinone		A	A	-----
Inks		A	A	-----
Iodine Tincture		A	-----	-----
Isopropyl Alcohol	100	A	A	-----
Isoctane	100	C	C	-----
Ketones		A	-----	-----
Lactic Acid	20	A	A	-----
Lanolin	100	A	A	-----
Lead acetate	Satd.	A	A	-----
Linseed Oil	100	A	A	-----
Lubricating Oil	100	A	B	-----
Magenta Dye (Aqu. Soln.)	2	A	A (some staining)	-----
Magnesium Carbonate	Satd.	A	A	-----
Magnesium Chloride	Satd.	A	A	-----
Magnesium Hydroxide	Satd.	A	A	-----
Magnesium Nitrate	Satd.	A	A	-----
Magnesium Sulfate	Satd.	A	A	-----
Magnesium Sulfite	Satd.	A	A	-----
Meat Juices		A	A	-----
Mercuric Chloride	40	A	A	-----
Mercuric Cyanide	Satd.	A	A	-----
Mercury	100	A	A	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Mercurous Nitrate	Satd.	A	A	-----
Methyl Ethyl Ketone	100	A	B	-----
Methyl Alcohol	100	A	A	-----
Methylene Chloride	100	A	-----	-----
Milk and it's Products		A	A	A
Mineral Oil	100	A	B	-----
Molasses		A	A	-----
Motor Oil	100	A	B	-----
Naphthalene	100	A	A	A
Nickel Chloride	Satd.	A	A	-----
Nickel Nitrate	Satd.	A	A	-----
Nickel Sulfate	Satd.	A	A	-----
Nitric Acid	Fuming	D	D	D
Nitric Acid	70*	C	D	-----
Nitric Acid	60	A	D (80° C)	-----
Nitrac Acid	10	A	A	A
50 - 50 HNO3 - HCI	*	A	D (80° C)	-----
50 - 50 HNO3 – H2S04	*	C	D (80° C)	-----
Nitrobenzene	100	A	A	-----
Oleic Acid		A	B	-----
Oleum		-----	-----	D
Olive Oil	100	A	A	-----
Oxalic Acid (Aqueous)	50	A	B	-----
Paraffin	100	A	B	-----
Paraffin Wax	100	A	A	-----
Petrol	100	B	C	-----
Phenol	100	A	A	-----
Phosphoric Acid	95	A	A	-----
Plating Solutions, Brass		A	A	-----
Plating Solutions, Cadmium		A	A	-----
Plating Solutions, Chromium		A	A	-----
Plating Solutions, Copper		A	A	-----
Plating Solutions, Gold		A	A	-----
Plating Solutions, Indium		A	A	-----
Plating Solutions, Lead		A	A	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Plating Solutions, Nickel		A	A	-----
Plating Solutions, Rhodium		A	A	-----
Plating Solutions, Silver		A	A	-----
Plating Solutions, Tin		A	A	-----
Plating Solutions, Zinc		A	A	-----
Petroleum Ether (BP 100 – 140 °C)	100	C	C	-----
Potassium Bicarbonate	Satd.	A	A	-----
Potassium Borate	1	A	A	-----
Potassium Bromate	10	A	A	-----
Potassium Bromide	Satd.	A	A	-----
Potassium Carbonate	Satd.	A	A	-----
Potassium Chlorate	Satd.	A	A	-----
Potassium Chloride	Satd.	A	A	-----
Potassium Chromate	40	A	A	-----
Potassium Cyanide	Satd.	A	A	-----
Potassium Dichromate	40	A	A	-----
Potassium Ferri / Ferrocyanide		A	A	-----
Potassium Fluoride		A	A	-----
Potassium Hydroxide	50	A	A	-----
Potassium Hydroxide	10	A	A	A
Potassium Nitrate	Satd.	A	A	-----
Potassium Perborate	Satd	A	A	-----
Potassium Perchlorate	10	A	A	-----
Potassium Permanganate	20	A	A	-----
Potassium Sulfate		A	A	-----
Potassium Sulfide		A	A	-----
Potassium Sulfite		A	A	-----
Propyl Alcohol	100	A	A	-----
Pyridine	100	A	-----	-----
Silicone Oil	100	A	A	-----
Soap Solution (Concentrated)		A	A	-----
Sodium Acetate		A	A	-----
Sodium Bicarbonate	Satd.	A	A	-----
Sodium Bisulfate	Satd.	A	A	-----
Sodium Bisulfite	Satd.	A	A	-----
Sodium Borate		A	A	-----
Sodium Bromide Oil Solution		A	A	-----

		Temperature °C		
Environment	Concentration %	20°	60°	100°
Sodium Carbonate	Satd.	A	A	-----
Sodium Chlorate	Satd.	A	A	-----
Sodium Chloride	Satd.	A	A	A
Sodium Chlorite	2	A	A (80° C)	-----
Sodium Chlorite	5	A	A (80° C)	-----
Sodium Chlorite	10	A	A (80° C)	-----
Sodium Chlorite	20	A	A (80° C)	-----
Sodium Cyanide	Satd.	A	A	-----
Sodium Dichromate	Satd.	A	A	-----
Sodium Ferricyanide	Satd.	A	A	-----
Sodium Ferrocyanide	Satd.	A	A	-----
Sodium Fluoride	Satd.	A	A	-----
Sodium Hydroxide	50	A	A	-----
Sodium Hydroxide	10	A	A	A
Sodium Hypochlorite	20	A	A	B
Sodium Nitrate		A	A	-----
Sodium Nitrate		A	A	-----
Sodium Silicate		A	A	-----
Sodium Sulfate	Satd.	A	A	-----
Sodium Sulfide	25	A	A	-----
Sodium Sulfite	Satd.	A	A	-----
Stannous Chloride	Satd.	A	A	-----
Stannic Chloride	Satd.	A	A	-----
Starch		A	A	-----
Sulfates of Calcium and Magnesium	Satd.	A	A	-----
Sulfites of Potassium and Sodium	Satd.	A	A	-----
Sulfur		A	A	-----
Sulfuric Acid	98 *	C	-----	D
Sulfuric Acid	60	A	B (80° C)	-----
Sulfuric Acid	50	A	B	-----
Sulfuric Acid	10	A	A	A
50 – 50 H2SO4 HNO3	*	C	D	-----
Tallow		A	A	-----
Tannic Acid	10	A	A	-----
Tartaric Acid		A	A	-----
Tetrahydrofuran	100	C	C	C
Tetralin		C	C	C

		Temperature °C		
Environment	Concentration %	20 °	60 °	100 °
Toluene		C	C	-----
Transformer Oil		A	C	-----
Trichloracetic Acid	10	A	A	-----
Trichhloroethylene	100	C	C	C
Triethanolamine	100	A	A (80 ° C)	-----
Turpentine	100	C	C	C
Urea		A		-----
Urine		A		-----
Vaseline		A		-----
Vinegar		A		-----
Water (Distilled, Soft, Hard and Vapor)		A	A	A
Wet Chlorine Gas		-----	D (70 ° C)	-----
Whiskey		A	A	A
White Paraffin	100	A	B (80 ° C)	-----
White Spirit	100	B	C	-----
Wines		A	A	-----
Xylene	100	C	C	C
Zince Chloride	Satd.	A	A	-----
Zinc Oxide		A	A	-----
Zinc Sulfate	Satd.	A	A	-----

The Chemical Resistance of Polyamide

VG	**very good resistance**
G	**good resistance**
L	**limited resistance**
P	**poor resistance**
S	**soluble**

Chemical Agents	Concentration %	Observations
Acetaldehyde	100	P
Acetic Acid	100	P
Acetic Acid (aqueous solution)	40	P
Acetic Acid (aqueous solution)	10	L
Acetone	100	VG
Acrylonitrile	100	VG
Aluminum Chloride (aqueous solution)	10	VG
Aluminum Sulphate (aqueous solution)	10	VG
Ammonia (aqueous solution)	10	VG
Ammonium Chloride (aqueous solution)	10	G
Amyl Acetate	100	VG
Amyl Alcohol	100	VG
Aniline	100	G - L
Benzene	100	VG
Benzyl Alcohol	100	L
Butyl Acetate	100	VG
Butyl and Isobutyl Alcohol	100	G
Calcium Chloride (aqueous solution)	10	VG
Calcium Chloride (alcoholic solution)	20	S
Carbon Disulphide		VG
Carbon Tetrachloride		VG
Chlorine	100	P
Chlorobenzene	100	VG
Chloroform	100	P
Chromic Acid (aqueous solution)	10	P
Chromic Acid (aqueous solution)	2	L

Chemical Agents	Concentration %	Observations
Citric Acid (aqueous solution)	10	L
Copper Sulphate (aqueous solution)	10	G
Cyclohexane	100	VG
Cyclohexanol	100	VG
Cyclohexanone	100	VG
Decalin	100	VG
Dimethylformamide	100	VG
Dioxane	100	VG
Ether	100	VG
Ethyl Acetate	100	VG
Ethyl Alcohol	96	G - L
Ethylene Chloride	100	VG
Ferric Chloride (aqueous solution)	10	G
Formaldehyde (aqueous solution)	30	G – L
Formic Acid (aqueous solution)	90	S
Formic Acid (aqueous solution)	10	P
Freon 12	100	VG
Fuel Oil	100	VG
Gas Oil	100	VG
Glycerin	100	VG
Glycol	100	VG
Grease		VG
Heptane	100	VG
Hexane	100	VG
Hydrochloric Acid (aqueous solution)	35	P – S
Hydrochloric Acid (aqueous solution)	10	L – P
Hydrofluoric Acid (aqueous solution)	40	P
Hydrogen Peroxide (aqueous solution)	3	P
Javelle Water		P
Kerosene	100	VG
Lactic Acid (aqueous solution)	90	P
Lactic Acid (aqueous solution)	50	L
Lactic Acid (aqueous solution)	10	G

Chemical Agents	Concentration %	Observations
Magnesium Chloride (aqueous solution)	10	G
Mercuric Chloride (aqueous solution)	10	L
Methyl Acetate	100	VG
Methyl Alcohol	100	G - L
Methylene Chloride (aqueous solution)	100	L
Methylethyl Ketone	100	VG
Molten Phenol		S
Mercury		VG
Milk		VG
Naphtalene		VG
Nitrates (aqueous solution)	10	VG
Nitric Acid (aqueous solution)	10	P
Nitric Acid (aqueous solution)	2	L
Oils	100	VG
Oleic Acid	100	G
Oxalic Acid (aqueous solution)	10	L
Ozone		P
Perchlorethylene	100	L - P
Petrol	100	VG
Petroleum Spirit	100	VG
Phenol (aqueous solution)		P – S
Phosphoric Acid (aqueous solution)	10	P
Phosphoric Acid (aqueous solution)	2	L
Potash (aqueous solution)	40	G
Potash (aqueous solution)	10	VG
Potassium Bromide (aqueous solution)	10	VG
Potassium Carbonate (aqueous solution)	100	VG
Potassium Carbonate (aqueous solution)	10	VG
Potassium Dichromate (aqueous solution)	5	G – L
Potassium Permanganate (aqueous solution)	1	P
Propyl and Isopropyl Alcohol	100	G - L
Pyridine	100	VG
Resorcinol	100	P
Resorcinal (aqueous solution)		P - S

Chemical Agents	Concentration %	Observations
Salicylic Acid	100	VG
Soap		VG
Sodium Bisulphite (aqueous solution)	10	VG
Sodium Carbonate (aqueous solution)	100	VG
Sodium Carbonate (aqueous solution)	10	VG
Sodium Chloride (aqueous solution)	10	VG
Sodium Hydroxide (aqueous solution)	50	G
Sodium Hydroxide (aqueous solution)	10	VG
Sodium Hydroxide (aqueous solution)	5	VG
Sodium Sulphate (aqueous solution)	10	VG
Sodium Thiosulphate		VG
Sulfuretted Hydrogen (aqueous solution)		VG
Sulphur		VG
Sulphuric Acid		S
Sulphuric Acid (aqueous solution)	98	P
Styrene	3	VG
Tartaroc Acid (aqueous solution)	30	G
Tetrahydrofurane	10	VG
Toluene		VG
Trichloroethylene		L - P
Triethanolamine		VG
Turpentine	100	VG
Urea (aqueous solution)	10	VG
Vaseline		VG
Vinyl Chloride	100	VG
Water		VG
White Spirit		VG
Wine		VG - C
Xylene		VG
Zinc Chloride (aqueous solution)	10	G - L

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Design & Production: www.stern.org.il **January 2004**