AUTOMAT®
Creating a Green World®

Aqua Disc

Automatic Disc Filters

3” Aqua Disc Filter Battery

Installation, Operation, Maintenance and Trouble shooting Guide

TABLE OF CONTENTS

Features

- Non corrosive Polymeric Construction with added UV Stabilizers for durability in outdoor conditions .
- Depth Filtration- Precisely grooved discs provide surface & in depth filtration .
- Helix effect creates centrifugal action optimizes filtration performance & reduces backwash frequency & maintenance.
- Easy to install with modular manifolds
- Compact footprint requires less space.
- Minimum water & Time requirement for back flushing , Flushing can be triggered by PD/TIME/Manual Mode.
- State of the art Automat “FILT SMART” controller is equipped to operate 1 to 10 filters.
- New Automat Automatic Disc Filter “AQUA DISC” offers high cleaning efficiency with non stop irrigation while flushing
- Provided with corrosion resistant , light weight plastic backflush valves.

Applications- Agriculture

- For surface water containing algae and other organic contains coming from reservoirs, canals , rivers & waste water treatment plants.
- Well water containing light sand (<3 ppm)

Applications- Landscaping

- Commercial landscapes , Institutional parks , Large residential complexes & sport fields.
- Golf Courses.

Technical Specifications

General	
Specifications	**AQUA DISC 80**
Maximum Recommended Flow Rate*	80 m3/hr (352 GPM)
Maximum Operating Pressure	10 bar (145 psi)
Minimum Backwash Pressure	2 bar (30 psi)
Filtration Surface Area	3240 cm2 (500 inch2)
Inlet/Outlet Dia	100 mm (4”)
Maximum Working Temperature	60° C (140° F)

* Depends on quality of water & Micron rating

Note - Grater than 3 ppm sand or silt may require primary filtration such as Hydro cyclone

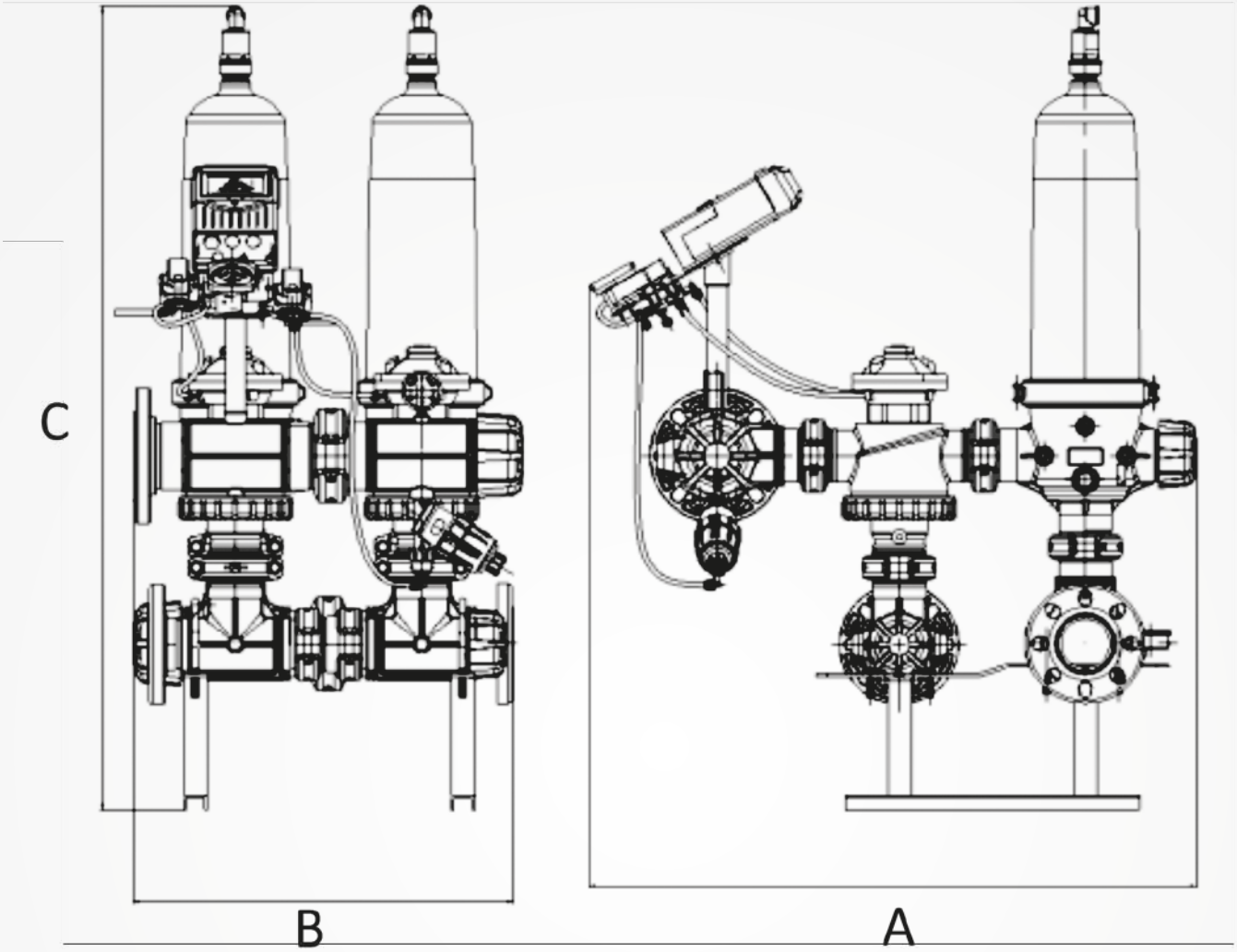
Back Flush Data:

Back Flush Data:	
Back flush Valve	3” (80 mm)
Flushing Time	20 sec
Min. Backwash Flushing Flow (m^3/hr)	12 m^3/hr
Control and Electricity:	
Rated Input Supply (To Controller)	6V DC / 12V DC

Disc Filtration Degree & Material			
Color Code			
Micron	200	130	100

Material of constructions	
Filter housing & cover	PAGF
Disc element	PAGF
Disc	PP
Backwash valve	PAGF
Manifolds	PPGF/HDPE
Seals	NBR/EPDM
Control tubbing	PE

Dimensions



Dimensions (mm)	2 Unit battery
A	1032 MM
B	660 MM
C	1362 MM

Unpacking

Step 1: Open the wooden pallet box with suitable tools

Step 2: Remove the foam sheet

Step 3: Remove the 4 boxes from wooden pallet

Box No 1 & 2 contains filter cover , disc cartridge & ARV

Box No 3 contains – Controller accessories & control tubbing's

Box No 4 contains - QPR & fittings

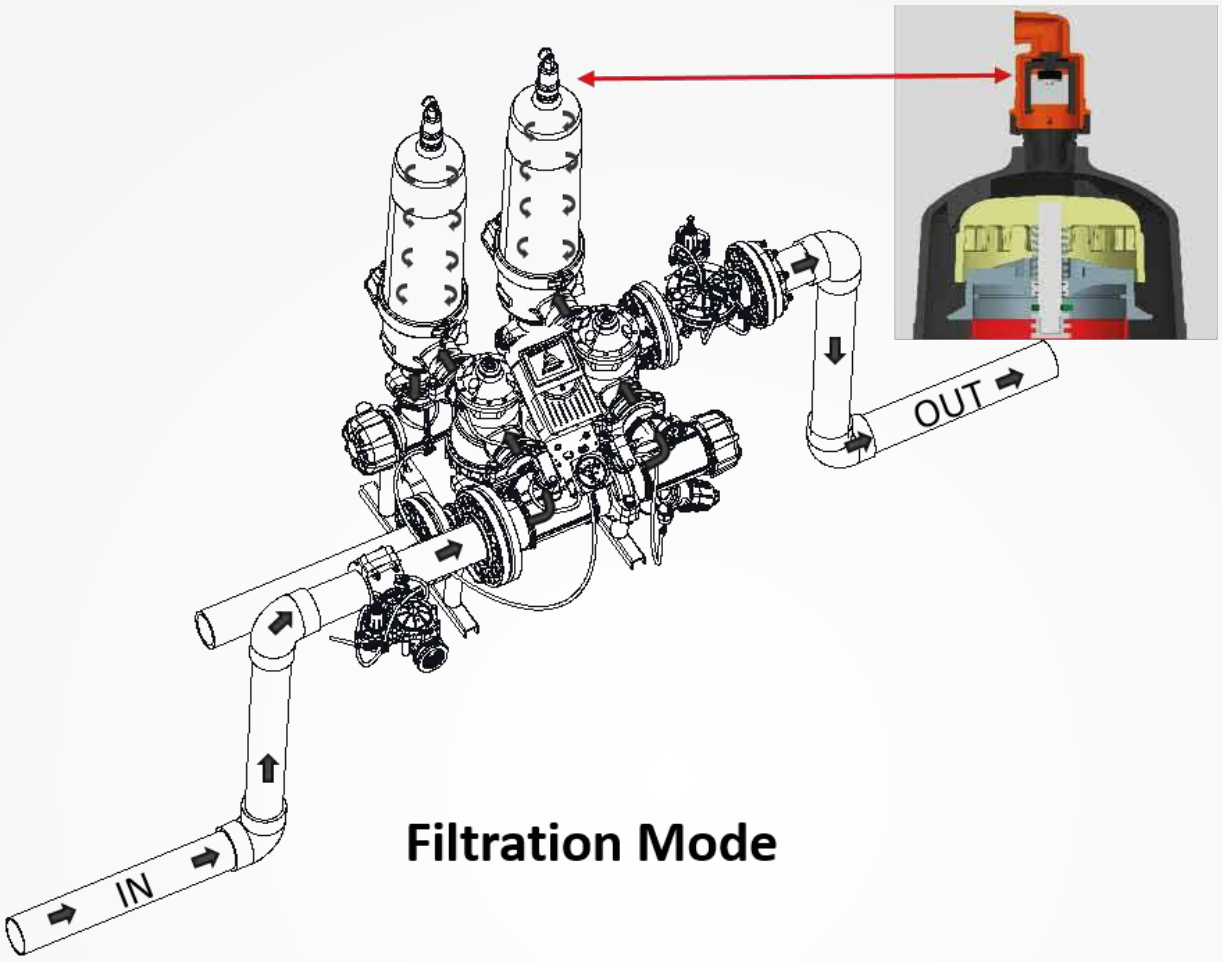
Step 4: Remove wooden pallets from all sides

Step 5: Remove clamping bolts which holds filter with wooden pallet

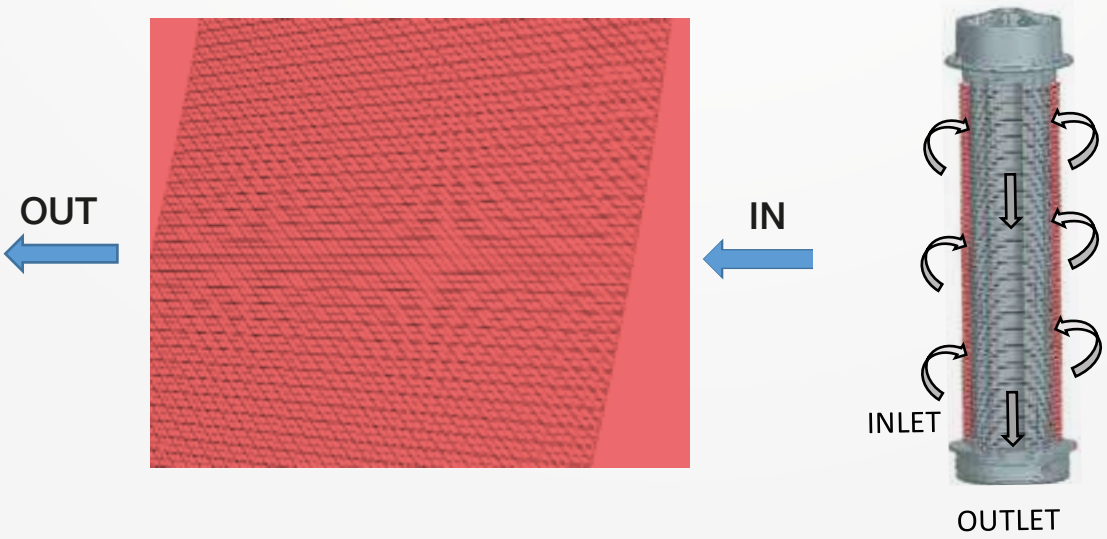
Step 6: Remove the filter from pallet and keep it on the site safely

Filter Operations

How It Works In Filtration Mode

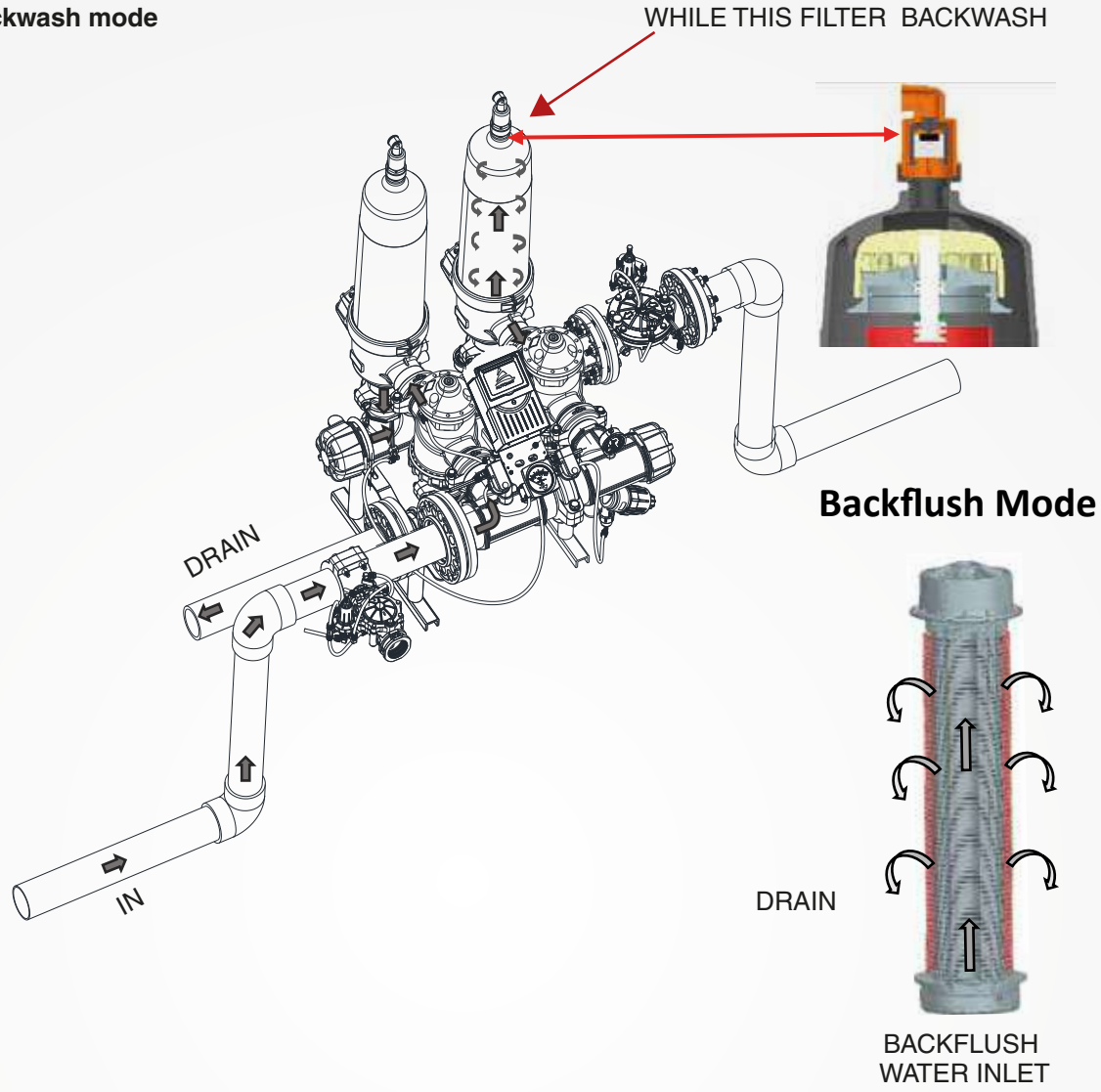


The intersections between the grooved faces of any pair of two adjacent discs create the tracks of water through the discs.



Filter Operations

How it works in backwash mode



BACKWASH PROCESS

Activated by pre-set PD, Time or Manual command , system enters to backwashing mode. Inlet valve port of filter 1 shuts & drain port opens. Clean water coming from filter 2 passed through outlet port of filter 1 in reverse direction through the disc housing cause to decompress discs and water coming from melty jet tangential nozzles provide peripheral spray on loosen discs causing them to separate from each other & spin freely on disc housing , efficiently backwash the discs by forcing out contaminants trapped in the grooves of the disc and finally evacuated through backwash manifold in the set duration. During backwashing each filter is backwashed sequentially one by one while other filters continue to supply filtered water to downstream causing uninterrupted irrigation during flushing process.

Filter Operations

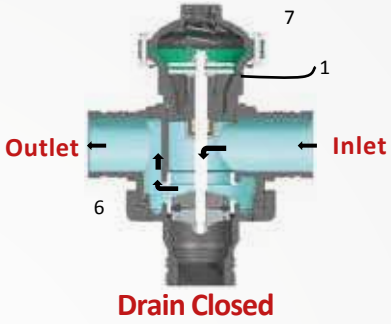
How Backflush valves work

The backflush valve has two built-in chambers, Upper chamber and the lower chamber. Each chamber has its own valve seat, but they have a common shaft and diaphragm. The valve chambers are mutually integrated units. When one port is open, the other is closed, permitting the backflush valve to perform two modes of operation:

Filtration Mode: The valve permits flow from the inlet manifold through the filter, into the pipeline.

Venting the Lower control chamber (2) causes the line pressure, together with the Spring [7] force, to move the valve back to lower seat (6) brings filter to filtration mode.

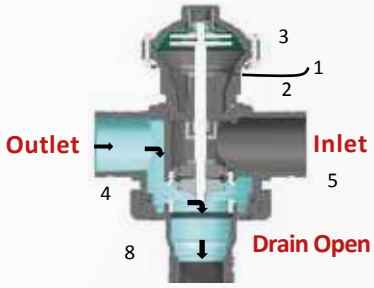
FILTRATION MODE



Backwash Mode: The valve closes the upper chamber and opens the lower chamber, causing reverse flow through the filter, ejecting impurities via the drain port.

A hydraulic command from the solenoid allows water to come in from control tubing [1], which pressurizes the Lower Control Chamber [2], forces the Diaphragm [3] actuated Plug Assembly [4] to move up towards upper seat [5], sealing the upper valve chamber drip tight. This allows water flow from the filter through the Drain Port [8] brings filter to backwash mode.

BACK WASH MODE



A manual override knob is installed on the solenoids to flush filter manually. During normal operation, the red arrow on the knob should be pointing towards the "Auto" position. Turning this knob to "open" position will activate the solenoid and put that filter into a backflush mode. Back flushing should be maintained for 20 seconds, then the knob can be returned to the auto position for normal irrigation.

SOLENOID VALVE

Installation

General Instructions

1. Kindly read carefully the installation instructions detailed in this manual before installing the filter.
2. Prior to start up , check for any damage to the unit & report it to nearest dealer /Distributor in case of damage found.
3. Filter should be installed on a suitable concrete platform with proper slope to avoid accumulation of water on platform.
4. Make sure to install the filter in the direction of flow arrow marked on the filte. .
5. Make sure you have enough space around the filter assembly & suitable light at the area of filter to enable proper visibility for maintenance.
6. Electric wiring should be done using standard and approved components by a qualified electrician only.
6. It is recommended to provide easily accessible emergency cut-off switch near to the controller.
7. Avoid direct water splash on electrical equipment.
8. Filter stands should be grout properly to avoid vibrations.
11. Ensure cover & clamp is properly closed & retighten the bolts during commissioning before starting the filter operation.
12. Keep the surrounding area to the filter dry & clean.

Hydraulics Instructions

1. The diameter of the upstream pipe must not be smaller than the filter inlet.
2. It is recommended to install a Quick Pressure Relief valve before the filter to protect the upstream line and filter from pressure surge.
3. It is recommended to install isolation valves on upstream & downstream lines to isolate filter during maintenance.
4. Ensure the filter is not exposed to water pressure that exceeds the maximum operating pressure defined in technical specifications. (Note that the maximum operating pressure indicated in the filter's specifications table includes the pressure caused by water hammer and pressure surge effects)
5. During the flushing process, a minimum back pressure of 2 bar (30 PSI) should be maintained at the outlet of the filter for efficient cleaning. In the event that the system cannot provide the minimum backwash pressure, a pressure sustaining valve should be installed downstream of the filter.
6. It is recommended to thoroughly flush the main line at the connection point to remove large objects that may damage the filter's internal mechanism.
7. Backflush line should not be reduced after the flush valve or should not be too long that it creates back pressure on the filter. This can affect cleaning of the filter during backwashing .
8. Make sure to provide drain valve to release filter pressure & evacuate filter before doing any maintenance of the filter .

Recommended Tools for Installation

Wrench Set

Cutter or Knife

Screw Driver Set

Allen Key Set

Recommended Installation Layout

The filter should be installed as shown below.

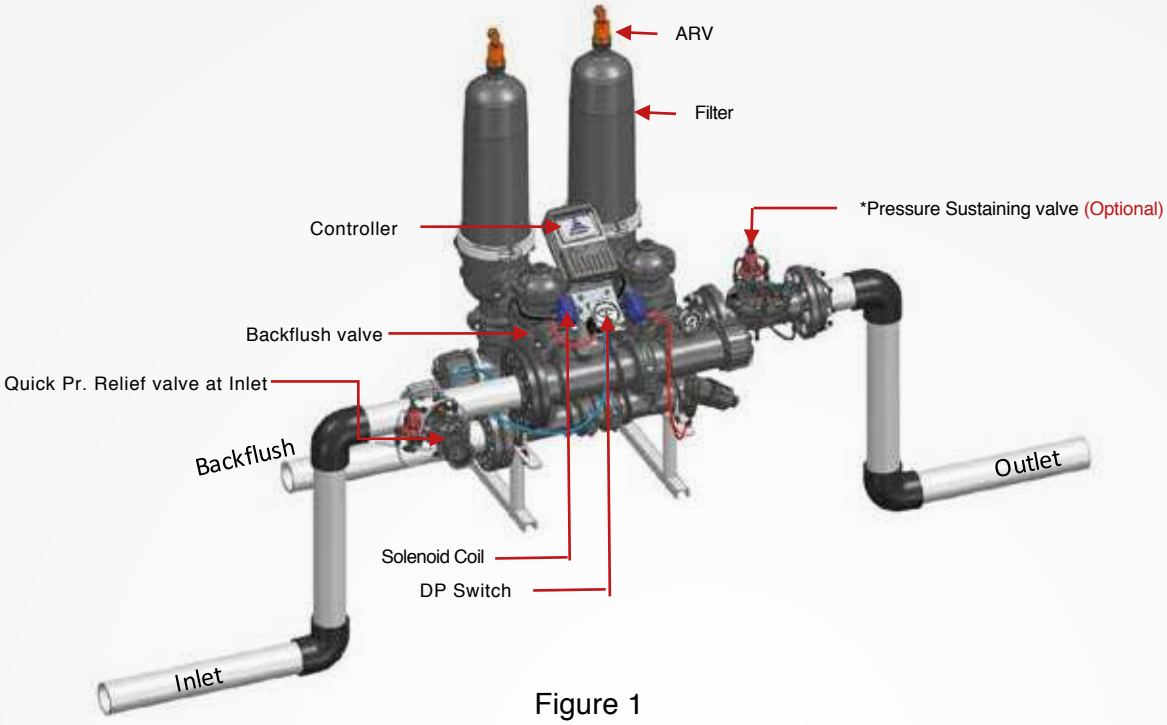


Figure 1

*** To be used if backwash pressure is less than 2 bar (30 PSI) during flushing.**

Installation Procedure

Step 1

Check filter for any damage & report immediately to the concern dealer or distributor .

Step 2

Connect the inlet ,outlet & drain ports with their valve to the main inlet & outlet lines as shown in fig 1 .

Step 3

Assemble the disc cartridge in the filter housing & assemble the cover on it with the help of St.St. clamp as shown in figure 2 below. Verify the cover & clamps are properly installed before starting the system 2

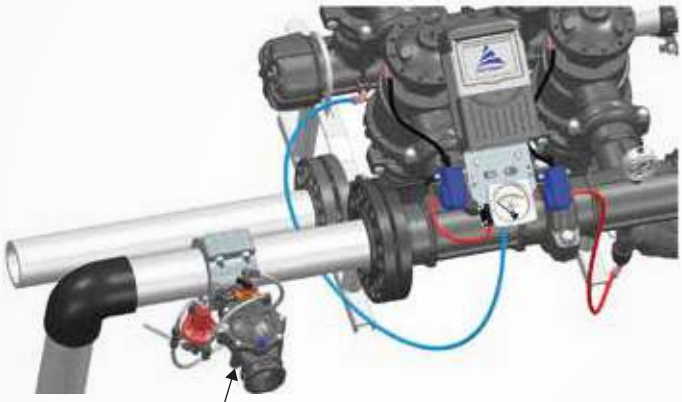
Figure 2

Step 4

Install the Air release valve on the top of filter cover as shown in figure below.

Step 5

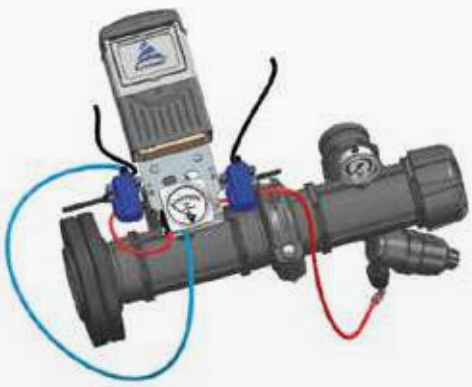
Install quick pressure relief valve on the port provided for it on Inlet manifold as shown in the figure below.



Quick pressure relief valve

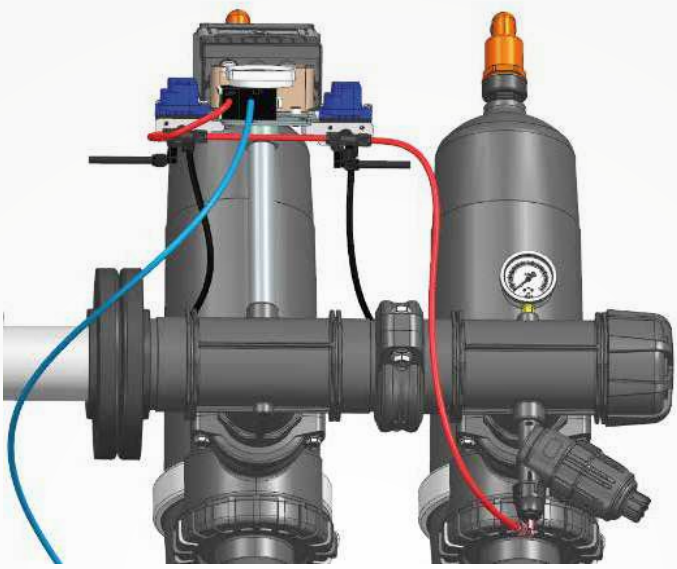
Step 6

Assemble controller stand & controller on inlet manifold as shown in figure .



Step 7

Connect Red control tubing coming from inlet to the HP port of DP switch & Blue control tube coming from outlet to the LP port on controller/P.D switch as shown in fig .



Step 8

Connect electrical connection as shown below . Ref to page no

Now your filter is ready for operation.

Backflush Controller connections

Wiring Diagram

DC MODEL

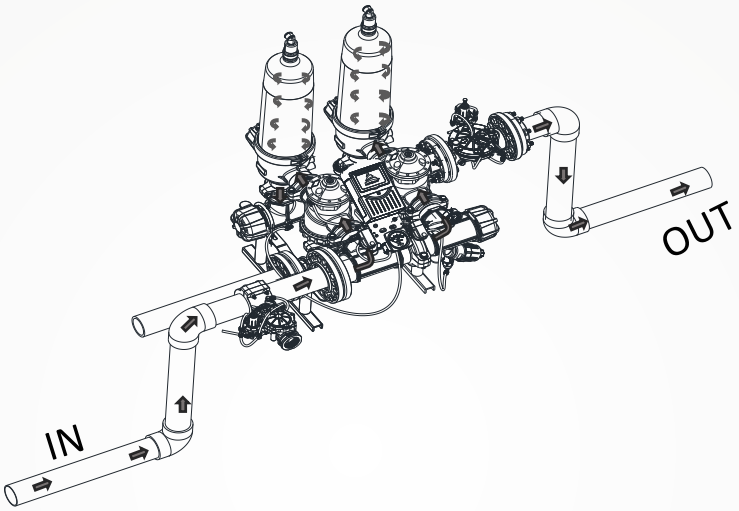
The drawing below shows the wiring of the DC model of the controller.

- The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.
- The powering of the unit can be either by 6v DC or 12v DC.
- The solenoids will be of 12VDC latch.

Make sure to DISCONNECT the POWER before inserting / removing the 2 ouputs plug-in unit.

Initial Operation

- Carefully read this operation manual prior to operating the filter.
- Only a qualified technician should commission the filter.
- Perform dry test run on the system and make sure all the wiring connections are ok.
- Open the flow of water by opening upstream valve or starting pump.
- Once air is vent out check for leakages from connections or assembly & repair them if any observed .
- Gradually open the inlet & outlet valves fully & allow water to flow from the filter .
- Activate manual back flushing by pressing manual button on the controller .check the inlet pressure while backwashing , the outlet pressure should not be less than 2 bar in this condition .in case of less pressure it is recommended to use suitable pressure sustaining valve to maintain this pressure to 2 bar .



- In filtration mode, water comes from inlet & gets distributed through backflush valves into the filter inlet .
- Filtered water comes out through disc flows through to the outlet manifold . Please see slide no 3.

Back flushing process

- Controller gives command to first solenoid coil when it get command from P.D switch /time .
- Solenoid operates backflush valve of first filter switching the valve position from filtration mode to backflush mode .
- First Filter gets backflush with the clean water from second filter and contaminants thrown-out backflush manifold .
- After completion of the set backflush time controller bring back backflush valve to previous position and first filter returns back to the filtration mode .
- After set dwell time second filter enters in back flushing mode and same process gets repeated till all the filters in the systems gets backwashed.
- After back flushing all the filters system returns back to the filtration mode till the next backflush cycle .

Attention

Check the downstream pressure during the back flushing cycle. Ensure it does not drop below 2 bar for efficient cleaning of the filter. Use pressure sustaining valve at filter outlet if required.

Maintenance

Filtration process

- Installation, operation, and maintenance should be performed in accordance with instructions described in this manual.
- A general inspection of the filter operation should be done regularly and prior to any scheduled maintenance. This includes seasonal and post season check-ups.
- When under pressure, the filter may start a flushing cycle automatically at any time, without prior indication.
- Do not perform any maintenance work or try to open filter parts when the filter is in pressurized condition.

General Inspection Procedure

- Initiate a flushing cycle manually.
- Check that the back flush valve opens and closes normally.
- Visually check the filter for leakage.

Maintenance Schedule

Once a Week

- Visually inspect the filter and parts for leakage. Repair if necessary.
- Perform 2 to 3 manual flushing of the filter .
- Make sure that during the flushing cycle the inlet pressure does not drop below 2 bar.

Once in a Month

- Check inlet & outlet pressure:- It should be below 0.5 bar (7 PSI) when pressure difference is above it & filter should gets back flush automatically that indicates pressure differential is high & discs are clogged, follow the point 1& 2 mentioned in trouble shooting table.
- Check for leakages from drain manifold during filtration :- If found leakage , check for damages of back flush valve seals .
- Backflush controller performance :- check controller function are working properly.

At the end of irrigation season

- Close the downstream isolation valve.
- Perform 2 to 3 manual flushing of the filter at 3 bar flushing pressure on outlet. (Increase pressure by closing downstream valve if it is less than 3 bar)
- Turn off the pump and close the upstream isolation valve.
- Drain the filter system to release the resilience pressure .
- Visually inspect the filter, O-rings and seals for any damage. Replace damaged ones if necessary and apply Silicone Molykote OKS111 grease for lubrication. Perform manual cleaning of the screen if necessary (Refer to Disc cartridge manual cleaning instructions given in this manual.)

Winterization

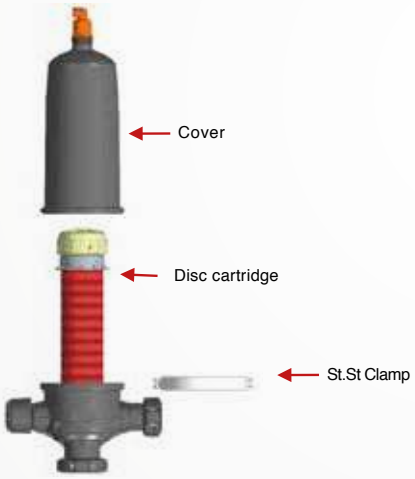
- To avoid damage or breakage, the filter, including the cover, valves and command tubes, must be drained prior to frost periods. Filter operation should be suspended in climates where the filter is exposed to freezing temperatures.

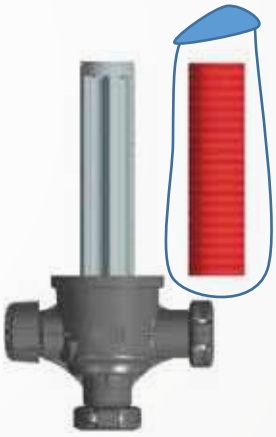
Cleaning Procedure

- During the operation, if the filter runs into back flushing frequently and the looping alarm does not subside, it indicates that the disc cartridge is clogged. In this situation, the disc cartridge needs a manual or chemical cleaning.

Manual Cleaning Procedure:

- Shutoff water supply.
- Ensure that the system is not pressurized .release the pressure by opening drain valve(at outlet manifold) before doing manual cleaning .
- Remove the St.St clamp, Cover & disc cartridge from filter housing .
- Unscrew the disc housing cap & take out the outer & inner cap assy from disc housing .
- Remove split ring from disc housing .
- Remove the disc (for convenience used plastic bags).
- Tie the discs in steel wire or a string .
- Now take clean water in bucket and dip the disc in it as shown in fig. thoroughly wash the disc with fresh water & reassemble disc housing as before .
- If the impurities have deposited and do not get removed by clean water , chemical cleaning of the disc disc is required.

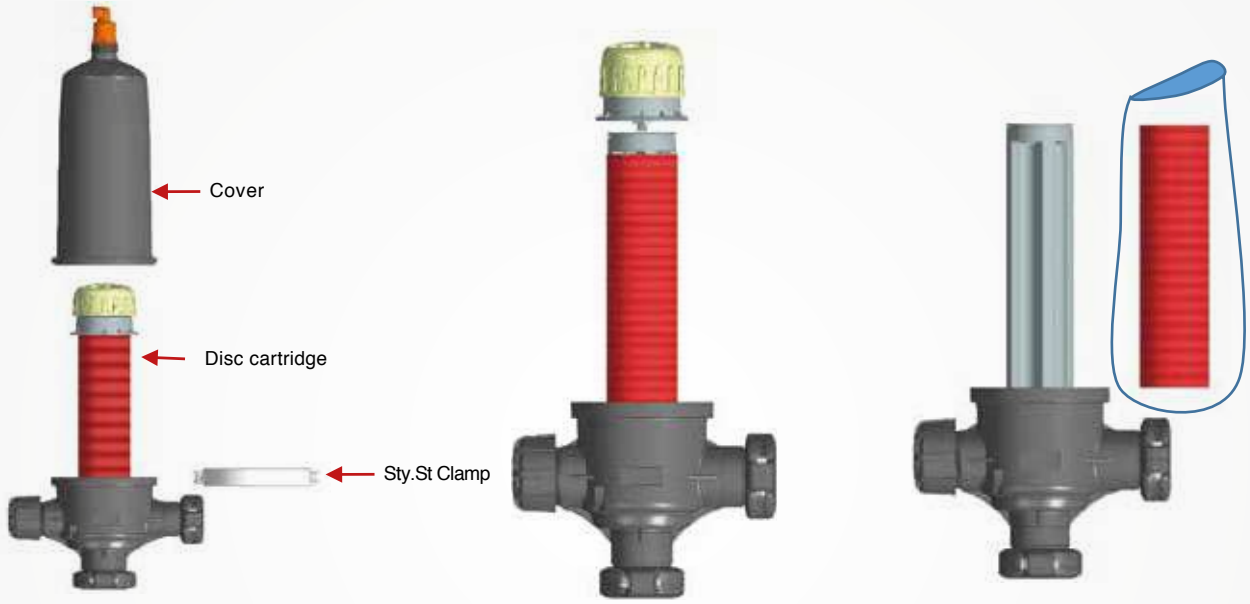


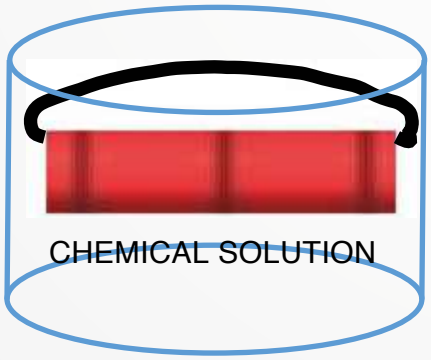


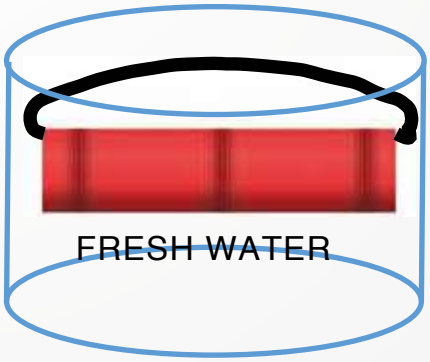
Before installing the disc cartridge, ensure to apply grease on the O-Rings.

Chemical Cleaning Procedure calcium ,magnesium & iron deposits

- Follow steps (1) to (7) given in manual cleaning procedure.
- Prepare a solution containing 7 liters of water and 3 liters of 30% HCL for calcium, magnesium & Iron deposits or a solution of 5% sodium hyper chloride (5 ltr water +5 ltr sodium hypochlorite (10%) for Organic, Bi-logical deposits .
- Dip the disc in this solution for 2-3 hours.
- Wash the disc with clean water to remove chemical residues as mentioned in manual cleaning procedure.
- Reinstall all the parts as before.







Apply

Before installing the disc cartridge, ensure to apply grease on the O-Rings.

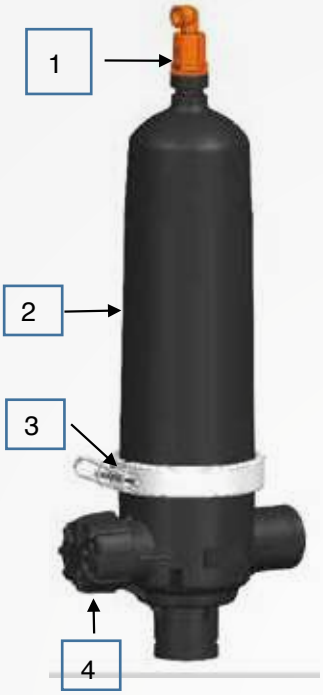
Attention

Take care while handling acids and chemicals; wear suitable hand gloves, shoes, full sleeve top, trousers and eye protection gear.

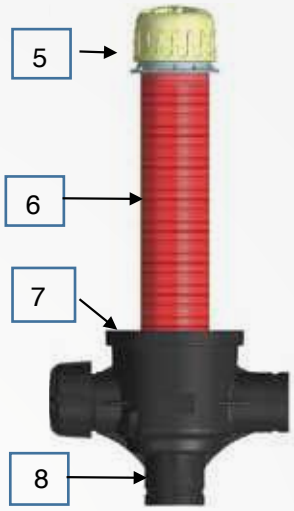
Troubleshooting Guide

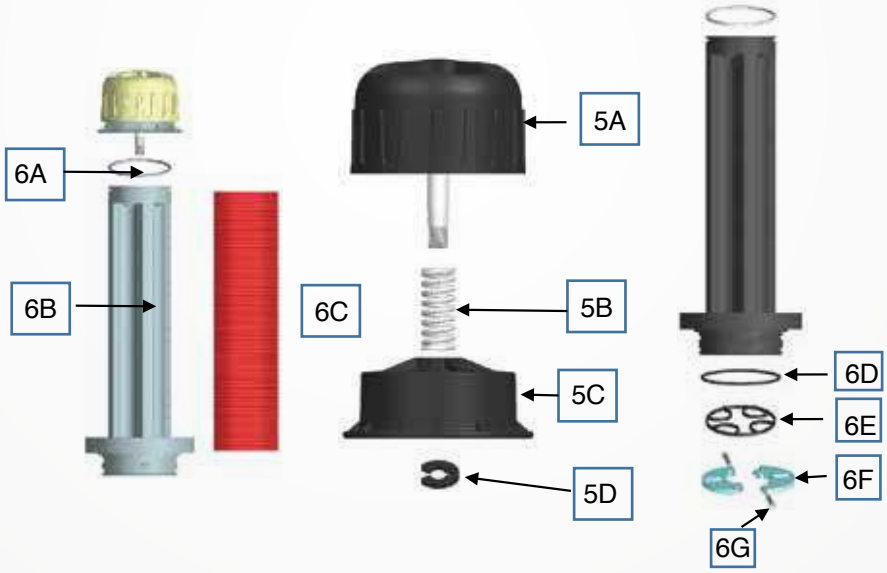
Problem	Cause	Solution
High pressure differential across the filter.	Disc cartridge is clogged.	1. Perform a manual back flush cycle. Follow the steps given below.
		a — Close the downstream isolation valve to increase backflush pressure to 3 bar.
		b — Press “Manual” button on controller to initiate the cycle. Repeat the step twice.
		c — Open the downstream isolation valve and verify the downstream pressure is came back to normal .
		2. Check for change in quality of water or flow through filter.
		3. If the problem persists, perform a manual cleaning of the disc cartridge. For details, refer to “Manual Cleaning Procedure” given in this manual.
Frequent flush cycles.	Water quality has changed.	Check the source water quality for poor quality conditions.
	Disc cartridge is clogged.	If the problem persists, perform a manual cleaning of the disc cartridge. For details , refer to “Manual Cleaning Procedure” given in this manual.
	Faulty DP Gauge (Erratic pointer or switch action).	Check if DP gauge is working properly. Erratic pointer or switch action may indicate the cleaning is required. Please report to your nearest dealer or distributor .
	disc cartridge is clogged due to calcium/manganese /Iron deposits	If the problem still persists, perform a chemical cleaning of the disc cartridge. For details , refer to “Chemical Cleaning Procedure” given in this manual.
Filter not back washing automatically.	No power supply to the controller.	Check power supply, loose wire connections or fuse of the controller. Tight the wire connections if found loose or Replace the fuse if faulty.
	Faulty DP Gauge	Check if DP gauge is working properly. Erratic pointer or switch action may indicate the cleaning is required. Please report to your nearest dealer or distributor
	Loose wire connections	Check for loose wire connections & repair if required.
	Clogged Y filter cartridge or blocked fittings/ control tube	Check for clogged filter cartridge & clean it if required. Check for blocked fittings /Control tubing's.
	Faulty/Blocked Solenoid.	Dismantle and clean the solenoid. Check for “click” by supplying rated input (24 VDC). Replace the solenoid if faulty.
Back wash valve remains open.	Backflush valve not switching on its position	• Check backflush valve piston assy is working properly. • check the diaphragm & seals for damage. • check the spring function . • check the function of respective solenoid • check the controller functions & commands are working properly
	Blocked in-line y- filter.	Disconnect upstream tube and check for firm water stream. Clean the screen cartridge of y-filter, if required.
	Debris on sealing seat (valve is continuously discharging small amount of water).	Manually operate the solenoid coil and let it remain open for sometime.
		If the problem persists, dismantle, clean and check that valve parts are not damaged.
	Damaged diaphragm /seals /Springs (continuous water discharge).	Replace the defective parts

FILTER SPARE PARTS



S.No.	DISCRIPTION
1	ARV
2	COVER
3	ST.ST.CLAMP
4	3” END CAP
5	PISTON ASSEMBLY
6	DISC CARTRIDGE
7	BODY SEALING GASKET
8	FILTER BODY

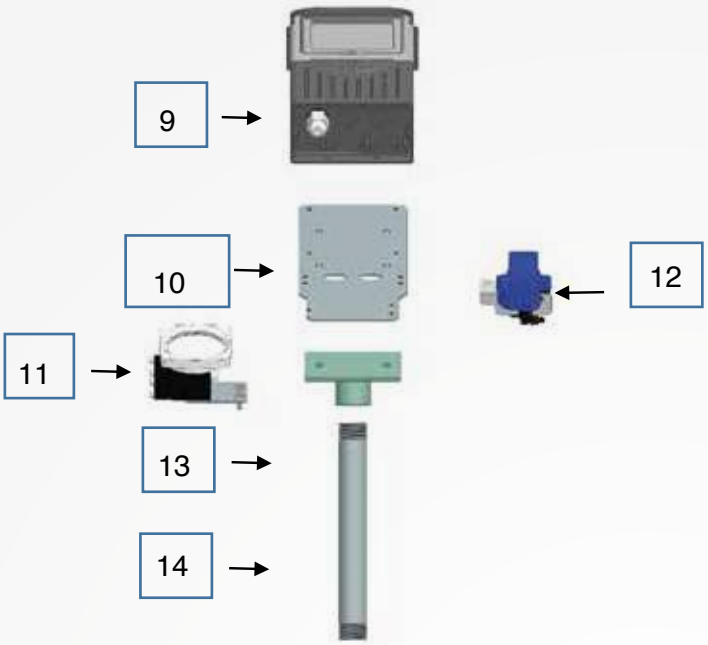




S.No.	DISCRIPTION
6A	SPILT RING
6B	DISC HOUSING
6C	DISC
6D	DISC HOUSING O RING
6E	CHECK VALVE SEAL
6F	CHECK VALVE FLAPS
6G	FLAP HINGE PIN

S.No.	DISCRIPTION
5A	ARV
5B	COVER
5C	ST.ST.CLAMP
5D	3” END CAP

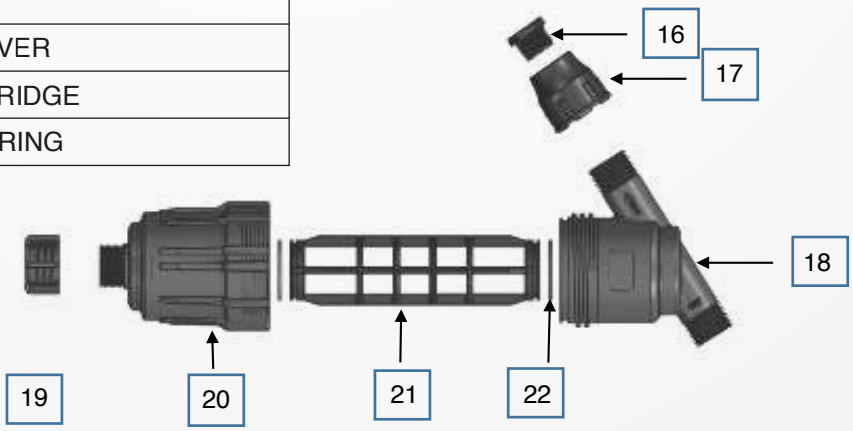
CONTROLLER



S.No.	DISCRIPTION
9	CONTROLLER
10	CONTROLLER MNT. PLATE
11	P.D. SWITCH
12	SOLENOID VALVE
13	BRACKET
14	PVC PILLAR
15	FILTER STAND

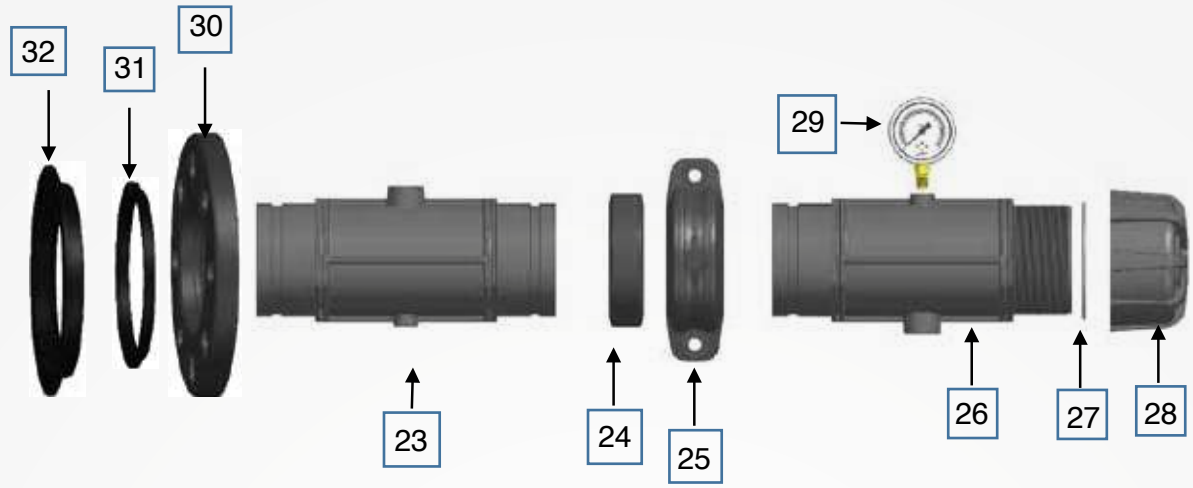
FILTER STAND

S.No.	DISCRIPTION
16	BRASS REDUCING BUSH 1/2"X1/4"
17	RED. 3/4" X 1/2"
18	3/4" FILTER BODY
19	¾" END CAP
20	3/4" FILTER COVER
21	SCREEN CARTRIDGE
22	CARTRIDGE O RING

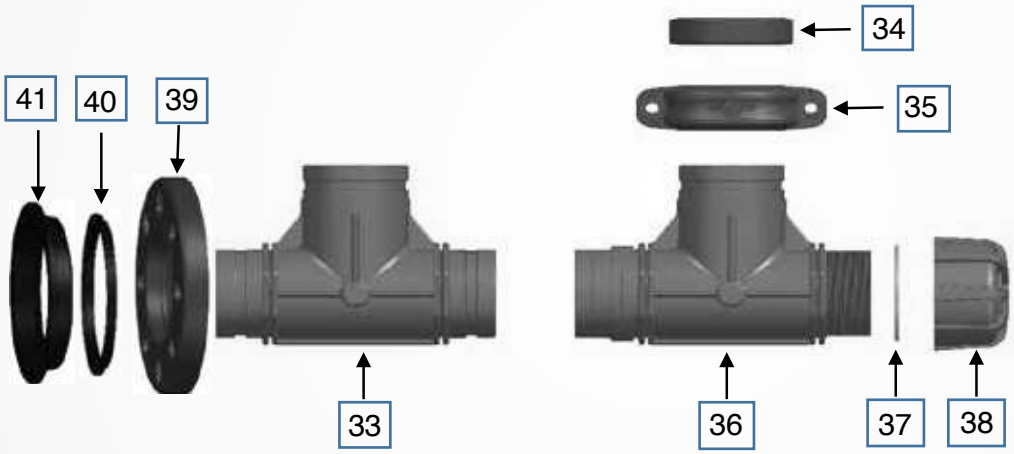


Y FILTER

INLET/OUTLET & BACKFLUSH MANIFOLD



INLET/OUTLET MANIFOLD

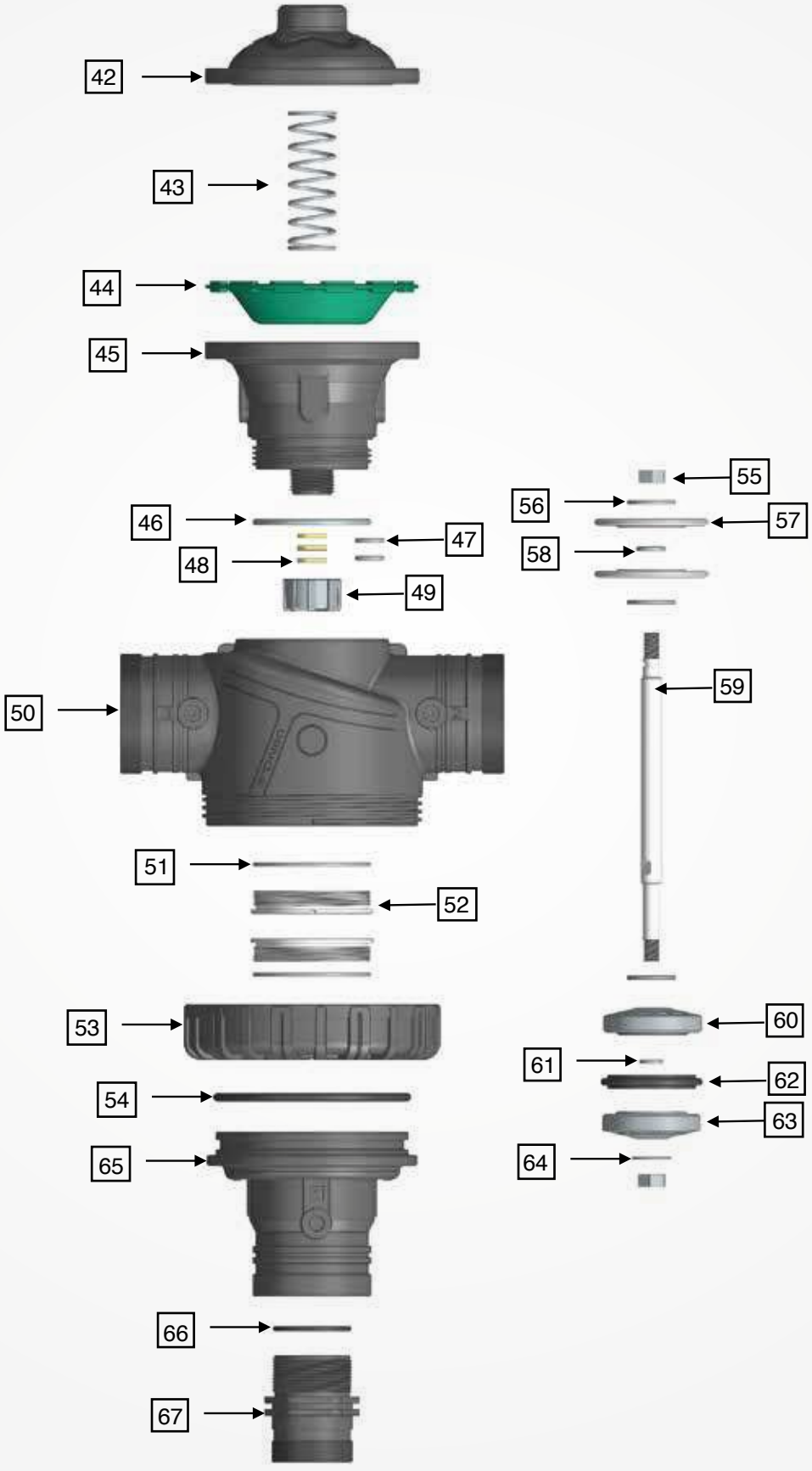


BACKFLUSH MANIFOLD

S.No.	DISCRIPTION
23	4” TEE VIC X VIC
24	4” VICTAULIC SEAL
25	4” VICTAULIC CLAMP
26	4” TEE VIC X THREADED
27	4” END CAP O RING
28	4” END CAP
29	2.5” S.S. PRESSURE GAUGE
30	4” VIC. FLANGE
31	4” C CLIP
32	4” VIC FLANGE SEAL

S.No.	DISCRIPTION
33	3” TEE VIC X VIC
34	3” VICTAULIC SEAL
35	3” VICTAULIC CLAMP
36	3” TEE VIC X THREADED
37	3” END CAP O RING
38	3” END CAP
39	3” VIC. FLANGE
40	3” C CLIP
41	3” VIC FLANGE SEAL

BACKFLUSH VALVE



S.No.	DISCRIPTION
42	COVER
43	SPRING
44	DIAPHGRAM
45	ACTUATOR
46	ACTUATOR O RING
47	SHAFT O RING
48	SPACER
49	END CAP
50	VALVE BODY
51	VALVE SEAT O RING
52	VALVE SEAT
53	COVER RING
54	LOWER ADAPTOR ORING

S.No.	DISCRIPTION
55	SS NUT M12
56	SS WASHER
57	DIPHGRAM SUPPORT
58	O RING
59	DRIVE SHAFT
60	BLACK PLUG
61	O RING
62	DYNAMIC SEAL
63	GRAY PLUG
64	WASHER
65	LOWER ADOPTER
66	2” VIC ADOPTER O RING
67	2” VICTAULIC ADOPTER

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