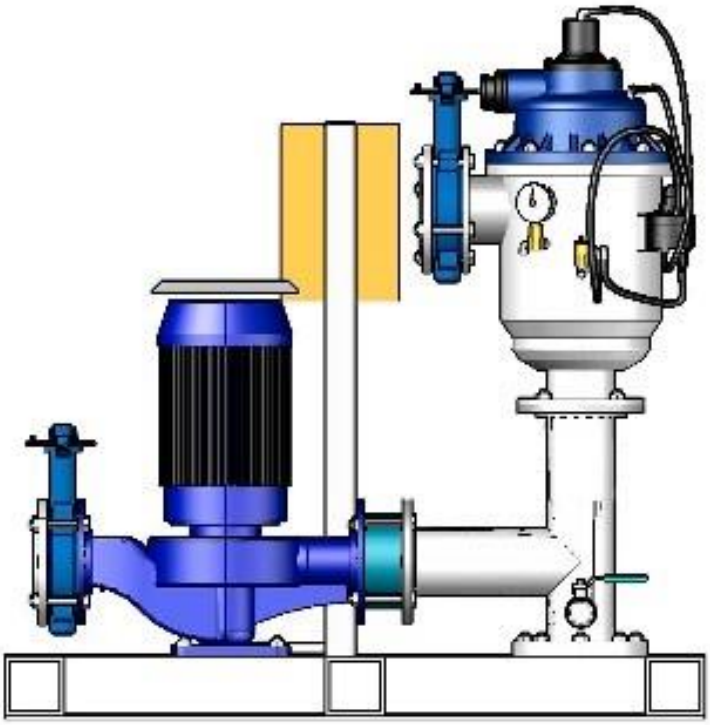
Artificial Destratification Module Manual



Designed to replicate natures winter thermal flow during the hot summer months

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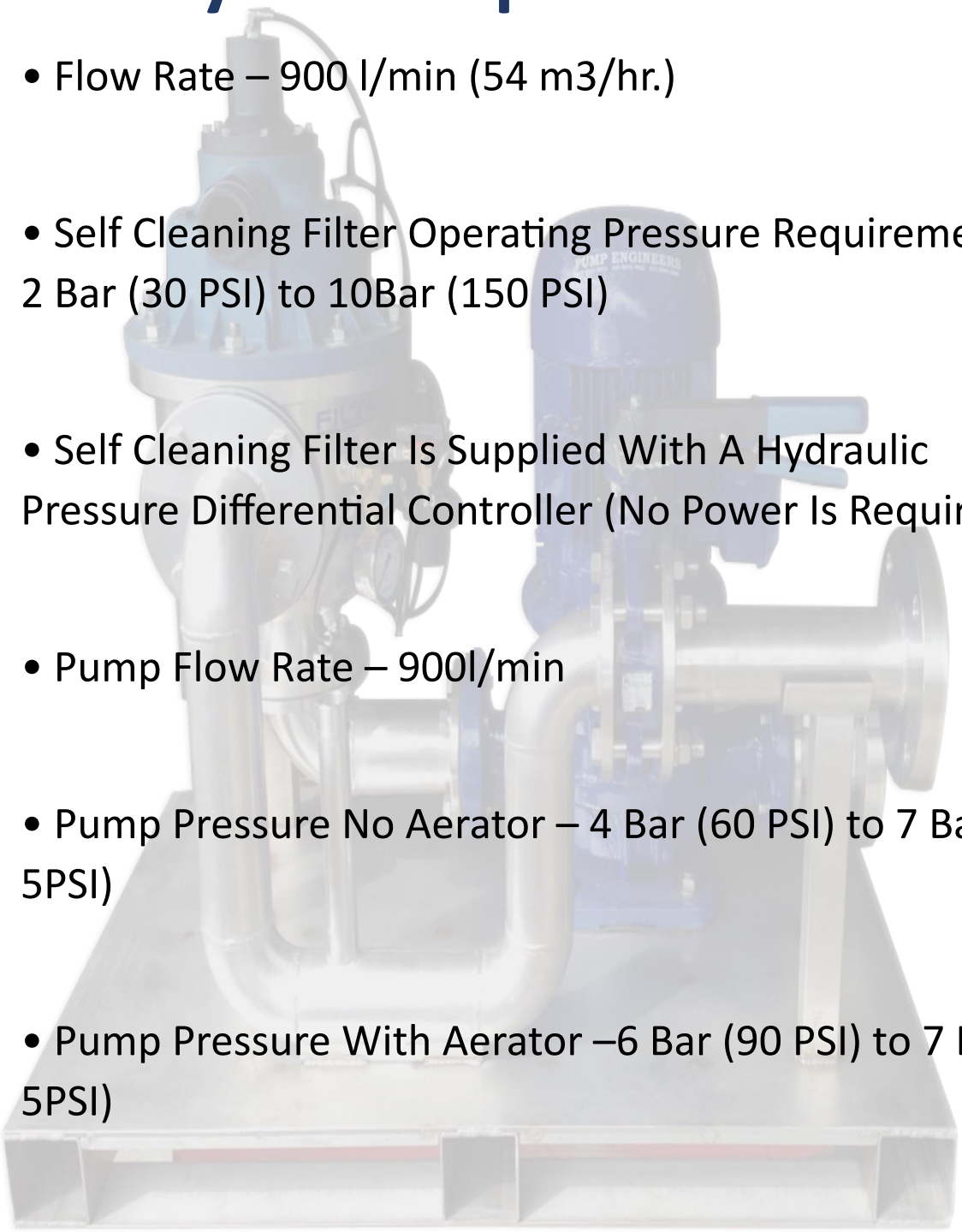
Systems Specifications



- Flow Rate – 900 l/min (54 m3/hr.)

- Self Cleaning Filter Operating Pressure Requirements – 2 Bar (30 PSI) to 10Bar (150 PSI)

- Self Cleaning Filter Is Supplied With A Hydraulic Pressure Differential Controller (No Power Is Required)

- Pump Flow Rate – 900l/min

- Pump Pressure No Aerator – 4 Bar (60 PSI) to 7 Bar (10 5PSI)

- Pump Pressure With Aerator –6 Bar (90 PSI) to 7 Bar (10 5PSI)

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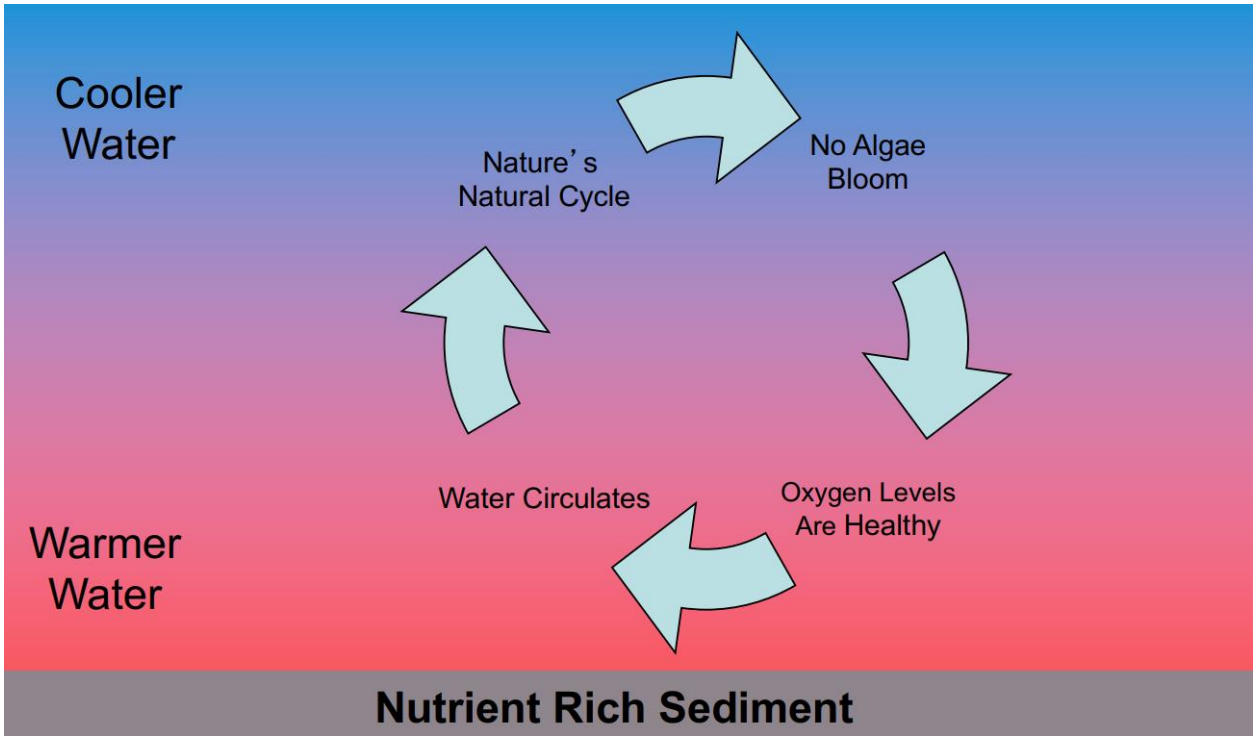
Cross Section of Golf Course Lake

WINTER MONTHS



Water Remains Healthier Due To The Natural Circulation Of Warmer Water Moving Up and Oxygenated Cooler Water Dropping Down To The Lower Levels.

Nutrients And Contaminants Settle At The Bottom Of The Lake!

Contaminants Entering The Lake Need To Be Reduced!

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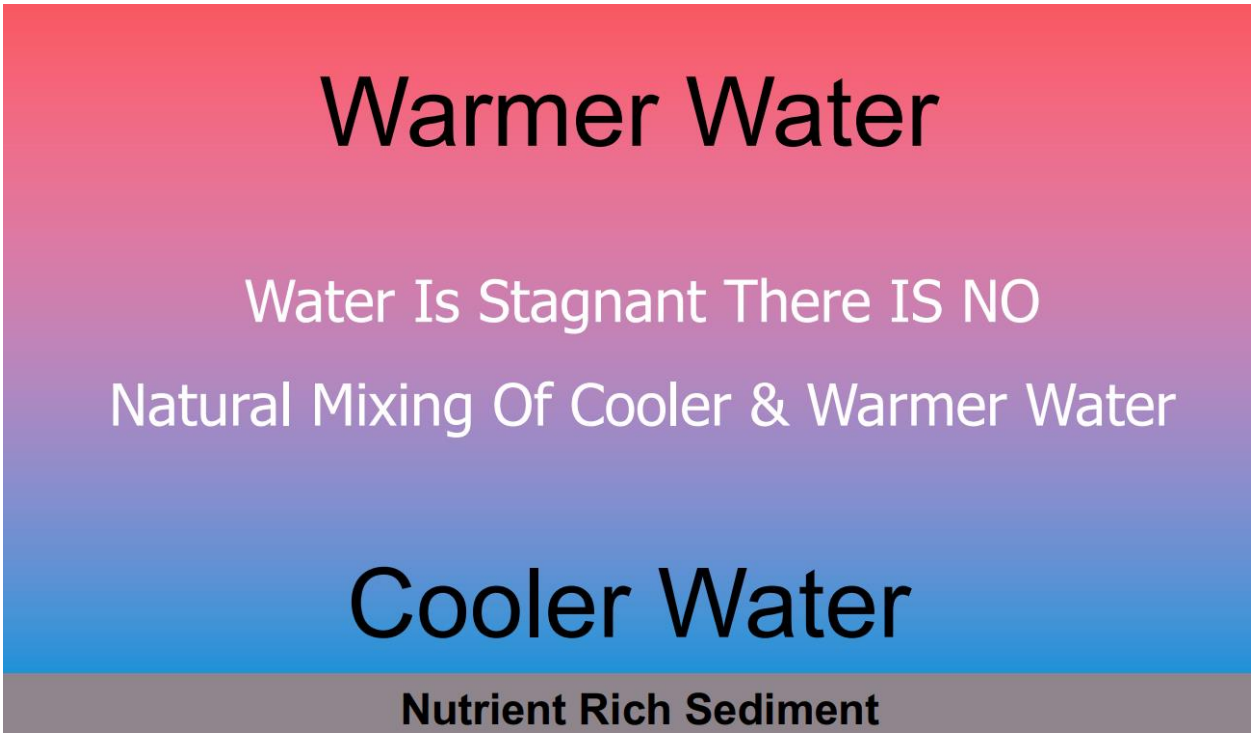
SUMMER MONTHS



Conditions In The Lake Are Reversed. Cooler Water Is now At The Bottom Of The Lake With The Warmer Water Being The Top Layer. There Is No Natural Circulation Of Water From The Depths To The Surface Of The Lake.

Oxygen Levels In The Deeper Water Become Depleted!
Contaminants Entering The Lake Need To Be Reduced!

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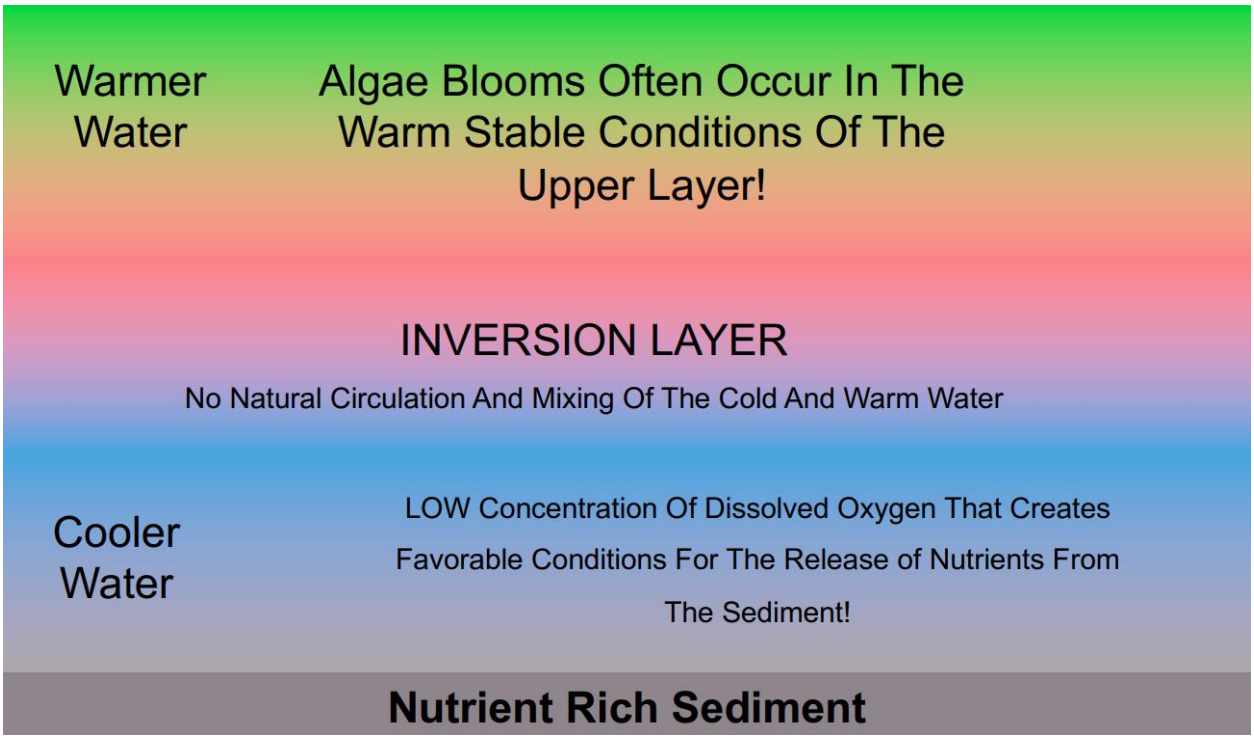
Cross Section of Lake

SUMMER MONTHS



Artificial Destratification Involves Increasing The Circulation Of The Water That Circulation Between The Shallower And Deeper Layers Of The Lake.

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Artificial Destratification

- IGS Water Aeration is achieved by recirculating water through a Water Conditioner and Aerator.
- A water intake manifold allows water to be drawn through the pump from various parts of the lake, especially the more stagnant parts that tend to suffer due to minimal or no water movement.
- The suction port should be installed as low as possible in the water table making sure that they do not clog up with algae or mud.
- Water is recirculated through the IGS Water Conditioner where areas of low and high pressure create turbulence increasing the water alloy contact ratio. Mixed with air in the aerator chamber subtle changes made to the minerals and nutrients in the water lower and along with the increased oxygen change the electrical charge of the minerals allowing for a softer wetter more aerated healthier water. The plumes of air rise to the surface creating a thermal flow.
- This can be achieved by one of two methods;
  - IGS Water Aerator being installed at the lowest point of the dam, or
  - A conditioned water fountain can achieve the same results.
- A circulation pattern is set up that reduces the differences in temperature, oxygen and nutrients between the top and the bottom waters.

- **Artificial destratification can reduce algal growth by**:
- Reducing the sediment phosphorus load available to the water column and so starving the algae of nutrients.
- Mixing algae deeper into the water column and starving them of light.

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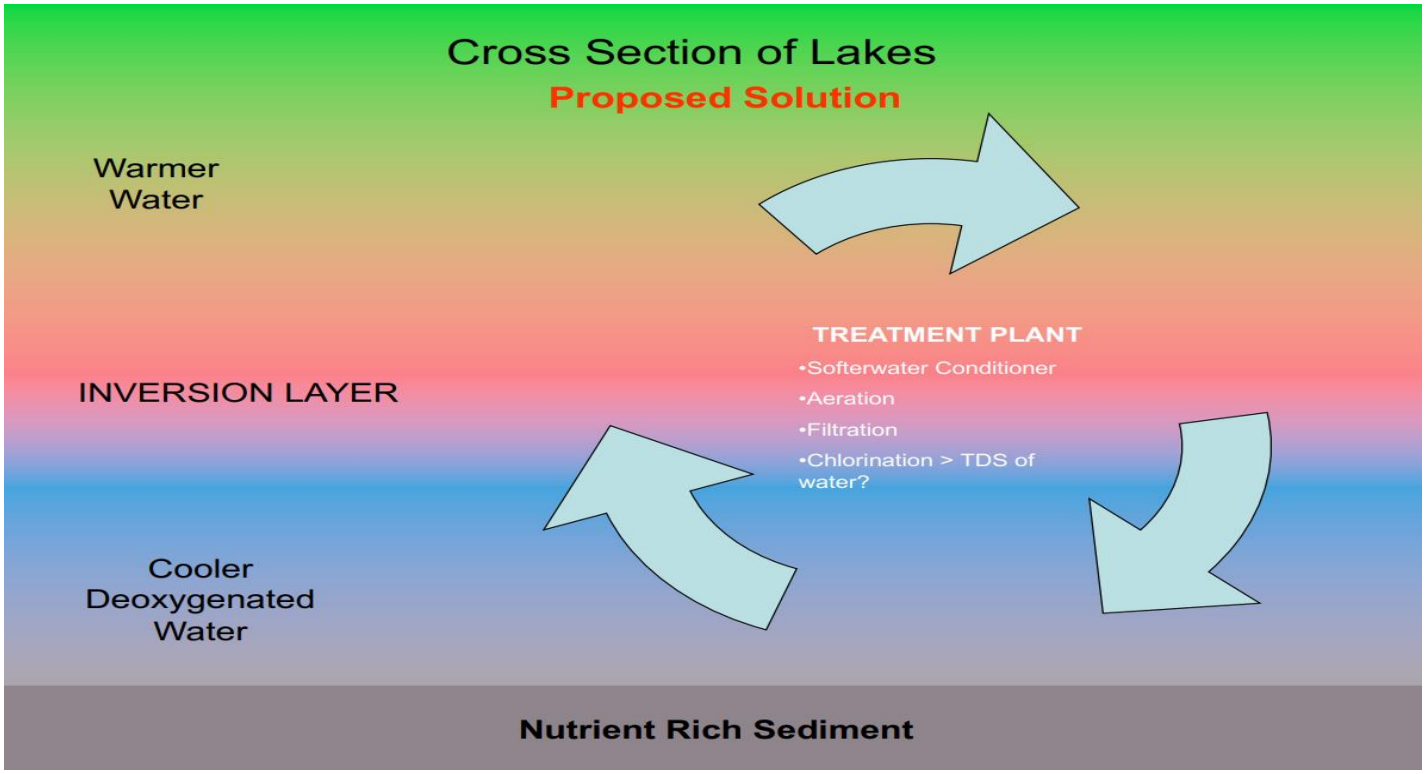

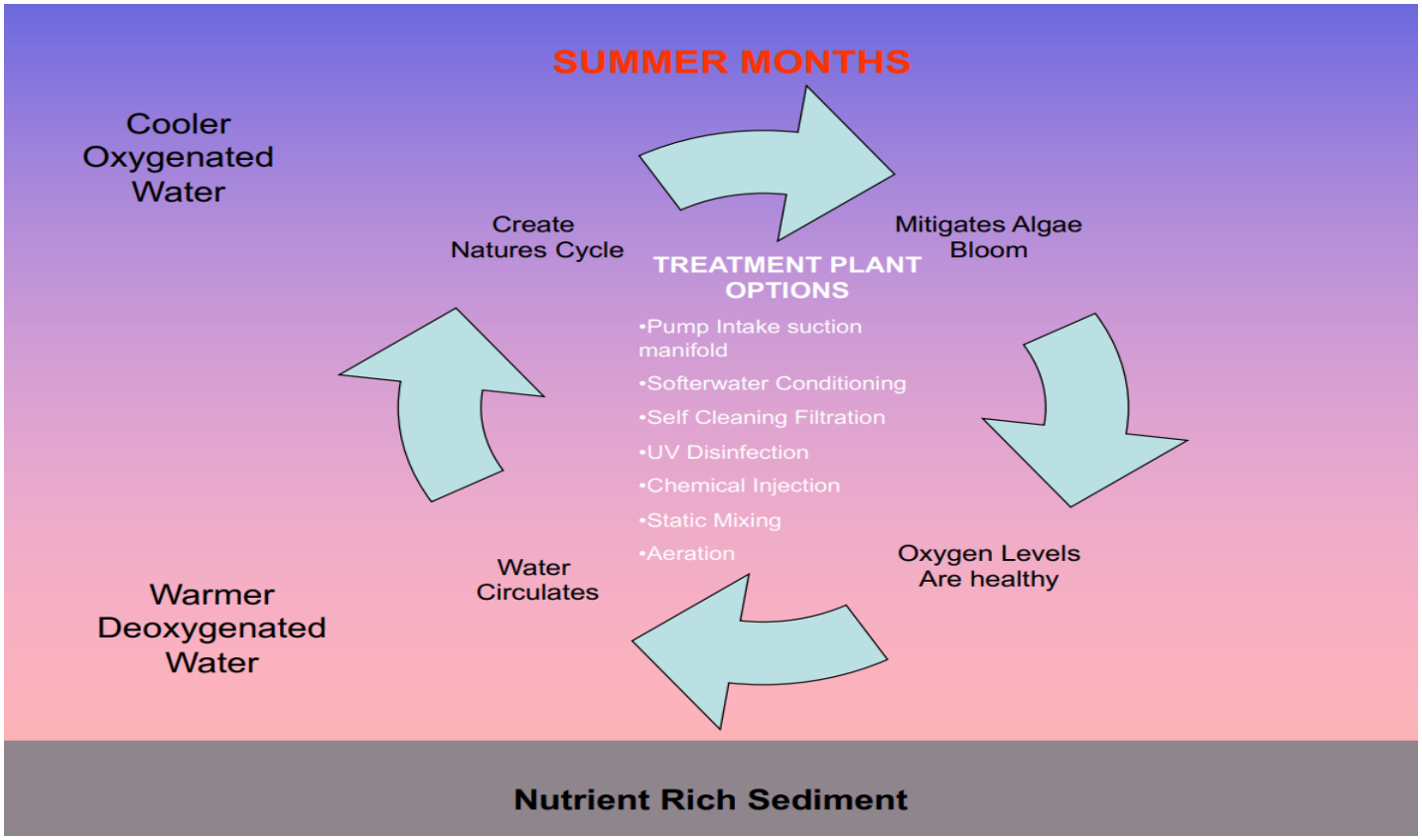

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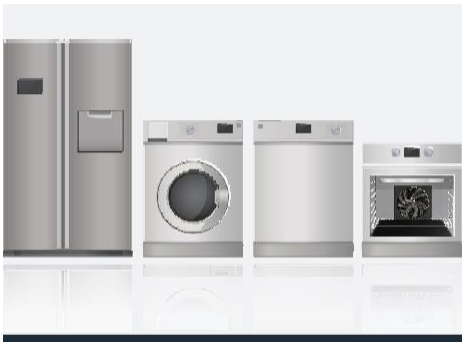
IGS WATER

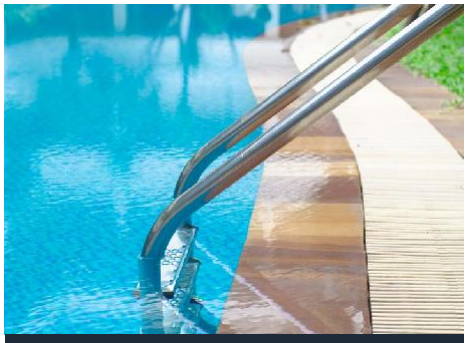
applications

Showers



Washing Machines & Dishwasher

Residential, Caravan & RV



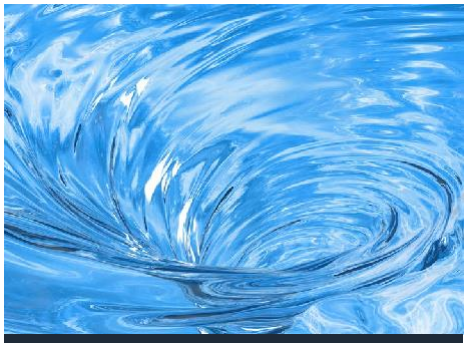
Swimming Pools

Drill Rigs

Commercial

Cooling Towers

Irrigation



Static Mixers

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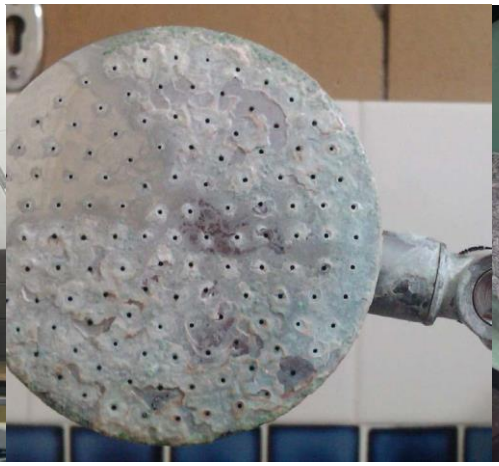
The global water problem






female header units

Model	Thread	Minimum Flow Rate (Ltrs/min)	Average Flow Rate (Ltrs/min)	Maximum Flow Rate (Ltrs/min)
T5	1/2" BSPP	0.5	5	7
T9-15	1/2" BSPP	6	9	12
T9-20	3/4" BSPT	6	9	12
T12-15	1/2" BSPP	10	12	15
T12-20	3/4" BSPT	10	12	15
T18	3/4" BSPT	16	18	26
T34	3/4" BSPT	27	34	45
T56	1" BSPT	41	56	68
T70	2" BSPT	65	70	90
T100	2" BSPT	91	100	125
T220	2" BSPT	126	220	300
Showersoft	1/2" BSPP Female/Male	6	9	12
Appliance	3/4" BSPP Female/Male	6	9	12

flanged units

Model	Table E	Minimum Flow Rate (Ltrs/min)	Average Flow Rate (Ltrs/min)	Maximum Flow Rate (Ltrs/min)
T335	65mm	301	335	450
T500	80mm	451	500	800
T900	100mm	801	900	1400
T1600*	125mm	1401	1600	2500
T2840*	150mm	2501	2840	3500
T4000*	200mm	3501	4000	4900
T5400*	250mm	4901	5400	6500
T7000*	300mm	6501	7000	8000
Concentric Reducer or Inline Manifolded Options, Contact Us For Further Information				
All models can be custom manufactured for your application				

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IGS WATER

technical information, results and advantages

THE CHEMISTRY

- Blended in a specialized foundry process, each alloy core is made up of a number of dissimilar metals scientifically selected from the anode and cathode galvanic scale. The alloy is not a sacrificial anode (i.e. does not need replacement).
- On contact with water thousands of intense galvanic electrochemical reactions occur along

the length of the alloy core.

- Minerals are attracted to these galvanic sites as they flow through the system.
- The electrical charge or zeta potential of the minerals in the water is reduced allowing the minerals to aggregate and form nano sized colloids which remain in suspension rather than precipitate on pipes and associated equipment.

THE PHYSICS

- Each alloy core has been designed and engineered for a specific flow range.
- Each core has offset discs so that there is no direct route for the water to travel. There is a definite water alloy contact.
- Water velocity is increased as water is squeezed through the disc apertures and on through the chambers along the length of the core.
- High- and low-pressure areas are developed either side of each disc.
- Extreme turbulence is generated in each chamber along the length of the core.
- The increase in water velocity and turbulence combines and create a mechanical washing action which prevents minerals building up on the core.

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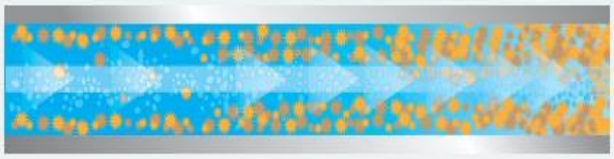
A SIMPLIFIED LOOK AT OUR ADVANCED TECHNOLOGY



STANDARD WATER SYSTEM scale-causing minerals have a high electrical charge, repel each other and 'stick' to pipes and equipment causing costly hard

WITH SOFTERWATER Non-sticking nano sized colloids are formed and flow through the system in suspension significantly reducing hard water problems.

- ✓ **Eco-Friendly**
- ✓ **Chemical & Salt Free**
- ✓ **No Moving Parts**
- ✓ **Maintenance Free**
- ✓ **No Power Source Required**
- ✓ **Australian Made**
- ✓ **Non-Sacrificial**
- ✓ **Australian Made**
- ✓ **Lifetime Warranty**

Nuclei are introduced into the system providing an attractive site for minerals to combine as nano sized colloids. These remain in suspension and flow through the system rather than precipitating on pipes and equipment. The subtle changes to the electrical charge of the minerals in water have significant effects on reducing downstream costly problems.

- ✓ **Lowered water surface tension Reduced hard water problems**
- ✓ **Investment in capital equipment is protected Improved equipment efficiency**
- ✓ **Reduced scaling and corrosion problems**
- ✓ **Soaps, detergents and shampoos mix and lather better**
- ✓ **Swimming pool water is clearer, softer, backwashing is reduced, saltwater chlorinators work more effectively, and chemical usage is reduced**
- ✓ **Ability to irrigate with brackish water**

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INSTALLATION GUIDE

Congratulations on your purchase of **Your IGS Water Conditioner, ...The Water Conditioner That Works!** The following instructions MUST BE ADHERED TO in order to obtain maximum efficiency.

Treatment Chemicals

Treatment chemicals which react with dissolved solids will also break down suspension. Typical examples are detergents, phosphates, acids, etc. However, any solution in which:

- the reaction is completed
- equilibrium reached
- a chemical is added downstream of the TUF,

will, in most cases, not interfere with the operation of the TUF. The following pollutants will coat the TUF anti-scale system. (This is due to the "stickiness" and/or insulation properties of the pollutants, disabling the galvanic action of the unit)

- soluble oil 3 ppm
- silicones
- glycerin
- chromates
- anything "sticky"

NOTE - In most re-circulating installations such as cooling towers, etc., it is **VERY IMPORTANT** that a previously chemically treated system be thoroughly purged of all residual chemicals. Disconnect and remove all automatic chemical containers to prevent accidental usage of chemicals which could render TUF ineffective. After backwashing sediment from the system and purging all lines,

refill the system with clean water from normal supply. **DO NOT ADD CHEMICALS, INHIBITORS, ETC. IF IN DOUBT, CONTACT TUF ENGINEER**. Control total soluble salts to less than 1000 ppm & pH at 9.5 or less. Do not stop chemical treatment for bacteria in the water.

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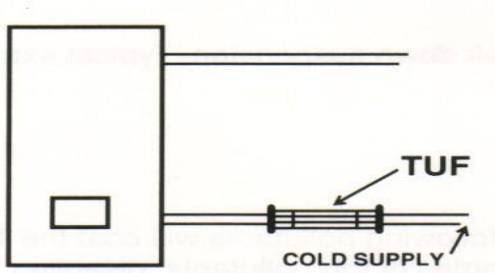
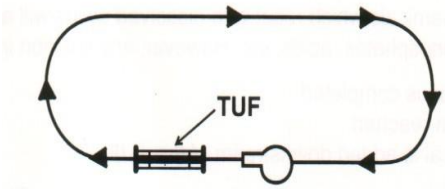
POSITION

It is very important that TUF is installed in the correct position

A. In most installations e.g. **HOT WATER SYSTEMS**

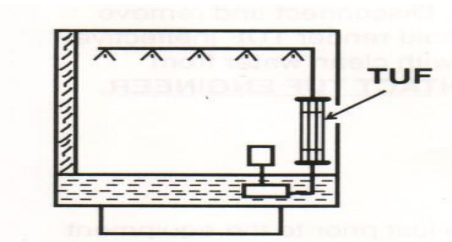
- fit TUF in the cold-water supply line just prior to the equipment to be protected.





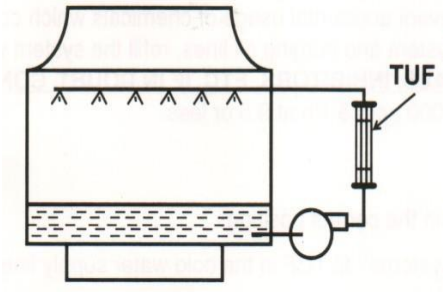
B. HOT WATER
RING MAIN - should be positioned immediately after (downstream) of the

circulatory pump.



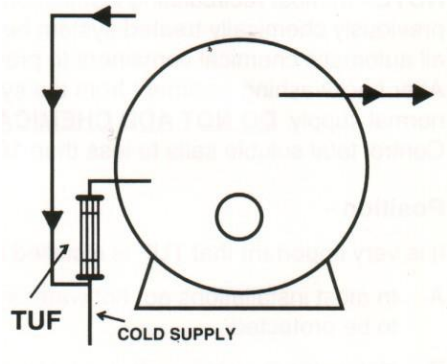
C. EVAPORATIVE AIR CONDITIONERS

- should be positioned immediately after the circulatory pump and prior to the distribution pipes to the evaporative pads (this is usually a flexible plastic pipe).



D. COOLING TOWERS - should be positioned immediately after the circulatory pump.

E. BOILERS - must be fitted to the supply line after make-up water is added and positioned as close to the boiler as possible.



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Installation

- Locate the correct position in your system for the TUF - usually just prior to the equipment which is most important to protect.
- Remove the corresponding length of piping to install TUF (see diagrams Typical Installations).
- In re-circulating systems, TUF MUST BE INSTALLED:
  - after make-up water is added
  - the pump(s) discharge
  - before the water goes into the system being protected
  - on a ring main - where possible the TUF should be installed so that secondary ring main passes over the TUF.

There should be no series connection of equipment to be protected without a TUF between them. It makes no difference at what attitude TUF is installed - i.e. vertical, horizontal, angled, flow from either end.

There are to be no additions of any kind to the system after installation without re-evaluating whether a new model TUF is necessary.

TUF should be installed on the cold-water supply line. Maximum operating pressure 1000 KPA.

Average Flow Rates

Model T18D	18	litres/minute	Model T100	120	litres/minute
Model T18	18	litres/minute	Model T220	220	litres/minute
Model T34	34	litres/minute	Model T336	336	litres/minute
Model T56	56	litres/minute	Model T500	500	litres/minute
Model T70	70	litres/minute	Model T900	900	litres/minute

Installer Instructions

Components used for water treatment purposes shall comply with AS3500.1.2

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Installation, Operation and Maintenance Manual

Metric

Models: FW100EX & FW150, 100 & 150 mm (4” - 6”) Piston models Electric Controls

Model No:		
Nominal Size	mm	inch
Serial No.:		
Screen Size (Micron):		
Flange Type		

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Index

Features include:

▲ Stainless steel filter body as standard (304 grade).

▲ All parts are made of corrosion resistant metals or engineering plastics.

▲ Fully automatic back flush operation.

▲ Available with hydraulic or electric controls.

▲ Large filtration area.

▲ Wide range of fine screen sizes, 50 to 800 microns.

▲ Standard sizes from DN50 to DN350 (2” – 14”).

▲ PN10 pressure rating as standard.

▲ Simple and quick installation.

▲ Full support and after sales service.

▲ Designed, built, owned and tested in Australia

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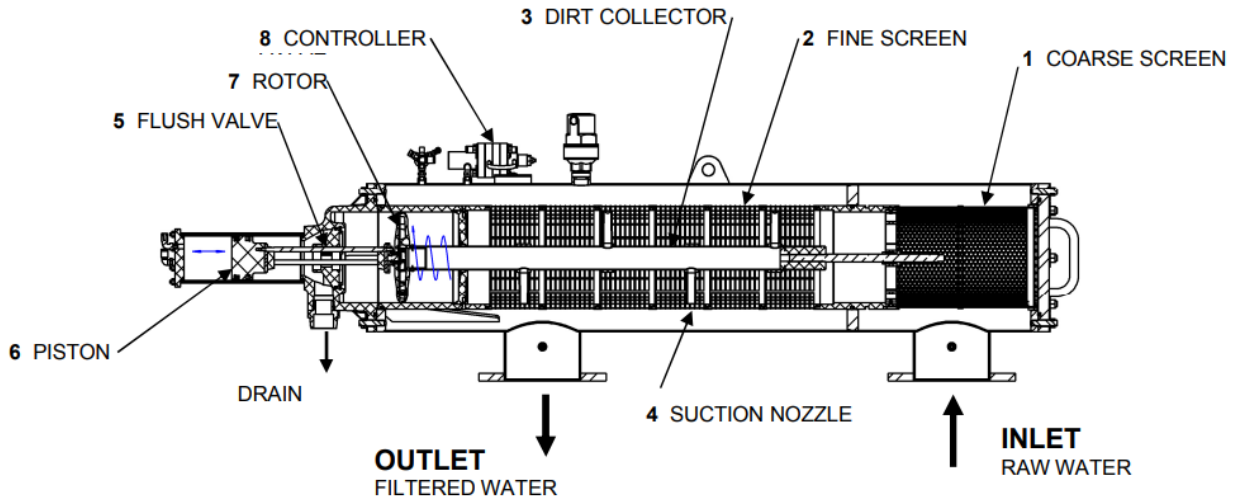
2.0 Operating Principal



Put simply the IGS filter cleaning cycle works in a similar way to a vacuum cleaner, cleaning the solids off the fine screen with suction nozzles that rotate and spiral up and down to clean the whole fine screen area.

During normal filtering mode the raw water enters the Inlet of the filter, passes through the Coarse Screen (1), the 7 mm perforations remove large debris that may obstruct the lower mechanism. Water then travels to the inside and through the Fine Screen (2) to the Outlet.

The solids in the water are trapped on the Fine Screen (2), eventually causing a pressure drop (DP) across the filter. At a pressure drop of 40 – 50 kPa the Controller (8) activates the cleaning cycle by opening the Flush Valve (5) to drain (atmosphere). The interconnection of the Suction Nozzles (4) via the Dirt Collector (3) to the Drain causes a back flushing or 'vacuum clean' effect on the Fine Screen (2) with a high velocity suction jet of water from the clean side of the screen, removing the dirt on the screen as it passes through.

The water escaping via the Rotor (7) causes the Dirt Collector and Suction Nozzle assembly (3 & 4) to rotate. The Piston (6) moves this assembly down the length of the Fine Screen (2) in a spiraling motion, cleaning the entire screen surface area in approximately 15 seconds. The Flushing Valve (5) closes, and the Piston (6) is returned to its original position, ready for the next cycle. Cleaning also occurs on the return stroke.

3.0 Technical Specification

Model No.	FW 100EX	FW 150
Inlet / Outlet Nominal size mm/inch	100 / 4”	150 / 6”
Connections	Flanged	
Min. operating pressure	200 kPa at all times (30 psi)	
Max. operating pressure	1000 kPa standard (150 psi), higher available on request	
Filter Area	5600 cm²	
Max. working temp	65° C	
Flushing Data		
Drain line size mm/inch	50 / 2”	
Flush cycle duration	15 – 20 seconds (depending on pressure)	
Flush cycle volume	150 litres approx (depending on pressure)	
Min. flow for backwash	35 m³/hr (8 l/sec) @ 200 kPa	
Materials of Construction		
Filter body	304 grade stainless steel *	
Cover lid assy.	GRN (glass reinforced nylon), St/St, brass	
Cleaning mechanism assy.	St/St, brass, GRN	
Fine screen	316 St/St mesh, GRN	
Coarse screen	GRN	
Seals	NBR, EPDM	
Controller	St/St, brass, Acetyl, PVC,	
Control tubing	Polyethylene	

* Other materials of construction 316 etc. are available on request.

Filtration Apertures Available

micron (µm)	50	80	100	**120***	150	**200***	400	800
mm	0.05	0.08	0.10	**0.12**	0.15	**0.20**	0.4	0.8
Mesh	250	200	150	**120**	100	**80**	40	20

* Most common sizes used.

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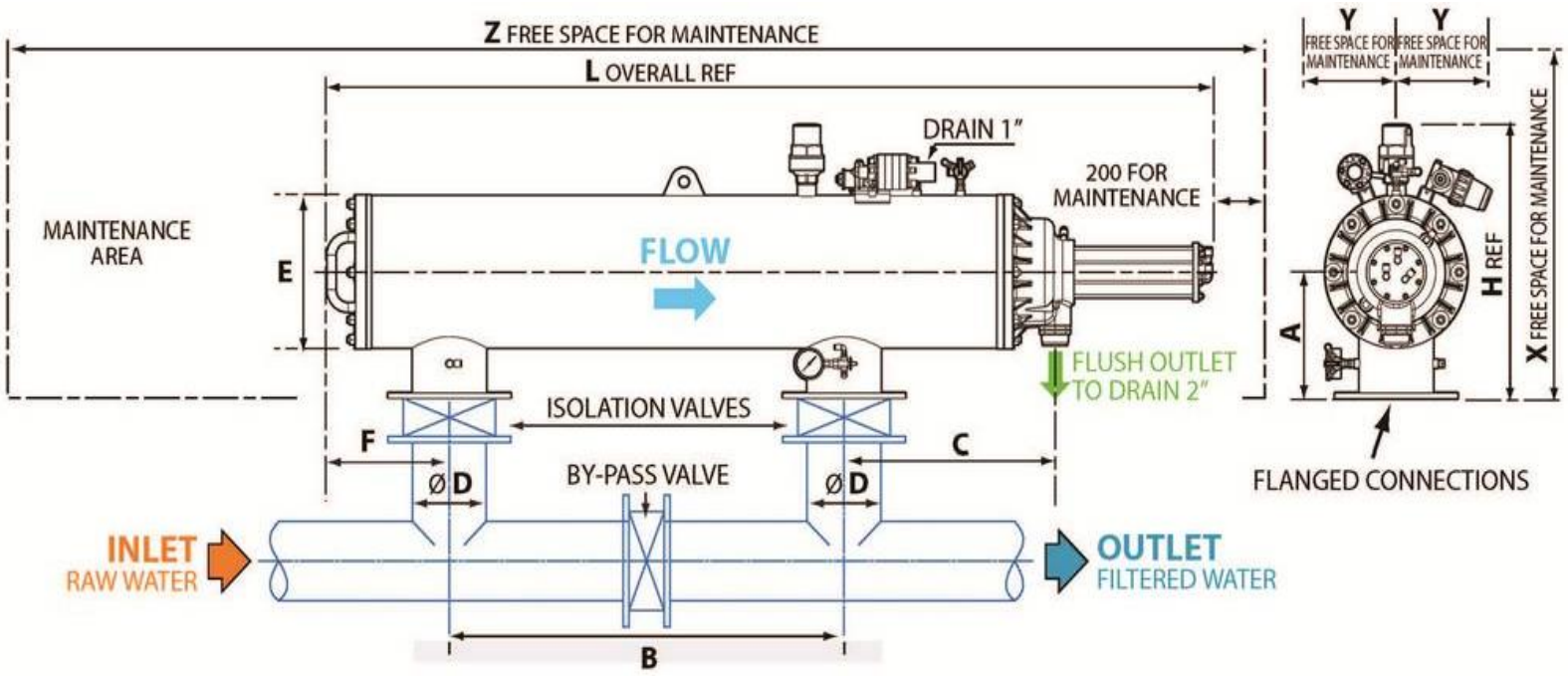
4.0 Dimensional Details



Model No.	ØD Nominal Size		Nominal Flow		Filter Area	Dimensions mm											Weight Kg	
	Inch	mm	l/sec	m³/hr	cm²	A	B	C	Ø D (NB)	E	F	H	L	X	Y	Z	Empty	Full
FW100EX	4	100	28	100	5600	235	900	466	4" / 100	273	229	525	1952	730	360	3650	85	165
FW150	6	150	50	180	5600	270	900	481	6" / 150	325	279	583	2017	780	360	3720	105	215
FW150EX	6	150	50	180	8115	270	900	844	6" / 150	325	279	583	2380	780	360	4430	115	265
FW200	8	200	89	320	8115	270	900	966	8" / 200	325	389	583	2612	780	380	4660	130	320
FW250	10	250	111	400	8115	270	900	966	10"/250	325	392	583	2615	780	400	4660	155	345
FW250EX	10	250	111	400	12423	310	1100	966	10"/250	406	682	665	3105	870	420	5310	235	540
FW300	12	300	167	600	12423	310	1100	966	12"/300	406	682	665	3105	870	420	5310	240	550
FW350	14	350	250	900	12423	310	1270	966	14"/350	406	512	665	3105	870	450	5310	285	595

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5.0 Safety Instructions

Your safety and that of your co-workers and work environment is critical! We recommend that you do the following:

- Follow all on-site safety procedures, instructions and restrictions whilst working on, installing, operating and maintaining the filter.
- Follow all on-site requirements for safety/protective clothing such as hard hats, eye wear, hearing protection, steel caped boots etc.
- If using lifting equipment ensure that it is operated by suitably qualified personnel using approved slings.
- Ensure that the filter can be safely accessed, isolated and maintained during and after installation.
- Ensure that the back flush drain line is securely fixed on installation.
- When the filter is pressurised do not attempt to remove any part of the filter.
- Ensure that any leaks are fixed immediately and that the area around the filter remains dry at all times to avoid and danger of slipping or electrocution.
- Do not modify or change the structure of any part of the filter.

6.0 Installation

Correct installation of your filter is critical to be able to get the best result from it! You will need to check and do the following:

a) The filter can be installed in any orientation or position, although horizontal is best.

b) Fit a manual isolating valve immediately after the filter.

c) Ensure that no back flow can occur through the filter, as this could damage the fine screen.

d) Do not tamper or play with the Electric Controller! This has been factory set and tested.

e) Ensure that there will be enough service and access space around the filter to be able to operate, service, dismantle and maintain the filter easily in years to come. Check the drawing for your particular model.

f) Ensure that you will have enough flow and pressure to backflush the filter at ALL times (8 l/sec @ 200 kPa). If not, the line pressure will drop too low and the filter will not clean itself effectively. If you do not have enough flow/pressure available you may need to restrict the flow after the filter during the backflush cycle.

g) For full flow industrial or critical installations, it is essential to install a manual (or automatic) by-pass around the filter. This is servicing and isolating the filter without disrupting any downstream plant or equipment.

h) The backflush drain line must be at least 2” / DN50 size to prevent any back pressure on the filter. It must drain downhill. Avoid or eliminate any elbows and restrictions in the line. If the drain line is longer than 10 meters use a 3” / DN80 line.

i) Fit a barrel union at or near the filter on the backflush drain line so that the Cover Lid can be easily removed.

j) Ensure that the backflush line is secured solidly and will not move or flex when high pressure water comes out of the flush valve.

k) The solenoid has a 6mm drain line that will bleed water during every backflush cycle. This will need to be piped away from the filter to drain.

l) If there is extensive pipe work after the filter, or if the downstream system runs downhill after the filter, you may need install a pressure sustaining valve (PSV) on the downstream side of the filter. This will restrict the flow during start-up and maintain pressure at the filter until pressure builds up in the system so that the filter will not block.

m) When the filter is installed ensure that all connections are tightened and secure.

n) The filter is delivered with all control tube connections in place. Do not remove or change any of these

7.0 Commissioning

Before proceeding with the commissioning process double check that the inlet, outlet and drain pipe work is securely fastened.

a) Open the inlet valve (if fitted) slightly to allow water pressure into the filter and start pump if necessary. Check for leaks and fix now if any are found.

b) Once the filter is pressurised, open the inlet valve fully.

c) Flush the filter manually by rotating the manual override switch on the solenoid for 3 seconds then return to the original position. This will cause the filter to go through a full backflush cycle. Do this at least 3 times to remove all the air from the control system.

d) Whilst doing this check the line pressure on the inlet side of the filter during the backflush cycle and ensure it remains above 200 kPa (30 psi).

e) Now slowly open the isolating valve after the filter. If you are filling empty pipelines you will need to do this gradually and in stages so that the pressure stays at around the normal operating pressure of the system. Once the system is filled you will then be able to open the valve fully.

f) Check the inlet and outlet pressures to make sure they are equal or near to equal.

g) Once the system has stabilized to its normal operating conditions with flow and pressure, manually back flush again and check the inlet pressure again to make sure it does not drop below 200 kPa at any time.

h) If all appears to be in order and if possible, wait for the filter to reach a back flush cycle caused by a buildup of DP (differential pressure).

i) Your filter should now be ready to leave online and is commissioned. Make sure the solenoid override switch is in the original position.

8.0 Operation

Once your filter has been commissioned it should operate without any external input or control. We suggest that you check the filter on a regular basis, say weekly or monthly, checking the DP and making sure the flush cycle is functioning correctly.

9.0 Maintenance

Generally, your IGS filter should be trouble free, however you may need to remove the Fine Screen on a regular basis to remove any large debris from the Coarse Screen that has come into the system.

9.1 Electric Controls

The electric controls fitted are basically the “brain” of the filter. It consists of a control box, differential pressure switch & solenoid. At about 50 kPa DP this will actuate a backflush or cleaning cycle by opening the flush valve to drain. We recommend that you do not tamper or adjust the Controller as it has been factory set at the correct differential pressure (DP) point to keep the filter clean and functioning correctly. You should not attempt to take the controls apart at any time. In most cases, if this part is malfunctioning it is usually a symptom of another problem with the filter and not a problem with the actual controller. It could be that there is a blocked fine screen or a mechanism fault. In some cases, depending on water quality &/or pressures for example, it may be necessary to change the programming of the controller. Although we have supplied information on how this is done, you should consult Triangle first.

10.0 Disassembly Instructions

Your filter can be easily disassembled by the following instructions:

a) If possible, backflush the filter manually first before any work is commenced, and shut down the filter after this flush cycle.

b) Make sure that the filter is isolated and contains no residual pressure before proceeding.

c) To remove the Cover Lid, undo & remove the 8 x nuts and washers holding this down. The Cover Lid will now come off from the filter.

d) The Coarse Screen can now be removed by pulling on the handle and sliding it out.

e) Drain the filter body if required so that the Fine Screen assembly is fully visible inside the filter.

f) Remove the Fine Screen from the filter using the IGS screen removal tool (Part No. 15040). This locks into the Screen Handle and levers the fine screen out.

g) The Fine Screen is seated into the housing by 2 x O Rings. If the screen has been in the housing for a long time, it may be reluctant to come out, so more force may be required. Do not jolt or use any shock loading.

h) Once the Fine Screen is out check it for cleanliness. You may need to clean the screen from inside to outside only! Using a high-pressure water cleaner. (A garden hose or tap will not be strong enough). You may need to take the assembly apart using a set of C spanners specially made for this job.

i) Before replacing the Fine Screen into the filter grease the 2 x O Rings using a suitable silicon grease.

j) To remove the Collector Assembly, you will need to split the Fine Screen apart using the correct “C” spanners (# 15045). Then remove the 4 x Philips head screws that attach the Rotor onto the Collector Pipe. Remove the Rotor from the tube and slide the Collector out.

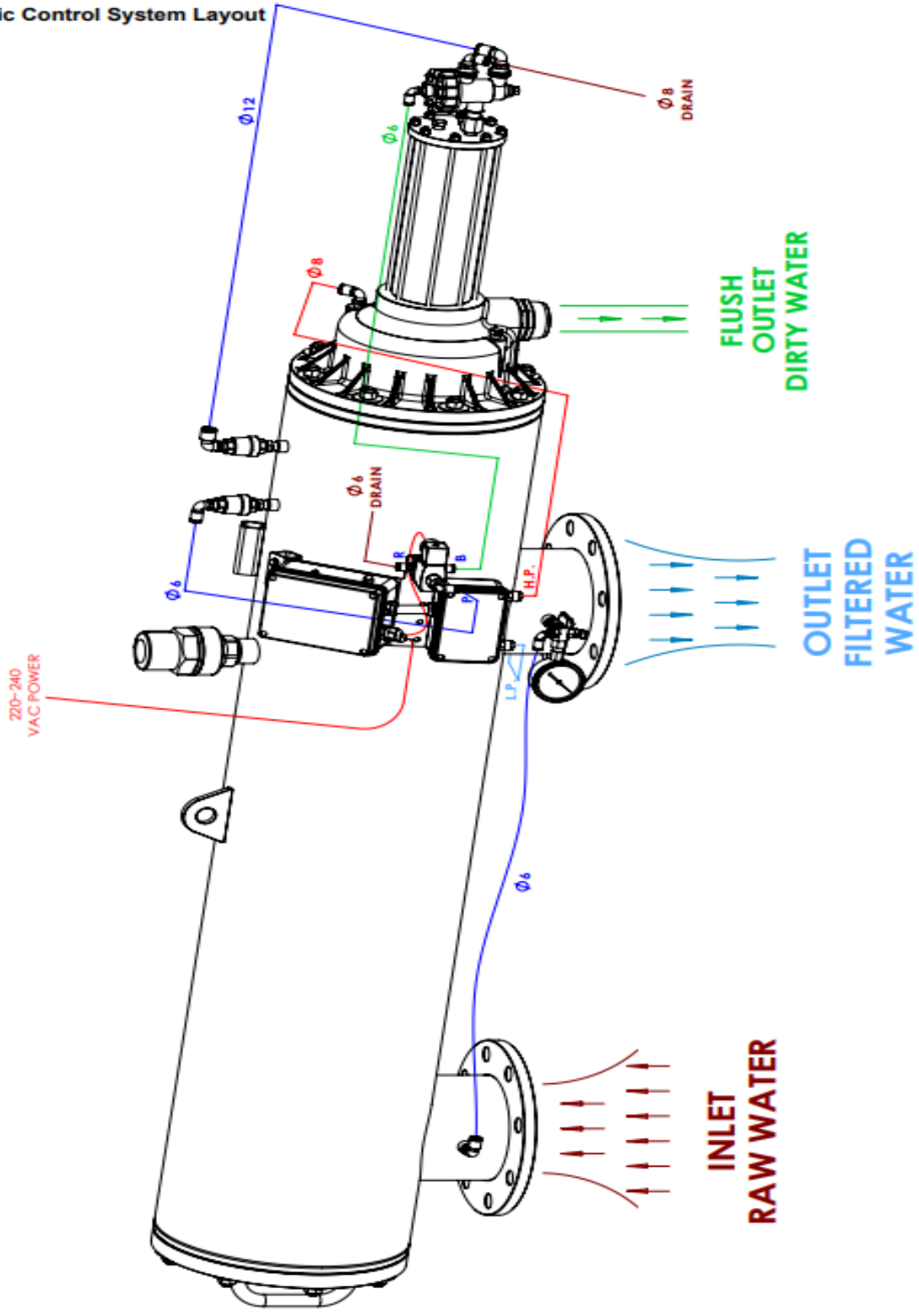
k) To remove the Piston Assembly, remove the 8 x nuts & washers holding it onto the body and remove

11.0 Trouble Shooting

Generally, you will find if the filter malfunctions it will show a high DP (differential pressure) or become blocked. This could be caused by a random condition like a sudden high dirt load event of a control malfunction or an internal mechanical problem. The trick will be to find which one of these three (3) is the cause.

Problem	Possible Cause	Solution
The filter does not flush	Valves are closed	Open valves
	Pressure differential is high, >100 kPa. (Rinse controller will normally be venting water in this mode).	Perform a manual flush as follows: 1. Close the filter outlet valve 2. Check that the filter outlet and inlet pressures are equal 3. Perform a manual flush as in Section 7.0 c, page 7. 4. Check the inlet pressure. 5. If the filter has been extensively blocked then flush the filter manually 2-3 times. 6. Open the outlet valve and check inlet- outlet pressures
	Control tubes or fittings or filter ports are blocked	Check and clear any blocked tubes.
The filter 2” flush valve stays open for a long time on the second/return stroke.	Drain pipes are not clear. The flush line is restricted, or too long, or not big enough in diameter	Check if drain lines are clear. Test by removing the flush line. Shorten existing line or replace with a larger diameter pipe.
Insufficient inlet pressure (less than 200 kPa)	Inlet valves not fully open	Open inlet valves to maximum. Increase the inlet pressure or throttle the outlet to increase pressure during the flush cycle. Fit a hydraulic pressure sustaining valve.
Pressure differential exceeds 10 psi during normal operation	Coarse filter is blocked	Check and clean the Coarse Screen
Water does not flow through the filter	Inlet lines blocked	Check inlet lines
	Isolating valves are closed	Open isolating valves
	The screen is blocked completely. Possibly causes are: Low inlet pressure, high flow, high dirt load, controller malfunction or internal mechanism problems	Perform a manual flush as follows: 1. Close the filter outlet valve 2. Check that the filter outlet and inlet pressures are equal 3. Perform a manual flush as in Section 7.0 c, page 7. 4. Check the inlet pressure. 5. If the filter has been extensively blocked then flush the filter manually 2-3 times. 6. Open the outlet valve and check inlet- outlet pressures.
2” Flush valve leaks or remains open	Valve seals may be leaking because of damage or the Piston is jammed.	Remove Piston Assembly, check seals and that it moves in and out freely. If not check/replace the 95 mm Piston seals. Check that the Collector Assy rotates and moves freely inside the Fine Screen. If not check what is obstructing it.

12.0 Electric Control System Layout



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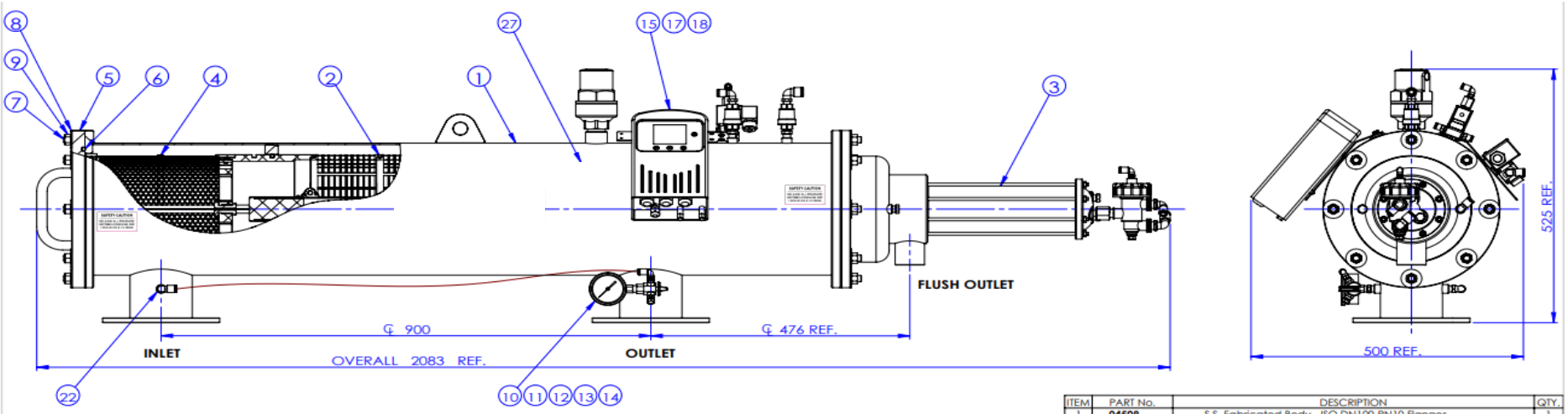

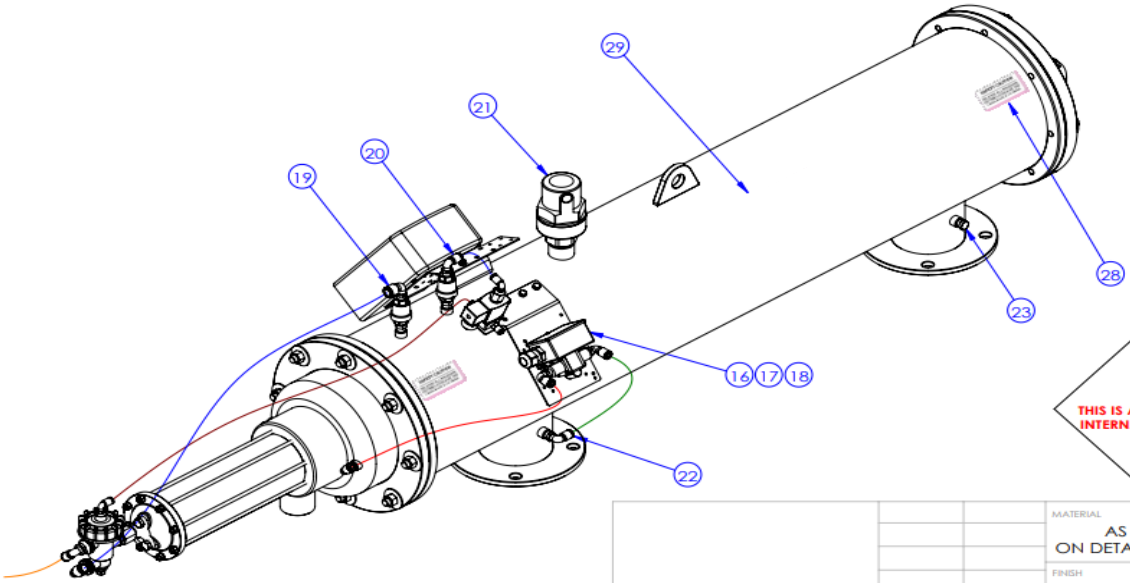

ITEM	PART No.	DESCRIPTION	QTY.
1	04509	S.S. Fabricated Body - ISO DN100-PN10 Flanges	1
2	23001	Fine Screen & Dirt Collector Assembly	1
3	21031	Cylinder & S.S. Cover Lid Assembly for Electrical Controller	1
4	17031	Coarse Screen - S.S.	1
5	17032	End Cover - S.S.	1
6	11505	BS448 O-Ring Seal - NBR	1
7	14003-1	1/2" UNC x 55 L Stud Bolt - 304 S.S.	16
8	14001-1	for 1/2" Bolt - 1 1/2" OD - 14 G Flat Round Washer - 304 S.S.	16
9	14002-5	1/2" UNC HEX Nut - Zinc Plated	16
10	14711-4	1/4" BSPT - 1/8" BSPT Male Reducing Nipple - Brass	1
11	15032	3-way Manual Tap without Red Indicator - P/N. V3W-25FM	1
12	15001	1000 kpa Gauge - Liquid Filled - 1/4" BSPT Male	1
13	14703-4	1/8" BSPT Male - 6mm Elbow Fitting - Brass Plated with Nickel	1
14	14704-4	1/8" BSPT Male Plug - Brass Plated with Nickel	1
15	15141	Electric Controller Assembly - Filtron 1-10 Model	1
16	15140	DP Switch & Solenoid Valve Assembly	1
17	14017-1	M6 Spring Washer - 304 S.S.	4
18	14012-1	M6x10 Length Set Screw - Hex Head - 304 S.S.	4
19	15006-R-STD	1/4" BSPF S.S.Check Valve with 12mm Elbow Fitting	1
20	15006-S-STD	1/4" BSPF S.S.Check Valve with 6mm Elbow Fitting	1
21	15005	Air Relief Valve - 1" BSP Connection - P/N.ARV-1-A	1
22	14712-4	1/4" BSPT Male - 6mm Elbow Fitting - Brass Plated with Nickel	2
23	14714-4	1/4" BSPT Male Plug - Brass Plated with Nickel	1
24	13101	Ø6mm Control Tube - Flexible Hose - Polyethylene - Black	2m
25	13102	Ø8mm Control Tube - Flexible Hose - Polytethylene - Black	0.3m
26	13103	Ø12mm Control Tube - Flexible Hose - Polyethylene - Black	1m
27	15051	Product Label - Self Adhesive	1
28	15053	Safety Caution Label - Self Adhesive	4
29	15054	[illegible] rade Mark Label - Self Adhesive	2

NOTE
THIS IS A WORKSHOP INTERNAL DRAWING

	NAME	DATE
DRAWN	YW	03/05/2016
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING, ±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

TITLE
FW100EX FILTER ASSEMBLY
DN100-PN10 FLANGE CONNECTION
-------- ELECTRIC CONTROLLER --------

SIZE	DWG. NO.	REV.
A3	04508	0

SCALE: N.T.S. | WEIGHT: approx. 85 kg | SHEET: 1 OF 1

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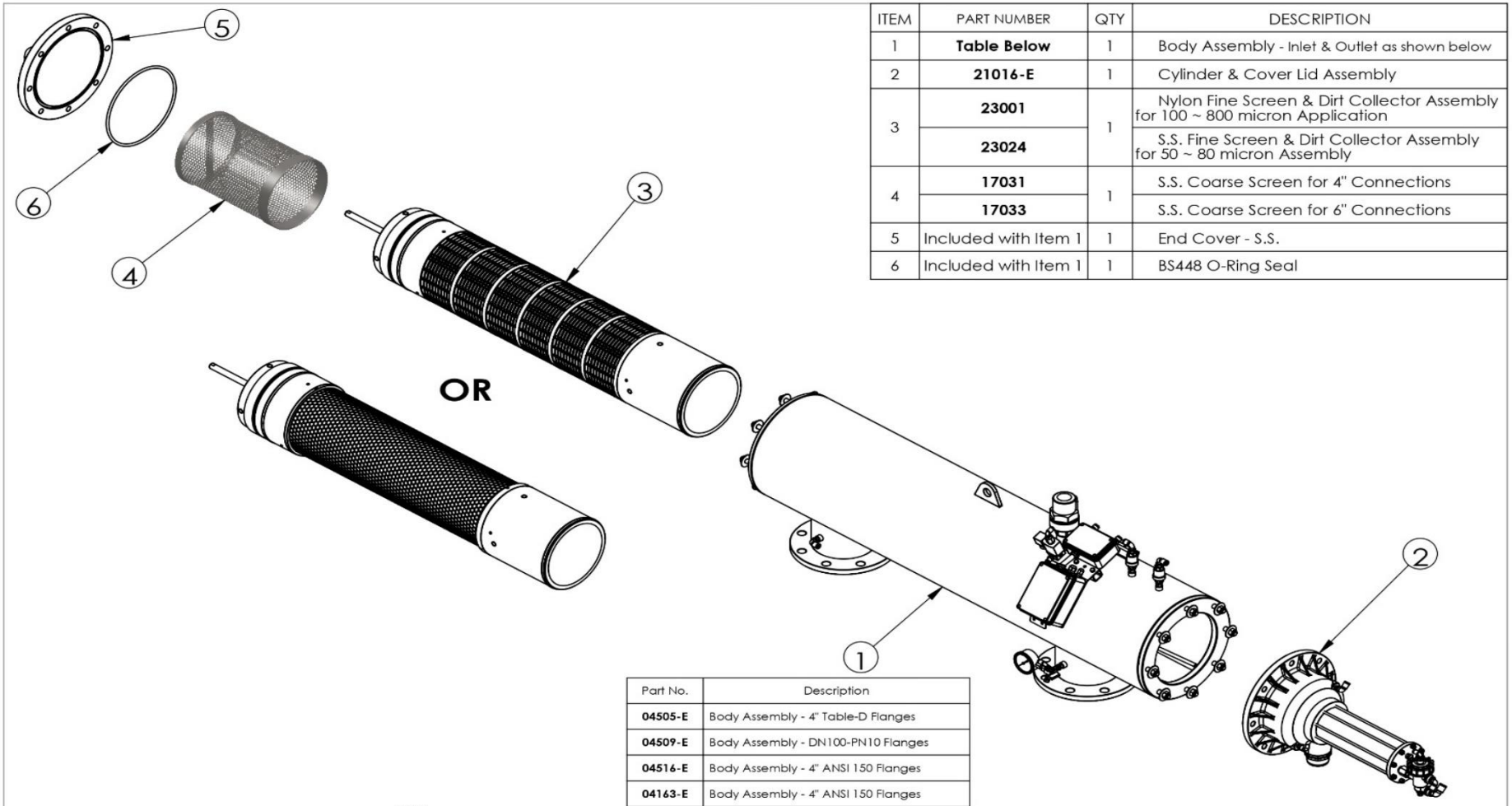

ITEM	PART NUMBER	QTY	DESCRIPTION
1	**Table Below**	1	Body Assembly - Inlet & Outlet as shown below
2	**21016-E**	1	Cylinder & Cover Lid Assembly
3	**23001**	1	Nylon Fine Screen & Dirt Collector Assembly for 100 ~ 800 micron Application
	23024		S.S. Fine Screen & Dirt Collector Assembly for 50 ~ 80 micron Assembly
4	**17031**	1	S.S. Coarse Screen for 4" Connections
	17033		S.S. Coarse Screen for 6" Connections
5	Included with Item 1	1	End Cover - S.S.
6	Included with Item 1	1	BS448 O-Ring Seal

Part No.	Description
04505-E	Body Assembly - 4" Table-D Flanges
04509-E	Body Assembly - DN100-PN10 Flanges
04516-E	Body Assembly - 4" ANSI 150 Flanges
04163-E	Body Assembly - 4" ANSI 150 Flanges
04512-E	Longer Body Assembly - 4" ANSI 150 Flanges
04606-E	Body Assembly - 6" Table-E Flanges
04609-E	Body Assembly - DN150-PN10 Flanges
04164-E	Body Assembly - 6" ANSI 150 Flanges

Note:
Part Number of the Body may add a Suffix Number to identify the Material.
e.g.
Body Assembly 04505-1-E shows the Body 04505 made by 304 S.S.
Body Assembly 04505-2-E shows the Body 04505 made by 316 S.S.

		MATERIAL: AS SHOWN ON DETAIL DRAWINGS
NEXT ASSY	USED ON	FINISH
APPLICATION		DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	YW	01/04/2016
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING
±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

TITLE: FW100EX - FW150 WATER FILTERS 4" - 6" FLANGE CONNECTIONS

SIZE A4 | DWG. NO. FW100EXFW150-E | REV. 0

SCALE: N.T.S. | WEIGHT: approx. 85 - 105 kg | SHEET: 1 OF 1

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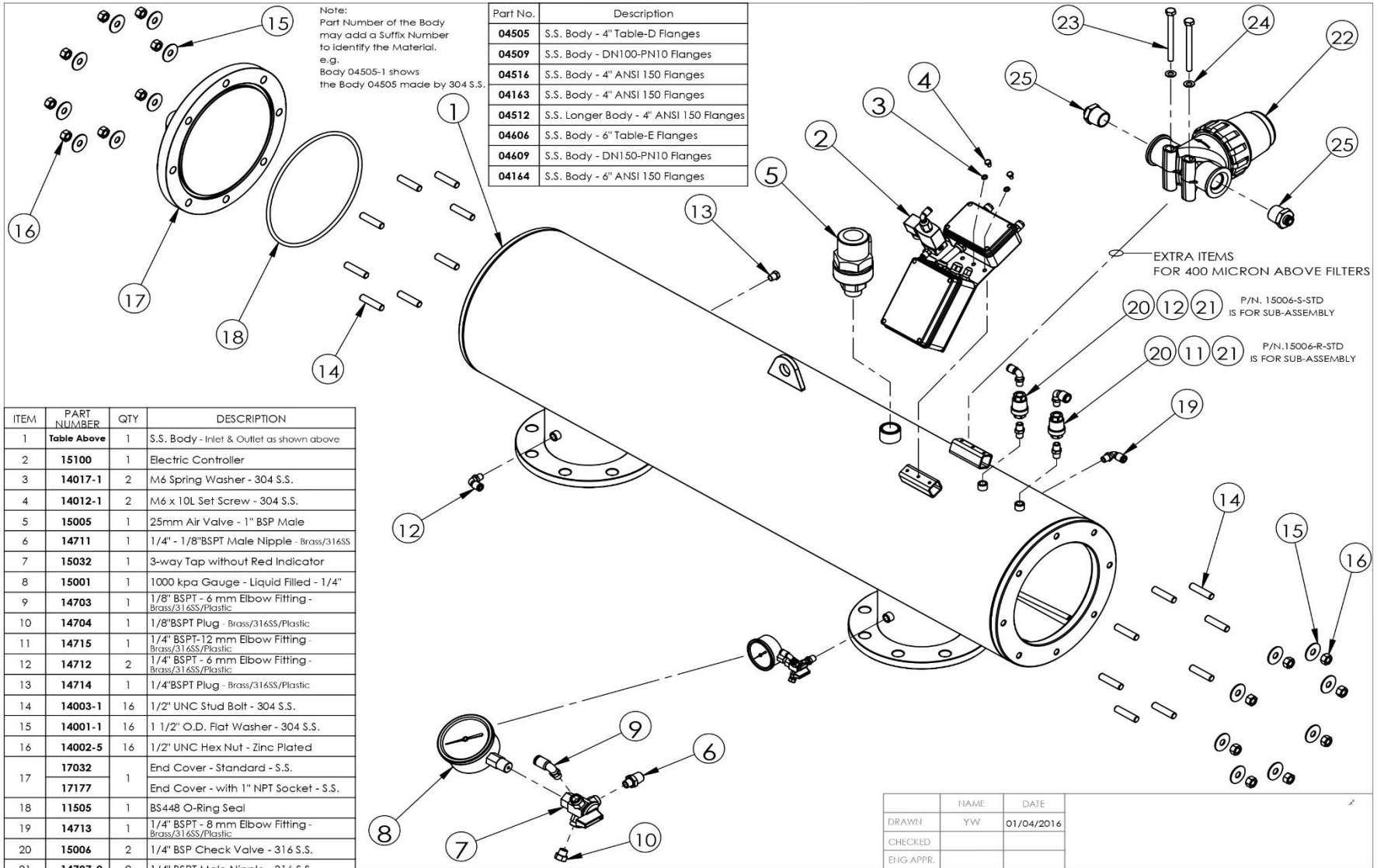
Note:
Part Number of the Body may add a Suffix Number to identify the Material.
e.g.
Body 04505-1 shows the Body 04505 made by 304 S.S.

Part No.	Description
04505	S.S. Body - 4" Table-D Flanges
04509	S.S. Body - DN100-PN10 Flanges
04516	S.S. Body - 4" ANSI 150 Flanges
04163	S.S. Body - 4" ANSI 150 Flanges
04512	S.S. Longer Body - 4" ANSI 150 Flanges
04606	S.S. Body - 6" Table-E Flanges
04609	S.S. Body - DN150-PN10 Flanges
04164	S.S. Body - 6" ANSI 150 Flanges



ITEM	PART NUMBER	QTY	DESCRIPTION
1	**Table Above**	1	S.S. Body - Inlet & Outlet as shown above
2	**15100**	1	Electric Controller
3	**14017-1**	2	M6 Spring Washer - 304 S.S.
4	**14012-1**	2	M6 x 10L Set Screw - 304 S.S.
5	**15005**	1	25mm Air Valve - 1" BSP Male
6	**14711**	1	1/4" - 1/8"BSPT Male Nipple - Brass/316SS
7	**15032**	1	3-way Tap without Red Indicator
8	**15001**	1	1000 kpa Gauge - Liquid Filled - 1/4"
9	**14703**	1	1/8" BSPT - 6 mm Elbow Fitting - Brass/316SS/Plastic
10	**14704**	1	1/8"BSPT Plug - Brass/316SS/Plastic
11	**14715**	1	1/4" BSPT-12 mm Elbow Fitting - Brass/316SS/Plastic
12	**14712**	2	1/4" BSPT - 6 mm Elbow Fitting - Brass/316SS/Plastic
13	**14714**	1	1/4"BSPT Plug - Brass/316SS/Plastic
14	**14003-1**	16	1/2" UNC Stud Bolt - 304 S.S.
15	**14001-1**	16	1 1/2" O.D. Flat Washer - 304 S.S.
16	**14002-5**	16	1/2" UNC Hex Nut - Zinc Plated
17	**17032**	1	End Cover - Standard - S.S.
	17177		End Cover - with 1" NPT Socket - S.S.
18	**11505**	1	BS448 O-Ring Seal
19	**14713**	1	1/4" BSPT - 8 mm Elbow Fitting - Brass/316SS/Plastic
20	**15006**	2	1/4" BSP Check Valve - 316 S.S.
21	**14727-2**	2	1/4" BSPT Male Nipple - 316 S.S.
Following Items are Extra Items for 400 micron above Filters			
22	**15021**	1	Mini Filter for Controller
23	**14015-1**	2	M6 x 70L Bolt - 304 S.S.
24	**14056-1**	2	M6 Flat Washer - O.D. 19 - S.S.
25	**14731**	2	1/2" BSPT - 6 mm Straight Fitting - Brass/316SS/Plastic

	NAME	DATE
DRAWN	YW	01/04/2016
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING ±0.25° ANGULAR UNLESS OTHERWISE SPECIFIED

TITLE: FW100EX - FW150 BODY ASSEMBLY 4" - 6" FLANGE CONNECTIONS

SIZE A4 | DWG. NO. 4-6BodyNumber-E | REV. 0
SCALE: N.T.S. | WEIGHT: approx. 48 - 66 kg | SHEET: 1 OF 1

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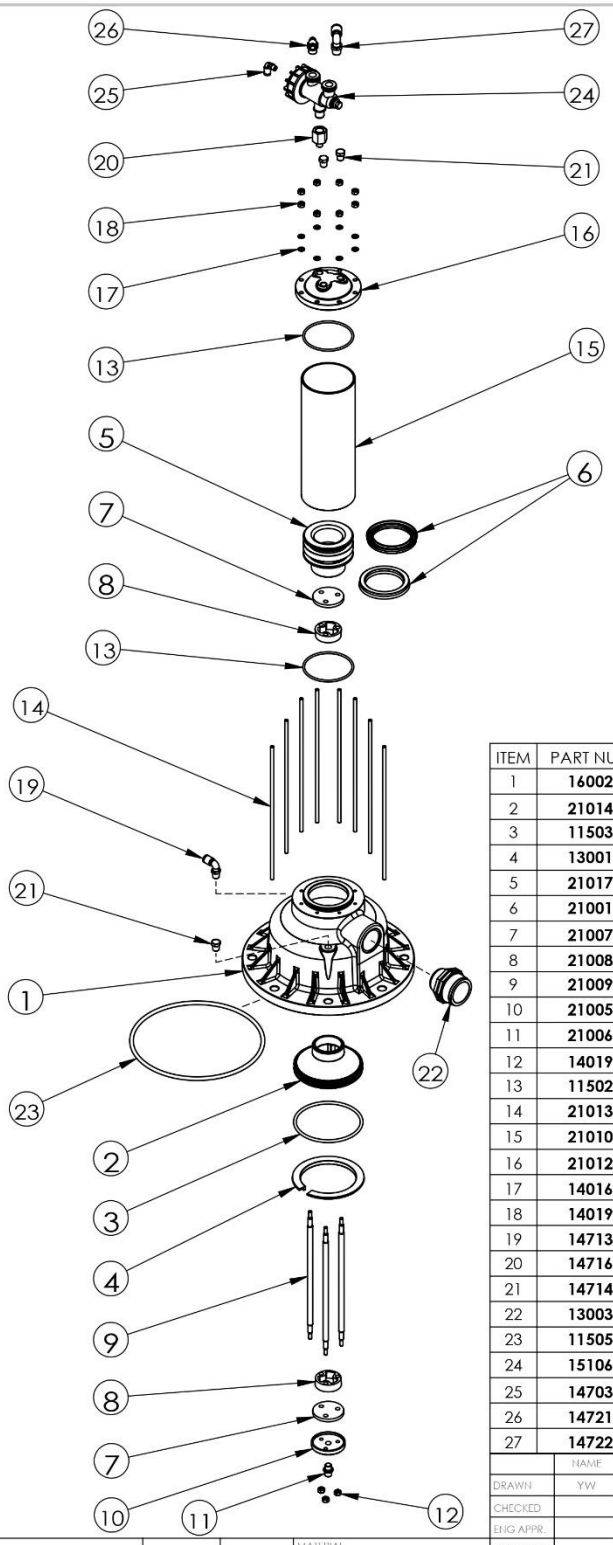

ITEM	PART NUMBER	QTY	DESCRIPTION
1	**16002**	1	Cover Lid - Reinforced Nylon
2	**21014**	1	Exhaust Valve Seat
3	**11503**	1	BS351 O-Ring Seal
4	**13001**	1	Locking Ring
5	**21017**	1	Piston Plug
6	**21001**	2	U-Ring Seal
7	**21007**	2	Seal Washer
8	**21008**	2	Disk Seat
9	**21009**	3	Piston Support Rod
10	**21005**	1	Bearing Holder
11	**21006**	1	Male Bearing
12	**14019**	3	M6 Hex Nut - S.S.
13	**11502**	2	BS237 O-Ring Seal
14	**21013**	8	Support Rod
15	**21010**	1	Cylinder Sleeve
16	**21012**	1	End Plate
17	**14016-1**	8	M6 Flat Washer - 304 S.S.
18	**14019-1**	8	M6 Hex Nut - 304 S.S.
19	**14713**	1	1/4"BSPT - 8mm Elbow - Brass/Plastic
20	**14716**	1	1/4"BSPT - 3/8"BSPF Adaptor - Brass/316 S.S.
21	**14714**	3	1/4"BSPT Plug - Brass/Plastic
22	**13003**	1	2"BSPT - 1 1/2"BSPT Nipple
23	**11505**	1	BS448 O-Ring Seal
24	**15106**	1	Hydraulic Relay - Reinforced Nylon
25	**14703**	1	1/8"BSPT - 6mm Elbow - Brass/Plastic
26	**14721**	1	3/8"BSPT - 8mm Elbow - Brass/Plastic
27	**14722**	1	3/8"BSPT - 12mm Elbow - Brass/Plastic

	NAME	DATE
DRAWN	YW	08/03/2016
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ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS

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DO NOT SCALE DRAWING

DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING
±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

TITLE: CYLINDER & COVER ASSEMBLY FOR ELECTRIC / PLC CONTROLLER

SIZE A4 | DWG. NO. 21016-E - ev | REV. 0

SCALE: N.T.S. | WEIGHT: approx. 6.5 kg | SHEET: 1 OF 1

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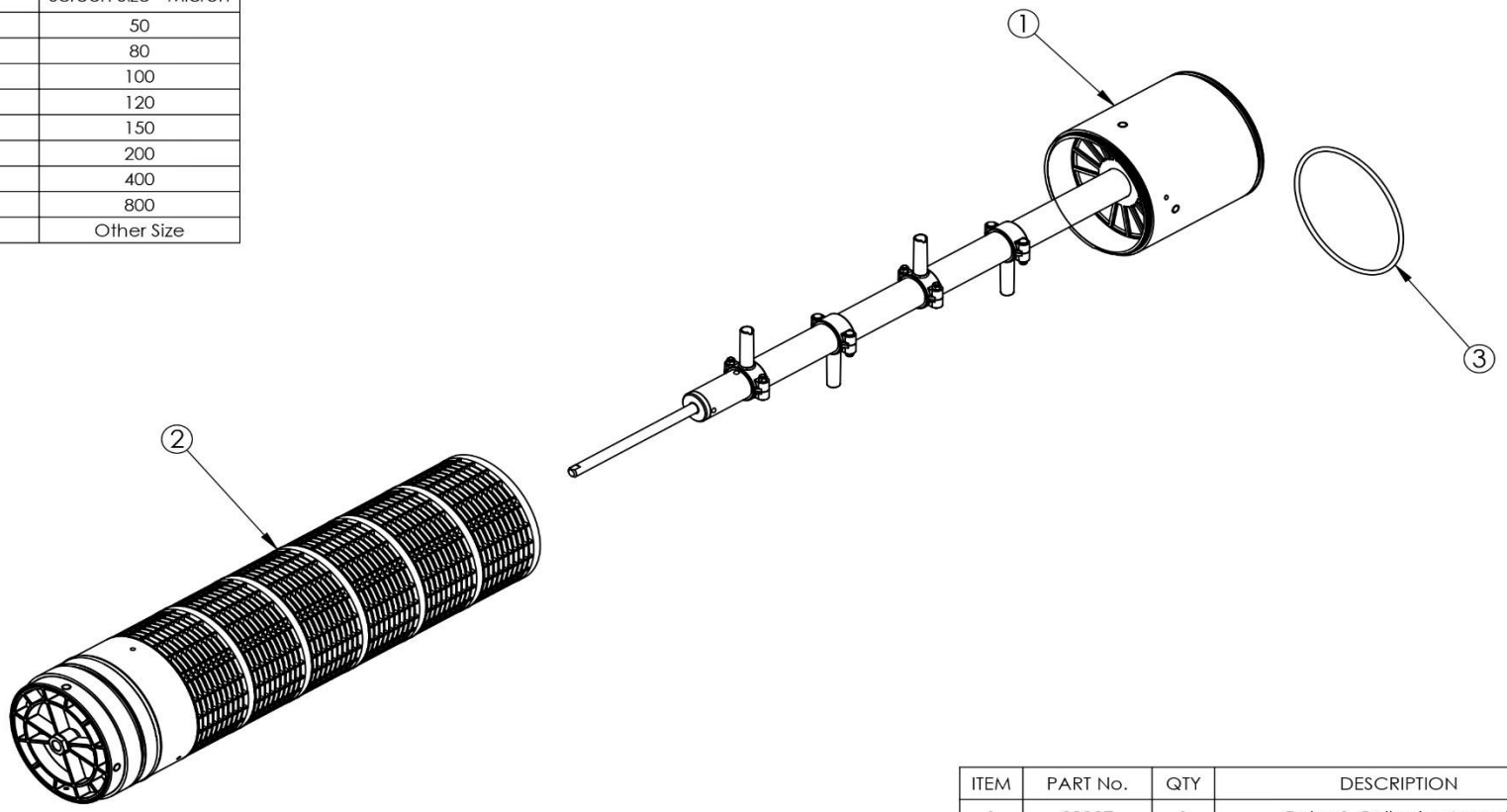
Part No. of Item 2 Fine Screen Assembly

Part No.	Screen Size - Micron
23011 - 050	50
23011 - 080	80
23011 - 100	100
23011 - 120	120
23011 - 150	150
23011 - 200	200
23011 - 400	400
23011 - 800	800
23011 - S	Other Size



ITEM	PART No.	QTY	DESCRIPTION
1	**22007**	1	Rotor & Collector Assembly
2	See Above	1	Fine Screen Assembly + Handle
3	**11504**	1	O-Ring (Special Soft)

	NAME	DATE
DRAWN	YW	02/02/2012
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS

FINISH

DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING, ±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

TITLE: FINE SCREEN & DIRT COLLECTOR ASSEMBLY

SIZE A4 | DWG. NO. 23001 - ev | REV. 0

SCALE: N.T.S. | WEIGHT: approx. 10.6 kg | SHEET: 1 OF 1

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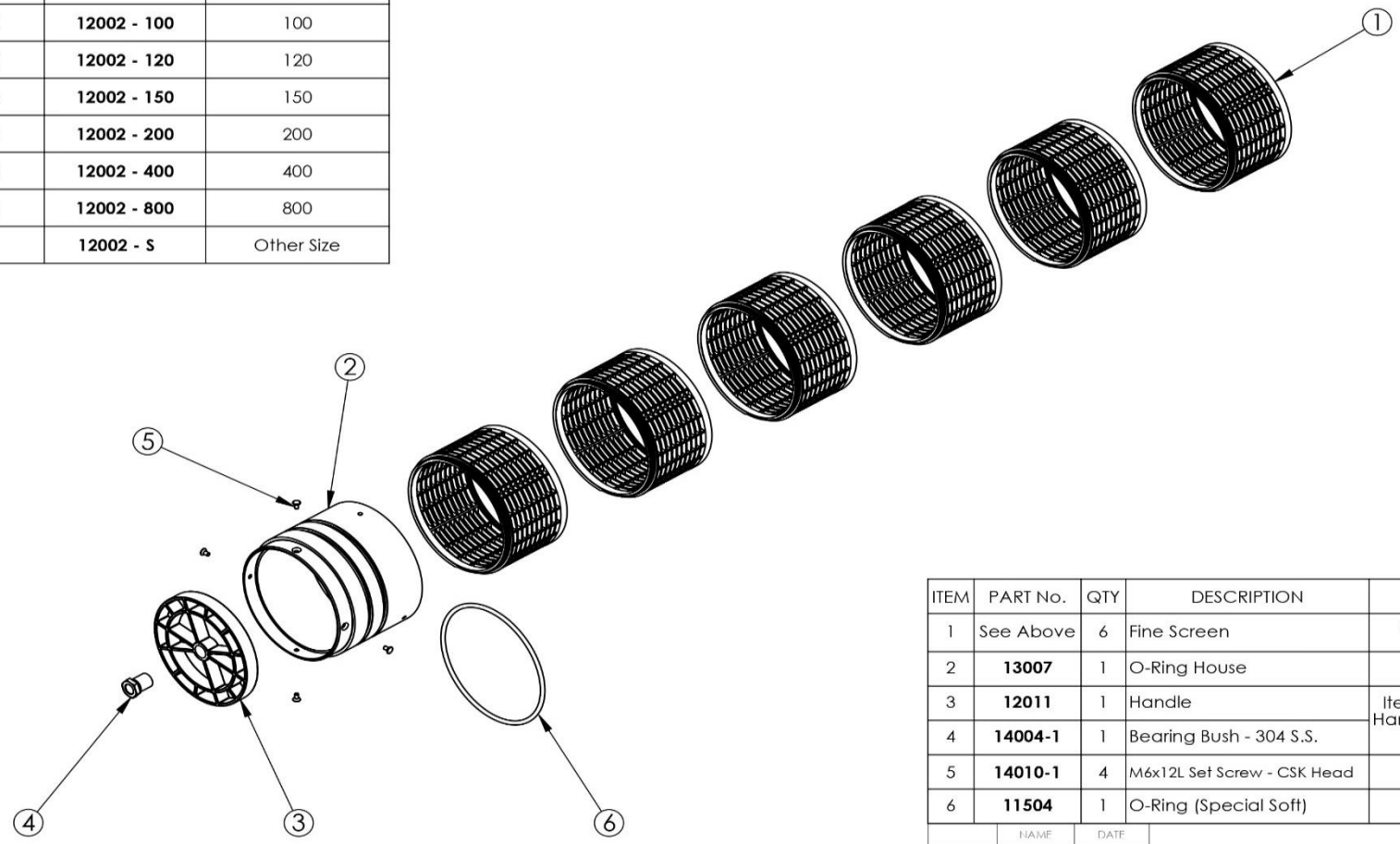
Part No. of Assembly	Part No. of Item 1	Screen Size - Micron
23011 - 050	**12002 - 050**	50
23011 - 080	**12002 - 080**	80
23011 - 100	**12002 - 100**	100
23011 - 120	**12002 - 120**	120
23011 - 150	**12002 - 150**	150
23011 - 200	**12002 - 200**	200
23011 - 400	**12002 - 400**	400
23011 - 800	**12002 - 800**	800
23011 - S	**12002 - S**	Other Size



ITEM	PART No.	QTY	DESCRIPTION	Note
1	See Above	6	Fine Screen	6 together P/N.12009
2	**13007**	1	O-Ring House	
3	**12011**	1	Handle	Item 3 + Item 4 Handle Sub-Assy. P/N.23002
4	**14004-1**	1	Bearing Bush - 304 S.S.	
5	**14010-1**	4	M6x12L Set Screw - CSK Head	
6	**11504**	1	O-Ring (Special Soft)	

	NAME	DATE
DRAWN	YW	02/02/2012
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS

FINISH

NEXT ASSY | USED ON

APPLICATION | DO NOT SCALE DRAWING

DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING
±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

TITLE: FINE SCREENS + HANDLE
----- SUB-ASSEMBLY -----

SIZE A4 | DWG. NO. 23011 - ev | REV. 0

SCALE: N.T.S. | WEIGHT: approx. 4.2 kg | SHEET: 1 OF 1

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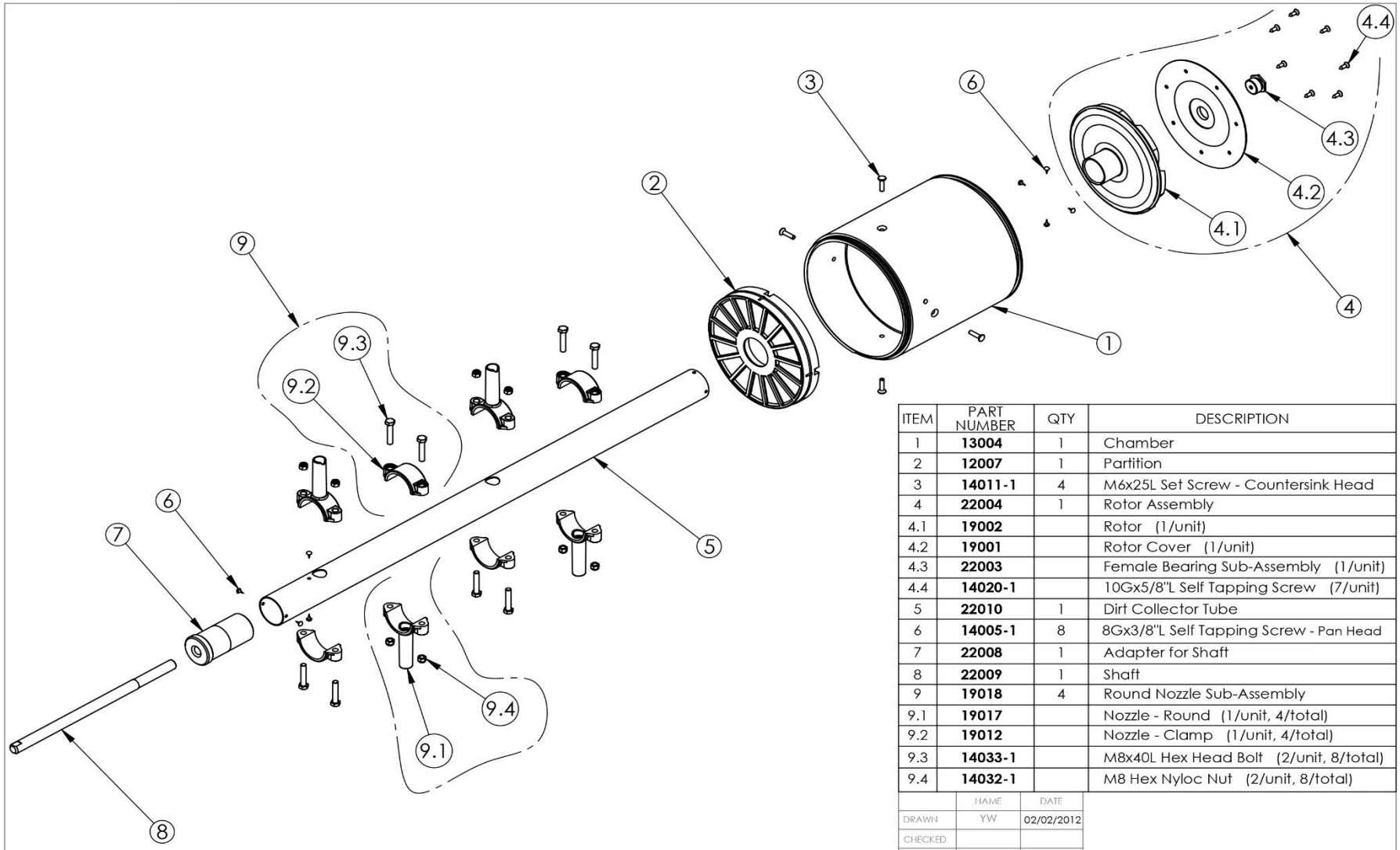

ITEM	PART NUMBER	QTY	DESCRIPTION
1	**13004**	1	Chamber
2	**12007**	1	Partition
3	**14011-1**	4	M6x25L Set Screw - Countersink Head
4	**22004**	1	Rotor Assembly
4.1	**19002**		Rotor (1/unit)
4.2	**19001**		Rotor Cover (1/unit)
4.3	**22003**		Female Bearing Sub-Assembly (1/unit)
4.4	**14020-1**		10Gx5/8"L Self Tapping Screw (7/unit)
5	**22010**	1	Dirt Collector Tube
6	**14005-1**	8	8Gx3/8"L Self Tapping Screw - Pan Head
7	**22008**	1	Adapter for Shaft
8	**22009**	1	Shaft
9	**19018**	4	Round Nozzle Sub-Assembly
9.1	**19017**		Nozzle - Round (1/unit, 4/total)
9.2	**19012**		Nozzle - Clamp (1/unit, 4/total)
9.3	**14033-1**		M8x40L Hex Head Bolt (2/unit, 8/total)
9.4	**14032-1**		M8 Hex Nyloc Nut (2/unit, 8/total)

	NAME	DATE
DRAWN	YW	02/02/2012
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL: AS SHOWN ON DETAIL DRAWINGS
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING ±0.25° ANGULAR UNLESS OTHERWISE SPECIFIED

TITLE: ROTOR & COLLECTOR ASSEMBLY

SIZE A4 | DWG. NO. 22007 - ev | REV. 0
SCALE: N.T.S. | WEIGHT: approx. 6.4 kg | SHEET: 1 OF 1

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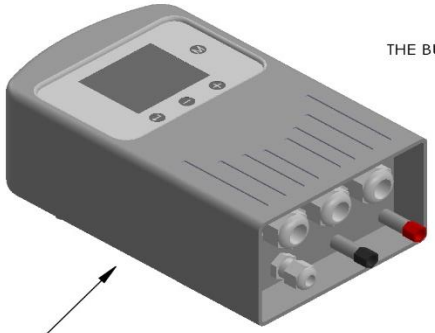
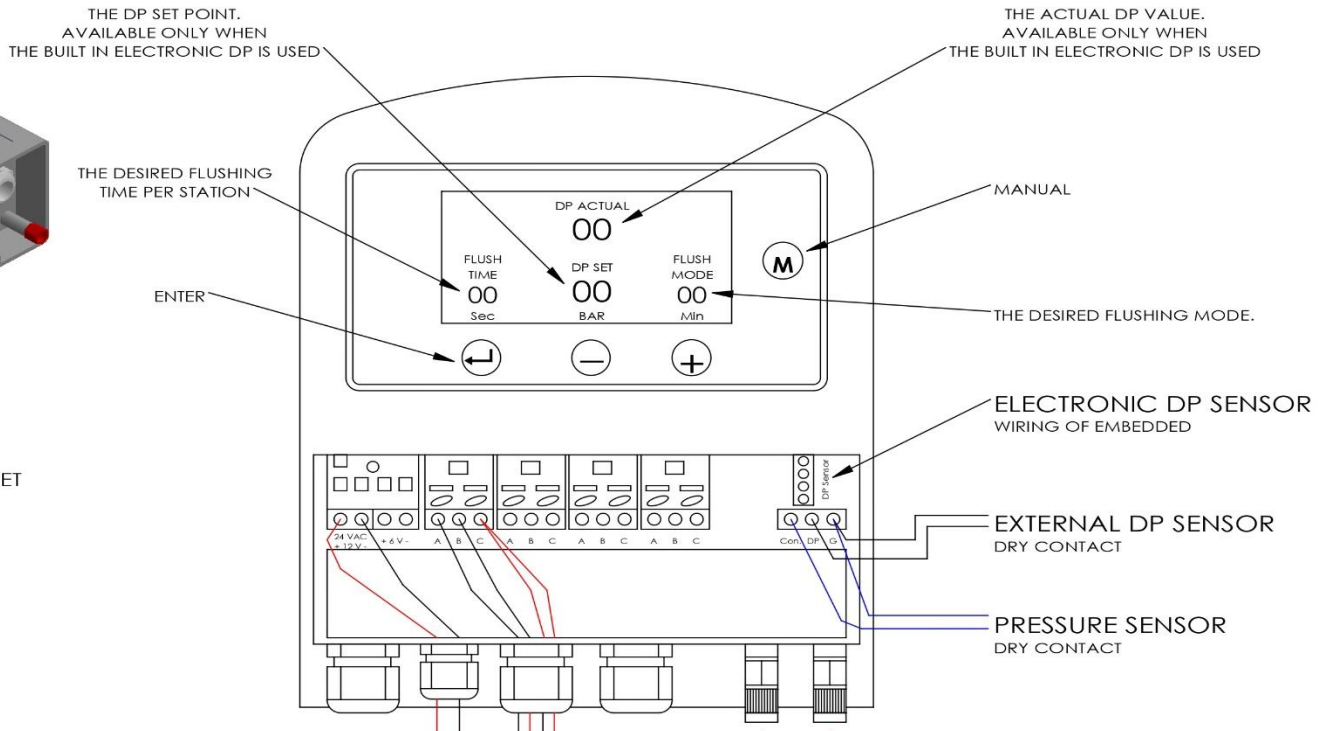


IT SHALL BE MOUNTED
INTO THE CONTROL BOX
OR ON INTERNAL WALL.

IF MOUNTING ON THE FILTER,
P/N. 15103 MOUNTING BRACKET
SHOULD BE USED.



REVISIONS		
REV.	DESCRIPTION	DATE
1	NO Solenoid Valve was NC Solenoid Valve	18/06/2015

	NAME	DATE
DRAWN	YW	13/03/2015
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

MATERIAL *****
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
DIMENSIONS ARE IN mm
TOLERANCES: ±0.25 MACHINING
±0.25° ANGULAR
UNLESS OTHERWISE SPECIFIED

TITLE
ELECTRIC CONTROLLER
FILTRON 1-10 AC MODEL - FOR MULTI FILTERS

SIZE	DWG. NO.	REV.
A4	15131	1

SCALE: N.T.S. | WEIGHT: ***** grams | SHEET: 1 OF 1

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FILTRON 1-10 (DC/AC)

List of features

- The “FILTRON 1-10” is a modular backflushing controller for automatic filters of 1 to 10 stations.
- There exist DC and AC models.
- The DC model can be powered either by 6v DC or 12v DC and it activates 2 wired 12v DC latching solenoids. The voltage for the solenoids switching is boosted by a charge pump.
- The AC model contains an internal transformer that generates the 24v AC for the solenoids.
- Flushing cycles may be triggered either by time or by the embedded electronic DP sensor reaching the set point, or by a dry contact signal from an external DP sensor.
- Endless looping problems can be eliminated by detecting repeated consecutive cycles passing beyond a predefined limit.
- The unit can optionally handle a Pressure-Sustaining / Main valve, and an Alarm output.
- The unit is equipped with a customized LCD display and key board.

The unit counts separately the number of flushing cycles triggered by DP, by time and manually

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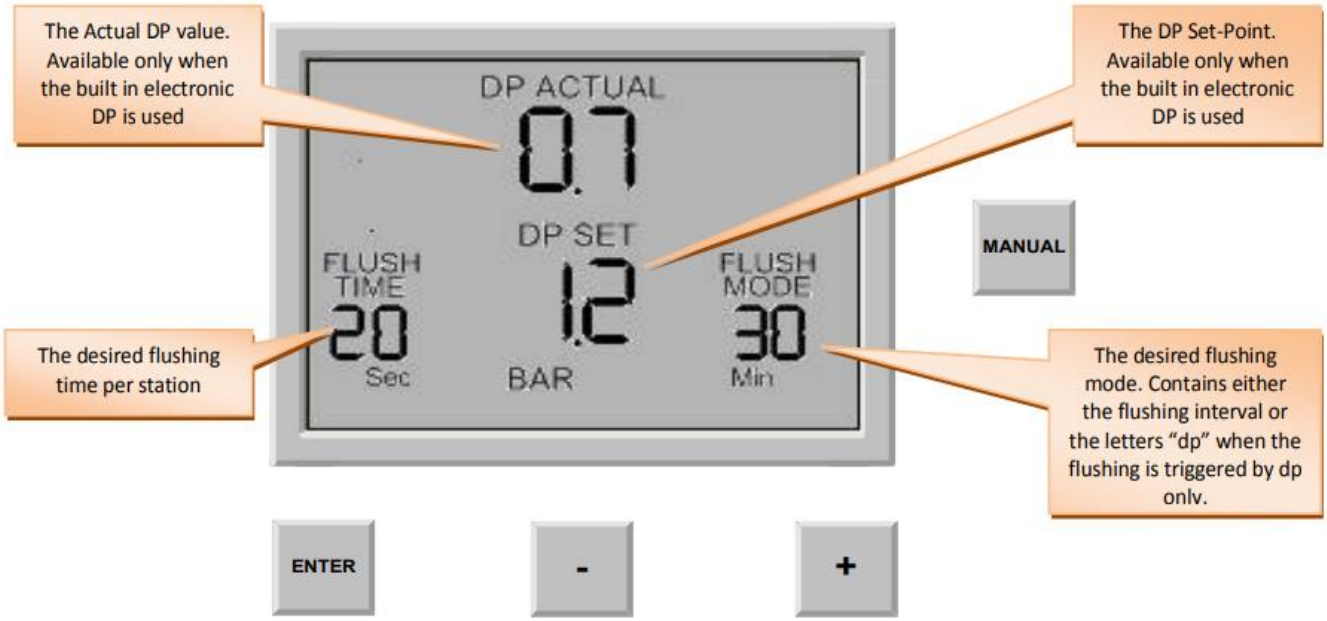
How to program the controller

The controller is equipped with an LCD display and 4 keys as displayed below. When the unit is left untouched for a minute the display is switched off and the only life signal is given by a beep sound that can be heard every 20 seconds. Holding down any of the keys for a few seconds will bring the screen back to life.



The screen consists of several fields, some of them are editable and some of them are not. For inserting EDIT MODE the ENTER key has to be pushed. The EDIT MODE is indicated by blinking of the characters at the currently editable field. Each time the ENTER key is pushed again, the next editable field becomes under focus and starts blinking. While in EDIT MODE the "+" and "-" keys can be used for changing the value under focus. Pushing the ENTER key again will set the selected value to the current field and move the focus to the next editable field which will start blinking. Once entering this process of passing through the edible fields, the user has no way back but by pushing the ENTER key repeatedly, he passes through the chain of edible fields until arriving back to the FLUSH TIME field, meeting no more blinking fields.

REMARK

Notice that before the first use of the unit, it may be necessary to pass through the configuration process prior to defining the flushing program in order to adjust the features of controller to the specific application. The configuration process is described below.

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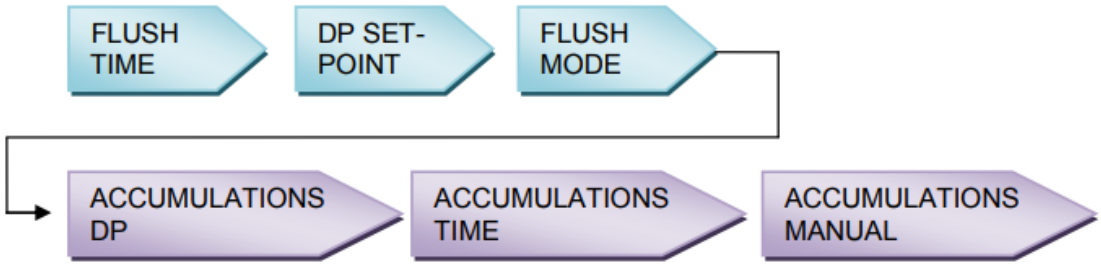
The chain of editable fields

Following is the chain of edible fields. The existence of the DP SET-POINT field depends on whether the system contains a built-in electronic DP or not.



The Flush Time

Defines the duration of the flushing time per station. The following options are selectable:

5-20 - sec in steps of 1 sec 20-55 - sec in steps of 5 sec

1-6 - min in steps of 0.5 min

The DP Set Point

At this field the user defines the pressure difference between the filter's inlet and outlet that when reached, a flushing cycle will take place. This field appears only when the system includes the built-in electronic DP sensor.

When the pressure is expressed in BAR the range of values is 0.1 – 2.0 BAR.

When the pressure is expressed in PSI the range of values is 1- 30 PSI.

When the system does not include the built-in electronic DP sensor but is connected to an external DP sensor, the flushing request signal arrives in the shape of a closed dry contact.

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The Flush Mode

The Flush Mode defines how the flushing cycles is triggered. The selectable options are as follows:

OFF - no flushing will take place

By time – In this case the flushing cycles will be repeated in a selected interval or will be triggered by the DP signal depending on what happens first. No matter how was the flushing cycle started the interval to the next cycle will start to be measured again after each ending of a flushing sequence. The selectable intervals are the following:

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 minutes
2, 3, 4, 5, 6, 8, 12, 18, 24, 72, 120 hours

dp – flushing will be triggered by DP only.

If the "+" and "-" keys are pressed and held down simultaneously the "Flush Mode" field will show the left time until next cycle, alternately hours and minutes.

The Accumulations

The unit accumulates and displays the number of flushing cycles caused by DP, by time, or manually

At each of the accumulation fields, the "+" or "-" keys may be used for clearing the accumulated value.

The Configuration

In order to enter into the configuration process, press and hold down the ENTER key for at least 3 seconds.

The unit will detect how many "plug-in" boards (each of 2 outputs) are used in the particular case. How will the outputs be allocated depends on the definitions made during the configuration process described below. The following rules apply:

1. Backflush valves will be allocated starting from output 1 and up.
2. The last backflush valve can be canceled and then its allocated output will be left unused.
3. Alarm output, Delay-Valve and Main-Valve when defined, will be allocated in this order, right after the last backflush valve (whether in use or not).

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Example:

Assuming there are 3 “plug-in” boards, this makes 6 outputs for use. If there are no Alarm-output, no Delay-Valve and no Main-Valve all the 6 outputs will be allocated for backflush valves. If additionally, a Main-Valve is defined, the first 5 outputs will be allocated for backflush valves and output No 6 for the Main-Valve. Output No 5 (of the last backflush valve) can be canceled and left unused. If additionally, a Delay-Valve is defined it will be allocated to output 5 rights before the Main valve, leaving the first 4 outputs for backflush valves, and once again output No 4 (of the last backflush valve) can be canceled and left unused. If additionally, an Alarm-output is defined it will be allocated before the Delay-Valve leaving only 3 of the first outputs for backflush valves. No 3 can again be canceled.

During the configuration process the following features are defined:

Main Valve (sustaining valve) - Yes/ No. When the answer is “Yes” the Pre-Dwell delay between the Main Valve opening and the opening of Station No. 1 can be defined. The selectable delay steps are: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 sec 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6 min

Dwell time - the delay between stations – 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 sec.

DP delay - the delay during which the DP sensor reading is expected to remain stable before reaction – 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 sec.

Looping limit - the number of consecutive flushing cycles triggered by the DP sensor before deciding that there is an endless lopping problem. The options are: 1-10 or “no” which means ignoring the looping problem.

Alarm - Yes/No – allocating one output for alarm activation.

Delay Valve - Yes/No – allocating an output for Delay Valve activation.

View Outputs - this is a special mode that enables passing through the list of outputs to see how each output was allocated. Use the + key to change the “no” into “yes” and confirm by “Enter”, then keep using the + key to pass through the list. At the bottom left corner, the ordinal number of the output is displayed and its allocated function appears in large letters at the center of the screen. Notice that the number of possible outputs that can be used is always an even number since it results from the number of “plug in” boards (each of 2 outputs) included. However, if the number of outputs needed is not an even number, then the last valve allocated for flushing may be canceled by use of the manual operations key.

Pressure units - deciding about the units to be used for pressure measurement. Selecting between BAR or PSI.

Calibration - Zero calibration of the built-in electronic DP sensor. While the sensor ports are disconnected select Calibration = Yes.

Handling Endless Looping problems

As explained above, endless looping problem will be declared when the number of consecutive flushing cycles triggered by the DP sensor exceeds the “Looping limit” defined during configuration. When endless looping problem was detected, the DP indication will no longer be considered as a trigger for flushing. The following flushing cycles will be triggered by the interval count down only.

The problem will be considered as solved when the constant indication of the DP sensor will be removed.

Handling Low pressure

When a closed contact indication is received at the low-pressure input of the controller, the symbol will start to appear blinking at the display. All activities will stop including the countdown to the next flushing cycle. If the low pressure happened while a flushing sequence was in progress, when the low-pressure condition terminates the flushing sequence will start from the beginning rather than continue from the stop point.

Connecting the DP sensor to the filter system

The DP sensor is connected to the filter system by 2 command tubes, the one which comes from the filter inlet (High pressure) will be connected to the red point, and the one that comes from the outlet (Lower pressure) will go to the black point. It is important to put a small filter of 120 mesh (not supplied) between the red point and the high-pressure connection point.

Low battery

The unit has two levels of low battery indication. At the first level when the battery voltage drops to the first level, the sign will start to appear at the screen. When the battery voltage drops further and reaches the second level, all outputs will shut down, the screen will be cleared leaving only the low battery icon.

Manual activation

A flushing sequence can be manually activated by the “MANUAL” key. When manually activated the icon will appear on the display. The same key will be used for manually terminating a sequence in progress.

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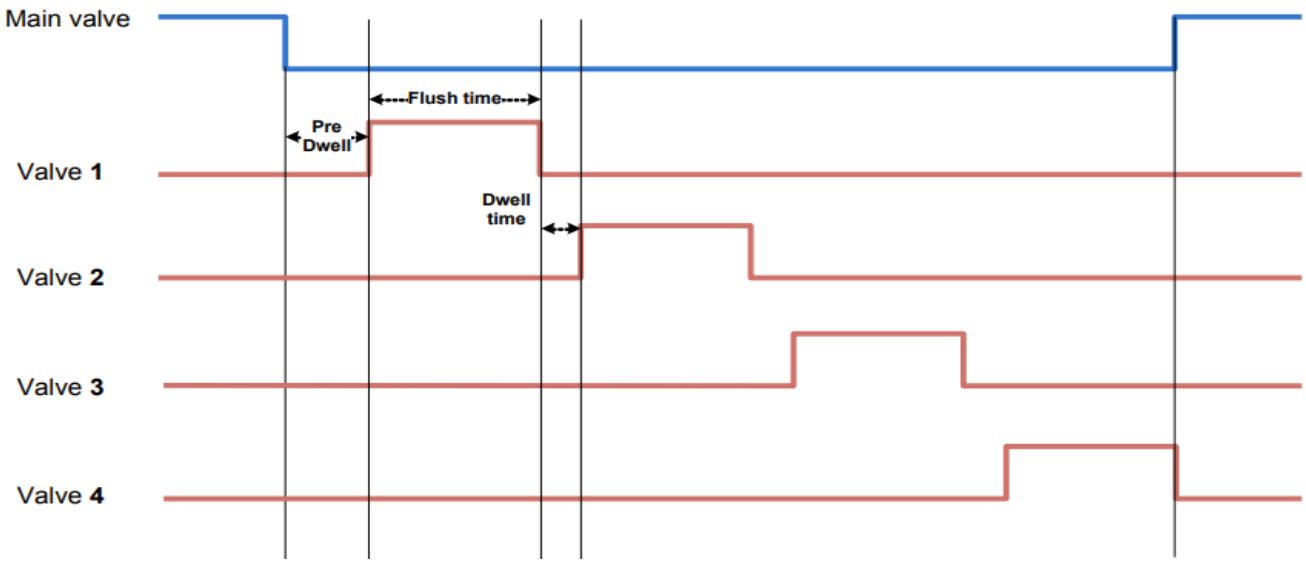
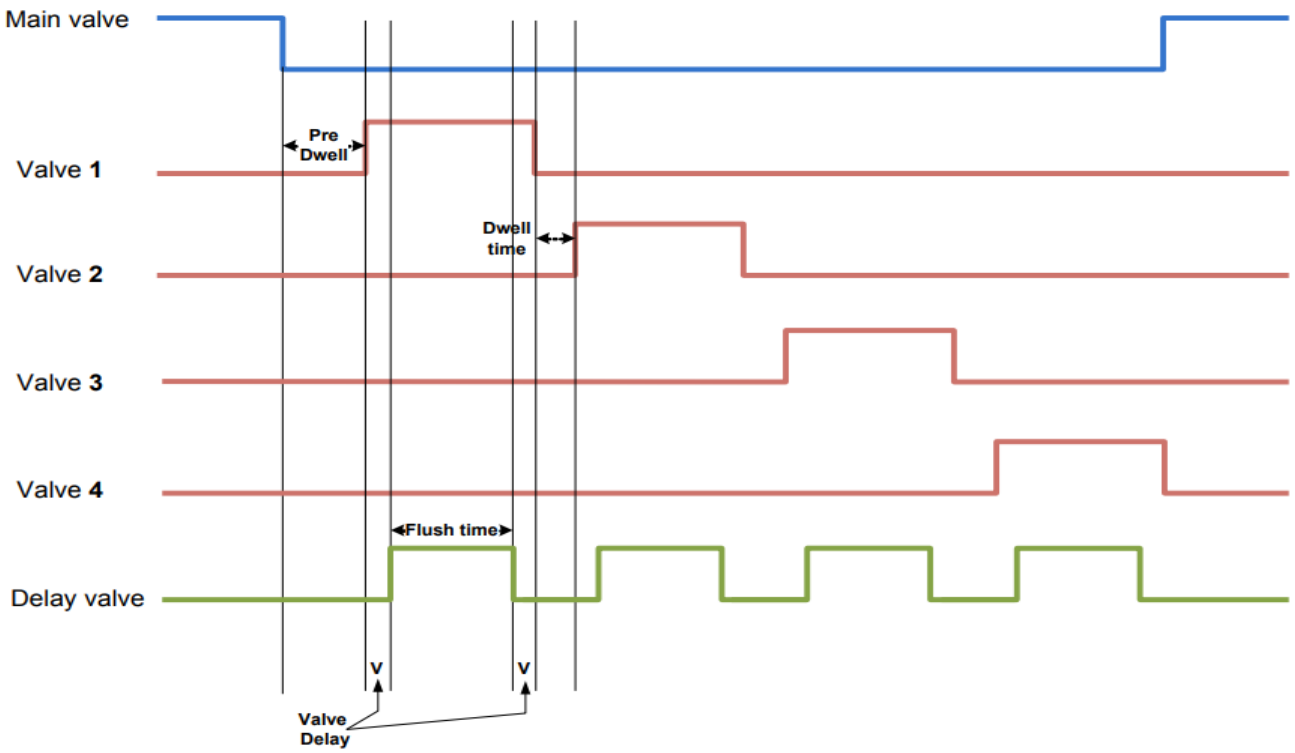
Timing Diagram

Without Delay Valve



Including Delay Valve



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Wiring Diagram

DC MODEL

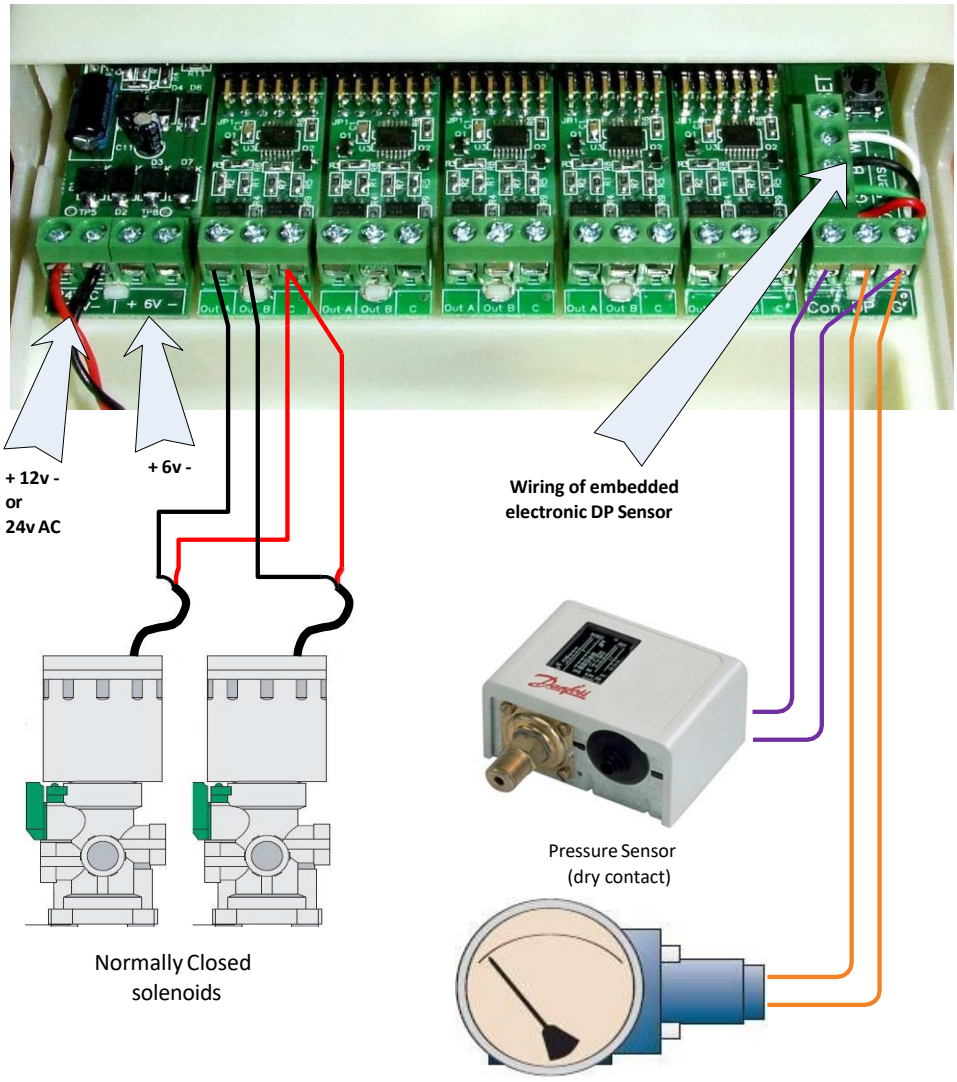
The drawing below shows the wiring of the DC model of the controller.

Notice that:

1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.

2. The powering of the unit can be either by 6v DC or 12v DC.

3. The solenoids will be of 12v DC latch.



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Wiring Diagram

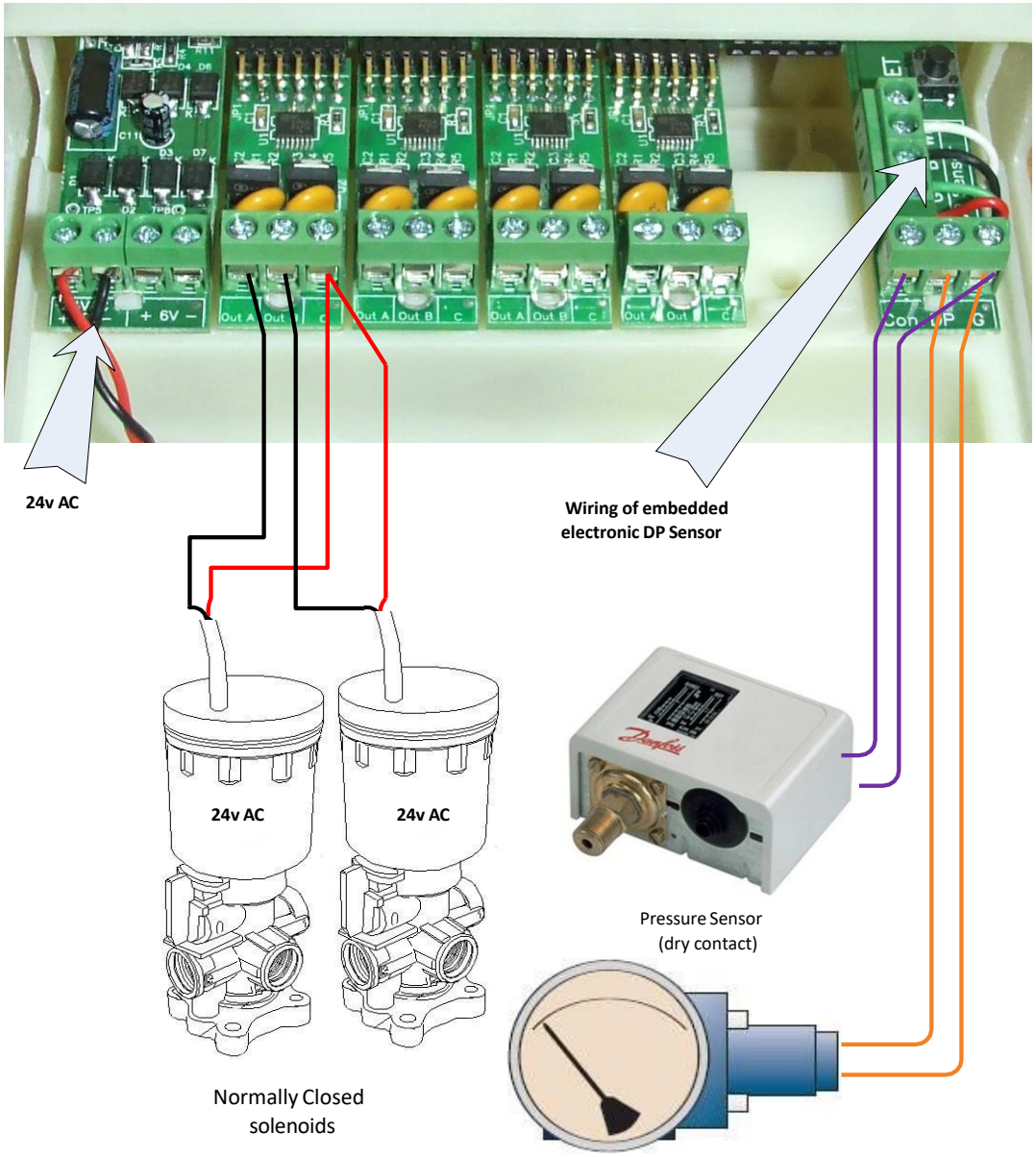
AC MODEL

The drawing below shows the wiring of the AC model of the controller. Notice that:

1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.

2. The powering of the unit is by 24v AC transformed from 220/110 v AC.

3. The solenoids will be of 24v AC.



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TECHNICAL DATA

DC MODEL

Power source: 6v supplied by 4 x 1.5 “D” size alkaline batteries. or 12v DC dry battery or 12v rechargeable battery with solar panel of 2 watts

Outputs : 12v DC latching solenoids. DP: Embedded electronic analog

DP : sensor or external dry contact DP sensor.

Pressure Sensor: Dry contact pressure sensor

Operating temperature: 0-60 C.

AC MODEL

Power source: 220 or 110 v AC 50 or 60 Hz with built in transformer to 24v AC.

Outputs : 24v AC solenoids. DP: Embedded electronic analog

DP sensor or external dry contact DP sensor.

Pressure Sensor: Dry contact pressure sensor

Operating temperature: 0-60 C

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14.0 Warranty

Triangle Waterquip warrants all IGS® products against defects in material and workmanship for a period of 24 months from commissioning date or 18 months from delivery date, whichever date comes first. The warranty is limited and valid only when the product is used in accordance with the manufacturer's standards and instructions and on condition that the customer fulfils their obligations set forth in this manual. The manufacturer's liability is limited to the replacement of defective parts with new or rebuilt parts free of charge. Any freight charges are for the customer's account. This warranty is extended only to the original purchaser. A purchase receipt or other proof of date of the original purchase may be required before warranty performance is rendered. This warranty only covers failures due to defects in materials and workmanship which occur during normal use. It does not cover damage caused by accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, modification or service by anyone other than the manufacturer or the manufacturers authorized agent or representative personnel. The manufacturer is not liable for incidental or consequential damage resulting from the use of this product or arising out of any breach of this warranty. All express and implied warranties including the warranties of merchantability and fitness for a particular purpose/use are limited to the applicable warranty period set forth above. In the event of a warranty claim a purchase order will be required from the customer to send the replacements part/s on. These parts will be invoiced at the standard replacement part price including freight. Faulty replaced parts are to be returned to Triangle Waterquip or their agent/distributor for evaluation, inspection and assessment, so that they can be checked for cause of damage and claim. If they are deemed to be a warranty claim then the part/s cost as invoiced will be credited to the customer, less the cost of any freight incurred. If the replacement parts are not deemed to be a warranty claim, then the invoice will remain in place as is.