

PPI DIX Stainless Steel

SCREEN FILTERS

Technical Manual



Designed and Manufactured in Australia
by a 100% Australian Owned Company



IMPORTANT NOTICE:

Ensure that all persons who use **PPI/DIX STAINLESS STEEL SCREEN** filters read and thoroughly understand these instructions prior to operation. Should you have any questions regarding the use of the filter, please call your dealer for assistance.

CONTENTS

1. INTRODUCTION TO PPI/DIX STAINLESS STEEL SCREEN FILTERS	2
2. SAFETY PRECAUTIONS.....	2
3. FEATURES AND BENEFITS.....	2
4. PRINCIPLES OF OPERATION.....	2
5. FILTER COMPONENTS	3
6. TECHNICAL DATA	6
7. INSTALLATION GUIDELINES.....	11
8. ANNUAL MAINTENANCE.....	12
9. WARRANTY.....	13



1. INTRODUCTION TO PPI/DIX STAINLESS STEEL SCREEN FILTERS

Congratulations on the purchase of your PPI/DIX Stainless Steel Screen Filter. The PPI/DIX Stainless Steel Screen Filters supplied by PPI Corporation have earned a reputation for superior performance and reliability since their introduction to the harsh Australian environment in 1972.

This manual will provide you with information concerning the design, efficient operation and maintenance of your filters.

2. SAFETY PRECAUTIONS

Safety precautions are essential when any filtration equipment is involved. These precautions are necessary when using and servicing your filter. Failure to observe appropriate safety precautions may result in personal injury or product damage.

Always observe the following precautions:

- Read this manual carefully. Consider the applications, limitations and potential hazards specific to your filter installation.
- PPI/DIX Stainless Steel Screen Filters are rated to operate at a maximum pressure of 1,000 kPa. (145 psi) Whilst catastrophic failure of the pressure vessel is highly improbable, eye protection should be worn at all times when in the vicinity of pressurised filters.
- Do not tamper with any filter components whilst the system is pressurised.
- Ensure that all unions, couplings and clamps are properly seated and tightened prior to system pressurisation.
- Filters with damaged or missing parts must not be operated.
- Serious shock or electrocution can occur when electricity contacts water. Never attempt to adjust or service the PPI Filter Controller if your hands or feet are wet or if you are standing on wet ground. Make sure outdoor electrical outlets are weatherproof and protected by an earth leakage device designed to protect you from electrical shock.
- **At no time may the filter's internal pressure exceed 1,000 kPa (145 psi).**

3. FEATURES AND BENEFITS

- Exclusive BrushVac™ system utilises a shrouded rotating brush and venturi effect to vacuum clean the filter screen during backflushing, providing more effective and shorter cleaning cycles – Saves valuable water.

BRUSHVAC™ System

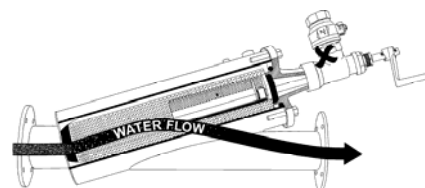


- Simple and robust construction that is easily serviced without the need for special tools.
- Automatic control utilises both time and pressure differential to trigger cleaning - Requires very little attention and reduces pump energy costs.
- High strength grade 304 stainless steel construction by professional stainless steel fabricators ensures exceptional corrosion and abrasive wear resistance - Provides many years of reliable service and protects your investment.
- Tapered screens on models 3000 and above eliminate possible eddy traps and low-flow areas - Guarantees effective backflushing.
- Designed and manufactured in Australia under a third party accredited AS/NZS/ISO 9001:2000 quality system - Assures quality, reliability, after sales service and spares availability.

4. PRINCIPLES OF OPERATION

Filtration Mode

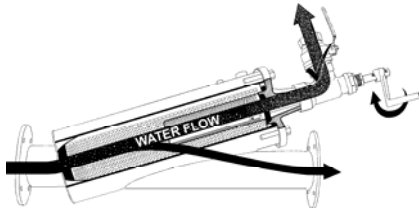
- With the Backflush Valve in the closed position, unfiltered water enters the Filter Body and passes through the cylindrical stainless steel Filter Screen, from its inside to outside.
- Contaminants are retained on the inside surfaces of the Filter Screen.
- Clean, filtered water flows out of the Filter Body.





Manual Backflush Mode

- The manual Backflush Valve is opened.
- Unfiltered water entering the Filter Body rushes along the inside surfaces of the Filter Screen collecting loose debris and expels it through the Backflush Valve.



- The stainless steel Brush is moved across the inside surface of the Filter Screen by rotating its handle in a clockwise direction four or five turns. A Shroud surrounding the Brush causes local water velocity to increase thereby creating a low-pressure zone that sucks the dislodged debris away from the Filter Screen surface and out through the Backflush Valve.
- The Backflush Valve is closed and the filter returns to normal operation.

Automatic Backflush Mode

- The PPI Filter Controller determines when the filter requires cleaning, either after a specified time or by sensing a preset differential pressure between inlet and outlet sides of the filter.
- The controller sends a signal to the Hydraulic Backflush Valve's operating solenoid and the Brush Motor. The Hydraulic Backflush Valve opens and the Brush Motor commences rotating moving the stainless steel Brush across the inside surface of the Filter Screen. A Shroud surrounding the Brush causes local water velocity to increase thereby creating a low-pressure zone that sucks the dislodged debris away from the Filter Screen surface and out through the Hydraulic Backflush Valve.
- After the set flush duration has elapsed, the PPI Filter Controller transmits a signal to valve's solenoid and Brush Motor, closing the valve and stopping the Brush rotation.
- The filter returns to normal operation.

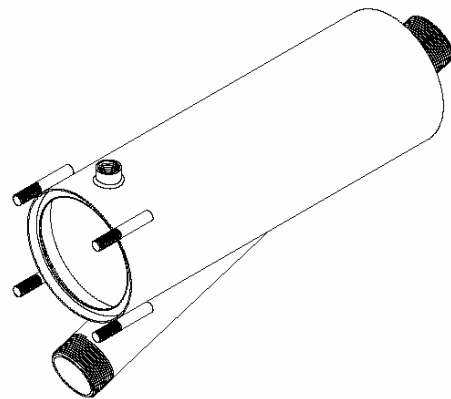
Note: In applications where there is a high risk of blockage due to loose gravel, marine shells or bulky vegetable material present in the water, a controller modification is available which delays the Brush Motor starting, for two to three seconds after the Hydraulic Backflush Valve is opened. This permits the majority of the debris to be cleared before brush rotation commences thereby reducing strain on electromechanical components.

5. FILTER COMPONENTS

Filter Body

PPI/DIX Stainless Steel Screen Filters are fabricated from grade 304 stainless steel to ensure chemical and abrasion resistance. Whilst stainless steel is an exceptionally strong and durable material, in installations where the water source contains chloride levels above 200mg/L (200ppm) at ambient temperatures, reducing to 150mg/L (150ppm) at 60°C, pitting, crevice corrosion or stress cracking may be experienced in grade 304 stainless steel, even after short periods of time.

Chlorine injection practices that result in concentrations >2mg/L (>2ppm) should be positioned downstream of the filter. The Nickel Development Institute recommends grade 316 stainless steel where chloride levels exceed 200mg/L (200ppm). These are available from your PPI dealer, subject to special order and pricing.





End Cap

A powder coated cast-iron End Cap locates the Filter Screen and supports a gland that prevents water leakage around the brush shaft. To ensure easy removal during servicing, End Caps are attached to the Filter Body's stainless steel studs with brass nuts. (Optional stainless steel End Caps are available for specialised applications.)



End Cap

End Cap Seal

Manufactured from synthetic rubber, the End Cap Seal fits between the Filter Body and End Cap to provide a watertight seal to the filter assembly.

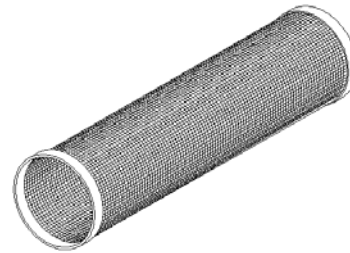


End Cap Seal

Filter Screen

Filter Screens are available in filtration grades ranging from 3.25mm punched screens to 150 mesh (100µm) woven wire sieves. (Note. Models 4,500 to 10,000 minimum filtration grade is 80 mesh (185µm)).

Parallel screens are supplied to all models up to 1,500. Models 3,000 and above utilise tapered screens to avoid eddy traps or areas of low flow. Considerable care must be exercised when replacing a parallel screen to avoid damage that will result from incorrect orientation between Brush and Filter Screen. All screens are manufactured from durable, grade 304 stainless steel.



Filter Screen

Filter Screen Seal

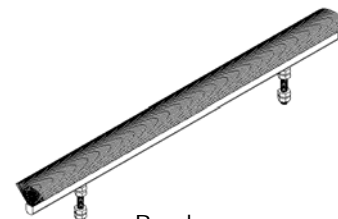
Filter Screen Seals are moulded from synthetic rubber. In parallel screen models, they are fitted to the ends of Filter Screens. In tapered screen models, they are fitted to the Filter Body and End Cap, to eliminate the possibility of contaminated water bypassing the Filter Screen.



Filter Screen Seal

Brush

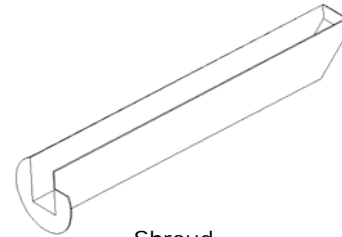
The adjustable Brush is attached to the brush shaft and is rotated within the Filter Screen to mechanically dislodge debris. Brushes are manufactured from stainless steel to ensure long life and reliability.



Brush

Shroud

Encasing the Brush and attached to the brush shaft, the Shroud's function is to channel backflushing water at high velocity along the Brush. This action creates a low-pressure zone in its vicinity that effectively vacuum cleans debris from the Filter Screen.



Shroud

Locking Collar

Two, brass Locking Collars fitted with stainless steel set-screws, are provided to position the brush shaft assembly within the filter and provide thrust bearing surfaces.



Locking Collar

Gland O-Rings

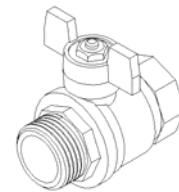
Gland O-Rings are located in the brass bush that forms the brush shaft gland to prevent water from escaping from the assembled filter.



Gland O-Rings

Manual Backflush Valve (375 and 500 models only)

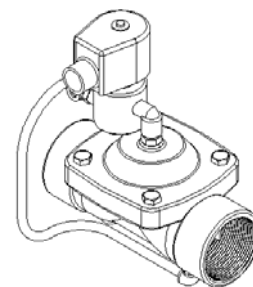
375 and 500 model filters are equipped with a 1" stainless steel Backflush Valve. The valve is manually opened during cleaning operations to facilitate the flushing of accumulated debris from the Filter Body. Models 750 and above utilise a 2" valve that is not supplied with the filter.



Manual Backflush Valve

Hydraulic Backflush Valve (Automatic backflush models only)

The PPI Filter Controller governs the operation of the Hydraulic Backflush Valve. When a cleaning cycle is initiated, the valve is opened automatically to permit the expulsion of debris from the filter. Models 375 and 500 are fitted with 25mm diaphragm valves whilst models 750 and above require a solenoid controlled, 50mm hydraulic valve.



Hydraulic Backflush Valve



Pressure Differential Gauge (Automatic backflush models only)

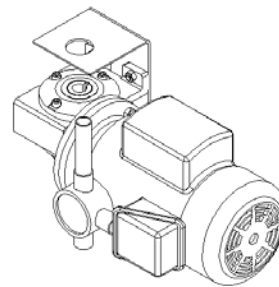
A Pressure Differential Gauge compares the line pressures on both inlet and outlet sides of the filter. The pressure differential value is conveyed to the filter's PPI Filter Controller for processing.



Pressure Differential Gauge

Brush Motor (Automatic backflush models only)

Brush Motors are available in both 240VAC single phase, 415VAC three phase, 12VDC and 24VAC power options. The motor is provided on automatic models to rotate the Brush during cleaning operations. The Brush Motor is provided with overload protection to avoid damage in the event of a severe brush jam. Models 375 and 500 employ 0.09kW motors, 750 to 3,000 utilise 0.187kW whilst 4,500 to 10,000 models are equipped with 0.375kW motors.



Brush Motor

PPI Filter Controller (Automatic backflush models only)

The PPI Filter Controller utilises time and pressure differential to initiate cleaning cycles. Operator inputs set the cleaning cycle interval and backflush duration. A manual flush function is also provided for system validation. The controller should be adjusted to normally backflush by time, reserving pressure differential as a backup to accommodate instances of unforeseeable rapid debris accumulation.

PPI Filter Controllers are supplied with a separate owner's manual that clearly details set-up, power connection details and operating procedures.



PPI Filter Controller
(Single phase model depicted)

6. TECHNICAL DATA

Model Configurations

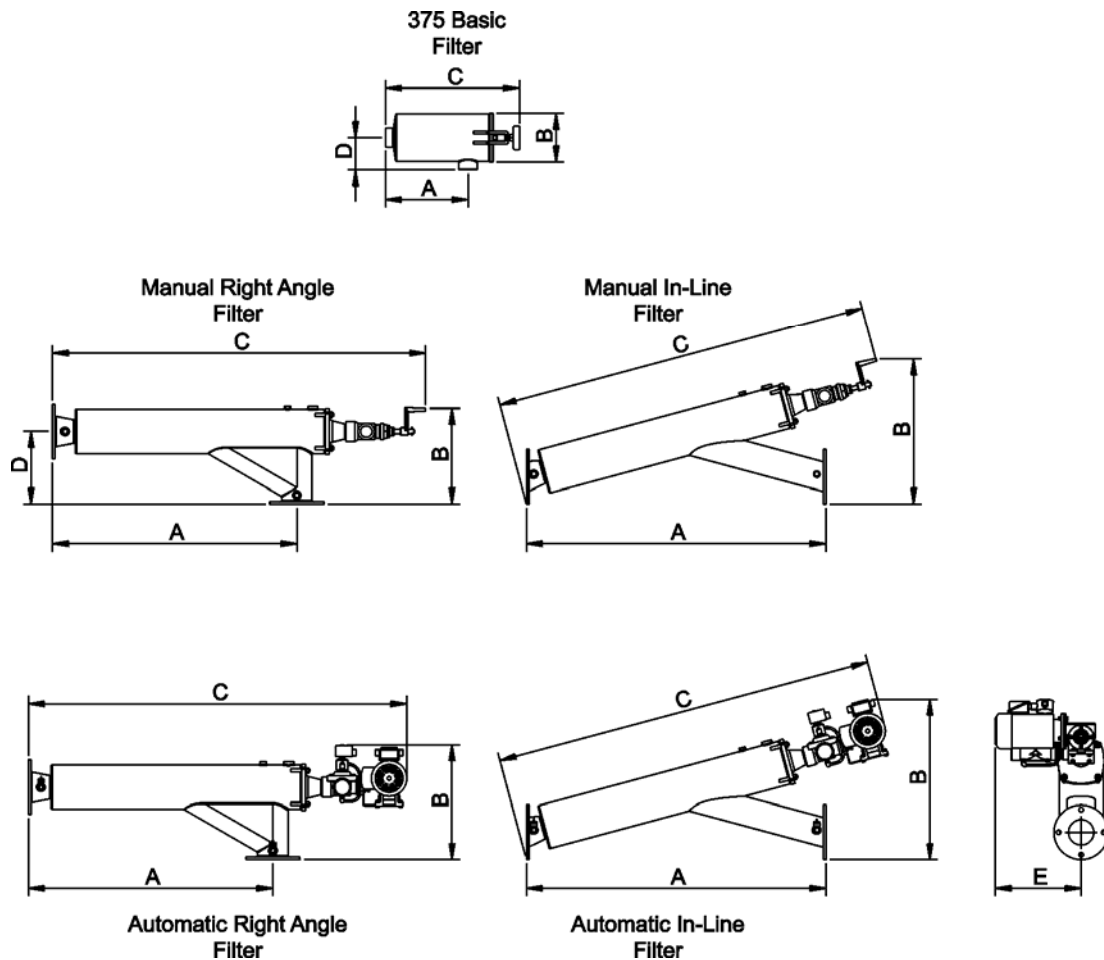
PPI/DIX Stainless Steel Screen Filters are supplied in an extensive range of configurations, sizes and filtration grades, with either manual or automatic backflushing in 12 volt DC, 24volt AC or single and three phase AC power options, to accommodate most applications.

For the most rudimentary installation, a 375 Lpm Basic filter is available that does not have the internal BrushVac™ system of cleaning. Also available are 375 and 500 full stainless steel "Hygienic" models for use in specialised food processing applications.



Dimension Table

Model	A	B		C		D	E
		Manual	Automatic	Manual	Automatic		
375 Lpm Basic	255	180	-	430	-	100	-
375 Lpm In-Line	418	300	355	610	605	-	230
500 Lpm In-Line	544	260	370	750	755	-	230
750 Lpm In-Line	668	380	510	1,000	995	-	270
750 Lpm Right Angle	485	345	415	985	1,000	250	270
1,500 Lpm In-Line	1,175	460	530	1,475	1,510	-	270
1,500 Lpm Right Angle	975	370	440	1,460	1,490	280	270
3,000 Lpm In-Line	1,140	640	660	1,500	1,505	-	270
3,000 Lpm Right Angle	830	470	490	1,430	1,440	330	270
4,500 Lpm In-Line (150F)	1,590	730	705	1,890	1,860	-	300
4,500 Lpm In-Line (200F)	1,370	755	730	1,790	1,760	-	300
4,500 Lpm Right Angle	1,120	540	530	1,755	1,730	400	300
7,500 Lpm In-Line	1,740	845	815	2,120	2,100	-	300
7,500 Lpm Right Angle	1,405	665	655	2,050	2,030	520	300
10,000 Lpm In-Line	2,240	1,035	1,010	2,555	2,535	-	300
10,000 Lpm Right Angle	1,760	845	835	2,625	2,600	700	300

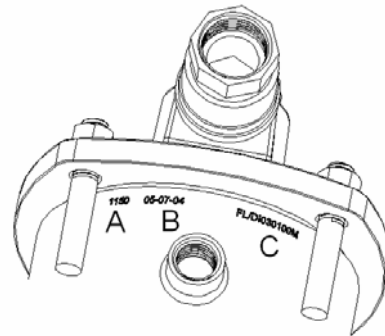




Serial Number

Should it become necessary to order replacement parts for a filter, the process is simplified by quoting its unique, three-part serial number. The serial number is permanently engraved into the filter body.

Part A is the original DIX job number, Part B identifies the date of manufacture in DD-MM-YY format and Part C is the filter's PPI part code.

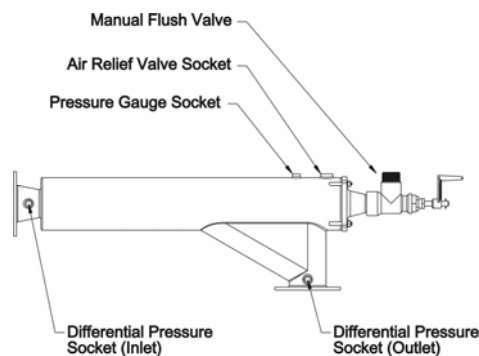


Mesh Size Table

Mesh Size	Open Area %	Micron (µm)	mm
150 Mesh	16	100	0.100
120 Mesh	18	124	0.125
80 Mesh	16	185	0.185
50 Mesh	21	315	0.315
0.51mm Punched Screen	20	510	0.510
0.75mm Punched Screen	35	750	0.750
1.00mm Punched Screen	41	1000	1.000
1.60mm Punched Screen	36	1600	1.600
3.25mm Punched Screen	48	3250	3.250

Ancillary Connection Table

Model	Flush Valve Socket	Air Relief Socket	Pressure Gauge Socket	Differential Pressure Sockets
375 Lpm Basic	n/a	n/a	n/a	n/a
375 Lpm	1" BSP (supplied)	n/a	n/a	½" BSP
500 Lpm	1" BSP (supplied)	n/a	n/a	½" BSP
750 Lpm	2" BSP	1" BSP	½" BSP	½" BSP
1,500 Lpm	2" BSP	1" BSP	½" BSP	½" BSP
3,000 Lpm	2" BSP	2" BSP	½" BSP	½" BSP
4,500 Lpm	2" BSP	2" BSP	½" BSP	½" BSP
7,500 Lpm	2" BSP	2" BSP	½" BSP	½" BSP
10,000 Lpm	2" BSP	2" BSP	½" BSP	½" BSP

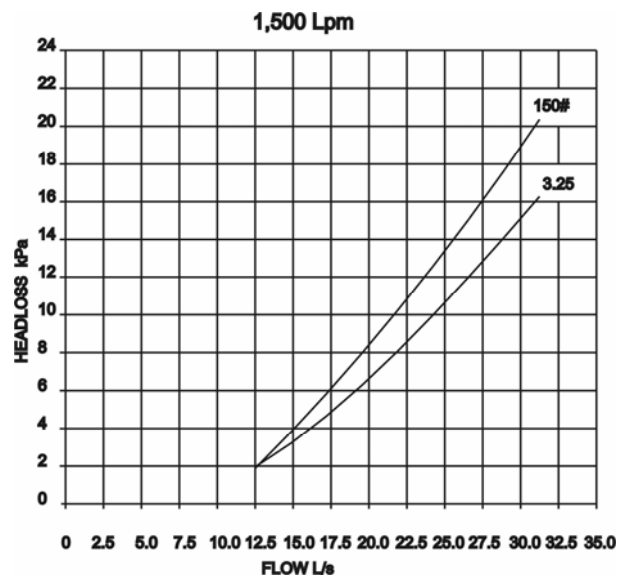
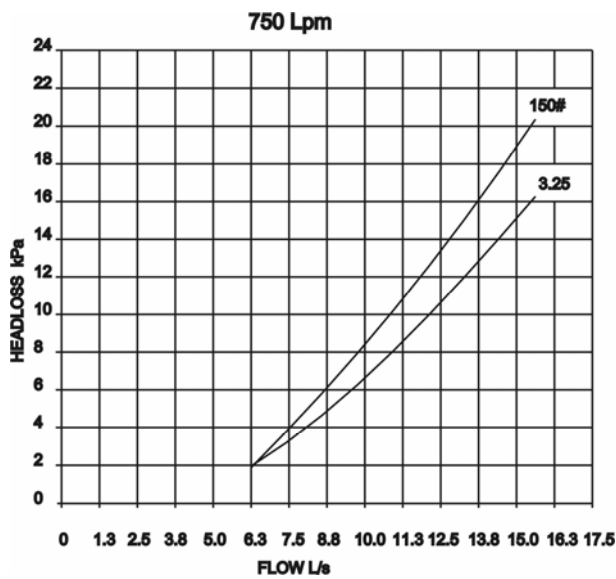
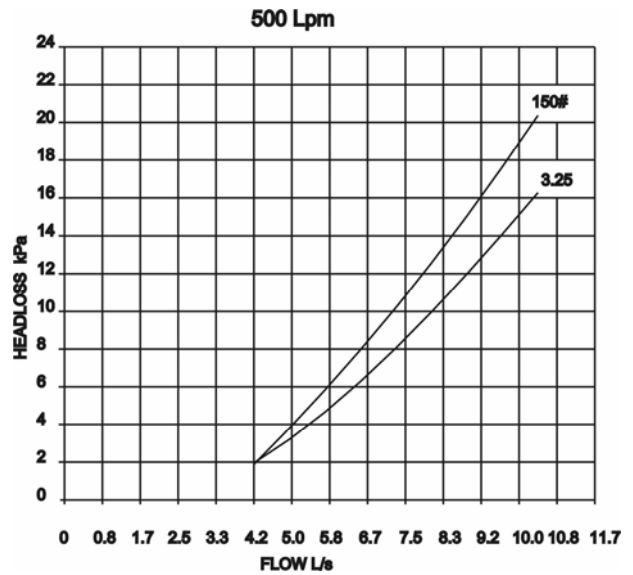
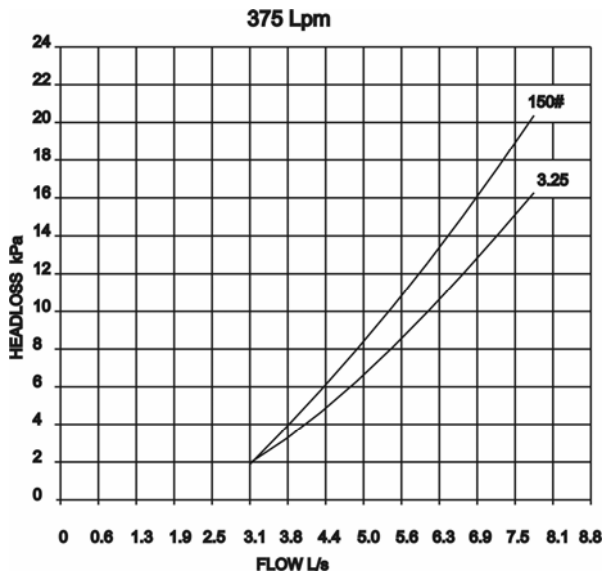




Maximum Flow Rate Table

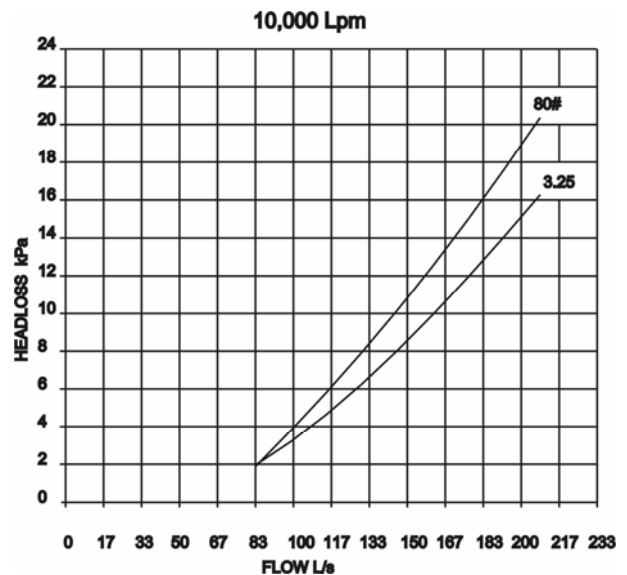
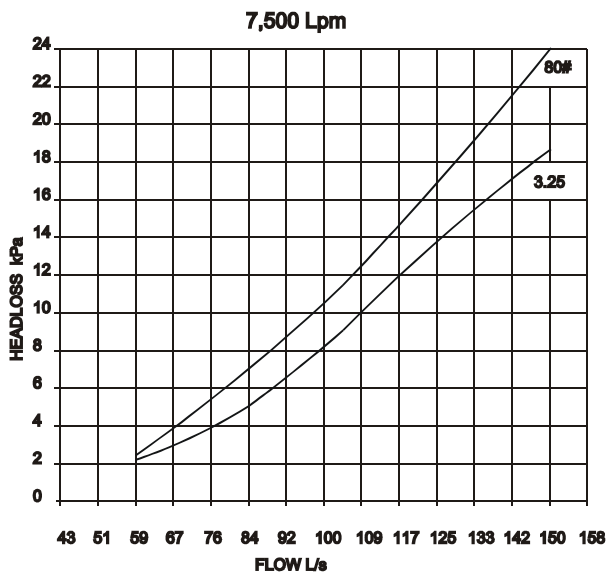
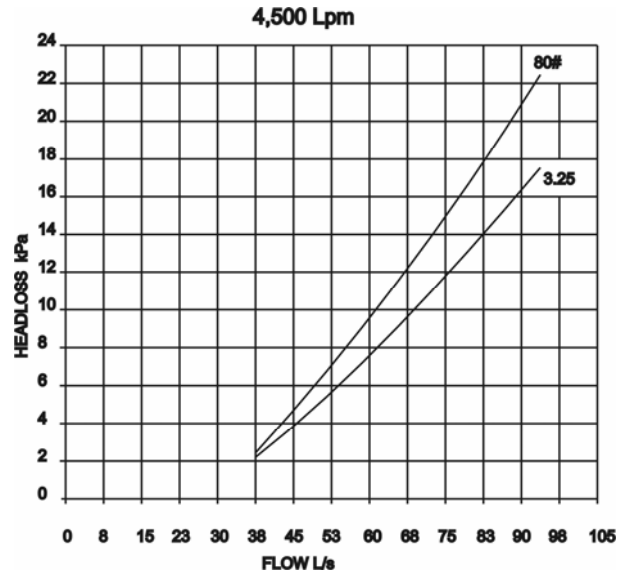
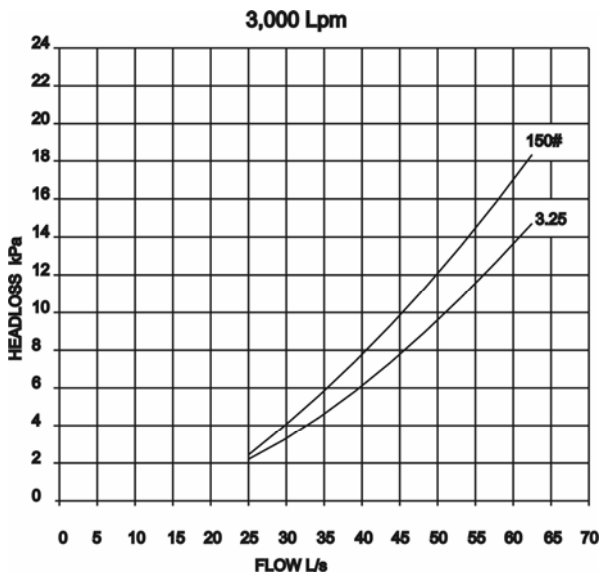
Model	Rated Flow			Filtration Surface Area
	L/sec	L/min	m ³ /hr	m ²
375 Lpm Basic	6.3	375	23	0.08
375 Lpm	6.3	375	23	0.08
500 Lpm	8.3	500	30	0.13
750 Lpm	12.5	750	45	0.15
1,500 Lpm	25.0	1,500	90	0.28
3,000 Lpm	50.0	3,000	180	0.46
4,500 Lpm	75.0	4,500	270	0.65
7,500 Lpm	125.0	7,500	450	1.04
10,000 Lpm	166.7	10,000	600	1.38

Head Loss Charts





Head Loss Charts



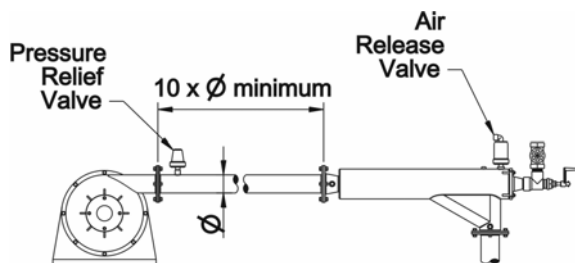
Shipping Data Table

Model	Manual (kg)	Automatic (kg)	Carton Dimensions (mm)
375 Lpm Basic	10	n/a	535x275x200
375 Lpm	12	n/a	535x275x200
500 Lpm	15	n/a	740x270x215
750 Lpm	23	n/a	910x365x230
1,500 Lpm	33	49	1,500x525x240
3,000 Lpm	53	69	1,415x630x365
4,500 Lpm	71	87	1,780x715x365
7,500 Lpm	120	136	2,400x1,000x600
10,000 Lpm	240	256	n/a

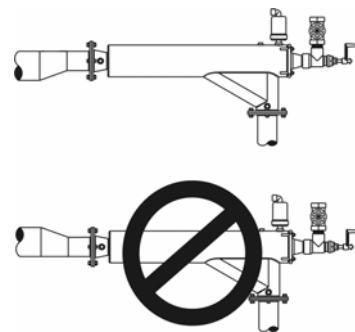
7. INSTALLATION GUIDELINES

The following guidelines are provided to assist with the installation and reliable operation of a PPI/DIX Stainless Steel Screen Filter.

- Ensure that the filter is installed with the direction of water flow as indicated on the filter. Water must enter the Filter Screen from the inside and pass through to the outside. Reversing the water flow will damage the Filter Screen.
- Pressure relief valves of a sufficient size and volume, set to relieve at 1,000 kPa (145 psi) should be installed upstream of the inlet and downstream of the outlet of the filter.
- Close coupling to pumps or valves is not recommended as turbulence may produce vibration within the filter that will cause the stainless steel to rapidly fatigue and fracture. It is recommended that a straight section of at least ten, but preferably fifteen, times the diameter of connecting pipe is allowed between the filter and any other device on the inlet side. (i.e. pump, meter etc.)



- If a combustion engine driven pump is used, the filter must be isolated from all vibration with a flexible isolation joint or coupling.
- PPI/DIX Stainless Steel Screen Filters are not recommended for use in conjunction with reciprocating piston-type pumps that deliver a pulsating flow.
- If a reducing coupling is required to connect the filter to the inlet piping, it is essential that an eccentric coupling is used and the straight section is oriented upwards to avoid air pockets forming.



- Surge pressure and severe water hammer may damage the filters. These forces can develop from air pockets or inappropriate system shutdown procedures. To avoid forces being applied to the filter, install check valves only between the filter and the distribution line. If air accumulation in the filter is likely, it is recommended that an air release valve be installed onto the filter body.

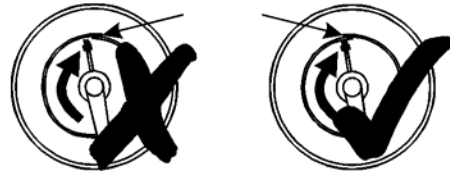


- System design should ensure that back-flow is prevented. If necessary, back-flow prevention devices should be installed upstream of the inlet and downstream of the outlet to prevent back-flow or vacuum effects due to pump-stop, bursts or topography.

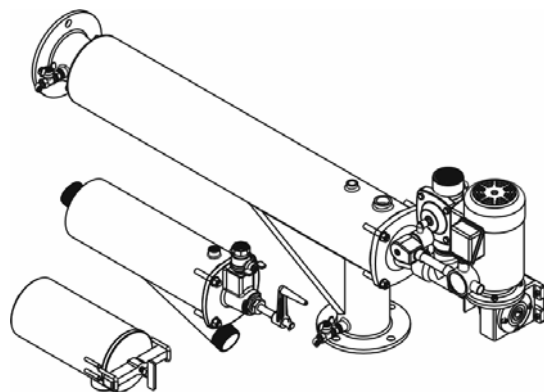
8. ANNUAL MAINTENANCE

- Immediately prior to shutdown, conduct a backflush operation to ensure the filter is in a clean state. If the system is to be shutdown for a period greater than seven days, drain the filter of all water and leave the system open to air. Failure to observe this precaution may result in pitting or crevice corrosion of the stainless steel components.
- After removing the motor or manual handle, loosen the gland's lock nut and remove the brass bush. Inspect and replace the O-rings as necessary, before greasing and replacing the bush on the End Cap.
- It is recommended that the Filter Screen is removed and inspected annually. Remove the brass nuts securing the End Cap and carefully withdraw the End Cap, Brush and Filter Screen assembly from the Filter Body. Inspect all rubber seals for signs of degradation and replace as necessary.
- Inspect the screen internally and externally for sign of wear or damage from incorrect Brush rotation and replace as necessary.
- Although the Brush is adjusted correctly at the time of manufacture, in time wear may necessitate adjustment. To access the adjustment nuts, first remove the Shroud. Adjust brush alignment to achieve light contact with the filter screen. Ensure that all nuts are tight and locked when reassembled.
- To refit a conical Filter Screen, lightly grease each end of the screen to aid its installation. Carefully insert the Filter Screen and Brush assembly into the Filter Body and locate the End Cap on the studs. Evenly tighten the End Cap nuts until virtually no gap is visible between the End Cap and Filter Body.

- Refitting a parallel Filter Screen requires considerable care and attention. Orient the screen onto the Brush such that when the Brush is rotated in a clockwise direction inside the screen, the mesh overlap is also in a clockwise direction. This will ensure the Brush does not pick-up and damage the Filter Screen overlap during rotation.



- Lightly grease each end of the Filter Screen Seal to aid its installation. Carefully insert the Filter Screen and Brush assembly into the Filter Body and locate the End Cap on the studs. Evenly tighten the End Cap's nuts until virtually no gap is visible between the End Cap and Filter Body.
- To avoid possible damage, always ensure that the Filter Screen and Brush are located in the correct positions before tightening End Cap's nuts. If you suspect that excessive force is being exerted on the nuts or screen, stop and check. Needlessly damaged Filter Screens are expensive to replace.





9. WARRANTY

Who gives this warranty (Warrantor).

PPI Corporation Pty Ltd
275 Robinson Road East
Geebung Qld 4034
Australia

Who receives this warranty (Purchaser).

The original purchaser (other than for purposes of resale) of the PPI product.

Duration

PPI/DIX Stainless Steel Screen Filters, Automatic Filter Controller and valves: One year from the date of purchase by the original purchaser.

What products are covered by this warranty.

PPI/DIX Stainless Steel Screen Filters, Automatic Filter Controller and valves manufactured or sold by the warrantor.

What is covered under this warranty.

Manufacturing defects in materials and workmanship, which occur within the duration of the warranty period.

What is not covered under this warranty.

Any incidental, indirect, or consequential loss, damage or expense that may result from any defect, failure or malfunction of the warranted product.

Any failure that results from an accident, purchaser's abuse, neglect, operation in excess of stated maximum working pressure or failure to operate and maintain the warranted product in accordance with the instructions provided in the owners manual supplied with the product. Items or service that are normally required to maintain the product in good working order. (eg. Seals, O-rings).

Corrosion, pitting and/or stress cracking of grade 304 stainless steel filter housings resulting from use of filters with a water supply that contains chloride levels above 200mg/L at ambient temperatures, reducing to 150mg/L at 60°C and/or as a consequence of water chlorination practices that produce chlorine concentrations above 2mg/L, even for short periods of time.

Responsibilities of warrantor under this warranty.

Repair or replace at the warrantor's option PPI/DIX Stainless Steel Screen Filter or components that have failed as a result of faulty manufacture, within the duration of the warranty period.

Responsibilities of purchaser under this warranty.

Immediately notify PPI Corporation Pty Ltd of any potential warranty claims. Deliver or ship the PPI/DIX Stainless Steel Screen Filter product to the warrantor's manufacturing facility. Freight costs if incurred must be borne by the purchaser.

Use reasonable care in the operation and maintenance of the product as described in the owner's manual.

When the warrantor will perform repair or replacement under warranty.

Repair or replacement will be scheduled and serviced according to the normal workflow at the warrantor's manufacturing facility, dependant upon the availability of replacement parts.

If the purchaser does not receive satisfactory results from the product repair or replacement, the purchaser shall advise the warrantor immediately.

NOTE: THIS WARRANTY IS VOID AND PPI CORPORATION ASSUMES NO LIABILITY WHATSOEVER IN THE EVENT OF THE PURCHASER FAILING TO COMPLY WITH ANY OF THE REQUIREMENTS FOR INSTALLATION AND USE OF PPI/DIX STAINLESS STEEL SCREEN FILTERS, OUTLINED IN THIS MANUAL.