



Installation
and Operation
Instruction
Manual
FWINSMAN301

Yardney - Filtaworx
FW04

Phone: 951.656.6716 | Toll-Free: 800.854.4788 | www.yardneyfilters.com

Yardney Water Management Systems, Inc. | 6666 Box Springs Blvd. | Riverside, CA 92507

Table of Contents

Introduction	3
Operating Principal.....	4
Technical Specification.....	5
Dimensional Details.....	6
Safety Instructions.....	7
Installation.....	7
Commissioning.....	8
Operation	9
Maintenance.....	9
Rinse Controller	9
Disassembly Instructions.....	10
Preventative Maintenance	11
Trouble Shooting.....	11
Hydraulic Control System Layout	13
Warranty	14

Introduction

We thank you for your purchase of a Filtaworx® automatic self-cleaning filter manufactured in Australia by Triangle Waterquip Pty. Ltd. Triangle has over 33 years of experience working with automatic self-cleaning screen filters. In this time we have gained a vast amount of experience and knowledge in this field, which has been used in the design of the Filtaworx® product range.

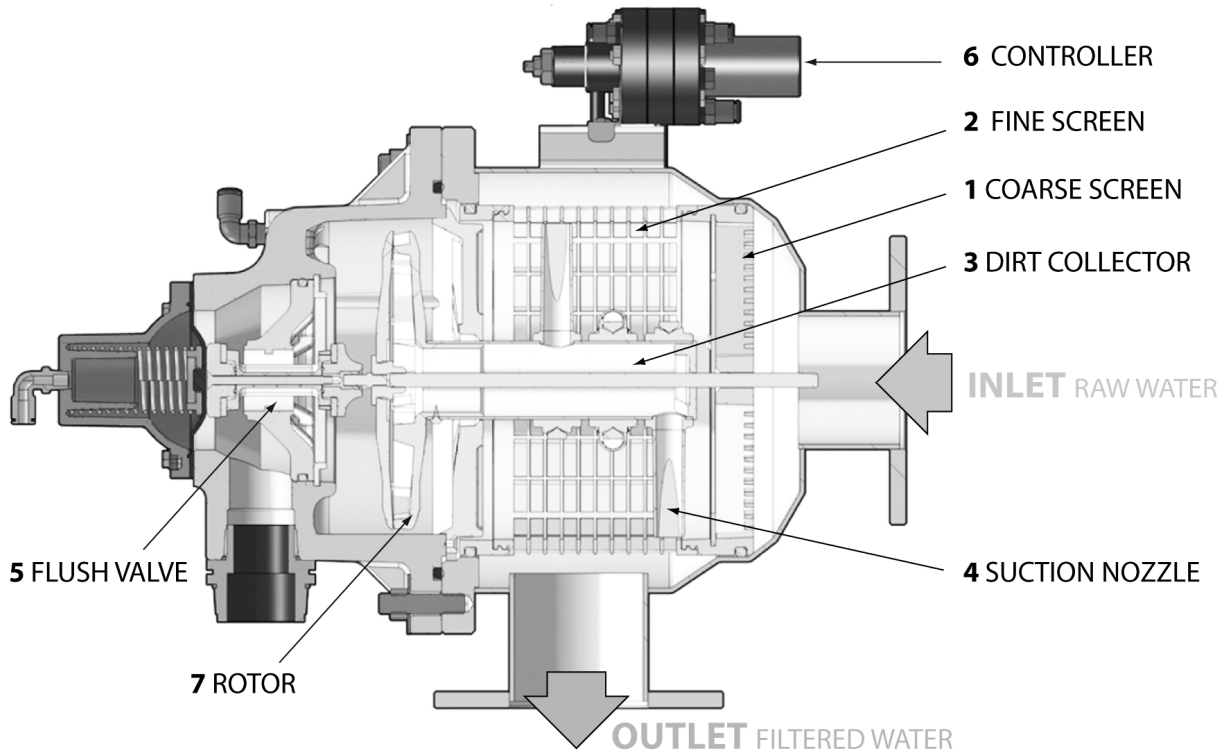
To enable **you** to achieve the best performance and trouble free life from your filter we suggest that you carefully read and follow these instructions.

FILTAWORX® range of fully automatic self-cleaning filters have been designed and built in Australia by an experienced team of engineers using the latest 3D CAD software. FILTAWORX® filters are one of the most technically innovative self-cleaning filters available on the market, combining high performance, reliability and economy in a compact robust design. The filter is simple to install and will give years of trouble free service if sized, installed, maintained and operated correctly.

Features include:

- ▲ Stainless steel filter body as standard (304 grade).
- ▲ All parts are made of corrosion resistant engineering plastics or metal materials.
- ▲ Fully automatic back flush operation.
- ▲ Available with hydraulic or electric controls.
- ▲ Large filtration area.
- ▲ Wide range of fine screen sizes, 20 – 250 mesh (50 to 800 micron).
- ▲ Standard sizes from 2" – 14".
- ▲ 150 psi pressure rating as standard.
- ▲ Simple and quick installation.
- ▲ Full support and after sales service.
- ▲ Designed, built, and tested in Australia.

Operating Principal



Put simply the Filtaworx 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). This removes 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 7 psi the Controller (6) 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) outlet 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 & 7) to rotate. The Flushing Valve (5) allows this assembly to travel down the length of the Fine Screen (2) in a spiraling motion, cleaning the entire screen surface area in approximately 5 seconds. The Flushing Valve (5) closes, and returns the mechanism back to its original position, ready for the next cycle. Cleaning also occurs on the return stroke.

Technical Specification

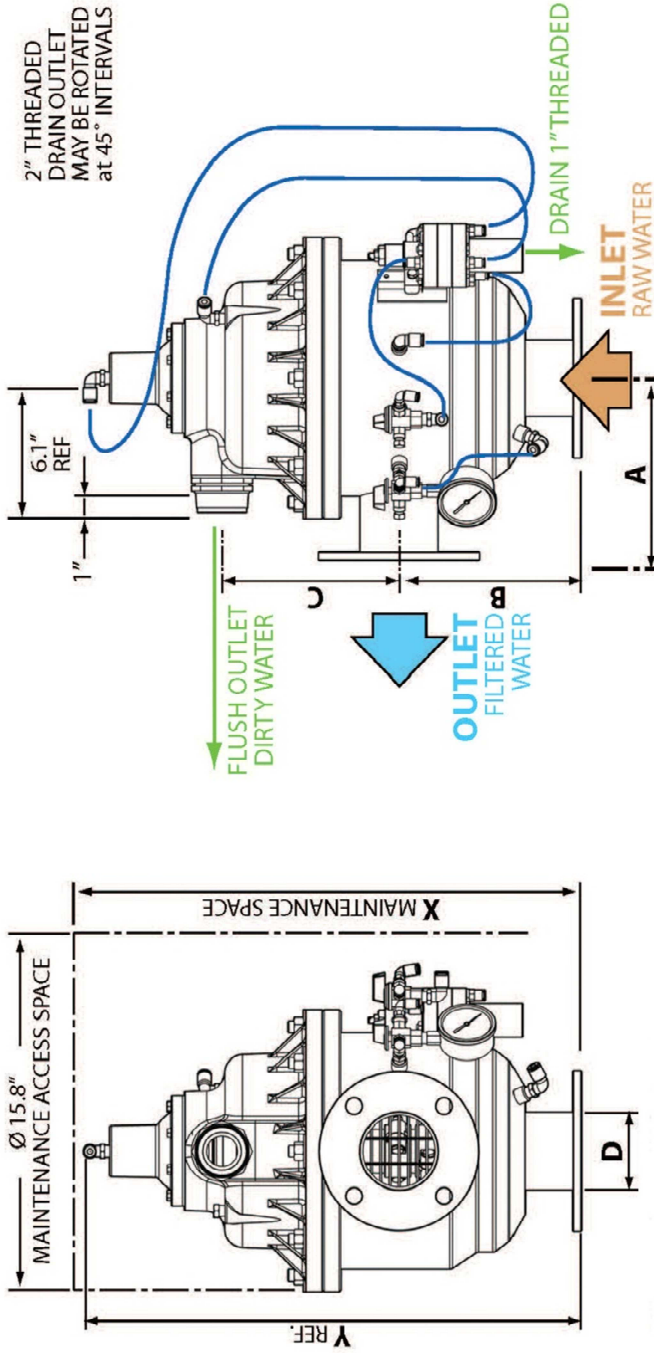
Model No.	FW04
Inlet / Outlet Nominal size inch	4"
Connections	Flanged
Min. operating pressure	30 psi at all times
Max. operating pressure	150 psi, higher available on request
Filter Area	307 inches ²
Max. working temp	150° F
Flushing Data	
Drain line size inch	2" minimum
Flush cycle duration	7 – 10 seconds (depending on pressure)
Flush cycle volume	8 gallons approx. (depending on pressure)
Min. flow for backwash	70 gpm @ 30 psi
Materials of Construction	
Filter body	304 grade stainless steel (316 and other grades on request)
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

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
Aperture (inch)	0.002"	0.003"	0.004"	0.005"	0.006"	0.008"	0.016"	0.031"

* Most common sizes used.

Dimensional Details



MODEL NO.	NOMINAL SIZE	NOMINAL D"	NOMINAL FLOW GPM / m3/Hr	FILTER AREA Inch 2	A	B	C	X	Y	WEIGHT LBS EMPTY / FULL
FW02	2"	2"	110	189	7 1/4"	7 3/4"	8"	28 3/8"	22"	48.5 / 92.6
FW02-F	2"	2"	110	189	8 1/4"	8 1/4"	8"	28 3/8"	22 5/8"	50.7 / 94.8
FW03	3"	3"	220	189	7 5/8"	8 3/8"	8"	28 3/8"	22 5/8"	48.5 / 92.6
FW03-F	3"	3"	220	189	8 1/4"	8 1/4"	8"	28 3/8"	22 5/8"	55.1 / 99.2
FW03EX	3"	3"	220	307	8 1/4"	12 3/8"	8 1/2"	35 1/2"	27 1/8"	63.9 / 123.4
FW04	4"	4"	350	307	9 1/4"	12 3/8"	8 1/2"	35 1/2"	27 1/8"	66.1 / 125.7

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 installing, commissioning, operating and maintaining the filter.
- Follow all on-site requirements for safety/protective clothing such as hard hats, eye wear, hearing protection, steel capped 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 pressurized 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.

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 at waist height is preferred for servicing access.
- 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 Rinse 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 (70 gpm @ 30 psi). 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 by-pass around the filter. This is so that the filter can be isolated and serviced without disrupting any downstream plant or equipment.
- h) The backflush drain line must be at least 2" in 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 25 feet use a 3" 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 Rinse Control has a 1" BSP-FM drain line that will bleed water during every backflush cycle. This will need to be piped away from the filter to drain.
- l) Fit a barrel union at the Rinse Controller 1" drain connection if you are piping this away, so that the Rinse Controller can be easily removed if required.
- m) If there is extensive pipe work after the filter, or if the downstream system is downhill from the filter, you may need install a hydraulic pressure sustaining valve 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.
- n) Ensure that all connections are tightened and secure.
- o) There will be one (1) control tube and tube fitting that will require to fitting onto the filter on installation. This # 3 line and fitting are supplied loose to avoid any damage in transport or installation. This is line # 3 from the Rinse Controller goes to the top of the Diaphragm Cover on top of the filter. Remove the fitting from the tube, fit the fitting into the cover and re-fit the 6 mm tube. The fittings are a simple Push-In type.

Commissioning

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

- a) Ensure that the small 3-Way tap for automatic/manual operation is in the **AUTO** position.
- b) 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.
- c) Once the filter is pressurised, open the inlet valve fully.
- d) Flush the filter manually by rotating the automatic/manual 3-way tap to the **OPEN** position for 3 seconds then return to the **AUTO** position. This will cause the filter to go through a full backflush cycle. Do this at least 3 times to remove any air from the control system. (The **AUTO** position is pointing to the filter body as per photo).
- e) Whilst doing this check the line pressure on the inlet side of the filter during the backflush cycle and ensure it remains above 30 psi.
- f) 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.

- g) Check the inlet and outlet pressures to make sure they are equal or near to equal, and that they stay above 30 psi at all times.
- h) Once the system has stabilized to its normal operating conditions with flow and pressure, manually back flush again via the 3-Way tap and check the inlet pressure again to make sure it does not drop below 30 psi at any time.
- i) If all appears to be in order and if possible wait for the filter to reach an automatic back flush cycle caused by a build-up of DP (differential pressure).
- j) Your filter should now be ready to leave online and is commissioned. Make sure the 3-way manually flushing tap is and remains in the **AUTO** position.

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. Make sure the 3-Way tap for manual flushing is in the **AUTO** position.

Maintenance

Generally your Filtaworx filter should be trouble free, however you will 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. The frequency of this will depend on the amount of large debris entering into the system. Grease the O Rings before reassembling the filter with suitable silicon grease.

Rinse Controller

The Rinse Controller is basically the “brain” of the filter. It is a pilot operated diaphragm valve that senses inlet and outlet pressure across a diaphragm. When the pressure drop (DP) across the filter increases it pushes a diaphragm against a spring. At about 7 psi 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 Rinse 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 Rinse Controller apart at any time.

In most cases if the Controller is malfunctioning it is usually a symptom of another problem with the filter and not a problem with the controller at all. It could be either a blocked fine screen or a mechanism fault.

Adjusting the Rinse Control may be required if it has been tampered or played with. To do this do the following:

- 1) Loosen the lock nut on the adjusting screw on top of the Rinse Controller.
- 2) Backflush the filter manually on the 3-way tap.
- 3) Undo the adjusting screw anti-clockwise until the filter back flushes.
- 4) Turn the adjusting screw in clockwise 2 turns.
- 5) Tighten the lock nut back down on the adjusting screw.

Disassembly Instructions

Your filter can be easily disassembled by following the below instructions:

- a) If possible backflush the filter manually on the 3-Way tap with the downstream valve fully closed first before any work is commenced.
- b) Isolate / shut down and de-pressurize the filter. Make sure that the filter does not contain any residual pressure before proceeding.
- c) Remove the 2 x control tubes from their fittings on the Cover Lid.
- d) Undo and remove the Cover Lid 8 x nuts and washers holding this down.
- e) Remove the Cover Lid and Dirt Collector assembly from the filter.
- f) Drain the filter body if required so that the Fine Screen assembly is fully visible inside the filter.
- g) Remove the Fine Screen from the filter using the "U" shaped pulling tool supplied with the filter. The feet pieces of the tool fit under the 2 x stainless steel plates visible at the end of the screen. (As shown on the next page).
- h) 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.
- i) Once the fine screen is out check it for cleanliness by holding it up to the light. You may need to clean the screen from inside to outside only! Using a high pressure water cleaner. (Karcher etc.) A garden hose or tap will not be strong enough.
- j) Before replacing the fine screen back into the filter, lubricate the 2 x O rings using suitable silicon grease.
- k) To remove the Collector Assembly, remove the 4 x Phillips head screws that attach the Partition to the Cover Lid. The Collector Assy will now pull out of the Cover Lid, (you may need to prise the Partition away from the Cover Lid) exposing the bearings and flush valve assembly.

Preventative Maintenance

1. Every 2 – 3 weeks
 - a. Flush Filter Manually
 - b. Check that all filter functions and cleaning cycle is operating correctly.
2. Every 3 weeks
 - a. Clean the Mini-Filter
 - b. Every 6 months
 - c. Clean the coarse screen
3. Every 12 months
 - a. Strip and inspect the complete filter internals
 - b. Piston shaft and plunger moves in and out of the Piston freely
 - c. The wear on the Piston Bearing and the Rotor Bearing
 - d. The wear on the Collector Shaft and the Top Bearing
 - e. Remove and replace any worn parts
 - f. Check that the Fine Screen is clean

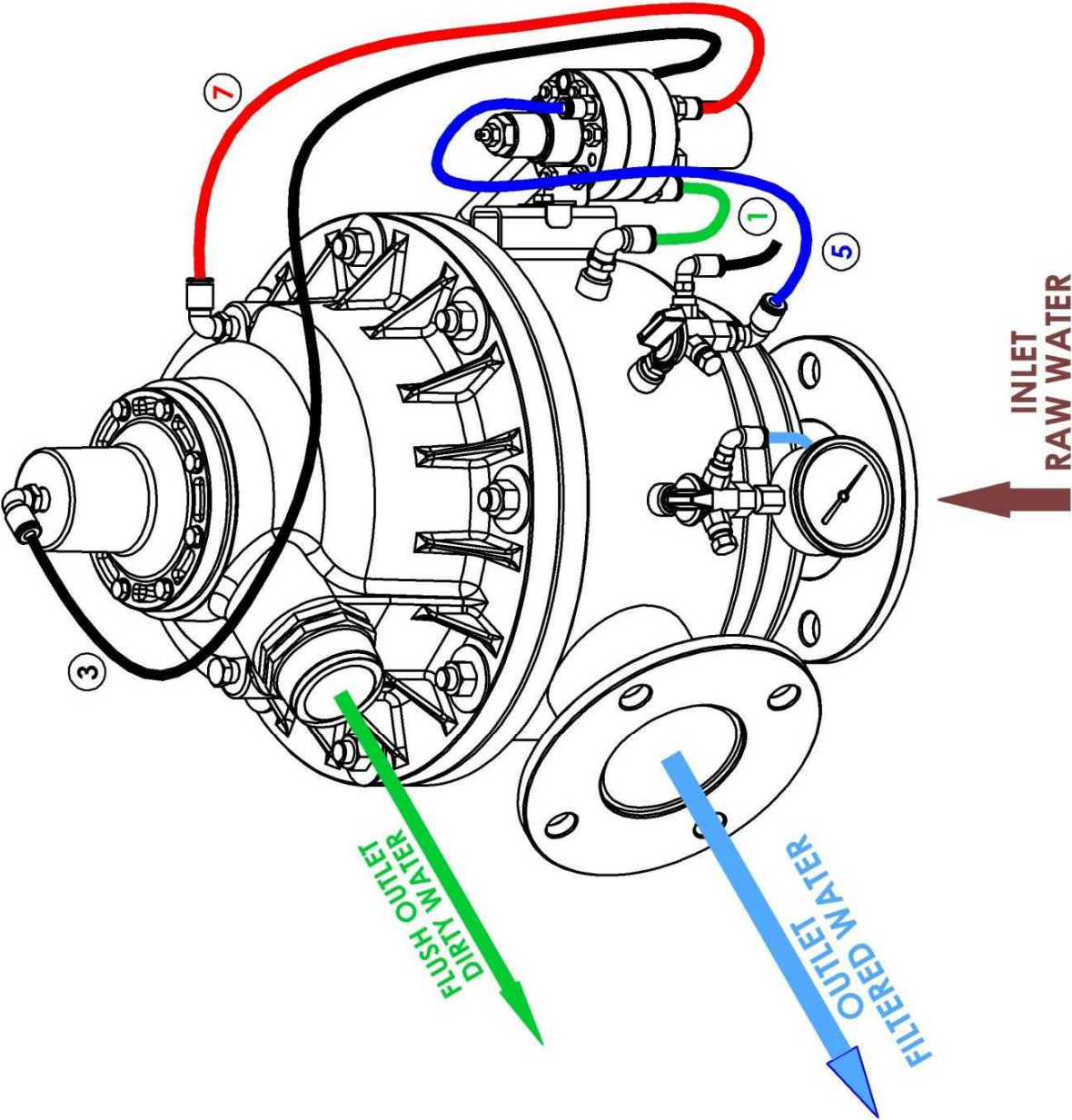
Trouble Shooting

Generally you will find if the filter malfunctions it will show as a high DP (differential pressure) or become blocked. This could be caused by a random condition like a sudden high dirt load event, a control malfunction or an internal mechanical fault. The trick will be to find which one of these three (3) is the cause. In most cases it is unlikely to be a Rinse Controller fault. The Rinse Controller becomes inactive if the outlet pressure drops below 50% of the inlet pressure.

Problem	Possible Cause	Solution
The filter does not flush	The valves are closed?	Open valves
	Check that the 3-way tap for manual/automatic flushing is in the AUTO position	Turn valve to AUTO
	Pressure differential is high, >15 psi. (Rinse Controller will normally be venting water in this mode).	Perform a manual flush cycle as follows: <ol style="list-style-type: none"> 1. Close the outlet valve. 2. Check that the filter inlet & outlet pressures are equal. They must be equal to be able to manually flush the unit. 3. Perform a manual flush as in Section 7.0 d, page 7. 4. Check the pressures at the inlet valve and in the rotor chamber. 5. If the filter has been extensively blocked then flush the filter manually 2-3 times. 6. Open the outlet valve slowly / gradually and check inlet-outlet pressures
	Rinse Controller dripper blocked. (Controller venting water).	Change the dripper

	Rinse Controller is not set/adjusted correctly	Check and re-adjust screw on rinse controller. (Section 10)
	Control tubes or fittings to Rinse Controller are blocked or connections are incorrect	Check and clear them. Check the controller connecting diagram
Excessive pressure in the rotor chamber	Drain pipes are restricted blocked, or too long.	Check if drain lines are unrestricted and not kinked. If necessary replace with a larger diameter line, or shorten the existing line.
Insufficient inlet pressure (less than 30 psi)	Inlet valve is not fully open	Open inlet valve fully. Increase the inlet pressure or throttle the outlet to increase pressure during the flush cycle. Fit a hydraulic pressure sustaining valve.
Pressure differential exceeds 70 kPa during normal operation	Coarse Screen is blocked	Check & clean Coarse Screen
	Rinse controller needs adjusting	Adjust rinse controller Section 9.1 P 8 & 9 Check for blockage at pressure sensor connection 3 & 7.
	Flow rate is too high	Check flow rate and reduce if necessary
Water does not flow through the filter	Inlet line blocked	Check and clear inlet line
	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: <ol style="list-style-type: none"> 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 d, page 7. 4. Check the pressures at the inlet valve and in the rotor chamber. 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.
Flush valve leaks or remains open	Valve seals may be leaking or valve is jammed.	Remove Cover Lid and remove Collector assy. Check that it moves freely and the seals are okay, If not free the valve or replace the seals.

Hydraulic Control System Layout



Warranty

Triangle Waterquip warrants all Filtaworx® products against defects in material and workmanship for a period of 12 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 fulfills 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 manufacturer's 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.