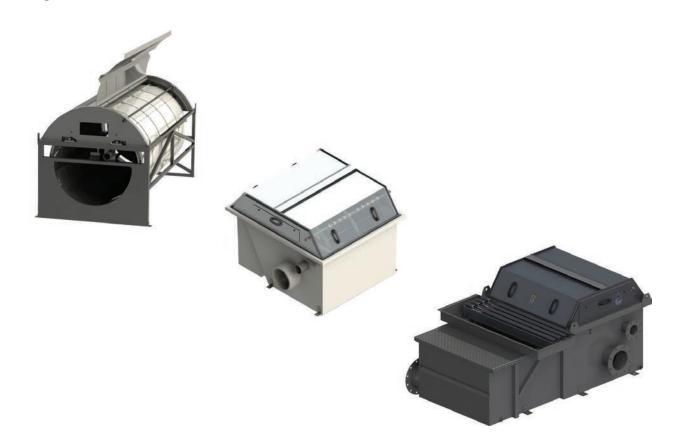


# PR AQUA ROTOFILTER™ DRUM FILTER



# INSTALLATION AND OPERATION MANUAL

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

SAVE THESE INSTRUCTIONS

#### **CUSTOMER SERVICE/TECHNICAL SUPPORT**

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International

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Web site PentairAES.com

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# **TABLE OF CONTENTS**

Section	1: Foreword5	Section	7: Pre-Operation	24
1.1	Scope5	7.1	Overview	24
1.2	Technical Specification Documents5	7.2	Checking Fasteners	24
1.3	Serial Number Location5	7.3	Checking the Drum Seal	25
1.4	Support Contact5	7.4	Checking Flow Levels	25
Section 2.1	2: Safety6 Safety Summary6	7.5	Adjusting Drive Tension (Chain-Drive Models)	26
2.2	Warning and Information Labels6	7.6	Checking the Housing and Drum Enclosure	27
2.3	Protective Equipment7	7.7	Pre-Operation Checklist	
2.4	Electrical Safety7	7.8	Performing a Test Run	
2.5	Jewelry7	7.9	Performing a 24-Hour Run	
2.6	Rotating Equipment7	7.10	Post 24-Hour Inspection	
2.7	UV Radiation7	7.11	Calibrating Float Switches	
Section	3: Shipping and Storage8		8: Startup and Shutdown	
3.1	Arrival on Site8	8.1	Filling the Rotofilter	
3.2	Lifting8	8.2	Startup Procedure	
3.3	Storage10	8.3	Shutdown Procedure	00
Section	4: Introduction11	0.0	(24 Hours or Less)	31
4.1	Overview11	8.4	Shutdown Procedure	
4.2	Location of Major Components11		(24 Hours or More)	31
4.3	Operational Mechanics12	Section	9: Maintenance	
Section	5: Pre-Installation13	9.1	Maintenance Schedule	
5.1	Overview13	9.2	Maintenance Considerations	32
5.2	Site Requirements and Preparation 13	9.3	Checking Flow and Water Levels	32
5.3	Foundation and Service	9.4	Inspect Mechanical Parts	33
	Access Requirements13	9.5	Combined Maintenance Procedure	34
5.4	Sump Requirements14	Section	10: Spray Bar Maintenance	39
5.5	Hydraulic Controls15	10.1	Spray Bar Overview	39
5.6	Backwash System Considerations16	10.2	Spray Bar Assembly	39
5.7	Control Panel Considerations18	10.3	Removing the Nozzle Cap	39
5.8	Electrical Power Requirements18	10.4	Cleaning the Nozzle Tip	39
5.9	Flushing Plumbing18	10.5	Removing the Nozzle Body	39
5.10	Pre-Installation Checklist19	10.6	Gaskets and O-rings	39
Section	6: Installation20	10.7	Nozzle Reassembly	39
6.1	Tools Required20			
6.2	Installing the Rotofilter20			
6.3	Installing the Backwash System21			
6.4	Connecting the Plumbing22			
6.5	Installing the Control Panel22			
6.6	Control Panel Installation Checklist22			
6.7	UV Installation (RFUV Only)23			

# **TABLE OF CONTENTS**

Section	11: Screen Maintenance	40
11.1	Screen Damage	40
11.2	Washing the Screens	41
11.3	Repairing Screen Panels	41
11.4	Removing Screen Panels and Gasket Seals	42
11.5	Replacing Screen Panels and Gasket Seals	43
Section	12: Drum Seal Maintenance	46
12.1	Overview	46
12.2	Removing the Drum Seal	46
12.3	Replacing the Drum Seal	47
Section	13: Support Wheel Maintenance	49
13.1	Overview	49
13.2	Support Wheel Assembly Parts	49
13.3	Greasing the Support Wheels	49
13.4	Removing the Support Wheels	50
13.5	Replacing the Support Wheels	51
Section	14: Drive Assembly Maintenance	53
14.1	Overview	53
14.2	Drive Assembly Parts (Chain-Drive Models)	54
14.3	Maintaining Oil Bath Levels (Chain-Drive Models)	54
14.4	Adjusting Chain Tension (Chain-Drive Models)	54
14.5	Removing the Drive Assembly (Chain-Drive Models)	55
14.6	Replacing the Drive Assembly (Chain-Drive Models)	55
14.7	Removing the Drive Assembly (Direct-Drive Models)	56
14.8	Positioning the Set Collar (Direct-Drive Models)	58
14.9	Replacing the Drive Assembly (Direct-Drive Models)	59

# **SECTION 1: FOREWORD**

# 1.1 Scope

This manual contains instructions for installation, operation, and maintenance of the PR Aqua Rotofilter™ Drum Filter.

Personnel should read the entire manual before installation or operation of the Rotofilter. The manual contains vital information regarding proper installation, operation, warranty conditions, and personal safety. Disregarding this information may cause irreversible damage to the unit or other equipment, limit the operation, void the warranty, or may cause bodily injury or death.

Due to the different configurations of Rotofilter models, some information provided in this manual may not be applicable to your model. If you are unsure whether certain information applies to your model, please contact us before proceeding.

All safety information and warnings apply to all Rotofilter models.

A dedicated ultraviolet (UV) reactor manual is provided with Ultraviolet (RFUV) models. Refer to the UV reactor manual for operation and maintenance of UV components.

#### 1.2 Technical Specification Documents

Specification documents containing information about the unique configuration and components of your Rotofilter are shipped prior to Rotofilter arrival. This information is useful for maintenance and troubleshooting. You should keep these documents near this manual and make copies for your records. Contact us if your specification documents have been lost or damaged.

#### 1.3 Serial Number Location

The serial number for the Rotofilter is stamped on a product information plate, located to the left of the drive system. The plate contains the model number, manufacture date, and company contact information.

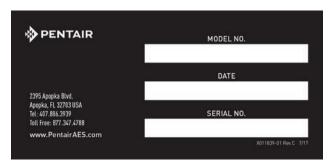


Figure 1. Product information location

- 1: Model Number
- 2: Manufacture Date
- 3: Serial Number

If you have a technical question, need support, or require parts, please have the information listed on the product information plate available when you contact a service representative at Pentair.

#### **1.4 Support Contact**

Additional copies of this manual are available at no cost from your dealer. For manuals, parts, service, warranty, or field support, please contact us:

Customer Service 8AM-5PM—Pacific Time

Canada & United States Toll Free: +1 866 714 0141

International Phone: +1 250 714 0141

Web site PentairAES.com

# **SECTION 2: SAFETY**

#### 2.1 Safety Summary

This safety summary contains warnings that must be understood and applied during operation and maintenance of the Rotofilter. Failure to obey these precautions could result in damage to equipment, serious injury, or death of personnel.

These are the icons used within the manual:



A Warning icon precedes an essential operating or maintenance procedure, practice, condition,

or statement, which, if not strictly observed, could result in injury to or death of personnel or long-term health issues



A Caution icon precedes an essential operating or maintenance procedure, practice, condition, or

statement, which, if not strictly observed, could result in damage to or destruction of equipment.



A Note icon precedes an essential operating or maintenance procedure, practice, condition,

or statement that should be heeded for maximum product benefit.

Make sure you read all information in the Warnings, Cautions, and Notes carefully. If any issues are unclear, consult us. Additional safety guidelines related to specific components of the unit are described in the corresponding component sections.

# 2.2 Warning and Information Labels

Warning and information labels are posted on the Rotofilter. Read labels and note their locations before operation, maintenance, or servicing of the product. Ultraviolet (RFUV) models contain additional labels. Refer to the UV manual for applicable warnings and precautions.



# **Automated Machinery:**

This unit may start at any time. STAY CLEAR.Lockout/tagout before servicing.

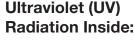
Located on individual lid panels



#### **Pinch Point:**

Do not operate without guards in place.

Located on drum support wheel finger guards





Exposure may cause eye damage. Do not operate without coverings. Do not look into UV source. Wear UV eye protection.

Located on UV chamber (RFUV only)

# **Hot Surface:**



Contact may cause burn.

Allow to cool before servicing.

Located on UV module light block shield (RFUV only)



#### **Rotation:**

Located on drive assembly end

# **SECTION 2: SAFETY**

#### 2.3 Protective Equipment



Protective equipment such as safety glasses and hearing protection may be appropriate

or required during installation, operation, and maintenance of the Rotofilter.

It is recommended that suitable personal protective equipment be selected by a qualified entity prior to installation and use of the unit. Personnel should utilize such equipment to avoid bodily injury or death.

#### 2.4 Electrical Safety



Electrical hazards can cause injury and death. Always use caution when working near electricity.

Danger may still exist when the power is set to OFF.

All electrical work should be performed by a qualified, professional electrician. This includes installation, inspection, and repair of electrical components.

A comprehensive lock-out, tag-out procedure should be observed and followed for installation and maintenance of the Rotofilter. Lock-out/tag-out procedures often exist as standard operating procedures within company guidelines. If your company does not employ a lock-out/tag-out procedure, please contact your nearest workplace safety and health administration to obtain one.

Never operate electrical equipment while you are standing in water.

Remove power, discharge, and ground a circuit before touching it.

When possible, work in pairs, preferably with basic life support qualified personnel.

Personnel working with or near dangerous voltage should be trained in modern methods of resuscitation.

### 2.5 Jewelry



Remove rings, watches, chains, and other metallic objects that could result in shock, burns, or may catch on equipment.

## 2.6 Rotating Equipment



The Rotofilter employs rotating equipment, which can cause severe injury or death. Be aware of

all rotating parts and keep body and objects away from these areas.

Never attempt to service the unit while it is in Automatic Mode. The drum may begin rotating without warning when it is in Automatic Mode. The unit should never be operated in Automatic

Mode without lids and access panels installed.

Some operation and service procedures require rotating the moving parts. These procedures should always be performed in **Manual Mode**.

Be aware of any personnel in the area when attempting to service the unit in Manual Mode.

Do not attempt to manually rotate the drum without first observing the area for any personnel or objects that may be caught in a rotating part.

Never attempt adjustments without powering off the unit and locking out the control panel unless otherwise specified by the service procedure.

#### 2.7 UV Radiation



The RFUV emits ultraviolet light. Never operate the unit without UV module lids and covers installed.

Shut down the UV reactor prior to maintenance. UV light can damage eyes and skin. Always wear appropriate eye protection and protective clothing when working on or around UV light.

# **SECTION 3: SHIPPING AND STORAGE**

#### 3.1 Arrival on Site

The Rotofilter is shipped fully enclosed and secured in a wooden crate. It may be packaged as a single unit or transferred with other system components.

UV modules for the Ultraviolet (RFUV) models are always shipped separately because they are extremely fragile.

There may be cardboard boxes on the floor of the crate containing the backwash pump, plumbing kit, or other items.

Inspect all crates for visible signs of damage before acceptance from the shipping contractor. If damage has occurred, the recipient should contact us prior to acceptance in case an insurance claim is required.

Verify the correct screen pore size from the specification documents.

#### 3.2 Lifting

The approximate dry and wet weights of the Rotofilters are listed below:

Frame (RFF) Models					
Size	Weight Dry/Wet (kg)	Weight Dry/Wet (lbs)			
32018	175/365 kg	385/800 lbs			
32036	190/410 kg	415/900 lbs			
32054	280/475 kg	615/1,040 lbs			
48048	335/685 kg	730/1,500 lbs			
48072	345/910 kg	760/2,000 lbs			
60072	775/1,680 kg	1,700/3,700 lbs			
60096	910/2,635 kg	2,000/5,800 lbs			
60120	1135/3,290 kg	2,500/7,250 lbs			

Molded (RFM) Models				
Size	Weight Dry/Wet (kg)	Weight Dry/Wet (lbs)		
20014	90/200 kg	190/435 lbs		
32018	185/670 kg	400/1,470 lbs		
32036	295/1,225 kg	650/2,700 lbs		
32054	355/1,470 kg	775/3,240 lbs		
48048	545/2,495 kg	1,200/5,500 lbs		
48072	820/3,585 kg	1,800/7,900 lbs		
60096	1,136/5,545 kg	2,500/12,200 lbs		

Ultraviolet (RFUV) Models				
Size	Weight Dry/Wet (kg)	Weight Dry/Wet (lbs)		
32036	545/1,955 kg	1,200/4,300 lbs		
48048	1,275/4,380 kg	2,800/9,650 lbs		

The Rotofilter can be extremely heavy. For mechanically assisted lifting, use an appropriately-sized lifting device capable of safely lifting the unit. Follow proper rigging procedures at all times. Never allow the unit to swing out of control.

To safely lift the unit, you should use a spreader bar accompanied with approved nylon slings. See Figure 2.

External or internal lifting lugs may be provided depending upon the unit.

# **SECTION 3: SHIPPING AND STORAGE**



Figure 2. Proper lifting procedure

- 1: Lifting Lug
- 2: Sling (Nylon or Canvas)
- 3: Spreader Bar

Slings should always be made of nylon or canvas, and should be attached to the Rotofilter in one of three ways:

- Passed through a shackle securely connected to the lifting lug
- Passed directly through the lifting lug
- If lugs are not present, passed beneath the underside of the frame

The minimum length of the sling should allow the distance between the spreader bar and the Rotofilter lifting points to be 1.5 times the distance between the lifting points. See Figure 3.

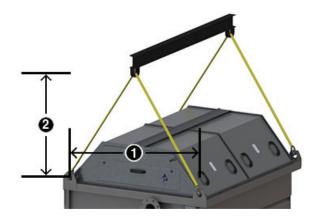


Figure 3. Proper sling length (not to scale)

- 1: Distance Between the Lifting Points (D)
- 2: 1.5 Times the Distance Between the Lifting Points (1.5 x D)

Do not attempt to lift using slings around the drum or any plumbing fittings. Doing so will damage the Rotofilter and void the warranty.

Use a pad between the sling and the Rotofilter, as pressure from the sling may mar the surface finish of the unit.

Rotofilter Frame (RFF) models have external lifting lugs provided on each corner of the unit, each with a hole to provide enough room to insert a shackle or sling.

Molded (RFM) 48-series and 60-series models should be lifted by the support bridge at the front of the unit, and internally-mounted lifting lugs at the back of the unit.

Molded (RFM) 32-series models should be lifted using two 75mm (3 in) wide slings at a minimum, looped underneath the housing and placed as close to each end as possible.

Ultraviolet (RFUV) models: Do not install UV Modules until the Rotofilter has been installed and properly anchored.

# **SECTION 3: SHIPPING AND STORAGE**

# 3.3 Storage

The Rotofilter should always be stored on a flat and level foundation.

The Rotofilter should remain in its crate until time of installation.

The unit should always be stored in a clean, heated, and ventilated area.

If these conditions are not available, the Rotofilter should be fully covered by a UV-treated, waterproof material such as a tarpaulin or plastic shroud.

Provide ventilation if the unit is covered. The ventilation should not allow moisture in and should not be located at the top of the unit.

Condensation can occur in the Rotofilter, both during shipping and storage. Ensure that the unit is fully dry before applying power.

Perform a systematic inspection on the Rotofilter and implement a maintenance schedule during longer storage periods.

Actions that should be performed every 40 days if the unit is in storage:

Visually inspect the storage area and storage materials for potentially damaging issues, such as leaks in the roof or tears in the covering.

Visually inspect the Rotofilter for any damage.

Actions that should be performed every 90 days if the unit is in storage include:

Visually inspect the storage area and storage materials for potentially damaging issues, such as leaks in the roof or tears in the covering.

Visually inspect the Rotofilter for any damage.

Add oil to the chain bath of the drive assembly for Frame (RFF) models. Add only Clarity® Synthetic Hydraulic Oil AW. Oil should cover the bottom links of the chain and lower sprocket.

Perform a megger test of the electrical system, and keep a record of insulation values, temperature, time, humidity, and length of voltage application to show winding conditions prior to start up. The unit must be fully dry before applying any power.



All electrical work should be performed by a qualified, professional electrician.

Please contact us with any questions concerning proper storage of the Rotofilter.

# **SECTION 4: INTRODUCTION**

#### 4.1 Overview

Microscreen Rotofilters provide an efficient means of solids removal from water. Drum filters are widely accepted in the treatment of water in municipal, aquaculture, and laboratory applications.

Rotofilters are intended for in-line applications. Internal components of the Rotofilter are constructed mainly from noncorrosive stainless steel, increasing the longevity of the product when operated under warranty conditions.

All Rotofilters are housed in an enclosure.

The Rotofilter Frame (RFF) model is installed into or above a concrete or fiberglass sump, which acts as the enclosure. A sump is a low space that collects water. Water is fed into the drum, and once treated occupies the bottom of the sump.

The Rotofilter Molded (RFM) model is housed in molded fiberglass-reinforced plastic. Water is fed into the drum, and once treated flows out of the enclosure.

The Rotofilter Ultraviolet (RFUV) model is housed in stainless steel. Water is fed into the drum, and once treated, flows out of the enclosure.

# 4.2 Location of Major Components

Listed below are the major operating components of the Rotofilter. Note: Lid panels are not shown for illustration purposes. Appearance may vary according to model size.

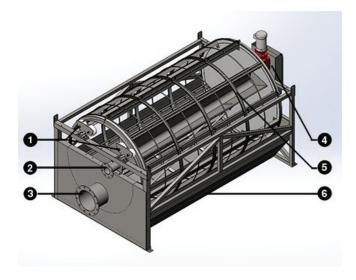


Figure 4. Major component locations - Frame (RFF) model

- 1: Support Wheel Assemblies
- 2: Solids (Waste) Outlet
- 3: Inlet
- 4: Drive Assembly
- 5: Spray Bar
- 6: Level Control Basin (optional)

# **SECTION 4: INTRODUCTION**

# 4.3 Operational Mechanics

Microscreen drum filters operate under the principle of a mechanical sieve. Untreated water is fed to the inside of a drum housed in an enclosure. The drum has fine screens mounted to its periphery. Gravity causes the water to flow through the screens, while suspended solids within the water adhere to the screen surface. The filtered water then flows out of the enclosure by gravity.

In Ultraviolet (RFUV) models, the filtered water passes through a chamber containing a series of UV modules, each sized to deliver a specific UV dose for disinfection, prior to exiting the enclosure.

The water level inside the drum rises as solids collect on the screen surface and obscure the screen pores. When the water level reaches a contact switch, the drum begins to rotate, and a backwash spray system is started.

The backwash spray system washes the solids from the screens into a separate trough inside the drum. The solids flow from the trough by gravity for disposal or recovery.

Clean screens are rotated into the water, and the water level falls. The backwash spray system shuts down once the screens are clean. In the event of a backwash system failure, the Rotofilter has integrated overflow protection that allows water to bypass the screens and flow directly into the enclosure, rather than backup into the waste trough and inlet supply.

The potential treatment capacity of the Rotofilter depends on the flow rate, solids concentration of the water, and the pore size of the microscreen. UV transmittance of the water is also a factor for Ultraviolet (RFUV) models.

The Rotofilter operates in Automatic Mode or Manual Mode. When in Automatic Mode, the backwash system and drum rotation turn on automatically when a high-level float switch reaches a predetermined position. Once the drum has been sufficiently cleaned, the backwash system and drum rotation automatically shut off.

When in Manual Mode, the backwash system and drum rotation are always on.

#### 5.1 Overview

Rotofilters require physical placement, electrical connections, and plumbing upon arrival. It is imperative to completely follow all preinstallation and installation instructions sequentially to maximize the efficiency and longevity of the unit.

A site will need to be established for the Rotofilter and the backwash pump. These sites will need to be prepared prior to installation.

A qualified electrician will need to be employed to establish electrical connections for the backwash system and the control panel. This manual does not detail any electrical wiring of the backwash system or control panel.

The site will require appropriate plumbing, and the plumbing must have flow controls to limit potential damage to the Rotofilter.

## 5.2 Site Requirements and Preparation

The Rotofilter requires a site that is prepared prior to installation. The site requires a level, solid concrete installation surface with adequate service clearance.

Molded (RFM) and Ultraviolet (RFUV) models require a solid, level concrete foundation. Section 5.3 of this chapter contains appropriate information.

Frame (RFF) models require a solid, level foundation within a sump. Sumps should be composed of solid concrete or fiberglass. Rotofilters may need to be installed inside the sump or directly above it. Section 5.4 of this chapter contains appropriate information.

Minimum service access is required for regular maintenance of the Rotofilter. Access is required on the inlet, drive assembly, and spray bar assembly sides of the unit.

Some maintenance procedures require the Rotofilter to be dry. To perform these procedures, Frame (RFF) models will need to have sumps that can be drained or pumped. Molded (RFM) and Ultraviolet (RFUV) models have integrated drains in their enclosures.

Inlet and outlet water levels coming to and going from the site must be controlled for the Rotofilter to function properly, and to avoid damage to the unit. The Rotofilter does not supply external controls for these levels.

External water source access, such as access to a municipal water supply, may be needed if the backwash system will not use the unit's filtered discharge.

Electrical sources are required for the backwash system and control panel.

# 5.3 Foundation and Service Access Requirements

Rotofilter Molded (RFM) and Ultraviolet (RFUV) models must be placed on a solid, flat, and level concrete foundation with adequate service access to the inlet, drive assembly, and spray bar assembly sides of the unit. The technical specification documents detail which side of the Rotofilter is the service access side (left or right, when facing the inlet).

The location of the foundation should be determined based on service access and stability. Minimum recommended service access is 92 centimeters (36 inches).

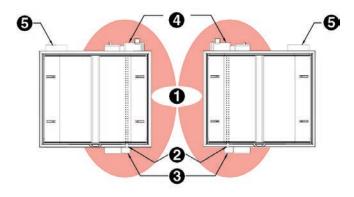


Figure 5. Minimum service clearance for right (standard) and left service access units

- 1: Minimum Service Access (red area) 96 centimeters (36 inches)
- 2: Spray Bar Assembly (can be connected at opposite end)
- 3: Inlet (location may vary)
- 4: Drive Assembly and Motor
- 5: Outlet (location may vary)

Service access is required <u>daily</u>. The following are some of the functions that require service access:

- Water level inspection
- · Spray bar nozzle cleaning
- Inspection and maintenance of screen panels
- Inspection and maintenance of support wheels
- Inspection and maintenance of drum seal
- Inspection and maintenance of drive assembly
- Scheduled cleaning

The foundation must be sturdy, as the weight of the Rotofilter can be extremely heavy when in operation. The weight of the unit is listed on the technical specification documents, or see Rotofilter weights in Section 3.2

The area must be flat and level. Operating the Rotofilter on an unleveled surface will cause irreversible damage to the internal components, will cause the unit to malfunction, and will void the warranty.

A layer of self-leveling concrete should be applied to the foundation and the consistency of the level should be confirmed prior to Rotofilter installation. Once this layer is applied, check that the foundation surface does not differentiate more than 6.4 millimeters (0.25 inches) across the entire area.

Places that exceed this difference should be ground down to prevent stress points from forming. The fiberglass housing of Molded (RFM) models can fracture from stress points. Stress points can also cause damage to Ultraviolet (RFUV) units.

## 5.4 Sump Requirements

Rotofilter Frame (RFF) models should be installed in or above concrete or fiberglass sumps, with service access to the inlet, drive assembly, and spray bar assembly sides of the unit.

Due to the high variation between Rotofilter configurations, this manual does not detail sump creation. The following are guidelines for consideration.

The sump should include (at a minimum) an inlet, outlet, drain, and waste channel. An additional channel may be required for overflow protection.

Dimensions of required channels can be determined from the technical specification documents. Contact us with questions.

The Rotofilter requires a minimum operating water level, which can be controlled through a weir integrated into the sump. Alternately, a level control basin may be included on a Frame (RFF) unit, the top edge of which acts as the level control.

Inlet and outlet channels must have fully functional flow controls located at or near the unit. These controls will be described in the following section.

In the event of a backwash system failure, unfiltered water will bypass the screens and flow directly into the enclosure via the integrated overflow weir of the Rotofilter. If unfiltered water can not be permitted to enter the outlet water channel, an overflow channel upstream of the filter inlet should be included in the sump design.

Some maintenance procedures require the Rotofilter to be dry. To perform these procedures, Frame (RFF) models will need to have sumps that can be drained or pumped.

The bottom of the sump must be a solid, level foundation. The location of the sump should be determined based on service access and stability. Minimum recommended service access is 92 centimeters (36 inches) on the inlet, drive assembly, and spray bar assembly sides.

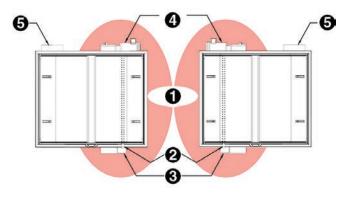


Figure 6. Minimum service clearance for right (standard) and left service access units

- 1: Minimum Service Access (red area) 96 centimeters (36 inches)
- 2: Spray Bar Assembly (can be connected at opposite end)
- 3: Inlet (location may vary)
- 4: Drive Assembly and Motor
- 5: Outlet (location may vary)

Service access is required <u>daily</u>. The following are some of the functions that require service access:

- Water level inspection
- Spray bar nozzle cleaning
- Inspection and maintenance of screen panels
- Inspection and maintenance of support wheels
- Inspection and maintenance of drum seal
- Inspection and maintenance of drive assembly
- Scheduled cleaning

The foundation must be sturdy, as the weight of the Rotofilter can be extremely heavy when in operation. The weight of the unit is listed on the technical specification documents, or see Rotofilter weights in Section 3.2 The area must be flat and level. Operating the Rotofilter on an unleveled surface will cause irreversible damage to the internal components, will cause the unit to malfunction, and will void the warranty.

A layer of self-leveling concrete should be applied to the foundation and the consistency of the level should be confirmed prior to Rotofilter installation. Once this layer is applied, check that the foundation surface does not differentiate more than 6.4 millimeters (0.25 inches) across the entire area.

## 5.5 Hydraulic Controls

The Rotofilter has no external flow controls, therefore the inlet and outlet channels connected to the unit must have fully functional flow controls located at or near the unit. These controls should be installed prior to installation of the Rotofilter. The type of controls will depend on the inlet and outlet channels at the installation site.

Control of the inlet and outlet water levels are critically important to maintaining proper water levels inside and outside of the Rotofilter. These water levels should never exceed the limits identified by Pentair.

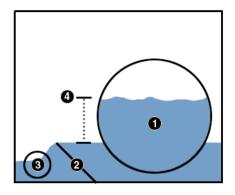


Figure 7. High water level differential inside and outside of the drum

- 1: Water Level Inside Drum
- 2: Outlet (Level Control) Weir
- 3: Outlet
- 4: Water Level Differentia

Problems that may occur if water levels are not controlled include:

Damage to the Rotofilter screens, drum shaft, support wheels, and drum frame, due to excessive weight caused by a high differential between water levels inside and outside of the drum. The warranty will be voided if the difference is greater than 30.5 centimeters (12 inches).

Reduced drum shaft bearing life, due to frequent or constant submergence from a high outlet water level.

Tray sludge may reenter the filter or may bypass the filter and enter the outlet water, due to water flowing into the backwash tray of the filter from a high inlet water level.

The above problems will result in reduced operating range of the filter, which may cause more frequent or continuous backwash, and will reduce filter performance.

Continuous monitoring of the inlet and outlet water levels (e.g., using a level transducer) is recommended, but may not be suitable or necessary in all applications.

- Inlet water levels should be continuously monitored regardless of application if large variations in flow are anticipated or could occur.
- Outlet water levels should be monitored if the Rotofilter does not have a low/high water level alarm switch or automatic backwash system.

An outlet (level control) weir is necessary to maintain a minimum water level inside the unit to prevent damage. Rotofilter Molded (RFM) and Ultraviolet (RFUV) models contain integrated level control weirs that help maintain the minimum water level required inside of the drum. Frame (RFF) models utilize one of two level control methods: a weir integrated into the filter sump design, or a level control basin installed on the underside of the Rotofilter.

A high overflow weir is necessary to protect the drum in the event of a backwash system failure. The overflow weir allows unfiltered water to bypass the drum screens at critical levels and flow directly into the outlet. Rotofilters contain integrated overflow weirs. If overflow directly into the outlet is unacceptable, RFM and RFUV units will require additional plumbing upstream of the filter. RFF units will require an overflow channel integrated into the sump.

#### 5.6 Backwash System Considerations

The backwash system requires a water supply, an electrical supply, a fixed pump location, and proper plumbing.

#### 5.6.1 Water Supply

The water supply may come directly from the Rotofilter or may need to come from an external source. This depends predominantly on the water quality requirements of the Rotofilter application.

Some applications require highly filtered or purified water. If water quality is not an issue, a source may be selected based on the desired frequency of maintenance.

The backwash system can be plumbed directly into the filtered water supply of the Rotofilter. Water coming directly from the unit has been filtered, but is not purified and contains dissolved nutrients that will support bacterial growth.

This growth, combined with accumulations of fine particles and deposition of dissolved minerals, can cause the backwash system to foul over time. Increased fouling will require more frequent maintenance.

More stringent water quality requirements will necessitate plumbing to an external water source. Municipal water supplies generally do not contain higher concentrations of dissolved nutrients and fine particles, reducing the degree of fouling over time.

Check with the local water supplier for quality parameters. Pressure and flow rates from external water sources should meet the values required for the Rotofilter, as specified by Pentair.

#### 5.6.2 Electrical Supply

The electrical supply requirements depend on the pump supplied with the Rotofilter. The separate pump manual will identify the supply requirements. The backwash system electrical supply should be diagrammed prior to filter installation.



All electrical work should be performed by a qualified electrician.

All dimensions and locations should be checked for accuracy and changes should be made if any part of the backwash system will interfere with the service clearance required by the Rotofilter.

# 5.6.3 Pump Location

The pump should be anchored near the Rotofilter. The pump can be placed above the filter, but a foot valve (not included) may need to be installed to prevent loss of prime due to back flow.

The pump location should allow for the pump to be securely attached, allow ample room for plumbing and electrical fixtures, and should not interfere with the service clearance required by the Rotofilter.

#### 5.6.4 Proper Plumbing

The backwash system is shipped with fittings, gauges, and valves. Plumbing fixtures are not included.

The backwash system plumbing should be diagrammed prior to filter installation. All plumbing dimensions and locations should be checked for accuracy and changes should be made if any part of the backwash system will interfere with the service clearance required by the Rotofilter.

If the backwash plumbing or pump will be outside or partially outside, it must be insulated to prevent freezing.

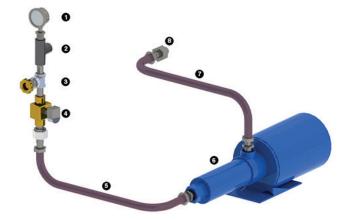


Figure 8. General backwash system assembly

- 1: Pressure Gauge
- 2: Connection Point (to Spray Bar Assembly)
- 3: Throttling Valve
- 4: Solenoid (if Required)
- 5: Outlet Plumbing (Pump to Unit)
- 6: Backwash Pump
- 7: Inlet Plumbing (Source to Pump)
- 8: Connection Point (to Source)

A pressure gauge, throttling valve, and solenoid valve (if required) will need to be connected to the spray bar. This assembly can be connected on either end of the spray bar. A solenoid valve is required where the supply water is pressurized or where the pump is located above the water supply or discharge level.

The pressure assembly should be connected at the Rotofilter. See Figure 8.

The water supply should be connected to the inlet of the pump. For Frame (RFF) models, the pump inlet should be connected to a supply that is completely submerged in the sump.

#### 5.7 Control Panel Considerations

Most Rotofilters are purchased with a control panel. This manual describes operation and maintenance procedures for units that utilize a control panel. If a control panel was not ordered with the Rotofilter, one may be ordered at any time.

The control panel allows toggling between Automatic Mode, Manual Mode, and Off for the drum rotation and backwash systems. The panel also displays Power-On and Unit-Run conditions.

The control system is made from high-quality, industrial-grade, CSA- and UL-approved components. The control panel box is a waterproof, corrosion-proof CSA- and UL-approved electrical enclosure that can be secured with padlocks. The control panel assembly is manufactured in a UL-certified facility, and should not be modified. Any modification voids the UL rating.

The control panel should always be installed within line of sight of the Rotofilter. If this is not possible, disconnects for the drum motor and backwash pump system must be installed next to the Rotofilter as a safety precaution. The control panel door should be able to open fully.



All electrical work should be performed by a qualified electrician. This manual does

not provide electrical installation procedures or wiring diagrams.

The control panel installation location should be outlined and diagrammed prior to Rotofilter installation. The location should allow ample room for electrical fixtures and should not interfere with the service clearance required by the Rotofilter.

#### 5.8 Electrical Power Requirements

The electrical power requirements for the Rotofilter motor and backwash pump are listed in the Technical Specification sheet sent prior to Rotofilter arrival.



All electrical work should be performed by a qualified electrician. This manual does

not provide electrical installation procedures or wiring diagrams.

# 5.9 Flushing Plumbing

The plumbing that will be connected to the Rotofilter should be thoroughly flushed prior to Rotofilter installation. Flushing the plumbing removes debris that could damage the screens and internal components of the Rotofilter.

All removed material should be collected and disposed of properly.

To flush a system, the discharge valve should be opened first, then the charge valve. Flush for at least 2 minutes. If there are multiple circuits within a system, flush one full circuit at a time, each for at least 2 minutes.

To prevent potentially dangerous pressure buildup, open the next circuit discharge valve before closing the preceding discharge valve. When all plumbing has been flushed, shut off the charge valve first and then shut off discharge valves.

5.10 Pre-Installation Checklist	☐ Appropriate connections are available and can b			
Be sure the following items are completed prior to beginning installation.	made between the outlet water channel and the Rotofilter outlet.			
☐ Site foundation is flat and level.	☐ Appropriate connections are available and can be made between the overflow channel and the			
☐ Sump is complete with all necessary channels (RFF models only).	Rotofilter overflow weir (if necessary).			
☐ Rotofilter will have at least 92 centimeters (36	☐ Backwash pump water source has been identified.			
inches) of service access on the inlet, spray bar assembly, and drive assembly sides.	☐ Backwash pump electrical supply has been identified.			
<ul> <li>Inlet water channel has fully functioning flow control capable of maintaining level identified by Pentair.</li> </ul>	☐ Backwash electrical system has been outlined, diagrammed, checked for accuracy, and will not interfere with the service clearance of the			
☐ Inlet water channel has monitoring system	Rotofilter.			
installed (if necessary).	☐ Backwash plumbing system has been outlined,			
<ul> <li>Appropriate connections are available and can be made between the inlet water channel and the Rotofilter inlet.</li> </ul>	diagrammed, checked for accuracy, and will not interfere with the service clearance of the Rotofilter.			
<ul> <li>Outlet water channel has fully functioning flow control capable of maintaining level identified by Pentair.</li> </ul>	☐ Control panel location has been identified, outlined, diagrammed, and will not interfere with the service clearance of the Rotofilter.			
Outlet water channel has monitoring system installed (if necessary).	☐ Existing plumbing has been thoroughly flushed.			

# 6.1 Tools Required

☐ Flathead screwdriver

☐ Phillips screwdriver

☐ SAE hex key (Allen) wrench set

☐ Socket wrench

☐ SAE socket set

☐ SAE open-end wrench set

☐ Rubber and machinist hammer (deadblow hammer)

Hammer

□ Carpenter's level

☐ Measuring tape

☐ Crescent wrench

 $\square$  Thread seal tape, or food-grade thread sealant

☐ Anti-seize paste (food-grade or equivalent)

# 6.2 Installing the Rotofilter

Once the Pre-Installation Checklist (Section 5.10) is complete, the Rotofilter is ready to be installed.

- Remove the top and sides of the shipping crate from around the unit.
- 2. Remove the lag screws securing the unit anchor brackets to the bottom of the pallet.
- 3. Remove lids from top of the unit.
- 4. Secure appropriate rigging to the Rotofilter and the lifting device. Refer to Section 3.2 for proper lifting procedures. Lift the unit until the bottom portion of the shipping pallet can be removed.



Rotofilters can be extremely heavy. For mechanically assisted lifting, use an appropriately-sized lifting

device capable of safely lifting the unit. Follow proper rigging procedures at all times. Never allow the unit to swing out of control.

5. Lower the unit until it rests on the installation location, but do not remove the lifting rigging. Ensure the inlet, solids, and overflow (if required) channels align properly with the external plumbing for Molded (RFM) and Ultraviolet (RFUV) units, and sump channels align with Frame (RFF) units.

- Measure the available service clearance on the inlet, drive assembly, and spray bar assembly sides of the Rotofilter. Move the unit if clearance is not adequate.
- 7. Use a carpenters level on all sides and top of the Rotofilter to ensure the unit is level. See Figure 9.



Figure 9. Leveling the Rotofilter

- 1: Level the Rotofilter from Side to Side
- 2: Level the Rotofilter from Front to Back

If the unit cannot be leveled, another layer of self-leveling concrete should be applied to the installation location and allowed to set. Place the Rotofilter on the foundation and test for level again.

If a Frame (RFF) model remains unleveled, solid, immobile stainless steel shims can be inserted under the lower corner posts of the unit. Shims should be used only if the installation location cannot be leveled using the procedure listed above. Do not attempt to use shims for Molded (RFM) or Ultraviolet (RFUV) models.

Most models will need to be secured to the installation location using the anchor brackets and appropriate fasteners. The unit should be anchored using sheer load-bearing hardware that is rated to 8 times the wetted weight of the Rotofilter. Use a hammer drill and always blow out the holes prior to inserting hardware.

#### 6.3 Installing the Backwash System

The backwash system is shipped in 2 separate packages. The first package contains all required fittings, gauges, and valves. The second package contains the booster pump.

Backwash system installations will vary based on the locations and plumbing diagrammed in Section 5.6. However, all assemblies should follow the guidelines below.



All threaded connections should be wrapped with plumbing tape or food-grade thread sealant prior to installation.

- 1. Ensure the throttling valve is fully closed before you assemble the system.
- Assemble the pressure gauge, connection point, throttling valve, and solenoid (if required). See Figure 10.

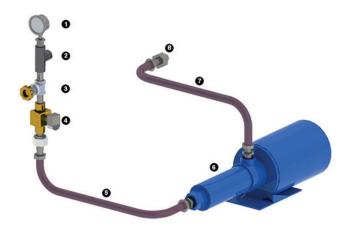


Figure 10. General backwash system assembly

- 1: Pressure Gauge
- 2: Connection Point (to Spray Bar Assembly)
- 3: Throttling Valve
- 4: Solenoid (if Required)
- 5: Outlet Plumbing (Pump to Unit)
- 6: Backwash Pump
- 7: Inlet Plumbing (Source to Pump)
- 8: Connection Point (to Source)

- Once assembled, the connection point can be installed on either side of the spray bar. See Figure 11.
- 4. Do not over-tighten threaded connectors when the female connection is PVC.

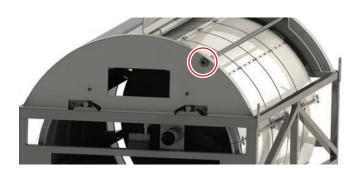


Figure 11. Spray bar connection (connect to either end)

- 5. Anchor the booster pump to its location using appropriate hardware.
- Connect the pressure assembly to the outlet end of the pump. If the pump is located above the Rotofilter, a foot valve will need to be installed if the water source is not pressurized.
- 7. Connect the water supply to the pump inlet. If the water is supplied from the Rotofilter, the pump inlet should be placed at the lowest level possible to prevent loss of prime. In Frame (RFF) models this would be the lowest area of the sump.
- 8. Make all electrical connections after the backwash system has been installed.



Electrical work should be performed by a licensed professional electrician.

#### 6.4 Connecting the Plumbing

All plumbing should be connected using the following guidelines:

- If the connection uses threaded pipes, wrap plumbing tape around the male threads or use food-grade thread sealant to ensure a watertight seal.
- If the connection is PVC, flexible or rigid couplings can be used:
- Ensure all clamps on the couplings are fully tightened.
- If a permanent connection is desired, PVC primer and solvent glue should be used. Follow the manufacturer's recommendations for use.
- If the connection is a flange, use appropriatelysized bolts, and tighten with a torque wrench.
- 1. Ensure the inlet water channel is closed.
- Connect the inlet water channel to the Rotofilter inlet and secure tightly. Do not open the inlet water channel until all installation and preoperation procedures are complete.
- 3. Ensure the outlet water channel is closed.
- 4. Connect the outlet water channel to the Rotofilter outlet and secure tightly. Do not open the outlet water channel until all installation and preoperation procedures are complete.
- Connect the waste (solids) channel to the Rotofilter solids trough outlet and secure tightly.
- 6. Install plugs into the remaining open connections of the Rotofilter. These may include the backwash connections and drains near the bottom of the unit, and the unused backwash inlet. Plugs are supplied in the owner's kit shipped with the Rotofilter.

## 6.5 Installing the Control Panel

Install the control panel supplied with the Rotofilter within sight of the unit. The control panel door should be able to open fully.



Installation of the control panel and all other electrical work should be performed by a licensed,

professional electrician. The electrician should provide information on the Control Panel Installation Checklist, Section 6.6.

We have pre-set the time delay switch of the drum and backwash system to provide a run-time of 2.5 revolutions. This ensures that the screens pass the spray bar twice each cycle.

Certain conditions, such as very high Total Suspended Solids (TSS) concentrations, may warrant changes to this setting. Consult us prior to making any changes.

#### 6.6 Control Panel Installation Checklist

Voltage of electrical supply to control panel:

Drum motor overload	•
Backwash pump ove	
	Amps:
Control panel externa	al connections terminated:
Yes	No
Monitoring and contr	rol wiring terminated:

## 6.7 UV Installation (RFUV Only)

UV modules are inserted from the top of the UV chamber and slide down until the module is on the top ledge of the UV chamber. See Figure 12.

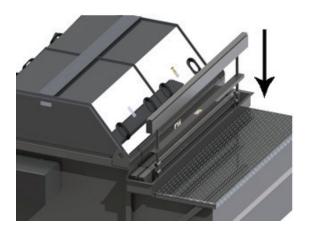


Figure 12. Inserting a UV module

The aluminum lid covering the outlet chamber can be used as a platform when installing or removing modules. Modules are prevented from moving side-to-side by finger locks on either side of the top ledge of the UV chamber. See Figure 13.



Figure 13. UV chamber finger locks (1)

You may need to adjust the light block guard on the UV module so that it sits in the guard channels located in the UV chamber. Two set collars hold the guard in place.

The UV module power cables should be located on the same side as the RFUV drive assembly when installed.

The modules plug directly into a Power Distribution Center (PDC), which is shipped separately and must be installed on location. Refer to the separate UV Manual for PDC location and installation.



Installation of the Power Distribution Center (PDC) and all other electrical work should be

performed by a licensed, professional electrician.

#### 7.1 Overview

The Rotofilter must be checked after installation to verify that all elements are ready for operation, and to prevent damage to the unit or other equipment.

Some components may need to be adjusted due to shifting during the shipping or installation process. The electrical components must be checked for proper operation and the Rotofilter will need to run for a 24-hour period to allow for final calibration.

Follow all sections sequentially.

# 7.2 Checking Fasteners

Check the fasteners that secure the screen clamps and the support wheels. These fasteners can loosen during the shipping and installation processes.

#### **7.2.1 Tools**

- ☐ SAE open-end wrench set
- ☐ SAE hex key wrench set
- ☐ Torque wrench

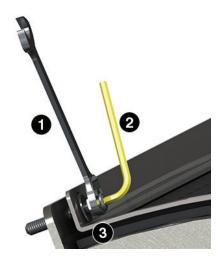


Figure 14. Adjusting the screen clamp fasteners

- 1: Open-end Wrench
- 2: Hex Key Wrench
- 3: Gasket

- 1. Turn off power to the Rotofilter.
- 2. Lock out the control panel.
- 3. Remove the Rotofilter lid.
- Adjust the screen clamps until the gasket (the material underneath the clamp) is compressed by approximately 3.2 millimeters (0.125 inches).
- Check that all filter screens are installed and undamaged. If screens are damaged, see Section 11.1.
- 6. Tighten support wheel bolts with a torque wrench.



Figure 15. Support wheel bolts (wheel assembly appearance may vary)

1: Support Wheel Bolts

# 7.3 Checking the Drum Seal

The drum seal is a sturdy, waterproof material that provides a 90-degree seal between the inner drum frame (trunnion) and the Rotofilter interior frame.

The seal prevents water from exiting the drum prior to filtration. The seal should always be in contact with the inner surface of the drum, and should appear smooth and even along the trunnion.

If the drum seal is misaligned or folded under the trunnion, it must be adjusted. See Figure 16.



Figure 16. Incorrect (left) and correct (right) drum seal alignment

#### **7.3.1 Tools**

- ☐ Phillips head screwdriver
- ☐ Socket wrench
- ☐ SAE socket set

#### 7.3.2 Procedure

- 1. Turn off power to the Rotofilter.
- 2. Lock out the control panel.
- 3. Remove the Rotofilter lid.
- Remove screen panels for service access. See Section 11.4.
- 5. Place a blunt, flat object under a portion of the seal that is properly aligned.
- Slide the object towards the misaligned portion.As the object slides, the seal will move on top of the object and realign correctly.

Replace the seal if it is ripped, cracked, or buckled. See Section 12.3 for drum seal replacement.

## 7.4 Checking Flow Levels

Control of the inlet and outlet water levels is critically important for properly maintaining water levels, and for effective operation of the unit. Water levels inside and outside of the Rotofilter should never exceed the limits identified by Pentair in the specification documents.

- Water should not enter the Rotofilter at this time.
   Shut off water and purge the plumbing system before checking flow valves, including both the inlet channel and backwash system water source.
- 2. Ensure that the inlet and outlet flow control valves operate properly.
- 3. Ensure the backwash system throttling valve operates properly.

# 7.5 Adjusting Drive Tension (Chain-Drive Models)

The drive chain must have proper tension to efficiently drive the Rotofilter. Shipping and installation can loosen the tension.

#### **7.5.1 Tools**

- ☐ Socket wrench
- ☐ SAE socket set
- ☐ Torque wrench

#### 7.5.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Turn off power to the Rotofilter control panel.
- 2. Lock out the control panel.
- Loosen (do not remove) the gear mount fasteners on the right side of the drive assembly (behind the oil bath). See Figure 18.

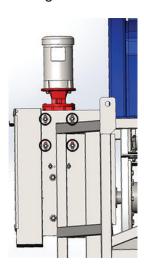


Figure 18. Gear mount fasteners

 Adjust the height of the motor and gear using the tension bracket fasteners on the left side of the oil bath. See Figure 19.

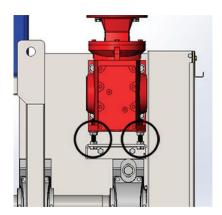


Figure 19. Tensioner bracket fasteners

5. Retighten the motor mount fasteners.

# 7.6 Checking the Housing and Drum Enclosure

Verify that the inside of the Rotofilter is clear of debris, construction or installation objects, and tools.

# 7.7 Pre-Operation Checklist

checklist before proceeding to test runs and normal operation.

Unit has correct screen pore size.

Verify that all items have been completed on the

$\square$ Unit is sufficiently supported and anchored.
☐ Unit is level.
$\square$ Unit has adequate service clearance on all sides.
$\hfill \square$ Inlet and outlet water channels have functioning flow controls.

Overflow water channel is connected (if

necessary).

□Up	stream	plumbing	is th	horough	nly fl	ushed	prior	to
Ro	tofilter	connection	٦.	_	-			

- □ Backwash system booster pump is installed and properly anchored.
- □ Backwash system plumbing is installed correctly (solenoid valve is installed, if required).
- ☐ Unit has necessary valves installed; valves function properly.
- ☐ Unit has necessary valve plugs installed.
- UV lamps and sleeves are free of damage and installed (RFUV only).
- ☐ UV modules are installed and connected to PDC/receptacle (RFUV only).
- ☐ Unit has all screens installed.
- ☐ Drum filter seal is in correct position.
- Unit housing and drum are clear of debris/objects.
- ☐ Control panel is installed.
- ☐ Control panel door opens without obstruction.
- ☐ Control panel installation checklist is completed by an electrician.

# 7.8 Performing a Test Run

Once the system is properly wired and plumbed, but before filling the enclosure with water, perform a test run to ensure proper operation.

A test run includes testing the drum and backwash pump motors by turning the power on and off and by using the Manual Mode switch on the control panel to verify correct rotation.

#### 7.8.1 Procedure

- 1. Remove lid panels.
- 2. Observe the area for any personnel or objects that could be caught in a rotating part.
- Turn on power to the Rotofilter control panel.The "Power" LED on the top of the control panel should illuminate.



If the LED does not illuminate, the control panel has not been properly wired. Turn off power.

A licensed, professional electrician will need to identify the problem.

4. Remove the pump plumbing on the suction end. Fill the pump volute (the centrifugal casing) with water. If the pump has been placed high enough that water will not stay in the volute, the Rotofilter enclosure or sump will need to be filled until the volute stays filled.



Do not run the pump before the volute is filled. Running the pump when it is dry will cause damage

that is not covered by the warranty.

- 5. Reattach the suction end of the pump plumbing.
- Ensure the backwash throttling valve is fully closed. Open the backwash pump supply isolation valve.
- 7. Open the backwash throttling valve one-quarter turn.
- 8. Turn the pump and backwash switches from Off to Manual. The "Drum Run" and "Backwash Pump Run" LEDs should illuminate. The drum should begin rotating and the backwash system should begin operation. If the LED does not illuminate or rotation does not occur, the control panel has not been properly wired.

- Verify the rotation of the backwash pump by observing the rotation of the fan blades. There is an arrow on the top of the pump body that indicates rotation direction.
- 10. Verify the rotation of the drum by observing the screens on the spray bar side of the filter being lifted out of the water. Signage is located on the drive end of the filter that indicates drum rotation direction.
- 11. Turn off the drum motor and backwash system.
- 12. Close the backwash throttling valve.
- 13. Replace lid panels.

# 7.9 Performing a 24-Hour Run

The Rotofilter should be allowed to run continuously for 24 hours prior to normal operation. This period allows for final adjustments and for fine-tuning calibration of the system, which ensures optimal performance.

- 1. Observe the area for any personnel or objects that could be caught in a rotating part.
- 2. Ensure the inlet and outlet valves are closed.
- Fill the sump with a suitable water source until the minimum water level is reached. The water level is identified in the specification documents.



Priming the Rotofilter allows the correct water levels between the inside and outside of the drum

to be reached. This ensures the drum does not become overloaded, and that the screens, drive assembly, and support wheels are not damaged.

- 4. Open the inlet valve.
- 5. Open the outlet valve.
- Ensure the backwash throttling valve is fully closed. Open the backwash filter supply valve.
- 7. Open the backwash throttling valve one-quarter turn.
- 8. Turn on power to the Rotofilter control panel.
- Turn the drum and backwash pump switches to Manual Mode.

10. Observe the pressure gauge. Adjust the throttling valve until the pressure gauge reads between 5.6 to 7.0 kg/cm2 (80 to 100 psi).



Do not exceed 7.0 kg/cm<sup>2</sup> (100 psi). Pressure above 7.0 kg/cm<sup>2</sup> (100 psi) will damage the screens.

- 11. Replace Rotofilter lids.
- 12. Turn the drum and backwash pump switches on the control panel to Automatic Mode.
- 13. Allow the system to run for 24 hours. Check the system periodically to observe backwash system frequency and water levels.

# 7.10 Post 24-Hour Inspection

After 24 hours of continuous operation, several components of the Rotofilter should be checked to ensure proper functioning. The Rotofilter should still be running from the 24-hour test prior to performing this inspection.

- 1. Remove the Rotofilter lids.
- Observe the nozzles on the spray bar assembly. If the pattern appears unusual, blockage may be present. To remove blockage, follow the steps in Section 10.1.
- 3. Turn the drum and backwash pump switches to "Off".
- 4. Turn off power to the Rotofilter control panel.
- 5. Lock out the control panel.
- 6. Check the filter screen clamps. The gasket material between the screen and the drum frame should be compressed to 0.32 centimeters (0.125 inches) evenly around the clamp. If clamps are loose, tighten them by following the steps in Section 9.4.
- 7. Check the drum seal. Ensure the seal is in the correct position. The seal should form an even 90-degree angle between the inlet and the drum trunnion. If the seal needs adjustment, follow the steps in Section 12.1.
- Check the UV intensity (Ultraviolet (RFUV) units only). See the separate UV manual.
- Check the Lamp Out indicators (Ultraviolet (RFUV) units only). Seethe separate UV manual.

## 7.11 Calibrating Float Switches

Float switches are mounted on a bracket installed above the inlet channel. Switches trigger functions, such as drum rotation and backwash cycle or a high-level alarm, when the float reaches a certain elevation.

The float switch may need to be calibrated after installation or if a change in flow or TSS occurs.

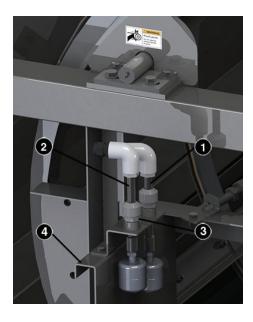


Figure 20. Float switch assembly

- 1: Backwash and Drum Rotation Switch
- 2: High-Level Alarm Switch
- 3: Float Switch Support Fastener
- 4: Overflow Bypass

Floats are factory adjusted to default settings. The backwash and drum rotation float is set at 5 centimeters (2 inches) below the overflow bypass, meaning the backwash cycle will commence when the water level inside the drum is 5 centimeters (2 inches) below the overflow bypass.

The high-level alarm (if included) is 2.5 centimeters (1.0 inch) below the overflow bypass.

- 1. Remove the Rotofilter lid.
- 2. Loosen the fastener(s) supporting the float to the bracket.
- Slide the float assembly up or down to the desired position. Retighten the fastener(s).



If a float needs to be removed for maintenance or replacement, make a note of the float's orientation.

Most floats have a small "o" symbol on one side indicating the top. Ensure the float is installed with the "o" facing up. Mark the top of the float before removing it if there is no distinguishable mark.

# **SECTION 8: STARTUP AND SHUTDOWN**

## 8.1 Filling the Rotofilter

The Rotofilter enclosure must be filled with water prior to opening the inlet and outlet valves.

Priming the Rotofilter allows the correct water levels between the inside and outside of the drum to be reached. This ensures the drum does not become overloaded, and that the screens, drive assembly and support wheels are not damaged.



If the unit is already filled to the minimum water level, proceed to the next section.

- 1. Ensure the inlet and outlet valves are closed.
- 2. Fill the sump with a suitable water source until the minimum water level is reached. The water level is identified in the specification documents.
- 3. Open the inlet valve. Open the outlet valve.

#### 8.2 Startup Procedure

- 1. Observe the area for any personnel or objects that could be caught in a rotating part.
- 2. Ensure the Rotofilter is filled to the minimum operating level. If the Rotofilter needs to be filled, refer to the previous section.
- 3. Ensure the backwash throttling valve is fully closed.
- 4. Open the inlet valve.
- 5. Open the outlet valve.
- 6. Open the backwash pump isolation valve.
- 7. Open the backwash throttling valve one-quarter turn.
- 8. Turn on power to the Rotofilter control panel.
- Turn the drum and backwash pump switches to Manual Mode.
- 10. Observe the pressure gauge. Adjust the throttling valve until the pressure gauge reads between 5.6 to 7.0 kg/cm² (80 to 100 psi).



Do not exceed 7.0 kg/cm<sup>2</sup> (100 psi). Pressure above 7.0 kg/cm<sup>2</sup> (100 psi) will damage the screens.

11. Turn the drum and backwash pump switches to Automatic Mode.

# **SECTION 8: STARTUP AND SHUTDOWN**

# 8.3 Shutdown Procedure (24 Hours or Less)

Use the following procedure to shutdown the Rotofilter if you intend to restart the unit within 24 hours.

- 1. Close the inlet valve.
- Turn the drum and backwash pump switches to Manual Mode. Run in Manual Mode for 10 minutes to allow the spray bar to thoroughly clean the screens.
- Turn the drum and backwash pump switches to OFF.
- 4. Turn off power to the Rotofilter control panel.
- 5. Remove the Rotofilter lids.
- Remove all spray bar nozzles. Twist the locking cap on the front of the nozzle counterclockwise.
   The cap will detach, along with the nozzle tip.
- 7. Turn on power to the Rotofilter control panel.



The Rotofilter will be in operation without lid panels. Use extreme caution when working around the unit.

- 8. Turn the backwash pump switch to Manual Mode. Run in Manual Mode for 30 seconds to flush the backwash system.
- 9. Turn the backwash pump switch to OFF.
- 10. Turn off power to the Rotofilter control panel.
- 11. Perform required maintenance. See Section 9.1 for required maintenance procedures.



Required maintenance procedures vary based on the period of shutdown and the frequency

of regular maintenance. At a minimum, daily maintenance procedures should be completed.

# 8.4 Shutdown Procedure (24 Hours or More)

Use the following procedure to shutdown the Rotofilter if you do not intend to restart the unit within 24 hours

- 1. Follow the steps in Section 8.3 before proceeding.
- 2. Ensure power to the Rotofilter control panel is off.
- Use a pressure washer to thoroughly clean the drum, screens, sludge tray, and filter housing. Hold the power washer at least 46 centimeters (18 inches) from the screens.



Do not exceed 7.0 kg/cm<sup>2</sup> (100 psi). Pressure above 7.0 kg/cm<sup>2</sup> (100 psi) will damage the screens. Do not

hold the pressure head closer than 46 centimeters (18 inches) from the screens. Do not use an oscillating pressure head. An oscillating pressure head will damage the screens.

- 4. Turn on power to the Rotofilter control panel.
- Turn the backwash pump and drum switches to Manual Mode. Run in Manual Mode for 2 minutes to remove solids from the drum and sludge tray.
- Turn the backwash pump and drum switches to OFF.
- 7. Turn off power to the Rotofilter control panel.
- 8. Drain the backwash system.
- Drain the Rotofilter enclosure. Pumping may be required.
- 10. Close the outlet valve.
- 11. Do not allow the Rotofilter to freeze.

#### 9.1 Maintenance Schedule

The Rotofilter requires maintenance to perform efficiently and effectively. Frequent, scheduled maintenance of the Rotofilter will reduce operating costs and extend the life of the equipment.

Below is a basic maintenance schedule that should be followed. Additional maintenance procedures may be required or advantageous.

Daily Maintenance	Manual Section
Check flow and water levels	9.3
Inspect and clean spray bar noz	zles 10.1
Inspect mechanical parts	9.4
Inspect screens	11.1
Inspect drum seal	12.1
Remove deposits or fouling	–
Weekly Maintenance	Manual Section
Inspect and grease support whe	els 13.1
Clean float switch	9.4
Clean solids trough	–
Adjust drive tension (belt/chain r	models) 14.2/14.7
Monthly Maintenance	
Wash screens	11.2
Inspect screen gasket seals	11.4
Inspect drive assembly	14.1
Inspect support wheels for wear	13.1
Inspect oil bath levels (chain-driv	ve models) 14.6
Yearly Maintenance	Manual Section
Inspect / replace support wheels	s 13.4
Inspect / replace drum seal	12.1

#### 9.2 Maintenance Considerations

Some maintenance procedures require the Rotofilter to be dry. To perform these procedures, Frame (RFF) models will need to have sumps that can be drained or pumped. Molded (RFM and Ultraviolet (RFUV) models have integrated drains in their enclosures.

Some maintenance procedures are significantly easier if they are performed at the same time. We recommend that you replace screen panels, gasket seals, and the drum seal at the same time.

These procedures maintain standard wear items that should be replaced on a regular schedule. Procedures contain common steps that need only be performed once if the maintenance procedures are performed in unison. In addition, there is increased service access that facilitates maintenance.

This manual provides the procedures as a combined unit in Section 9.5, and also as separate tasks.

If an issue occurs that is not covered by a maintenance procedure listed in this manual, please contact us.



Performing maintenance or service procedures not listed in this manual without first

consulting us limits our liability and may void the Rotofilter warranty.

# 9.3 Checking Flow and Water Levels

Check flows at least once per day to ensure that the water levels inside and outside the drum remain within the acceptable range. Minimum and maximum water levels are identified on the specification documents.

Flow may need to be altered to maintain the correct balance between water inside and outside of the drum.

# 9.4 Inspect Mechanical Parts

Check the fasteners securing the screen clamps and the support wheels, and check the float assemblies.

#### 9.4.1 Tools

- ☐ SAE open-end wrench set
- ☐ SAE hex key wrench set
- ☐ Torque wrench

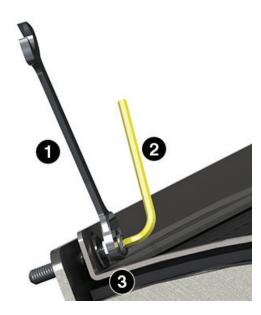


Figure 21. Adjusting the screen clamp fasteners

- 1: Open-end Wrench
- 2 Hex Key Wrench
- 3 Gasket

## 9.4.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Turn off power to the Rotofilter.
- 2. Lock out the control panel.
- 3. Remove the Rotofilter lid.
- 4. Adjust the screen clamps until the gasket (the material underneath the clamp) is compressed by approximately 0.32 centimeters (0.125 inches).
- 5. Check that all filter screens are undamaged. If screens are damaged, see Section 11.1.
- Tighten support wheel bolts with a torque wrench.

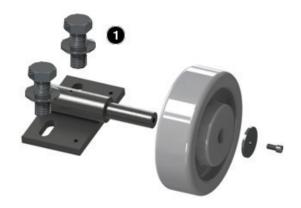


Figure 22. Support wheel bolts (wheel assembly appearance may vary)

- 1: Support Wheel Bolts
- 7. Inspect float switch assemblies for movement and cleanliness. The switch should move easily. If there is fouling, clean the float assembly with a mild liquid detergent solution.



If a float needs to be removed for maintenance or replacement, make a note of the float's orientation.

Most floats have a small "o" symbol on one side indicating the top. Ensure the float is installed with the "o" facing up. Mark the top of the float before removing it if there is no distinguishable mark.

#### 9.5 Combined Maintenance Procedure

Some maintenance procedures are significantly easier if they are performed at the same time. We recommend that you replace screen panels, gasket seals, and the drum seal at the same time.

These procedures maintain standard wear items that should be replaced on a regular schedule, and contain common steps that only need to be performed once if the maintenance procedures are performed in unison. In addition, there is increased service access that facilitates maintenance.

#### 9.5.1 Tools

☐ Socket wrench

☐ Sump pump (if necessary)

☐ SAE socket set

☐ SAE open-end wrench set

☐ SAE hex key wrench set

☐ Torque wrench

☐ Razor blade

☐ Acetone

☐ Anti-seizing compound

☐ Clean cloth

☐ Gasket seal tape

☐ Replacement drum seal

☐ Replacement screen panels

#### 9.5.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Drain or pump the enclosure.
- 2. Remove the Rotofilter lid. If the model has removable side panels, it may be beneficial to remove them for more service access.
- 3. Turn on power to the Rotofilter control panel.
- 4. Rotate the drum in Manual Mode until a screen is accessible.



Use caution when operating the Rotofilter without lid panels.

- 5. Turn off power to the Rotofilter control panel.
- 6. Lock out the control panel.
- 7. Use an open-end wrench to loosen and remove nylocs, screen cams, and washers while holding the set screws with a hex key wrench. See Figure 23. There are 2 nylocs, screen cams, and washers at each end of screen clamp.



Figure 23. Removing nylocs from screen clamps

- 8. With all 4 nylocs removed, remove the screen clamp from the drum.
- 9. Thread the set screws into the flat bar (away from the screen to be removed) until they are approximately 1.3 centimeters (0.5 inches) from the face of the flat bar. See Figure 24.



Figure 24. Threading the set screw away from the screen panel

10. Pull the screen panel up until it clears the set screw and flat bar, then slide out the panel from underneath retainer bar. See Figure 25.



Figure 25. Removing the screen panel

- 11. After the first panel has been removed, remove the retainer bar from the drum. The retainer bar may be held in place by bolts or hex head screws.
- 12. Once the retainer bar has been removed, the second screen can be taken off. The screen gaskets will be the only things remaining on the drum periphery for this section of the drum. Inspect screen gaskets whenever screen panels are removed. We recommend replacing screen gaskets anytime you remove screen panels.
- 13. Use a razor blade to gently remove the screen gasket from the frame. Use acetone (or equivalent solvent) to remove glue residue.
- 14. Remove all remaining screen gaskets from the drum periphery. Repeat steps 1 through 13 for other screen clamp sections.
- 15. After screen panels and gaskets are removed, pressure wash the inside of the filter box, drum, and solids trough. Wipe off and dry drum periphery.

16. Use a socket wrench to remove the stainless bolts securing the outer seal ring to the drum seal. You may need to physically enter the drum to reach the drum seal depending on the size of the Rotofilter model. Use the drum frame to support yourself. Never step on a screen panel. See Figure 26.



Ensure the power to the Rotofilter control panel is off, and the control panel is locked out. Never enter the Rotofilter drum with the power on.

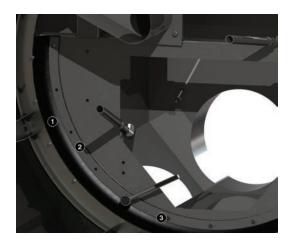


Figure 26. Removing the drum seal

- 1: Drum Seal
- 2: Outer Seal Ring (bolted to seal and inlet)
- 3: Drum Seal Bolt



Rotofilter appearance may vary by model.

- 17. Remove the old seal.
- 18. Clean the outer seal ring by wiping it with a clean cloth.
- Inspect and clean the inlet trunnion before installing the new seal. Apply anti-seizing compound to the rivet nuts that will be used to install the seal.

20. Pre-assemble the new drum seal to the outer ring by inserting all fasteners halfway through the ring and drum seal. See Figure 27.



Figure 27. Drum seal pre-assembly

- 21. Align the seal assembly fasteners with the corresponding rivet nuts on the inlet plate, while pushing the drum seal onto the inlet trunnion to form the proper right-angle seal. Start with the top-left bolt and thread it into the rivet nut by hand-tightening. Work your way around the seal ring until all fasteners are threaded in and hand-tight.
- 22. Ensure the seal is positioned evenly on the inside of the drum trunnion and makes contact all the way around. See Figure 28. Realign the seal if necessary.



Figure 28. Incorrect (left) and correct (right) drum seal alignment

- 23. Starting at the top-left bolt, torque all bolts until the seal compresses between the outer seal rim and inlet plate by 0.32 centimeters (0.125 inches).
- 24. The drum seal may have excess material that must be trimmed off. Trim the excess material from the drum seal by using the inside of the inlet trunnion as a guide. See Figure 29.



Figure 29. Use the inlet trunnion to trim the seal

25. Trim the top ends of the seal using the filter bypass as a guide. See Figure 30.

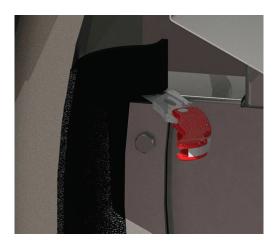


Figure 30. Use the bypass to trim the drum seal

# **SECTION 9: MAINTENANCE**

- 26. Remove any grease or oil from the drum that will affect screen gasket adhesion. Wipe thoroughly.
- 27. Ensure the drum is dry. Gasket will not adhere properly if moisture is present.
- 28. Gasket forms a watertight seal between the screen panel and the drum frame due to the pressure of the screen clamps. Therefore, the gasket must be applied to the areas of the drum frame that align with where the screen clamp will press on the screen panel. It may be beneficial to hold the screen clamp over the drum frame to see where the contact will occur.
- 29. Apply the screen gasket to all the circumferential sections of the drum. See Figure 31. Circumferential sections are the rounded sections of the drum. The drum may be light enough to rotate by hand. If the drum is too heavy, rotate the drum in Manual Mode.

**A**WARNING

Use extreme caution when performing maintenance that requires drum rotation. Rotating

parts can cause severe injury or death. Always shut off power after rotation. Do not leave the power on when performing any maintenance procedures.

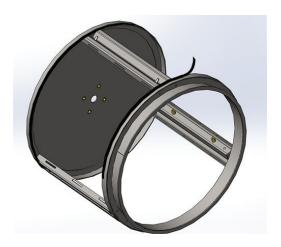


Figure 31. Applying circumferential gasket



The gasket must align with the screen clamp in order to function properly. The pressure of the

screen clamp on the gasket creates a watertight seal. Apply gaskets with care.

30. Apply gaskets to the drum channels. See Figure 32. The drum channels are the sections between the circumferential gaskets.



Figure 32. Applying channel gasket

31. Use a razor blade to cut the gasket so it firmly abuts the circumferential gasket edge and creates tight joints. See Figure 33. Rotate the drum to access the remaining portions of the drum.

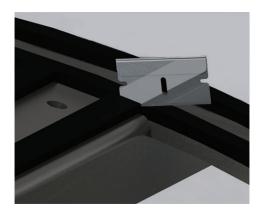


Figure 33. Creating tight gasket joints

32. Replace the retainer bar on the rear drum channel using the bolts and new nylocs. Use anti-seizing compound on all fasteners. Handtighten the nylocs. Fasteners may also be hex head screws.



Do not reuse nyloc fasteners. Nylocs are no longer effective after being removed.

# **SECTION 9: MAINTENANCE**

33. Insert the lower screen panel under the retainer bar, then insert upper screen. Ensure set screws are threaded away from screen panel to allow panel to clear while installing. See Figure 34.



Figure 34. Installing a screen panel

- 34. Once the panel has cleared the set screws, thread the screws back out until they keep the panel in place.
- 35. Ensure that both panels are centered and seated into the retainer bar as far as possible. Tighten the fasteners.
- 36. Repeat steps 32 through 36 for the front screen section and remaining sections. It is best to start at the back of the drum and move forward when moving to a new section.
- 37. Adjust the set screws on each section until they are centered in the tapped flat bar. See Figure 35.



Figure 35. Centering the set screws

- 38. Reinstall the two screen clamps in each section by pushing the screen clamp angled ends down onto the screen. Slide the clamps onto the set screws on the tapped flat bar.
- 39. Install washers, screen cams, and nylocs on each end of the screen clamp (use anti-seizing compound on all fasteners). Using a hex key wrench, hold the set screw while tightening the nyloc with an openend wrench. See Figure 36.



Figure 36. Reinstalling the screen clamps

- 40. Tighten both ends of the clamp evenly, until you have equal spacing between the screen clamp and the flat bar, and the screen panel is compressing the gasket by approximately 0.32 centimeters (0.125 inches).
- 41. Ensure the screen cams are rotated until tight.
- 42. Rotate the drum to a new section. Repeat steps 38 through 40 for remaining sections.
- 43. Replace the Rotofilter lid.

# **SECTION 10: SPRAY BAR MAINTENANCE**

#### 10.1 Spray Bar Overview

The nozzles on the spray bar have small orifices that can easily be plugged by debris. The nozzles must be checked daily and cleaned as required.

Gaskets and O-rings that provide watertight seals can become worn or damaged and may need to be replaced. A visual inspection will reveal abnormalities in the spray pattern, which indicates a clogged nozzle tip, or a damaged gasket or O-ring.

#### 10.2 Spray Bar Assembly

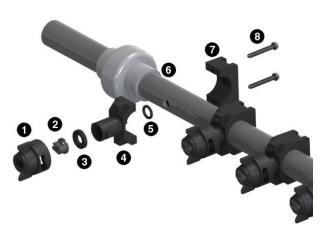


Figure 37. Spray bar assembly

- 1: Locking Nozzle Cap
- 2: Steel Spray Tip
- 3: Spray Tip Gasket
- 4: Nozzle Body (Front End)
- 5: Manifold O-ring
- 6: Spray Bar Manifold
- 7: Nozzle Body (Back End)
- 8: Nozzle Body Screws

#### 10.3 Removing the Nozzle Cap

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

1. Remove the nozzle locking cap by twisting counterclockwise.

#### 10.4 Cleaning the Nozzle Tip

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Remove the nozzle tip from the locking cap.
- Remove any foreign objects from the nozzle tip by probing the tip with the end of a paper clip or similarly pointed object.

#### 10.5 Removing the Nozzle Body

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

Remove the 2 screws that attach the nozzle body to the spray bar.

#### 10.6 Gaskets and O-rings

Inspect the nozzle gasket and manifold O-ring. Replace if either appears cracked, brittle, or worn. If water leaks from under the locking cap during normal operation, replace the spray tip gasket. If water leaks where the nozzle body meets the manifold, replace the O-ring.

#### 10.7 Nozzle Reassembly

- 1. Insert the stainless steel spray tip into the locking cap.
- 2. Ensure that the spray tip nozzle gasket is properly aligned on the spray nozzle body.
- 3. Ensure that the manifold O-ring is properly aligned on the manifold.
- Attach the spray nozzle body onto the spray bar manifold using both screws. Do not over tighten the screws.
- 5. Reassemble the nozzle by inserting the locking cap over the spray nozzle body, pushing in, and twisting clockwise until the cap snaps in place.

#### 11.1 Screen Damage

The screens on the Rotofilter are made from polyester fabric molded into polypropylene grid frames. Although strong and resilient, they may become damaged from the following:

#### 11.1.1 Punctures

#### **Prevention**

Protecting the Rotofilter from large debris is the best way to prevent puncture damage.

#### Remedy or Repair

If the grid is still intact around the cell that was punctured, use the square rubber plugs supplied in the owner's kit to repair the screen. See Section 11.3 for plug installation.

If damage is more extensive, replace the entire screen. See Section 11.5 for screen removal and installation.

#### 11.1.2 Breakdown by Ultraviolet Light

#### **Prevention**

Do not allow direct UV light to hit the screens. If the Rotofilter is installed outside, a weatherproof shelter should be built to prevent UV light from reaching the unit.

Ultraviolet (RFUV) units come with UV light block baffles to prevent UV breakdown of screen panels. The baffles stop direct UV from penetrating the screen membrane.



You will still see light emitting from UV chamber inside of the drum area. This is normal.

#### 11.1.3 Mineral Deposits

#### Remedy or Repair

Certain high water-soluble mineral environments may cause screens to be obscured by mineral deposits. The frames and polyester screens are unaffected by acids effective in cleaning away these deposits. Either of the following solutions is effective:

 Remove all affected screens as outlined in Section 11.4, and fully immerse in a 5 to 15% muriatic acid solution until clean.

- 2. Follow the appropriate Shutdown procedure, as outlined in Section 8.3.
- Drain the tank/sump. Prepare an appropriate quantity of the following phosphoric/citric acid solution:
- 3 liters (3.17 quarts) of clean water
- 1 liter (1.05 quarts) phosphoric acid (84%)
- 110 grams (0.25 pounds) commercial-grade citric acid
- 30 cc (1 fluid ounce) liquid detergent (common dishwashing fluid is acceptable)
- 4. With the backwash system off and tank/sump empty, run the drum motor and evenly apply the acid solution to the screens using a common garden sprayer or similar device.
- Leave the drum motor turning for 20 minutes to prevent pooling and drip-off. Rinse the screens and the inside of the machine with a pressure washer.

Do not exceed 7.0 kg/cm² (100 psi). Pressure above 7.0 kg/cm² (100 psi) will damage the screens. Do not hold the pressure head closer than 46 centimeters (18 inches) from the screens. Do not use an oscillating pressure head. An oscillating pressure head will damage the screens.

- Flush and drain or pump out the enclosure (tank/sump).
- 7. Follow the Rotofilter Startup procedure as outlined in Section 8.1. 11.1.4 Biological Growth

#### **Prevention**

No single solution resolves this problem due to the high diversity of growth that can occur. We recommend that screens be kept away from light and heat sources to minimize biological growth.

#### Remedy or Repair

- Remove growth with a high-pressure power washer as described in Section 11.2. For stubborn deposits, a 15 to 20% sodium hypochlorite solution can be effective when applied as follows:
- Follow the appropriate Shutdown procedure as described in Section 8.3.
- 3. Drain the enclosure (tank/sump).

- 4. With the backwash system off and the tank/sump empty, run the Rotofilter and evenly apply the solution to the screens using a common garden sprayer or similar device.
- Leave the Rotofilter turning for 20 minutes to prevent pooling and dripoff. Rinse the screens and the inside of the machine with a pressure washer.
- 6. Flush and drain or pump out the enclosure.
- Follow the Rotofilter Startup procedure as described in Section 8.1.

#### 11.2 Washing the Screens

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

Wash screens with high-pressure washer periodically. Be sure to hold the pressure washer nozzle at least 46 centimeters (18 inches) away from the screens to prevent screen puncture.



Do not exceed 7.0 kg/cm<sup>2</sup> (100 psi). Pressure above 7.0 kg/cm<sup>2</sup> (100 psi) will damage the screens. Do not

hold the pressure head closer than 46 centimeters (18 inches) from the screens. Do not use an oscillating pressure head. An oscillating pressure head will damage the screens.

Periodic removal of screens for deep cleaning and power washing may be required if organic or mineral loads are high. The frequency of these cleaning procedures is entirely dependent on inlet water quality. An increase in backwash frequency or a decrease in flow capacity indicates that cleaning is required.

#### 11.3 Repairing Screen Panels

Panels with damaged cells and an intact grid can be repaired using screen repair plugs. Replace panels that have sustained damage to 3% or more (maximum 10 plugs) of the screen cells.

#### 11.3.1 Tools

☐ Utility knife☐ Screen repair plug☐ Blunt object (such as a pencil eraser)

#### 11.3.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

1. Locate the damaged cell. Ensure that the grid around the cell has little or no damage.

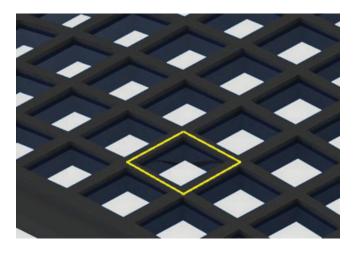


Figure 38. A damaged screen cell

2. Cut the damaged cell out using a utility knife. Be careful not to damage the surrounding grid.



Figure 39. Removing a damaged cell

 Insert the bottom of the repair plug into the cell.
 Using a small blunt bject such as a pencil eraser, push the center of the repair plug into the cell until it snaps into place.

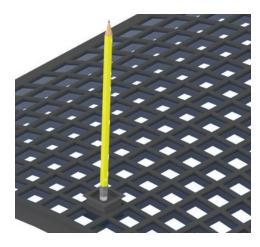


Figure 40. Installing a screen repair plug

4. If the plug does not completely cover the area, remove it and replace it with another plug by following the preceding steps.

# 11.4 Removing Screen Panels and Gasket Seals

Some maintenance procedures are significantly easier if they are performed at the same time. We recommend that you replace the screen panels, gaskets, and the drum seal at the same time.

This procedure describes removing screen panels and gasket seals only. For the combined maintenance procedure, see Section 9.5.

To remove screen panels and gasket seals, you will need to rotate the drum until you are able to access the fasteners at both ends of the screen clamp and center retainer bar. Each screen clamp holds down 2 screen panels.

Remove the Rotofilter lid. If the model has removable side panels, it may be beneficial to remove them for more service access.

#### 11.4.1 Tools

- ☐ Socket wrench
- ☐ SAE socket set
- ☐ SAE open-end wrench set
- ☐ SAE hex key wrench set
- ☐ Torque wrench
- ☐ Acetone, citrus cleaner, or equivalent
- ☐ Razor blade
- ☐ Pressure washer
- ☐ Clean, soft cloth

#### 11.4.2 Procedure

- 1. Rotate the drum in Manual Mode until a screen is accessible.
- 2. Turn off power to the Rotofilter control panel.
- 3. Lock out the control panel.
- 4. Use an open-end wrench to loosen and remove nylocs, screen cams, and washers while holding the set screws with a hex key wrench. See Figure 41. There are 2 nylocs and washers at each end of screen clamp.



Figure 41. Removing nylocs from screen clamps

- 5. With all 4 nylocs removed, remove the screen clamp from the drum.
- 6. Thread the set screws into the flat bar (away from the screen to be removed) until they are approximately 1.3 centimeters (0.5 inches) from the face of the flat bar. See Figure 42.



Figure 42. Threading the set screw away from the screen panel

7. Pull up the screen panel until it clears the set screw and flat bar, then slide out the panel from underneath the retainer bar. See Figure 43.

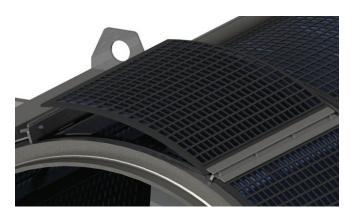


Figure 43. Removing the screen panel

- After the first panel has been removed, remove the retainer bar from the drum. The retainer bar may be held in place by bolts or hex head screws.
- 9. Once the retainer bar has been removed, the second screen can be taken off. The screen gaskets will be the only things remaining on the drum periphery for this section of the drum. Inspect screen gaskets whenever screen panels are removed. We recommend replacing screen gaskets anytime you remove screen panels.
- Use a razor blade to gently remove the screen gasket from the frame. Use acetone (or equivalent solvent) to remove glue residue.
- Remove all remaining screen gaskets from drum periphery. Repeat steps 1 through 10 for other screen clamp sections.
- 12. After all screen panels and gaskets are removed, pressure wash the inside of the filter box, drum and solids trough. Wipe off and dry drum periphery.

# 11.5 Replacing Screen Panels and Gasket Seals

Follow this procedure only after completing Screen Panel and Gasket Seal Removal.

This procedure requires the Rotofilter to be dry. Drain or pump out the enclosure (tank/sump).

11.5.1 100IS
$\square$ Sump pump (if necessary)
□ Gasket
☐ Razor blade
☐ Replacement screen panels
☐ Nyloc fasteners
☐ SAE socket set
$\square$ SAE open-end wrench set
☐ SAE hex key wrench set

☐ Torque wrench

☐ Anti-seizing compound

## 11.5.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- Remove any grease or oil from the circumferential and channel sections of the drum that will affect screen gasket adhesion. Wipe thoroughly.
- Apply screen gasket to the left and right side of the circumferential sections of the drum. These are the front and back rounded sections of the drum. Gasket should be flush with inside edges of screen openings and abutting both tapped flat bars. See Figure 44.



Figure 44. Gasket abutting the flat bar

3. Apply gaskets to the left and right sides of the drum channels between the circumferential gaskets. Use a razor blade to create tight joints between the gasket. See Figure 45.



Gaskets must abut tightly against the circumferential gaskets. Use a razor blade to make all gasket cuts

to ensure tight joints. Ensure sides of the gaskets are parallel with the start of the rounded edge of the drum channel.



Figure 45. Cutting gasket for tight joints

4. Replace the retainer bar on the rear drum channel using the bolts and new nylocs. Use antiseizing compound on all fasteners. Hand-tighten the nylocs. Fasteners may be hex head screws.



Do not reuse nyloc fasteners. Nylocs are no longer effective after being removed.

5. Insert the lower screen panel under the retainer bar, then insert the upper screen. Ensure the set screws are threaded away from screen panel to allow the panel to clear the set screws while installing. See Figure 46.



Figure 46. Installing a screen panel

- Once the panel has cleared the set screws, thread the screws back out until they keep the panel in place.
- 7. Ensure both panels are centered and seated into retainer bar as far as possible. Tighten the fasteners of the retainer bar.
- 8. Repeat steps 1 through 7 for the front screen section and remaining sections. It is best to start at the back of the drum and move forward when moving to a new section.
- Adjust the set screws on each section until they are centered in the tapped flat bar. See Figure 47.



Figure 47. Centering the set screws

10. Reinstall the two screen clamps in each section by pushing the angled ends of the screen clamp down onto the screen. Slide the clamps onto the set screws on the tapped flat bar. 11. Install washers, screen cams, and nylocs onto each end of the screen clamp (use anti-seizing compound on all fasteners). Using a hex key wrench, hold the set screw while tightening the nyloc with an openend wrench. See Figure 48.



Figure 48. Reinstalling screen clamps

- 12. Tighten both ends of the clamp evenly, until you have equal spacing between the screen clamp and the flat bar, and the screen panel is compressing the gasket by approximately 0.32 centimeters (0.125 inches).
- 13. Ensure the screen cams are rotated until tight.
- 14. Rotate the drum to a new section. Repeat steps1 through 12 for remaining sections.

# **SECTION 12: DRUM SEAL MAINTENANCE**

#### 12.1 Overview

The drum seal is a sturdy, waterproof material that provides a 90-degree seal between the inner drum frame (trunnion) and the interior of the Rotofilter frame. The seal prevents water from exiting the drum prior to filtration. The seal should always be in contact with the inner surface of the drum, and should appear smooth and even along the trunnion. See Figure 49.

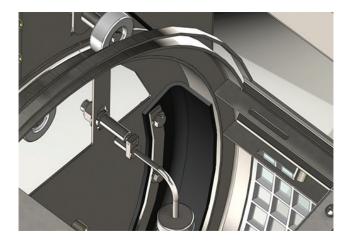


Figure 49. Correct drum seal alignment

If the seal is ripped, cracked, or buckled, it will need to be replaced.

Some maintenance procedures are significantly easier if they are performed at the same time. We recommend that you replace the screen panels, gaskets, and the drum seal at the same time.

This section describes removing and replacing the drum seal only. For the combined maintenance procedure, see Section 9.5.

#### 12.2 Removing the Drum Seal

#### 12.2.1 Tools

☐ SAE socket set

☐ Anti-seizing compound

#### 12.2.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

You may need to physically enter the drum to reach the drum seal depending on the size of the Rotofilter model. Use the drum frame to support yourself. Never step on a screen panel.

- 1. Turn off power to the Rotofilter control panel.
- 2. Lock out the control panel.
- 3. Remove the lid panel from the Rotofilter.
- 4. Remove the screen clamp and screen panel closest to the inlet of the Rotofilter. More than one panel may need to be removed to gain access. See Section 11.4



Ensure the power to the Rotofilter control panel is off, and the control panel is locked out. Never enter the

Rotofilter drum with the power on.

Use a socket wrench to remove the stainless steel bolts securing the outer seal ring to the drum seal. See Figure 50.

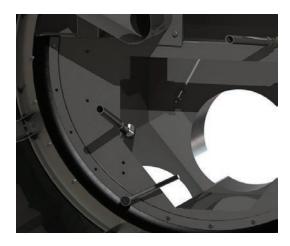


Figure 50. Removing the drum seal

6. Remove the old seal.

# **SECTION 12: DRUM SEAL MAINTENANCE**

## 12.3 Replacing the Drum Seal

Follow this procedure only after completing the previous section.

#### 12.3.1 Tools

- ☐ Socket wrench
- ☐ SAE socket set
- ☐ Anti-seizing compound
- ☐ Utility knife
- ☐ Clean cloth

#### 12.3.2 Procedure

- Clean the outer seal ring by wiping it with a clean cloth.
- 2. Inspect and clean the inlet trunnion before installing the new seal. Apply anti-seizing compound to the rivet nuts that will be used to install the seal.
- 3. Pre-assemble the new drum seal to the outer ring by inserting all fasteners halfway through the ring and drum seal. See Figure 51.



Figure 51. Drum seal pre-assembly

- 4. Align the seal assembly fasteners with the corresponding rivet nuts on the inlet plate, while pushing the drum seal onto the inlet trunnion to form the proper right-angle seal. Start with the top-left bolt and thread it into the rivet nut by hand-tightening. Work your way around the seal ring until all fasteners are threaded in and hand-tight.
- Ensure the seal is positioned on the inside of the drum trunnion and makes contact all the way around. Realign the seal if necessary.
   See Figure 52.



Figure 52. Incorrect (left) and correct (right) drum seal alignment

- Starting at the top-left bolt, torque all bolts until the seal compresses between the outer seal rim and inlet plate by 0.32 centimeters (0.125 inches).
- 7. The seal may have excess material, either being too wide or too long. Trim excess material from the drum seal using the inside of the inlet trunnion as a guide, See Figure 53.

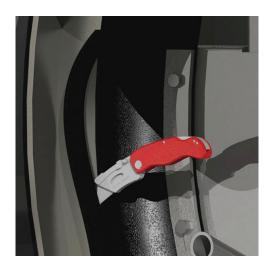


Figure 53. Trimming the drum seal using the inlet trunnion

# **SECTION 12: DRUM SEAL MAINTENANCE**

8. Trim the top ends of the seal using the filter bypass as a guide, See Figure 54.

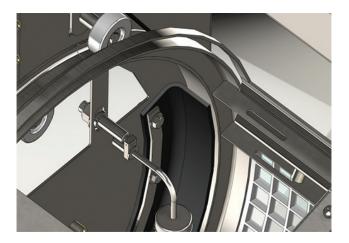


Figure 54. Trimming the drum seal using the filter bypass

9. Replace the removed screens, as described in Section 11.5

#### 13.1 Overview

Rotofilters use bearing-mounted urethane wheels for supporting the rotating drum. These should be considered a normal wear item and should be replaced at a regular service interval.

Allowing the wheels to sustain significant wear or fail will cause the drum to become deformed, which could cause filter failure. Pentair recommends that you replace support wheels at 1 year intervals.

#### 13.2 Support Wheel Assembly Parts

#### 13.2.1 20-Series, 32-Series, and 48-Series

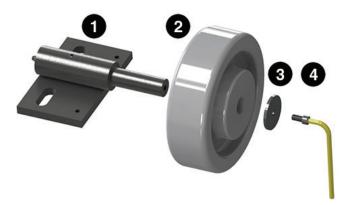


Figure 55. Support wheel assembly (20-, 32-, and 48-series)

- 1: Support Axle
- 2: Elastomer Wheel
- 3: Washer
- 4: Socket Cap Screw

Please contact us with part number inquiries.

#### 13.2.2 60-Series

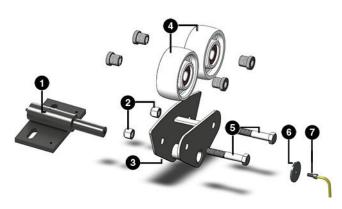


Figure 56. Support wheel assembly parts (60-series)

- 1: Support Axle
- 2: Nyloc Nuts
- 3: Walking Beam Assembly
- 4: Elastomer Wheel (2)
- 5: Wheel Axle Bolts
- 6: Washer
- 7: Socket Cap Screw

Please contact us with part number inquiries.

## 13.3 Greasing the Support Wheels

Greasing the drum wheels prevents water entry into the wheel bearing. Grease should be applied until it discharges from the bearing seals.

#### 13.3.1 Tools

☐ Flathead screv	vdriver or coin
☐ Grease gun	

- ☐ Food-grade general purpose grease (We use Lubriplate® FGL-2)
- ☐ Clean, soft cloth

#### 13.3.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

 Remove the access door located on the front of the lid assembly by turning both latches counterclockwise. See Figure 57. Latches can be turned with a coin or flathead screwdriver.

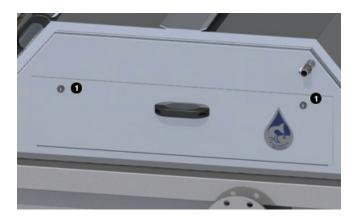


Figure 57. Access door latch locations

2. Grease fittings are located at end of each support wheel shaft. See Figure 58.



Figure 58. Support wheel grease fittings

Apply grease until it discharges from the bearing seals.

#### 13.4 Removing the Support Wheels

Removing and replacing the support wheels requires lifting the drum frame. The drum frame can be extremely heavy. In most cases lifting the drum frame will require a bottleneck hydraulic jack to lift safely and successfully.

#### 13.4.1 Tools

A bottleneck hydraulic jack (minimum lift capacity 1815 kilograms or 2 tons) able to fit between the bridge and inside of the drum wheel. See Figure 59.

- ☐ A nylon strap
- ☐ Socket wrench
- ☐ SAE socket set
- ☐ SAE hex key wrench set
- ☐ Bench vice
- ☐ Anti-seizing compound
- ☐ Pencil or marker
- ☐ Grease gun
- ☐ General purpose grease
- ☐ Torque wrench

#### 13.4.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Shut off power to the Rotofilter control panel.
- 2. Lock out the control panel.
- 3. Position the hydraulic jack on the bridge under the center of the drum. See Figure 59. Secure the jack by using a clamp, cord or strap to prevent the jack from accidentally falling into the drum and damaging the screens.

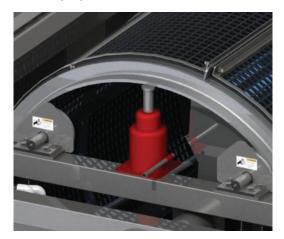


Figure 59. Hydraulic jack placement

4. Raise the drum until the support wheels turn freely, approximately 0.64 centimeters (0.25 inches).



Lift only high enough to allow wheels to turn. Excessive lifting may warp the drum or damage the drum seal. 5. Mark the location of the axle plate with a pencil, then remove the bolts that secure the axle plate assembly to bridge. See Figure 60.



Figure 60. Marking the support wheel assembly location

- 6. Remove one support wheel assembly.
- 7. Secure support wheel assembly in a vice.
- 8. Remove the old wheel and clean the axle assembly.

#### 13.5 Replacing the Support Wheels

Follow this procedure only after completing the steps in Section 13.4

Removing and replacing the support wheels requires lifting the drum frame. The drum frame can be extremely heavy, and in most cases will require a bottleneck hydraulic jack to lift safely and successfully.

# 13.5.1 Tools □ A bottleneck hydraulic jack (minimum lift capacity 1815 kg or 2 tons) able to fit between the bridge and inside of the drum wheel. □ A nylon strap □ Socket wrench □ SAE socket set

☐ Anti-seizing compound

☐ SAE hex key wrench set

- ☐ Pencil or marker
- ☐ Grease gun

☐ Bench vice

- ☐ General purpose grease
- ☐ Torque wrench

#### 13.5.2 Procedure

- Pump grease through the grease fitting using the grease gun. Grease should be applied until it discharges from the bearing seals to ensure no dirt or water is present.
- 2. Clean the threads on the axle and the two mounting bolts and apply anti-seizing compound.
- 3. Place a new wheel onto the assembly.
- 4. Grease the assembly through the grease fitting until grease is forced out around the axle.
- Apply anti-seizing compound to all stainless fasteners.
- 6. Place the support wheel assembly onto the tapped flat bar on the bridge. Thread in both bolts and hand-tighten.
- 7. Align the axle support plate to the location line penciled on the tapped flat bar. Tighten both bolts with a torque wrench.
- 8. Repeat the previous section, then this section, for the other support wheel assembly.
- Lower the hydraulic jack until the drum rests on the support wheels. Remove the jack and any other tools or parts.
- 10. Follow the Startup procedures in Section 8.2.
- 11. Ensure that all wheels turn smoothly.

#### 14.1 Overview

Rotofilter drive assemblies vary by model and size. The drive assembly will be one of the two listed below:

The Rotofilter drive assembly is a <u>direct-drive</u> <u>system</u> that uses a motor to drive a reduction gear directly attached to the drive shaft. The gear and motor do not require maintenance, however the gear and shaft seal are standard wear items and will need to be replaced occasionally. The motor can burn out and may also need to be replaced.

The Rotofilter drive assembly is a <u>chain-drive</u> <u>system</u> that uses a motor to drive a gear. A chain is attached between this gear and a gear on the drive shaft, and provides drum rotation. The chain-drive assembly requires scheduled maintenance, such as adjusting the chain and monitoring oil bath levels. The gear is a standard wear item and will need to be replaced occasionally. Rarely, the motor can burn out and may also need to be replaced.

# 14.2 Drive Assembly Parts (Chain-Drive Models)

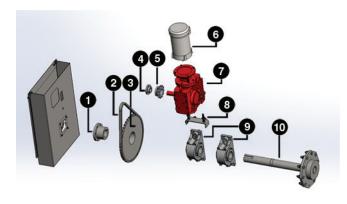


Figure 62. Drive assembly parts for chain-drive models

Part numbers will vary based on the size of the model. Please contact us with part number inquiries.

- 1: Bushing
- 2: Chain
- 3: Sprocket
- 4: Idler Bushing
- 5: Idler Sprocket
- 6: Motor
- 7: Reduction Gear
- 8: Alignment Bracket
- 9: Pillow Block (2)
- 10: Shaft Assembly

# 14.3 Maintaining Oil Bath Levels (Chain-Drive Models)

The chain drive assembly oil bath ensures operational longevity of the Rotofilter. Check the oil levels monthly. Ensure that oil covers the bottom lengths of the chain. Refill the bath using only Clarity® Synthetic Hydraulic Oil AW.

# 14.4 Adjusting Chain Tension (Chain-Drive Models)

The drive chain must have proper tension to drive the Rotofilter efficiently. Shipping and installation can loosen the tension.

#### 14.4.1 Tools

- ☐ Socket wrench
- ☐ SAE socket set
- ☐ Torque wrench

#### 14.4.2 Procedure

- 1. Turn off power to the Rotofilter control panel.
- 2. Lock out the control panel.
- 3. Loosen (do not remove) the gear mount fasteners on the right side of the drive assembly (behind the oil bath). See Figure 63.



Figure 63. Gear mount fasteners

 Adjust the height of the motor and gear using the tension bracket fasteners on the left side of the oil bath. See Figure 64.

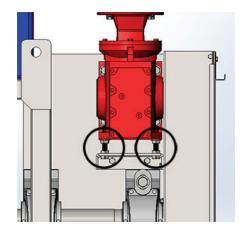


Figure 64. Tensioner bracket fasteners

5. Retighten the motor mount fasteners.

# 14.5 Removing the Drive Assembly (Chain-Drive Models)

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Remove the motor from the gear. The motor is attached with four bolts on the bottom.
- Loosen (do not remove) the gear mount fasteners on the right side of the drive assembly (behind the oil bath). See Figure 65.



Figure 65. Gear mount fasteners

3. Lower the gear using the tension bracket fasteners on the right side of the drive assembly. See Figure 66.

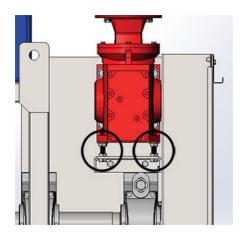


Figure 66. Tension bracket fasteners

- 4. Remove the chain.
- Remove the gear. Remove the mounting fasteners and lift up to uncouple from the tension bracket.
- 6. Drain the oil bath.

# 14.6 Replacing the Drive Assembly (Chain-Drive Models)

Follow this procedure only after completing the procedure listed in Section 14.8

- 1. Slide the gear onto the tension bracket.
- 2. Attach the gear to the drive assembly plate. Leave the fasteners loose enough that the gear can slide up and down.
- 3. Check the vertical alignment of the 2 sprockets. The sprockets must align vertically to prevent overstressing of the chain. Place a level across the face of both sprockets. If adjustment is necessary, loosen the idler (top sprocket) bushing and adjust the idler sprocket. Tighten the bushing.
- 4. Attach the chain to the lower sprocket.

- 5. Attach the chain to the gear sprocket.
- 6. Adjust the tension of the chain, as described in Section 14.7
- Fill the oil bath. Use only Clarity Synthetic
   Hydraulic Oil AW. Fill until the bottom lengths of
   the chain and lower gear are covered.
- 8. Attach the motor to the gear.

# 14.7 Removing the Drive Assembly (Direct-Drive Models)

The drive assembly may need to be removed to replace standard wear items or to adjust the set collar that positions the drum. It is recommended that the shaft seal be replaced (as described in this section) and the set collar properly positioned any time the drive assembly is removed.

See Section 14.11

#### 14.7.1 Tools

Socket wrench
SAE socket set
SAE open-end wrench set
SAE hex key wrench set
Anti-seizing compound
Loctite<sup>®</sup> 609 retaining compound

☐ Loctite® 243 thread locker

#### 14.7.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- 1. Turn off power to the Rotofilter control panel.
- 2. Lock out the control panel.

3. Remove the 2¼-inch wing nuts securing the motor cover to the ledger bracket assembly. Lift the motor cover off. See Figure 67.

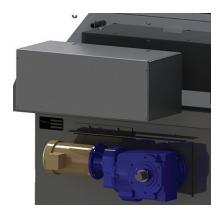


Figure 67. Removing the drive cover

 Remove the access plate on the motor.
 Disconnect the supply wires coming from the control panel.



Electrical work should be completed by a qualified electrician.

- 5. Remove the washer securing the 90-degree elbow to the access plate.
- 6. Using a socket wrench, loosen the 4 bolts securing the motor to the gear until you can turn them by hand. See Figure 68.

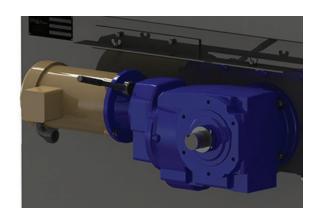


Figure 68. Removing the motor

- 7. Support the motor with one hand and remove bolts with the other hand. Slide the motor out from the gear and set aside.
- Using a hex key wrench, loosen both cap screws on the set collar until you are able to slide the collar off of the shaft.
- 9. Remove the bolts securing the gear to the enclosure by using an open-end wrench to hold the nylocs on the gear mount flange, and an open-end wrench to loosen the bolt heads on the inside of the enclosure. See Figure 69.

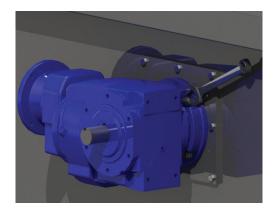


Figure 69. Removing the gear mount bolts (inside not shown)

10. Slide the gear off the shaft once all nyloc fasteners have been removed. See Figure 70.

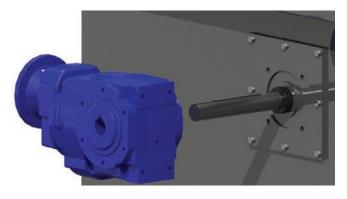


Figure 70. Removing the gear from the shaft

- 11. Remove the <sup>1</sup>/<sub>8</sub>-inch key stock from the drive shaft.
- 12. Inspect the black oxide set collar on the shaft, which can be seen once the gear has been removed.
- 13. If the collar is tight and cannot be moved, mark the collar location on the shaft with a pencil or marker. See Figure 71.

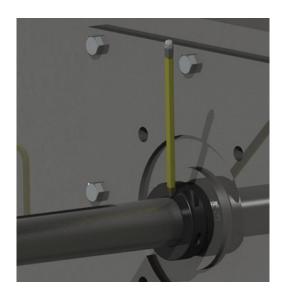


Figure 71. Marking the set collar

- 14. If the set collar is loose, it will need to be repositioned before marking its location. See Section 14.11 prior to continuing.
- 15. Remove the 2 socket cap screws in the set collar with a hex key wrench.
- 16. Remove the set collar from the shaft.

17. When removing the gear from the shaft, you should also replace the shaft seal, as it is a normal wear item. It is seated within a rebate on the gear mount plate and can only be removed by taking off the black oxide set collar. You will need a small flathead screwdriver to pop the seal out of the rebate. See Figure 72.



Figure 67. Removing the drive cover

# 14.8 Positioning the Set Collar (Direct-Drive Models)

The set collar is located on the drive shaft and prevents the drum from becoming misaligned or falling off the support wheels. The collar may become loose or misaligned during Rotofilter operation, and will need to be repositioned.

The drive assembly must be removed prior to positioning the set collar. To remove the drive assembly, see Section 14.10.

#### 14.8.1 Tools

☐ SAE hex key wrench set
☐ Loctite 609 retaining compound
□ Prv har

#### 14.8.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

 Ensure the space between the drum and frame on the end of the Rotofilter opposite the drive assembly is between 1.3 and 1.9 centimeters (0.5 and 0.75 inches). See Figure 73. The support wheels should also be centered on the inside of inlet trunnion. Push or pull the drum frame assembly from the drive assembly end of the unit to achieve the proper position.



Figure 73. Proper drum spacing

- Attach the set collar onto the shaft and retighten the collar fasteners until the collar is tight to the shaft, but can slide along it.
- Position the collar approximately midway on the shaft.
- 4. Place the gear on the shaft and push forward until the gear seats into the mount plate. This will set the collar location.
- 5. Pull the gear back off of the shaft and mark the location of the collar with a pencil or marker.
- 6. Remove the set collar fasteners. Apply Loctite 609 retaining compound to each.
- 7. Reinstall the set collar by aligning it to the location mark. Retighten the fasteners.

# 14.9 Replacing the Drive Assembly (Direct-Drive Models)

#### 14.9.1 Tools

☐ Socket wrench
☐ SAE socket set
☐ SAE open-end wrench set
☐ SAE hex key wrench set
☐ Anti-seizing compound
☐ Loctite 609 retaining compound
☐ Loctite 243 thread locker
☐ Silicone sealant

#### 14.9.2 Procedure

Always follow the proper shutdown procedure (Section 8.2 or 8.3) before performing any maintenance on the Rotofilter.

- Slide a new shaft seal onto the shaft and seat it into the rebate.
- 2. Install the black oxide set collar onto the shaft. See Section 14.11
- 3. Install the key stock into the key way.
- 4. Apply anti-seizing compound onto the shaft and slide the gear into place.
- Apply silicone sealant to gear mount washers that will be in contact with the inside enclosure. Apply anti-seizing compound to the gear mount bolts.
- Insert the bolts and washers through the enclosure and gear mount from inside of the enclosure.
- 7. Thread nylocs onto the bolts and tighten the bolts with a torque wrench.

# **A**CAUTION

Never reuse nyloc fasteners. Always replace used nylocs with new nylocs when performing maintenance.

- 8. Wipe off any excess anti-seizing compound from the area of the shaft protruding from the gear.
- Reinstall the stainless set collar approximately 0.08 centimeters (0.03 inches) from the gear.
   Apply Loctite 243 thread locker to the collar fasteners and tighten them.
- Apply anti-seizing compound to the motor bolts. Install the motor and thread in bolts and washers. Tighten the bolts with a torque wrench.
- 11. Install the 90-degree elbow and attach the electrical supply wires. Close the access plate. Reinstall the motor cover and hand-tighten the wing nuts.

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