HYDROTECH

Operation & Maintenance Manual

Discfilter HSF2600 series PFC

Type: 2F, 3F

Serial no: .....

Revised: 2015-08-26 EN

VEOLIA WATER
Solutions & Technologies

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APPENDICES

1. INTRODUCTION

This manual contains instructions for the operation of Hydrotech Discfilters in the HSF2600 series, types 2F and 3F (standing filter).

Pay attention to all warning symbols that appear in this manual. If this information is ignored it may result in serious personal injury and/or damage to equipment.

The manual must always be available to personnel that work with the equipment.

It is important that:

- The manual and other applicable documents must be kept for the entire duration of the equipment's lifespan. The manual and other relevant documents are included as part of the equipment.

  The following documents (manuals) are a part of the equipment:
  ▸ Reception & Installation Manual
  ▸ Operation & Maintenance Manual

- The manuals must be read carefully by all relevant personnel.

2. SAFETY INSTRUCTIONS

Hydrotech Discfilters in the HSF2600 series are designed for safe operation provided that they are installed correctly and used in accordance with the enclosed instructions. The equipment must be installed correctly and adapted in accordance with local regulations. The machine equipment is intended for use by multiple operators. You must read the applicable chapters in this manual prior to using the equipment or performing maintenance.

- Pay attention to all warning symbols that appear in this manual.
  If this information is ignored it may result in serious personal injury and/or damage to equipment.
- Assume all electrical equipment to be live.
- Consider all hoses and pipes to be pressurised.
- Before carrying out maintenance work, the main power switch (see Figure 2.3) must be turned to the OFF (0) position and locked with a padlock.
- Maintenance and service may only be performed by authorised personnel.

2.1 Warning symbols

Warning symbols are used in this manual to draw attention to potentially dangerous situations:

Information that warns you of a potential risk of personal injury and/or damage to equipment.

Figure 2.1

Warning labels (see Figure 2.1) are attached to the filter to warn personnel and act as a reminder to keep hands and fingers away from the filter's moving parts.

2.2 CE marking

This equipment is CE marked (see Figure 2.2), which guarantees that the equipment is designed, manufactured and described in accordance with the requirements set out in the EU Machinery Directive.

Figure 2.2

2.3 Conversion

The CE marking does not extend to any components that are not approved by Hydrotech AB and that are used in conversion/reconstruction of the equipment.

The warning symbols and CE marking must be attached in such a way that they are fully visible. If any part of the equipment with a warning symbol is replaced, a new symbol must be attached in the same position. Damaged symbols and CE markings must be replaced immediately.

2.4 Personnel requirements

In order to avoid personal injury and damage to the equipment, service and maintenance may only be carried out by personnel that have been trained to use the equipment and are conversant in local regulations. Service and maintenance personnel may only handle those parts of the equipment they have been trained for.

The operator may need to work inside the safety barrier and in the safety zone during maintenance and set-up before operation.

2.5 Emergency stop

The filter is equipped with an emergency stop and a main switch, see Figure 2.3.

In the event of a power outage, turn the main power switch to the OFF (0) position to prevent the filter drum from unintentionally starting when the power returns.

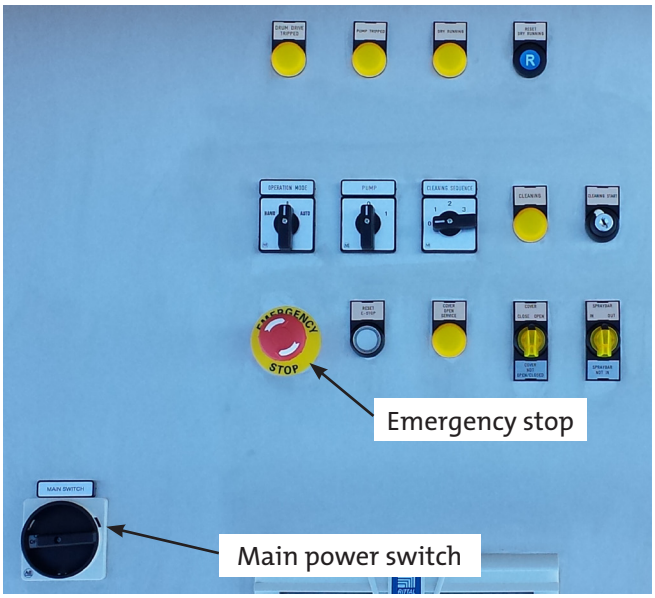


Figure 2.3 *Electrical cabinet, with emergency stop and safety circuit-breaker highlighted*

2.6 Electrical safety

Electrical installation must be carried out by a qualified electrician and in accordance with local regulations. Also see Appendix I.

The filter tank must be connected to earth, see section 6.4 in the "Reception & Installation Manual".

The main power switch/emergency switch must be fitted in accordance with applicable regulations.

2.7 Safety instructions

The filter is activated by turning the main power switch to the ON position (1), then selecting AUTO or HAND mode using the mode selector located on the front of the electrical cabinet. The filter stops if the mode selector is turned to the 0 (OFF) position.

NB See instructions in section 4.1.

Turn the main power switch to the OFF (0) position and lock it with a padlock before performing any work on the filter.

Access to the filter by unauthorised persons is strictly prohibited. Outdoor installations must be fenced in.

The filter can start rotating without warning if automatic control is activated. Moving parts must not be touched.

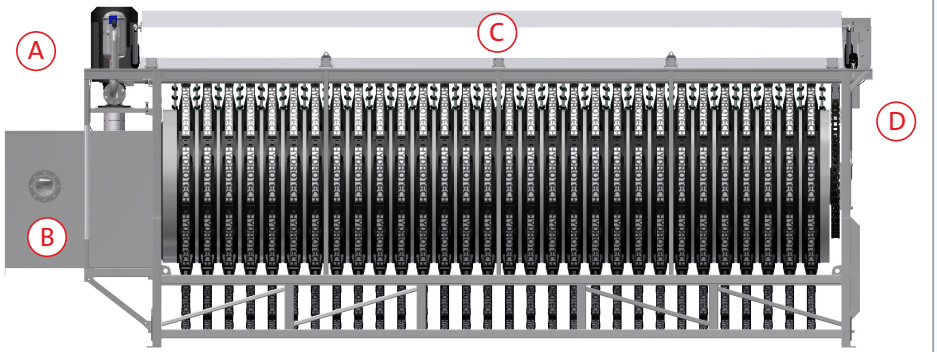
Safety guards are fitted around the power transmission. Make sure these are secured and correctly fitted.

The aerosols from the backwash water may contain harmful substances.

Measured noise levels from the filter are less than 74 dB(A). Personnel should use appropriate protection, when necessary, in accordance with local regulations.

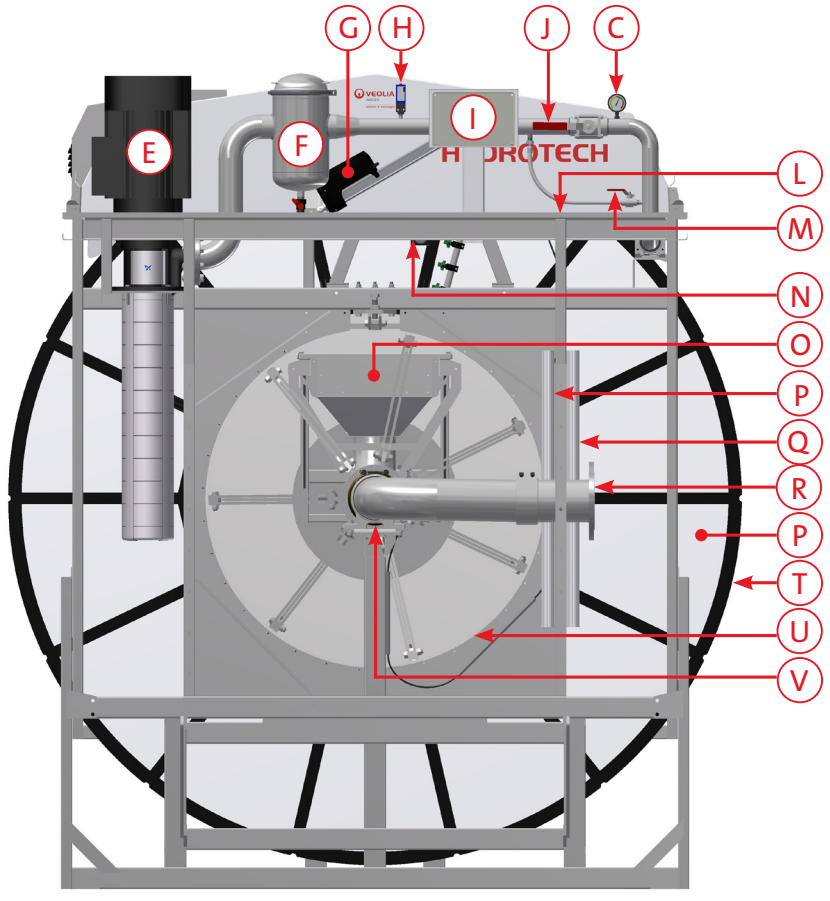
3. HYDROTECH DISCFILTER HSF2600 SERIES

3.1 Overview



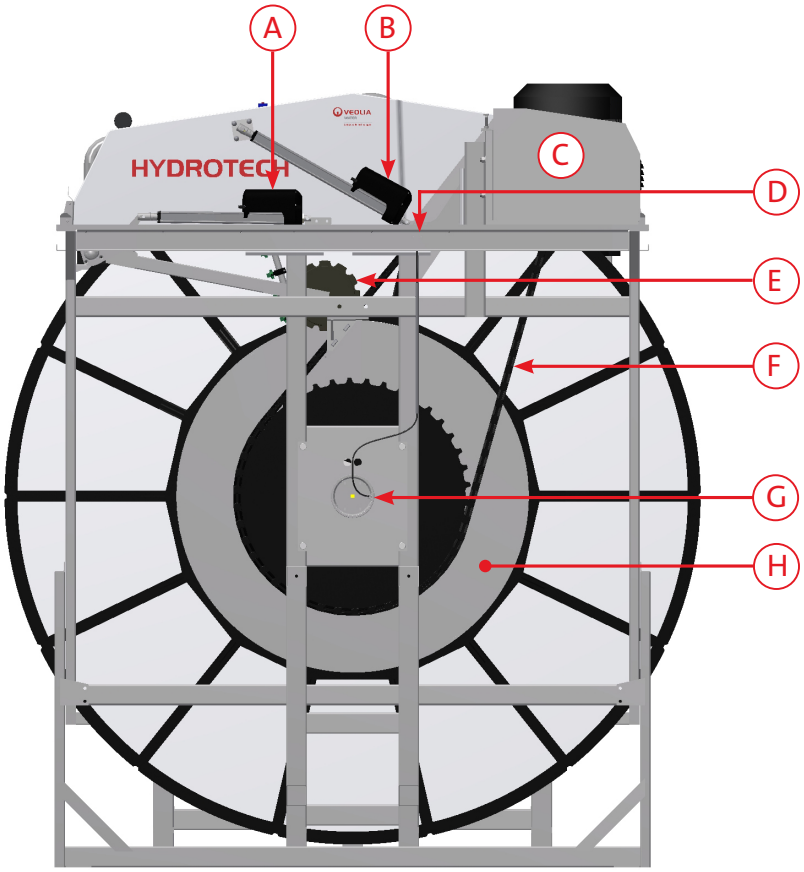
A. Inlet side
B. Inlet passage
C. Filter cover
D. Outlet side

Figure 3.1 *Hydrotech Discfilter in HSF2600 series type 1F (side view).*



E. Backwash pump (option)
F. Backwash water filter
G. Actuator for opening cover
H. Pressostat (protects pump from running dry) (option)
I. Electrical connection box
J. Shut-off valve, backwash pipe
K. Manometer
L. Lubrication point
M. Bypass valve for nozzle check
N. Connection, chemical cleaning
O. Sludge trough
P. Holder for level sensor, inlet water
Q. Holder for level sensor, outlet water
R. Sludge outlet
S. Filter panel
T. Filter segment
U. Drum
V. Drum bearing, inlet side

Figure 3.2 *Hydrotech Discfilter in HSF2600 series type 2F (from inlet side).*



A. Actuator for backwash system servicing

B. Actuator for opening cover

C. Drive unit

D. Lubrication point

E. Backwash pipe drive

F. Drive chain

G. Drum bearing, outlet side

H. Drum

Figure 3.3 *Hydrotech Discfilter in HSF2600 series type 2F (from inlet side).*

Two drum lifters are supplied unassembled for each installation, see Figure 3.4. These are only used when servicing drum bearings. The supplier should be contacted when servicing bearings.

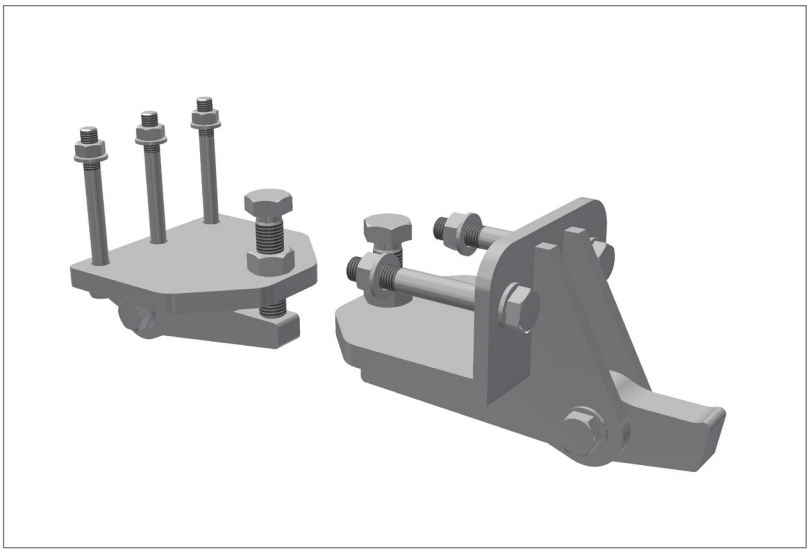


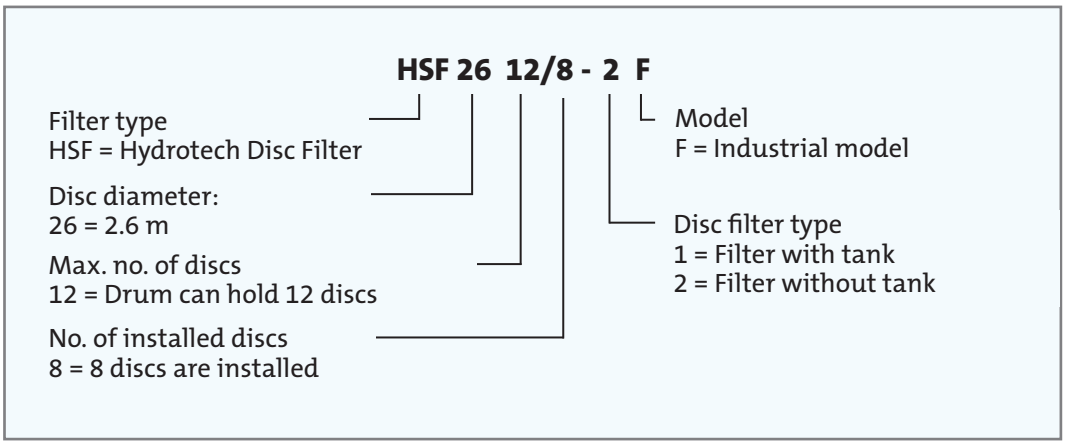
Figure 3.4 *Drum lifter.*

3.2 Identifying the filter

The filter type, serial number and year of manufacture are stated on the identification plate. The filter type and serial number are also stated on the front of this manual.

Figure 3.5 *Filter marking plate*

Definition of filter designation:



4. START UP AND OPERATION

4.1 Check procedures during start-up

1. Check that the drive unit cover is installed correctly.
2. Set the pump switch to the 0 (OFF) position, see Figure 4.1.
3. Set the main power switch to the 1 (ON) position.
4. Set the mode selector to HAND mode.
5. Open the water supply partially so that water slowly flows into the filter drum. Make sure that the difference in water level between the inside and outside of the filter drum does not exceed 450 mm (see section 4.2.1). If the filter cover becomes clogged, it may be necessary to fill the filter tank with water from an external source or to remove a filter panel and allow unfiltered water to fill the filter tank.

A difference in water level between the inside and outside of the filter drum greater than 450 mm will damage the filter.

6. When the water level inside the filter tank is above the pump suction pipe (or the pump if a CRK or MTR pump is installed), the pump must be started by turning the pump switch to the 1 (ON) position.
   NOTE Also read section 2.7 (Safety instructions).

The backwash pump must not be started until the water level has reached the suction pipe (or pump if a CRK or MTR pump is installed), otherwise the pump will run dry and fail.

7. If the water level inside the filter tank reaches the overflow wall, set the mode selector to the AUTO position (see section 4.2).
8. Fully open the water supply.

The filter is now run in the mode for automatic level control. It may be necessary to adjust the level sensor so that the filter can be run optimally.

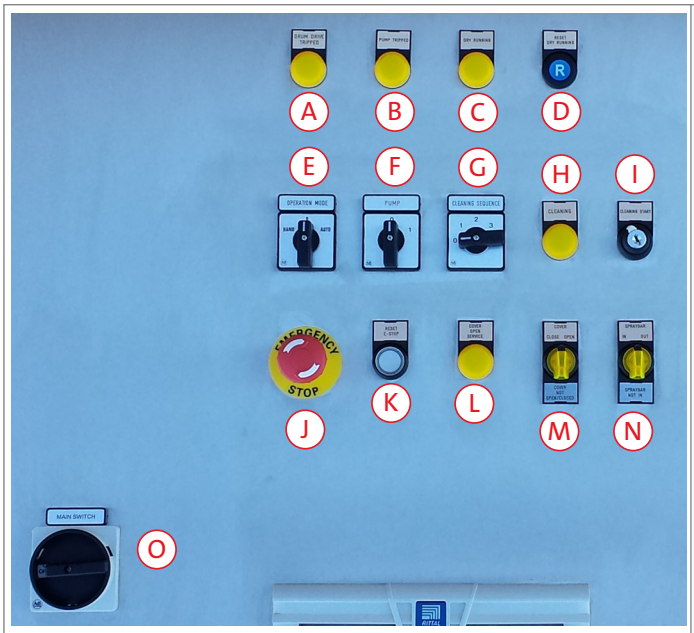
4.2 Automatic settings

The control system for the HSF2600 series must always be equipped with a frequency converter for the drive unit. This is factory calibrated if delivered from Hydrotech. To perform a soft start of the drive motor, the frequency converter settings must be min. 5 sec “ramp up” and min. 3 sec "ramp down". The filter works with 50 Hz as standard.

If the filter is equipped with Hydrotech’s control system, the filter has two operation modes:

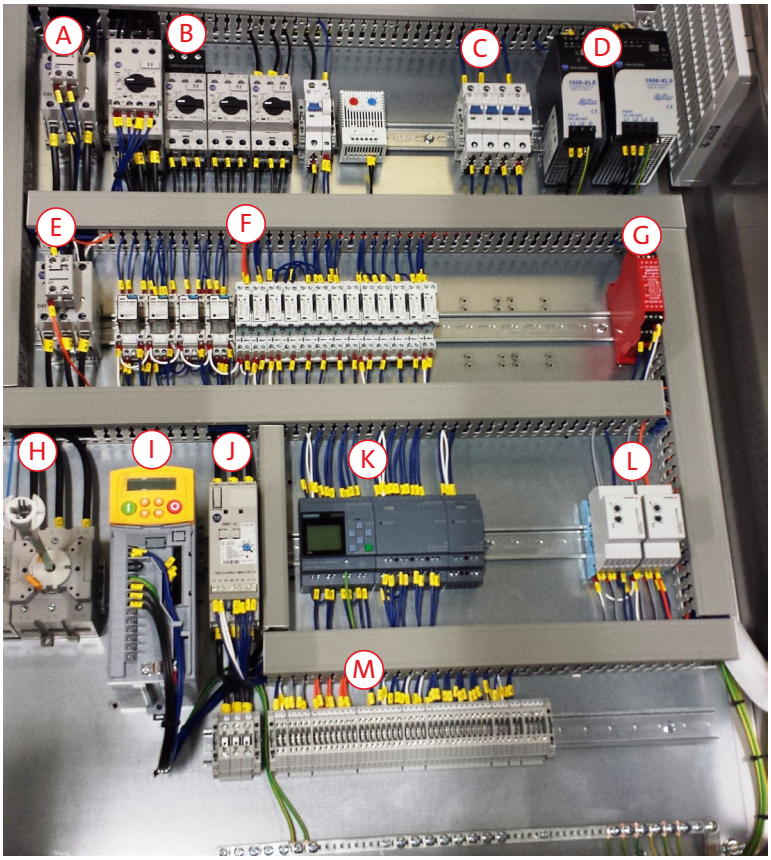
1. Continuous rotation (HAND mode)
2. Automatic level control (AUTO mode).

Turn the mode selector to select the operating mode.



A. DRUM DRIVE TRIPPED. Lamp that indicates when the frequency converter has tripped.
B. PUMP TRIPPED. Lamp that indicates when the backwash water pump’s motor protection device has tripped.
C. DRY RUNNING. Lamp that indicates when the dry running protection device for the backwash water pump has tripped.
D. RESET DRY RUNNING. Resetting the backwash water pump’s dry running protection.
E. OPERATION MODE. Mode selector
F. PUMP. Pump switch.
G. CLEANING SEQUENCE. Selector for number of sequences, chemical cleaning.
H. CLEANING. Lamp that indicates when the chemical wash is in progress.
I. CLEANING START. Chemical wash switch, key operated.
J. EMERGENCY STOP. Emergency stop.
K. RESET E-STOP. Resetting the emergency stop.
L. COVER OPEN SERVICE. Lamp that indicates when the cover is open so that the backwash ramp can be extended.
M. COVER NOT OPEN/CLOSED. Switch for operating the cover. Lamp that indicates when the cover is not fully opened nor fully closed.
N. SPRAYBAR NOT IN. Switch for operating the backwash ramp. Lamp that indicates when the backwash pipe is not retracted.
O. MAIN SWITCH. Main power switch.

Figure 4.1 *Front side of electrical cabinet.*



A. Contactor
B. Fuses
C. Fuses
D. Mains supply
E. Contactor
F. Relays
G. Emergency stop relay
H. Main power switch
I. Frequency converter
J. Soft start pump
K. Logic module
L. Level relays
M. Terminal blocks

Figure 4.2 *Component parts of the Hydrotech electrical cabinet.*

4.2.1 Level differences

The maximum permitted difference between the water levels inside and outside the drum is 250 mm during normal operation (see Figure 4.3). The recommended level difference is 100-200 mm.

If an even flow after the filter is required, the filter must be run with a small level difference.

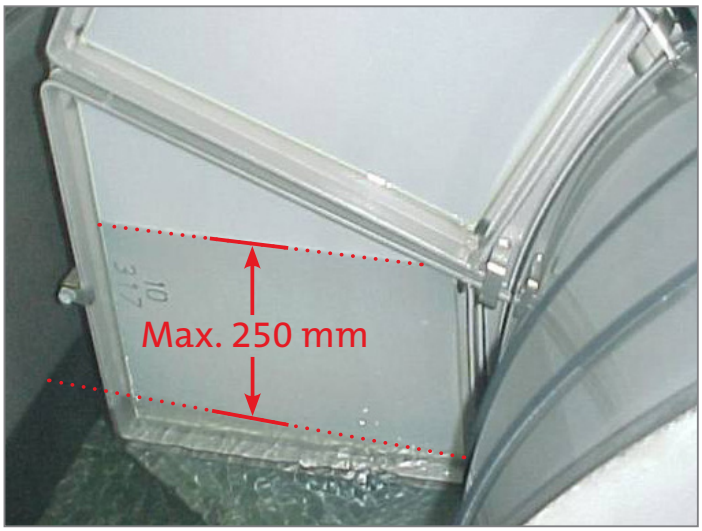


Figure 4.3 *Maximum permitted level difference during level-controlled operation.*

The filter must be installed so that the level difference in the event of operating disturbances under no circumstances exceeds 450 mm.

The filter shall be operated so that the level difference during normal operation does not exceed 250mm.

Prolonged operation with a greater level difference will significantly shorten the life of the filter panels and other vital parts.

4.2.2 Operating mode HAND – Continuous rotation/backwash

Operation with continuous drum rotation and backwash. In this mode, the water level inside the drum is kept virtually constant.

The level sensor and the automatic level control are disabled when the HAND operating mode is selected.

4.2.3 Operating mode AUTO – Automatic level control

With automatic level control enabled, drum rotation and the backwash pump are activated when the water level inside the drum reaches the level sensor. If an external wash water supply is used, the level sensor can control a solenoid valve instead of a pump.

The water level inside the drum will vary when AUTO mode has been selected. The water level is at its lowest immediately after a backwash cycle and then rises until it reaches the level sensor.

Opening the cover in AUTO mode deactivates drum rotation and backwashing.

4.2.4 Adjusting the level sensor

NB Prior to servicing, read section 2.7.

Place the level sensor 50–100 mm below the overflow wall. Optimal placement depends on the turbulence of the water surface.

Figure 4.4 *Adjusting the level sensor*

4.2.5 Setting of level relay

NB Prior to servicing, read section 2.7.

The sensitivity of the level sensor can be set from MIN to MAX on the level relay's upper adjusting screw.

The lower adjusting screw must always point to the side marked EMPTY, on this side there are three different sensitivity ranges, H, S and L. If appropriate sensitivity cannot be set using the selected sensitivity range, another sensitivity range can be chosen.

4.3 Backwash system

NB Prior to servicing, read section 2.7.

The system pressure for backwashing must be set to 7-9 bar.

Newly connected pipe systems for external wash water should be flushed before they are connected to the filter. Thoroughly check that the nozzles are not blocked, see section 6.3.

5. FUNCTION

5.1 Intended use

The filter is designed and manufactured to remove solid particles in unpressurised water flow systems. The filter is not a pressure vessel.

5.2 Non-intended use

Unless approved in writing by Hydrotech, the filter must not be used to filter liquids other than water. The filter must not be installed in an environment with an explosive atmosphere or another risk of explosion, such as high concentrations of dust.

5.3 Filtration and backwash process

A brief description of the process is given below.

1. The water to be filtered flows with gravity from the inside of the filter drum out to the filter segments.
2. Solid particles are separated from the water using a filter medium attached to both sides of the filter segments, whilst clean water passes through the filter medium to the outside of the filter segment.

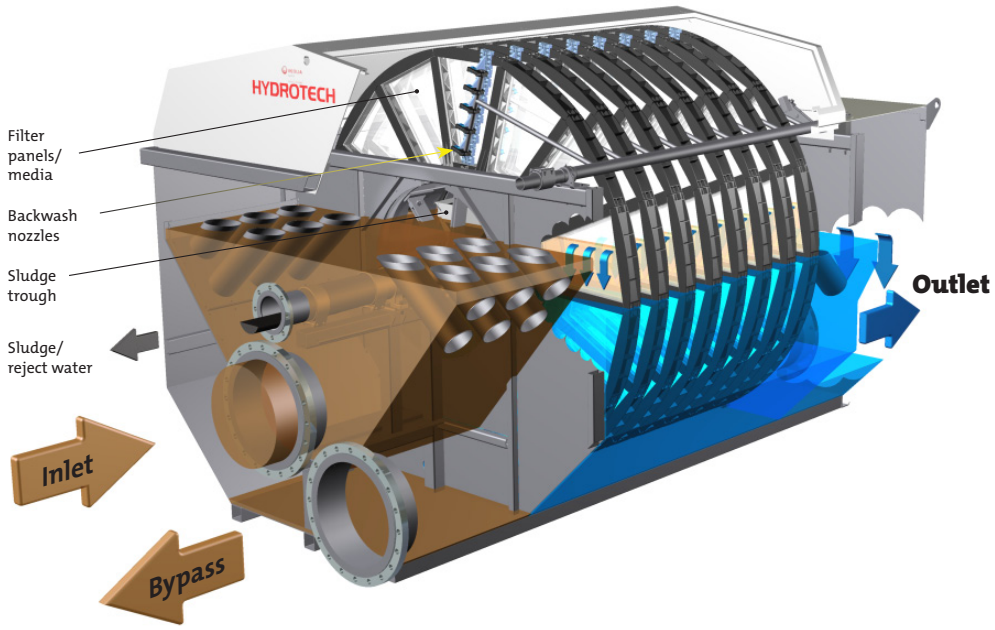


Figure 5.1 *Disc filter function.*

3. **Operating mode AUTO** – The solid particles that accumulate on the inside of the filter medium gradually reduce the water flow through the filter panel. The water level on the inside of the drum begins to rise. When the water reaches the level sensor, drum rotation and backwashing is started. **Operating mode REMOTE** – The filter is controlled as in AUTO operating mode or with an external control (e.g. time-controlled drum rotation and back-washing). **Service HAND** – Drum rotation and backwashing are started manually.
4. The backwash nozzles spray wash water on the outside of the filter panels. The solid particles that accumulate are washed from the filter panels to the sludge channel, at the same time as the drum rotates.
5. The removed particles and backwash water flow with gravity out of the filter.

6. MAINTENANCE/SERVICE

This chapter describes how maintenance and servicing is to be carried out. Chapter 7 describes how often the various components require servicing.

6.1 Filter cover

NB Prior to servicing, read section 2.7.

The filter cover for the Hydrotech Discfilter HSF2600 series is controlled from the electrical cabinet and can be opened in two directions depending on which side of the filter needs to be accessed.

6.1.1 Hinge

Before the filter cover is operated from the operator panel, its hinge must be locked on the correct side. The locking pin (A) must lock the hinge lock (B) securely as shown in Figure 6.1a below.

Make sure that the filter cover is completely closed and that the hinge lock (B) shown in Figure 6.1a surrounds the shaft (C) in Figure 6.1b.

The locking pin (A) and the hinge lock (B) must ALWAYS sit on the two outermost hinges (E), as shown in Figure 6.2 or on the opposite side depending on which direction you want the cover to open in.

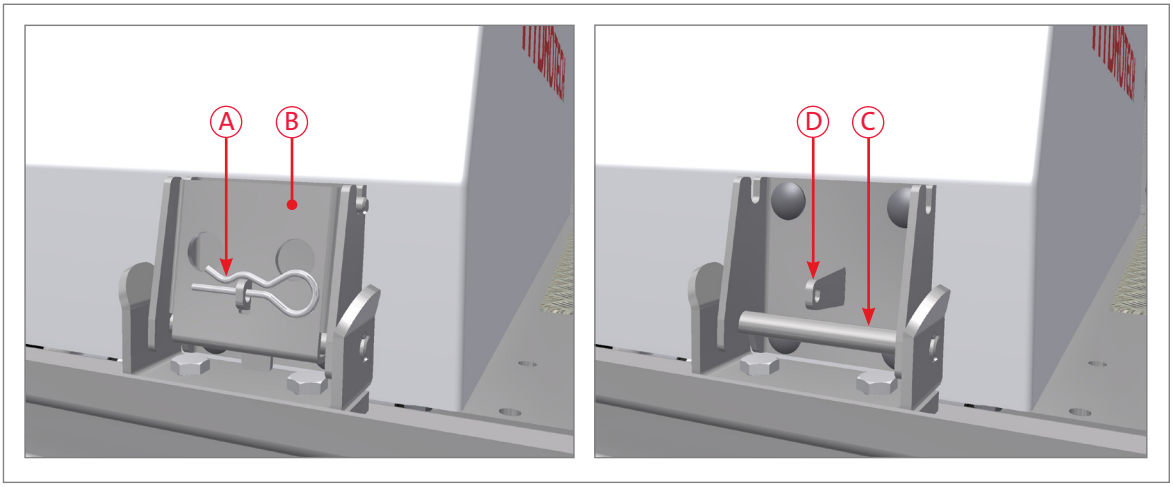


Figure 6.1 ***a*** *Locked hinge* ***b*** *Open hinge*

In order to access the backwash pipe, the hinges must be locked (E in Figure 6.2) on the side of the cover on which the drive unit (F) sits (see Figure 6.2), and the hinges must be open (see Figure 6.1b) on the opposite side, i.e. the backwash pipe side.

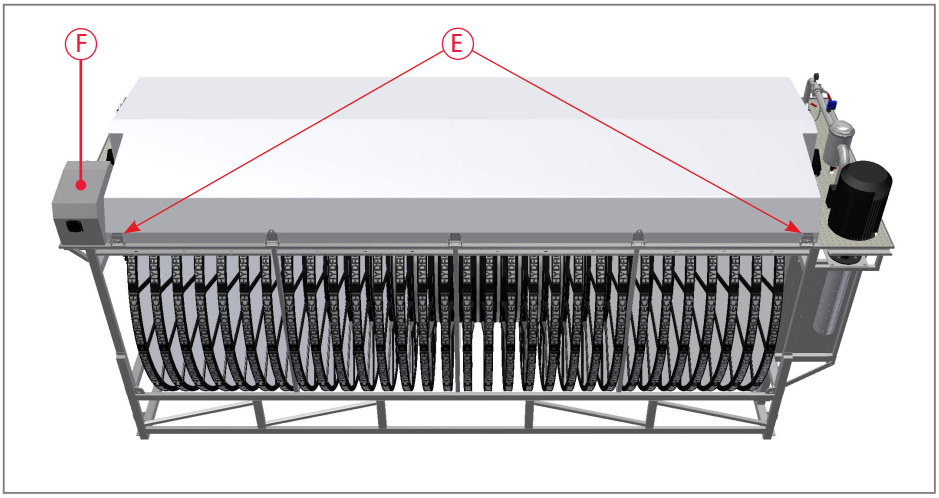


Figure 6.2 *Shows the location of the lockable hinges and the drive unit.*

6.1.2 Operating the filter cover

1. The filter cover is opened by turning the cover switch to the OPEN position, see Figure 6.3.
2. When the cover is opened in AUTO operating mode, drum rotation and backwashing are activated. In the HAND operating mode the drum rotates.
3. The filter cover is closed by turning the cover switch to the CLOSE position.

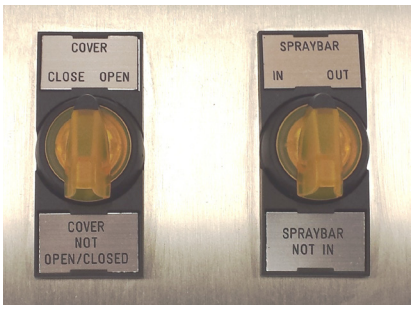


Figure 6.3 *Switch for operating the cover and backwash pipe*

NB The indicator lamp "COVER NOT OPEN/CLOSED" will illuminate when the cover is not fully opened nor fully closed.

Check that the hinges are fully locked before opening the filter cover, see section 6.1.1 "Hinges".

6.2 Operating the backwash pipe

NB Prior to servicing, read section 2.7.

1. First open the cover fully on the backwash pipe side, see section 6.1 2, the "COVER OPEN SERVICE" lamp will light up when the cover is fully open.
2. Extend the backwash pipe by turning the backwash pipe switch to the OUT position, see Figure 6.3.
3. The backwash pipe is retracted by turning the backwash pipe switch to the IN position.

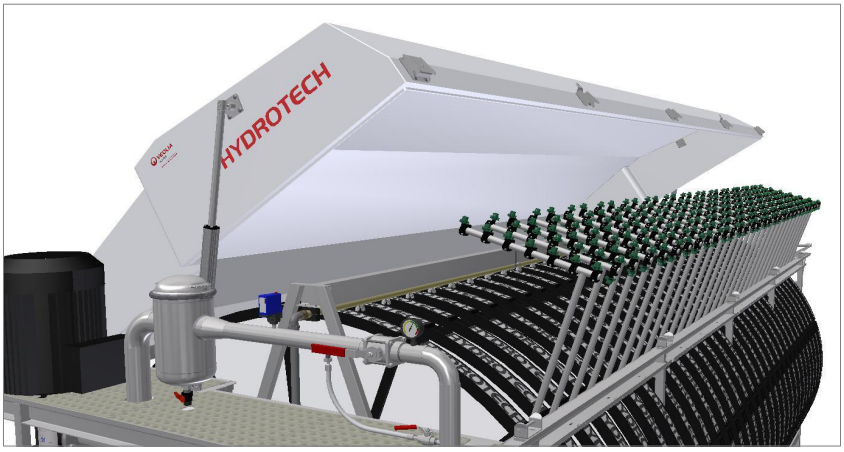


Figure 6.4 *Filter cover open and backwash pipe extended.*

4. Close the cover, see section 6.1 2.

NB The indicator lamp "SPRAYBAR NOT IN" must be off to be able to operate the cover.

6.3 Backwash system

NB Prior to servicing, read section 2.7.

The most common cause of disruption in the backwash system is nozzle clogging. Clogging is caused by particles in the wash water and/or by e.g. biological fouling in the pipe system.

6.3.1 Servicing nozzles

1. Turn the mode selector to AUTO position.
2. Turn the pump switch to 0 (OFF).
3. Open the cover on the the backwash pipe side and extend the backwash pipe as described in sections 6.1 and 6.2.
4. Open the bypass valve (B) and close the main valve (A), see Figure 6.5.

Maintain a safe distance from the filter whilst the drum is rotating.

5. Start drum rotation by turning the mode selector to the HAND position.
6. Start the pump by turning the pump switch to 1 (ON).

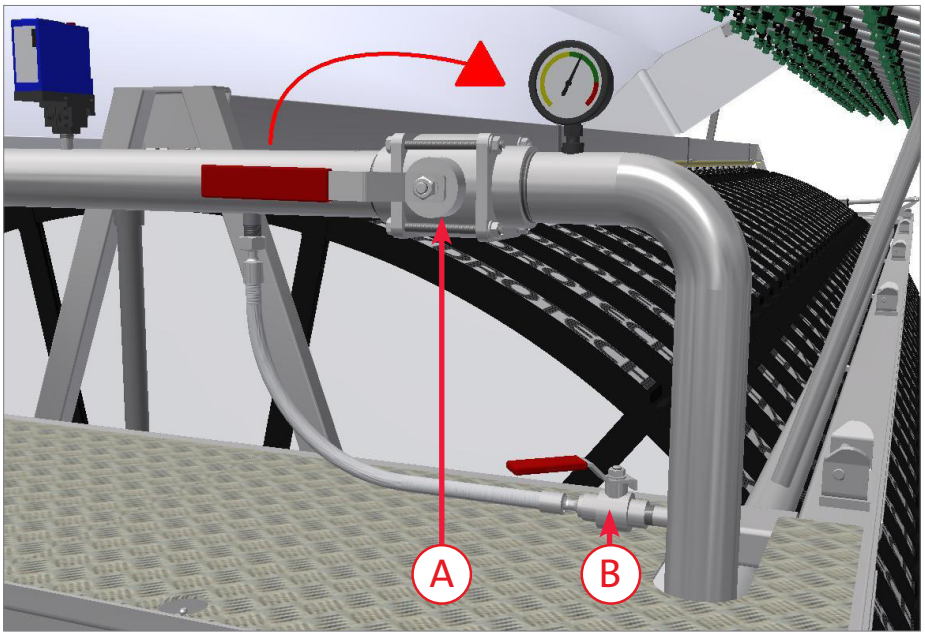


Figure 6.5 *Main valve A and bypass valve B.*

7. Adjust the backwash water flow using the bypass valve so that there is a small but constant flow through the nozzles. This makes it easy to identify which nozzles need to be cleaned.
8. Check for clogged nozzles by comparing the water jets.

The operating time in this mode must be minimised in order to not risk the pump overheating.

9. Fully or partially clogged nozzles must be cleaned.

Figure 6.6 *Hydrotech backwash nozzles.*

10. Remove the nozzle nut by turning it a ¼ turn anticlockwise. Do not lose the rubber seal!
11. Clean the nozzle using compressed air or a plastic brush. **Never** use a steel brush or metal pins as these may damage the nozzle.
12. Fit the nozzle in reverse order. Check that the nut has reached the stop position once it has been tightened a ¼ turn clockwise.
13. Turn the mode selector to the AUTO position.
14. Open the backwash water main valve and close the bypass valve.
15. Reset the backwash pipe to operating mode.
16. Close the filter cover
17. Start operation again as described in section 4.1.

6.4 Backwash pipe position

NB Prior to servicing, read section 2.7.

6.4.1 Checking backwash pipe position

1. Turn the pump switch to the 0 position.
2. Open the cover.
3. Start drum rotation by turning the mode selector to HAND.
   Maintain a safe distance from the filter whilst the drum is rotating.
4. When the drum rotates, the backwash pipe moves slowly. Stop drum rotation when the backwash pipe is in its **lowest** position.

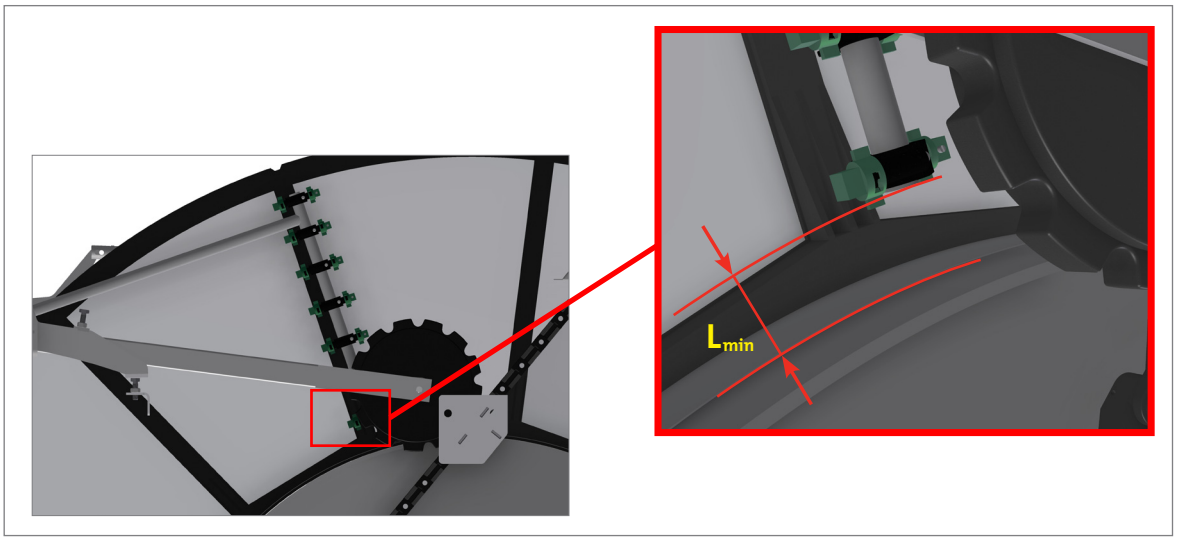


Figure 6.7 *Lowest position of backwash pipe during operation.*

5. Check that the distance Lmin is not less than 55 mm, see Figure 6.7.
   If the distance Lmin is less than 55 mm, the equipment may suffer serious damage.
6. If necessary, adjust the backwash pipe safety stop in accordance with section 6.4.2.
7. Adjust the backwash pipe safety stop in accordance with section 6.4.2.
8. Close the filter cover.
9. Start operation again as described in section 4.1.

6.4.2 Adjusting backwash pipe position

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Undo the nut (B), see Figure 6.8.
3. Adjust the position of the backwash pipe using the screw (A).

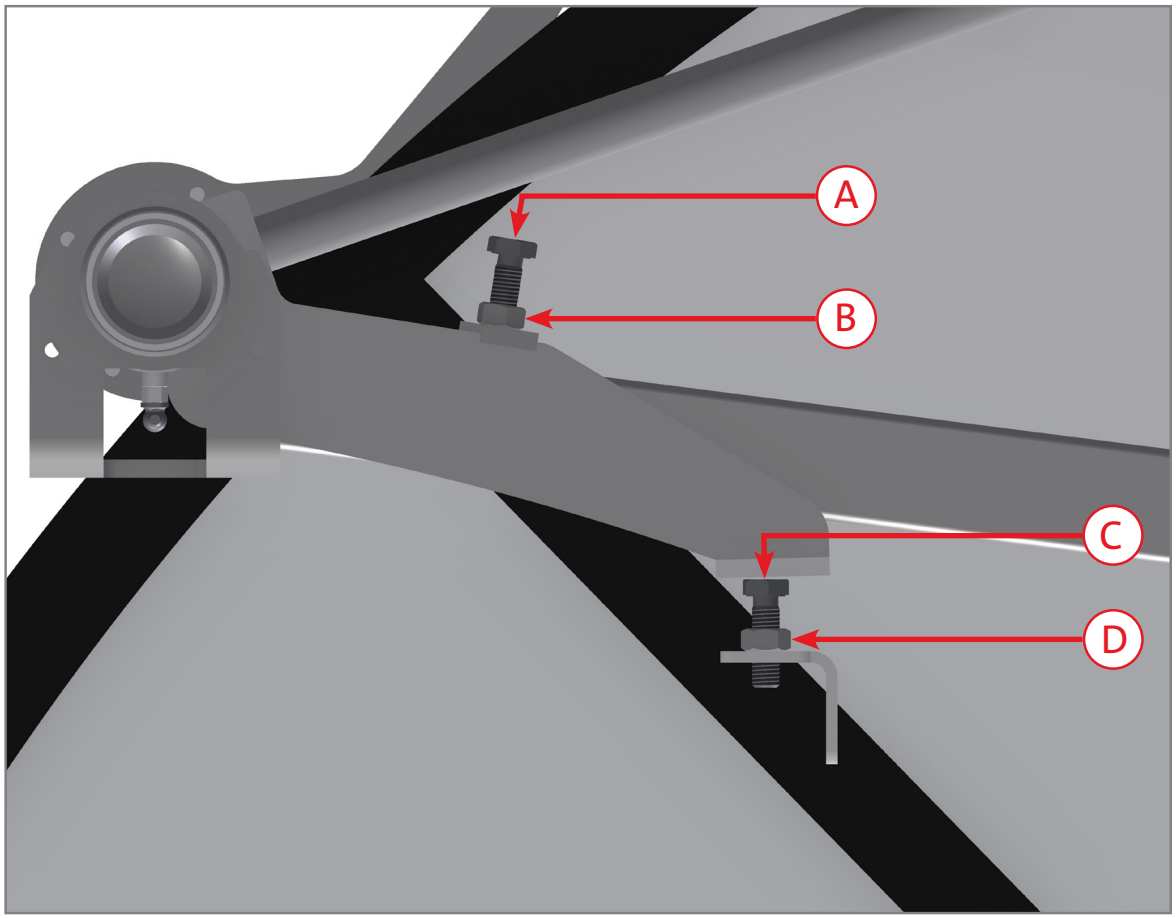


Figure 6.8 *Screw and nut for adjustment of rinse header position and rinse header safety stop*

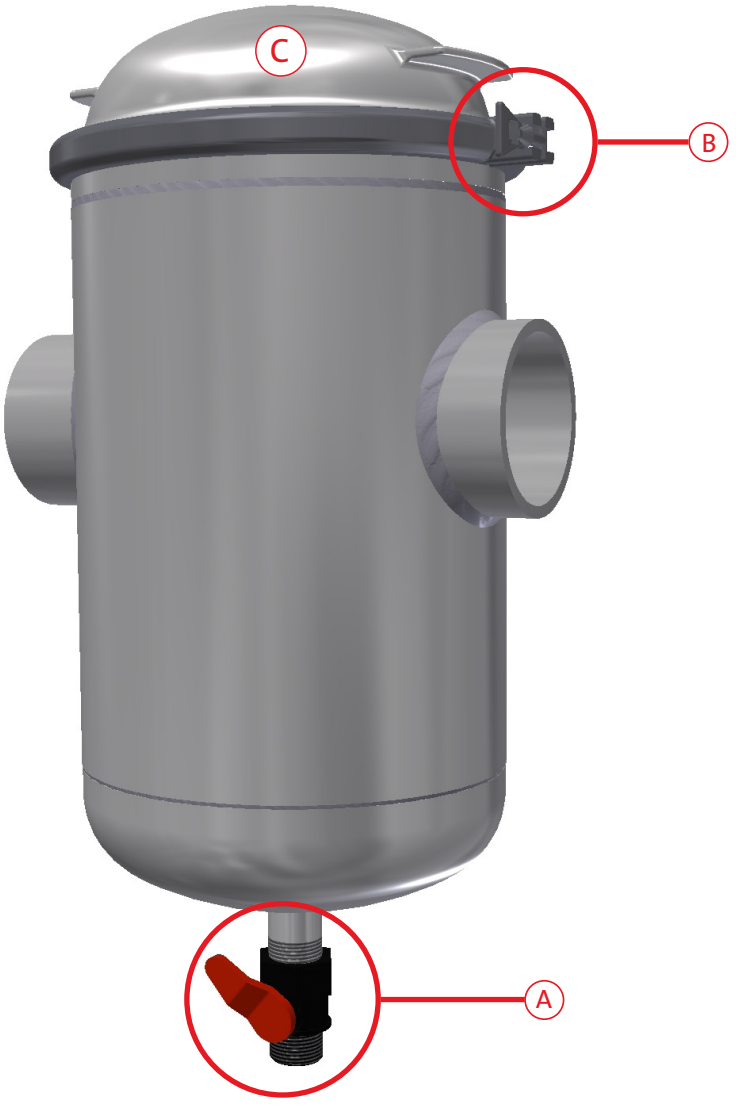
4. Secure the screw (A) using the nut (B).
5. Check backwash pipe position as described in section 6.4.1.
6. Adjust the rinse header safety stop in the corresponding way using the screw (C) and nut (D). The screw must be set so that the distance L in Figure 6.7 cannot, under any circumstances, be less than 55 mm.
7. Close the filter cover
8. Start operation again as described in section 4.1.

6.5 Cleaning the wash water filter

NB Prior to servicing, read section 2.7.

If the pressure gauge indicates a pressure that is more than 0.5 bar below normal pressure, it's time to clean the wash water filter.

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Drain the wash water filter by opening the valve (A), see Figure 6.9.
3. Loosen the wing nut (B) and remove the clamp ring.
4. Lift off the backwash water filter cover (C).
5. Pull up and clean the filter insert.
6. Place the filter insert in the cover.
7. Refit the cover/filter insert and the clamping ring.
8. Close the drain valve (A).
9. Start operation in accordance with section 4.1.



A. Drainage

B. Wing nuts

C. Cover

Figure 6.9 *Hydrotech wash water filter.*

6.6 Bearings

NB Prior to servicing, read section 2.7.

6.6.1 Lubrication of swivel

The swivel, the backwash pipe bearing, is located under the cover and connects the piping with the backwash pipe, see Figure 6.10.

When lubricating the swivel, the instructions below must be followed:

1. Turn the mode selector to "HAND" and lift the filter cover on the backwash pipe side, see section 6.1.
2. Turn the main power switch to the OFF (0) position and lock with a padlock.
3. Lubricate the swivel using the recommended grease (see chapter 7).

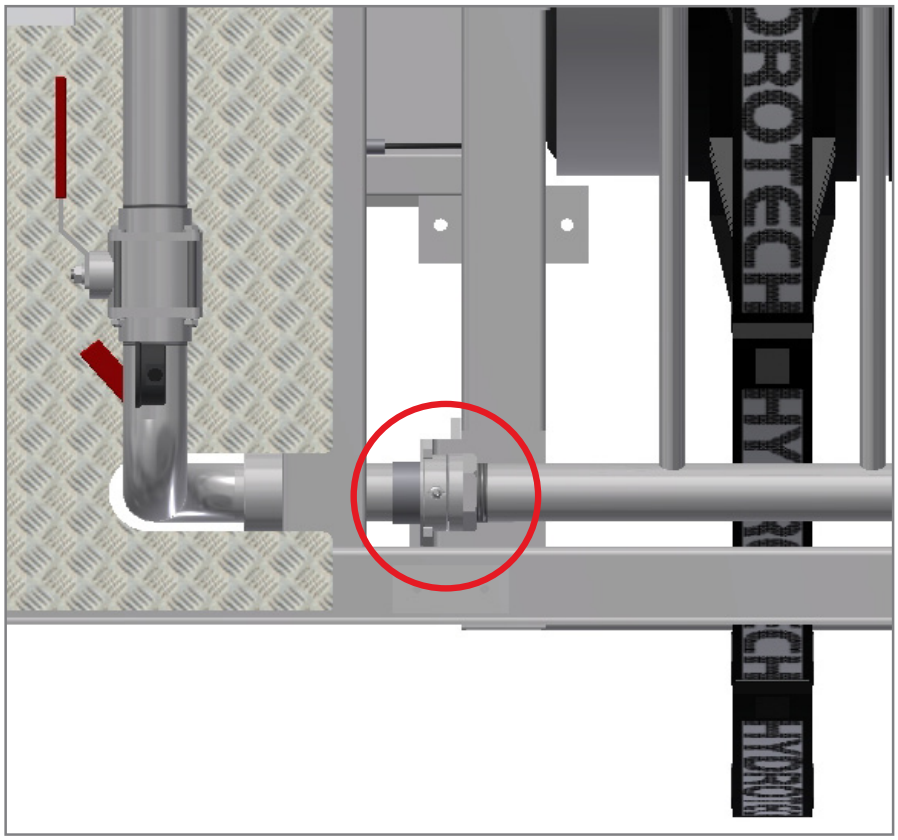


Figure 6.10 *Swivel.*

4. Close the filter cover.
5. Start operation in accordance with section 4.1.

6.6.2 Lubricating drum bearings

The bearings' lubrication nipples are fitted on the outside of the filter. Decals indicating the lubrication points are attached to the filter, see Figure 6.11. The lubrication points are also marked in Figure 3.2 and 3.3.

The drum must be rotating when the bearings are lubricated.

Lubricate the bearings using the recommended grease (see chapter 7).

Figure 6.11

6.6.3 Checking drum bearing wear

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Drain the filter basin.
3. Check the drum bearings for wear. If the distance between the bearing housing (A) and the shaft (B) is less than 29 mm (see Figure 6.12), the drum bearing must be replaced.
4. Contact your supplier if the drum bearing needs to be replaced.
5. Start operations again as set out in section 4.1.

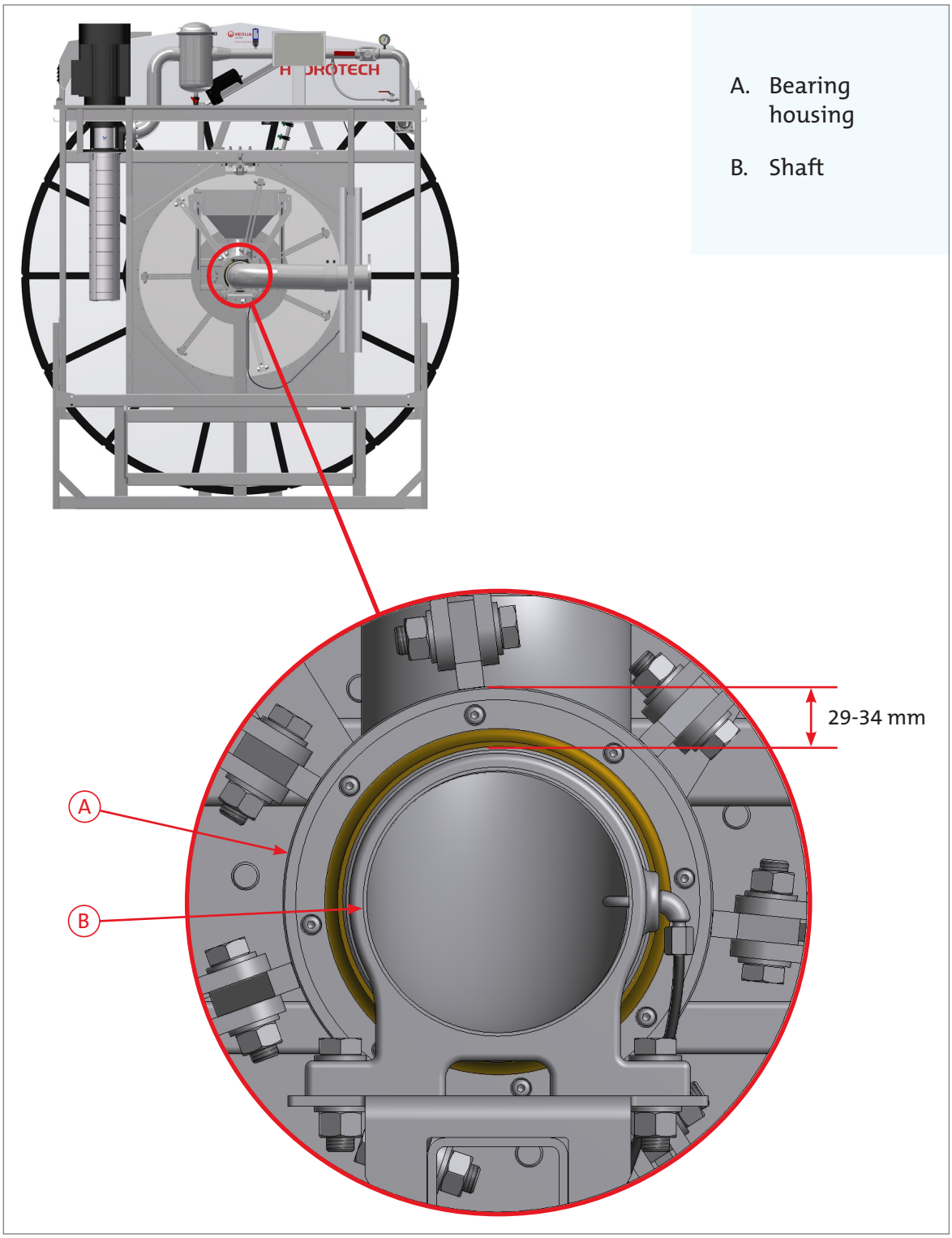


Figure 6.12 *Drum bearing on inlet side.*

6.7 Filter panels

NB Prior to servicing, read section 2.7.

6.7.1 High pressure cleaning

It may be necessary to manually clean the filter panels. It may be obvious that manual cleaning is required as automatic backwashing starts on a more frequent basis. Manual cleaning can be done using a high pressure washer.

When using a high pressure washer a wash pressure of max. 80 bar may be used. Never hold the cleaning nozzle directly against the filter media.

An automatic high pressure washer, controlled from the operator panel, is available as an optional extra. Contact your Hydrotech reseller.

6.7.2 Chemical cleaning of filter panels

Long-term clogging of the filter media can be caused by, among other things, iron, calcium or organic fouling. This clogging can normally be removed through chemical cleaning. Three proven products that do not affect the life of the filter media are dilute hydrochloric acid (HCl), dilute sodium hypochlorite (NaClO) and dilute sodium hydroxide (NaOH).

The use of other types of cleaning agents may cause damage to equipment.

The cleaning products must not be mixed. If HCl and NaClO mix, toxic chlorine gas forms. HCl and NaOH are highly corrosive. For safety advice, see applicable local regulations.

For more detailed instructions, please contact your supplier.

Hydrotech Discfilter HSF2600 is equipped with a chemical ramp to enable cleaning of long-term clogging of the filter panels.

The dosing equipment (option) must be connected to the chemical ramp connector, see Figure 6.13. The control system is prepared and programmed for connection of a dosage system. After completing electrical and mechanical installation, chemical cleaning is started as follows:

1. Set the mode selector to AUTO and the pump switch to 1 (ON).
2. Set the number of cleaning sequences with the CLEANING SEQUENCE selector.
3. Start chemical cleaning with the CLEANING START switch.

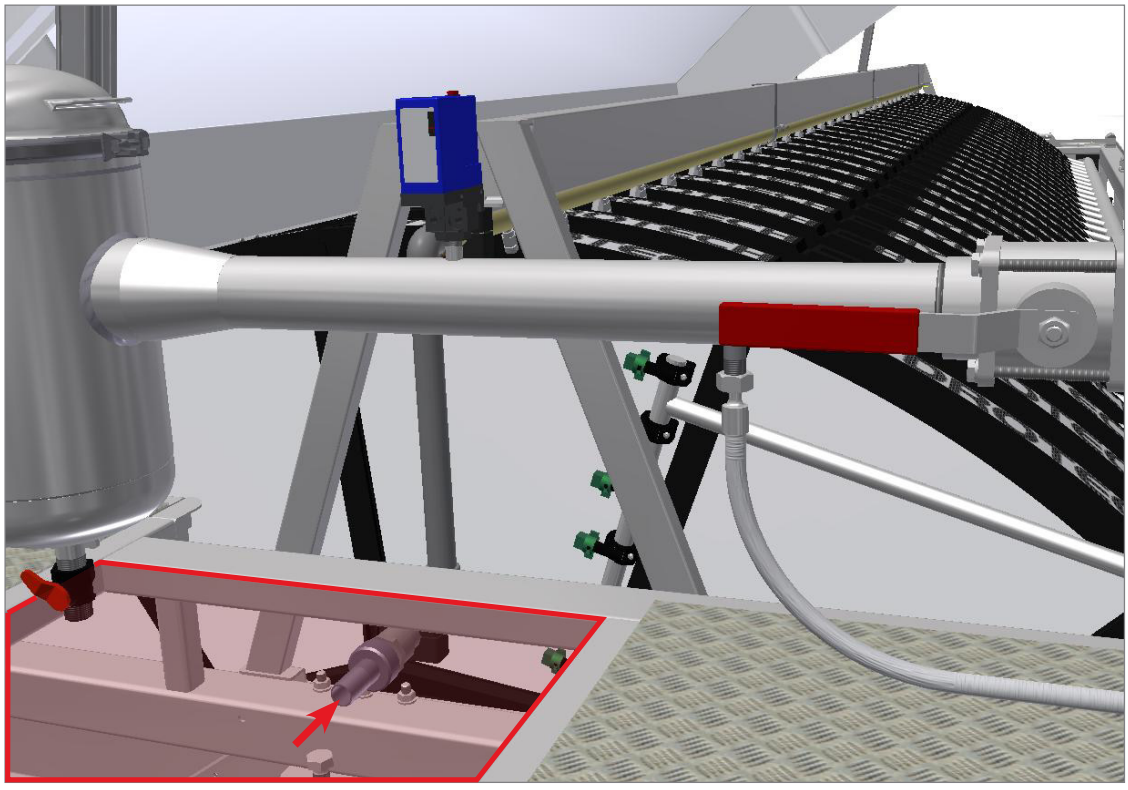


Figure 6.13 *A floor plate must be lifted to access the connection to the chemical ramp.*

Once cleaning is completed the filter automatically returns to normal operation in AUTO mode.

If necessary clean the chemical ramp nozzles as described below:

1. Remove the nozzle by turning it ¼ turn anticlockwise.
2. Clean the nozzle with compressed air or a plastic brush. Never use a wire brush, metal pins or similar as these can damage the nozzle.
3. Refit the nozzle.

Figure 6.14 *Nozzles on chemical ramp.*

6.7.3 Changing filter panels

It is important to maintain the balance of the drum when changing filter panels. Remove/refit every other filter panel. This prevents unintentional rotation of the drum and reduces the load on the drive chain and gearbox.

NEVER remove or re-fit all filter panels on just ONE side of the disc, see Figure 6.15.

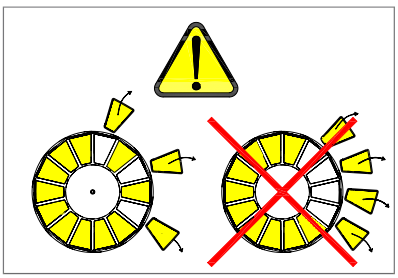


Figure 6.15 *Correct way of changing filter panels.*

1. Open the filter cover.
2. Turn the main power switch to the OFF (0) position and lock it with a padlock.
3. Undo the filter segment cover screw and remove the cover, see Figure 6.16.
4. Pull out the filter panel.
5. Insert a new filter panel and press in until it touches the bottom.
   The filter panels with steel frames MUST be installed with the filter medium inwards and the frame outwards as shown in Figure 6.17.
6. Re-fit the filter segment cover (see Figure 6.16) and tighten the screw.
   Maximum tightening torque: 3 Nm.
7. Close the filter cover.
8. Start operation again as described in section 4.1.

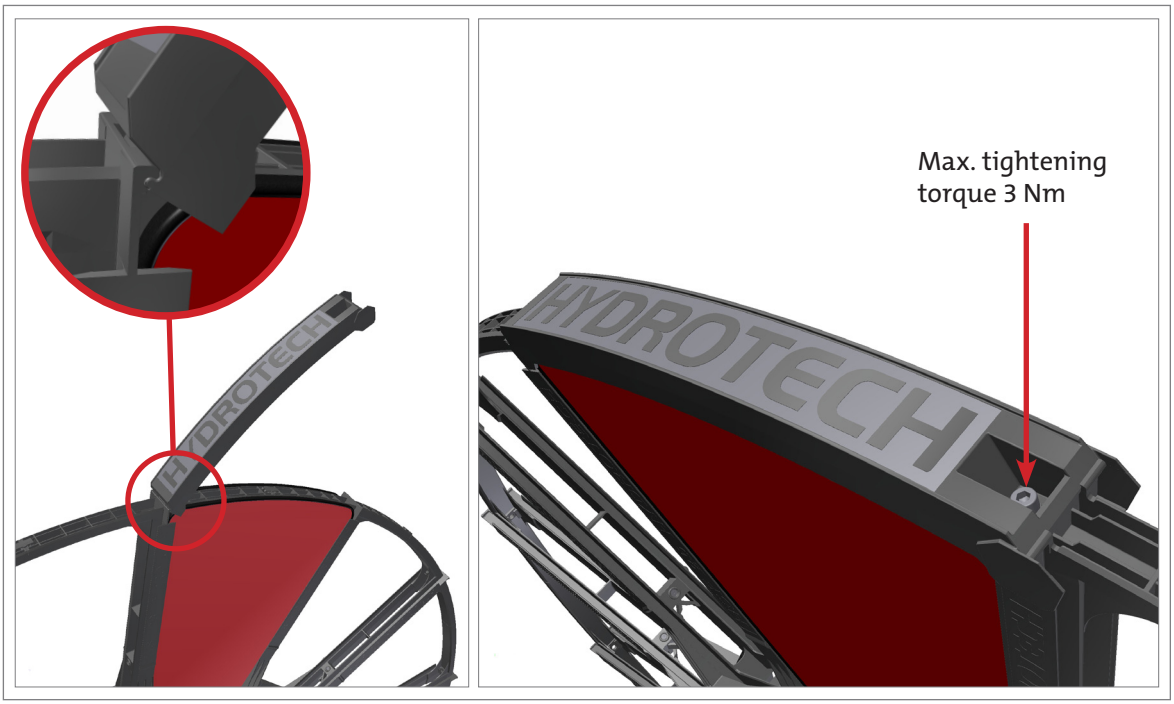


Figure 6.16 *Installation of filter segment cover.*

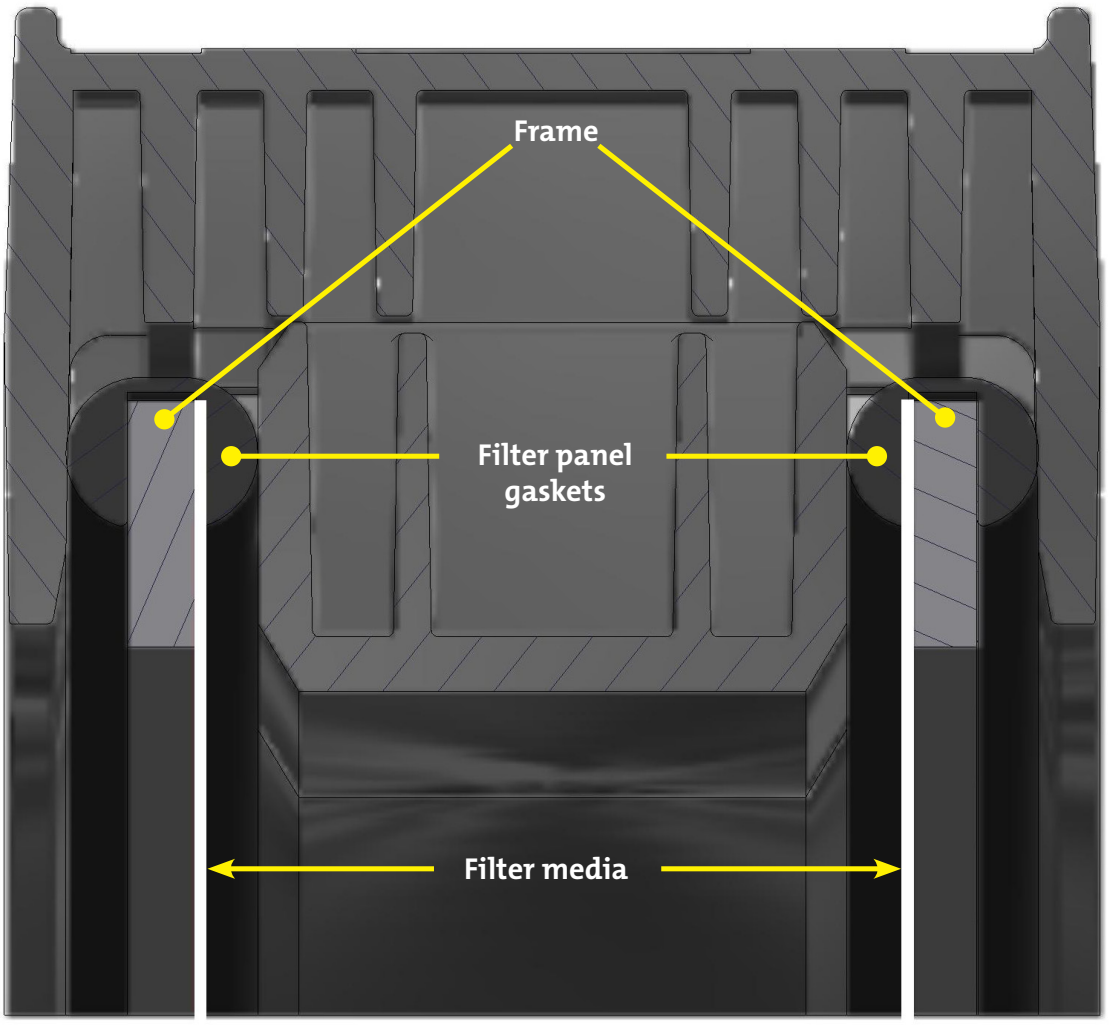


Figure 6.17 *Location of filter panels.*

6.8 Drive chain

NB Prior to servicing, read section 2.7.

The filter is equipped with a chain drive. For technical data, see Appendices A and D.

6.8.1 Checking the drive chain

1. Turn the mode selector to the OFF (0) position and lift the filter cover on the same side as the drive unit, see section 6.1.
2. Turn the main power switch to the OFF (0) position and lock it with a padlock.
3. Turn the drum by hand in the direction of rotation in order to stretch the chain.
4. Check the tension of the chain return; it must be possible to move it between 50-75 mm, see figure.

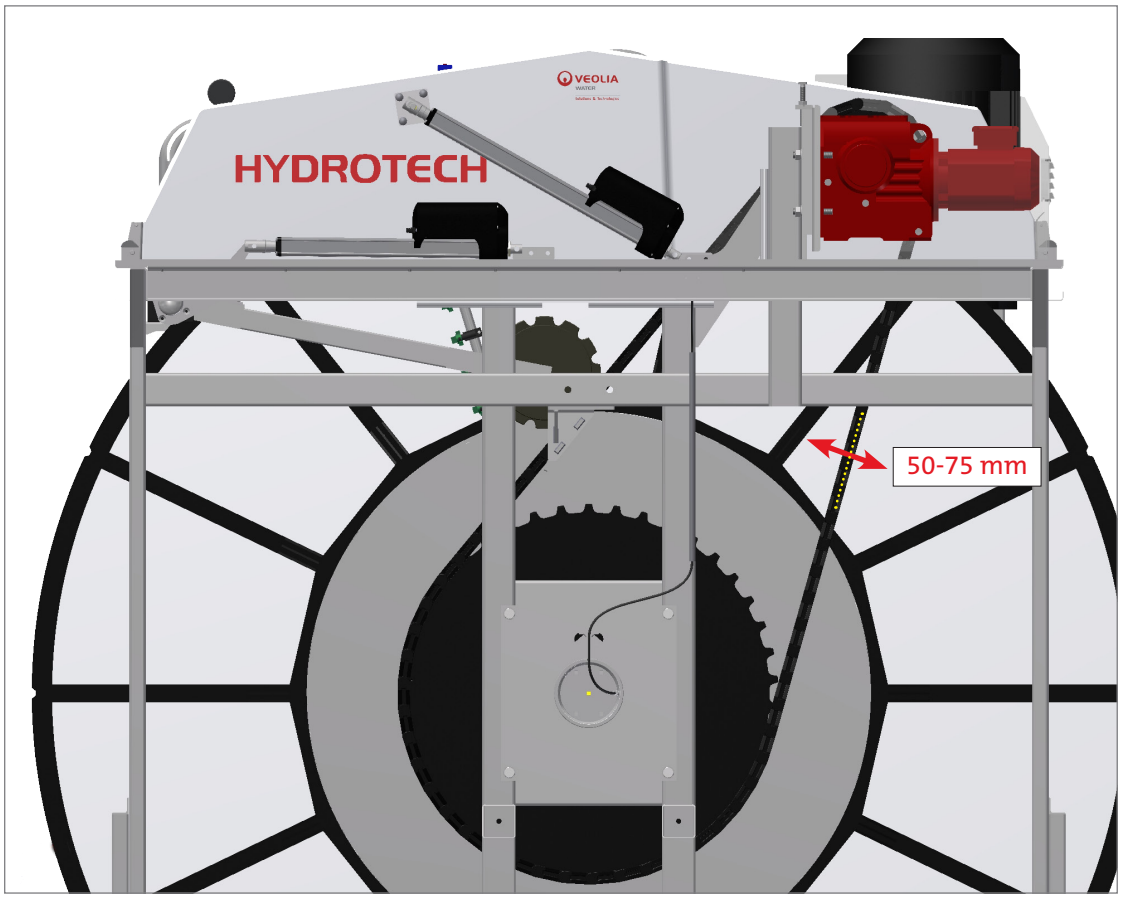


Figure 6.18 *Filter drive unit.*

5. If necessary, adjust the chain in accordance with section 6.8.2.
6. Close the filter cover.
7. Start operation again as described in section 4.1.

6.8.2 Adjusting drive chain tension

Adjust drive chain tension as follows:

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Loosen the four nuts (A). See Figure 6.19.
3. Loosen the nut (B).
4. Adjust the tension of the chain using the screw (C).
5. Secure the screw (C) using the nut (B).
6. Tighten the four nuts (A).
7. Close the filter cover
8. Start operation again as described in section 4.1.

When the drive chain cannot be adjusted any longer, the chain is worn and must be replaced, see section 6.8.3.

Figure 6.19 *Engine suspension plate.*

6.8.3 Replacing the drive chain

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Lower the drive unit to its lowest position, see section 6.8.2.
3. Split and remove the drive chain. The drive chain can be separated in all links.
4. Fit the new drive chain.
5. Adjust drive chain tension in accordance with section 6.8.2.
6. Start operation again as in section 4.1 (Check measures for restart).

6.9 Driven unit

NB Prior to servicing, read section 2.7.

For information about the drive unit, see Appendix D.

6.10 Inlet seal

NB Prior to servicing, read section 2.7.

6.10.1 Checking inlet seal.

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Reduce the water level in the filter until the whole inlet gasket is accessible.
3. Check the inlet seal for damage and wear, see Figure 6.20.
4. If necessary, replace the inlet seal in accordance with section 6.10.2.
5. Start operation again as described in section 4.1.

Figure 6.20 *Check of inlet seal.*

6.10.2 Replacing the inlet gasket

1. Turn the main power switch to the OFF (0) position and lock with a padlock.
2. Reduce the water level in the filter until the whole inlet gasket is accessible.
3. Note how the inlet gasket is fitted before it is dismantled.
4. Loosen the screws and nuts holding the inlet gasket in position.
5. Remove the inlet seal.
6. Fit a new inlet seal.
7. Start operations again as set out in section 4.1.

7. MAINTENANCE SCHEDULE

Check/Action	Maintenance interval
Check whether the wash water filter is clogged. See section 6.5.	The interval is based on experience from the application in question. (When the wash water pressure drops 0.5 bar below the normal value.)
Check the filter panels for clogging and damage, see section 6.7.	Once a week, or at another interval based on experience from the application in question.
Inspect the inside of the filter: Make sure no large objects that can get caught in the drum, filter segments or sludge trough have entered the filter. Also check that the reject does not accumulate (sediment) in the sludge trough. **NB** Prior to servicing, read section 2.7. Remove large objects and rinse the sludge trough. ⚠ ***WARNING! Turn the main power switch to the OFF position and lock with a padlock.***	Once a week or another interval based on experience from the application in question.
Rinse the metal surfaces of the filter structure with clean water. Clean (uncontaminated) metal surfaces minimise corrosion, particularly in salt water applications.	Twice a month or another interval based on experience from the application in question.
Check the nozzles with respect to clogging. See section 6.3.	Twice a month or another interval based on experience from the application in question.
Lubricate the swivel to the backwash pipe using grease of the type NLGI:2 (e.g. Molykote Multilub, Rembrandt EP or equivalent grease). See section 6.6.1.	Twice a month with continuous drum rotation. Once a month with intermittent drum operation.
Lubricate the drum bearings (on the inlet and drive side) using grease of the type NLGI:2 (e.g. Molykote Multilub, Rembrandt EP or equivalent grease). See section 6.6.2.	Twice a month with continuous drum rotation. Once a month with intermittent drum operation.
Check drive chain tension and condition. See section 6.8	Four times a year with continuous drum rotation. Twice a year with intermittent drum rotation.
Check backwash pipe position, see section 6.4.	Twice a year.
Check drive unit oil level, see section 6.9.	Twice a year.
Check drum bearing wear, see section 6.6.3.	Once a year.
Check inlet seal, see section 6.10.	Once a year.
Change the gearbox oil. Oil type and volume is stated on the motor label. Also see Appendix D.	See Appendix D.

User guide in original

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