



Technical Manual

Installation, operation and maintenance

Sand-Filter 350



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EXPLANATION OF SYMBOLS

	<u>Warning!</u> Immediate danger that can lead to serious injury to persons or damage to the machine or the loss of the vessel.		<u>Warning!</u> Warnings regarding electric power equipment. Non-observance of safety instructions could lead to danger of life or limb:		<u>Attention!</u> Indicates an instruction that requires special attention.
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Functional description

The filter uses special filter sand to remove sediments from the raw water.

The filter sand is loaded into the filter tank and serves as a medium for removing sediment.

When the control valve is in the FILTER position, the raw water containing the dissolved impurities is pumped through the piping system and automatically pumped into the filter tank through the patented filter control valve at the top.

As the raw water is pumped through the filter, dirt particles are trapped in the sand bed and filtered out. The purified raw water is pumped from the bottom of the filter tank through the control valve and through the piping system to the finer pre-filters.

After a certain time, the impurities accumulated in the filter lead to a flow resistance and the flow rate is reduced. This means that it is time to clean your filter. To do this, set the control valve to BACKWASH

BACKWASH

The water flow through the filter is reversed. The water now flows from the bottom of the tank upwards through the sand and flushes the previously trapped impurities and dirt particles from the waste water pipe overboard.

After the filter has been backwashed, set the control valve to RINSE and let the pump run for approx. 1/2 to 1 minute. Then set it to (filter) to resume normal filter operation.

Recommended hose diameters

Seacock- pump- filter: 1" / 25 mm

Filter- Desalination system: 3/4" / 19 mm

Filter- Overboard: 1" / 25 mm

Installation

1. The filter should be installed on a equal, stable base.
Position the filter so that the pipe connections and the control valve are practical and easily accessible for operation and maintenance purposes.
Screw the filter to the base.

1. Filling in the sand medium

The filter sand is filled in through the top opening of the filter.

- a. Open the flange clamp and remove the filter control valve (if previously installed).
 - b. Place a cover on the inner pipe to prevent sand from entering.
 - c. We recommend filling the tank about half full with water to steam the sand filling, this reduce dust.
 - d. Pour in the correct quantity and quality of filter sand. (The center tube must remain in the middle of the opening).
2. The sand surface should be smoothed and reach approximately to the middle of the filter tank. Remove the cover from the inner pipe.

3. Install the filter control valve in the filter tank

- a. Insert the filter control valve (with O-ring inserted) into the tank neck. Make sure that the center tube slides into the opening at the bottom of the valve.
- b. Place the two plastic clamps around the valve flange and the tank flange and tighten just enough to allow the valve to rotate in the tank for final placement.
- c. Screw pressure gauge (15) (add Teflon tape to the thread) into the threaded hole in the valve body.
- d. Connect the feed pump to the inlet of the control valve marked PUMP. After making the connections, tighten the valve flange clamps with the screwdriver. Tap around the clamp with the screwdriver handle to ensure that the valve flange clamp is properly seated.

4. 4. Connections

Connect the return line to the pre-filters to the control valve opening marked RETURN and make all necessary connections, e.g. suction line to feed pump, waste water, etc.

5. check all connections.

First commissioning of the sand filter



Max. Feed- pressure 2.5 bar!



To prevent damage to the control valve seal, always press the handle down before turning it.

1. Make sure that the correct amount of filter medium/ sand is in the tank and that all connections have been made and are tight.
2. Press the control valve handle down and turn it to the BACKWASH position.
3. Start the feed pump (make sure that all suction and return lines are open). This allows the filter tank to fill with water. When the water runs out of the waste water pipe, let the feedpump run for at least 1 minute. The first backwash of the filter is recommended to remove impurities or fine sand particles from the sand medium.
4. Switch off the feed pump and set the valve to RINSE. Start the feed pump and let it run until the water in the sight glass is clear. This takes approx. 1/2 to 1 minute. Switch off the feed pump and set the valve to the FILTER position and restart the feed pump. The filter now runs in normal filter mode. Sediments are now filtered out of the raw water.

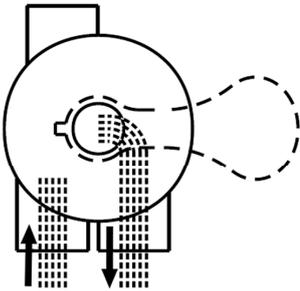
Valvepositions



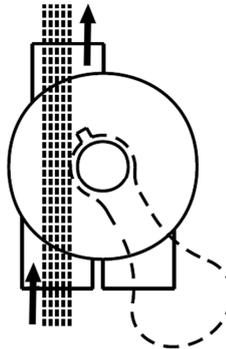
Switch off the feed pump before changing the valve position.

Valveposition	Function
FILTER	Normal filtering mode
BACKWASH	Cleaning the filter by reversing the flow direction
RINSE	Used after backwashing to flush dirt out of the valve
WASTE	Bypasses the filter, direct flow to the overboard side
RECIRCULATE	Bypasses the filter to feed water directly to the pre-filters
CLOSED	Close the water flow to the pre-filters

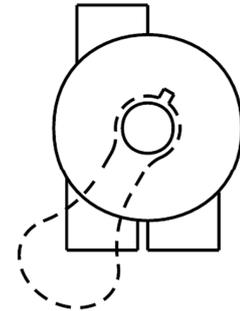
Filter



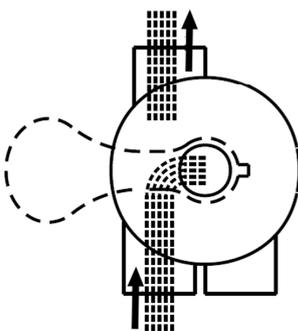
WASTE



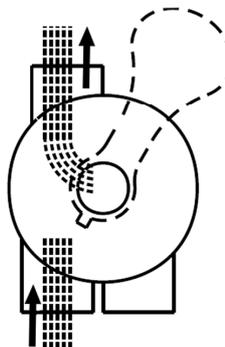
CLOSED



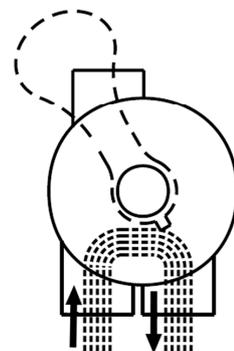
BACKWASH



RINSE



RECIRCULATE



Handling the filter

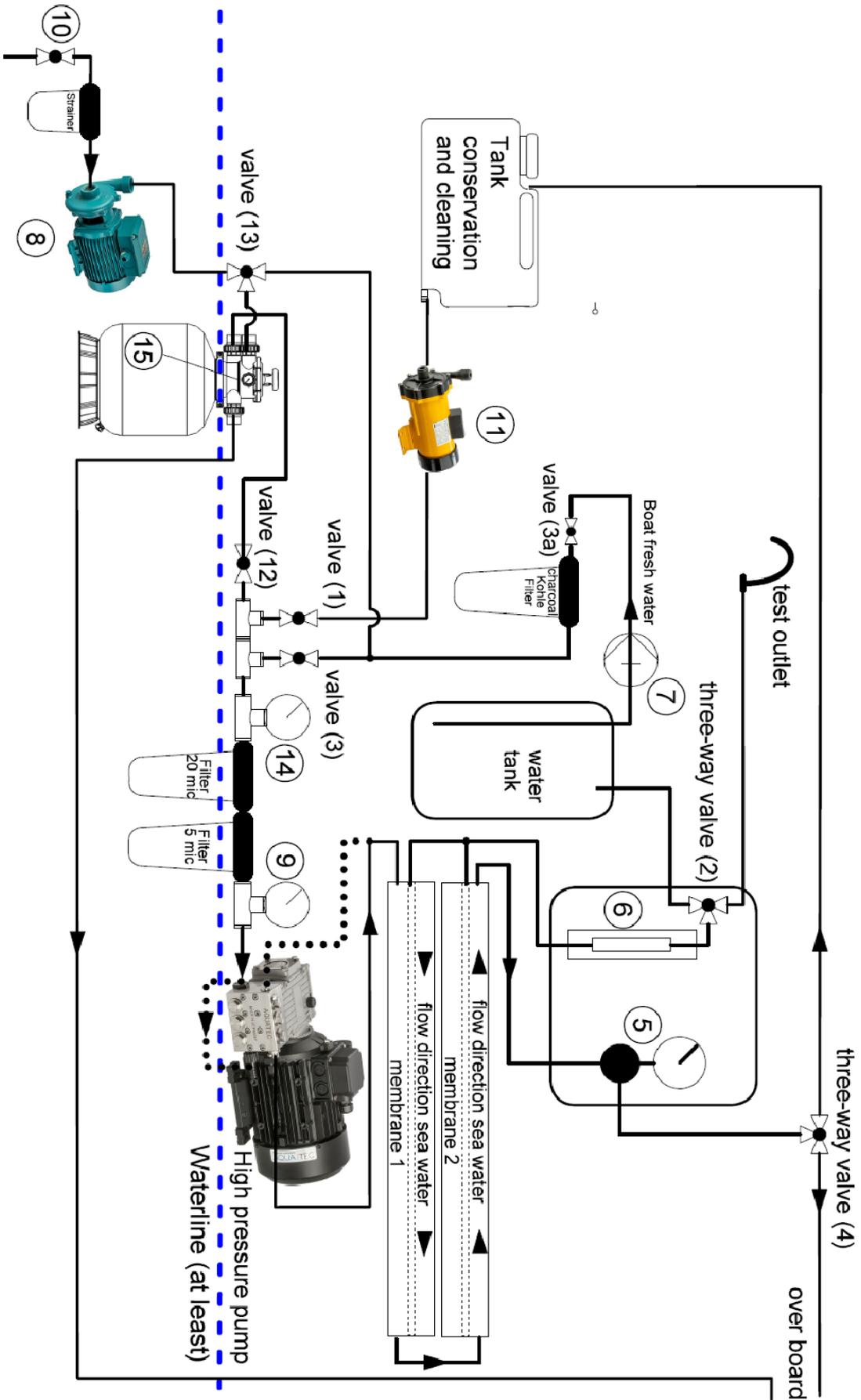
1. Open the seacock (10) and set the 3-way valve (13) to sea water.
Valve (12) is open, valves (1) and (3) are closed
2. Start the feed pump (8) and check the pressure gauge (15) to see if there is feed pressure. On pressure gauge (14) you can read how the pressure drop is due to soiling of the sand filter, on pressure gauge (9) you can read the pressure drop due to soiling of the pre-filter. If the pressure on pressure gauge (9) falls below 0.1 bar when the system is operating with the high-pressure pump switched on, the corresponding filters must be cleaned
3. The sand filter is cleaned via the "Backwash" position of the sand filter control valve. This can be done with clean seawater and the feed pump or, if this is not available, via the ship's fresh water system. Valve (13) is used for selection. The on-board pump should be able to deliver approx. 20 l/min, the pressure must not exceed 2.5 bar. The flushing procedure is described in the chapter "First commissioning of the sand filter".
4. The sand filter must be rinsed once a week even when not in use.
5. If the filter is not used for a longer period of time, it must be drained via the drain valve on the filter bowl



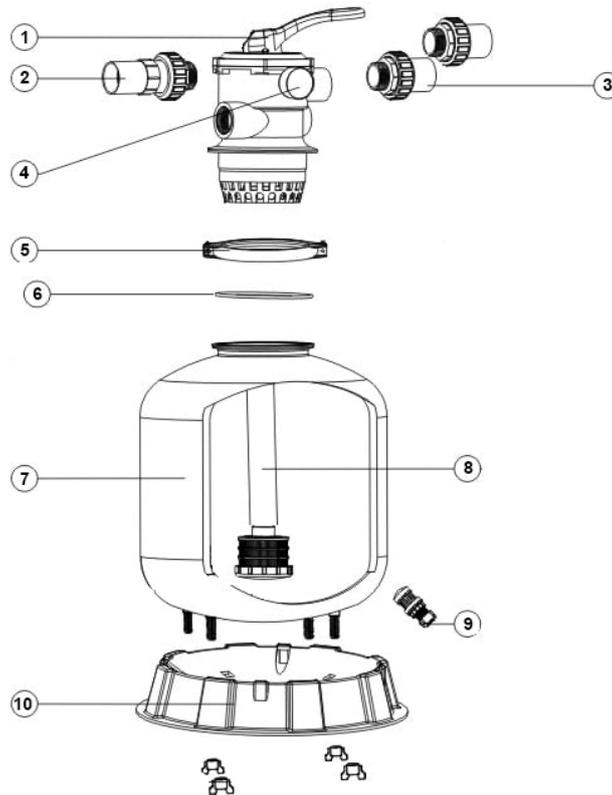
Different preservation process for the RO- System

Due to the different positioning of the feed pump compared to the desalination system without sand filter, the pump (11) is used for preservation instead of the feed pump.

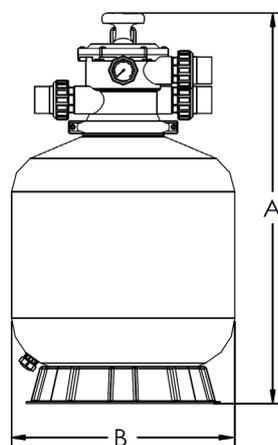
Flowdiagram



Partlist



Pos.	Art. Nr.	Description
1	88280105	1,5" Valve
2	89280101	1.5" Connection with sight glass, O-ring
3	89280102	1.5" Connection (2 St.) with O-Ring
4	06011029	Pressure gauge
5	01271010	Flange clamp
6	02011134	O- Ring for tank neck
7	89010114	350 Filtertank
8	89010106	Filterpipe
9	01172008	Sidearms filterpipe
9	89010107	Water drain kit
10	01111052	Base



Dimensions

A= 726 mm

B= 355 mm

Connections G 1 ½" internal thread

Filling quatity

Sand quantity= approx. 20 kg or
middle of tank