Operation, Inspection, and Maintenance Instructions
HYDAC stands for worldwide presence and accessibility to the customer. HYDAC has over 1000 distributors worldwide and more than 40 wholly owned branches. HYDAC has been active in the field of fluid condition monitoring and filtration for more than 30 years and is a global leader in the design and production of such products. The experience of our staff, and distributors become the customer’s asset when working with HYDAC. Controlling contamination is crucial to fluid power systems — Let the experts at HYDAC help!

**HYDAC Products**

Our product range includes portable and online contamination monitors and water content sensors, as well as portable and permanent offline filters. For more critical applications, we offer in-depth analysis kits which return detailed reports about the condition of a system’s fluid.

**HYDAC Quality**

HYDAC stands for quality and customer satisfaction. This quality is the result of constant research and development combined with 35 years of global application experience and know-how. Our products are designed to be reliable and cost-effective solutions for monitoring and maintaining hydraulic and lube oil cleanliness.

**HYDAC Customer Service**

Our internal staff and worldwide distribution network take care of the important matter of customer service. HYDAC values high standards, professional ethics, and mutual respect in all transactions with customers, vendors, and employees. We invest in our relationships by providing expertise, quality, dependability, and accessibility to foster growth and a sense of partnership. Our customer service representatives are committed to serving the customers’ needs.

**Power Generation**

HYDAC Fluid Service Products play a key role in providing system maintenance and monitoring in power generation plants. By implementing a comprehensive filtration & fluid condition monitoring program these systems will operate more efficiently, and downtime and component failure will be reduced.

**Mobile Market**

Our rugged, portable contamination monitors allow easy field use to check oil cleanliness. OEM’s use our products to verify and document that equipment is leaving the factory with clean oil. Our portable filtration units are ideal for correcting extreme water and contamination problems caused by the severe environments in which these machines operate.

**Steel & Heavy Industry**

Maintaining clean hydraulic systems in steel mills and other heavy industrial plants is very important. The use of HYDAC fluid service products will help keep these operations running smoothly and efficiently, by reducing costly system and component failures. Investment in these products can easily be justified by the resulting cost savings.

**Offshore Shipbuilding and Marine Technology**

HYDAC offline filtration units protect the hydraulic systems of cranes, blow-out preventors, motion compensators, thruster and ballast controls, and riser tensioning systems on offshore drilling rigs. Our compact offline filter is available in an explosion proof (intrinsically safe) version, making it ideal for use in any industry where volatile gasses may be present.

**Pulp and Paper**

Lube oil circuits and hydraulic systems found in paper mills benefit greatly from the implementation of HYDAC fluid service products as well as HYDAC filters, coolers, accumulators, and other products. As with all industrial hydraulics and lube oil circuits, it is crucial to keep the levels of both water and solid contamination to a minimum.

**Plastics**

Injection molding and blow molding machines, are all perfect candidates for the supplemental filtration loops that HYDAC can help you install. When machine downtime is a problem, HYDAC’s fluid service product are the solution!
# Table of Contents

1 Introduction .................................................. 1

2 Description of FAMH Unit ................................... 2
   2.1 The Components of the System ....................... 2
   2.2 Performance ........................................ 3
   2.3 Function ........................................... 3
   2.4 Possible Applications ................................ 4
      2.4.1 Bypass Purification  
         (dewatering, filtration and degasifying) .......... 4
      2.4.2 Transfer by pumping  
         (dewatering, filtration and degasifying) .......... 4

3 Commissioning .............................................. 5
   3.0 Transport and Packing ................................ 5
   3.1 Set-up ............................................ 5
   3.2 Connection ......................................... 5
      3.2.1 Suction Port Connection ...................... 5
      3.2.2 Pressure Port Connection ..................... 5
      3.2.3 Water Connection  
         (optional) ....................................... 5
      3.2.4 Electrical Connection ......................... 5
   3.3 Start Up ............................................ 6
      3.3.1 Before the Initial Operation ................... 6
      3.3.2 Switching On .................................. 6
      3.3.3 Vacuum Regulation ............................. 7
      3.3.4 De-aeration of Filter Housing ................. 7
      3.3.5 Setting the Fluid Temperature ................. 7
      3.3.6 Switching Off ................................ 7
   3.4 Storage .............................................. 8

4 Operation .................................................... 8
   4.0 Placement / Connection ............................... 8
   4.1 Screen Layouts ..................................... 8
   4.2.1 Main Screen ................................... 8
   4.2.2 Maintenance Functions ......................... 8
   4.2.3 Operation Functions ............................. 8
   4.2.4 Automatic Mode ................................ 8
   4.2.5 Manual Mode ................................... 9
   4.2.6 FAMH User’s Guide ............................. 9
   4.2.7 FAMH Maintenance ............................... 9

5 Maintenance .................................................. 10
   5.0 Visual Checks ...................................... 10
   5.1 Vacuum Pump ...................................... 10
   5.2 Filter ............................................. 10
   5.3 Change Fluid Filter ................................ 10
   5.4 Water Filter Combination for Automatic  
      Water Supply Vacuum Pump  
      (if available) ...................................... 10
   5.5 Others ............................................. 10

6 Troubleshooting ............................................. 11

7 Technical Data .............................................. 12

8 Safety Information and Instructions ...................... 13

9 Inspection and Maintenance Schedule ..................... 14

10 Detailed Maintenance Guidelines .......................... 15
   10.0 Check Malfunction and Any Display Lamps ........ 15
   10.1 Change Air Filter ................................ 15
   10.2 Clean RLT Filter and Replace the Element .......... 15
   10.3 Check Level Switch of Vacuum Pump  
      (Only Elmo L Vacuum Pump) ......................... 16
   10.4 Replace Water filters  
      (Only Vacuum Pump) ............................... 17
   10.5 Clean Cooling Fins of the Water Cooler  
      (Only Elmo L Vacuum Pump) ......................... 17
   10.6 Flush and Clean the Whole Vacuum System ......... 18
   10.7 Clean Condensation Cooler  
      (Only Elmo L Vacuum Pump) ......................... 20
   10.8 Reverse Rinsing of the Water Filter Combination  
      (Only Version with Rotary Vane Pump) ............. 21
   10.9 Oil, Oil Filter and Exhaust Filter Change  
      (Only Version with Rotary Vane Pump) ............. 21
   10.10 Change Fluid Filter Elements ..................... 22
   10.10.1 OLF-Filter Housing ........................... 22
   10.11 Check Reactor Level Switch ...................... 23
   10.12 Check Float Switch in Oil Pan ..................... 23

11 Spare Parts .................................................. 24

---

**Trademarks**

The trademarks of other companies are exclusively used for the products of those companies. This manual may be reproduced as needed without copyright infringements.

**Exclusion of Liability**

We, HYDAC Technology Corporation, have used our best endeavours to ensure the accuracy of the contents of this document. However, errors cannot be ruled out. Consequently, we accept no liability for such errors as may exist or for any damage or loss, whatsoever which may arise as a result of such errors.

The content of the manual is checked regularly. Any corrections required will be incorporated in subsequent editions. We welcome any suggestions for improvements.

All details are subject to technical modifications.
1.0 Introduction
The safety of all persons coming into contact with the FAMH and the availability of the installation essentially depend on the ability to master the unit. Therefore:

> Read this manual before taking the unit into operation!

The safety of the FAMH largely depends on maintenance. Regular required maintenance is described in this manual. We will support you if the unit needs repair and will provide original spare parts.

**Note:** You may see different references for FAM and FAMH throughout this manual. These designations apply to the same unit but with the exception that HYDAC has an internal designation of FAMH. There are no differences between FAM and FAMH.

### Abbreviations and Symbols
- This symbol denotes safety precautions, the non-observance of which can endanger persons and the environment.
- This symbol denotes safety precautions, the non-observance of which can endanger persons by electrical voltage.
- This symbol marks an important note for the proper use of the unit / software. The non-observance of these notes can lead to damage or failures of the unit / software.
- This symbol is followed by user tips and particularly useful information.

### Delivery
The following items are supplied:
1. Vacuum Dehydrator.
1. Operating and Maintenance Instructions.
1. Operating and Maintenance Instructions Vacuum Pump

### General Safety Precautions
- Operation- and maintenance work may only be carried out by technically skilled and trained personnel. Personnel entrusted with work on this system must have read these operating instructions before beginning work.
- The safe operation of this unit can only be ensured if it is used for the purpose it was intended. If there is any question about the use of this unit, please contact the manufacturer. The manufacturer will not accept responsibility for damages resulting from misuse of this equipment.
- In addition to any instructions for safe operation of our equipment, all national and provincial workplace safety and health regulations must be observed, as well as in-plant safety regulations.
- Spills of dangerous substances must be contained and disposed of in accordance with current waste disposal legislation.
- Before any maintenance or repair work is carried out on the unit, electrical power to the unit must be disconnected, and all hydraulic pressures relieved.

### Suitable Fluids
We recommend using the FAMH only with lubricating and mineral oils or mineral oil based fluids or biodegradable liquids - based on synthetic ester. Please contact us if you want to use other fluids.

### In Case of Emergency
In case of emergency turn main emergency switch off by turning the switch 90° to the left to shut down the FAMH. The vessel will continue to hold pressure over the next 2 to 3 minutes.
2.0 Description of FAMH Unit

The FAMH was designed for the dewatering, filtration and degassing of hydraulic and lubricating oils. It removes free and emulsified water from the solution. Solid particles are separated efficiently by the fluid filter.

The fluid is degassed through a vacuum in the reactor.

2.1 The Components of the System

1. Ring bolts for the transport with crane.
2. Vacuum gauge with regulating valve to regulate the necessary vacuum in the vacuum chamber.
3. The control panel consisting of
   - Main switch and emergency off
   - Siemens Simatic Touch Panel (TP177)
   - Fault indicator light (yellow) light to indicate “heater on” (red)
4. Heater
5. Inlet valve (2/2-directional valve)
6. Vacuum pump
7. Hinged box for the recipients collecting the condensation water
8. Vacuum chamber
9. Fluid filter for the separation of solid particles
10. AS 1000 - % Saturation Sensor
11. RLT Filter
12. Air Filter

(The range and type of components depend upon the FAMH version. The above is an example)
2.2 Performance

The FAMH is able to reduce the water content of those fluids described in the chapter “suitable fluids” to less than 100 ppm (100 ppm = 0.01%).

<table>
<thead>
<tr>
<th>Estimated dewatering rates</th>
<th>Depends on fluid</th>
<th>Dewatering rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMH-15</td>
<td>Approx. 1.0 l/h</td>
<td></td>
</tr>
<tr>
<td>FAMH-30</td>
<td>Approx. 1.7 l/h</td>
<td></td>
</tr>
<tr>
<td>FAMH-50</td>
<td>Approx. 2.2 l/h</td>
<td></td>
</tr>
<tr>
<td>FAMH-70</td>
<td>Approx. 2.6 l/h</td>
<td></td>
</tr>
</tbody>
</table>

Generally, the dewatering rate depends upon the following factors:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Dewatering rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water content</td>
<td></td>
</tr>
<tr>
<td>Fluid temperature</td>
<td></td>
</tr>
<tr>
<td>Detergent additives</td>
<td></td>
</tr>
<tr>
<td>Flow rate of the FAMH</td>
<td></td>
</tr>
</tbody>
</table>

2.3 Function

After the FAMH-15/30/50/70 has been switched on, the fluid is pumped by means of the heater pump (1) via the heater (2) into the reactor (4). There, the fluid trickles downward over a special tower packing. With this tower packing a thin fluid film is created. The fluid is collected in the bottom part of the reactor. After reaching the level sensor 02 the evacuation pump (5) is switched on and pumps the fluid continuously to the outlet. At the same time the 2/2-directional valve (3) closes and the level in the reactor falls until it reaches the level sensor 01. Then the 2/2-directional valve opens again and the procedure is repeated. Due to the vacuum created in the reactor, air is sucked into the reactor via the air filter/dryer (10). This air is also passing through the tower packing but in opposite direction to the oil. The dry air is taking up the moisture from the oil and is evacuated by means of the watering vacuum pump (7).

In the vacuum pump, the air is cooled before being released into the atmosphere. Due to the cooling, the moist air is condensed and the water collected in the absorber tank that is built around the actual pump and is used as operating media in the vacuum pump. If more water is removed from the oil than is being used by the vacuum pump, this excess water is collected in the water canisters (8).

The vacuum in the reactor is regulated with the regulating valve (9).

After actuating the stop switch the 2/2-directional valve closes, the heater is being switched off and the evacuation pump empties the reactor. The heater pump keeps on running until the reactor is completely drained.
2.4 Possible Applications

2.4.1 Bypass Purification (dewatering, filtration and degasifying)

The FAMH-15/30/50/70 is connected to the tank with suction and pressure hose and purifies the fluid continuously.

2.4.2 Transfer by Pumping (dewatering, filtration and degasifying)

The FAMH-15/30/50/70 is connected to the contaminated oil tank with the suction hose and pumps the fluid into the tank for the purified oil.

The electric control supports several operation modes, the FAMH-15/30/50/70 can be switched on or off:

a) from a control room
b) by a level sensor.

For more details please contact HYDAC.
3 Commissioning

3.0 Transport and Packing

- All FAMH units are tested at the factory for leaks and function. They are then carefully packaged for shipment.
- The fluid connections are all sealed with plugs to prevent the intrusion of contaminants during transport.
- Upon receipt of the unit, check for any damage from transportation.
- The packaging material should be re-used/re-cycled as appropriate for your area.
- These Operating and Maintenance Instructions are a component part of the FAMH.
- To lift the FAMH please use the ring bolts.
- If it is not necessary to lift the FAMH, its wheels may be sufficient to push it to its new emplacement.
- Take care to evacuate the reactor and the fluid filter and to close the drain valve before transport.

As the FAMH weighs more than 1765 lbs. we recommend transporting with two people.

3.1 Set-up

- The unit must be mounted level and on flat surface. No special mounting is required (the brakes at the wheels must be blocked!)
- The FAMH should be located near the tank (length of the hoses 16 ft. max.), difference in high between tank and FAMH 7 ft. max.
- Sufficient room to operate and maintain the unit must be left around the FAMH.

3.2 Connection

3.2.1 Suction Port Connection

- The suction port may be connected to a flexible hi-collapse hose, or to hard piping. The nominal size of the connected hoses/piping, must be at least as large as the inlet/outlet port sizes of the FAMH in order to prevent an excessively high negative suction pressure.
- Make sure that the tank connection is always below the fluid level.
- Do not prime the fluid from the sump of the tank where high contamination may affect the operation of the unit.

Priming in the sump of the tank can lead to damage to the FAMH

3.2.2 Pressure Port Connection

- The return line must also be installed below the fluid level in order to prevent air being introduced into the system again.

3.2.3 Water Connection (optional)

- If the unit is supplied with an automatic water supply for the vacuum pump, the water supply hose must be connected according to all relevant national and provincial regulations.

<table>
<thead>
<tr>
<th>Conditions for the water connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold water until max. 86°F</td>
</tr>
<tr>
<td>Working pressure:</td>
</tr>
<tr>
<td>min. 1.5 bar / 150 kPa / 21.76 psi.</td>
</tr>
<tr>
<td>max. 16 bar / 1600kPa / 232 psi.</td>
</tr>
</tbody>
</table>

- The Unit is equipped with a filter combination.

**Setting outlet pressure of the filter-combination** (pressure after filter unit): To avoid turbulence in the tank of the vacuum pump, the pressure must be reduced. Set the outlet pressure according to the operating instruction FA. Honeywell:

| Outlet pressure | max. 5 bar / 500 kPa / 73 psi |

3.2.4 Electrical Connection

- The voltage and frequency given on the type plate, must agree with that of the power supply.
- Connection: 3xL+ PE. conduit is not necessary.

The electrical connection must be carried out by a qualified electrician. All local and national electrical regulations and codes must be adhered to.

Now the FAMH is ready to operate!
3.3 Start Up

3.3.1 Before the Initial Operation

The vacuum pump and the separator is filled before distributed with a sufficient amount of water. In case of losses of water during longer transportation or storing or restarting after prolonged shutdowns, the separator has to be filled up with normal tap water via the filler opening N3.4. The water is only filled up to the lower edge of the filler opening.

If the unit is equipped with an automatic water supply, the separator is filled automatically.

If, after switching on the unit, the vacuum pump does not create a vacuum, approx. 1/2 gallon of water will be needed to fill the suction hose (N1.0) of the vacuum pump.

During operation, the water level is monitored automatically by means of a level switch.

In order to avoid damages to the vacuum pump you should use anti-freezing compound if the ambient temperature is below 32°F (10°C) (commercial anti-freezer for cars).

Note: Do not reduce the hose size on the suction or return line.

3.3.2 Switching On

- Move main switch to position “ON” and wait until the touch panel displays the main screen (with HYDAC logo showing). The FAMH can run manually or automatically.

- Manually: Click on “Operation Functions” and then “Manual Mode.” From this screen, the Vacuum Pump can be turned on/off, the Discharge Pump can be turned on/off, the Fill Valve can be open/close, values can be reset, and L and M Faults can be accessed. Only use Manual Mode to check the function of the unit.

- Automatic Mode: Click on “Operation”. Press the “Start” button to turn on.
3.3.3 Vacuum Regulation
- Now regulate the vacuum pressure with the regulating valve on the right of the vacuum gauge depending upon the operating viscosity according to the following table.

<table>
<thead>
<tr>
<th>Operating viscosity</th>
<th>Vacuum pressure (absolute pressure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm²/s Hydraulic Oil</td>
<td>250 mbar / 25 kPa / 3.6 psi</td>
</tr>
<tr>
<td>300 mm²/s Lube Oil</td>
<td>500 mbar / 50 kPa / 7.3 psi</td>
</tr>
<tr>
<td>50 mm²/s Ester Fluids</td>
<td>400 mbar / 40 kPa / 5.8 psi</td>
</tr>
</tbody>
</table>

3.3.4 De-aeration of Filter Housing
- In order to de-aerate the filter housing, open the bleed port until fluid escapes from it.

3.3.5 Setting the Fluid Temperature
Set the fluid temperature by following these steps through the touch panel.
- Click on “Operation Functions” on the main screen, shown in section 3.2.1
- Click on “Automatic Mode” on the operation functions screen, shown in section 3.2.3
- Click on the I/O field shown as “000” next to “Enter Temp.” on the FAMH automatic mode screen. The following keypad will show up.

- Type the desired temperature followed by enter.
  Note: The maximum allowed temperature is 135°F.

After a voltage loss the FAMH-15/30/50/70 will not start automatically, it has to be started again!

3.3.6 Switching Off
- Follow appropriate procedure whether running manually or automatically.
  - Manually: Click on “Operation Functions” and then “Manual Mode.” From this screen, the Vacuum Pump can be turned on/off, the Discharge Pump can be turned on/off, the Fill Valve can be open/close, values can be reset, and L and M Faults can be accessed. Note: Reference pictures in section 2.4.2 for visual aid.
  - Automatically: Click on “Operation Functions” and then “Auto Mode.” Press the “Push to turn FAMH off” button to turn off. Note: Reference pictures in section 2.4.2 for visual aid.
• The FAMH evacuation and heater charge pumps will remain on for 1 and 2 minutes, respectively. Wait until they turn off before manually turning off the main switch.
• Move main switch to position “OFF.”

3.4 Storage
The water in the vacuum pump can freeze if the temperature falls below 0°C. Use the required amount of antifreezing compound. Check the freezing point regularly.

4 Operation

4.0 Placement / Connection
The FAMH comes mounted on a portable frame. Make sure the FAMH is placed on a level surface.

If the FAMH is placed on a sloped surface, it may roll during operation.

4.1 Screen Layouts

4.2.1 Main Screen
From the Main Screen, you have the option of entering Maintenance Functions or Operation Functions.

4.2.2 Maintenance Functions
The Maintenance Functions screen gives the user options and links to other screens. Refer to 4.2.7 for details.
• Back will take the user back to the Main Screen.

4.2.3 Operation Functions

The Operation Functions screen allows the user to select between automatic or manual modes and provides links to various other screens.
• Main will take the user back to the Main Screen.
• The FAMH Users Guide button will take the user to the FAMH Users Guide screen where information contained in this manual may be found on screen through several categories.
• The Automatic Mode button directs the user to the Automatic Mode screen where the FAMH may be turned on/off and run automatically with inputted values.
• The Manual Mode button directs the user to the Manual Mode screen where the FAMH may be turned on/off manually. Other options on this screen include turning the discharge pump on/off and open/close the fill valve.

4.2.4 Automatic Mode
• The Automatic Mode screen allows the user to run the FAMH automatically.
• A default temperature and % Shutdown need to be entered to run in automatic mode. Select “Setpoint” under Saturation and enter your value. Select “Setpoint” under Temperature to enter you default temperature value.
• The current % saturation can then be observed on the scale. All values during testing can be reset by selecting the appropriate “Setpoint” again.
• If the fault light turns on during automatic mode, you will directed to the corresponding screens to observe and reset the cause of the alarm.
4.2.5 Manual Mode

- The Manual Mode screen allows the user to run the FAMH using various switches (Vacuum Pump, Discharge Pump, Fill Valve).
- The Vacuum Pump switch will turn the vacuum pump on/off.
- The Discharge Pump switch will turn the discharge pump on/off.
- The Fill Valve switch will open/close the fill valve.
- All values during testing can be reset by pressing the RESET button.
- If the fault light turns on during automatic mode, you will be directed to the corresponding screens to observe and reset the cause of the alarm.

4.2.6 FAMH Maintenance

The FAMH Maintenance screen allows the user to choose from 4 maintenance categories:

- **Safety Information:** Provides basic safety information and instructions the user must follow while operating the FAMH.
- **Maintenance Schedule:** This section provides the user the schedule that needs to be followed to ensure correct maintenance. There are inspection and maintenance schedules in the following categories: General, Fluid Filter, Electrical, Vacuum Pump, Functional Test, and Drain Pump/Charge Pump.
- **Maintenance Procedures:** This section provides the user with step-by-step maintenance procedures to follow to ensure correct maintenance.
- **Troubleshooting:** This section of the manual provides information regarding basic problems encountered while operating the FAMH. On these screens, the user can find the cause and remedy of the problem by locating the error message.
- **Contact HYDAC:** This screen provides all information needed to contact HYDAC for product information, technical support, or for any suggestions for improvement related to the maintenance instructions.
- **Commissioning:** This section of the manual provides information regarding transport and packing, set-up, connection, start up, and storage.
- **Spares Parts:** This section of the manual provides information regarding spare parts. It contains a list of basic components of the FAMH with their HYDAC part number. Contact HYDAC with any part not listed or with a “per inquiry” part number.
- **Screen Maintenance:** Provides information on adjusting screen settings.
- **Technical Data:** This section of the manual provides information regarding basic technical data of the feed pump, evacuation pump, vacuum pump, heater, and the FAMH unit.
5 Maintenance

5.0 Visual Checks

- Check regularly if all hoses and pipes are tight.
- Check electrical installations regularly to see if cables, plugs, sensors or connections or other parts in the switch cupboard are damaged.

5.1 Vacuum Pump

See also manual for vacuum pump.
- Change water twice a year via the drainage hose connected to the drain connection (N4.6). Refill via filling connection (N3.4). If the water is heavily contaminated the system has to be drained in shorter periods and flushed thoroughly.
- Every three months the injection water pipe and condensation water pipe including filter and throttle sleeves have to be checked and cleaned or replaced if necessary (see separate manual for vacuum pump).
- The air cooler (N7.0) should be cleaned once or twice a year by blowing compressed air through the pipes. Clean also from outside.
- The whole system should be delimed if hard water is used.

The vacuum pump runs trouble-free, when the discharge air on the discharge connection (N2.0) is at or below ambient temperature.

5.2 Filter

The suction strainer/filter has to be cleaned regularly and when the error message “check suction strainer” appears. To do this remove the suction strainer / filter from the housing and clean it with compressed air. Then put it back into the housing. The dirt from the suction strainer has to be collected and disposed of according to the local regulations as hazardous waste.

Operating the FAMH-15/30/50/70 without suction strainer filter can lead to damages.

5.3 Change Fluid Filter

As soon as the error message “change fluid filter” appears on the display the filter should be taken out of the housing and be replaced by a new one. The contaminated filter has to be disposed of according to the local regulations as hazardous waste.

5.3.1 OLF-Filter Housing

- Relieve the pressure in the housing by carefully opening the bleed plug on the top of the housing.
- Open the drain port, and collect the fluid (follow regulations for personal protection and environmental safety).
- When the housing is completely drained, open the housing clamp and remove the upper housing.
- Turn the locking cap 90° in a counter clockwise direction for one element package. For each additional element package turn an additional 90°.
- Remove the contaminated elements and clean the filter housing.
- Inspect the O-ring for damage, and possible replacement.
- Install new filter elements in reverse order to the removal sequence.

Warning: Install and close the last filter element with the locking cap. Without this cap installed, no filtration will take place.

- Grease and install O-ring, Re-install the upper housing and clamp. Tighten the housing clamp until the two housing halves seat against each other.
- Close the drain port.
- After re-starting the unit open the bleeding port to de-aerate the filter housing. Fill the housing completely, keeping the bleed port open until fluid escapes from it.

5.4 Water Filter Combination for Automatic Water Supply Vacuum Pump (if available)

Back flush the water filter on a regular basis, at the latest every 2 month. See manual for the filter combination.

5.5 Others

- The water from the water canisters for the condensate can contain drops of oil. It has to be disposed of according to the local regulations as hazardous waste.
- Once a year the fluid-filter should be completely emptied, opened and cleaned. This cleaning has to be done in a well ventilated room, so that possibly arising gases can escape.

For further information and specific instructions please refer to the suppliers documents.
## 6 Troubleshooting

<table>
<thead>
<tr>
<th>Fault Message</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Inlet Flow</td>
<td>The system is running but there is little or no flow into the vacuum chamber.</td>
<td>Verify that the inlet to the system is not blocked. Verify that the oil being dehydrated is within the acceptable viscosity range. Verify proper operation of the chamber float switch.</td>
</tr>
<tr>
<td>No Discharge Flow</td>
<td>The system is running but there is little or no flow out of the vacuum chamber.</td>
<td>Verify that the system discharge is not blocked. Verify proper operation of the discharge pump. Verify proper operation of the chamber float switch.</td>
</tr>
<tr>
<td>Vacuum Pump Drain Blocked</td>
<td>The vacuum pump reservoir is overfilled and the discharge solenoid has activated but there is little or no flow from the reservoir.</td>
<td>Verify proper operation of the discharge solenoid. Verify that the outlet is not blocked. Verify that the end of the hose is not above the water level in the reservoir.</td>
</tr>
<tr>
<td>Replace Filter Element</td>
<td>The filter element is dirty.</td>
<td>Replace the filter element.</td>
</tr>
<tr>
<td>Drip Pan Full</td>
<td>There is oil in the drip pan.</td>
<td>Check for leaks, tighten any fittings that are loose. If there is no oil in the pan replace the float switch.</td>
</tr>
<tr>
<td>Phase, Check Wiring</td>
<td>The wiring is not correct.</td>
<td>Switch any two legs of your three phase power to reverse the phase.</td>
</tr>
<tr>
<td>Discharge Motor Overload</td>
<td>The discharge motor overload has tripped.</td>
<td>Verify wiring, checking for short circuits or damaged cables. Verify overload setting. Reset overload.</td>
</tr>
<tr>
<td>Vacuum Pump Overload</td>
<td>The vacuum pump motor overload has tripped.</td>
<td>Verify wiring, checking for short circuits or damaged cables. Verify overload setting. Reset overload.</td>
</tr>
<tr>
<td>Heater Overload</td>
<td>The heater overload has tripped.</td>
<td>Verify wiring, checking for short circuits or damaged cables. Verify overload setting. Reset overload.</td>
</tr>
<tr>
<td>Vacuum Pump - Add Water</td>
<td>The vacuum pump reservoir is under filled.</td>
<td>Add water to the vacuum pump reservoir. If your system is equipped with the automatic refill, clear the faults and the system should return to normal operation.</td>
</tr>
<tr>
<td>Emergency Stop Activated</td>
<td>The emergency stop button has been activated.</td>
<td>Deactivate the switch. If the switch as not activated, verify wiring and replace switch.</td>
</tr>
<tr>
<td>Chamber Float Switch</td>
<td>The cable to the chamber float switch has been damaged or disconnected.</td>
<td>Verify that the cable is plugged in. Replace the cable.</td>
</tr>
<tr>
<td>Manual Mode Timer Expired</td>
<td>The system has been in manual mode for longer than 15 minutes.</td>
<td>Diagnostic mode is for troubleshooting, please refrain from using the system in manual mode for extended periods of time. Clear faults to reset the timer.</td>
</tr>
</tbody>
</table>
## 7 Technical Data

<table>
<thead>
<tr>
<th></th>
<th>FAMH 15</th>
<th>FAMH 30</th>
<th>FAMH 50</th>
<th>FAMH 70</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feed pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume current</td>
<td></td>
<td></td>
<td></td>
<td>See type plate motor</td>
</tr>
<tr>
<td>Max. pressure</td>
<td></td>
<td></td>
<td>145 psi</td>
<td></td>
</tr>
<tr>
<td>Power E-Motor:</td>
<td></td>
<td></td>
<td>See type plate motor</td>
<td></td>
</tr>
<tr>
<td><strong>Evacuation pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate (appr.)</td>
<td>5 gpm</td>
<td>10 gpm</td>
<td>15 gpm</td>
<td>20 gpm</td>
</tr>
<tr>
<td>Max. pressure</td>
<td></td>
<td></td>
<td>72.5 psi</td>
<td></td>
</tr>
<tr>
<td>Power E-Motor</td>
<td>0.5 hp</td>
<td>1.5 hp</td>
<td>1.5 hp</td>
<td>4 hp</td>
</tr>
<tr>
<td><strong>Vacuum pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See also separate Operation instruction Siemens ELMO 2 BL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power E-Motor</td>
<td>1.5 hp</td>
<td>1.5 hp</td>
<td>2.1 hp</td>
<td>2.1 hp</td>
</tr>
<tr>
<td><strong>Heater</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See Type plate heater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical dates</td>
<td></td>
<td></td>
<td></td>
<td>See Type plate</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
<td>appr. 2,095 lbs</td>
</tr>
</tbody>
</table>
Abbreviations and Symbols

- This symbol denotes safety precautions, the non-observance of which can endanger persons and the environment.
- This symbol denotes safety precautions, the non-observance of which can endanger persons by electrical voltage.
- This symbol marks an important note for the proper use of the unit / software. The non-observance of these notes can lead to damage or failures of the unit / software.
- This symbol is followed by user tips and particularly useful information.
- Eye Protection recommended. Approved eye protection wear (Safety goggles, safety glasses) should be used when working with cleaning liquids or compressed air.
- Protective gloves recommended. Approved protective gloves should be used when working with cleaning liquids or compressed air.
- This symbol is followed by recommended tools.

8 Safety Information and Instructions

- All inspection, maintenance, repair, cleaning work have to be carried out timely and by skilled personnel. Repair work required at the system is only to be carried out if the necessary qualification and technical skill are available, otherwise specialists from the manufacturer have to be called.
- The a. m. work may only be carried out by technically skilled and qualified personnel, who gained their knowledge and competence through training and education especially for this kind of work.
- Before starting the system operating personnel are to be informed about the scheduled work, and one responsible supervisor to be determined.
- The repair area is to be protected in a wide range if necessary.
- If the system is put to a standstill for maintenance and repair measures, steps have to be taken which prevent the system from being started even though this is prohibited, e.g. by locking the main and/or control switch with personal security locks. Keys are to be stored personally.
- The fact that maintenance, repair or cleaning work is carried out has to be indicated by suitable signs which are put into position.
- When single parts or structural components are being dismantled the persons involved have to take utmost care that in doing so the repair personnel will not be in danger of being hurt by, e.g. sudden movements of valves, pumps and flaps etc. If such danger can not be excluded, suitable safety measures have to be taken e.g. by means of supports or fixed devices.
- Single parts or structural components of the system are to be dismantled only when it is guaranteed that the people doing this job have the required qualification to carry out this job according to technical specification and safety regulations. In case of doubt, information and/or specialists form the manufacturer have to be called.
- If on changing single parts or structural components the use of lifting devices is required then it is absolutely necessary to take care that the parts to be changed are fixed securely by means of stop motion devices and that the lifting devices have the required loading capacity.
- Use only those lifting devices which are adequate and technically without any defect.
- No persons should stay below hanging weights.
- Before high-pressure cleaners or other cleaning devices are used to clean the system, cover/glue up all openings into which no cleaning agents are allowed to enter due to system safety and/or functional reasons.
- Remove all covers/glued connections after cleaning.
- When working on tubes or hose pipes and fittings leading or containing liquids or vapour, take utmost care, that the pumps are switch off. The tubes or hose pipes and fittings have to be cooled down completely and be totally pressure free. In front of and behind the parts of tubes or hose pipes and fittings in question the attached closing valves have to be closed and secured against being opened by accident. The conveying means is to be drained off, if possible.
- After cleaning, check all tubes or hose pipes and fittings on leakage, examine all loosened connections, chafe marks or other damages! Repair defects which have been discovered immediately!
- Always refasten screw connections which have been loosened for maintenance and repair work.
- If it is necessary to dismantle the safety devices during maintenance, cleaning or repair, they are to be reassembled and examined immediately after completion of maintenance, cleaning and repair work.
# Inspection and Maintenance Schedule

The schedule listed below is supposed to be an indication of the inspections- and maintenance work, to make long lifetime and faultless operation of the supplied system possible.

In Chapter 3 you will find detailed guidelines.

Specific information regarding care, maintenance and troubleshooting can be found in the specific supplier’s documents.

<table>
<thead>
<tr>
<th></th>
<th>Refer to</th>
<th>24 hours or daily</th>
<th>500 hours or monthly</th>
<th>3000 hours or 1/2 year</th>
<th>6000 hours or yearly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for leakage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check hoses and pipes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for leaks and snug seat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check measuring devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vacuum gauge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pressure gauge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fluid filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check malfunction lamps</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Change air filter</td>
<td>3.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(if not earlier required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean RLT Filter &amp;</td>
<td>3.3</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>change element</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vacuum Pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watering type (Elmo 2BL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check and clean level</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace water filters</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean cooling fins</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the water cooler</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush and clean the</td>
<td>3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>whole vacuum pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disassemble and clean</td>
<td>3.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>condensation cooler</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse rinsing of</td>
<td>3.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>water filter (only for</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Version with automatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>water supply)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotary vane type (Busch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check oil level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil-, oil filter-</td>
<td>3.10</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>and exhaust filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>change</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect and clean fan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drain Pump / Charge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>pump</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect and clean fan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluid Filter</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change filter element</td>
<td>3.111</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>(if not earlier required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain filter housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and clean from inside</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check cable grommets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of damage</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Measure motor current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>consumption of all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>motors and compare with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type plate</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Electrical safety test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>according to DIN VDE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0702 or equivalent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>regional regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heater (only version</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with integrated heater)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>consumption and compare</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with type plate</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Functional Test</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check reactor level</td>
<td>3.12</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check float switch</td>
<td>3.13</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>in oil pan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test all components</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in manual operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10 Detailed Maintenance Guidelines
The pictures and sketches in the following guidelines are only examples. They do not represent all different versions of the FAMH.

10.0 Check Malfunction and Any Display Lamps
Move the main switch to position “ON”.
After switching on, a lamp test is performed where all malfunction and display lamps flash once.

10.1 Change Air Filter
What you need:
Air Breather - HYDAC Part Number: 01265765
Description:
The air filter must be changed every 6 months. However, a more frequent change is necessary if the unit is operated in a very humid / dusty environment.
• Remove filter manually
• Assemble filter manually

10.2 Clean RLT Filter and Replace the Element, PN: 02088766
What you need:
Compressed air
Torque wrench with a 1-5/16 in. socket
Description:
• Secure the RLT Filter by clamping the head in a vice (container upward).
• Use a torque wrench with a 1-5/16 in. socket to loosen the container from the head.
• Remove the container from the head manually.
• Remove the element from the bushing manually.
• Clean the container with compressed air and check for damages.
• Replace the element and assemble in reverse order. Make sure the container is tightened on the head to 40 ft-lbs.
10.3 Check Level Switch of Vacuum Pump (Only Elmo L Vacuum Pump)

What you need:
Phillips screwdriver size PH 2 + PH 3

Description:
• Remove cover plate
• Remove level switch
  New Version (stainless steel): Remove the 4 screws and pull out the level switch
  Old version (plastic): carefully pull out the level switch
• Check the float for any contamination or damage and clean if necessary
• Check the function of the switch by checking the input signals of the PLC as described in the picture below. The main switch of the unit must be ON.
• Assemble in reverse order
10.4 Replace Water Filters (Only Vacuum Pump)

What you need:
- Water filter 2 x HYDAC Part Number: 06023886
- Compressed air
- Phillips screwdriver size PH 2 + PH 3
- Slot tip screwdriver size 0,6x4,5x100

Description:
If the whole vacuum system is going to be flushed and cleaned, first flush and clean the vacuum system and then replace the water filters.

- Remove cover plate
- Remove protective grille
- Replace the two water filters
- Assemble in reverse order
- After starting the unit slowly fill about one liter of water into the discharge connection and observe the water filters and the connected hoses.
  Water should slowly circulate through the hoses and filters.
- If not, disassemble the hoses and clean with compressed air.

10.5 Clean Cooling Fins of the Water Cooler (Only Elmo L Vacuum Pump)

What you need:
- Compressed air
- Phillips screwdriver PH 2 + PH 3

Description:
- Remove cover plate.
- Remove protective grille.
- Blow compressed air through the cooling fins of the water cooler, preferably from inside to outside.
- Assemble in reverse order
10.6 Flush and Clean the Whole Vacuum System

What you need:
- Compressed air
- VacuCleaner HYDAC Part Number: 03161264
  - FAMH 15/30: 1.25 litres
  - FAMH 45/60: 1.75 liters
- Measuring cub (min 2 liters)
- Funnel
- Hot water, ideal 60 to 65°C
- Phillips screwdriver size PH 2 + PH 3
- Slot tip screwdriver size 0,6x4,5x100
- Face spanner 3-11-60 / HYDAC Part Number: 01007270

Description:
- Drain the water off the vacuum pump via the drain line.
- Remove cover plate of water cooler
- Loosen hose clamp of feed hose section
- Remove hose section
- Loosen hose clamp of return hose section and remove hose from screwed socket / T-nipple depending upon version (see picture below).
- Blow carefully compressed air through the return hose (see arrow in picture below)

Attention: Fluid will squirt out of feed hoses section

- Clean the cooler thoroughly.
- Assemble in reverse order.
- Remove cover plate (1) and level switch (2).
- Remove bung plug from the filling opening (3).
- Refill the pump with hot water, ideal 60-65°C, via the opening from the level switch until water runs out of the filling opening.
- Close the filling opening with the bung plug.
- Add VacuCleaner via the opening of the level switch.
- Install level switch.
- Start pump in manual operation.
- Set vacuum to appr. 250 mbar (abs)

- After 5 minutes drain about 2 litres of the water/cleaner mix into the measuring cup.
- Fill slowly into the discharge connection.
- Drain again about 2 liters into the measuring cup.
- Disconnect the suction hose from the inlet connection.
- Fill the 2 liters into the inlet connection.
- Run the vacuum pump/FAMH for 60 minutes.
- Switch pump/FAMH off.
- Drain the pump

- Flush with fresh water via the connection of the float switch.
- Refill the pump with fresh water and assemble.
- After restarting the FAMH check the vacuum pump for leakage.
10.7 Clean Condensation Cooler
(Only Elmo L Vacuum Pump)

What you need:
- Compressed air
- VacuCleaner HYDAC Part Number: 03161264
- Bucket (25l) or similar
- Hot water, ideal 140 to 149F (60 to 65°C)
- O-rings - FAMH 15/30 (2BL1040/2041):
  47,29 x 2,62 and 53,57 x 3,53
  HYDAC Part Number: 03166785
- FAMH 50/7045/60 (2BL1060/2061):
  67,95 x 2,62 and 72,62 x 3,53.
  HYDAC Part Number: 03166786
- Phillips screwdriver size PH 2 + PH 3
- Slot tip screwdriver size 0,6x4,5x100
- Allen key, size 5

Description:
- Remove cover plate.
- Mark and remove all hoses connected to the condensation cooler.
- Unscrew and pull out the condensation cooler.
- Unscrew front cap of the cooler and remove (4 screws).
- Pull out the cooler inlet by slightly turning it.
- Pre-clean the inlet with compressed air.
- Place the inlet in a bath with hot water and 5% Vacuclean
  (e.g. 10l Water + 0.5l Vacuclean) and leave for 60 minutes.
- Remove the inlet and clean with compressed air.
- Clean the cooler housing.
- Before assembling replace o-rings and grease.
- Assemble in reverse order
- After restarting the FAMH check Vacuum-pump for leakage
10.8 Reverse Rinsing of the Water Filter Combination
(Only Supplied with Automatic Water Supply
for Elmo Vacuum Pump)\(^8\)

**What you need:**
Bucket (25l)

**Description:**
An inlet pressure of at least 1.5 bar is required for reverse rinsing.

- Put bucket underneath (25l).
- Open the ball valve by turning the reverse rinse knob until it reaches stops.
  - Indicator bar must be vertical
  - The reverse rinsing system will start operating
  - Filtered water can be drawn during reverse rinsing.
- Close the ball valve after approximately 15 seconds.
  - A longer reverse rinse period may be necessary if the filter is very dirty.
  - The date of the next scheduled reverse rinsing can be marked using the memory ring.

10.9 Oil, Oil Filter and Exhaust Filter Change
(Only Version with Rotary Vane Pump)\(^9\)

**What you need:**
Oil VE101, HYDAC Part Number: 06018129 (Canister 5ltr)
Service kit (oil filter, exhaust filter, seal) HYDAC part no.: 06018123
Open-ended spanner, size 27 and 32

**Description oil- and oil filter change:**
For the oil change, the vacuum pump must be warm. Therefore:

- Start the pump in manual operation or run the FAMH for about 10 minutes.
- Switch off the pump / FAMH
- Leave until vacuum pressure gauge indicates atmospheric pressure.
- Drain the oil through the oil plug (1).
- When oil stops running, close the plug and start up the pump again for a few seconds.
- Reopen the oil drain plug and discharge the remaining oil.
- Refasten the oil drain plug.
- Remove the oil filter (3) and replace it.
- Fill with fresh oil through the oil fill plug (2).

Used oil and used oil filters are to be disposed of according to environmental laws.

**Description exhaust filter change:**
Increased energy intake by the motor or oil mist escaping from the exhaust could be a sign of an earlier filter change.

- Remove the four screws holding the exhaust cover and remove cover (1)
- Loosen the filter spring screw and remove filter spring (2)
- Remove and replace exhaust filter element (3)
- Replace exhaust cover seal
- Assemble in reverse order

10.10 Change Fluid Filter Elements

10.10.1 OLF-Filter Housing

What you need:
Fluid filter elements N15DM (amount and type depends upon Version, see Section 11 for element part numbers)
- Allen key, size 6

- Relieve the pressure in the housing by carefully opening the bleed plug on the top of the housing.
- Open the drain port, and collect the fluid (follow regulations for personal protection and environmental safety).
- When the housing is completely drained, open the housing clamp and remove the upper housing.
- Turn the locking cap 90° in a counter clockwise direction for one element package. For each additional element package turn an additional 90°.
- Remove the contaminated elements and clean the filter housing.
- Inspect the O-ring for damage, and possible replacement.
- Install new filter elements in reverse order.
- Install and close the last filter element with the locking cap. Without this cap installed, no filtration will take place.

- Wet the O-ring with operating fluid and install. Re-install the upper housing and clamp.
- Tighten the housing clamp until the two housing halves seat against each other.
- Close the drain port.
- After re-starting the unit open the bleeding port
- Fill the housing completely, keeping the bleed port open until fluid escapes from it
- After restarting the unit check for leakage
10.11 Check Reactor Level Switch

What you need:
- Phillips screwdriver size PH 2 + PH 3
- Open-ended spanner, size 13

Description:
- Remove the four cover plate screws.
- Remove level switch plug.
- Remove cover plate.
- Remove cover plate and fix to reactor.
- Check the floats for any contamination or damage and clean if necessary.
- Check the function of the switch by checking the inlet signals of the PLC as described in the picture below. The main switch of the unit must be ON.

When moving the upper float upwards, the malfunction message “Reactor overfilled” appears on the text display. Press button “RESET” to acknowledge the message.

- Assemble in reverse order

10.12 Check Float Switch in Oil Pan

Description:
- Lift float switch
- FAMH must switch off and the malfunction message “float switch” appears.
- After leaving the float switch reset the message by pressing button “RESET”
### 11 Spare Parts

When ordering spare parts always indicate the following:

- Type,
- Material No.,
- Serial No. and Year of manufacturing as indicated on the type plate of the FAMH.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water filters for Watering Vacuum pump <em>(two required)</em></td>
<td>06023886</td>
</tr>
<tr>
<td>VacuCleaner (canister 5 ltr.)</td>
<td>03161264</td>
</tr>
<tr>
<td>O-ring for condensation cooler <em>(only watering vacuum pump)</em></td>
<td></td>
</tr>
<tr>
<td>FAMH 15/30 (2BL1040/2041)</td>
<td>03166785</td>
</tr>
<tr>
<td>FAMH 50/70 (2BL1060/2061)</td>
<td>03166786</td>
</tr>
<tr>
<td>Oil VE101 for rotary vane pump (Fa. Busch), canister 5 ltr.</td>
<td>06018129</td>
</tr>
<tr>
<td>Service Kit for rotary vane pump (Fa. Busch) consisting of: oil filter, exhaust filter, seals</td>
<td>06018123</td>
</tr>
<tr>
<td>Face spanner 3-11-60</td>
<td>01007270</td>
</tr>
<tr>
<td>Filter element N15DM002 2 µm</td>
<td>01251590</td>
</tr>
<tr>
<td>Filter element N15DM010 10 µm</td>
<td>03115180</td>
</tr>
<tr>
<td>Filter element N15DM020 20 µm</td>
<td>00349576</td>
</tr>
<tr>
<td>Filter element N15DM030 30 µm</td>
<td>03048790</td>
</tr>
<tr>
<td>Air filter</td>
<td>01265765</td>
</tr>
<tr>
<td>Evacuation pump</td>
<td>per inquiry</td>
</tr>
<tr>
<td>Feed pump</td>
<td>per inquiry</td>
</tr>
<tr>
<td>Suction filter (RLT)</td>
<td>02088766</td>
</tr>
<tr>
<td>Vacuum pump</td>
<td>per inquiry</td>
</tr>
<tr>
<td>Vacuum gauge</td>
<td>02090271</td>
</tr>
<tr>
<td>2/2-directional valve</td>
<td>00639937</td>
</tr>
<tr>
<td>Pressure hose</td>
<td>per inquiry</td>
</tr>
<tr>
<td>Suction hose</td>
<td>per inquiry</td>
</tr>
<tr>
<td>Level switch (reactor)</td>
<td>01204801</td>
</tr>
</tbody>
</table>