

## Dewatering unit

OPS2 010



### Safety and operating instructions

**Read safety and operating instructions before use.**

**Note:** The indicated data only serve to describe the product. Specifications regarding the use of this product are only examples and suggestions. Catalog specifications are no guaranteed features. The information given does not release the user from his / her own assessments and inspection.

Our products are subject to natural wear and aging process.

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The picture on the title page shows a configuration example. The delivered product may thus differ from the illustration.

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## 1. About this documentation

### 1.1 Applicability of the documentation

This documentation is applicable for the following product:

- › Dewatering unit OPS2 010

This documentation is written for technicians, operators, service engineers and system operators.

This document contains important information for safe and appropriate assembly, transport, activation, operation, usage, servicing, dismantling and simple troubleshooting.

- › Read this document completely and in particular Chapter 2, "Safety Instructions", before you work with the product.

### 1.2 Required and supplementary documentation

Do not commission the product until you have received the documentation marked with the book icon and before you have understood and complied with the information therein.

|   | Title                               | Document number | Document type      |
|---|-------------------------------------|-----------------|--------------------|
|  | Data sheet                          | OPS2_1125       |                    |
|  | R5 Oil-Lubricated Vane Vacuum Pumps | 0870169526      | Instruction manual |

Table 1: Required and supplementary documentation

### 1.3 Presentation of information

So that this document can help you to work quickly and safely with your product, we use standardized safety instructions, symbols, terms and abbreviations. For better understanding, these are explained in the following sections.

#### 1.3.1 Safety instructions

In this documentation, safety instructions are faced with a sequence of actions which would result in the danger of personal injury or damage to equipment. The measures described to avoid these hazards must be observed.

Safety instructions are as follows:

|  <b>SIGNAL WORD</b> |  |
|--|--|
| <b>Type and source of danger</b>   |  |
| › Consequences of the danger   |  |
| › Escaping or averting the danger  |  |
| › Rescue (optional)  |  |

- › Warning signal: draws attention to the danger
- › Signal word: indicates the severity of the danger
- › Type and source of danger: specifies the type and source of the danger
- › Consequences: describes the consequences in the event of non-compliance
- › Action: indicates how the danger can be avoided

| Warning sign, signal word  | Meaning  |
|--|--|
|  <b>DANGER</b>  | Indicates a dangerous situation which results in death or serious injury if not avoided.           |
|  <b>WARNING</b> | Indicates a dangerous situation which may result in death or serious bodily injury if not avoided. |
|  <b>CAUTION</b> | Indicates a dangerous situation which may result in light to moderate injury if not avoided.       |
| <b>NOTE</b>  | Indicates property damage: The product or surrounding could be damaged.                            |

Table 2: Hazard classes according to ANSI Z536.6-2006

### 1.3.2 Symbols

The following symbols indicate notes which are not safety-relevant but increase the intelligibility of the documentation.

| Symbols   | Meaning   |
|---|---|
|  | If this information is not observed, the product cannot optimally be used or operated.            |
| >   | Singular, independent action step / instruction   |
| 1.<br>2.<br>3.  | Numbered instruction<br>Die Nummerierung zeigt an, dass die Handlungsschritte aufeinander folgen. |
|  | Dieses Symbol weist auf eine Gefahr für Gerät, Material und Umwelt hin.                           |
|  | Dieses Symbol weist auf das Risiko leichter Verletzungen hin.                                     |
|  | Dieses Symbol weist auf das Risiko schwerer oder tödlicher Verletzungen hin.                      |
|  | This symbol specifies that protective gloves should be worn.                                      |
|  | This symbol specifies that safety shoes should be worn.   |
|  | This symbol specifies that protective goggles should be worn.                                     |
|  | This symbol specifies that the unit should be disconnected from the power supply.                 |

Table 3: Meaning of symbols

### 1.3.3 Terms

In this documentation the following terms are used:

| Term | Meaning |
|------|---------|
|      |         |

Table 4: Terms

### 1.3.4 Abbreviations

In this documentation the following abbreviations are used: Term

| Term | Meaning         |
|------|-----------------|
| OPS2 | Dewatering unit |

Table 5: Abbreviations

### 2.1 About this chapter

This product was manufactured according to the generally recognized standards of engineering. Nevertheless, there is a danger of injury or damage if you do not observe this chapter and the safety instructions in this documentation.

- › Read this document thoroughly and completely before working with the product.
- › Retain this document and ensure that it is available for all users at all times.
- › Always include the necessary documentation when passing the equipment along to a third party.

### 2.2 Intended use

This product is a hydraulic component.

You may use the product for the following:

- › dehydration of hydraulic fluids in a bypass circuit, in accordance with the device's technical specifications,
- › degassing of hydraulic fluids in a bypass circuit, in accordance with the device's technical specifications,
- › filtration of hydraulic fluids in a bypass circuit, in accordance with the device's technical specifications,
- › monitoring of hydraulic fluid parameters during the dehydration and/or filtration process, in accordance with the device's technical specifications.

This product is intended for professional use only and not for private use.

"Intended use" also includes that you have completely read and understood this documentation, in particular Chapter 2 "Safety Instructions".

### 2.3 Improper use

Any other use than the intended use described, is improper and inadmissible.

If unsuitable products are installed or used in safety-related applications, unintended operating states may occur in the application, which may cause personal injury and / or property damage.

Therefore only use this product in safety-related applications if this use is explicitly specified and permitted in the product documentation, e.g. in explosion protection areas or in safety-related parts of a control system (functional safety).

ARGO-HYTOS Polska assumes no liability for damages resulting from improper use. The risks associated with improper use are solely with the user.

### 2.4 Reasonable foreseeable misuse

The delivery of the following media is forbidden:

- › others than listed in Chapter 18.1 "Technical data"

especially:

- › flammable liquids such as petrol or thinner (explosion hazard)
- › foodstuffs
- › sludge and sediment

The operator alone is liable for damages resulting from improper use.

### 2.5 Qualification of personnel

The operations described in this document require fundamental knowledge of mechanics and hydraulics as well as knowledge of the appropriate technical terms. In order to ensure safe use, these operations may therefore only be carried out by a correspondingly skilled worker or an instructed person under the guidance of a skilled worker.

A skilled worker is someone who can - based on his / her technical education, knowledge and experience as well as knowledge of the respective regulations of the jobs assigned to him / her - recognize possible dangers and ensure appropriate safety measures. A skilled worker must observe the relevant technical regulations.

## 2.6 General safety instructions

- › Observe the valid regulations for accident prevention and environmental protection.
- › Observe the safety regulations and requirements of the country in which the product is used / applied.
- › Only use ARGO-HYTOS products that are in technically perfect condition.
- › Observe all instructions on the product.
- › People who assemble, operate, disassemble or maintain ARGO-HYTOS products may not do so under the influence of alcohol, other drugs or medications that affect the responsiveness.
- › Only use manufacturer-approved accessories and spare parts, in order to prevent personal danger due to unsuitable spare parts.
- › Observe the technical data and ambient specifications specified in the product documentation.
- › If unsuitable products are used or installed in safety-relevant applications, unintended operating states may occur in the application, which can cause personal injury and / or material damage. Therefore only use the product in safety-relevant applications if this use is explicitly specified and permitted in the product documentation.
- › You may only put the product into operation, when it has been established that the final product (e.g. a machine or system), into which the ARGO-HYTOS products have been installed, complies with the country-specific regulations, safety regulations and standards of the application.

## 2.7 Product and technology related safety instructions

|  <b>CAUTION</b> |   |
|--|---|
|                 | <p><b>Leaked hydraulic oil</b><br/><b>Environmental hazard / risk of slipping.</b></p> <ul style="list-style-type: none"><li>› In case of spills, cover the oil-covered surface immediately with an oil-binding medium.</li><li>› Then immediately dispose of the oil-binding medium according to the national environmental regulations.</li></ul> |
|                | <p><b>Ignition hazard</b><br/><b>Risk of electrostatic charge by poorly conducting hydraulic fluid.</b></p> <ul style="list-style-type: none"><li>› If the electrical conductivity of the hydraulic fluid is not known, please contact the manufacturer of the hydraulic fluid.</li></ul>   |
|               | <p><b>Risk of burns</b><br/><b>Contact temperatures according to DIN EN563 (3) and DIN EN13202 (4) may be exceeded during operation.</b></p> <ul style="list-style-type: none"><li>› Allow the off-line filter unit to cool down before touching it.</li></ul>  |

#### For prevention of material damage and product damage



CAUTION



#### **Danger due to improper handling**

##### **Property damage**

- › The off-line filter unit may only be used in accordance with Section 2.2, "Intended use".

##### **Leakage or spillage of hydraulic fluid**

##### **Environmental pollution and ground water contamination.**

- › Use oil binding agents in order to bind leaked hydraulic oil.



#### **Risk of burns**

##### **Contact temperatures according to DIN EN563 (3) and DIN EN13202 (4) may be exceeded during operation.**

- › Allow the off-line filter unit to cool down before touching it.

#### **Contamination due to fluids and foreign bodies**

##### **Premature wear, malfunction, risk of damage, property damage.**

- › Ensure cleanliness during installation in order to prevent foreign bodies, such as welding beads or metal chips, from entering the hydraulic lines, leading to premature wear or malfunction.
- › Make sure that connections, hydraulic lines and attachment parts (e.g. gauges) are free from dirt and chips.
- › Prior to commissioning, check that all hydraulic and mechanical connections are connected and tight, and that all gaskets and seals of the plug connectors are correctly assembled and undamaged.
- › For removal of lubricants and other contaminants, use residue-free industrial wipes.
- › Make sure that all connections, hydraulic lines and attachment parts are clean.
- › Ensure that no contaminants enter when closing the connections.
- › Make sure that no detergents enter the hydraulic system.
- › Do not use cotton waste or faying cleaning rags for cleaning.
- › Do not use hemp as sealing agent.



#### **Improper cleaning**

##### **Premature wear, malfunction, risk of damage, property damage.**

- › Close all openings with appropriate protective fittings to prevent penetration of detergents.
- › Do not use aggressive cleaning agents for cleaning. Clean the product with a suitable cleaning fluid.
- › Do not use a high-pressure cleaner.
- › Do not use compressed air to clean function interfaces such as seal areas.

## 4. Scope of delivery

---

This package includes:

- › 1 Dewatering Unit OPS2 010
- › 1 Operating manual

5.1 Component overview \*

\*The unit is presented without front and back cover plate.

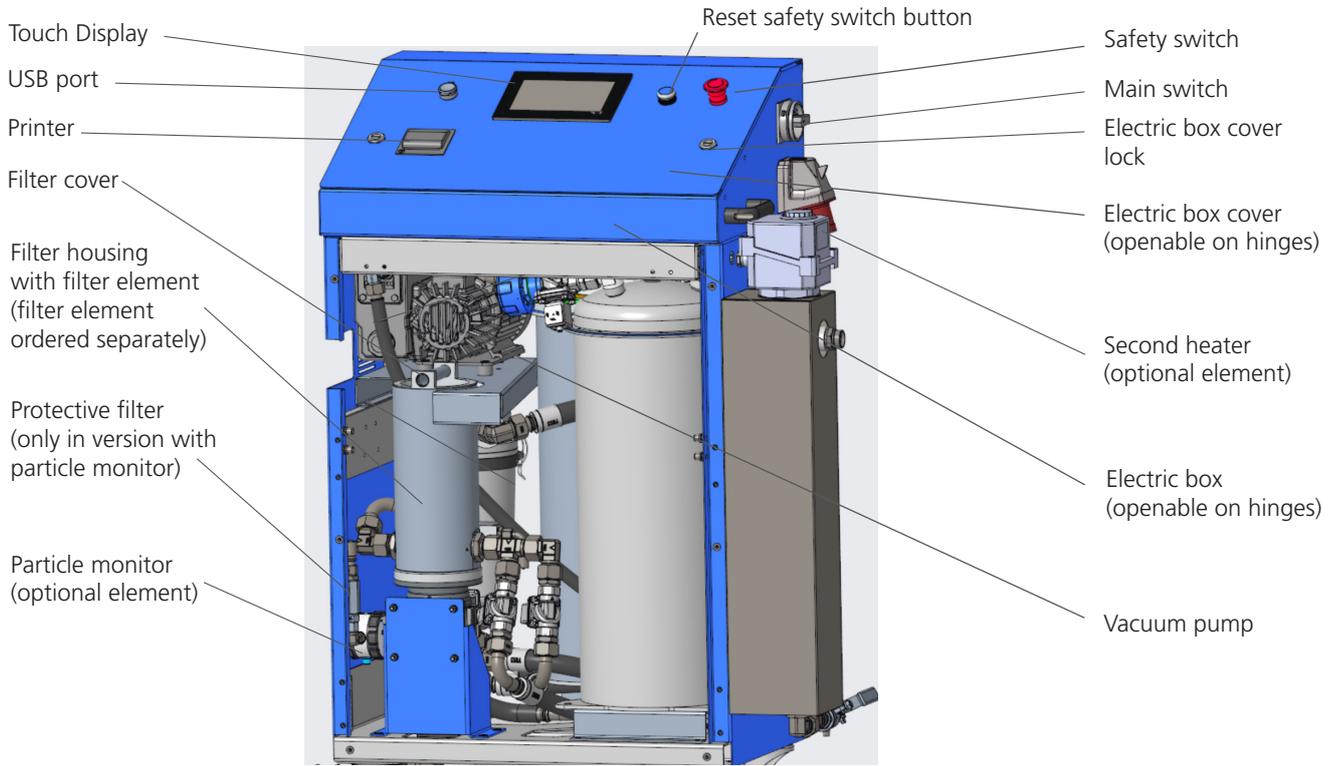


Fig.1a: Component overview

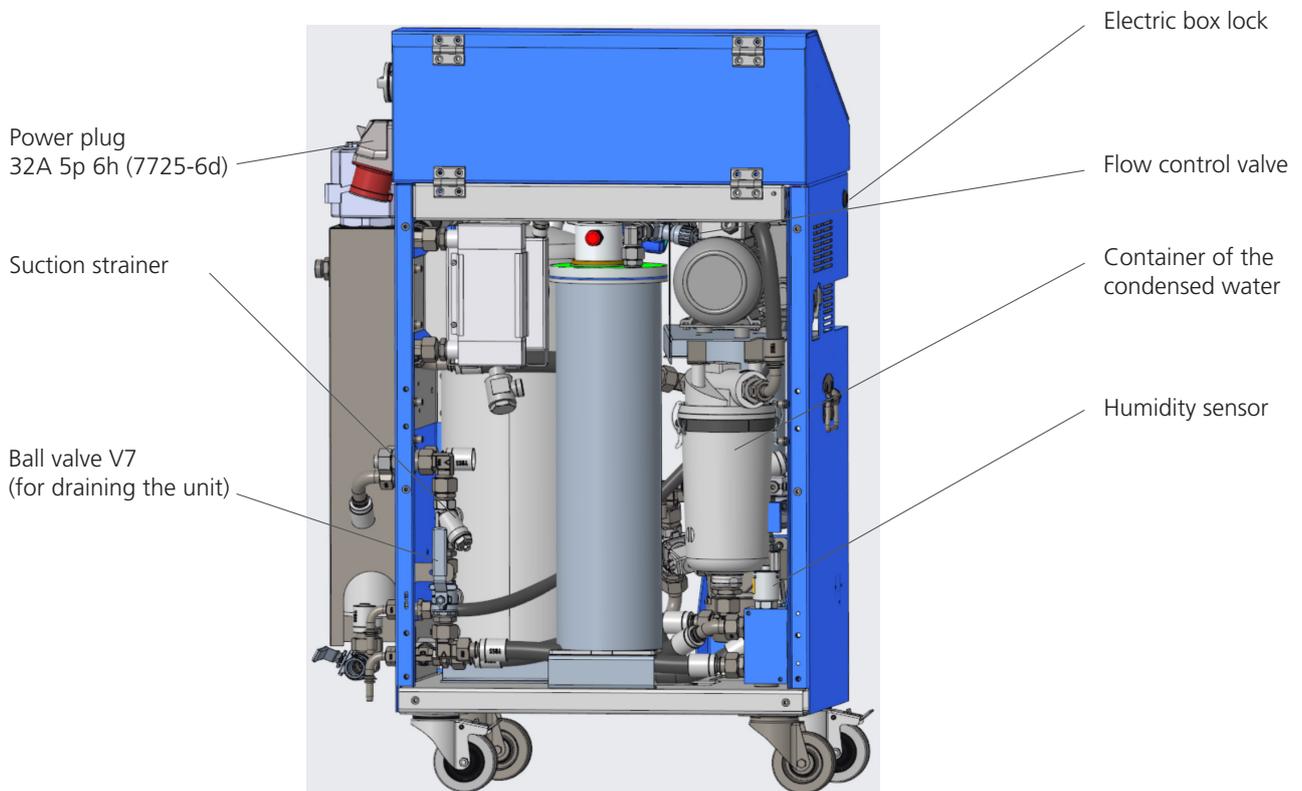


Fig.1b: Component overview

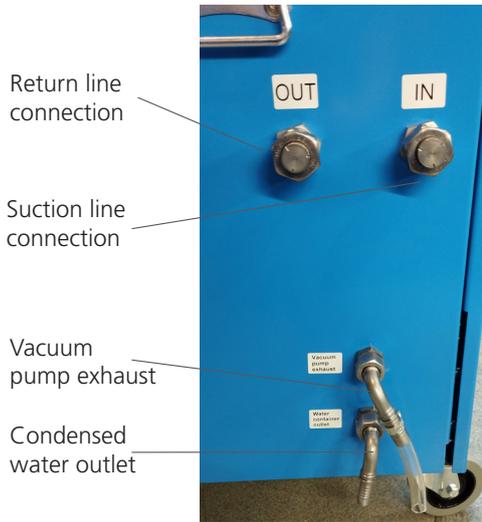


Fig. 1c: Component overview  
(versions with one heater)

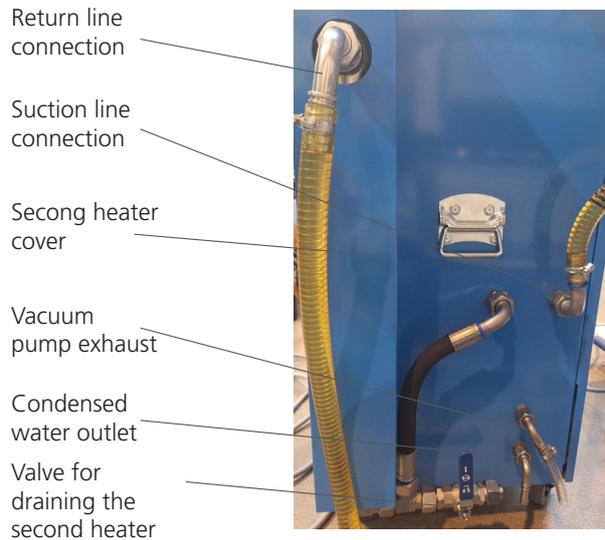


Fig. 1d: Component overview  
(versions with two heaters)

## 5.2 Description of selected components

### Touch display

The touch display is a control panel for steering the unit and visualizing the results. The control menu is described in chapter 8.

### Printer

The built-in printer is used for printing of measurement reports.

### Filter cover

The filter cover closes the filter housing of the off-line filter unit. The filter cover is equipped with ventilating valve.

### Filter housing with filter element

The filter housing contains the replaceable filter elements.

Changing the filter elements is described in chapter 10.

### Protective filter (only in version with particle monitor)

Coarse protection for the OPCOM Particle Monitor against solid particles. This filter should be inspected regularly and cleaned if necessary

### Suction line connection

Inlet port for the filtered fluid. Size 22L (M30x2 24 cone end).

### Return line connection

Outlet port for the filtered fluid. Size 22L (M30x2 24 cone end).

### Vacuum pump exhaust

Air outlet from the vacuum pump. During the dehydration process some moisture is released through this channel along with the exhaust air. Outlet size DN12.

### Condensed water outlet

During the dehydration process the condensed water collects in a collecting container. When the container is full the water is removed manually or automatically through the outlet line (see also chapter xxxxx). Outlet size DN12.

**Particle monitor** (option - only for version OPS2...PC...)

Laser sensor for measurement fluid contamination with solid particles. For more information see OPCOM Manual V 2.02.20

### **Safety switch**

The purpose of an emergency switch is to stop the unit quickly when there is a risk of injury or the workflow must be stopped.

### **Reset safety switch button**

For confirmation the machine is ready for operation. Press each time the device is connected to the power supply and/or after using the safety switch.

### **Flow control valve**

The valve is used to regulate the flow rate of the fluid delivered to the reactor during the dehydration process. The valve is factory-set. It is recommended to change its setting only when necessary (e.g., for very low-viscosity oil). Access to the valve is possible after opening the electrical box (openable on hinges).

### **Container of the removed water**

The water which is removed from the fluid during the process is partially collected in this container. This element could be drained manually or automatically. When it is full there is an appropriate signal in the touch screen.

### **Second heater (optional elements, all versions with EH in the ordering code)**

Apart from main heater which is mounted inside of the OPS2 unit all versions with the designation EH in the ordering code are equipped with extra flow heater. It is used to additionally heat the oil in the return line. In large-capacity applications, this accelerates the dehydration process. Power plug 32A 5p 6h (7725-6d)

### **Power plug 32A 5p 6h**

The plug is equipped with phase inverter.

### **Suction strainer**

Coarse protection for the OPS2 unit against solid particles. **This filter should be inspected regularly and cleaned if necessary.**

### **Ball valve V7**

The 2-way ball valve is used for switching between the two modes: normal operation or daining mode. On the touch screen, the operator is informed about the need to switch the valve to work in the appropriate mode.

### **Electric box (openable on hinges)**

The electric box is closed by the cover. The complete electric box is openable on hinges after unlocking locks shown in the Fig 1b. After tilting the electrical box, it is possible to access, for example, the throttle valve or the filter cover.

### **Electric box cover (openable on hinges)**

Cover of the electric box can be opened after unlocking the locks shown in the Fig 1a.

## **DANGER**



### **Danger to life**

### **Risk of electric shock**

- › Only trained, authorized personnel are permitted to open the electric box cover.
- › During repair work, turn off the unit and pull the mains plug.

### 5.3 Identification of the product

|                         |       |  |  |
|-------------------------|-------|--|--|
| Producer address        | _____ | <b>Oil service unit</b><br>PL 32-640 Zator<br>www.argo-hytos.com<br>Made in EU                 | <b>ARGO</b><br><b>HYTOS</b><br>A Voith Company                                     |
| Type                    | _____ | <b>Type:</b> OPS2 010XXXX/40050-PC-EH<br><b>Filter element:</b> -<br><b>Filter fineness:</b> - |  |
| Nominal flow volume     | _____ | <b>Qnom:</b> 10 l/min (dehydration),<br>16 l/min (off-line filtration)                         |  |
| Max. operating pressure | _____ | <b>pmax:</b> 5 bar   |  |
| Electric parameters     | _____ | <b>U</b> 3~380-440V<br><b>I<sub>max</sub></b> 28,5 A<br><b>P<sub>max</sub></b> 13,5kW          |  |
| Serial number           | _____ | <b>Serial number:</b> 2362313  |  |

Fig.2: Nameplate

### 6.1 Transport and Handling Instructions

Transport of the OPS2 unit between different facilities must be carried out in a vertical position. Loading and unloading of the unit onto or from vehicles shall be performed using a forklift truck, operated only by trained and authorized personnel. During road transport, the unit must be properly secured and fastened to prevent any movement, tilting, or tipping over. For in-plant transport, the unit is equipped with wheels and may be moved in a horizontal position. Before transport, ensure that no residual oil is leaking from the device or hoses. Seal or protect all potential leakage points of oil or water prior to transport. Always observe the safety notes provided in Chapter 2 "Safety Instructions." After transporting the unit to its final operating location, ensure that the transport wheel brakes are engaged to prevent unintended movement.

#### CAUTION



##### Hydraulic oil spills

##### Environmental hazard / risk of slipping

- › Before the transport completely drain the unit.
- › In case of spills, cover the oil-covered surface immediately with an oil-binding medium.
- › Then immediately dispose of the oil-binding medium according to the national environmental regulations.

### 6.2 Storage

The OPS2 010 dewatering unit should be stored in a confined space to protect it from humidity and condensation.

#### DANGER



##### Risk of injury

##### Danger of chemical reactions

Chemical substances in the immediate vicinity of the filter unit can react and lead to the destruction of the device and to injuries to persons in the immediate vicinity of the device.

- › Storage in the immediate vicinity of chemically active substances such as acids, alkalis, salts, organic solvents and rechargeable batteries is prohibited.

The ambient temperature during storage of the filter unit OPS2 010 should be between +0 °C and +50 °C at a maximum humidity of 80%.

Before storage over a period of more than 6 months, the device should be filled with oil in order to preserve it against corrosion.



**Risk of functional impairment**  
**Faulty power supply**

- › Always consider the country-specific regulations.

Let - prior to commissioning - an electrician check whether:

- › the mains voltage matches with the voltage specified on the type plate of the motor,
- › the power source has appropriately been secured: 16A for all versions with one heater, 30A for all versions with two heaters (EH in the ordering code)
- › the cross-section is of sufficient size,
- › cable and connection to the power source are in perfect condition.

The following steps are to be followed in detail:

- › connect the voltage plug to the local power supply (3~380-440V).
- › connect the fluid suction and return hose
- › check if the condenser return line is connected to the external container.

## 8. Menu structure and functions

The OPS2 is controlled via a touch screen. The home screen of the touch display is shown in Fig. 3. By clicking on the appropriate field / icon, it is possible to activate the given function or to go to the next screen with submenu. This chapter provides a description of the individual submenus and functions included in the steering algorithm.

There are two navigation buttons for switching between the screens of the display:



back to the previous screen

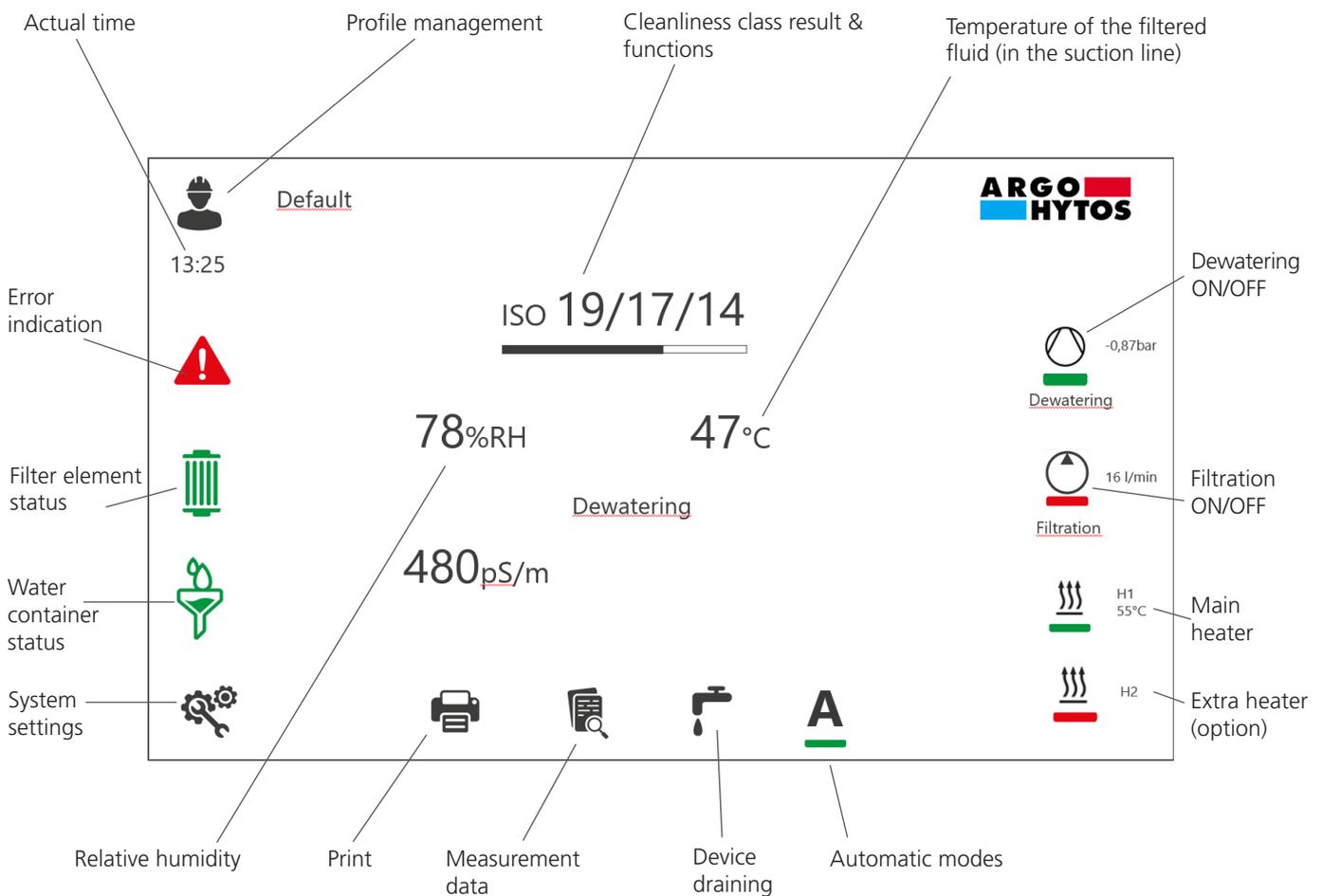


Fig.3: Start screen

### 8.1.1 Dewatering ON/OFF

Fields for switching-on and off the dewatering process. The bar below the pump symbol changes its color from red into green when the process is running. Dewatering can run in parallel with the filtration process, see also section 8.1.2

### 8.1.2 Filtration ON/OFF

Fields for switching-on and off the filtration process. The bar below the pump symbol changes its color from red into green when the process is running. Filtration can run in parallel with the dewatering process, see also section 8.1.1

| NOTE  |   |
|---|---|
|  | To stop the unit quickly in case of risk of injury, the safety button must be used. |

### 8.2 Main heater H1

The heater H1 is installed in the suction line of the dehydrator (before the reactor).  
The heater screen shown in the figure below enables the user to set the dehydration temperature. Next to the heater icon, the current oil temperature in the reactor—where the dehydration process takes place—is displayed.  
The temperature setting in the H1 heater is factory limited to a maximum value of 75°C

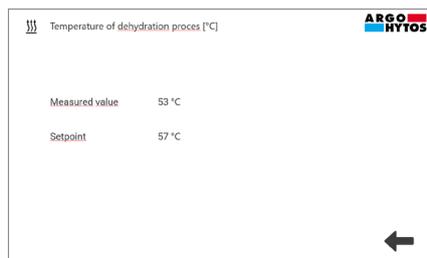


Fig. 4.: Heater H1 screen

| NOTE  |  |
|---|--|
|  | Note: For most hydraulic oils, the recommended dehydration temperature is <b>55–60°C</b> . Exceeding this range may lead to accelerated oil degradation. |

### 8.3 Extra heater H2 (option - only for version OPS2...PC...)

The auxiliary heater H2 is an optional component available only in OPS2 010...EH versions.  
It is installed in the dehydrator return line (downstream of the reactor). The oil discharged from the vacuum reactor can be heated in the return line, which accelerates the dehydration process—especially at the beginning, when the oil is initially cold and the volume to be dehydrated is large.

A thermostat is integrated into the H2 heater cover, allowing the user to set the maximum heating temperature.  
The maximum temperature that can be set on the H2 heater is 75 °C - see Fig. 5.



Fig. 5.: The H2 heater thermostat knob

## NOTE



Note: For most hydraulic oils, the recommended dehydration temperature is **55–60°C**. Exceeding this range may lead to accelerated oil degradation.

### 8.4 Actual time

Non-clickable field.

Shows the current time. The correct time can be set under the "System settings" button - see chapter 8.11.

### 8.5 Profile management

Through this field there is a possibility to activate, view and edit single profiles.

The OPS2 unit may be used for servicing of many systems which require completely different parameters and device settings. Changing of working conditions (for example the temperature of dewatering) does not result in the loss of the defined parameters. Operator can save the current settings in the individual profile. Profiles can be defined for different customers, machines, working stations etc. Each profile consists of a name and a set of individual settings. In the screen "Profile selection" see - Fig. 6.1 the user can choose and activate profiles. The "View" button displays the profile editing screen - see Fig. 6.2.

There is a default profile defined by the manufacturer. The name and settings of this profile cannot be changed.

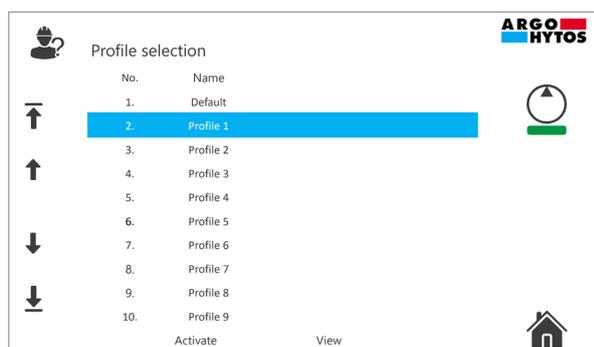


Fig. 6.1: Profile selection screen

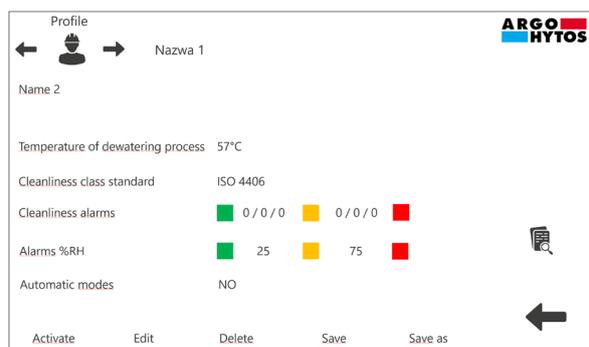


Fig. 6.2: Profile edition screen

In the "Profile" screen there is one additional button described below.



By clicking on this icon the data memory table is displayed. This button is also available in the home screen. Each profile has its own data memory. For more information see chapter 8.13.

## NOTE



The operator can temporarily change all settings of the OPS2. When doing so, the settings of the selected profile are not changed until the changes are saved with the SAVE key. The settings of the DEFAULT profile cannot be changed.

### 8.6 Errors and warnings history

An active error in the system is indicated by the icon  displayed on the home screen.

An active warning is indicated by the icon  displayed on the home screen.

After clicking these icons the screen with table is opened. In the table the user can read the error/warning number and description.

### 8.7 Filter element status

When the filter element is clogged, the color of the icon  changes from green to red. By clicking on this symbol, the operator can view the list of possible filter elements. The currently installed element is highlighted in blue - see Fig. 7. After installing another type of element, the correct code must be selected from the given list.

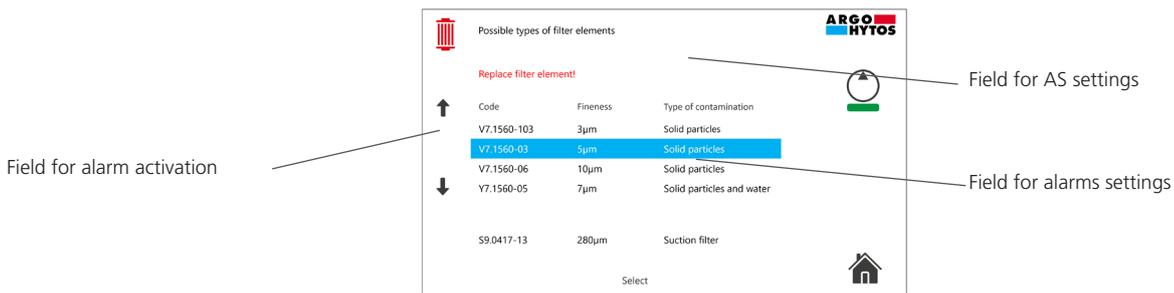


Fig. 7: Filter elements screen

### 8.8 Water (condensate) container status

During the dehydration process some water (condensate) which removed from oil is collected in the water container. When the water container

is full the color of the icon  changes from green to red. Clicking this icon opens the screen shown in Fig. 8 From this menu, the user can manually empty the water container by pressing the "Drain Water Container Manually" button. This button is monostable. The water container can also be set to empty automatically when it becomes full. To enable this function, press the "Activate Auto Drain When Full" button.

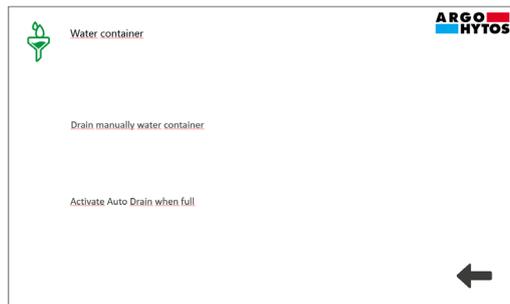


Fig. 8: Water container screen

 **CAUTION**

|   |   |
|---|---|
|  | <p><b>Water (condensate) spills</b><br/><b>Environmental hazard / risk of slipping</b></p> <ul style="list-style-type: none"> <li>› Before switching on the device, ensure that the outlet from the water container is connected to an external container intended for collecting the discharged water.</li> <li>› In case of spills, cover the water-covered surface immediately with a water-binding medium.</li> </ul> |
|---|---|

## 8.9 Relative humidity results

Displays the actual result of the relative humidity of the filtered fluid. By clicking in this field the screen shown in Fig 9 is opened.

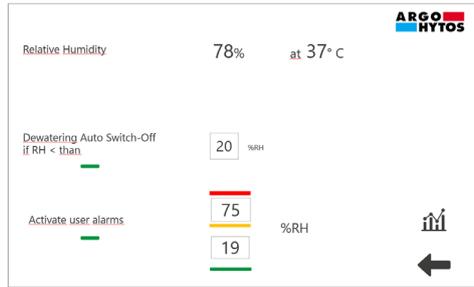


Fig. 9 Relative humidity screen

In the screen shown in Fig. 9 the operator can define and activate alarms and Auto Switch-off function.

By clicking on the icon  , the results are presented in the form of diagrams.

### 8.9.1 Relative humidity alarms

The operator can set the upper and lower limits for Relative Humidity (RH) and activates the function by clicking on the "Activate user alarms" field.

When the function is activated, the following alarms can be displayed on the home screen:

- RED alarm is displayed when the actual RH is above the upper defined limit. .
- YELLOW alarm is displayed when the the actual RH is between the lower and the upper defined limit.
- GREEN alarm is displayed when the actual RH is below the lower defined limit.

The alarms are displayed in the form of a red, yellow or green frame that appears around the RH result on the home screen.

### 8.9.2 Auto switch-off function

When the preset Relative Humidity (RH) is reached (three times in a row), the dewatering process is switched off automatically. The function is activated by clicking on the "Dewatering Auto switch-off if RH < than".

In the OPS2, the operator can also set automatic shutdown based on a defined time - see chapter 8.15.

## 8.10 Temperature of the filtered fluid

Displays the actual result of the temperature of the filtered fluid measured in the suction line (before the heater). By clicking in this field the screen shown in Fig 9 is opened. For description of functions shown in Fig.9 see chapter 8.9.1 and 8.9.2.

## 8.11 Conductivity of the filtered fluid

Non clicable field. Displays the actual result of the conductivity of the filtered fluid measured in the suction line (before the heater). For more infor see the LubCos H2O+ II manual.

Field that shows the current degree of contamination of the fluid, having the submenu shown in Fig. 10. The individual parts of the submenu are described in this chapter.

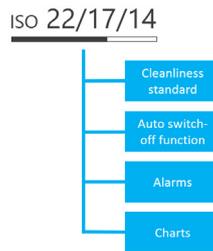


Fig. 10: Submenu of cleanliness class functions

8.12.1 Cleanliness standard

The operator can choose the following cleanliness standards: ISO 4406:1999, NAS 1638, SAE AS4059 and GOST 17216.

8.12.2 Filtration Auto switch-off (AS) function

When the preset cleanliness class (or better) is reached (three times in a row), the filtration process is automatically switched off. The desired degree of contamination for switching off the motor-pump is set by clicking on the field shown in Fig. 11. The function is activated by clicking on the "Automatic switch-off" field.

NOTE

Recommended cleanliness classes for selected hydraulic components are available after clicking on the icon ⓘ in the cleanliness class screen - see Fig. 11.

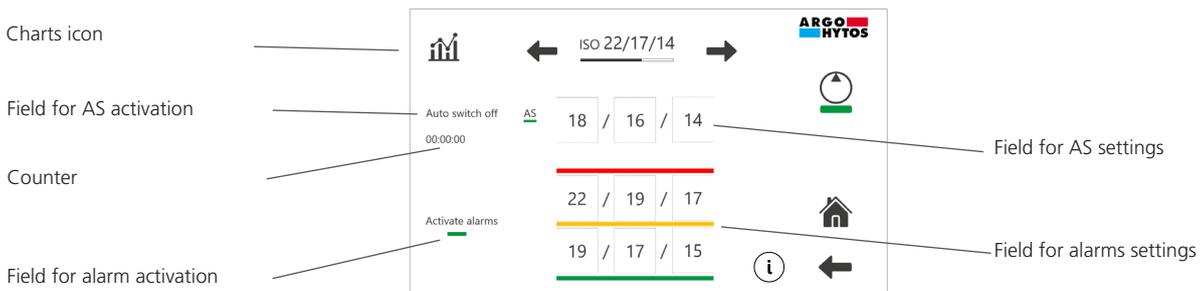


Fig. 11: Cleanliness class settings and functions

As an indication that the function is active, the letter combination AS is displayed with a green bar next to the cleanliness class field on the start screen.

The counter shown in Fig. 11 measures the time from the moment the AS is activated until the motor-pump unit is switched off. When the AS function is activated, the defined cleanliness class for switch-off can be stored in the selected profile - see chapter 8.5.

8.12.3 Alarms

This is an additional function for displaying the current state of oil cleanliness. The settings of this function are made in the field shown in Fig. 15. The operator sets the upper and lower limits for the cleanliness alarms and activates the function by clicking on the "Activate alarms" field.

When the function is activated, the following alarms can be displayed on the home screen:

- RED alarm is displayed when the current cleanliness class is equal or above the upper defined limit. For three-digit standards (for example ISO 4406 or SAE AS4059) the RED alarm is displayed when at least one part of the code is equal or above the upper defined limit.
- YELLOW alarm is displayed when the cleanliness class is between the lower and the upper defined limit. For three-digit standards (for example ISO 4406 or SAE AS4059) the YELLOW alarm is displayed when all parts of the code are below the upper defined limit and at least one part of the code is equal or above the lower defined limit.
- GREEN alarm is displayed when the cleanliness class is below the lower defined limit. For three-digit standards (for example ISO 4406 or SAE AS4059) the GREEN alarm is displayed only when all parts of the code are below the lower defined limit.

The alarms described above are displayed in the form of a red, yellow or green frame that appears around the cleanliness class field on the home screen - see Table 6. In the table, examples have been provided for ISO 4406 and NAS 1638 standards. For other cleanliness standards, the same rules for activating alarms apply.

| NOTE   |   |
|--|---|
|  | <p>If the OPS2 unit is operating in dewatering mode only and the filtration mode is disabled, the operator can configure the Auto-Switch Off and Alarm functions. When either of these functions is activated, the system will display the message:</p> <p>“Function will be activated in filtration mode.”</p> <p>This indicates that the selected function will become active only when the filtration mode is enabled.</p> |

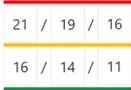
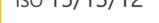
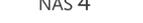
| Standard      | Pre-set values for alarms   | Current result and displayed alarm  |
|---------------|---|---|
| ISO 4406:1999 |  | <div style="border: 2px solid red; padding: 5px; display: inline-block;">ISO 22/18/15</div><br>    |
|               |   | <div style="border: 2px solid yellow; padding: 5px; display: inline-block;">ISO 15/13/12</div><br> |
|               |   | <div style="border: 2px solid green; padding: 5px; display: inline-block;">ISO 15/13/10</div><br>  |
| NAS 1638      |  | <div style="border: 2px solid red; padding: 5px; display: inline-block;">NAS 11</div><br>          |
|               |   | <div style="border: 2px solid yellow; padding: 5px; display: inline-block;">NAS 6</div><br>        |
|               |   | <div style="border: 2px solid green; padding: 5px; display: inline-block;">NAS 4</div><br>         |

Table. 6: Examples of cleanliness alarms

### 8.13 Measurement data

The measurement results collected by the particle monitor and the humidity sensor are stored in memory. Each profile has its own internal memory and temporary data memory.



Access to the Temporary Data Memory screen is available by pressing the icon on the home screen. This button is also accessible from the Profile Management screen. The results are presented in a tabular format (see Fig. 12).

Using the navigation arrows, the operator can select the desired profile to display the data.

The data recording frequency depends on the measurement time and pause time settings defined in the system configuration (see Chapter 8.17).

The system can store up to 1000 entries in the table. Once the table reaches its capacity, it is automatically cleared and refilled. The data is not lost, as all measurements are simultaneously saved in the internal memory. The system can store up to 65,535 measurement entries per profile in internal memory.

Data stored in the internal memory can be exported to a USB memory stick as a CSV file.

| Date & time         | %RH | T°C | ISO 4406 | P   | C Pj/m |
|---------------------|-----|-----|----------|-----|--------|
| 18.11.2020 14:52:03 | 44  | 37  | 4000     | 2.3 | 120000 |
| 18.11.2020 14:53:03 | 45  | 36  | 4000     | 2.3 | 120000 |
| 18.11.2020 14:50:03 | 45  | 34  | 4000     | 2.3 | 120000 |
| 18.11.2020 14:48:03 | 48  | 32  | -        | 2.3 | 120000 |
| 18.11.2020 14:47:03 | 48  | 32  | -        | 2.3 | 120000 |
| 18.11.2020 14:45:03 | 48  | 32  | -        | 2.3 | 120000 |

Fig. 12: Data memory

### 8.14 Printing of results



Measurement results can be printed after clicking on the "Print" icon in the home screen.

The printing of selected data is also possible from the screen "Measurement data" - see chapter 8.13.

A printout example is shown in Fig. 13. The settings for printout / quick reports are made in the System settings - see chapter 8.17.

```

ARGO-HYTOS
User name

Profile 1
09.06.2021
13:36:21

ISO 4406: 18/15/09
T: 27 °C
RH: 30 %
    
```

Fig. 13: Example of a printout

### 8.15 Automatic modes

The dehydration and filtration processes can be steered either manually by the operator or automatically based on predefined operating conditions. The menu for configuring automatic modes is available after clicking the icon **A** on the home screen.

The available automatic modes are shown in Fig. 14.

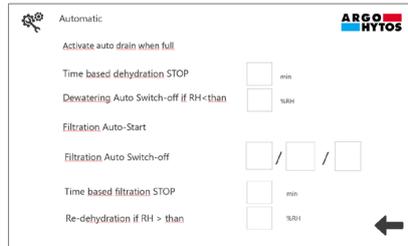


Fig. 14. Automatic modes

From this screen, the user can configure various process-control functions. For example, the device can be set to automatically stop the dehydration or filtration process after a specified time by using the “Time-based Dehydration STOP” and “Time-based Filtration STOP” buttons.

Processes may also be terminated automatically once a defined measurement threshold has been reached:

Dehydration: the process will stop when the Relative Humidity (RH) value is below the set threshold for three consecutive measurements — using the “Dewatering Auto Switch-off if RH < than” button.

Filtration: the process will stop when the purity class is better (lower) than the set value for three consecutive measurements — using the “Filtration Auto Switch-off” button.

If the OPS2 is operating only in dewatering mode, the operator may enable the automatic start of filtration by pressing the “Filtration Auto-Start” button.

Filtration will then begin automatically once the dewatering process is completed (e.g., according to one of the automatic stop conditions).

If the OPS2 is operating only in filtration mode, the operator may set an RH threshold at which the OPS2 will automatically re-start the dehydration process.

Dehydration will resume when the Relative Humidity exceeds the specified value for three consecutive measurements — using the “Re-dehydration if RH > than” button.

|  <b>CAUTION</b> |  |
|--|--|
|                 | <p><b>Hydraulic oil, water spills</b><br/><b>Environmental hazard / risk of slipping</b></p> <ul style="list-style-type: none"> <li>› Ensure that all hydraulic and electrical connections are correctly installed before enabling any automatic mode</li> <li>› Verify that the water discharge line is properly connected to an external container to prevent unintended leakage</li> <li>› Do not leave the device unattended during the initial setup of automatic modes</li> <li>› If abnormal noise, vibration, or temperature rise is detected, immediately stop the process and inspect the system</li> <li>› Only trained personnel should modify automatic settings or operate the unit</li> </ul> |

### 8.16 Device draining

When the dehydration and filtration processes are switched -off, the OPS2 unit can be drained from residual water and oil.

The draining screen shown in Fig 15. is available after clicking the icon  on the home screen.

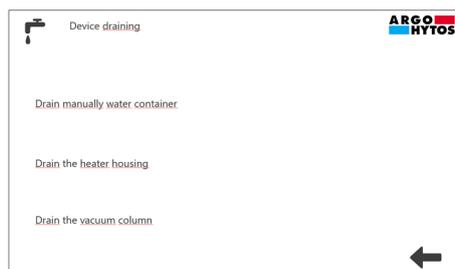


Fig. 15 Draining functions

“Drain manually water container” – this button is used to manually remove water/condensate from the water container.

“Drain the heater housing” – this button is used to remove residual oil from the heater housing.

“Drain the vacuum column” – this button is used to remove residual oil from the vacuum column.

| NOTE  |   |
|---|---|
|  | If you plan to drain residual oil from the device using the Device Draining function, it is recommended to first empty the suction hose. To do this, start any process (dehydration or filtration), lift the suction lance above the oil level, and draw in air until the suction hose is completely emptied. Once this step is completed, you can proceed to the Device Draining screen. |

| ! CAUTION   |  |
|---|--|
|  | <p><b>Hydraulic oil/ water spills</b><br/> <b>Environmental hazard / risk of slipping</b></p> <ul style="list-style-type: none"> <li>› During the draining process observe if there is not oil/water spills.</li> <li>› In case of spills, cover the oil/water-covered surface immediately with an appropriate binding medium</li> </ul> |

| ! CAUTION  |  |
|--|--|
|  | <p><b>Danger of environmental damage</b></p> <ul style="list-style-type: none"> <li>› Any oil/water that has leaked out should immediately be covered with oil/water binder.</li> <li>› Dispose of contaminated binders according to regulations.</li> </ul> |

### 8.17 Settings

Screen for basic system settings. This chapter contains a more detailed description of some parts of the submenu presented in Fig.16.1. The screen for system settings is presented in Fig. 16.2.

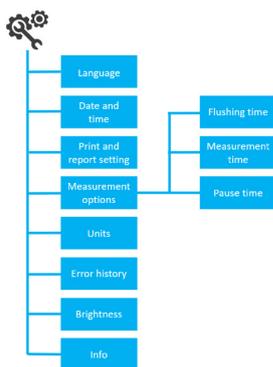


Fig. 16.1: System settings submenu

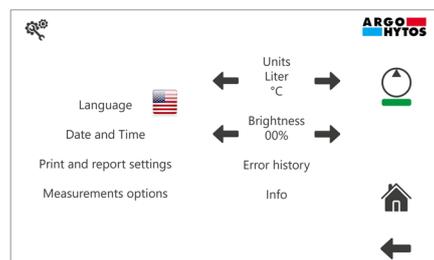


Fig. 16.2: System settings screen

#### 8.17.1 Print settings

The printout can be customized. The user can change titles and define which parameter is printed in the report. These settings apply to all printouts, regardless of the profile selected.

By clicking on the icon  , the printout preview is displayed.

## 8.17.2 Measurement options

In this screen the user can define:

- flushing time [in minutes] - time from the moment filtration starts until the first measurement is displayed. This is the period required to flush the device with filtered oil
- measurement time [in minutes] - time of the single measurement realized by the sensor
- pause time [in minutes ] - intervals between single measurements

### NOTE



#### **Inaccurate results**

#### **Erroneous measurements**

The measured values from the first few minutes should not be taken into account as the particle monitor is initializing and the hydraulic circuit has to stabilize (air bubbles, flushing, etc.).

## 9. Operation

### 9.1 Before commissioning

- › Connect hoses or pipes to the oil inlet and outlet. Minimum diameter of hoses: DN19mm.
- › Connect the hose at the outlet of the condensed water container and lead the hose into a suitable collecting vessel. Diameter of the hose DN12mm.

#### NOTE



- › The collecting vessel must be located below the liquid level of the collecting vessel in the unit.
- › Separated water must be able to drain unimpeded when the valve is opened.

- › Check the oil level and the condition of the oil at the oil sight glass of the vacuum pump (also see separate operating manual vacuum pump).

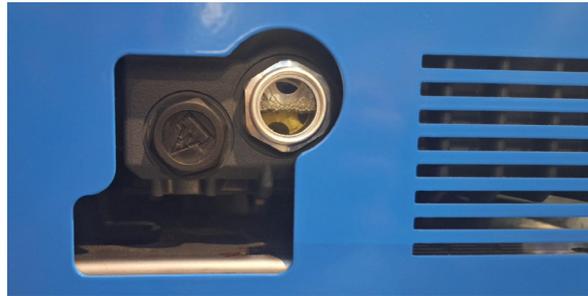


Fig. 17. Oil sight glass

- › Connect the appropriate power cable to the device.
- › Insert the suction hose and the return hose into the oil to be dewatered and secure it against slipping out.
- › Make sure that the suction line is clean.

#### NOTE



- › Keep the distance between suction and return hoses in the oil tank as large as possible to prevent the dehydrated oil from being sucked in again.

Prerequisites: Checks and settings are carried out before commissioning.

- › Switch on the device with the main switch and follow the instructions displayed on the touch screen.

| NOTE  |   |
|---|---|
|  | <ul style="list-style-type: none"> <li>› If the phase sequence is incorrect, the dewatering/filtration process cannot be started. On the touch display there will be an appropriate message about incorrect phase order.</li> <li>› If necessary change the phase order in the plug located on the side of the device.</li> </ul> |

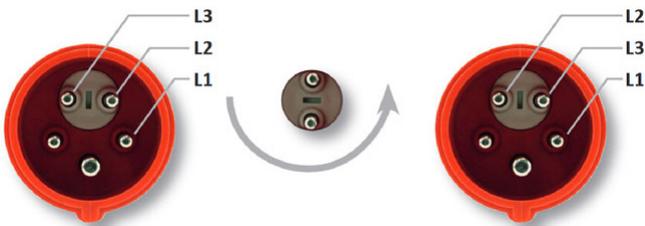


Fig.18: Electric plug

|  CAUTION |   |
|--|---|
|         | <p><b>Hydraulic oil spills</b><br/><b>Environmental hazard / risk of slipping</b></p> <ul style="list-style-type: none"> <li>› During operation observe if there is not oil spills.</li> <li>› In case of spills, switch off the device and check the tightness of the connections and hoses</li> <li>› Cover the oil-covered surface immediately with an oil-binding medium</li> </ul> |

|  CAUTION |  |
|---|--|
|          | <p><b>Danger of environmental damage</b></p> <ul style="list-style-type: none"> <li>› In the case of leaks in the device or at the connections, switch off the device immediately and eliminate leaks.</li> <li>› Any oil that has leaked out should immediately be covered with oil binder.</li> <li>› Dispose of contaminated oil binders according to regulations.</li> </ul> |

|  DANGER |   |
|--|---|
|         | <p><b>Life-threatening voltage</b></p> <ul style="list-style-type: none"> <li>› Open the control panel door only when the mains plug is disconnected</li> <li>› Connect the device to the power supply only when the fuses under the control panel are set to "ON"</li> </ul> |

 **CAUTION**



**Danger of property damage**

- › During operation observe if there is not oil spills.
- › In case of spills, switch off the device and check the tightness of the connections and hoses
- › Cover the oil-covered surface immediately with an oil-binding medium

- › Select the process which should be realized by the OPS2.  
The following processes can be selected (see also chapter 8.1.1 and 8.1.2):
  - Dewatering
  - Dewatering & filtration
  - Filtration

9.2.1 Dewatering

The system performs the vacuum dewatering process. - see also chapter 8.1.1.

The dehydrated oil collects in the reactor. There are level switches for switching the drain pump on and off. As soon as the maximum filling level has been reached, the emptying pump is switched on and the dehydrated oil is fed to the oil outlet via a housing where the fine filter element could be installed.

- › Define the correct temperature of the process - see chapter 8.2
- › Check indication of "Relative Humidity" on the home screen
  - Indication 100 % = free water is in the oil - red alarm
  - Indication 75 -100% = risk of free water in the system - red alarm in the warning screen.
  - Indication 50 - 75% = high water content in the system - yellow warning in the warning screen.
  - Indication < 50% No alarm in the warning screen.

The operation of the device is mostly automatic. However, the unit should be constantly checked for normal function or leaks during operation.

- › Regularly check the filling level in the water container. If necessary drain the water container manually or set the automatic water water removal when full - see chapter 8.8.
- › For dual-barrel operation monitor the tank from which the suction lance is drawing oil and stop the process once this tank becomes empty. After stopping the unit, swap the suction and discharge lances before restarting the operation.

See also chapter 8.15 to set automatic operation of the device.

**NOTE**



**Achieving the maximum dewatering performance**

- › Optimal water removal efficiency is achieved when the unit draws oil from one container and returns it to another.
- › If operation with two separate containers is not feasible, ensure that the suction pipe and the return pipe are positioned as far apart as possible within the same container. This prevents short-circuiting of the oil flow and improves the dewatering performance.
- › For dewatering-only operation, it is recommended to remove the filter element from the filter housing. Removing the filter element results in a faster water removal process.

9.2.2 Dewatering & Filtration

The OPS2 system simultaneously performs the vacuum dewatering process and the filtration process.- see also chapter 8.1.1 and 8.1.2.

- › Define the correct temperature of the process - see chapter 8.2
- › Check indication of "Relative Humidity" on the home screen
  - Indication 100 % = free water is in the oil - red alarm
  - Indication 75 -100% = risk of free water in the system - red alarm in the warning screen.
  - Indication 50 - 75% = high water content in the system - yellow warning in the warning screen.
  - Indication < 50% No alarm in the warning screen.

The operation of the device is mostly automatic. However, the unit should be constantly checked for normal function or leaks during operation.

- › Regularly check the filling level in the water container. If necessary drain the water container manually or set the automatic water water removal when full - see chapter 8.8.
- › Regularly check the filter element icon on the home screen - see also chapter 8.7.  
If the icon changes color from green to red, the fine filter must be replaced. For instructions on replacing the filter, refer to the Maintenance chapter.

See also chapter 8.15 to set automatic operation of the device.

| NOTE |   |
|------|---|
|      | <p><b>Achieving the maximum dewatering performance</b></p> <ul style="list-style-type: none"><li>› When both Dewatering and Filtration processes are active, optimal water removal performance is achieved when both the suction and return lances are placed in the same container</li><li>› Ensure that the suction pipe and the return pipe are positioned as far apart as possible within the same container. This prevents short-circuiting of the oil flow and improves the dewatering performance.</li><li>› For dewatering-only operation, it is recommended to remove the filter element from the filter housing. Removing the filter element results in a faster water removal process.</li></ul> |

9.2.3 Filtration

The system performs the solid particles filtration process. - see also chapter 8.1.2

The operation of the device is mostly automatic. However, the unit should be constantly checked for normal function or leaks during operation.

- › Regularly check the filter element icon on the home screen - see also chapter 8.7.  
If the icon changes color from green to red, the fine filter must be replaced. For instructions on replacing the filter, refer to the Maintenance chapter.

See also chapter 8.15 to set automatic operation of the device.

| NOTE |  |
|------|--|
|      | <p><b>Achieving the maximum filtration performance</b></p> <ul style="list-style-type: none"><li>› Ensure that the suction pipe and the return pipe are positioned as far apart as possible within the same container. This prevents short-circuiting of the oil flow and improves the dewatering performance.</li></ul> |

### 9.3 Shutting down and draining the device

When the results has been reached:

1. Switch -off the heater by reducing the heating temperature in the heater screen- see also chapter 8.2.  
In the OPS2 versions equipped with extra heater (**EH** in the ordering code) switch -off the heater by reducing the heating tempara ture in the thermostar - see chapter 8.3
2. Pull the suction lance above the oil level and suck in air until the suction hose is emptied of oil.
3. Switch -off all processes



#### Danger of environmental damage

- › After switching off, there is still residual oil and condensation in the unit.
- › Do not pull or disassemble the hoses until the device has been emptied

4. If necessary remove the condensate water from the water container - see chapter 8.16
5. Remove residual oil from the heater housing - see chapter 8.16
6. Remove residual oil from the vacuum column - see chapter 8.16
7. In the OPS2 versions equipped with extra heater (**EH** in the ordering code) remove residual oil from the extra heater housing.  
To remove residual oil from the extra heater housing open the ball valve shown in Fig. 5. Make sure there is a container below the valve outlet into which the oil will be drained.



Ball valve for removing residual oil from the device.

Fig. 19 View of the OPS2 010...EH.



#### Hydraulic oil spills

#### Environmental hazard / risk of slipping

- › During drainage observe if there is not oil spills.
- › In case of spills, switch off the device and check the tightness of the connections and hoses
- › Cover the oil-covered surface immediately with an oil-binding medium

## 9.4 Throttle Valve Adjustment

The throttle valve is located beneath the electrical box (see Fig. 20). The valve is factory-set and normally does not require adjustment.

Inspect the water collecting container. If oil droplets are observed in the separated water, reduce the flow by turning the throttle valve adjustment knob accordingly.



Fig. 20 Localization of the throttle valve

This chapter provides information on the inspection, maintenance and repair of the device

### DANGER



#### **Danger to life Risk of electric shock**

- › During repair work, turn off the unit and pull the mains plug.

### NOTE



#### **On performing any work please observe:**

- › The safety instructions in chapter 2
- › The component documentation

#### 10.1. Safety instructions

The general instructions in the operating instructions for inspection, maintenance and repair must be complied with.

Please also pay attention to the "supplier's documentation" for purchased parts such as motors, pumps, etc.

Maintenance work may only be carried out by qualified persons.

The authorized persons must be instructed by the operator and be familiar with the operating instructions of the device as well as the applicable occupational safety and accident prevention regulations.

After completion of the maintenance work and before each restart, check the safety devices for presence and functionality

### WARNING



#### **Risk of personal injury and equipment damage**

- › Disconnect all supply lines during all maintenance work on the device.
- › Protect against reconnection, disconnect the mains connection cable.
- › Check that no voltages are present.
- › Depressurize all lines

#### 10.2. Cleaning

Clean the device regularly with fiber-free cleaning cloths.

- › Do not use aggressive cleaning agents.
- › Observe the manufacturer's instructions when using cleaning agents. Improper detergents can damage or destroy components. They can also be the cause of disturbances.
- › When cleaning and removing dirt, do not blast components with compressed air, but vacuum the dirt, wipe with a hand brush or wipe with fiber-free cleaning cloths.
- › After cleaning, inspect all cables for leaks, loosened connections and scrubbers.
- › Fix any defects immediately

### NOTE



#### **Risk of damage to the control panel**

- › Clean the operating panel only with a damp cloth.
- › Do not use aggressive or abrasive cleaning agents

### 10.3. Maintenance

Maintenance includes cleaning, retightening of loose parts, replacing operating and auxiliary materials.

#### 10.3.1 Cables and hoses

Regularly inspect all pipes, hoses and fittings for leaks and visible signs of damage. Eliminate any damage immediately. Make sure that the pressure lines are properly laid and installed. Do not mix up the connections. Fittings, length and quality of the hose lines must meet the requirements. Disconnect all pipes and hoses before any maintenance work on the unit

#### 10.4 Maintenance overview

The following maintenance tasks shall be carried out on the device:

Inspect the suction filter and clean or replace it as required.

Inspect the filter element and replace it if necessary.

Inspect the OPCOM protective filter and clean or replace it as required.

Inspect the vacuum pump oil level and condition.

Replace the oil in the vacuum pump and the exhaust filter in accordance with the maintenance schedule.

#### 10.5 Changing the filter element

1. Remove residual oil from the OPS2unit (see Chapter 9.3 and 8.16).
2. Disconnect the OPS2 unit from the power supply and, if necessary, pull the mains plug.

|  <b>CAUTION</b> |   |
|--|---|
|                 | <p><b>Risk of burns</b><br/>Contact temperatures according to DIN EN563 (3) and DIN EN13202 (4) may be exceeded during operation.</p> <p>› Allow the filter unit to cool down before touching it.</p> |

| Maintenance work                       | Maintenance interval  |
|--|---|
| Checking / changing the filter element | Once the clogging indicator responds at a permissible viscosity. Filter element status is displayed on the home screen - see also chapter 8.7.<br><br>It is recommended to replace the filter element at least once a year. |

| <b>NOTE</b>   |  |
|---|--|
|  | Compatible filter elements are listed in this manual and also in the corresponding screen of the touch display - see Chapter |

### 10.5.1 Removing filter element

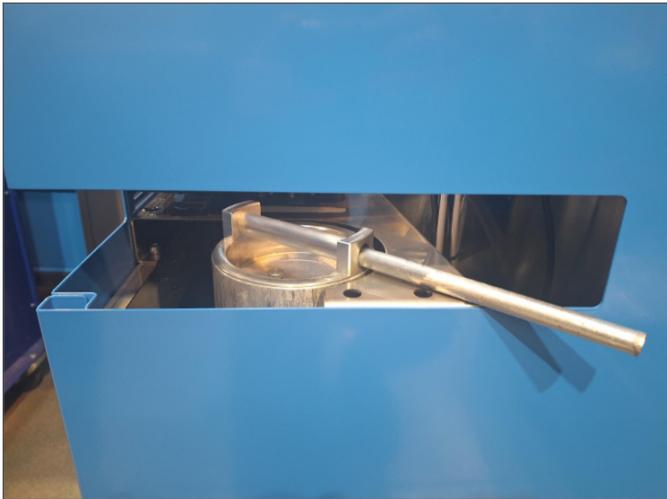


Fig. 21: Removing the filter element

1. Loosen the cover counterclockwise. Use a tube or rod to do this. Access to the cover is provided through a special cutout in the casing - see Fig. 21
2. Disconnect the hose from the connector to have better access to the cover - see Fig. 22
3. Carefully remove the cover (1) with the filter element (2) from the filter tube -see Fig. 23  
(The filter element is attached to the cover.  
Let the draining oil drip off into the housing.)

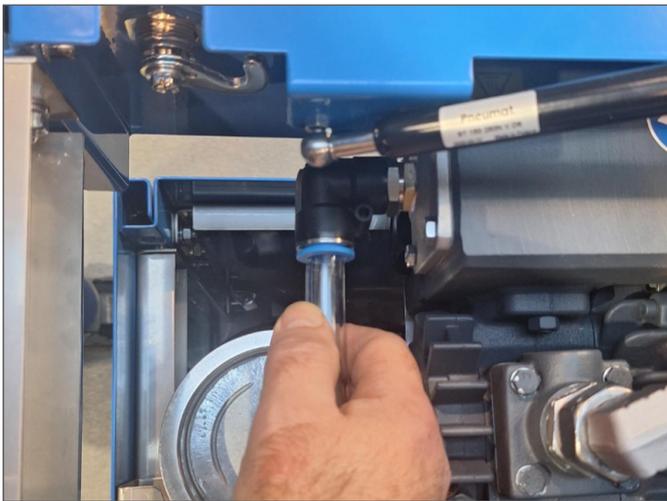


Fig. 22: Removing the filter element



Fig. 23: Removing the filter element

### 10.5.2 Removing the filter element from the cover



Fig. 24: Removing the filter element from the cover

1. Push the filter element at the cover in arrow direction 1 and remove it in arrow direction 2.
2. Dispose of the filter element according to the national environmental legislation (Waste code: Oil filter 16 01 07).

### 10.5.3 Attaching the filter element

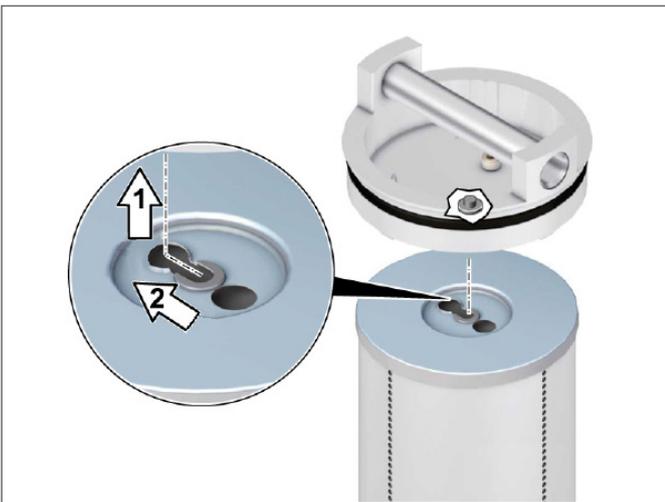


Fig. 25: Attaching the filter element

1. Check the filter element type number. Does the laser inscription on the filter element match with the indications on the type plate or in the operating manual?
2. Attach the filter element in arrow direction 1 and lock it in arrow direction 2.

### 10.5.4 Installing the filter element



Fig. 26: Installing the filter element

1. When changing the filter element, always replace the O-ring in the cover (supplied with the filter element) (O-ring Order No. N007.1175, included with replacement filter elements).
2. Carefully insert the cover (1) with the filter element (2) into the filter tube.
3. Screw in the cover manually until it stops. A gap between the cover and the filter tube may remain visible.
4. Plug the hose into the connector, close the electric box

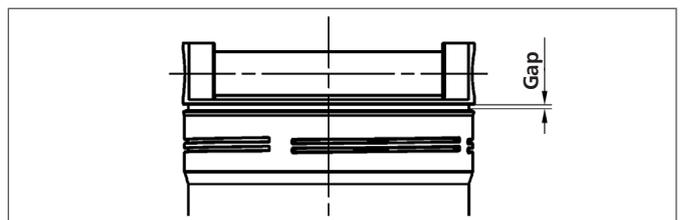


Fig. 27: Gap at the filter cover

**NOTE**



**ARGO-HYTOS offers you a comprehensive service package for the repair of the OPS2 unit.**

- › Repairs to the OPS2 unit may only be carried out by the manufacturer or his authorized dealers and branches. No warranty is given for self-made repairs.

**10.6 Checking & cleaning (changing) the suction strainer.**

The localization of the suction strainer is presented in the Fig. 28



Fig. 28: Suction strainer localization

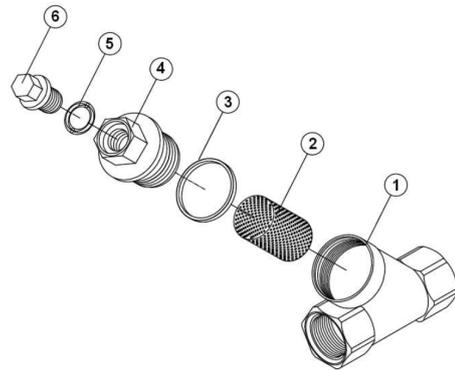


Fig. 29: Suction strainer elements.

1. Remove residual oil from the OPS2unit (see Chapter 9.3 and 8.16).
2. Disconnect the OPS2 unit from the power supply and, if necessary, pull the mains plug.
3. Unscrew the bonnet (4) - see Fig. 29
4. Clean the screen (2) or if necessary replace it for the new element (code 980141)

| Maintenance work                                     | Maintenance interval   |
|--|--|
| Checking & cleaning (changing) the suction strainer. | Minimum once a month.<br>It is recommended to check the suction strainer before each start up of the device. |

Table 6. Maintenance schedule for suction strainer

**NOTE**



**When the suction strainer is serviced, oil accidentally spilled onto components of the OPS2 unit can create the appearance of a leak.**

- › As far as possible - remove any residual oil from the device!

**10.7 Checking / cleaning OPCom protective filter (only in version with particle monitor, PC in the ordering code)**

The localization of the OPCom protective filter is presented in the Fig.30 (front cover must be removed).

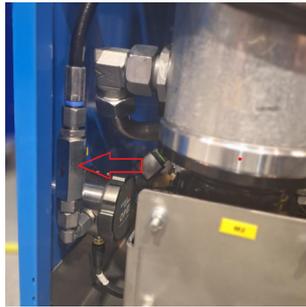


Fig. 30 Localization of the protective filter

1. Remove residual oil from the OPS2unit (see Chapter 9.3 and 8.16)
2. Disconnect the OPS2 unit from the power supply and, if necessary, pull the mains plug.
3. Provide a drip tray for residual oil and the contaminated filter element.
4. Unscrew the filter
5. Clean filters using cleaning agent and compressed air. If necessary install new filter (order no. 15077600)
6. Install filter to the system

| Maintenance work                            | Maintenance interval   |
|---|--|
| Checking / cleaning OPCom protective filter | Minimum quarterly<br>This filter should be inspected regularly and cleaned if necessary. |

Table 7. Maintenance schedule for protective filter

**10.8 Vacuum pump maintenance**

| <b>CAUTION</b> |   |
|----------------|---|
|                | <p><b>Hot surface</b><br/><b>Risk of burns</b></p> <ul style="list-style-type: none"> <li>› Allow the device unit to cool down before touching it.</li> </ul> <p><b>Hot liquids</b><br/><b>Risk of burns</b></p> <ul style="list-style-type: none"> <li>› Before draining liquids, let the machine cool down first.</li> <li>› Use personal protective equipment.</li> <li>› Wear safety gloves.</li> </ul> |

The vacuum pump maintenance intervals depend very much on the individual operating conditions. The intervals given below are considered as starting values which should be individually shortened or extended as appropriate.

For detailed information about vacuum pump maintenance see also Busch vacuum pump instruction manual, pump type KC 0016 E.

| Maintenance work                             | Maintenance interval               |
|--|------------------------------------|
| Check the oil level                          | Weekly                             |
| Change the oil and the exhaust filters (EF). | Every 2000 hours or every 6 months |

Table 8. Maintenance schedule for vacuum pump

### 10.8.1 Oil Level Inspection

1. Stop the machine.
2. Wait 1 minute.
3. Check the oil level.
4. Fill up if necessary.

### 10.8.2 Filling Oil

1. Only use an oil type which has previously been approved and recommended by the manufacturer.
2. Follow the graphical instruction presented in the Fig. 31.

Oil type: VM 032 - 1 Liter, code 0831000086

Exhaust filter, code 0532140154

O-ring (1), code: 0486 000 590

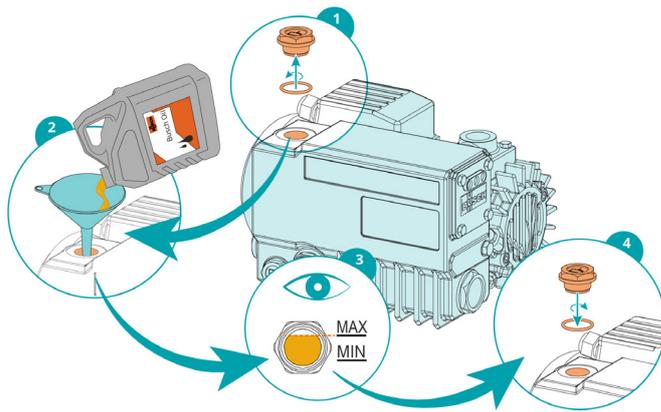


Fig. 31: Oil filling illustration (source Busch Instruction no. R5 KB KC 0010-0016 E no. 0870169526)

### 10.8.3 Oil Change

1. Only use an oil type which has previously been approved and recommended by the manufacturer.
2. Remove the oil from the pump - follow the graphical instruction presented in the Fig. 32.
3. Fill the pump with the new oil - see chapter 10.8.2

Oil type: VM 032 - 1 Liter, code 0831000086

O-ring (1), code: 0486 000 505

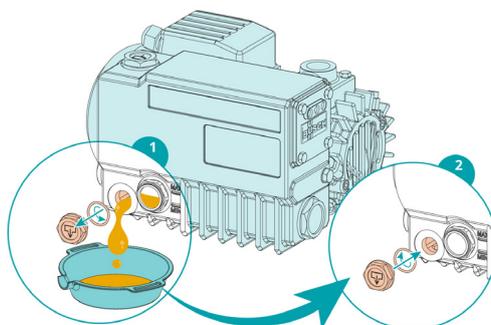


Fig. 32: Oil change illustration (source Busch Instruction no. R5 KB KC 0010-0016 E no. 0870169526)

### 10.8.4 Exhaust Filter Change

1. To remove the used filter follow the graphical instruction presented in the Fig.33
2. To install the new filter follow the graphical instruction presented in the Fig. 34

Exhaust filter, code 0532140154

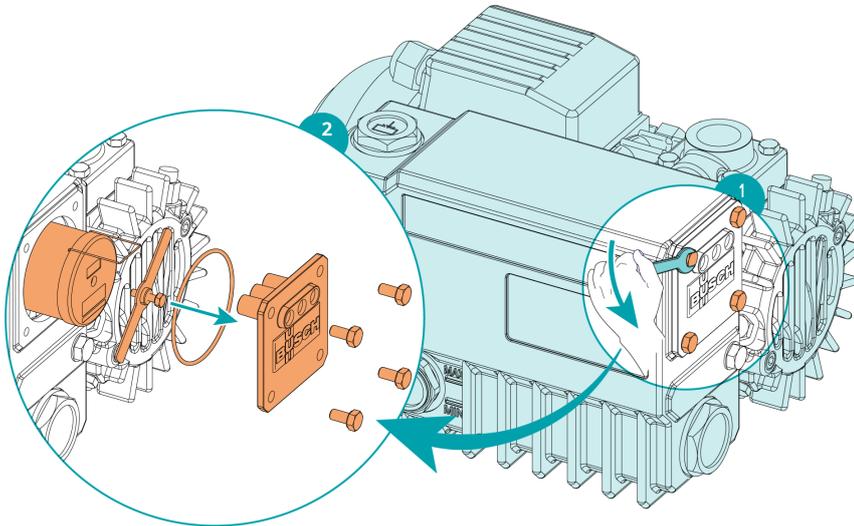


Fig. 33: Exhaust filter removal - illustration (source Busch Instruction no. R5 KB KC 0010-0016 E no. 0870169526)

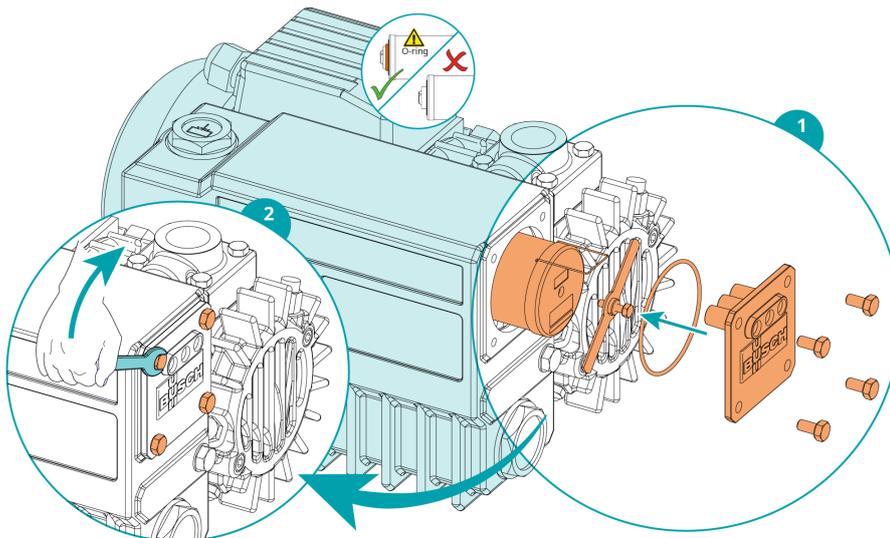


Fig. 34: Exhaust filter installation - illustration (source Busch Instruction no. R5 KB KC 0010-0016 E no. 0870169526)

## 10.9 Disposal of operating and auxiliary materials

All substances, e.g. waste oil (including biodegradable oil), filters, auxiliaries, etc., must be carefully separated from other waste. To keep waste disposal costs as low as possible, waste oils from the various categories should be collected separately

|  CAUTION |  |
|---|--|
|          | <p><b>Danger of environmental damage</b></p> <ul style="list-style-type: none"><li>› In case of improper disposal, operating and auxiliary materials can lead to environmental damage.</li><li>› Ensure safe and environmentally safe disposal of operating and auxiliary materials as well as exchange parts.</li><li>› Observe the applicable national and regional regulations.</li></ul> |

## 11. Decommissioning

| DANGER   |   |
|--|---|
|  | <p><b>Danger to life</b><br/><b>Risk of electric shock</b></p> <ul style="list-style-type: none"><li>› Electrical installation work must only be executed by qualified personnel.</li></ul> |

|  CAUTION |   |
|---|---|
|          | <p><b>Hot surface</b><br/><b>Risk of burns</b></p> <ul style="list-style-type: none"><li>› Allow the device unit to cool down before touching it.</li></ul> <p><b>Hot liquids</b><br/><b>Risk of burns</b></p> <ul style="list-style-type: none"><li>› Before draining liquids, let the machine cool down first.</li><li>› Use personal protective equipment.</li><li>› Wear safety gloves.</li></ul> |

- › Stop the machine and lock it to prevent accidental start-up.
- › Disconnect the power supply.
- › Disconnect all hydraulic connections.

- › Drain and collect the oil.
- › Make sure that no oil drips onto the floor..
- › Remove and dispose all filters from the machine.
- › Separate special waste from the machine.
- › Dispose of special waste in compliance with applicable regulations.
- › Dispose of the machine as scrap metal.

### 13.1 Environmental protection

Careless disposal of the dewatering unit OPS2 010 and fluid residues can lead to environmental pollution. Therefore, dispose of the unit and fluid residues according to the national regulations of your country. Dispose fluid residues according to the relevant safety data sheets for these fluids.

Do not modify the OPS2 010 dewatering unit.

### NOTE



The warranty of ARGO-HYTOS applies to the delivered configuration and extensions, which were taken into account during configuration.  
The warranty expires after a conversion or extension that goes beyond the conversions or extensions described here.

Unauthorized conversions or extensions, which are not described in this chapter, make the CE marking invalid.



### CAUTION



#### Risk of personal injury and equipment damage.

- › Troubleshooting must only be carried out by qualified persons.
- › The authorized persons must be instructed by the operator and be familiar with the operating instructions of the device as well as the applicable occupational safety and accident prevention regulations.
- › Check the safety devices for existence and operability after completion of the work and before each restart.

### 15.1 Basic procedure

- › You should also be systematic and targeted under time pressure.  
Random, unsupervised dismantling and adjustment of setting values can lead to the fact, that the original cause of the fault cannot be detected anymore.
- › Get an overview on the function of the unit in connection with the overall system.
- › Try to find out whether the product has provided the required function in the overall system before the error occurred.
- › Try to record changes to the overall system in which the unit is installed:
- › Have the operating conditions or the area of application of the unit been changed?
- › Have modifications (e.g. conversions) or repairs been carried out at the overall system (device / unit, electrics, control) or at the product? If so, which modifications?
- › Has the product or the device been operated correctly?
- › How does the fault tend to show?
- › Get a clear impression about the cause of trouble. Possibly consult the direct operator.

If you cannot correct the error, please contact one of the contact addresses listed under [www.argo-hytos.com](http://www.argo-hytos.com).

| Error   | Reason  | Measure   |
|---|---|---|
| Device does not start   | <ul style="list-style-type: none"> <li>› Emergency stop button is pressed</li> <li>› Reset safety button not pressed</li> <li>› Fuses under control panel are not switched to "ON"</li> <li>› Missing mains voltage</li> <li>› Motor defective</li> </ul> | <ul style="list-style-type: none"> <li>› Release emergency stop button</li> <li>› Press the reset safety button</li> <li>› Switch the fuses under the control panel to "ON"</li> <li>› Establish power supply / activate electrical fuse</li> <li>› Replace motor (repair at manufacturer)</li> </ul>   |
| Vacuum pump does not start  | <ul style="list-style-type: none"> <li>› Motor protection switch is tripped</li> <li>› Oil level of the vacuum pump is too low</li> <li>› Viscosity too high</li> <li>› Suction height too great</li> <li>› Pump defective</li> </ul>                     | <ul style="list-style-type: none"> <li>› Press the motor protection switch</li> <li>› Refill the pump oil</li> <li>› Heat medium or decrease the flow setting</li> <li>› Adjust suction height</li> <li>› Replace pump (repair at manufacturer)</li> </ul>  |
| Vacuum is not achieved  | <ul style="list-style-type: none"> <li>› Leakage in the system</li> <li>› Check the filter in the vacuum pump</li> <li>› Oil level of the vacuum pump too low</li> </ul>  | <ul style="list-style-type: none"> <li>› Check for leaks</li> <li>› Replace the exhaust filter in the vacuum pump</li> <li>› Refill the pump oil</li> </ul>   |
| Filter unit pump does not suck  | <ul style="list-style-type: none"> <li>› Leakage on the suction side</li> <li>› Sealing plug of the screen element is leaking</li> <li>› Unit is pumped empty (when refilling)</li> </ul>   | <ul style="list-style-type: none"> <li>› Replace the suction hose or seal the connection points (retighten them)</li> <li>› Check / replace sealing ring, check tightening torque</li> <li>› Prime the unit (0.5 l to 1 l)</li> </ul>   |
| Cleanliness classes displayed on the screen do not change during cleaning | <ul style="list-style-type: none"> <li>› Max. dirt capacity of the filter element is reached</li> <li>› Leakage at the suction hose, falsification of the measurement results by free air in the oil (air bubbles)</li> </ul>                             | <ul style="list-style-type: none"> <li>› Replace filter element</li> <li>› Check the suction connection, if necessary, tighten the hose clips / check the oil for foaming or air bubbles and eliminate the cause.<br/>If the cause cannot be eliminated, take the oil sample and have it evaluated in the laboratory. Vent the filter unit</li> </ul> |
| Cleanliness classes displayed on the screen become poorer during cleaning | <ul style="list-style-type: none"> <li>› Max. dirt capacity of the filter element is reached</li> <li>› Leakage at the suction hose, falsification of the measurement results by free air in the oil (air bubbles)</li> </ul>                             | <ul style="list-style-type: none"> <li>› Replace filter element</li> <li>› Check the suction connection, if necessary, tighten the hose clips / check the oil for foaming or air bubbles and eliminate the cause.<br/>If the cause cannot be eliminated, take the oil sample and have it evaluated in the laboratory. Vent the filter unit</li> </ul> |
| Displayed cleanliness classes are not plausible                           | <ul style="list-style-type: none"> <li>› Viscosity range below or exceeded. Particle counter is supplied with too little or too much oil</li> </ul>   | <ul style="list-style-type: none"> <li>› Adjust the fluid temperature (also see operating conditions)</li> </ul>  |
| Relative humidity does not improve during the process                     | <ul style="list-style-type: none"> <li>› Process temperature too low</li> <li>› Damp filter element</li> </ul>  | <ul style="list-style-type: none"> <li>› Adjust the process temperature (check maximum allowable temperature for the filtered fluid)</li> <li>› Remove the filter element</li> </ul>  |

Table 9: Error description

16.1 Dimension drawing

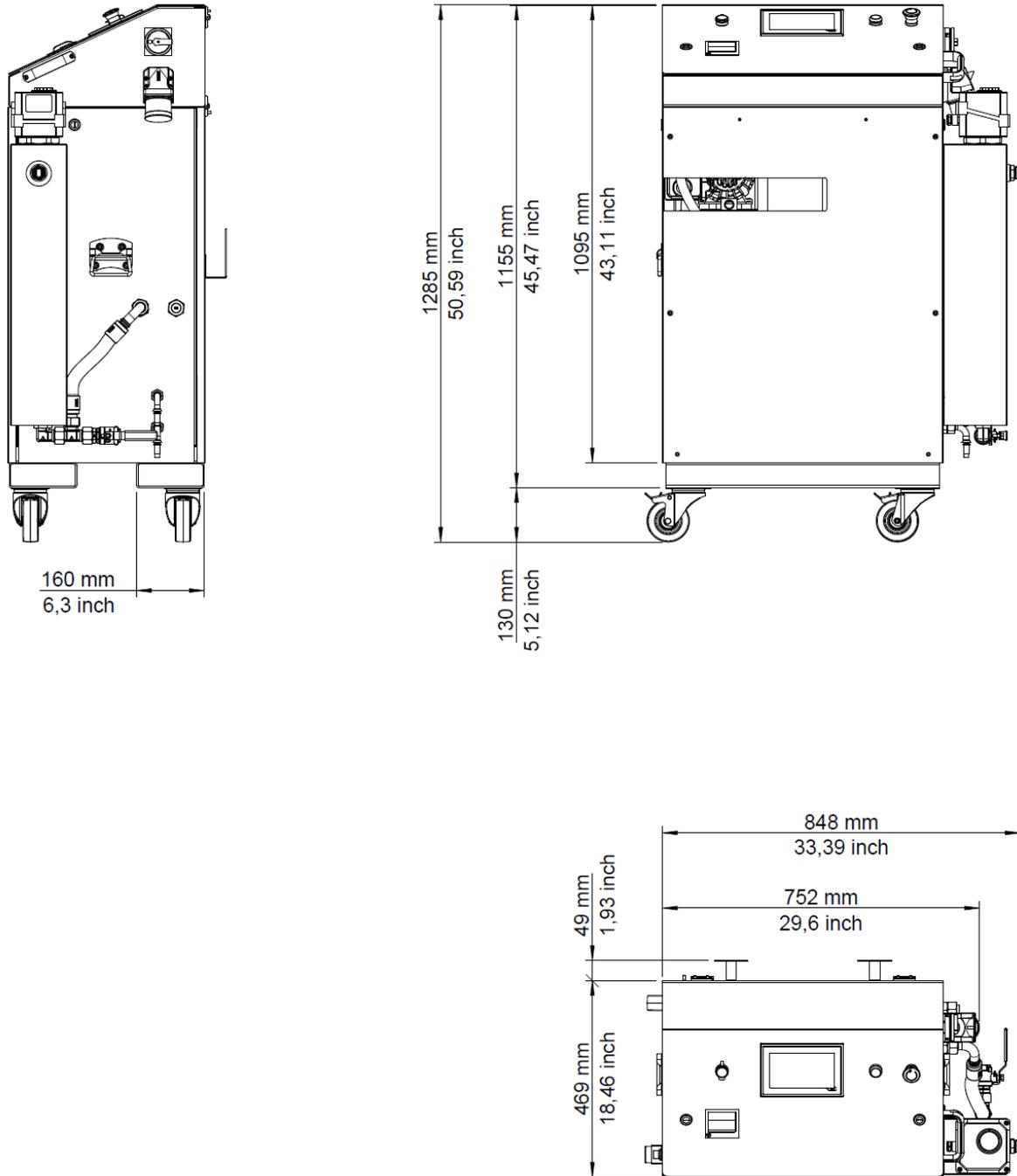


Fig. 35: Dimension drawing

## 16.2 Technical data

|   |                |   |
|---|----------------|---|
| Nominal flow  | l/min<br>l/min | 10 for dewatering process<br>16 for filtration process  |
| Pressure relief valve                               | bar            | 5 ± 0.5   |
| Max. operating pressure                             | bar            | 5   |
| Filter element                                      |                | V7.1220-113 B3(c) ≥ 200<br>V7.1220-13 B5(c) ≥ 200<br>V7.1220-06 B10(c) ≥ 200<br>Y7.1220-113 B3(c) ≥ 200 (removing free water and solid particles)<br>Y7.1220-05 B7(c) ≥ 200 (removing free water and solid particles) |
| Clogging indicator                                  |                | Electrical clogging indicator DG 042<br>p = 2.0 ± 0.3 bar   |
| Suction side  |                | Size 22L (M30x2 24 cone end). Recommended hose internal diameter 19mm.  |
| Pressure side                                       |                | Size 22L (M30x2 24 cone end). Recommended hose internal diameter 19mm.  |
| Suction strainer                                    |                | Screen element 1mm, code 980141   |
| Electrical connection<br>Frequency<br>Rated current |                | 3~380-440 V;<br>50 / 60 Hz;<br>16 A (versions OPS2 010 XXXX/40050 and OPS2 010 XXXX/40050-PC)<br>28,5 A (versions OPS2 010 XXXX/40050-PC-EH)  |
| Mains fuse  |                | 16 A (versions OPS2 010 XXXX/40050 and OPS2 010 XXXX/40050-PC)<br>30 A (versions OPS2 010 XXXX/40050-PC-EH)   |
| Max. power.   | kW             | 7,5 (versions OPS2 010 XXXX/40050 and OPS2 010 XXXX/40050-PC)<br>13,5 (versions OPS2 010 XXXX/40050-PC-EH)  |
| Weight  | kg             | approx. 180 kg (version with extra heater EH: 205kg)  |
| Sound power level                                   | db(A) max.     | max. 73 (Under operating conditions permissible for continuous operation)<br>max. 78 (Under operating conditions permissible for short-term operation)  |
| Dimensions  | l x w x h      | 752 x 564 x 1224 mm (versions OPS2 010 XXXX/40050 and<br>OPS2 010 XXXX/40050-PC)<br>848 x 564 x 1224 mm (versions OPS2 010 XXXX/40050-PC-EH)  |

Table 10: Technical data

### 16.3 Operating conditions



#### Risk of burns

Contact temperatures according to DIN EN563 (3) and DIN EN13202 (4) may be exceeded during operation.

- › Allow the filter unit to cool down before touching it.

### NOTE



#### Variable viscose behavior

- › Viscosities of a medium are always temperature-dependent.

|                                       |                                       |  |
|---------------------------------------|---------------------------------------|--|
| Viscosity range, continuous operation |                                       | 15 - 1000  |
| Permissible temperature range         | Hydraulic fluid °C<br>Surroundings °C | max. 85<br>+10 ... 45  |
| Permissible suction height            | m (max.)                              | 2  |
| Media resistance                      |                                       | Hydraulic fluids based on mineral oil, rapeseed oils and synthetic esters. |
| Working position                      |                                       | standing   |

Table 11: Operating conditions

### 16.4 Hydraulic circuit diagram

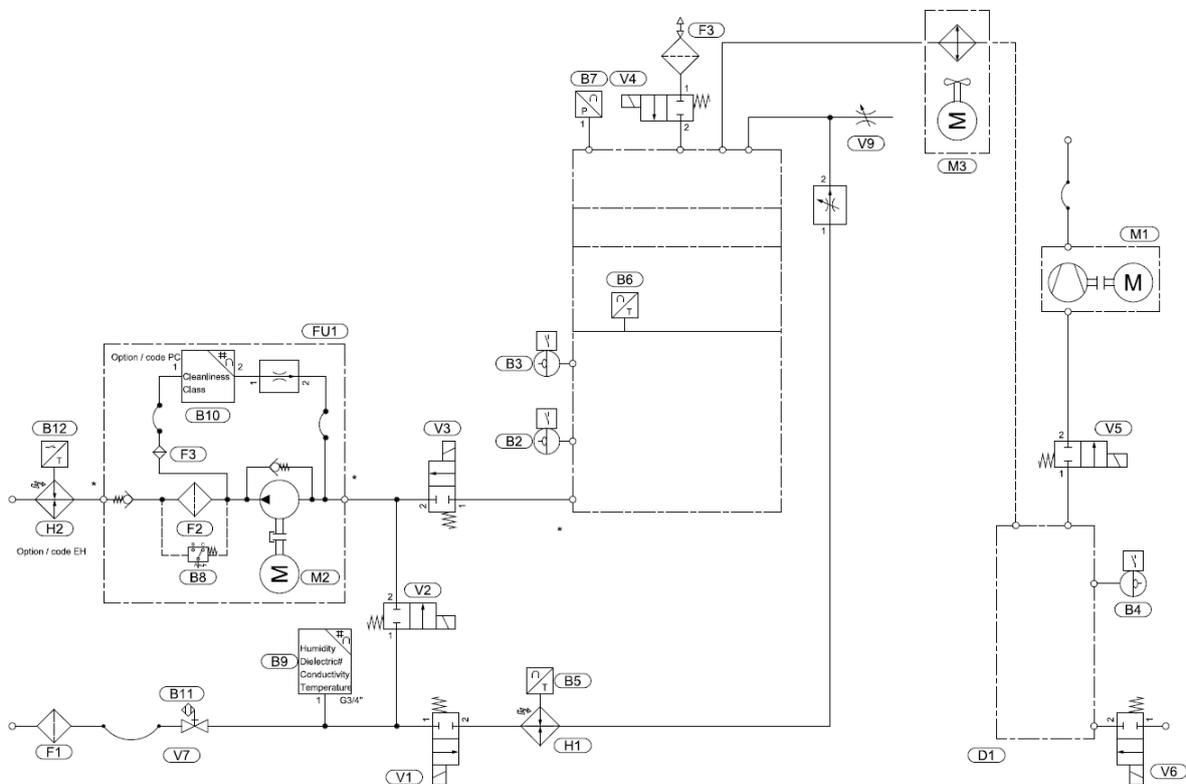


Fig. 36: Hydraulic diagram

17.1 Declaration of conformity

## EC Declaration of Conformity

We, the company,

ARGO-HYTOS Polska sp. z o.o.  
Władysława Grabskiego 27  
32-640 Zator, Poland,

declare on our sole responsibility that the products in the model series

Dewatering unit **OPS2**

to which this declaration pertains are in conformity with the following directives:

Directive 2006/42/EC (Machinery Directive)  
Directive 2014/30/UE (EMC Directive)

Conformity with the directives is assured through compliance with the following standards:

EN 809:1998+A1:2009/AC:2010

Pumps and pump units for liquids -Common safety requirements

EN 60204-1:2018

Safety of machinery -- Electrical equipment of machines -- Part 1: General requirements

Zator, 03.11.2025



Arkadiusz Noworyta  
AHPL, CEO

**NOTE**



**Use of non-ARGO-HYTOS genuine spare parts**  
**Risk of premature failure**  
**Loss of efficiency**

- › Use only ARGO-HYTOS genuine parts, consumables and supplies to ensure correct operation of the machine and to validate the warranty

If other parts are required, contact your ARGO-HYTOS representative.

| Designation                     | Pieces | Order No.  | Comment   |
|---------------------------------|--------|--|---|
| Paper rolls for thermal printer | 1      | SCSO 900-5075  |   |
| Spare filter element            | 1      | V7.1220-113<br>V7.1220-13<br>V7.1220-06<br>Y7.1220-113<br>Y7.1220-05 | 3 µm<br>5 µm<br>10 µm<br>3 µm (removing free water and solid particles)<br>7 µm (removing free water and solid particles) |
| Filter cover                    | 1      | 43427300   |   |
| O-ring for the filter cover     | 1      | 11899200   | NBR70, 117.48x5.33  |
| OPCom protective strainer kit   | 1      | 15077600+ 14783300+<br>14789800                                      |   |
| Suction strainer element        | 1      | S1. 9801411  | Fineness 1mm  |
| Vacuum pump oil                 | 1      | 0831000086   | VM 032; 1Liter  |
| Vacuum pump exhaust filter      | 1      | 0532140154   |   |
| Vacuum pump O-ring              | 1      | 0486 000 590   | for filling plug - see page 38  |
| Vacuum pump O-ring              | 1      | 0486 000 505   | for draining plu - see page 38  |
| Hose                            | 1      | H-20/3   | Transparent hose, inner diamter 20 mm, length 3 m. Could be used as a suction and return hose                             |
| Lance                           | 1      | LA 20X1000   | Aluminum lance DN20 mm, length 1 m<br>Could be used as a suction and return lance   |
| Electric cable                  | 1      | EC 10-32/32  | Cable length 10m / version with 32A/32A plug  |
| Electric cable                  | 1      | EC 20-32/32  | Cable length 20m / version with 32A/32A plug  |
| Electric cable                  | 1      | EC 10-32/16  | Cable length 10m / version with 32A/16A plug (only for versions without extra heater)                                     |
| Electric cable                  | 1      | EC 20-32/16  | Cable length 20m / version with 32A/16A (only for versions without extra heater)  |

Table 12: Spare parts list

International

## ARGO-HYTOS worldwide

|                       |  |                             |
|-----------------------|--|-----------------------------|
| <b>Benelux</b>        | ARGO-HYTOS B.V.                                  | info.benelux@argo-hytos.com |
| <b>Brazil</b>         | ARGO-HYTOS Fluid Power Systems Ltda.             | info.br@argo-hytos.com      |
| <b>China</b>          | ARGO-HYTOS Fluid Power Systems                   | info.cn@argo-hytos.com      |
| <b>Czech Republic</b> | ARGO-HYTOS s.r.o                                 | info.cz@argo-hytos.com      |
|                       | ARGO-HYTOS Protech s.r.o                         | info.protech@argo-hytos.com |
| <b>France</b>         | ARGO-HYTOS SAS                                   | info.fr@argo-hytos.com      |
| <b>Germany</b>        | ARGO-HYTOS GMBH                                  | info.de@argo-hytos.com      |
| <b>Great Britain</b>  | ARGO-HYTOS Ltd.                                  | info.uk@argo-hytos.com      |
| <b>Hong Kong</b>      | ARGO-HYTOS Hong Kong Ltd.                        | info.hk@argo-hytos.com      |
| <b>India</b>          | ARGO-HYTOS PVT. LTD.                             | info.in@argo-hytos.com      |
| <b>Italy</b>          | ARGO-HYTOS S.r.l.                                | info.it@argo-hytos.com      |
| <b>Poland</b>         | ARGO-HYTOS Polska spz o.o.                       | info.pl@argo-hytos.com      |
| <b>Russia</b>         | ARGO-HYTOS LLC                                   | info.ru@argo-hytos.com      |
| <b>Sweden</b>         | ARGO-HYTOS Nordic AB                             | info.se@argo-hytos.com      |
| <b>Turkey</b>         | ARGO-HYTOS Hidrolik Ekip. San. ve Tic. Ltd. Şti. | info.tr@argo-hytos.com      |
| <b>USA</b>            | ARGO-HYTOS Inc.                                  | info.us@argo-hytos.com      |

