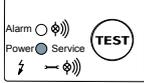
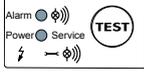


Indication	Operational state	Function
	Ready to operate	Power on
	Fault/alarm	Fault occurred Valve opens and closes repeatedly in an attempt to clear the fault.
	Test of the valve function	For manual draining, press and hold the button for about 2 seconds.
	Test the alarm function	To test the alarm function, press and hold the button for at least 1 minute.

Tab. 24 Indication of the operational state of the condensate drain

4.6 Safety devices

The following safety devices are provided and may not be modified in any way.

- Main switch
The main switch also functions as a power supply disconnecting device. In the "0" position, the machine stops immediately.
- Safety pressure switch:
The switch shuts down the machine if the pressure of the refrigerant exceeds the permitted maximum. It is factory set.
- Enclosures and guards for moving parts and electrical connections:
These protect against accidental contact.

4.7 SIGMA CONTROL SMART

4.7.1 Operating panel

Keys (mechanical)

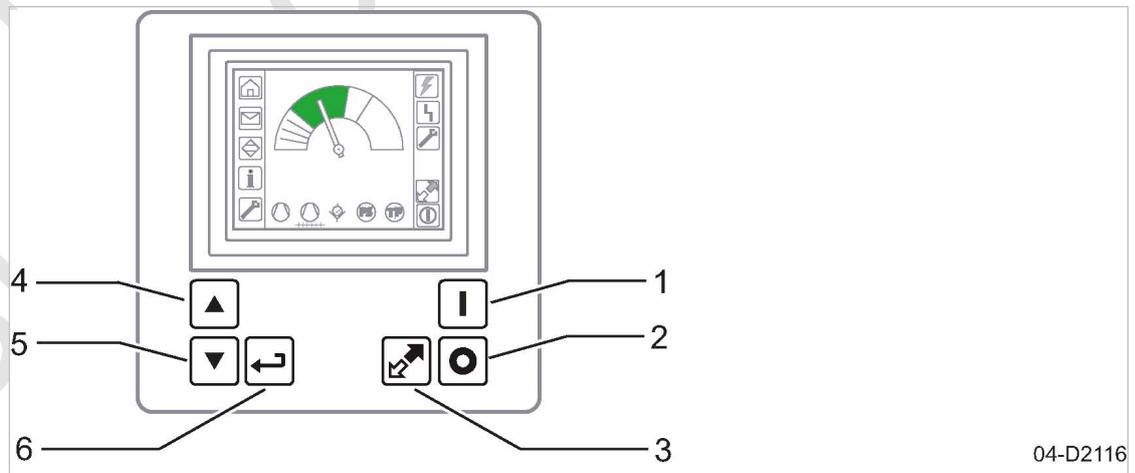


Fig. 7 Keys – overview

Item	Description	Function
1	«ON»	Switches the machine on.
2	«OFF»	Switches the machine off.
3	«Remote control»	Switches the remote control on and off.
4	«Up»	Scrolls up the menu options. Increases a parameter value.
5	«Down»	Scrolls down the menu options. Reduces a parameter value.
6	«Enter»	Jumps to the selected menu option. Switches to Edit mode. Exits the edit mode and saves. Acknowledge the message.

Tab. 25 Keys (mechanical)

Keys (soft key)

The menu displays further keys which can be controlled with the arrow keys.

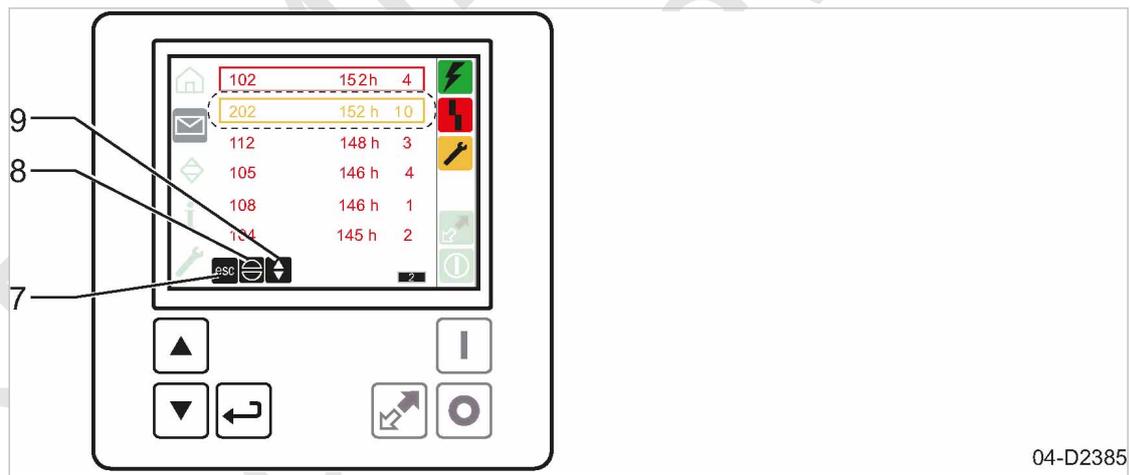


Fig. 8 Keys (soft key)

Item	Description	Function
7	Escape	Returns to the next higher menu option level.
8	Acknowledgement	Acknowledges alarms and warning messages.
9		White: Use the «UP» and «DOWN» keys to navigate: <ul style="list-style-type: none"> ■ Press Escape and Acknowledge ■ Changing images in sub-menus Gray: The «up» and «down» keys are inactive.

Tab. 26 Keys (soft key)

Indicators

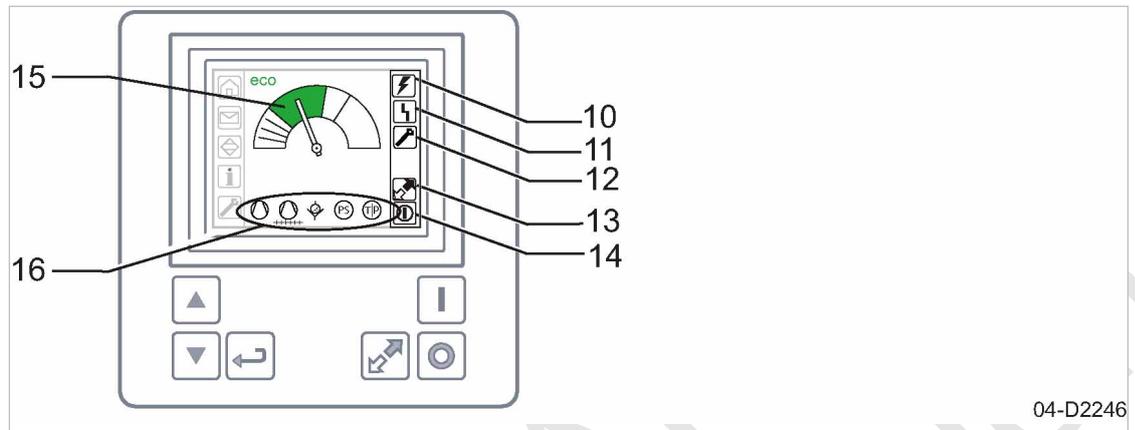


Fig. 9 Indicators

Item	Description	Function
10	<i>Controller Voltage</i>	Lights green when the power supply is switched on.
11	<i>Fault</i>	Flashes red when an alarm occurs. Lights continuously when acknowledged.
12	<i>Warning</i>	Flashes yellow for the following events: <ul style="list-style-type: none"> ■ Maintenance work due ■ Warning message
13	<i>Remote control</i>	The LED lights when the machine is in remote control.
14	<i>ON</i>	Lights green when the machine switched on.
15	<i>Dew point</i>	Indicates the dew point progress (trend display): <ul style="list-style-type: none"> ■ Blue: Pressure dew point too low ■ Green: Optimal pressure dew point ■ Yellow: Pressure dew point rising ■ Red: High pressure dew point (message contact switches)
	<i>eco</i>	Energy-saving operation
16	Indicates messages concerning individual components	From left to right: <ul style="list-style-type: none"> ■ Refrigerant compressor ■ Refrigerant condenser ■ Condensate drain ■ Safety pressure monitor ■ Analog sensors <ul style="list-style-type: none"> – Temperature transducer – Pressure transducer

Tab. 27 Indicators

4.7.2 User operation SIGMA CONTROL SMART

Handling concept

Task	Procedure
Navigating the menu	<p>For navigating the menus, a cursor is provided to move the «UP» and «DOWN» keys. The current cursor position is indicated by inverse coloring.</p> <p>Use the «Enter» key to switch, for example, from the main menu into a sub-menu. If a single menu is too large, the information is provided in several numbered screens (images). The corresponding symbol in the Main menu appears somewhat darker in this case.</p>
Changing parameters	<p>To change parameters, navigate to an entry and confirm with «Enter».</p> <p>This enables you to use the «UP» and «DOWN» keys to change values or activate/deactivate check boxes:</p> <ul style="list-style-type: none"> ■ Check box activated: ✓ ■ Check box deactivated: □ <p>Confirm your selection with «Enter». The change is now active.</p>

Tab. 28 Handling concept

Main menu



Fig. 10 Main menu

Item	Designation	Description
17	Opening page	Display: Pressure dew point
18	<Messages>	<p>The following events (messages) are saved:</p> <ul style="list-style-type: none"> ■ Faults ■ Warnings <p>The machine shuts down when an alarm message is triggered.</p>
19	<Flow diagram>	Displays all control-relevant sensors and actuators.
20	<Information>	<p>Display: Operating hours</p> <p>Setting option for temperature limits and units.</p>

Item	Designation	Description
21	<Service>	Displays maintenance tasks to be performed and the maintenance timer.

Tab. 29 Main menu

Color concept

Different colors indicate the various operating states.

Color	Meaning
White	Component is shut down. For sensors: The activation criteria is not met
Green	Component is switched on. For sensors: The activation criteria is met Measured value in normal range.
Yellow	Warning or maintenance message for a component Measured value in critical range.
Red	Fault in a component. Measured value in impermissible range. The machine will be shut down

Tab. 30 Color concept

4.7.3 Start screen

The start screen is displayed during normal operation. The controller automatically switches to this screen if you don't activate a key for three minutes.

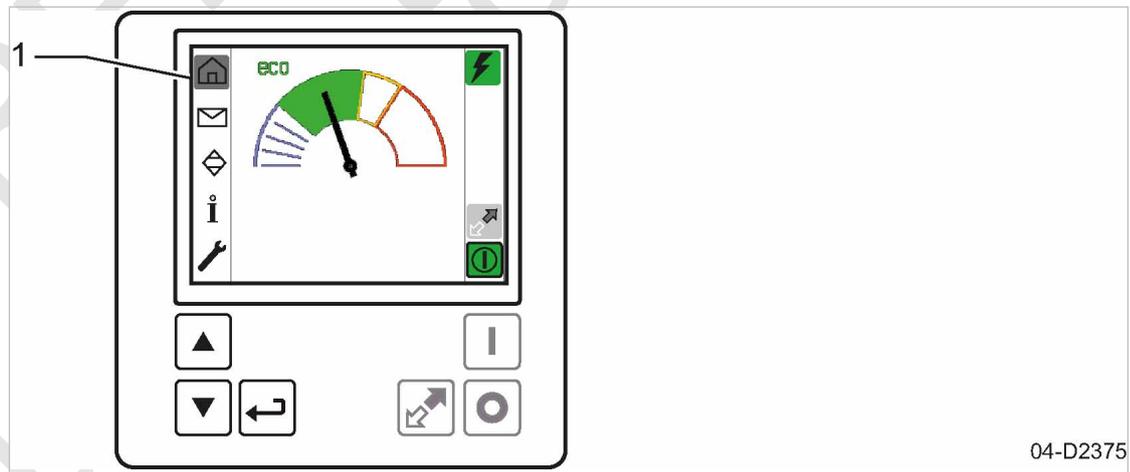


Fig. 11 Start screen

① Active start screen

4.7.4 Messages menu

All messages reported in the past are listed and displayed in the color of their classification:

- Warning/maintenance message: Yellow
- Alarm message: Red

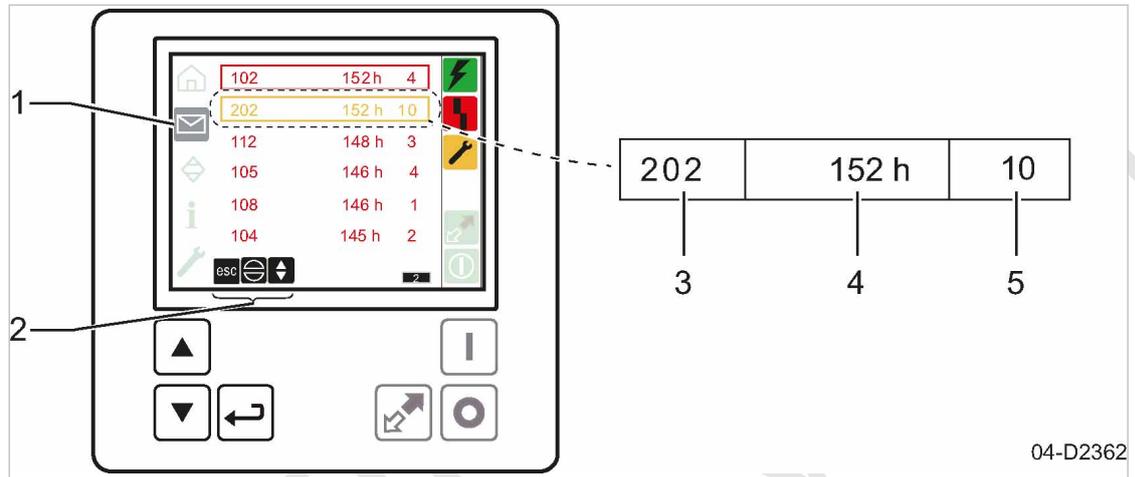


Fig. 12 Event history

- | | |
|---|--|
| <p>① <Messages></p> <p>② Additional navigation options:
Escape
Acknowledgement</p> <p>③ Message number (example: 202)</p> | <p>④ Operating hour during which the message had been issued the last time (example: 152 h)</p> <p>⑤ Frequency of occurrence (example: 10)</p> |
|---|--|

Use the «UP» or «DOWN» keys to select the <Message> menu.

Press «Enter» to open the corresponding screen.

Active faults or warnings which have not yet been acknowledged are indicated by a flashing frame.

Acknowledged messages are framed as long as the cause for the message is not resolved.

This frame disappears as soon as the message cause has been resolved. This is also the case if it is a message which does not require acknowledgement.

Further information See chapter 9.2 for a list of all message codes.

4.7.5 Flow diagram menu

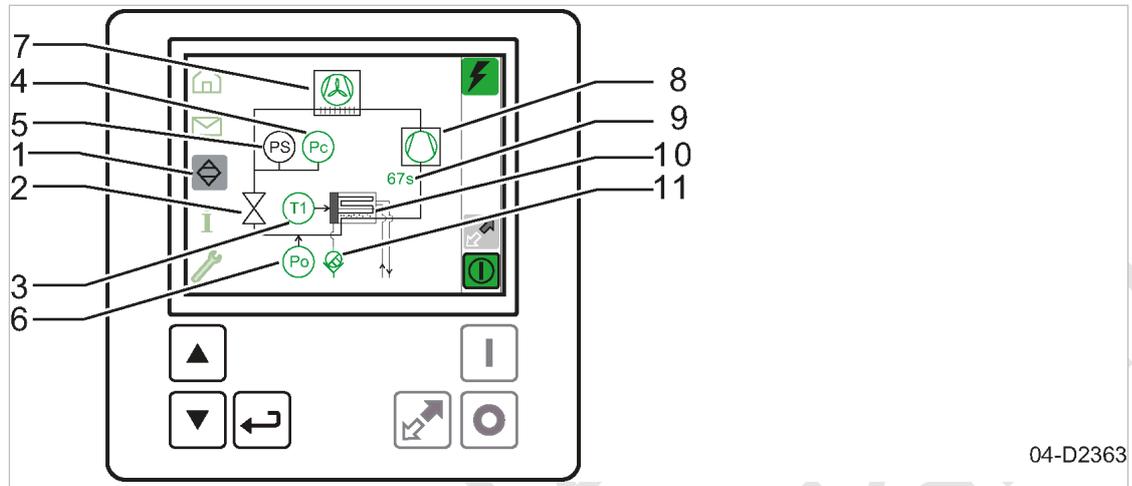


Fig. 13 Flow diagram

- | | |
|---|--|
| ① <Flow diagram> | ⑦ Refrigerant condenser |
| ② Expansion valve: thermostatic | ⑧ Refrigerant compressor |
| ③ Temperature transducer (pressure dew point) | ⑨ Run time of the refrigerant compressor in the current cycle (here: 67 s) |
| ④ Pressure transducer (condensation pressure) | ⑩ Heat exchanger |
| ⑤ Pressure monitor | ⑪ Condensate drain |
| ⑥ Pressure transducer (evaporation pressure) | |

Use the «UP» or «DOWN» keys to select the <Flow diagram> menu.

The <Flow diagram> menu provides a simplified overview of the components with supplementary information.

For a complete <Flow diagram>, see chapter 13.3

The operating states are identified by the colors used to represent components.

4.7.6 "Information" menu

Use the «UP» or «DOWN» keys to select the <Information> menu. This menu comprises several screens.

Press «Enter» to open the first screen.

4.7.6.1 Screen 1

The system displays the operating hours of the individual machine components. You cannot modify the settings in this screen.

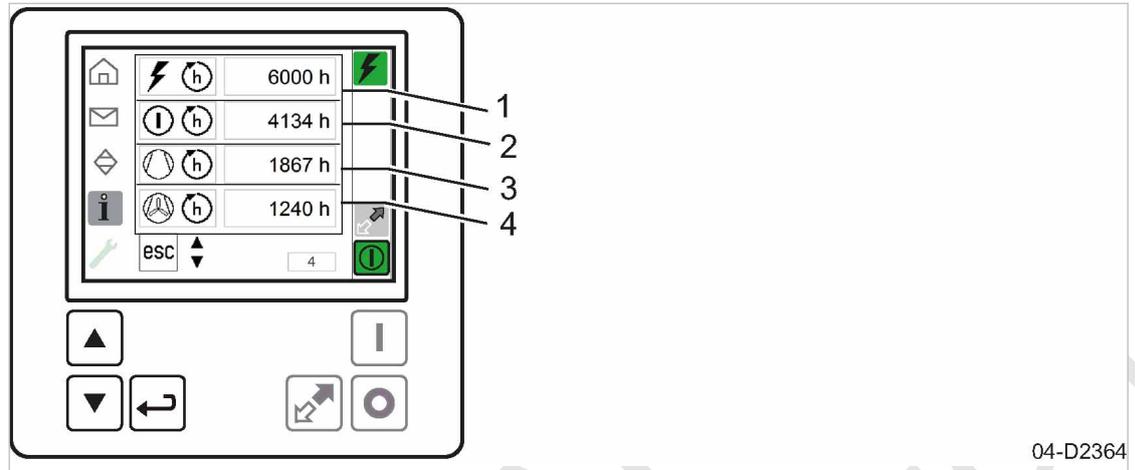


Fig. 14 Information: Screen 1

- ① Number of operating hours during which the controller is under power (here: 6000 h)
- ② Number of operating hours during which the machine was switched on (here: 4134 h)
- ③ Number of operating hours of the refrigerant compressor (here: 1867 h)
- ④ Number of operating hours of the fan motor (here: 1240 h)

4.7.6.2 Screen 2

Use «DOWN» to open the next screen.

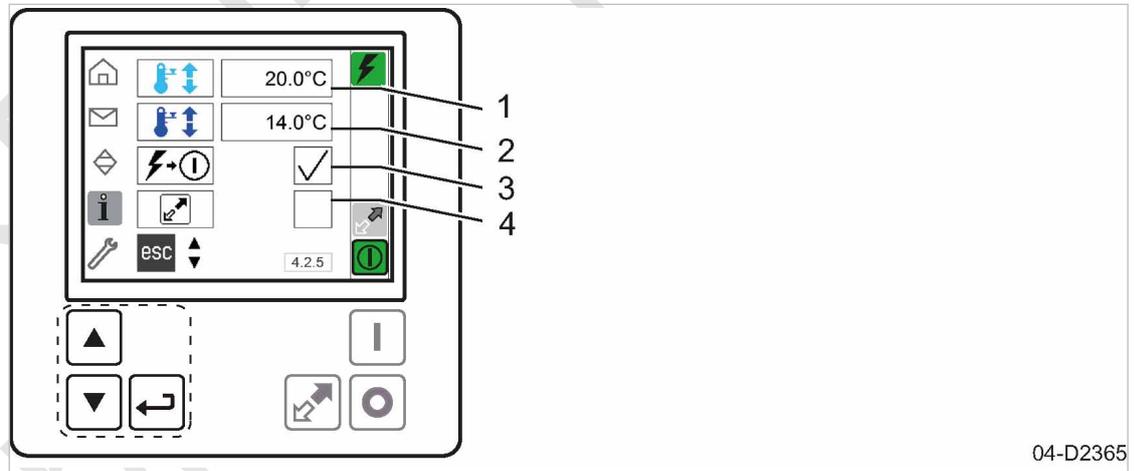


Fig. 15 Information: Screen 2

- ① Red warning range (here: 20.0 °C)
- ② Yellow warning range (here: 14.0 °C)
- ③ Automatic restart (here: active)
- ④ Remote control (here: inactive)

You can modify the following settings in this screen.

- Pressure dew point: Pressure dew point: Specify the lower temperature limit for the red warning range.
- Pressure dew point: Pressure dew point: Specify the lower temperature limit for the yellow warning range.
- Activate/deactivate automatic restart after a power failure:
- Activate/deactivate the «Remote control» key

4.7.6.3 Screen 3

Use «DOWN» to open the next screen.

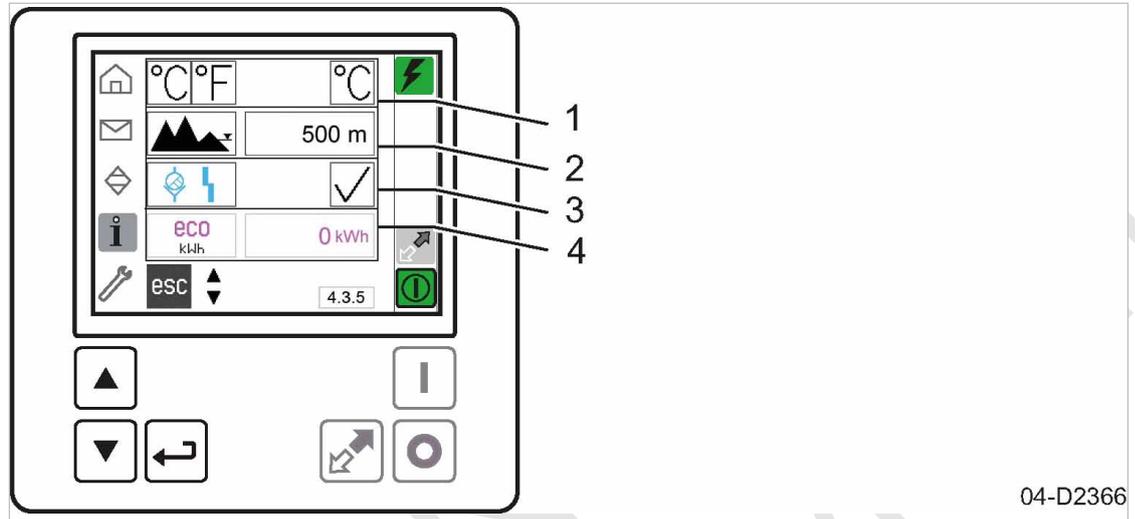


Fig. 16 Information: Screen 3

- | | | | |
|---|-------------------------------------|---|--|
| ① | Units of measure used (here: °C) | ③ | Condensate drain: Activate fault message (here: Fault message activated) |
| ② | Installation altitude (here: 500 m) | ④ | Electric energy saved with "eco" operation |

You can change the following settings in this screen:

- Setting the unit of measurement:
 - Parameter °C: Temperature in “°C”, pressure in “bar” and length in “m”
 - Parameter °F: Temperature in “°F”, pressure in “psi” and length in “feet”
- Adjust installation altitude:
 - Adjustment range: 0 m to 4000 m (default setting 500 m)
 - Above 1000 m the altitude setting must always be adjusted.

■ Activate or deactivate fault message:

In the delivery condition a fault message is output at the condensate drain in the event of a fault. The refrigerated dryer continues running.

If you activate the fault message, the control additionally reports a fault. This is only output if the condensate drain was malfunctioning for the duration of 10 min without interruption. The refrigerated dryer switches off.

4.7.7 Service menu

Use the «UP» or «DOWN» keys to select the <Service> menu. This menu may consist of several screens.

Press «Enter» to open the first screen.

Screen 1: Condensate drain

It is not possible to change the start value.

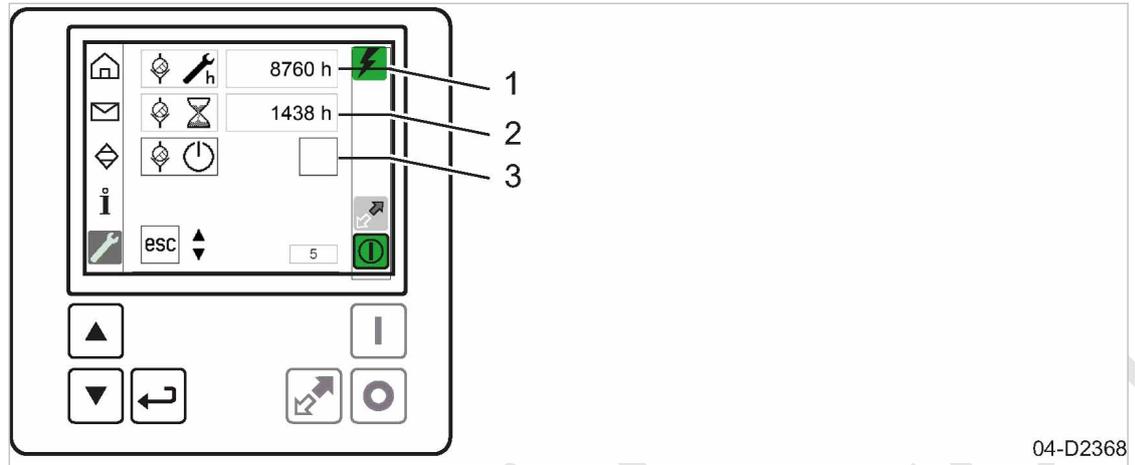


Fig. 17 Screen 1: Condensate drain

- ① Start value of the maintenance counter (example: 8760 h)
- ② Remaining operating hours to the next due maintenance (example: 1438 h)
- ③ Resetting the maintenance interval counters: activate/deactivate

To reset the maintenance hours counter to its start value, activate the check box and confirm with «Enter».

Option K1 Screen 2: Refrigerant condenser

It is possible to change the start value and adjust the maintenance interval for your individual operating conditions.

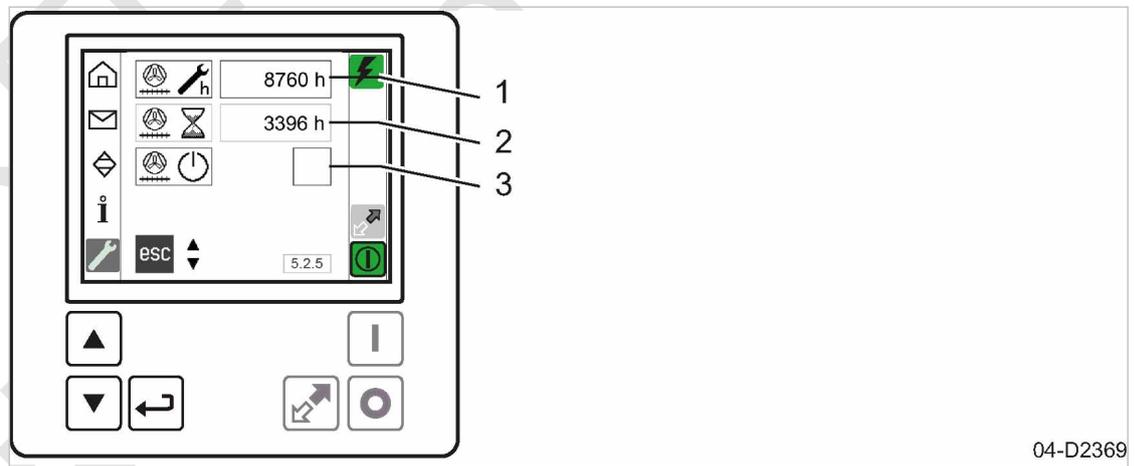


Fig. 18 Screen 2: Refrigerant condenser

- ① Start value of the maintenance counter (example: 8760 h)
- ② Remaining operating hours to the next due maintenance (example: 3396 h)
- ③ Resetting the maintenance interval counters: activate/deactivate

To reset the maintenance hours counter to its start value, activate the check box and confirm with «Enter».