

GREASE LEVEL CONTROL

- Measuring device for grease layer thickness -



⚠ DANGER

Please read through this manual carefully and completely prior to commissioning this appliance.
Observe and comply with the mentioned safety notes!

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Notes, safety notes and warnings

1. Notes on manual

General

- Please read through the notes mentioned below and in the following chapters prior to commissioning! The symbols used in the manual are to point to safety risks.
- The symbol used cannot replace the text of the safety note. Therefore, the text must always be read completely!

Symbol	Description
 DANGER	Texts with this symbol point to dangerous situations which could lead to death or severe injuries in case of non-observance of directions given.
 CAUTION	Texts with this symbol point to dangerous situations which could lead to light or severe injuries in case of non-observance of directions given.
 NOTICE	Texts with this symbol point to situations which could cause faults during operation of the appliance in case of non-observance of directions given.

2. Basic safety notes and warnings

DANGER

The electrical connection must be carried out by a qualified contractor as per the pertinent VDE regulations.

DANGER

The product may only be applied and operated in accordance with its intended use, as described in this manual (also refer to chapter 3.4).

DANGER

The appliance may not be altered or subjected to other modifications.

DANGER

- The assembly or maintenance works may only be carried out by trained staff members, authorised for this work thanks to their education.
- Assembly and service works may only be carried out in dead-voltage condition.

DANGER

The terminal can be damaged by incorrect bolting torques at the connecting terminals or by inappropriate tools by what insulation or contact making is jammed. Cables which were improperly connected can disconnect during operation and present a considerable safety risk. By transfer resistance at clamp connections, an increased heat build-up is generated which could cause a fire. Incorrectly wired connections may damage electrical components and cause other damages (notes on chapter 5) .

NOTICE

In the case of long connection lengths, the setting of the potentiometer may change due to the capacitive load of the electrode input. Therefore, it may be advisable to have the setting checked after a change of cable length by a qualified contractor (notes on chapter 5).

3. Product description

3.1 Scope of supply

Single components	Appliance
1 Measuring stick with heated electrodes (sensors)	
2 Evaluation device with ready to plug-in connecting cable - 3 m long	
3 Screw joint with half-shell	
4 Sealing and counter nut (not depicted)	
5 Installation and operating manual	

3.2 Technical data

Designation	Description
Operating voltage	230VAC/5 VA max.
2 x relay	Change-over contact for Ohm resistive load Load NC connection 230V AC / 5A Load NO connection 230V AC / 2 A
Fault clearance	NC connection by means of varistor VZ 05/390V
Consumption	approx. 12W
Dimensions	Type -230V (15 65 46) 100 x 100 x 60 mm Supplied in plastic housing, with ready to plug-in connecting cable (3 m)
Impedance switch-point	15-80 kOhm, adjustable via individual potentiometers
Measurement voltage	max. 5 Vss
Measurement current	< 250µA

3.3 Description

General

In the measuring stick, four heated electrodes (sensors) are mounted which project into the medium in accordance with required switch-point (see also chapter 6). A fifth electrode serves as reference electrode.

Depending on water contact, the filling level is shown by four green LEDs L1 to L4. As grease layer thickness progresses, the LEDs go out top down. When reaching 50 % of max. grease layer, 2 green LEDs are still flashing and when reaching > 80 %, only 1 red LED is still lighting. Emptying of the separator must be arranged.

Two relays with change-over contact activate the aggregates (signals).

The NC connection can be loaded with 230V/5A AC and is de-jammed with a varistor. The NO connection is loadable up to 230V/2A.

In the housing is a 230V AC mains adapter and a control unit with LEDs to display filling level as well as two buttons for manual switching-on of relays.

Delays in switching behaviour may result from sensor surfaces coated by grease, dissolving only in the course of several minutes and admitting a proper test reading. In the case of indication error of the sensor, the cleanliness of the sensor heads must be checked.

Operators whose plants do not possess of an automatic cleaning system are to check the cleanliness of the sensors during each disposal and are to clean the sensor heads, if applicable.

Product description and assembly

3.4 Correct intended use

This device for measuring grease layer thickness is intended for installation in ACO grease separator plants as per DIN EN 1825.

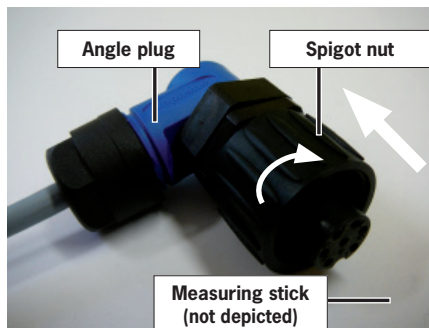
It displays 50 % and > 80 % of max. grease layer thickness in the grease separator.

A different use of the device is not permitted!

4. Assembly

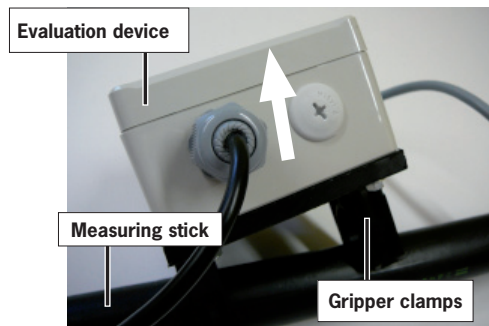
4.1 Disassembly of appliance

Step 1



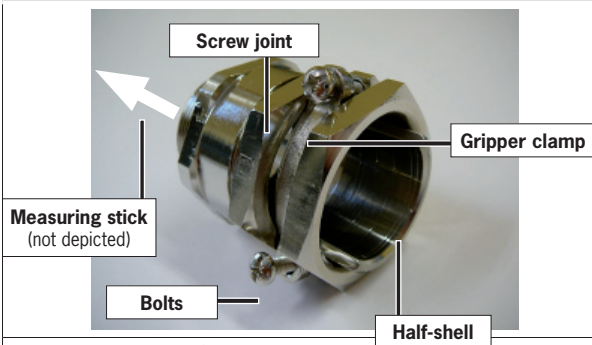
> Loosen spigot nut of angle plug and remove from measuring stick.

Step 2



> Remove evaluation device and gripper clamps from measuring stick.

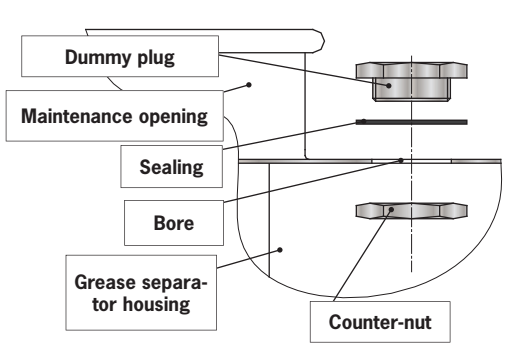
Step 3



> Loosen bolts of gripper clamp.
 > Take half-shell out of screw joint.
 > Remove screw joint from the measuring stick.

4.2 Preparations at grease separator

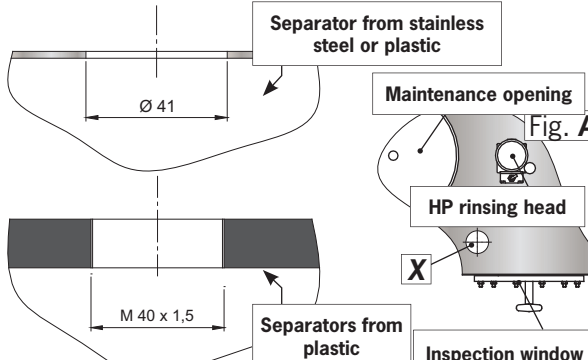
With assembly opening *



> Dismantle dummy plug with sealing and counter-nut.

***ACO grease separators are generally supplied with assembly opening for measuring device of grease layer thickness.**

In the case of retro-fit



> Make the bore or the thread respectively.

NOTICE

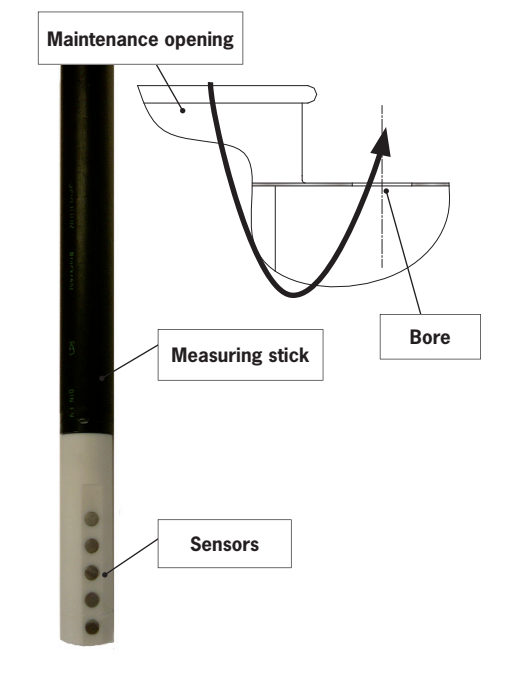
Position of bore X as per fig. A!

CAUTION

Deburr bore and cutting edges!

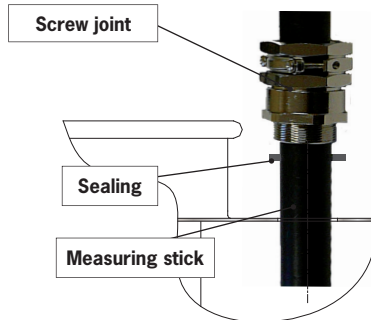
4.3 Assembly of appliance at the grease separator

Step 1



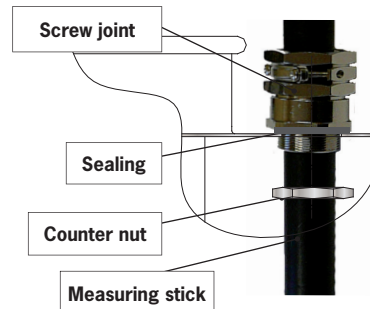
> Take the measuring stick in the separator through the maintenance opening and bring it to the outside again through the bore (the part containing the sensors remains in the separator).

Step 2



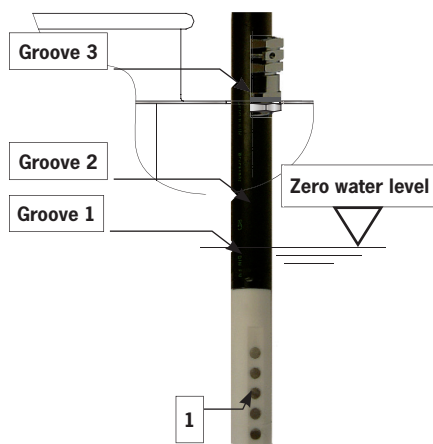
- > Pull the sealing over the measuring stick.
- > Push the screw joint over the measuring stick.

Step 3



- > Push the sealing and the screw joint through the bore up to the dead stop.
- > Push the counter nut over the measuring stick, turn it to the thread neck of screw joint and firmly tighten up the connection.

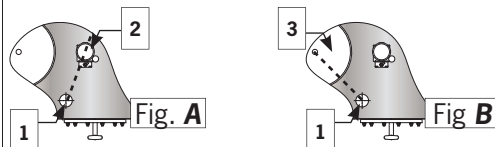
Step 4



- > Depending on grease separator type, adjust the measuring stick by setting relevant groove (see table A) to zero water level height (= static water level, water reaches up to pipe bottom of outlet or overflow edge).

Table A

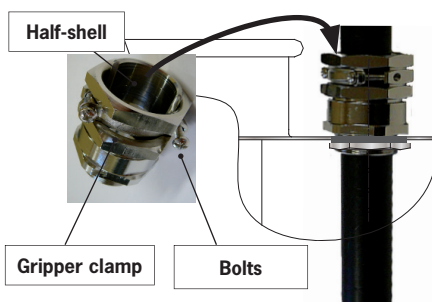
Grease separator	Nominal size	Groove no.
Shape	NS	
oval	1 - 4	1
oval	5 - 10	2
round	2 - 4	2
round	7 - 10	2
round	15 + 20	3



NOTICE

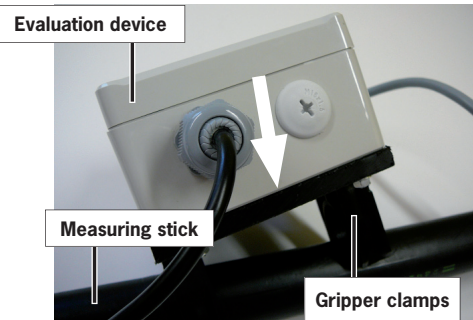
In the case of separators with high-pressure (HP) internal cleaning (fig A), sensors (1) point towards HP Orbital cleaning head (2) and with separators without HP internal cleaning (fig. B), towards a maintenance opening (2) - Reason: effective sensor cleaning.

Step 5



- > Reinsert the half-shell into the screw joint.
- > Retighten the bolts of the gripper clamp.

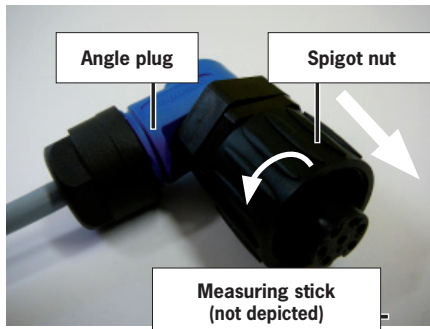
Step 6



- > Click the evaluation device or the gripper clamps again to the measuring stick.

Assembly and commissioning

Step 7



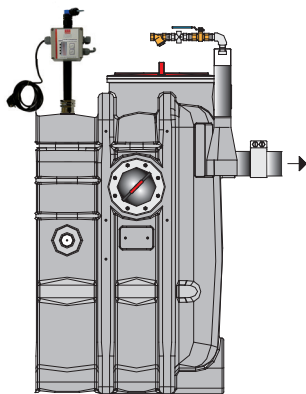
- > Put the angle plug on the measuring stick and tighten the spigot nut again.

⚠ DANGER

The appliance is not suitable for use in potentially explosive atmospheres. The user has to make sure by adequate measures (e. g. earthing of metal containers) that no hazardous touch voltage is able to develop in the medium.

5. Commissioning

Description



- > Put the safety plug of the plug-in evaluation device into the socket with earth contact mounted in situ.

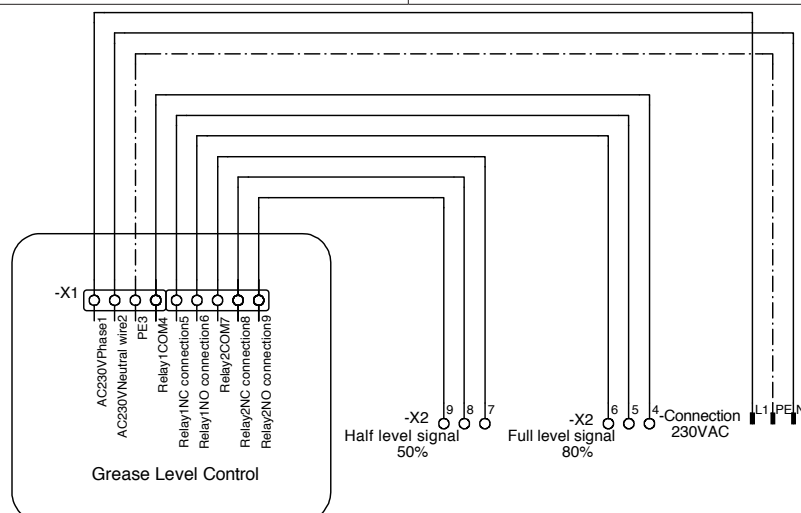
⚠ DANGER

The electrical connection must be carried out by a qualified contractor in accordance with the pertinent VDE regulations.

NOTICE

- Operation is permitted only with 230 V AC voltage.
- The mains voltage connection is protected against excess voltage by a varistor 390 V.
- Fuse protection of the appliance must be carried out by an external fuse. Observe operator protection! Error current protective circuit!

Connection



Commissioning and operation

Description

The NC / NO connections (2 relays) with potential-free change-over contacts activate signals (ZLT = central technical supervision). The NC connection can be loaded with 230V/5A AC and is de-jammed with a varistor. The NO connection can be loaded up to 230V/2A.

Use a cable 7 x 0.5 mm² as connecting cable.

> Please take the terminal connections from the connecting diagram depicted on page 8.

Signals:

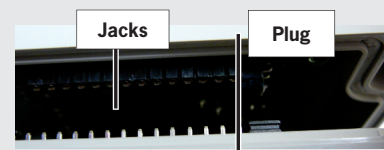
- Half level signal = 50 % grease storage capacity
- Full level signal = 80 % grease storage capacity

NOTICE

Fuse protection of the load circuit must be carried out externally via a fuse, if required (max. 5A NC connection, 2A NO connection). For switching of higher currents, relevant switching elements have to be used.

NOTICE

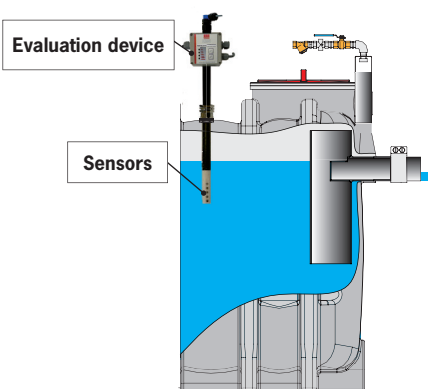
When closing the evaluation device cover, pay attention that jack and plug intertwine correctly!



6. Operation

6.1 Function

Description



For more detailed description of conditions in the separator (at the sensors) and of displays (signals) at the evaluation device, refer to next page.

> Corresponding to water contact, the filling level is displayed by four green LED's L1 to L4 at the evaluation device. With > 80 % of max. storage capacity, the L1 lights up red.

6.2 Description of evaluation device front wall

Description

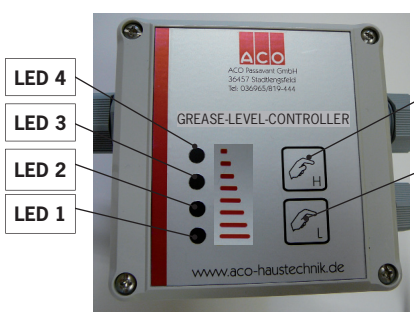


Table A: Possible displays

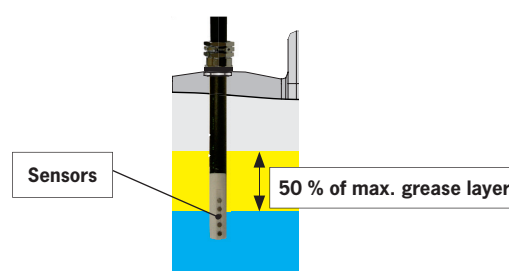
Display	Lights			Explanation		
	off	green	red	Water exists	Grease exists	Air exists
LED 4	●			●	●	●
LED 3	●			●	●	●
LED 2	●			●	●	●
LED 1		●		●	●	●

Table B:

Button	Description
Test button 1	Output relay 1 is switched, half level signal can be checked at ZLT (central technical supervision).
Test button 2	Output relay 2 is switched, full level signal can be checked at ZLT (central technical supervision).

6.3 Condition description: Half level signal = 50 % of max. grease storage capacity

Condition in separator



The 2 upper sensors are covered with grease

Evaluation at evaluation device

Table C: Half level signal=50% max. grease storage cap.

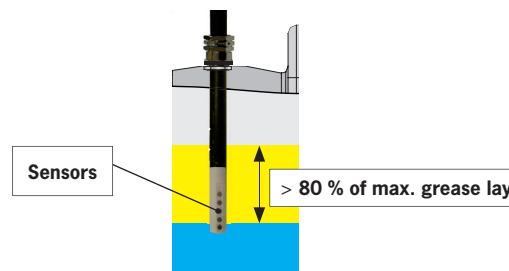
Display	Lights			Sensors	
	off	green	red	Water exists	Grease exists
LED 4	●				●
LED 3	●				●
LED 2		●		●	
LED 1		●		●	

NOTICE

By pressing test button 1, this condition can be simulated and tested at the ZLT prior to reaching the condition.

6.4 Condition description: Full level signal = 80 % of max. grease storage capacity

Condition in separator



The 4 upper sensors are covered with grease.

Evaluation at evaluation device

Table D: Full level signal=80% max. grease storage cap.

Display	Lights			Sensors	
	off	green	red	Water exists	Grease exists
LED 4	●				●
LED 3	●				●
LED 2	●				●
LED 1			●		●

NOTICE

By pressing test button 2, this condition can be simulated and tested at the ZLT prior to reaching the condition.

Operation, servicing and spare parts

6.5 Possible malfunctions

Setting of switching points	Switching manner
<p>The switching points are pre-set at our works.</p> <p>Depending on conductivity of water, the switching point is adjusted at the trim-pot. Generally, it is sufficient for most applications with clean tap water to leave the potentiometers in the most sensitive setting (left stop), corresponding to a switching point of approx. 12µS.</p> <ul style="list-style-type: none"> > If required, sensitivity for each electrode can be separately adjusted. When turning against the clockwise direction, the electronics become more insensitive leading to better results with wastewater. > Generally, all potentiometers should be in the same position. Only in the case of very different distances of electrodes to the reference electrode or in the case of long connection lines it is reasonable to adjust sensitivity in different ways. Following changing the cable connecting length, the setting must be checked. 	<div style="background-color: #0070C0; color: white; padding: 2px; margin-bottom: 10px;">NOTICE</div> <p>Delays in switching behaviour may result from sensor surfaces coated by grease, dissolving only in the course of several minutes and admitting a proper test reading. In the case of indication error of the sensor, the cleanliness of the sensor heads must be checked.</p> <div style="background-color: #D9534F; color: white; padding: 2px; margin-bottom: 10px;">DANGER</div> <p>Risk of scalding: The sensors are heated and reach an operating temperature of approx. 65-75°C. After disconnecting it from the mains voltage, the device may still be hot for several minutes. In case of need, adequate protective measures must be taken.</p>
<p>If during operation situations develop which are not sufficiently described, please contact:</p>	<div style="background-color: #D9D9D9; padding: 5px;"> <p>ACO -Service: Telefon +49 (0) 36965 - 819-444 Fax +49 (0) 36965 - 819-367 E-Mail service@aco-online.de</p> </div>

7. Servicing

<div style="background-color: #0070C0; color: white; padding: 2px; margin-bottom: 10px;">NOTICE</div> <p>Operators whose plants do not possess of an automatic cleaning system are to check the cleanliness of the sensors during each disposal and are to clean the sensor heads, if applicable.</p>	<div style="background-color: #D9534F; color: white; padding: 2px; margin-bottom: 10px;">DANGER</div> <p>Risk of scalding: The sensors are heated and reach an operating temperature of approx. 65-75°C. After disconnecting it from the mains voltage, the device may still be hot for several minutes. In case of need, adequate protective measures must be taken.</p>
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Questions	
<p>If you have questions of any kind which are not sufficiently described, please contact:</p>	<div style="background-color: #D9D9D9; padding: 5px;"> <p>ACO -Service: Telefon +49 (0) 36965 - 819-444 Fax +49 (0) 36965 - 819-367 E-Mail service@aco-online.de</p> </div>

8. Spare parts

For spare parts, please contact:

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 E-Mail service@aco-online.de

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