

WATER LEVEL TRANSMITTER/ALARM DEVICE - Type NRGT**1 GENERAL DESCRIPTION**

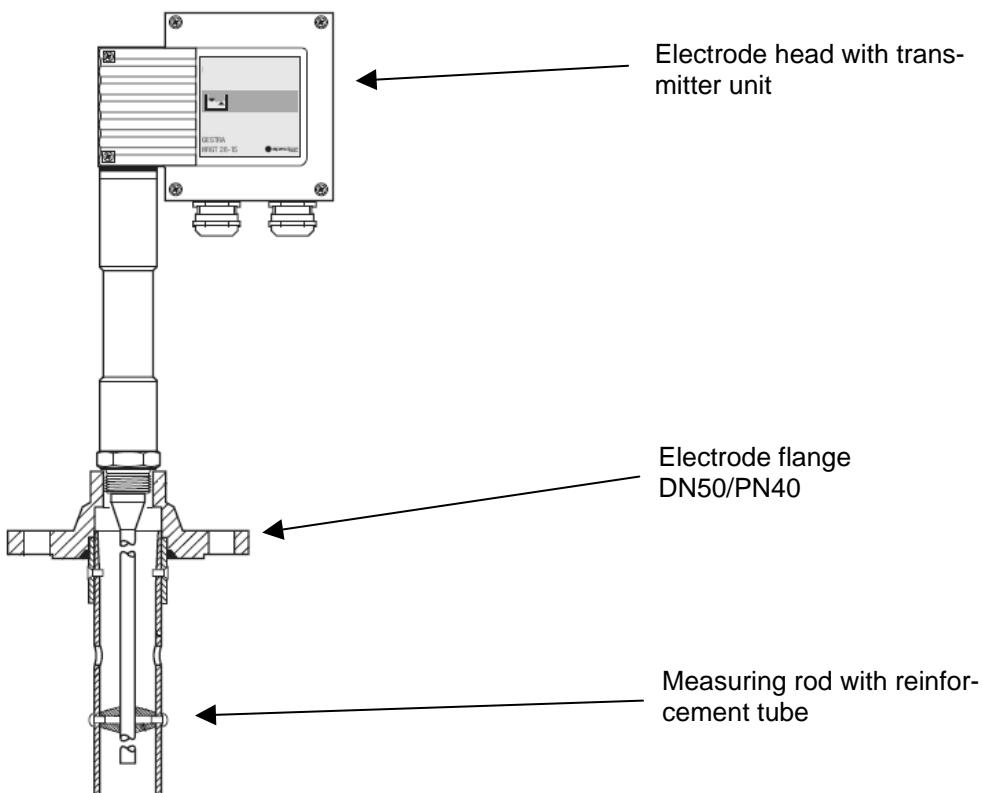
The water level transmitter/alarm device consists of a **capacitive** electrode which is mounted either directly on the boiler top plate or in an external unit, connected to the boiler body with valves equipped with limit switches.

The length of the water level transmitter electrode is selected according to the indication range of the water level gauges BO 019 and BO 020. As a general guideline, the electrode tip should reach down approximately 100 mm below the lower rim of the lowest gauge glass in order to ensure always a safe indication of the actual boiler water level.

When the water level in the boiler drum rises and falls during operation of the boiler, the resistance of the electrode increases and decreases proportionally to the boiler water level and the electrode transmits a 4...20 mA signal to the electronic components mounted in the boiler control cabinet.

If an on/off feed water control system is applied, the electrode signal is distributed to the remote indicator coil instrument in the panel door as well as to the limit switch device for pump on/pump off control and alarm generation.

If a continuous feed water control system is applied, the electrode signal is also used for the level feedback to the controller unit. This controller unit can either be a separate PID controller or can also be incorporated in the SAACKE Se@vis control system.



2 EXPLANATION OF SYMBOLS

Important safety and system-specific notes in this operating manual are marked with symbols. The notes must be adhered to in order to avoid accidents, personal injuries and damage to property.



WARNING!

This symbolizes dangers that can lead to adverse effects on health, injuries, permanent physical damage or to death.

Adhere at all costs to the notes specified regarding work safety, and be particularly careful in these cases.



WARNING! Danger of life!

This symbol draws attention to dangerous situations involving life-threatening electrical voltages. There is a danger of serious injury or death if the safety notes are not complied with. The work may only be carried out by qualified electricians.



ATTENTION!

This symbolizes notes, which if not complied with, can lead to damages, malfunctions and/or breakdown of the system.



NOTE!

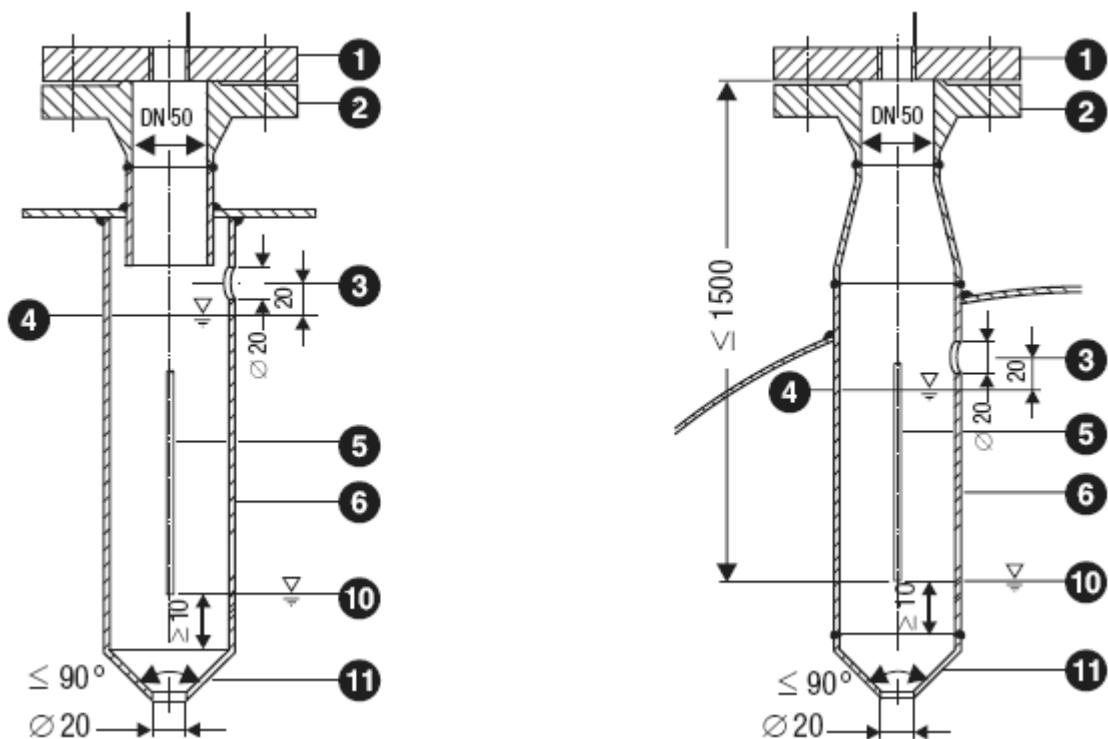
This symbol highlights tips and information that are to be observed for efficient and disruption-free operation of the system.

3 MOUNTING AND COMMISSIONING

Mechanical installation

- Step 1 Check the condition of the sealing surface on electrode flange and boiler flange
- Step 2 Place the (graphite) gasket on the boiler flange (do not use grease for fixing)
- Step 3 Check if the foam protection tube inside the boiler has been provided with a vent hole
- Step 4 Insert the electrode into the protection tube and fix it with screws, tighten by hand first.
- Step 5 Tighten the screws with a spanner. Follow crosswise pattern.

Examples for installation:

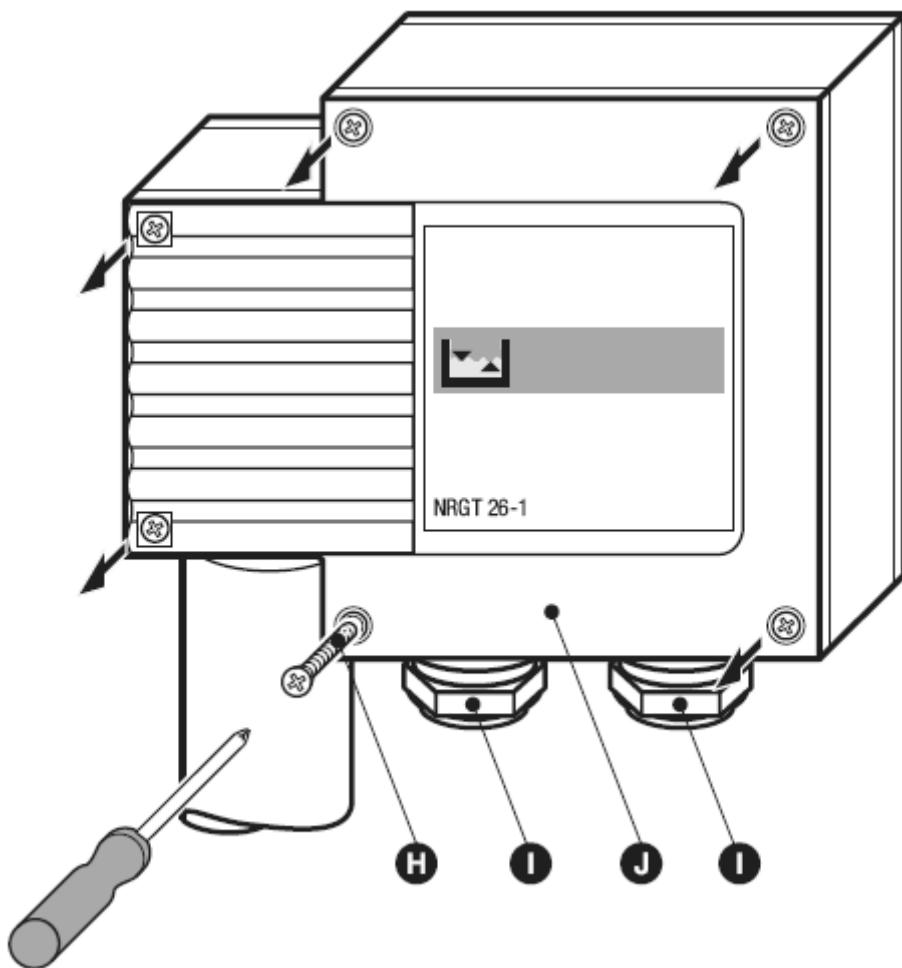


- | | | | |
|---|-----------------------|----|--|
| 1 | Electrode flange | 6 | Foam protection tube |
| 2 | Boiler flange | 10 | Low water level mark
(minimum electrode length) |
| 3 | Vent hole (20 mm) | 11 | Reduction piece |
| 4 | High water level mark | | |
| 5 | Measuring rod | | |

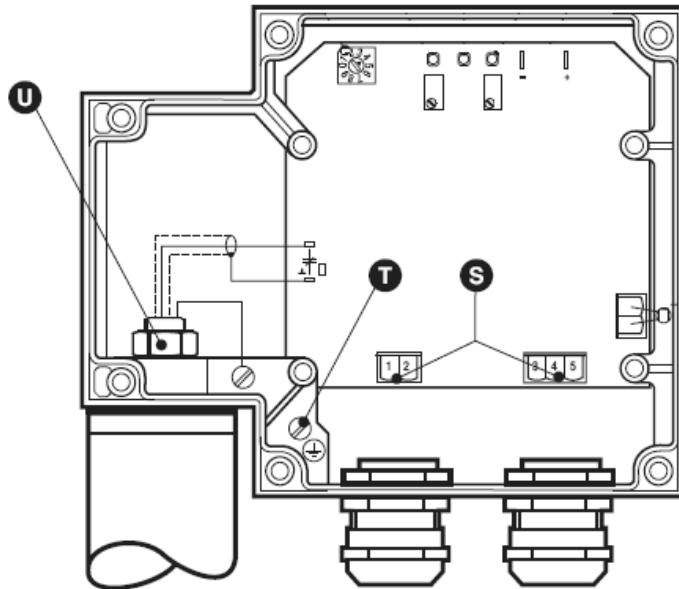
Electrical connection

For connecting the electrode unit to the boiler control panel we recommend to use two separate cables. One standard cable should be used for power supply and one screened cable should be used for signal transmission. The cross section of the cables must not be below 1.5 mm².

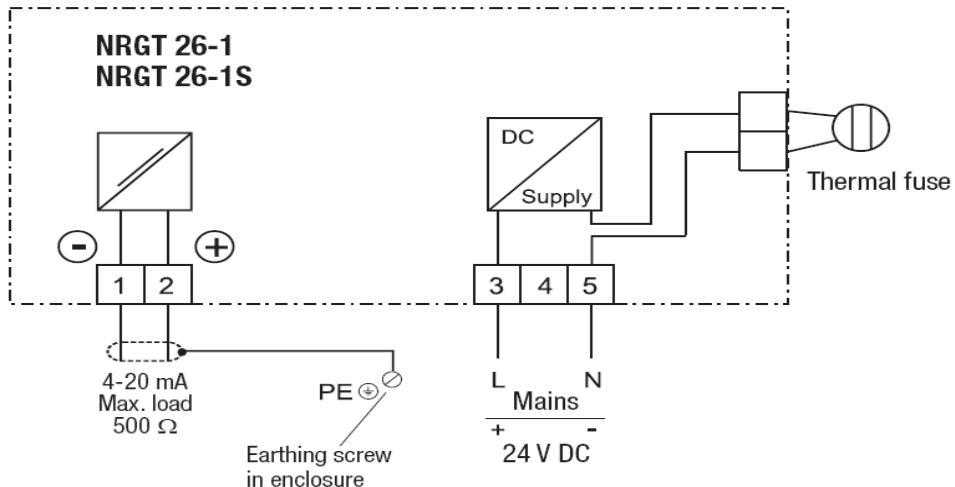
The connection of the electrode shall be done in the following way:



- Step 1 Loosen the screws (H). The screws are fixed in the cover to protect them from falling out of the cover.
- Step 2 Remove electrode head cover (J)
- Step 3 Loosen and take off the nuts from the cable glands (I)



- Step 4 If required, the electrode head can be turned around by +/- 180 degrees. For this Purpose, loosen but not take off screw (U), carefully turn the electrode head to the Desired position and tighten again screw (U).
- Step 5 Take off the terminals (S) from the electronic board inside the electrode head
- Step 6 Insert the cables through the cable glands (I) and connect to the terminals according to below connection diagram:



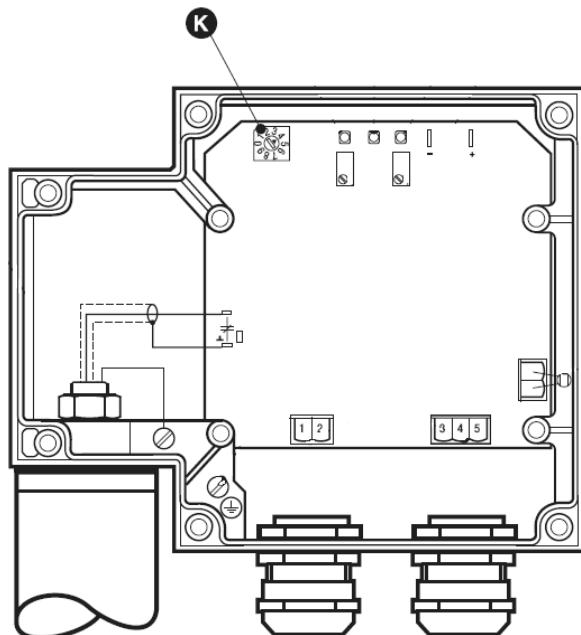
- Step 7 Connect signal cable screen to PE-terminal (T)
- Step 8 Plug the connection terminals (S) onto the electronic board
- Step 9 Fix the cable glands (I)
- Step 10 Mount the electrode head cover (J) and carefully tighten the cover screws (U)

ITEM BO 021 - OPERATING INSTRUCTIONS

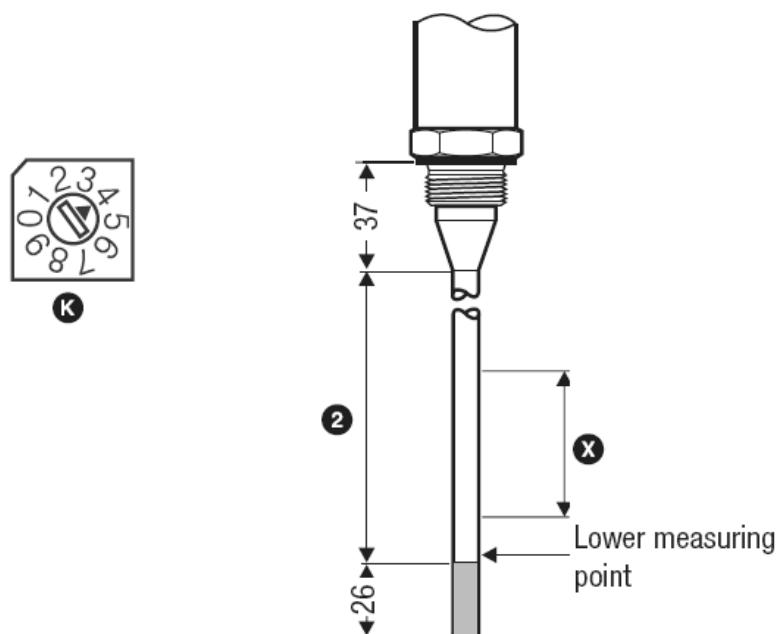
Issued on:
Issued by:24.02.2007
1600/Fre**Basic settings**

The electrode NRGT 26-1 S is factory pre-set to the following parameters:

Electrode length (effective):	275 mm	Switch (K):	Position 4 (Boiler water)
	375 mm to 675 mm		Position 4 (Boiler water)
	775 mm to 1475 mm		Position 4 (Boiler water)
	1575 mm to 1975 mm		Position 5 (Boiler water)



Within the possible measuring range of the electrode (2) it is possible to define the active measuring range (x). This selection can be done also by the switch (K):



Settings for boiler water:

X (mm)	Switch (K)
200 - 1500	4
1600 - 2000	5

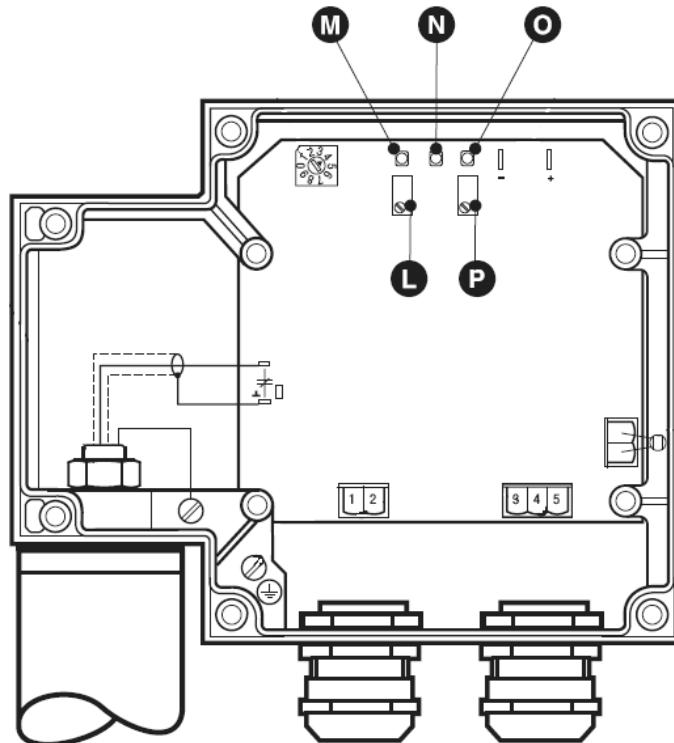
Attention !!

If the actual range (x) is significantly smaller than the effective length (2), reduce setting of the switch (K) by one digit.

Commissioning**WARNING! Danger of life!**

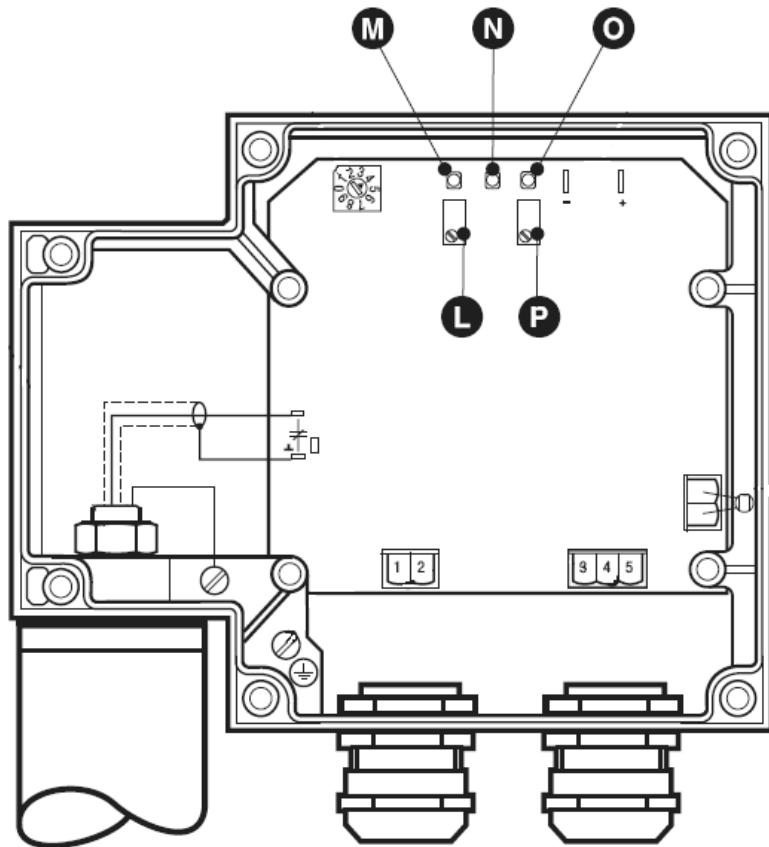
Terminal strip and electric components of the electrode are under electric voltage during operation. Serious Injuries by electric current are possible !! Use only fully insulated screwdriver for adjusting the electrode. The work may only be carried out by qualified electricians.

- Step 1 Check if electric connection has been done according to connection diagram (page 5)
- Step 2 Check if the supply voltage is according to the name plate of the electrode
- Step 3 Switch on the supply voltage. The LED (M) will light up, provided that the electrode is not immersed in water



- Step 4 Adjust lower limit of active measuring range (4 mA / 0% output):
 - a) Fill the boiler up to the 0% level (lower rim of lowest level gauge glass). The red LED (M) may become inactive when the water level reaches the electrode.
 - b) Fire the burner in emergency mode until the boiler has reached the pressure set point.
 - c) Turn potentiometer (L) in counter-clockwise direction until the red LED (M) lights up.
 - d) Turn potentiometer (L) in clockwise direction until **only** the green LED (N) is active. The lower measuring limit is now adjusted

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Step 5 Adjust upper limit of active measuring range (20 mA / 100% output):

- a) Fill the boiler up to the 100% level (upper rim of highest level gauge glass) and wait for 30 seconds to allow the boiler level to settle.
- b) Turn potentiometer (P) in clockwise direction until **only** the red LED (O) lights up.
- c) Turn potentiometer (P) in counter-clockwise direction until the green LED (N) lights up.
- e) Turn potentiometer (P) in clockwise direction until the green LED (N) becomes inactive. The upper measuring limit is now adjusted.
- f) Put electrode head cover (J) back in position.



In case the electrode adjustment is done on a cold boiler, the measuring limits will move after heating up the boiler due to the thermal expansion of the measuring rod. In this case it is necessary to do a re-adjustment of the measuring limits.

4 TROUBLESHOOTING

Fault finding list for troubleshooting

Electrode fails to work

Fault: Mains voltage has not been applied.

Remedy: Apply mains voltage. Wire equipment according to the wiring diagram.

Fault: The thermal fuse has been activated.

Remedy: In case of a defective thermal fuse the mains voltage has not been applied to terminal (R). Replace defective thermal fuse (*Article no. 613901*). The ambient temperature must not exceed 70 °C.

Fault: The electrode housing does not have earth connection to the boiler body.

Remedy: Clean seating surfaces and insert metal joint ring (of stainless steel .430) D 27 x 32 to DIN 7603. Do not insulate the electrode with hemp or PTFE tape!

Fault: Electronic board is defective.

Remedy: Replace board (*Article no. 613899*).

Electrode does not work accurately

Fault: Electrode has been installed without protection tube. The protection tube serves as reference electrode.

Remedy: Install protection tube.

Fault: The vent hole in the protection tube does not exist, is obstructed or flooded.

Remedy: Check protection tube and, if necessary, provide vent hole.

Fault: The isolating valves of the external measuring pot (if applied) are closed.

Remedy: Open isolating valves.

Fault: The desired zero point does not lie within the measuring range of the electrode.
The electrode is too short.

Remedy: Replace by other electrode. Choose adequate electrode length.

Fault: The adjustment of the measuring range is wrong.

Remedy: Adjust switch (K) correctly. See "Basic settings".

Fault: Dirt deposits have accumulated on the electrode rod.

Remedy: Remove compact system and clean electrode rod with a wet cloth.

Fault: The gasket of the electrode rod is damaged.

Measuring current at terminal and 2 = 20 mA.

Remedy: Replace electrode by new one

If faults occur that are not listed above, please contact our subsidiary or agency in your country or any of our global service partners.