



Level Electrode

# **NRG 16-50S**

**EN**  
English

Original Installation Instructions  
**819013-01**

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## Important Notes

### Usage for the intended purpose

The level electrode NRG 16-50 S is used in conjunction with level switch NRS 1-50 (de-energizing delay: 15 seconds) as water-level limiter for steam boilers and (pressurized) hot-water installations on board of seagoing vessels, mobile offshore platforms or river boats.

Water level limiters switch off the heating when the water level falls below the set minimum level (low water).

### Function

When the water level falls below the low level, the level electrode is exposed and a low level alarm is triggered in the level switch NRS 1-50. This switchpoint "Low water level (LW)" is determined by the length of the electrode tip.

After the de-energizing delay has elapsed, the two output contacts of the level switch NRS 1-50 will open the safety circuit for the heating. The equipment has a factory set default de-energizing delay of 15 seconds to compensate for the the movements of the ship.

The self-monitoring function ensures that an alarm will also be triggered if the electrode insulation is contaminated or has developed a leak or if there is a malfunction in the electrical connection.

The level electrode is installed inside steam boilers, vessels or inlet lines of hot-water systems. The protective tube mounted on site (see section **Examples of Installation** (pages 10, 11)) ensures correct functioning.

If the level electrode is installed in an isolatable level pot outside the boiler, make sure that the connecting lines are rinsed regularly. In addition, the logic unit SRL 6-50 is required to monitor the purging times and the purging sequence.

If the connecting lines for steam  $\geq 40$  mm and water  $\geq 100$  mm, the installation is considered to be internal. In this case the rinsing processes do not have to be monitored.

## Important Notes – continued –

### Safety note

Water level limiters are safety devices and must only be installed, wired and commissioned by qualified and competent staff.

Retrofitting and maintenance work must only be performed by qualified staff who – through adequate training – have achieved a recognised level of competence.



#### Danger

When loosening the level electrode steam or hot water might escape!

This presents the risk of severe scalding all over the body!

It is therefore essential not to dismantle the level electrode unless the boiler pressure is verified to be 0 bar.

The level electrode becomes hot during operation.

Risk of severe burns to hands and arms.

Before carrying out installation and maintenance work make sure that the equipment is cold.



#### Attention

The name plate specifies the technical features of the equipment. Do not commission or operate any item of equipment that does not bear its specific name plate.

### Scope of supply

#### NRG 16-50 S

1 Level electrode NRG 16-50 S, PN 40, DN 50

1 Installation manual

## Technical data

### NRG 16-50 S

#### Service pressure

PN 40, 32 bar at 238 °C

#### Mechanical connection

Flange PN 40, DN 50, DIN 2527, form B

#### Materials

Sheath 1.4301, X5 CrNi18-10

Flange 1.0460 / A 105

Screw-in body 1.4571, X6CrNiMoTi17-12-2

Measuring electrode 1.4571, X6CrNiMoTi17-12-2

Electrode tip 1.4401, X5CrNiMo17-12-2

Electrode insulation Gylon®

Four-pole connector Polyamid (PA)

#### Lengths available

500 mm, 1000 mm, 1500 mm, 2000 mm

#### Electrical connection

Four-pole connector, cable gland M 16

#### Protection

IP 65 to EN 60529

#### Max. admissible ambient temperature

70°C

#### Weight

Approx. 4.5 kg (without electrode tip)

#### Approvals

see data sheet

## Name plate / marking





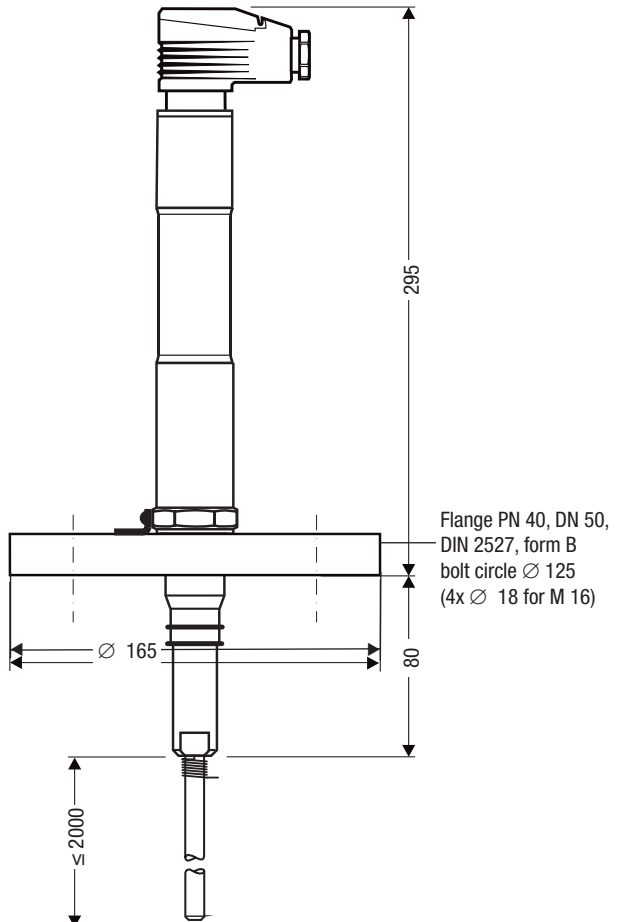
Equipment designation		Safety note		
<b>NRG 16-50S</b>			 Betriebsanleitung beachten See installation instructions Voir instructions de montage	 Disposal note
PN 40	DN 50	1.4571/1.0460	IP 65	Pressure rating, flange type, material number
	32 bar (464psi) 238°C (460°F) T amb = 70°C (158 °F)			
GESTRA AG		• D-28215 Bremen		
Manufacturer		Pressure/temperature rating		

Fig. 1

Dimensions NRG 16-50 S



**Fig. 2**  
NRG 16-50 S for  
marine applications

# Installation

## NRG 16-50 S

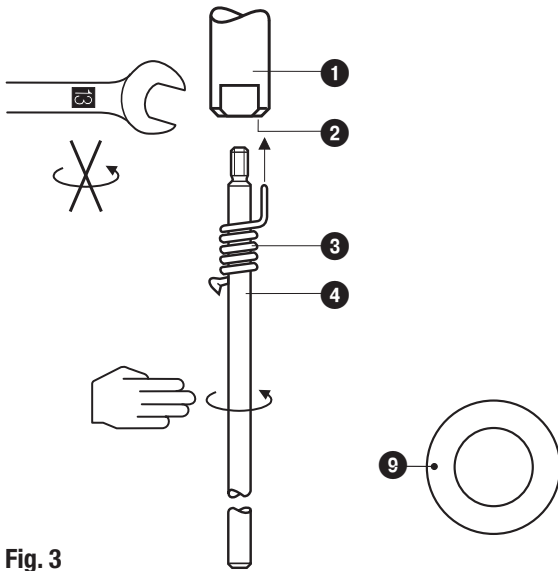


Fig. 3

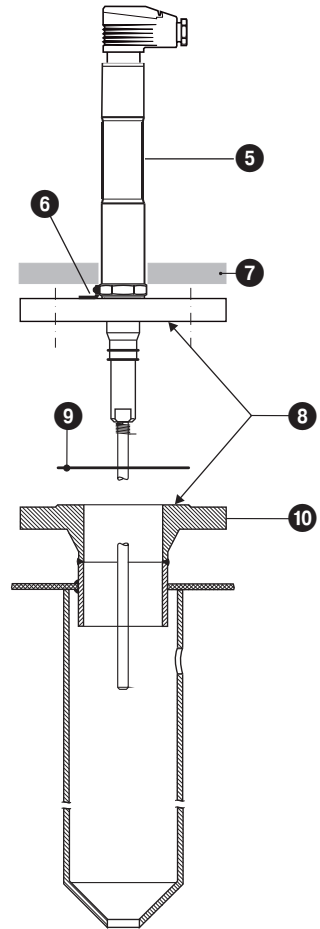


Fig. 4

### Key

- |  |   |
|--|---|
| ① Measuring electrode                  | ⑥ Anti-rotation element   |
| ② Bore                                 | ⑦ Thermal insulation (provided on site) d=20 mm (outside of thermal insulation of steam boiler) |
| ③ Spring                               | ⑧ Sealing surface   |
| ④ Electrode tip                        | ⑨ Flange joint (provided on site)   |
| ⑤ NRG 16-50 S with four-pole connector | ⑩ Connecting pipe socket (provided on site)   |



### NRG 16-50 S, step 1

1. Screw electrode tip ④ into measuring electrode ①. **Fig. 3**
2. Carefully determine required measuring length of electrode.
3. Mark length of electrode tip ④.
4. Unscrew electrode tip ④ from measuring electrode ① and cut tip.
5. After visual inspection screw electrode tip ④ into measuring electrode ①. Slide spring ③ along electrode tip ④ so that its end completely enters the small hole ②.

### NRG 16-50 S, step 2

6. Check seating surfaces. **Fig. 4**
7. Put flange joint ⑨ onto connecting pipe socket ⑩. **Fig. 4**
8. Put level electrode onto connecting pipe socket and fix it with four bolts M 16.
9. Tighten bolts in diagonally opposite pairs. The tightening torque depends on the flange joint used.



#### Note

- For the approval of the boiler standpipe the relevant regulations must be considered.
- Refer to pages 10 for typical installation examples.



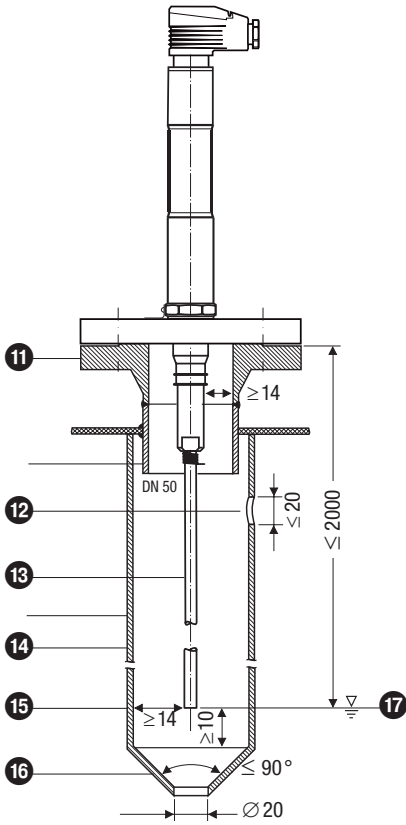
#### Attention

- Make sure that the sealing surface of the connecting pipe socket is accurately machined!
- Do not bend electrode tip when mounting.
- Do not lag electrode body above the hexagonal section.
- Observe minimum spacing of 14 mm between measuring electrode / electrode tip and protection tube / level pot! **Fig. 5, Fig. 6**
- Observe the minimum spacings when installing the electrode!

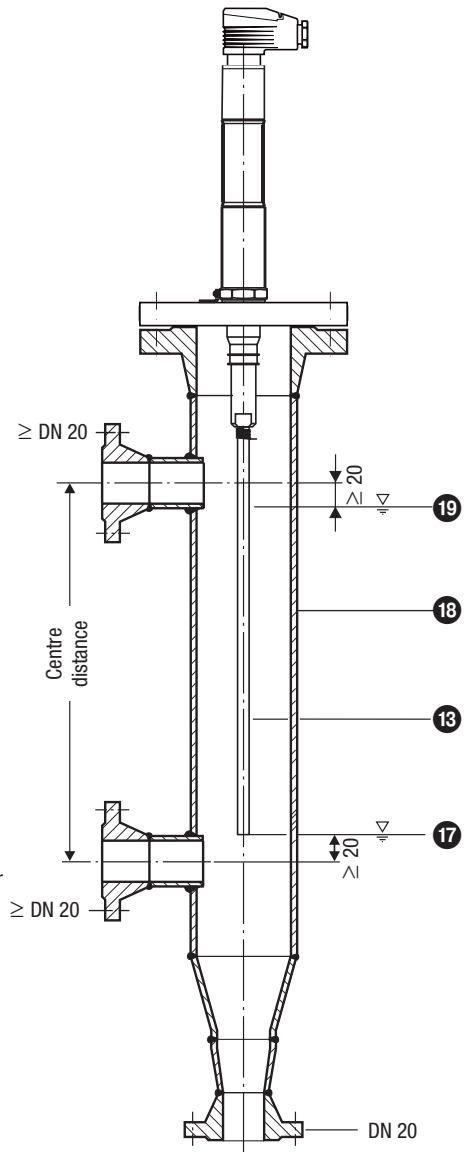
#### Tools

- Open-end spanner A. F. 13, DIN 3110, ISO 3318
- Scriber
- Hacksaw
- Flat file, medium cut, DIN 7261, form A

**Examples of installation for NRG 16-50 S**



**Fig. 5** Protection tube (provided on site) if electrode is used as internal water-level limiter



**Fig. 6** Level pot if electrode is used as external water-level limiter

### Key

- 11 For the approval of the boiler standpipe with connecting flange the relevant regulations must be considered.
- 12 Vent hole                      Provide vent hole as close to the boiler wall as possible!
- 13 Electrode tip  $\varnothing$  8 mm
- 14 Protection tube  $\geq$  DN 80
- 15 Distance between electrode tip and protection tube  $\geq$  14 mm
- 16 Reducer DIN 2616-2, K-88.9 x 3,2- 42.4 x 2.6 W
- 17 Low water (LW)
- 18 Level pot  $\geq$  DN 80
- 19 High water HW

## Electrical Connection

### NRG 16-50 S with four-pole connector

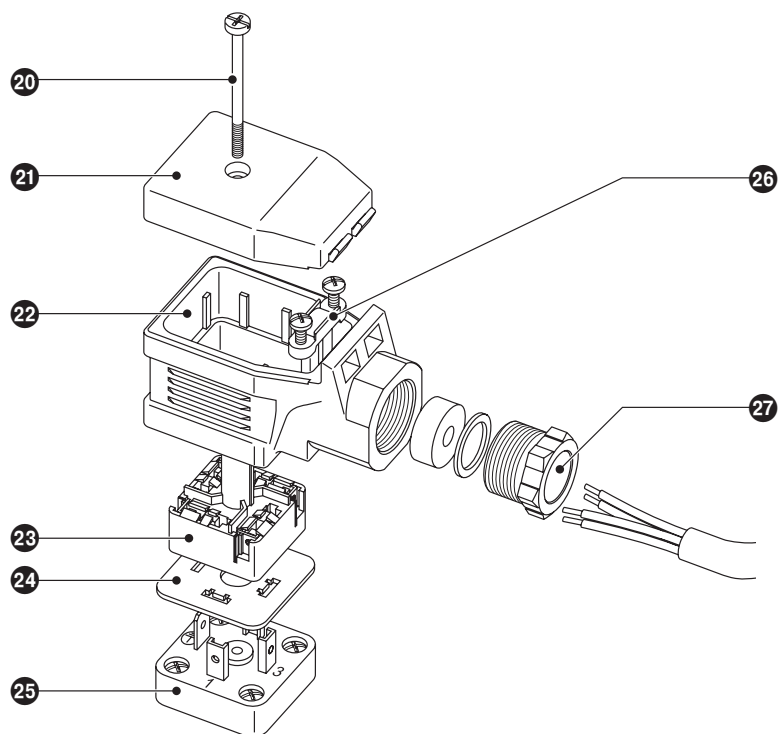


Fig. 7

#### Key

- 20 Screw M 4
- 21 Cover
- 22 Upper part of the terminal box
- 23 Connecting plate
- 24 Insulating plate
- 25 Contact plate of level electrode
- 26 Cable strain relief
- 27 Cable gland M 16 (PG 9)

### Connection of level electrode

To connect the level electrode(s) use screened multi-core control cable with a min. conductor size 0.5 mm<sup>2</sup>, e.g. LiYCY 4 x 0.5 mm<sup>2</sup>.

Max. length 100 m with an electrical conductivity of the boiler water > 10 µS/cm at 25 °C.

Wire terminal strip in accordance with the wiring diagram. **Fig. 8, 9**

Connect screens to terminals 5 and 13 and to the central earthing point (**CEP**) in the control cabinet.

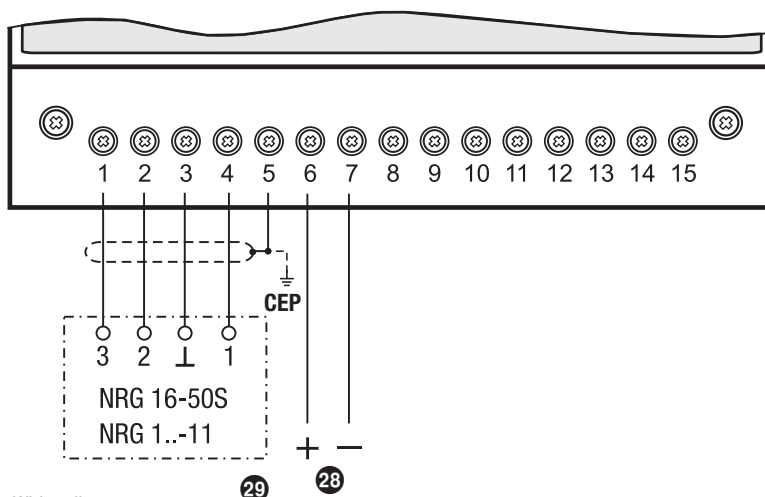
### NRG 16-50 S with four-pole connector

1. Undo screw **20**. **Fig. 7**
2. Remove upper part **22** of the terminal box from the level electrode but leave insulating plate **24** on contact plate **25**.
3. Remove cover **21**.
4. Press connecting plate **23** out of upper part of the terminal box **22**.  
**The upper part of the terminal box can be turned in steps of 90°.**
5. Detach cable gland **27** and cable clamp **26** from upper part of the terminal box **22**.
6. Run cable through cable gland **27** and upper part of the terminal box **22** and wire terminals of the connecting plate **23** in accordance with wiring diagram. **Fig. 8**
7. Press connecting plate **23** into the upper part of the terminal box and align cable.
8. Fix cable with cable clamp **26** and cable gland **27**.
9. Put cover **21** in place and insert screw **20**.
10. Put upper part of the terminal box onto the level electrode and fix it with screw **20**.

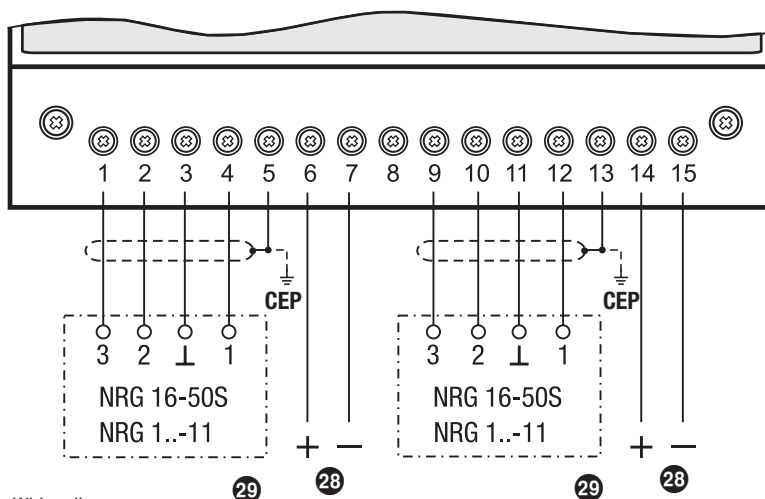
### Tools

- Screwdriver size 1
- Screwdriver size 2.5, completely insulated according to DIN VDE 0680-1
- Open-end spanner A.F. 18 (19) mm

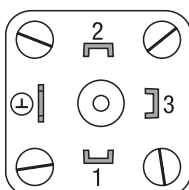
**Wiring diagram**



**Fig. 8** Wiring diagram for equipment with ONE electrode



**Fig. 9** Wiring diagram for equipment with TWO electrodes



**Fig. 10** Electrical connection of level electrode with four-pole connector

## Electrical Connection – continued –

### Key

- 28 Stand-by input 1 / 2, 24 V DC, for connecting the logic unit SRL
  - 29 Level electrode NRG 1...-50S
- CEP Central earthing point in control cabinet

## Commissioning, fault indication and remedy

For additional information on commissioning procedures and troubleshooting refer to the installation manual of the level switch NRS 1-50.

## Removing and disposing of electrode



### Danger

When loosening the level electrode steam or hot water might escape! This presents the risk of severe scalding all over the body! It is therefore essential not to dismantle the level electrode unless the boiler pressure is verified to be 0 bar.

The level electrode becomes hot during operation.

Risk of severe burns to hands and arms.

Before carrying out installation and maintenance work make sure that the equipment is cold.

## Removing and disposing of electrode

1. Undo screw 20. Fig. 7
2. Detach upper part of the terminal box 22 from the level electrode. Before removing the equipment make sure that it is neither hot nor under pressure.

For the disposal of the equipment observe the pertinent legal regulations concerning waste disposal.



### Note

When ordering spare parts or replacement equipment please state the material number indicated on the name plate.

If faults occur that are not listed above or cannot be corrected, please contact our service centre or authorized agency in your country.



Agencies all over the world: [www.gestra.de](http://www.gestra.de)

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