

Level Electrode

**NRG 10-52**

**NRG 16-52**

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## Important notes

### Usage for the intended purpose

The level electrode NRG 10-52 / NRG 16-52 in conjunction with level switch NRS 1-... is designed for signalling up to four different water levels and used for instance in steam boiler plants and (pressurized) hot-water installations or in condensate and feedwater tanks, e. g. as water level limiter with MIN/MAX alarm.

The level electrode is designed for use in conjunction with the following level switches: NRS 1-52, NRS 1-53, NRS 1-54 and NRS 1-55 or NRS 1-1, NRS 1-2, NRS 1-3 and NRS 1-5.

### Function

The electrode operation is based on the conductive measuring principle using the electrical conductivity of the water for signalling water level. The length of the individual electrode rods determines the switchpoints for the respective water levels.

The level electrode is installed inside steam boilers, vessels or in an external level pot. If the electrode is installed inside the boiler or vessel, a protection tube provided on side ensures correct functioning. (see section **Examples of installation** on page 9).

The level electrode can be installed together with one GESTRA level electrode for water level limiting or for high-level alarm in a single protection tube or external level pot.

### Safety note

The equipment 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 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 electrode unless the boiler pressure is verified to be 0 bar.

The 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.

## Technical data

### NRG 10-52, NRG 16-52

#### Operating pressure

NRG 10-52: PN 6, 6 bar at 164 °C

NRG 16-52: PN 40, 32 bar at 238 °C

#### Mechanical connection

Screwed G 1 A, ISO 228

#### Materials

Screw-in body 1.4571, X6CrNiMoTi17-12-2

Electrode tips 1.4571, X6CrNiMoTi17-12-2

Insulation, spacer disks PTFE

Five-pole connector 3.2161 G AISi8Cu3

#### Lengths available

1000 mm, 1500 mm

#### Electrical connection

Five-pole connectors, cable glands Pg 11

#### Protection

IP 65 to EN 60529

#### Max. admissible ambient temperature

Max. 70 °C

#### Weight

Approx. 1.6 kg (NRG 16-52 L = 1000 mm)

### Scope of supply





#### NRG 10-52

- 1 Level electrode NRG 10-52, PN 6
- 1 Joint ring 33 x 39 form D to DIN 7603, made from 1.4301, bright annealed
- 1 Installation manual

#### NRG 16-52

- 1 Level electrode NRG 16-52, PN 40
- 1 Joint ring 33 x 39 form D to DIN 7603, made from 1.4301, bright annealed
- 1 Installation manual

### Example name plate/markings

Equipment designation				Safety note		
<b>NRG 16-52</b> 				 Betriebsanleitung beachten See installation instructions Voir instructions de montage		 Disposal note
PN 40	G 1	1.4571	IP 65	TÜV . WR / WB . xx-424		Type approval
 Pmax Tmax		32 bar (464psi) 238°C (460°F) T amb = 70°C (158 °F)		Mat-Nr.:		Conformity marking
GESTRA AG		Münchener Straße 77		• D-28215 Bremen		

Manufacturer

Application range

Pressure rating, thread type, material number

Fig. 1

## Installation



### Note

- One level electrode NRG 10-52 / NRG 16-52 can be installed together with one GESTRA level electrode, one compact level switch or transmitter in a single protection tube or external level pot (inside diameter 100 mm). **Fig. 4 - 7.** If the level limiting electrode is installed inside the vessel, it must be at least 40 mm away from the upper vent hole.
- For the approval of the boiler standpipe the relevant regulations must be considered.
- Refer to page 9 for typical installation examples.
- If installed outdoors the level electrode **must** be equipped with a GESTRA weather protection cover.



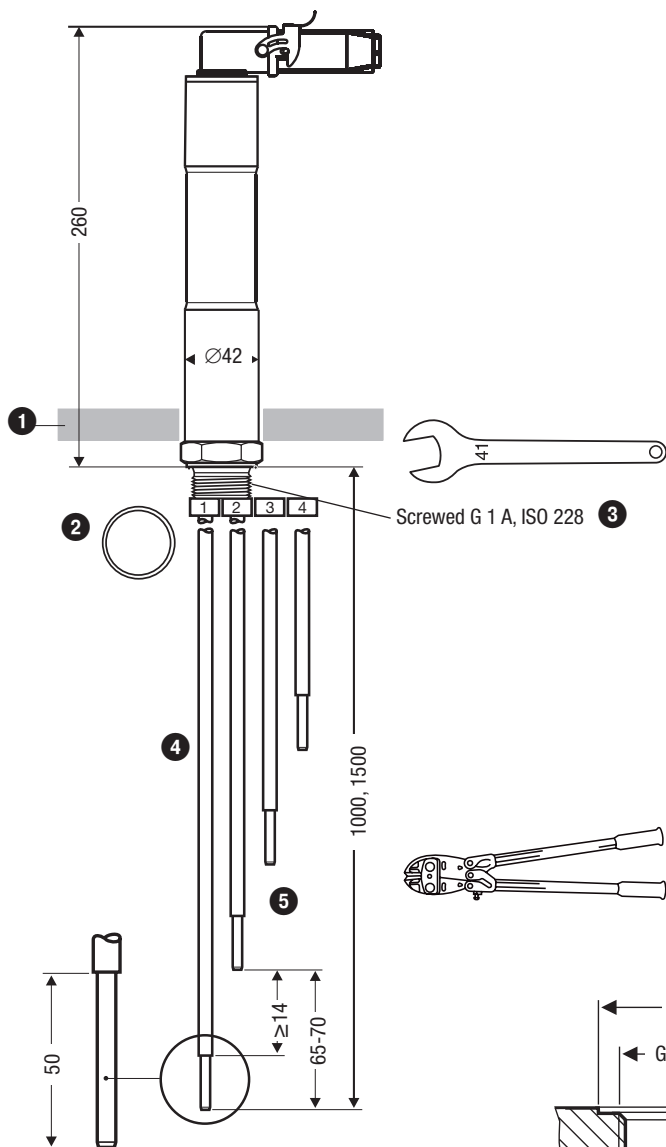
### Attention

- The level electrode shall be installed vertically.
- The seating surfaces of the standpipe or the flange provided on the vessel must be accurately machined, see **Fig. 3.**
- Do not bend electrode tips when mounting.
- Do not subject electrode tips to physical shocks.
- At least 30 mm of the insulating tube must remain on the electrode tips.
- Use only the supplied joint ring.  
NRG 1.-52: 33 x 39, form D, DIN 7603, 1.4301, bright annealed
- Do not lag electrode body above the hexagonal section.
- Do not insulate electrode thread with hemp or PTFE tape!
- Do not apply conductive paste or grease to the electrode thread!
- Make sure that the air distance between the electrode tips and earth (flange, vessel wall) is not less than 14 mm. **Fig. 4 - 7.**
- Observe the minimum withdrawal distance when installing the electrode!
- The specified torques must be strictly observed.

### Tools

- Open-end spanner A. F. 41, DIN 3110, ISO 3318
- Scriber
- Bolt cutter
- Flat file, medium cut, DIN 7261, form A

## Dimensions NRG 10-52, NRG 16-52



**Fig. 2**  
NRG 1..-52 with five-pole connector

**Fig. 3**


**NRG 10-52, NRG 16-52, step 1**

1. Determine required measuring lengths of electrode tips and enter data in **table “Functions”**.
2. Use a bolt cutter to cut the four electrode tips **1 2 3 4** .
2. Deburr faces of electrode tips.
3. Strip off 50 mm of PTFE insulation from the ends of the electrode tips. Make sure that the remaining insulation is at least 30 mm long, measured from the lower edge of the screwed connection.

**NRG 10-52, NRG 16-52, step 2**

7. Check seating surfaces. **Fig. 3**
8. Place supplied joint ring **2** onto seating surface of the threaded standpipe or flange. **Fig. 3**
9. Apply a light smear of heat resistant silicone grease (e.g. WINIX® 2150) to electrode thread **3**.
10. Screw level electrode into threaded standpipe or flange and tighten with an open-end spanner A. F. 41 mm. The torque required **when cold is 140 Nm**.

**Table “Functions”**

Function	Function Please enter function!	Electrode rod/ Connecting terminal	Length [mm] Please enter length
Electrode body	Functional earth		
e. g. MIN alarm		1	
e. g. pump OFF		2	
e. g. pump ON		3	
e. g. MAX alarm		4	

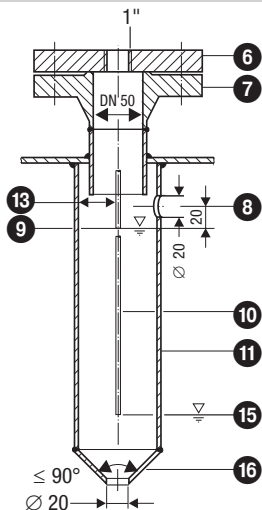
**Key**

- 1** Thermal insulation, provided on site, d = 20 mm (outside of thermal insulation of steam boiler)
- 2** NRG 1..-52: Joint ring 33 x 39, form D, DIN 7603, 1.4301, bright annealed
- 3** Electrode thread
- 4** Insulation of electrode tips
- 5** Electrode tips

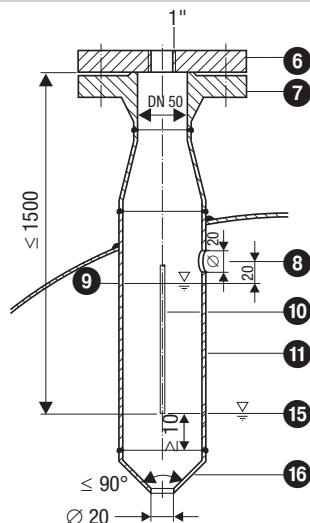


## Examples of installation

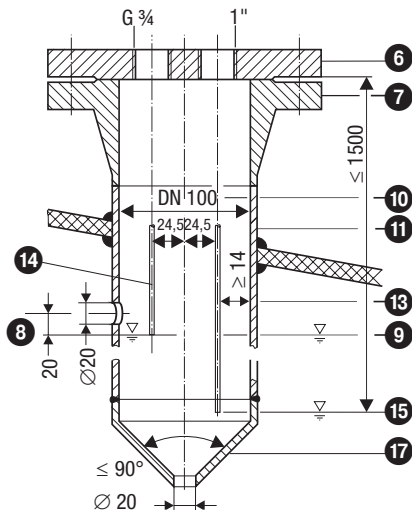
NRG 10-52, NRG 16-52



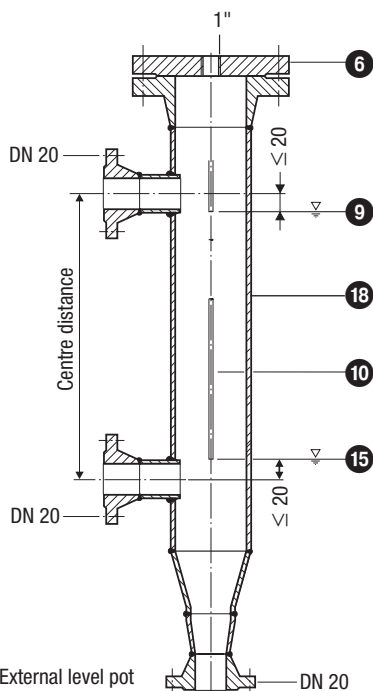
**Fig. 4** Protection tube (provided on site) for installation inside the boiler



**Fig. 5** Protection tube (provided on site) for installation inside the boiler



**Fig. 6** Protection tube (provided on site) for installation inside the boiler and in combination with other GESTRA equipment



**Fig. 7** External level pot

## Examples of installation - continued -

### Key

- ⑥ Flange PN 40, DN 50, EN 1092-01 (single electrode)  
Flange PN 40, DN 100, EN 1092-01 (combination of electrodes)
- ⑦ For the approval of the boiler standpipe with connecting flange the relevant regulations must be considered.
- ⑧ Vent hole    Provide vent hole as close to the boiler wall as possible!
- ⑨ High water (HW)
- ⑩ Electrode tip  $d = 5 \text{ mm}$
- ⑪ Protection tube DN 80 (in France according to AFAQ  $\geq$  DN 100)
- ⑫ Protection tube DN 100
- ⑬ Distance between electrode rods and protection tube  $\geq 14 \text{ mm}$
- ⑭ Distance between electrode tips (NRG 1...-50 or NRG 1...-51)  $\geq 14 \text{ mm}$  (creepage distances and clearances)
- ⑮ Low water LW
- ⑯ Reducer DIN 2616-2, K-88.9x3.2-42.4 x 2.6 W
- ⑰ Reducer DIN 2616-2, K-114.3x3.6-48.3 x 2.9 W
- ⑱ Level pot  $\geq$  DN 80

## Electrical connection

### NRG 10-52, NRG 16-52 with five-pole connector

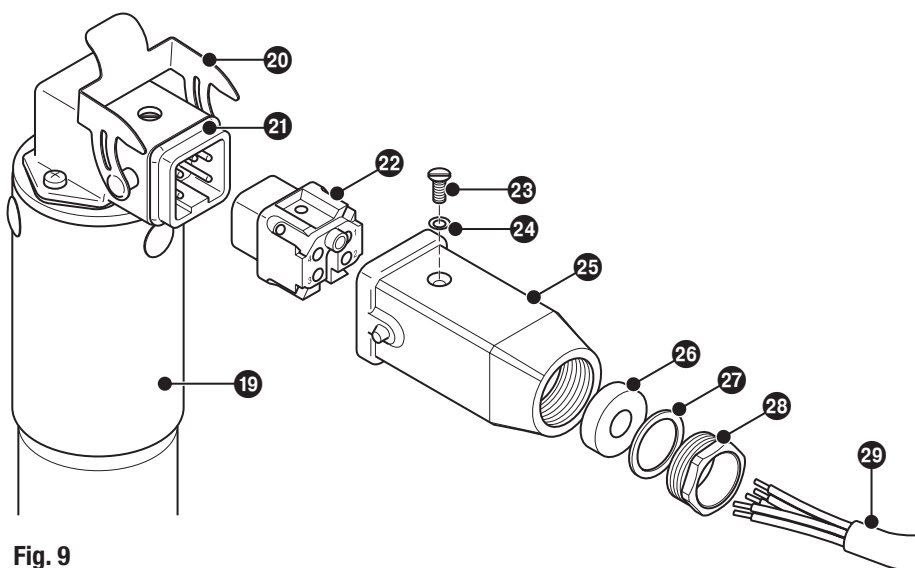


Fig. 9

#### Key

- |   |                               |
|---|-------------------------------|
| 19 Level electrode NRG 10-52, NRG 16-52 | 25 Upper part of terminal box |
| 20 Retaining bracket                    | 26 Gasket                     |
| 21 Lower part of terminal box           | 27 Ring                       |
| 22 Contact block                        | 28 Cable gland                |
| 23 Screw                                | 29 Control cable              |
| 24 Sealing ring                         |                               |

#### Tools

- Screwdriver, size 1
- Screwdriver, size 2.5, completely insulated according to DIN VDE 0680-1

### Connection of level electrode

To connect the level electrode use screened multi-core control cable with a min. conductor size 0.5 mm<sup>2</sup>, e. g. LiYCY 5 x 0.5 mm<sup>2</sup>, max. length: 100 m.

Connect the screen **only once** to the central earthing point (CEP) in the control cabinet.

### NRG 10-52, NRG 16-52 - connecting the five-pole connector

1. Swing up the retaining bracket 20 and detach the upper part of the terminal box 25 from the level electrode.
2. Undo screw 23 and press the contact block 22 out of the upper part of the terminal box 25. Make sure that you do not lose the sealing ring 24.
3. Unscrew cable gland 28.
4. Pull cable through cable gland 28, ring 27, gasket 26 and upper part of terminal box 25.
5. Connect the terminals in the contact block 22 (Fig. 10) according to table "Functions" on page 9.
6. Press the contact block 22 into the upper part of the terminal box 25.
7. Insert screw 23 (with sealing ring 24) into hole and tighten. In doing so the contact block 22 is fixed to the upper part of the terminal box 25.
8. Fasten the cable gland 28.
9. Plug the upper part 25 into the lower part 21 of the terminal box and secure it in place by swinging down the retaining bracket 20.

### Connecting terminals in contact block

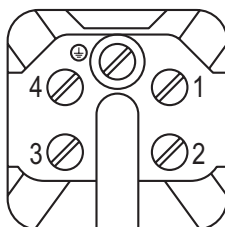


Fig. 10



#### Attention

- Please observe the instructions given in the installation & operating manual for the NRS 1-52, NRS 1-53, NRS 1-54 and NRS 1-55 or NRS 1-1, NRS 1-2, NRS 1-3 and NRS 1-5.
- Make sure that connecting cables leading to the level electrode are segregated and run separately from power cables.
- Check the connection of the screen to the central earthing point (CEP) in the control cabinet.

## Commissioning, fault indication and troubleshooting

For additional information on commissioning procedures and troubleshooting refer to the installation & operating manuals for level switch NRS 1-52, NRS 1-53, NRS 1-54 and NRS 1-55 or NRS 1-1, NRS 1-2, NRS 1-3 and NRS 1-5!

## Removing and disposing of the level electrode



### Danger

When loosening the 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 electrode unless the boiler pressure is verified to be 0 bar.

The 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 level electrode NRG 10-52 / NRG 16-52

1. Undo screw ②③. **Fig. 9**
  2. Detach upper part of the terminal box ②⑤ from the level electrode.
  3. Before removing the equipment make sure that is is neither hot nor under pressure.
- For the disposal of the equipment observe the pertinent legal regulations concerning waste disposal.

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

## **Declaration of Conformity Directives and Standards**

For more information on the conformity of the equipment as well as applied Directives and Standards please refer to our Declaration of Conformity and associated certificates and/or approvals.

The Declaration of Conformity can be found online at [www.gestra.com](http://www.gestra.com) and associated certificates can be requested from:

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Note that Declarations of Conformity and associated certificates lose their validity if equipment is modified without prior consultation with us.





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

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