

Self-Monitoring Level Electrode

NRG 16-11

NRG 17-11

NRG 19-11

System description

NRG 1...-11 level electrodes operate on the conductivity measurement principle to detect when the fill level has dropped to minimum (water shortage) in a steam boiler.

The NRG 1...-11 combines with an NRS 1-50 level switch acting as a water-level limiter (equipment with safety function).

For use in steam and hot-water plants in accordance with EN 12952 and EN 12953.

Function

The water-level limiter combines two devices, an NRG 1...-11 level electrode and a GESTRA NRS 1-50 level switch. The NRG 1...-11 level electrode consists of two concentrically arranged electrodes (measuring electrode and compensating electrode). Both electrodes feature special seal discs to insulate them from one another.

The water-level limiter operates based on the principle of conductive measurement. This requires the water to be electrically conductive. Under standard, undisrupted operation, the level electrode is immersed in the boiler water and does not send a low-level alarm signal (LW alarm). A low-level alarm signal triggers as soon as the electrode rod remains above the water level for longer than 3 seconds. Water entering the inside of the level electrode in the event that its body is no longer tightly sealed will also trigger a low-level alarm. When a low-level alarm is triggered, always check the water level in the boiler unit's gauge glass first.

Design

NRG 1...-11:

Version with 3/4" male thread, ISO 228-1.

Technical data

Service pressure

NRG 16-11: 32 bar at 238°C

NRG 17-11: 60 bar at 275°C

NRG 19-11: 100 bar at 311°C

Connection

Screwed 3/4", ISO 228-1

Materials

Shaft 1.4571 X6CrNiMoTi17-12-2

Measuring electrode 1.4401, X5CrNiMo17-12-2

Electrode insulation Gylon®

Four-pin polyamide (PA) connector

Lengths available

500 mm 1000 mm

1500 mm 2000 mm

2500 mm 3000 mm

Cell constant C

0.13 cm⁻¹ **with** enlarged measuring surface

0.3 cm⁻¹ **without** enlarged measuring surface

Response sensitivity

10 µS/cm at 25°C, cell constant 0.3 cm⁻¹

0.5 µS/cm at 25°C, cell constant 0.13 cm⁻¹

Connection

Four-pin connector, M16 (PG 9) cable glands

Protection

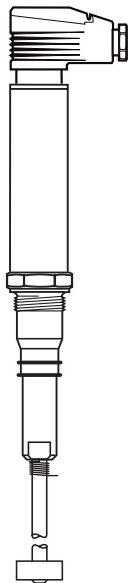
IP 65 acc. to EN 60529

Admissible ambient temperature

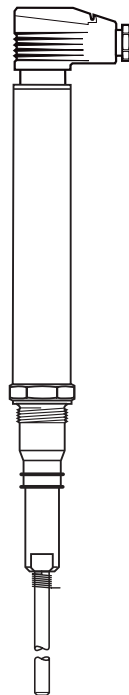
Max. 70°C

Weight

Approx. 1.1 kg



NRG 16-11 with enlarged measuring surface (optional)



NRG 17-11, NRG 19-11

Key

- 1 Flange PN 40, PN 63, PN 160, DN 50, EN 1092-1
Flange PN 40, PN 63, PN 160, DN 100, EN 1092-1
- 2 Pre-inspect standpipe and connection flange when inspecting the boiler.
- 3 Vent hole
Locate vent hole as close to boiler wall as possible!
- 4 High water level
- 5 Electrode rod $d = 8\text{ mm}$
- 6 Protection tube $\geq \text{DN } 80$
(in France acc. to AFAQ ≥ 100)
- 7 Protection tube DN 100
- 8 Electrode gap $\geq 14\text{ mm}$
- 9 Low water level
- 10 Reducer DIN 2616-2, K-88.9x3.2-42.4 x 2.6 W

Installation examples

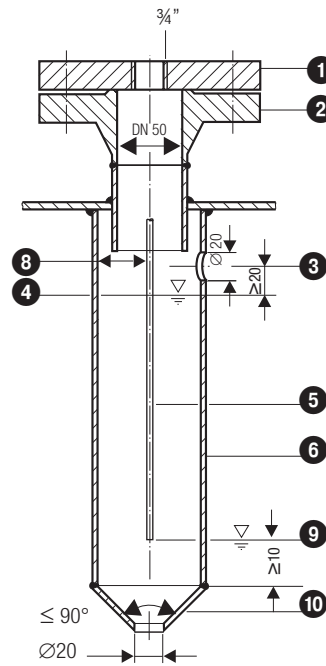


Fig. 1

Protection tube (on-site) when used as interior water-level limiter, PN 40, PN 63

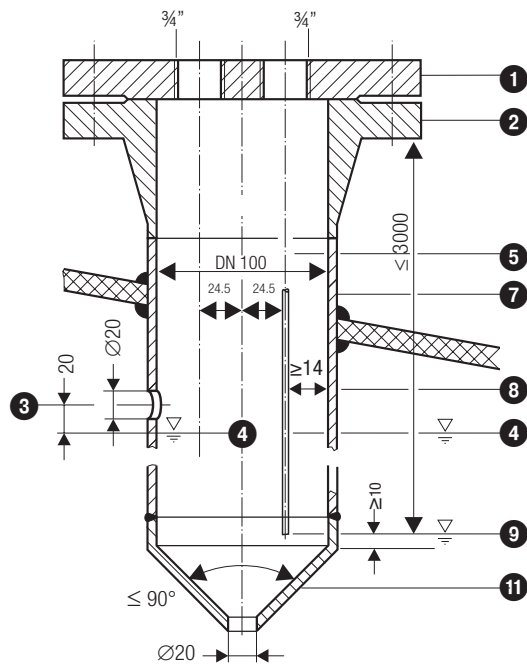


Fig. 2

NRG 16-11/NRG 17-11 level electrode combined with NRG 16-12/NRG 17-12 in protection tube, PN 40, PN 63

Installation examples

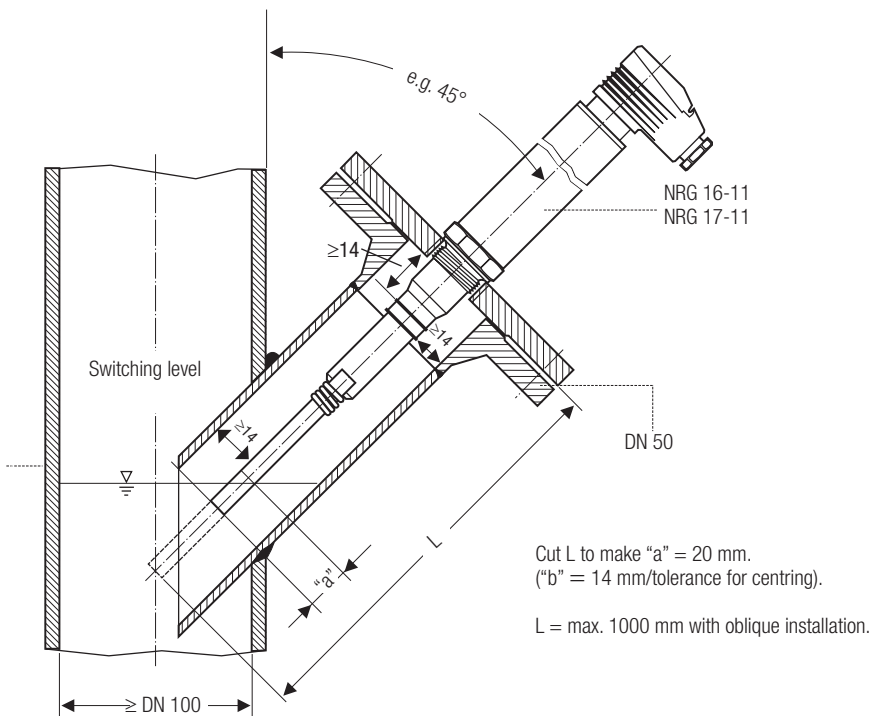


Fig. 3

Oblique installation, e.g. in riser feed line for hot-water plant or boiler.

Important notes

Installation

■ One NRG 1...-11 level electrode can be installed in a shared protection tube or measuring pot (internal diameter 100 mm) together with a GESTRA level electrode, a level switch or transmitter for water-level control or low-level alarms. When installing the NRG 1...-11 on the inside, it must be located at least 40 mm away from the top vent hole.

■ The electrode's angle of inclination must not exceed 45°, and the length of the electrode rod is limited to 1000 mm.

■ In conjunction with an NRS 1-50 level switch with a response sensitivity of 0.5 µS/cm, please use an enlarged measuring surface.

Electrical connection

To connect the level electrode, please use:

■ For NRS 1-50 level switch with response sensitivity of 10 µS: multi-core, shielded control cable, minimum conductor size 0.5 mm², e.g. LiYCY 4 x 0.5 mm², length at most 100 m.

■ For NRS 1-50 level switch with response sensitivity of 0.5 µS: multi-core, dual-shielded, low-capacitance data cable, minimum conductor size 0.5 mm², **Li2YCY PiMF 2 x 2 x 0.5 mm², length at most 30 m.**

Electrode installation position is vertical or inclined to one side by up to 45°. When installing obliquely, electrode length needs to be limited to 1000 mm. We recommend installation inside in boiler units for ease of maintenance and to reduce cost. This will require a protection tube (≥ DN 80).

For hot-water plants, side installation into the feed line at an inclination of up to 45° is admissible (≥ DN 50).

When installed on the inside, a protection tube with a clearance of ≥ 80 mm (water level 100) needs to be accommodated. As shown in Fig. 2, the limiter electrode needs to be installed so that there remains a gap of at least 40 mm between the electrode and the top vent hole.

Installing the level electrode in an external level pot requires monitoring of intermittent boiler blowdown using an SRL 6-50 control unit.

Please note

■ Combining two low-level water-level limiters in a single fitting is not permitted!

■ The boiler standpipe and connecting flange must be preliminary boiler inspection.

■ The electrode's angle of inclination must not exceed 45°, and the length of the electrode rod is limited to 1000 mm.

Fig. 3

■ When installing outdoors, the level electrode requires a GESTRA weather protection cover.

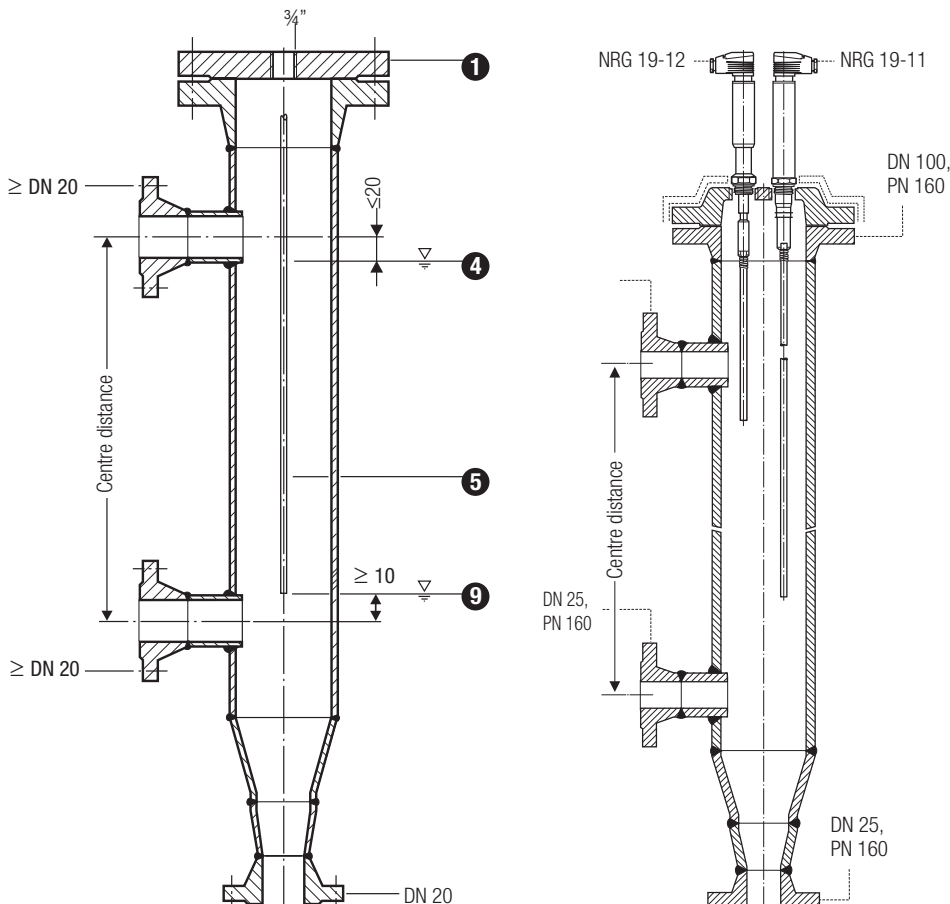


Fig. 4

Type III measuring pot when used as exterior water-level limiter, PN 160.

Fig. 5

Type III measuring pot when used as exterior combination.

Self-Monitoring Level Electrode

NRG 16-11

NRG 17-11

NRG 19-11

Wording in orders and specifications

GESTRA level electrode, self-monitoring, water-level limiter as equipment with safety function.

- Level electrode type NRG 16-11
PN 40, connection
Certified compliance
C value.....
Available length mm
- Level electrode type NRG 17-11
PN 63, connection
Certified compliance
C value.....
Available length mm
- Level electrode type NRG 19-11
PN 160, connection
Certified compliance
C value.....
Available length mm

A compliance certificate acc. to EN 10204-2.1, -2.2 and -3.1B is available at additional cost.

All compliance requirements must be stated in the order. Certificates can no longer be issued once delivery has been made. The cost and scope of the certificates and the tests they certify can be found in our price list "Test and Inspection Charges for Standard Equipment". Please enquire if you require any further testing.

Accessories

- SRL 6-50 monitoring unit for boiler blowdown monitoring on an external level pot.

Potentially explosive atmospheres

Do **not** use the equipment in potentially explosive atmospheres.

Note: The equipment is simple electrical equipment in accordance with EN 60079-11, section 5.7. The equipment may be used in potentially explosive atmospheres only in conjunction with approved Zener barriers. Suitable for use in Ex zones 1, 2 (1999/92/EC). The equipment does not come with Ex markings. Suitability of the Zener barriers is certified as part of a separate inspection.

Directives and standards

You can find details on the conformity of the equipment and the applicable standards and directives in our Declaration of Conformity and the relevant certificates or approvals.

Please note our general terms of business.

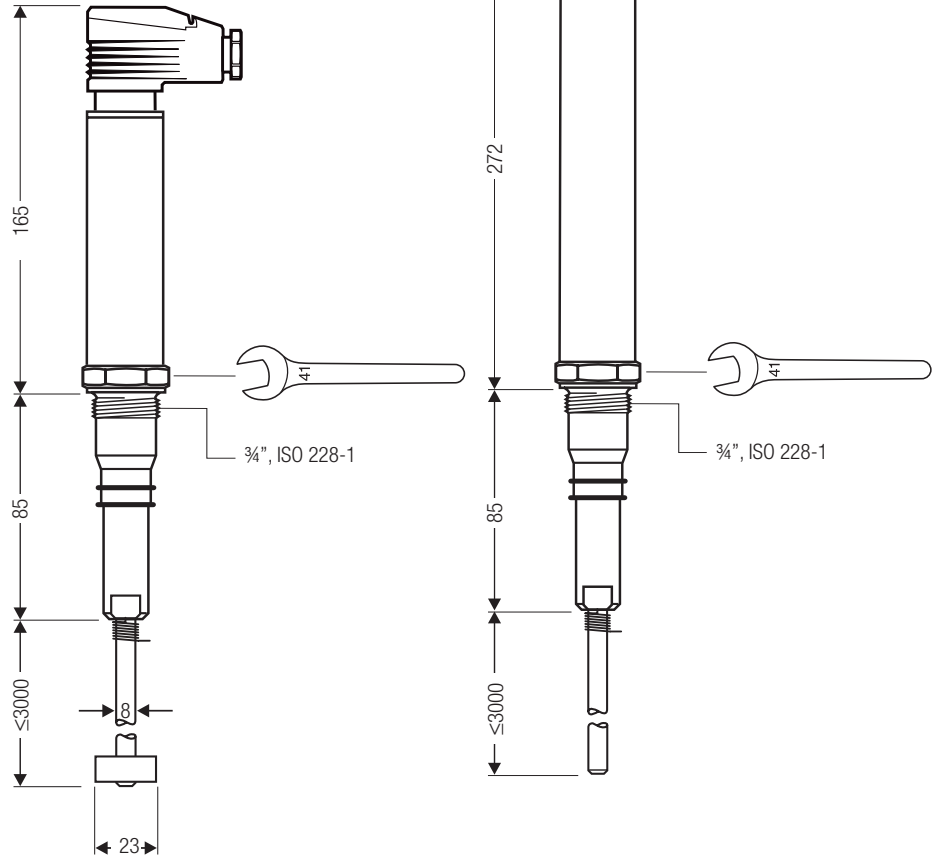


Fig. 6

NRG 16-11 with enlarged measuring surface

Fig. 7

NRG 17-11, NRG 19-11 without enlarged measuring surface

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 **GESTRA®**