

NRG 26-61

## Level Electrode NRG 26-61

### System description

The NRG 26-61 level electrode is used in conjunction with the URS 60 / URS 61 safety control unit as a safety high-level limiter and low-level limiter for pressurised steam and hot-water plants.

- Safety high-level limiters prevent the defined maximum high water (HW) level from being exceeded, e.g. by switching off the feedwater supply.
- Low-level limiters react when the water drops below the set minimum level (LW), e.g. by switching off the heating.

They are elements of a safety circuit up to a rating of SIL 2 as per EN 61508 in the SPECTORconnect system.

### Additional use as a level control system

In addition, the NRG 26-61 level electrode can be used with an NRR 2-60 / NRR 2-61 level controller for continuously measuring the water level in pressurised steam and hot-water plants or in condensate and feedwater tanks.

- In combination with the NRR 2-60 / NRR 2-61 level controller, the electrode can be used as a level control system with MIN/MAX alarm, for example.
- The limiter functions can be disabled independently and by an infinitely variable measurement signal.

### Function

The NRG 26-61 level electrode works using the capacitance measurement principle and converts the information on the water level into a data telegram. The 0 - 100 % measuring range can be scaled on the basis of the effective length of the electrode rod.

### Automatic self-test

An automatic self-test cyclically monitors the safety and function of the level electrode and measured value acquisition. Faults in the electrical connection or electronic measuring equipment trigger fault indications and safety shutoffs.

The data are transferred to the URS 60 / URS 61 safety control unit in the form of a Black Channel data telegram in the CANopen protocol via an ISO 11898 CAN bus.

### Limiter functions

When one of the two switchpoints, "High Water (HW)" or "Low Water (LW)" is reached, the URS 60 or URS 61 safety control unit executes a safety shutoff. Both switchpoints are adjusted solely using the rotary knob on the NRG 26-61 level electrode.

### Behaviour in the event of alarms (the level has strayed beyond a limit value)

"LO.LE" (for LW) or "HI.LE" (for HW) are shown on the display, alternating with the actual level value.

The alarm state is transferred to the URS 60 or URS 61 safety control unit via CAN data telegram. There, once the time delay has elapsed, the alarm signal triggers the safety shutoff in the safety control unit.

### Level control functions

In addition, the NRG 26-61 level electrode can be used in conjunction with an NRR 2-60 / NRR 2-61 level controller to form a level control system. Controller parameterization is done solely using the URB 60 visual display and operating unit.

### Technical data

#### Model and mechanical connection

- Thread G $\frac{3}{4}$  A, EN ISO 228-1

#### Nominal pressure rating, admissible service pressure and temperature

- PN 40                      32 bar (g) at 238 °C

#### Materials

- Terminal box: 3.2581 G AISI12, powder-coated
- Sheath: 1.4301 X5 CrNi 18-10
- Electrode rod insulation: PTFE
- Screw-in body: 1.4571, X6CrNiMoTi17-12-2

#### pH value

- Maximum admissible = 10

#### Max. installed length at 238 °C, all measurements in mm

- see "How to order", Fig. 1 table
- Do **not shorten** the electrode rod.

#### Measurement quality

The information below applies to a compensated fluid conductivity range from 100 – 10000  $\mu$ S/cm based on 25 °C.

- Reading error:                      +/- 1 % of set measuring range at the operating point
- Limit error:                          + 1 % from MAX (AL.Hi)  
   - 1 % from MIN (AL.Lo)
- MAX hysteresis:                      - 3 % from limit value
- MIN hysteresis:                        + 3 % from limit value
- Resolution of reading on display: 0.1 %
- Resolution for internal processing: 15 bits with plus or minus sign (16 bits)

#### Supply voltage

- 24 V DC +/-20 %

#### Power consumption

- Max. 7 VA

#### Current input

- Max. 0.3 A

#### Internal fuse

- T2A

#### Safety cutout at excessive ambient temperature

- The cutout at excessive ambient temperature takes place at Tamb. = 75 °C

#### Input/output

- Interface for CAN bus to ISO 11898, CANopen, insulated
- M12 CAN bus connector, 5-pole, A-coded
- M12 CAN bus socket, 5-pole, A-coded

# Level Electrode NRG 26-61

## Indicators and controls

- 1 x 4-digit green 7-segment display for showing status information
- 1 x red LED for indicating an alarm
- 1 x green LED for indicating OK
- 1 x rotary knob IP65 with button for menu navigation and test function

## Protection class

- III Safety Extra Low Voltage (SELV)

## IP rating to EN 60529

- IP 65

## Admissible ambient conditions

- Service temperature: 0 °C - 70 °C
- Storage temperature: -40 °C - 80 °C
- Transport temperature: -40 °C - 80 °C
- Air humidity: 10 % - 95 % (non-condensing)

## Weight

- Approx. 2.1 kg

## Admissible installation positions

- Vertical
- Oblique to a maximum inclination of 45°. In this case, the length of the electrode rod is limited to 688 mm maximum.

## Applicable directives:

The NRG 26-61 level electrode has been tested and approved for use in the scope governed by the following directives and standards:

- Directive 2014/68/EU EU Pressure Equipment Directive
- Directive 2014/35/EU Low Voltage Directive
- Directive 2014/30/EU EMC Directive
- Directive 2011/65/EU RoHS II Directive

## Notes for planning

### Installation

A capacitance NRG 26-61 level electrode and a conductive NRG 1x-60 or NRG 1x-61 level electrode can be installed in the same protective tube or level pot.

- Since the electrode measures continuously using capacitance, the low-level limiter function of the NRG 26-61 may only be used in combination with a conductive NRG 16-60 level electrode.
- Always use the NRG 16-60 level electrode as the first low-level electrode.

If a level electrode is installed in a lockable level pot outside the boiler, the connecting pipes must be flushed regularly. An SRL 6-60 monitoring unit is additionally required to monitor the flushing times and flushing process.

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## Electrical connection

Use a shielded, multi-core, twisted-pair control cable, e.g. UNITRONIC® BUS CAN 2 x 2 x .. mm<sup>2</sup> or RE-2YCYV-fi 2 x 2 x .. mm<sup>2</sup> as the bus line.

Pre-wired control cables (with plug and coupling) are available as accessories in various lengths.

The baud rate (transfer rate) is determined by the cable length between the bus terminal devices, and the wire cross-section is determined by the overall power input of the measuring sensors.

0.2 A at 24 V is required per sensor. With five sensors, there is therefore a voltage drop of approx. 8 V per 100 m when using cables of 0.5 mm<sup>2</sup>. In this case, the system is operating at its limits.

With five or more sensors and a cable length of ≥100 m, the wire cross-section needs to be doubled to 1.0 mm<sup>2</sup>.

At larger distances of > 100 m, the 24 V DC supply can also be connected on site.

## How to order:

### Level electrode

- Type: NRG 26-61 Stock code: 34961.. xx

A = installed length (mm)		xx
B = measuring range (mm)		
A	B	
373	300	40
477	400	41
583	500	42
688	600	43
794	700	44
899	800	45
1004	900	46
1110	1000	47
1214	1100	48
1319	1200	49
1423	1300	50
1528	1400	51
1636	1500	52
2156	2000	53

### Fig. 1

## Additional modules:

- Safety control unit URS 60
- Safety control unit URS 61
- Level controller NRR 2-60 / NRR 2-61
- Visual display and operating unit URB 60 or SPECTORcontrol
- Monitoring unit SRL 6-60

## Dimensions

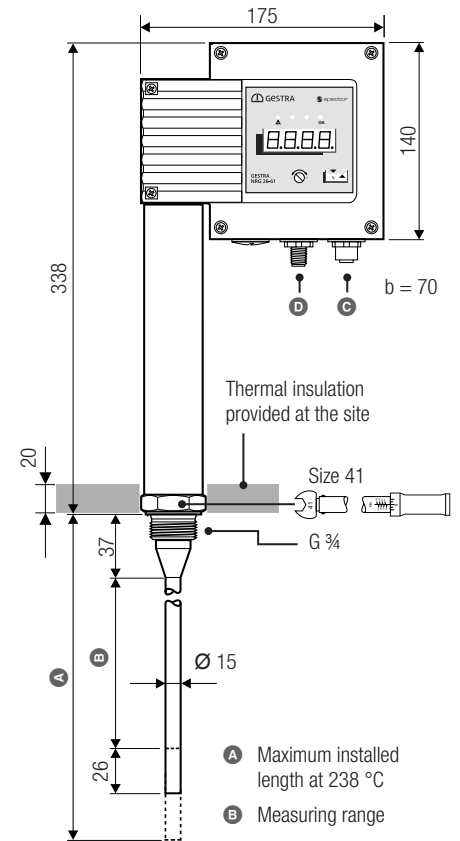


Fig. 2

## Connections

- M12 CAN bus socket, 5-pole, A-coded
- M12 CAN bus connector, 5-pole, A-coded

## Wiring diagram of CAN bus system

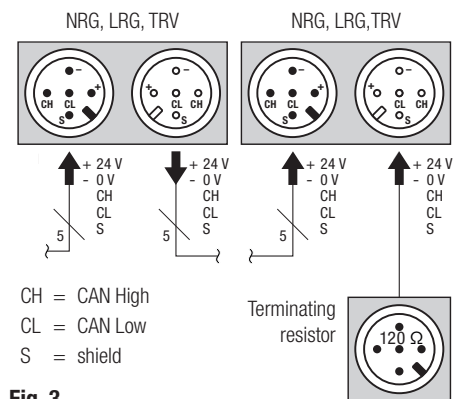


Fig. 3

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