GESTRA Steam Systems

Product Range B

High-Level Alarm
With CAN Bus, CANopen Protocol
NRG 16-41, NRG 17-41, NRG 19-41

NRG 16-41
NRG 17-41
NRG 19-41

System Description

The level electrode operation is based on the conductive measuring principle. The NRG 1...-41 is designed for signalling the max. liquid level in electrically conductive liquids.

■ One liquid level with **one** switchpoint

The NRG 1...-41 is to be used in conjunction with the switching controller NRS 1-41 and further system components. The NRG 1...-41 in conjunction with its associated control equipment constitutes a water level limiter with periodic self-testing routine (SMART function) in accordance with TRD 604, sheet 1 and 2 and EN regulations. The level data are transferred from the electrode NRG 1...-41 to the control unit via a CAN bus using the CANopen protocol.

Function

The conductivity of the liquid is used to signal the liquid level. Some liquids are conductive, which means that they allow an electric current to flow through them. For the safe functioning of this device a minimum conductivity of the liquid to be measured is required.

The conductivity measurement method can detect two conditions: electrode rod submerged or exposed, meaning switchpoint reached (or exceeded) or not yet reached. Before installation, the length of the electrode rod must be cut to the required switching level, e. g. for "Pump OFF" or "Control valve CLOSED" or, in case of economiser and air heaters that are installed close to the steam-generating unit and exposed to a risk, "Firing/Burner OFF".

An additional electrode fully integrated in the system automatically monitors the electrical resistance path between earth and measuring electrode. As soon as the actual value falls below the admissible resistance value the protection circuit is interrupted and cuts off the pump or heat supply to the boiler.

At regular intervals the level electrode NRG 1...-41 sends a data telegram to the switching controller NRS 1-41. The data are transferred via a CAN bus to DIN ISO 11898 using the CANopen protocol.

Design

NRG 1...-41: Screwed ¾" BSP, EN ISO 228-1

Technical Data

Type Approval
TÜV · SWB / SHWS · 02-403
EG BAF-MUC 02 02 103881 002

Service pressure
NRG 16-41: 32 bar g at 238 °C
NRG 17-41: 60 bar g at 275 °C
NRG 19-41: 100 bar g at 311 °C

Connection
Screwed ¾" BSP, EN ISO 228-1

Materials
Terminal box: Die cast aluminium 3.2161 (G AlSi8Cu3)
Stem: S. S. 1.4571 (X6CrNiMoTi17-12-2)
Measuring electrode: S. S. 1.4401 (X5CrNiMo17-12-2)
Electrode insulation: PEEK

Lengths supplied
500 mm
1000 mm
1500 mm

Sensitivity of response
> 0.5 µS/cm at 25 °C.

Supply voltage
18 – 36 V DC (coming from NRS 1-41)

Current consumption
35 mA

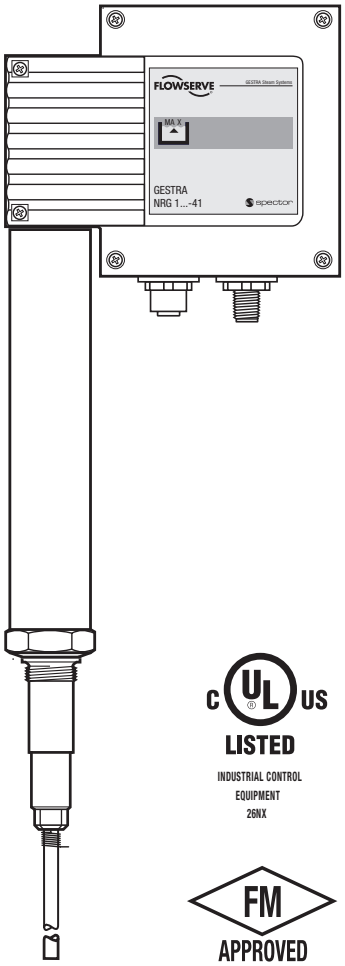
Fuse
Electronic thermal fuse T_{max} = 85 °C

Hysteresis
-2 K

Electrode voltage
2 V_{ss}

Data exchange
CAN bus to DIN ISO 11898, CANopen Protocol

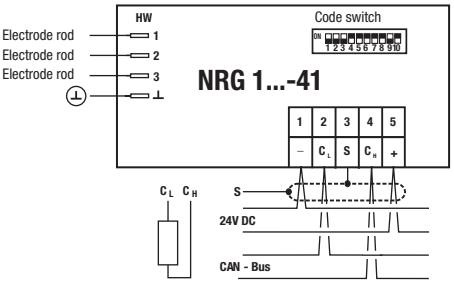
P.T.O.



c UL us LISTED
INDUSTRIAL CONTROL EQUIPMENT
26NX

FM APPROVED

Wiring Diagram



Terminating resistor 120 Ω,
Multi-paired cable.

e.g. UNITRONIC® BUS CAN 2 x 2 x...²

Important Note

Note that screened multi-core twisted-pair control cable is required for the BUS line, e. g. UNITRONIC® BUS CAN 2 x 2 x ... mm² or RE-2YCYV-fl 2 x 2 x ... mm².
Prefabricated control cables (with connector and coupler) of various lengths for connecting the equipment are available as accessories. The baud rate (data transfer rate) dictates the cable length between the bus nodes and the total power consumption of the sensor dictates the conductor size.

S 8	S 9	S 10	Baud rate	Cable length	Number of pairs and conductor size [mm²]
OFF	**ON**	**OFF**	**250 kBit/s**	**125 m**	2 x 2 x 0.34
Factory setting					
ON	ON	OFF	125 kBit/s	250 m	2 x 2 x 0.5
OFF	OFF	ON	100 kBit/s	335 m	2 x 2 x 0.75
ON	OFF	ON	50 kBit/s	500 m	on request, dependent on bus configuration
OFF	ON	ON	20 kBit/s	1000 m	
ON	ON	ON	10 kBit/s	1000 m	

The baud rate is set via a code switch. Reduce baud if cable is longer than specified in the table. Make sure that all bus nodes have the same settings. To protect the switching contacts fuse circuit with 2.5 A (anti-surge fuse) or according to TRD regulations (1.0 A for 72 hrs operation).
Note: If the cable is longer than 125 m (max. 1000 m!) the baud rate must be changed.

spector bus

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Technical Data – continued –

Indicators and adjustors
One 10-pole code switch for node ID and baud rate settings
Two LEDs "Program running"
Two LEDs "Can bus communication"

Electric connection
M 12 sensor connector, 5 poles, A-coded,
M 12 sensor jack, 5 poles, A-coded

Protection
IP 65 to DIN EN 60529

Max. admissible ambient temperature
70 °C

Weight
Approx. 2.5 kg

Order and Enquiry Specification

GESTRA Level electrode NRG 1...-41

Associated Controller

- Switching controller NRS 1-41

Ancillary Unit

- Operating terminal & visual display unit URB 1, URB 2

Key

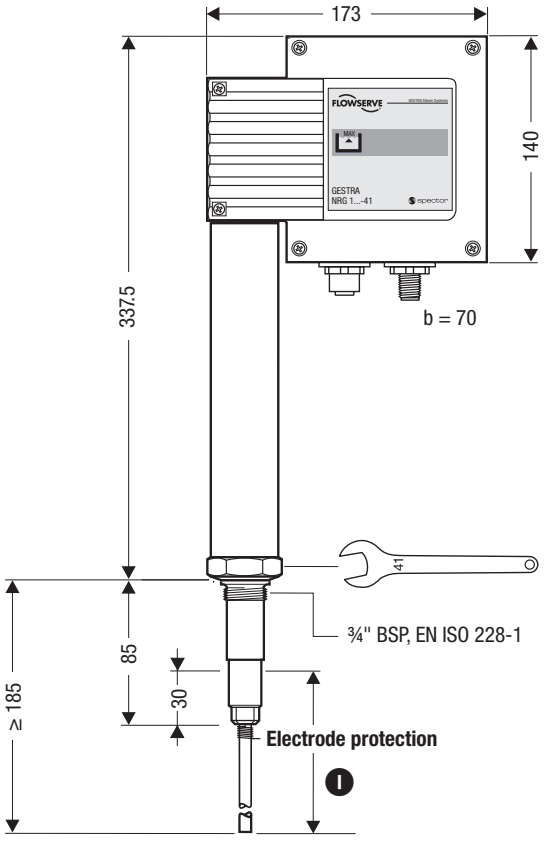
- **A** Flange PN 40 , DN 50, DIN 2527
  Flange PN 40, DN 100, DIN 2527
- **B** For the approval of the boiler standpipe with connecting flange the relevant regulations must be considered.
- **C** Vent hole
- **D** Electrode rod d = 8 mm
- **E** Protection tube ≥ DN 100
- **F** High water level (HW)
- **G** Reducer K-88.9 x 3.2 - 42.4 x 2.6 W
- **H** Electrode distance
- **I** Lentghs of electrode tips
  500 mm
  1000 mm
  1500 mm
- **I** Low water level (LW)

ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must **not** be used in explosion-risk areas.

Supply in accordance with our general terms of business.

Dimensions



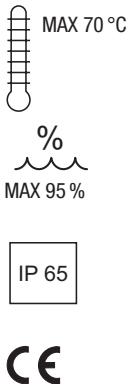


Fig. 1 *NRG 16-41, NRG 17-41*

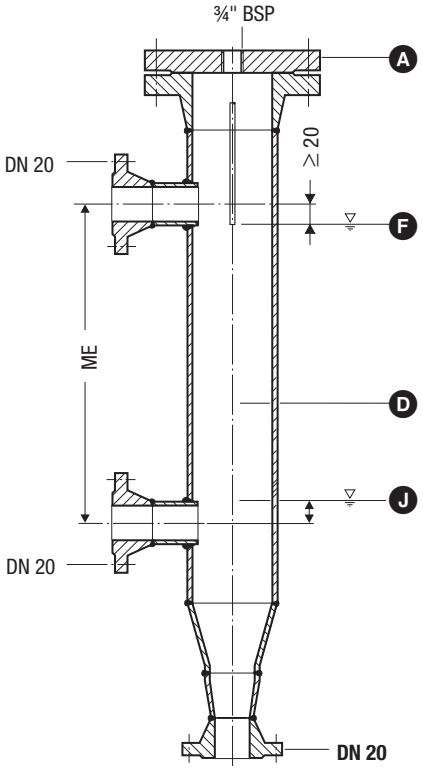


Fig. 2 *External measuring pot*

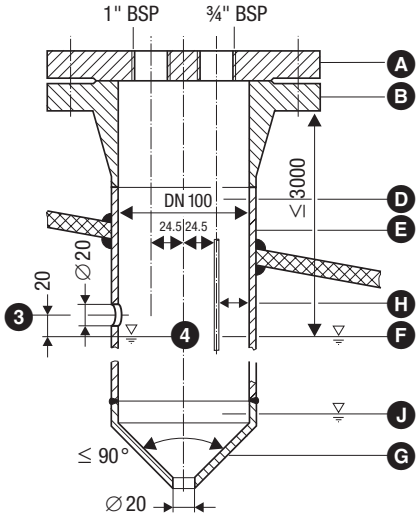


Fig. 4 *Protection tube for installation of electrode inside the boiler*

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