

## GESTRA Steam Systems

## Product Range B

### High-Level Alarm NRS 1-41

### NRS 1-41

#### System Description

##### High-level alarm with one level electrode

The switching controller NRS 1-41 is a self-monitoring high-water level alarm, with automatic routine testing (SMART) feature and output relay monitoring, to be used in conjunction with **one** level electrode type NRG 16-41, 17-41 or 19-41. The switching controller features the following function:

- High-level alarm with **one** switchpoint

The equipment combination detects the max. water level (high-level limiter).

Application in steam boilers and (pressurised) hot-water installations in accordance with TRD 604, sheet 1 and 2 (24/72 hours operation without constant supervision) / EN 12852 and EN 12953.

The equipment complies with the regulations on protection circuits for firing equipment of furnaces DIN VDE 0116 (prEN 50156).

The level data are transferred from the electrode NRG 1...-41 to the switching controller via a designated CAN bus using the CANopen protocol.

#### Function

At regular intervals the level electrode NRG 1...-41 sends a data telegram to the controller NRS 1-41. The data transfer is effected by means of a CAN bus according to DIN ISO 11898. The transferred measuring data are constantly evaluated by the controller. A periodic self-checking routine tests every 3 seconds the integrity of the system and its safety functions, with a malfunction in the controller resulting in immediate boiler shut-down. If the CAN bus line and, consequently, the data transmitting cycle are interrupted, the controller sends a visual signal to indicate a faulty condition and the relays are instantaneously de-energized (normally closed relay outputs).

The controller also enables user-friendly performance tests and detection/evaluation of malfunctions.

To guarantee the correct and safe functioning of the high-level limiter a min. electrical conductivity of 0.5 µS/cm at 25 °C is required.

The relay de-energizing delay is normally set to 3 seconds at the factory but delays of 15 to 25 seconds are available on request.

Apart from the burner protection circuit there is also a separate photo MOS make contact output for remote indication.

#### Design

##### NRS 1-41b

Enclosure of insulating material with terminals for installation in control cabinets. The terminals are externally accessible.

Snapping onto a 35 mm standardised supporting rail (DIN EN 50022). External dimensions: 73 x 100 x 118

#### CAN Bus

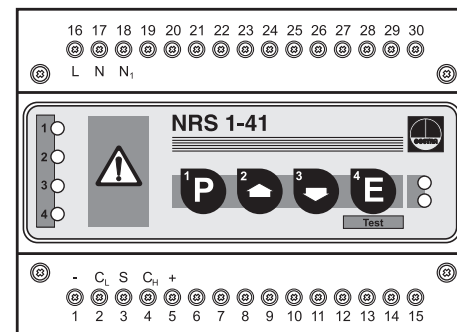
All controllers and associated level electrodes are interconnected by means of a CAN bus using the CANopen protocol. Every item of equipment features an electronic address (node ID). The four-core bus cable serves as power supply and data highway for high-speed data exchange.

The CAN address (node ID) for the NRS 1-41 can be set between **1** and **123**.

The high-level limiter, consisting of **one** level electrode and **one** controller, is configured at our works and ready for service. The high-level limiter can be used straight away without having to set a new node ID.

#### CANopen

The CAN bus of the controller NRS 1-41 uses the CANopen protocol. An Electronic Data Sheet with detailed information on the configuration procedure is available on request.



#### Technical Data

##### Type approval

TÜV · WB · 99-403

EG BAF-MUC 02 02 103881 02

##### Input / Output

Interface for CAN bus to DIN ISO 11898 CANopen

##### Output voltage supply for electrode

18 – 36 V, short-circuit protected

##### Output control circuit

Power supply of level electrode 24 V DC, short-circuit protected

Two volt-free relay contacts, internally connected in series. Max. contact rating with switching voltages of 24 V AC/DC, 115 V AC and 230 V AC: 4 A resistive/inductive.

Contact material Ag Ni 0.15.

##### Interference suppression

Provide contactor with external RC combination (100 Ω / 47nF)

P.T.O.

#### Important Note

Note that screened multi-core twisted-pair control cable is required, e. g. UNITRONIC® BUS CAN 2 x 2 x ...<sup>2</sup> or RE-2YCYV-fl 2 x 2 x ...<sup>2</sup>.

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 rate 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).

High-Level Alarm  
NRS 1-41

Technical Data – continued –

**Signal output**  
Photo MOS output, instantaneous high-level alarm, timed malfunction signal, max. contact rating for switching voltages of 24 V AC, 115 V AC and 230 V AC/DC: 100 mA resistive.

**Relay de-energizing delay**  
The “High-level alarm” output is factory set to 3 sec. (15 or 25 sec. available for marine applications)

**Indicators and adjustors**  
4 pushbuttons for “parameterisation/Test”  
1 red LED for “High-level alarm electrode 1”  
3 red LEDs “Multifunction”  
1 red LED “Bus status”  
1 green LED “Power”  
1 ten-pole code switch, seven poles for node ID, three poles for baud rate settings  
1 two-pole code switch – without function.  
**Do not change the factory settings!**

**Internal self-checking routine**  
Every 3 sec.  
**Periodic checking of output relay contacts**  
Every 6 hours

**Supply voltage**  
230 V +/- 10 %, 50/60 Hz  
115 V +/- 10 %, 50/60 Hz (optional)  
24 V +/- 10 %, 50/60 Hz (optional)

**Power consumption**  
10 VA

**Response sensitivity**  
From 0.5 µS/cm at 25 °C

**Protection**  
Case: IP 40 to DIN EN 60529  
Terminal strip: IP 20 to DIN EN 60529

**Admissible ambient temperature**  
0 – 55 °C

**Enclosure material**  
Front panel: polycarbonate, grey  
Case: polycarbonate, black

**Weight**  
Approx. 0.8 kg

Order and Enquiry Specification

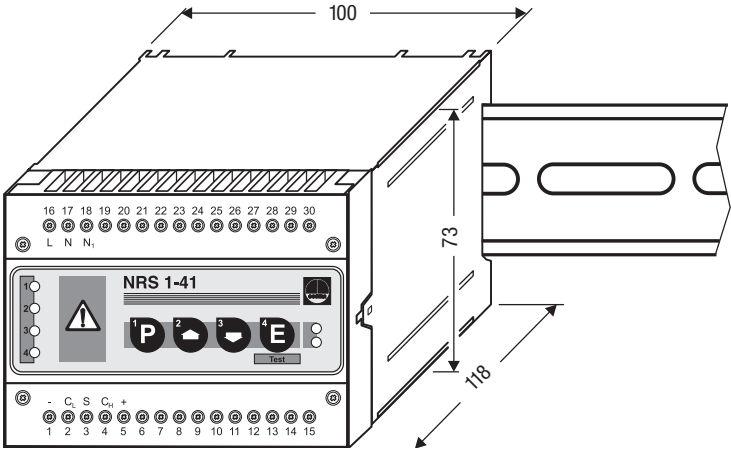
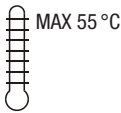
GESTRA Level switch NRS 1-41  
Controller .....  
Mains supply ..... V  
Level electrode with external measuring pot ..... (yes/no)

Associated Equipment

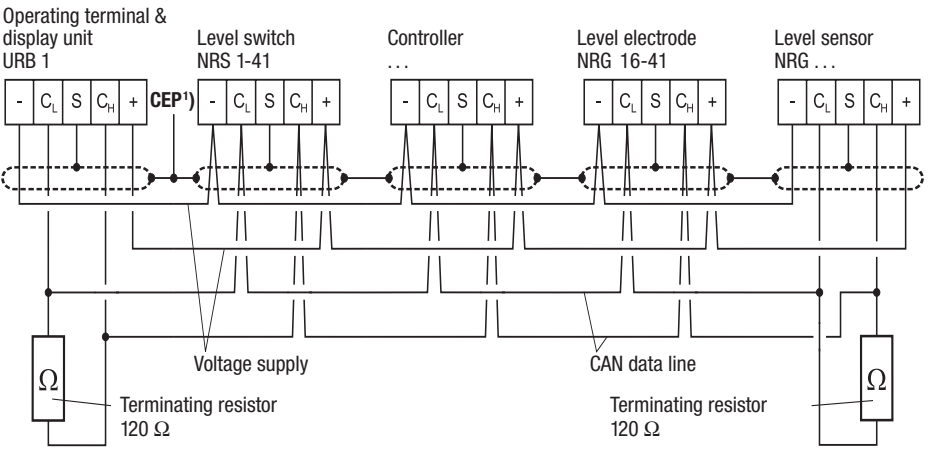
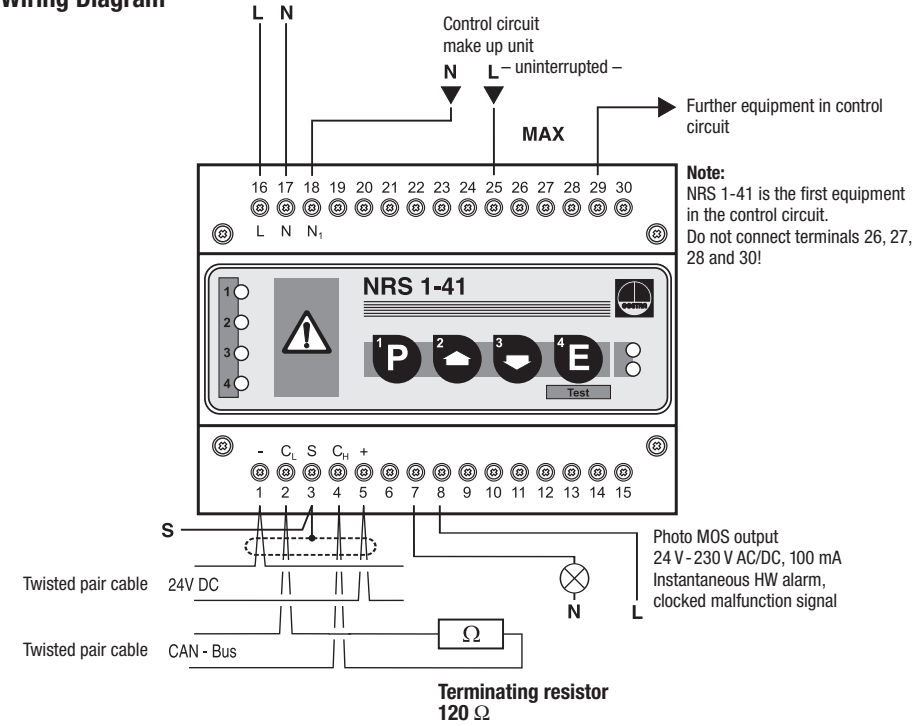
- Conductivity level electrode NRG 16-41
- Conductivity level electrode NRG 17-41
- Conductivity level electrode NRG 19-41
- SRL 6 for intermittent blowdown monitoring (for external measuring pot)

Supply in accordance with our general terms of business.

Dimensions



Wiring Diagram



1) CEP = Central earthing point



Master Distributor in China & Taiwan  
**Quko Int'l Development Limited**  
Unit B, 17/F, EGL Tower, 83 Hung To Road, Kwun Tong,  
Kowloon, Hong Kong, China  
Tel: (852) 2344 0201  
Email: sales@qukointl.com  
Fax: (852) 2343 6078  
Website: www.qukointl.com



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