

Water Level Limiter

Level Switch

NRS 1-50

For TWO electrodes

Description

The NRS 1-50 level switch is used in conjunction with NRG 1...-50 level electrodes as a water level limiter for steam boilers and hot water installations.

Water level limiters switch off the heating when the water drops below the set low water level (LW).

The NRS 1-50 level switch can be combined in a circuit with the level electrodes stipulated by the standards below:

| Standard | Type of level electrode |
|---------------------------------------|-------------------------------------|
| UL 60730-2-15, CAN/CSA E60730-2-15 | NRG 16-50 NRG 17-50 NRG 19-50 |

Function

The NRS 1-50 level switch is designed for different boiler water conductivities and for the connection of two level electrodes.

If the water falls below the minimum level, the level electrodes are exposed and an alarm is triggered in the level switch. This switchpoint is determined by the length of the electrode extension.

When the off delay has elapsed, the two output contacts of the level switch open the safety circuit for heating. The heating cut-off is interlocked in the external safety circuit and this interlock can only be deactivated again when the level electrode is immersed once more. The NRS 1-50 level switch must be used in combination with an external manual reset when used as a protective device per ASME CSD-1.

In addition, two signal contacts for external signaling devices close without a delay.

An alarm is also triggered if faults occur in a level electrode and/or the electrical connection.

The manufacturer recommends connection pipes of ≥ 1.57 in (40 mm) for steam and ≥ 3.94 in (100 mm) for water. If smaller connection pipes or fittings are used, these shall not be smaller than 1-inch NPS. The level pot must have a suitable flushing device at its lowest point. This device flushes the connection pipes to the boiler and enables the function of the water level limiter to be tested.

No shut-off valves of any type shall be placed in the piping between the boiler and the low water cutoff.

An automatic self-test monitors the safety functions in the level switch and the level electrode. In the event of a fault, the safety circuit opens without a delay and switches the heating off.

Alarm and fault indications are displayed by LEDs and an alarm can be simulated by pressing a button.

Technical data

Supply voltage

24 VDC $\pm 20\%$, 0.3 A; SELV / PELV / CLASS2
100 – 240 VAC $\pm 10\%$ -15%, 47 – 63 Hz, 0.2 A (optional)

Fuse

External 0.5A; UL category JDYX, e.g., RND 170-00012

Power consumption

7 W

Response sensitivity [Water conductivity at 77 °F (25 °C)]:
> 5 ... < 5000 ppm (> 10 ... < 10000 $\mu\text{S}/\text{cm}$)

Connecting the level electrode

Please use the following to connect the level electrode(s):

- A shielded, multi-core TC-ER control cable with a minimum wire size of AWG18, e.g., OELFLEX CONTROL TM CY 5G1. Max. length 328 ft (100 m).

Safety circuit

2 volt-free NO contacts, 6 A 250 V AC / 30 V DC $\cos \varphi = 1$.
Off delay 3 seconds. Inductive loads must have interference suppression (RC combination) in accordance with the manufacturer's specification.

Signal output

2 volt-free outputs for external signaling without a delay, 24 V DC, max. 100 mA (semiconductor output).
Connection of control cables 2 x AWG20 (0.5 mm²).

Indicators and controls

2 buttons for testing and diagnosis, 4 red/green LEDs for indicating operating state and alarm. 3 red LEDs for fault diagnosis, 2 2-pole code switches for setting the number of electrodes.

Terminal box

Terminal box material: base of black polycarbonate, front of gray polycarbonate. Terminal strips can be removed separately
Terminal box attachment: Mounting clip on support rail TH 35, EN 60715.

Electrical safety

Pollution degree 2, overvoltage category II according to UL 60730-1.

Protection

Terminal box: IP 40 according to EN 60529

Terminal strip: IP 20 according to EN 60529

As a UL open type, the equipment must be installed in a control cabinet.

Weight

Approx. 1.1 lb (0.5 kg)

Ambient temperature

at power-on 32 ° ... 131 °F (0 ° ... 55 °C),
in operation 14 ° ... 131 °F (-10 ° ... 55 °C)

Transport temperature

-4 °F ... +176 °F (-20 °C ... +80 °C) (<100 hours),
defrosting time of de-energized equipment before it can be put into operation: 24 hours.

Storage temperature

-4 °F ... 158 °F (-20 °C ... +70 °C),
defrosting time of de-energized equipment before it can be put into operation: 24 hours.

Relative humidity

Max. 95%, non-condensing

Site altitude

Max. 6560 ft (2000 m)

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Interlock

In the event of an alarm, the NRS 1-50 level switch interlock does not take place automatically. If the installation requires an interlock, this must be implemented in the external (safety) circuit.

It is important that the interlock is not deactivated when the level switch signals a malfunction to the diagnostic LEDs or the signaling outputs.

In order to guarantee Class C function with a Level 2 fail-safe rating in accordance with UL 60730-1, both signaling outputs must be monitored during interlock deactivation. To conform with ASME CSD-1 two low water level limiters are required.

Power supply

A safety power supply unit (SELV / PELV / CLASS2) must be used to supply the NRS 1-50 level switch with 24 V DC.

Directives and standards

The equipment has been tested and approved for use in the scope governed by the following directives and standards:

Standards:

- UL 60730-1 and CAN/CSA E60730-1
General Requirements for Automatic Electrical Controls
- UL 60730-2-15 and CAN/CSA E60730-2-15
Requirements for Automatic Electrical Water Level Sensing Controls

Improper use

There is a danger of death due to explosion if the equipment is used in potentially explosive atmospheres. Do not use the equipment in potentially explosive atmospheres.

How to order and specify

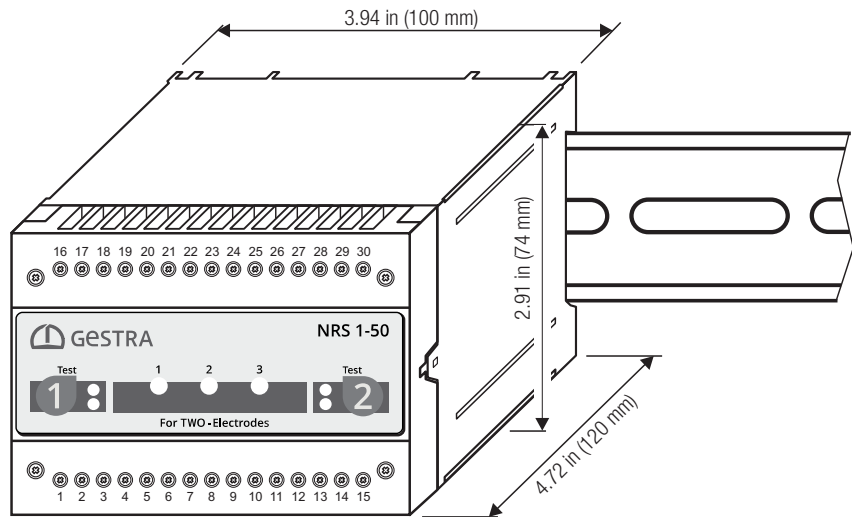
GESTRA level switch NRS 1-50 as a water level limiter For TWO electrodes

Supply voltage

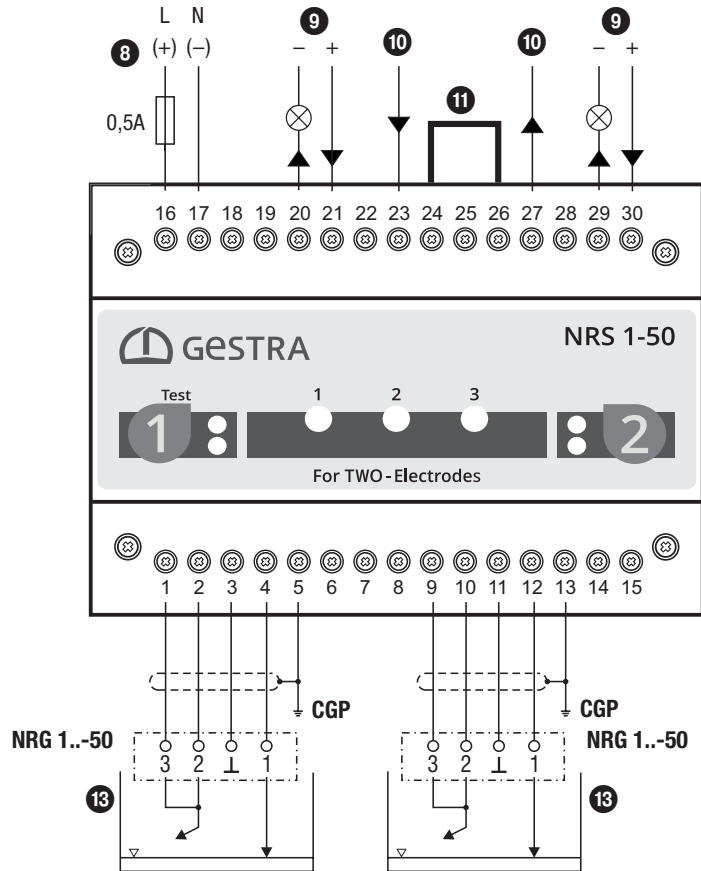
Sensitivity 5 ppm (10 µS/cm)

Please note our general terms of business.

Dimensions



Wiring diagram



Key

- ⑧ Supply voltage
- ⑨ Signal output 1/2 for external alarm 24 V DC, 100 mA (semiconductor output)
- ⑩ Safety circuit, input and output, external fuse T1A (slow blow)
- ⑪ Jumper, provided by customer
- ⑫ Level electrode NRG 1...-50
- CGP Central grounding point in control cabinet

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