

High Level Alarm

Level Switch

NRS 1-51

Description

The NRS 1-51 level switch is used in conjunction with NRG 1...-51 level electrodes as a high level alarm for steam boilers and hot water installations.

A high level alarm prevents the defined high water (HW) level from being exceeded and switches off the feedwater supply, for example, to achieve this.

The NRS 1-51 level switch can be combined in a circuit with the level electrodes stipulated by the directives below:

Directive	Type of level electrode
UL 60730-2-15, CAN/CSA E60730-2-15	NRG 16-51 NRG 17-51 NRG 19-51

Function

The NRS 1-51 level switch is designed for different boiler water conductivities and for the connection of a single level electrode.

When the water exceeds the high water level, the level electrode is immersed 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 control circuit, e.g., for the feedwater supply. If the feedwater cut-off is interlocked in an external control circuit, this interlock can only be deactivated again when the level electrode is exposed.

An alarm is also triggered if faults occur in the 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.

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

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

Alarm and fault indications are displayed by LEDs, and a signal output is also actuated without a delay.

An alarm can be simulated by pressing a button.

Note

A high level alarm prevents the defined high water level from being exceeded. To achieve this, the feedwater supply may be cut, for example. If cutting the feedwater supply poses a danger to heating surfaces in the feedwater pre-heater, the heating must be switched off as well.

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 μ S/cm)

Inputs:

Connecting the level electrode

Please use the following to connect the level electrode:

- A shielded, multi-core TC-ER control cable with a minimum wire size of AWG18, e.g., OELFLEX CONTROL TM CY 5G1.

Safety circuit

2 volt-free NO contacts,
6 A 250 V AC / 30 V DC $\cos \phi = 1$
Off delay 3 seconds.

Inductive loads must have interference suppression (RC combination) as specified by the manufacturer.

Signal output

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

Indicators and controls

1 button for testing and diagnosis, 2 red/green LEDs for indicating operating state and alarm.
3 red LEDs for diagnosis

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 conditions:

Ambient temperature

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

Transport temperature

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

Storage temperature

-4 ° ... 158 °F (-20 ° ... +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 1-51 level switch interlock does not take place automatically. If the installation requires an interlock, this must be implemented in the downstream (control) circuit.

In order to guarantee Class C function with second fault protection in accordance with UL 60730-1, both signaling outputs must be monitored during interlock deactivation.

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

Power supply

A safety power supply unit (SELV) must be used to supply the NRS 1-51 level switch with 24 V DC.

Note

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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.

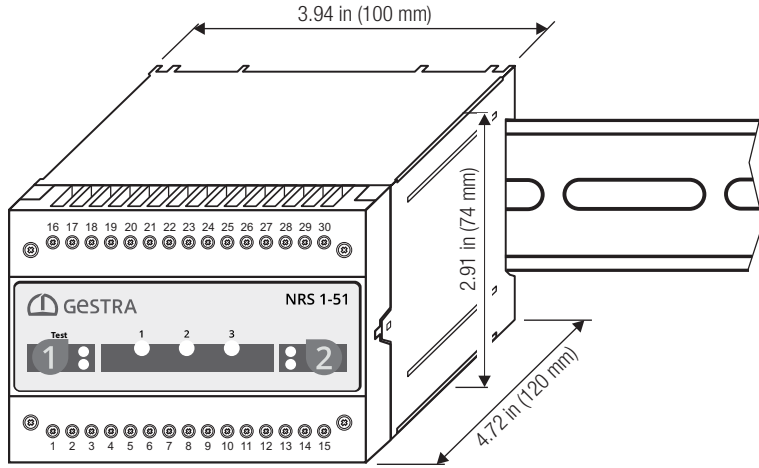
How to order and specify

GESTRA Level Switch NRS 1-51
as a high level alarm

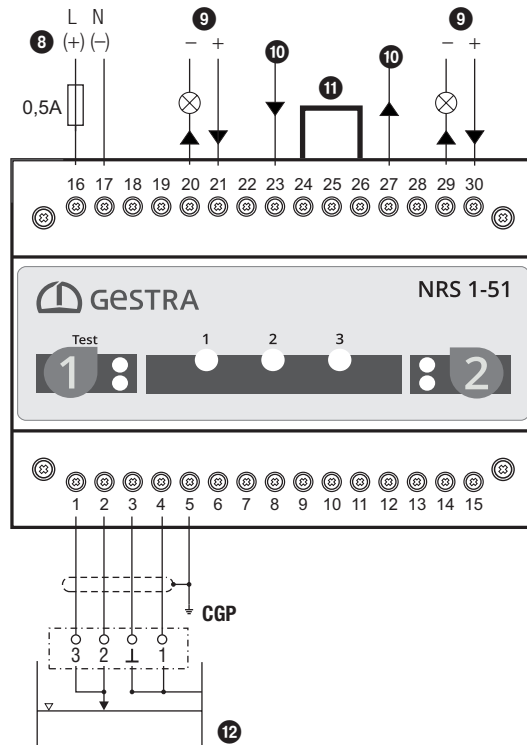
Supply voltage

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 T1A fuse (slow blow)
- 11 Jumper, provided by customer
- 12 Level electrode NRG 1...-51
- CGP Central grounding point in control cabinet

GESTRA AG

Münchener Straße 77, 28215 Bremen, Germany
Tel. +49 421 3503 0, Fax +49 421 3503 393
e-mail info@de.gestra.com, website www.gestra.com

