

NRS 1-53

Level Switch NRS 1-53

Description

The level switch NRS 1-53 in conjunction with level electrodes NRG 16-.. and ER 5. is used as limit switch, for instance as water level limiter in steam boilers and (pressurized) hot-water installations. The level switch detects and indicates two low water levels (MIN 1, MIN 2).

The level switch can work with following level electrodes: NRG 10-52, NRG 16-52, NRG 16-4 and ER 5.-1.

Function

The operation of the level switch NRS 1-53 is based on the conductive measuring principle using the electrical conductivity of the water for signalling water level. The level switch is designed for different electrical conductivities and for connecting two level electrodes.

The length of the associated electrode rod determines switch-points for MIN 1/MIN 2 water level.

The level switch detects that the MIN1/MIN 2 water level is reached when the corresponding electrode rods are exposed. After the de-energizing delay has elapsed, the MIN 1/MIN 2 output contact is switched over. At the same time the MIN 1/MIN 2 LED changes from green to red.

When the equipment is used as water level limiter, the safety circuit for the heating is opened by the output contacts.

The disconnection of the heating is interlocked in the external safety circuit and can only be deactivated when the electrode rods enter the water again.

A MIN 1/MIN 2 alarm can be simulated by pressing the button "Test".

Directives and standards

VdTÜV Bulletin "Wasserstand 100" (= Water Level 100)

The level switch NRS 1-53 is certified acc. to VdTÜV Bulletin "Wasserstand 100" if used in combination with the following level electrodes: NRG 10-52, NRG 16-52, NRG 16-4 and ER 5.-1

The VdTÜV Bulletin "Wasserstand (=Water Level) 100" specifies the requirements made on water level control and limiting equipment for boilers.

LV (Low Voltage) Directive and EMC (Electromagnetic Compatibility)

The equipment meets the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must not be used in potentially explosive areas.

Note:

The level electrodes NRG 10-52, NRG 16-52, NRG 16-4 and ER 5.-1 are simple items of electrical equipment as specified in EN 60079-11 section 5.7. According to the European Directive 94/9/EC the equipment must be equipped with approved Zener barriers if used in potentially explosive areas. Applicable in Ex zones 1, 2 (1999/92/EC). The equipment does not bear an Ex marking. The suitability of the Zener barriers is certified in a separate wiring diagram provided by the manufacturer.

UL/cUL (CSA) Approval

The equipment meets the requirements of: UL 508 and CSA C22.2 No. 14-13, Standards for Industrial Control Equipment. File E243189.

Technical data

Supply voltage

24 VDC, + / -20 %, 0.1 A

Fuse

external 0.5 A (semi-delay)

Power consumption

2 VA

Connection of level electrode

2 inputs for level electrode NRG 10-52, NRG 16-52, NRG 16-4 and ER 5.-1, 4 poles with screen.

Response sensitivity

(electrical conductivity of water at 25 °C)
>0.5 ... < 1000 µS/cm or >10 ... < 10 000 µS/cm (switch-selectable).

Outputs

2 volt-free change-over contacts,
8 A 250 V AC / 30 V DC cos φ = 1
De-energizing delay: 3 sec.
Provide inductive loads with RC combinations according to manufacturer's specification to ensure interference suppression.

Indicators and adjusters

1 pushbutton "Test" for simulating MIN 1/MIN 2 alarm,
2 red/green LEDs for indicating "Operating mode" and MIN 1/MIN 2 alarm,
1 green LED indicating "Power ON",
1 code switch with 4 poles for changing the sensitivity.

Housing

Housing material: base: polycarbonate, black;
Front: polycarbonate, grey.
Terminal strips separately detachable.
Fixing of enclosure: Mounting clip on supporting rail TH 35, EN 60715

Electrical safety

Contamination class 2.

Protection

Housing: IP 40 to EN 60529
Terminal strip: IP 20 to EN 60529

Weight

Approx. 0.2 kg

Ambient temperature

when system is switched on: 0 ... 55 °C,
during operation: -10 ... 55 °C

Transport temperature

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

Storage temperature

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

Relative humidity

max. 95%, no moisture condensation

Approvals

Type approval no: TÜV - WR / WB - XX-XXX (see name plate)

Level Switch NRS 1-53

Important Notes

The level switch NRS 1-53 is clipped onto the support rail in the control cabinet.

The equipment is supplied with 24 V DC and fused with an external semi-delay fuse 0.5 A.

The power supply unit must be electrically isolated from dangerous contact voltages and must meet at least the requirements on double or reinforced isolation according to one of the following standards: DIN EN 50178, DIN EN 61010-1, DIN EN 60730-1 or DIN EN 60950.

To prevent the welding together of contacts provide an external slow-blow fuse T 2.5 A or 1.0 A (TRD 604, 72 hrs. operation) for the output contacts.

When used as water level limiter the level switch NRS 1-53 does not interlock automatically when the electrode rods are exposed.

If an interlock function is required for the installation it must be provided in the follow-up circuitry (safety circuit). The circuitry must meet the requirements of the EN 50156.

When switching off inductive loads, voltage spikes are produced that may impair the operation of control systems. Connected inductive loads must be provided with suppressors such as RC combinations as specified by the manufacturer.

To connect the level electrode(s) use screened multi-core control cable with a min. conductor size 0.5 mm², e. g. LiYCY 3 x 0.5 mm², max. length: 100 m.

Make sure that connecting cables leading to the level electrodes are segregated and run separately from power cables.

Order & Enquiry Specification

Level switch type NRS 1-53

GESTRA SPECTOR module

Output: 2 volt-free change-over contacts MIN alarm

De-energizing delay: 3 seconds

Supply voltage: 24 V DC, 2 VA

Key

- 1 Upper terminal strip
- 2 Lower terminal strip
- 3 Housing
- 4 Supporting rail type TH 35, EN 60715
- 5 Connection of supply voltage 24 V DC with fuse 0.5 A (semi-delay), provided on site
- 6 Reference electrode or vessel used as functional earth
- 7 Electrode rod for MIN 2
- 8 Electrode rod for MIN 1
- 9 Central earthing point (CEP) in control cabinet
- 10 Output contact for MIN 1
- 11 Output contact for MIN 2
- 12 Level electrode NRG 10-52, NRG 16-52, five pole connector
- 13 Level electrode ER 5.. 4 pole connector
- 14 Level electrode ER 5.. 5 pole connector
- 15 Level electrode NRG 16-4

Supply in accordance with our general terms of business.

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Dimensions

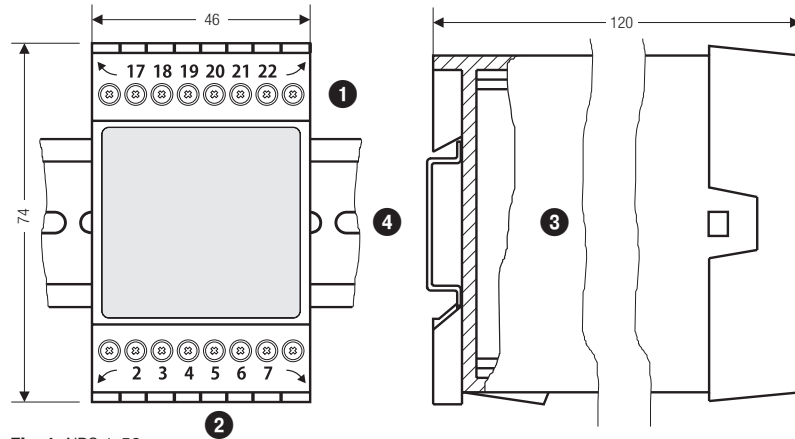


Fig. 1 NRS 1-53

Electrical connection

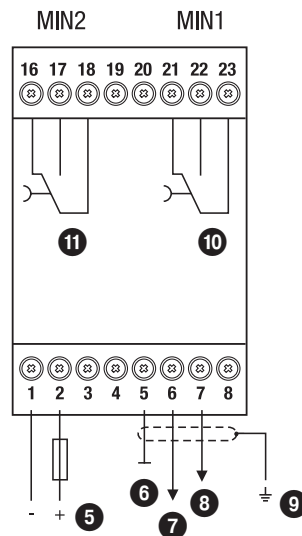
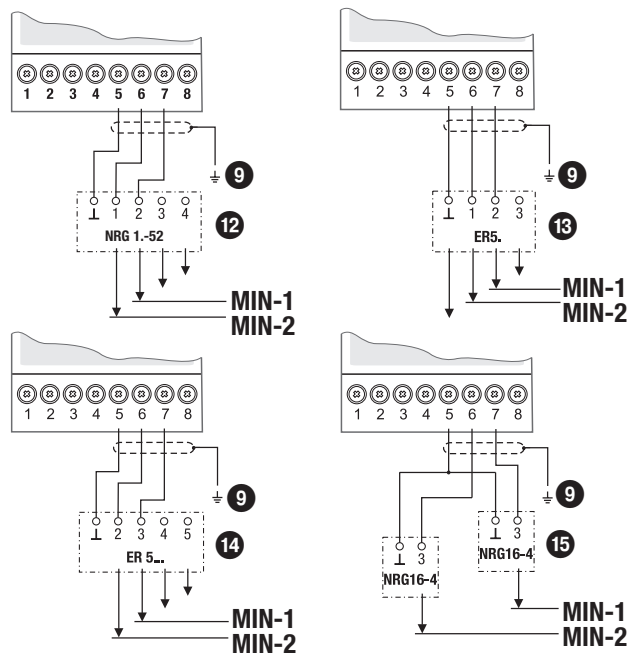


Fig. 2

Connecting several level electrodes



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