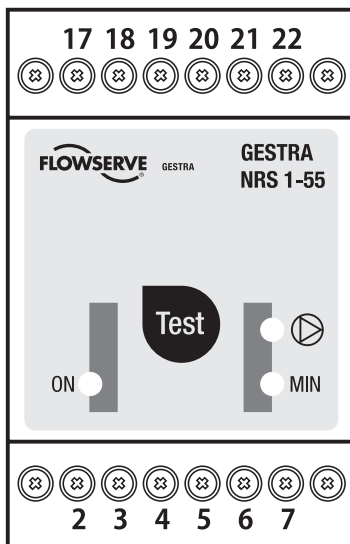


NRS 1-54



NRS 1-55

## Level Switch NRS 1-54, NRS 1-55

### Description

The level switch NRS 1-54, NRS 1-55 in conjunction with level electrodes NRG 16-.. and ER 5. is used as water level controller, for instance in steam boilers and (pressurized) hot-water installations. The level switch detects and indicates in addition a MIN or a MAX water level.

The level switch can work with following level electrodes: NRG 10-52, NRG 16-52, NRG 16-36, NRG 16-4 and ER 5.-1.

### Function

The operation of the level switch NRS 1-54, NRS 1-55 is based on the conductive measuring principle using the electrical conductivity of water. The level switch is designed for different electrical conductivities and for connecting three electrodes rods.

The level switch works as on-off water level controller (for fill or discharge control) and indicates in addition when the preset MAX or MIN water level (MAX: NRS 1-54; MIN: NRS 1-55) is reached.

The lengths of the associated electrode rods determine the switchpoints for water level control and MIN or MAX water level.

The equipment monitors the water level by sensing whether the electrode rods are exposed or immersed and - by energizing or de-energizing the controller output contact - switches the feedwater pump on or off. The LED "Pump" is illuminated when the feedwater pump is switched on by the level switch. The level switch detects that the MIN or MAX water level is reached when the corresponding electrode rod is exposed or submerged. After the de-energizing delay has elapsed, the MIN / MAX output contact is switched over. At the same time the MIN or the MAX LED changes from green to red.

A MIN or MAX alarm can be simulated by pressing the button "Test".

### Directives and standards

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

The level switch NRS 1-54, NRS 1-55 is certified acc. to VdTÜV Bulletin "Wasserstand 100" if used in combination with the following level electrodes: NRG 10-52, NRG 16-52, NRG 16-36, 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 16-36, 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 16-36, NRG 16-4 and ER 5.-1, 4 poles with screen.

#### Sensitivity of response

(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  $\cos \varphi = 1$   
De-energizing delay: 3 seconds (MIN or MAX alarm).  
Provide inductive loads with RC combinations according to manufacturer's specification to ensure interference suppression.

#### Indicators and adjusters

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

#### 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

Pollution degree 2.

#### Protection

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

#### Weight

approx. 0.2 kg

#### Further conditions:

#### 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 · 10-424 (see name plate)

# Level Switch NRS 1-54, NRS 1-55

## Important Notes

The level switch NRS 1-54, NRS 1-55 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 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 mm<sup>2</sup>, e. g. LiYCY 3 x 0.5 mm<sup>2</sup>, 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 1-54

GESTRA SPECTOR<sub>module</sub>

ON-off level controller with high level alarm

Output: 2 volt-free change-over contacts pump/MAX alarm

De-energizing delay: 3 seconds

Supply voltage: 24 V DC, 4 VA

### Level switch type NRS 1-55

GESTRA SPECTOR<sub>module</sub>

ON-off level controller with run-dry alarm

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

De-energizing delay: 3 seconds

Supply voltage: 24 V DC, 4 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 MIN electrode rod
- 8 MAX electrode rod
- 9 Electrode rods for water level control
- 10 Central earthing point (CEP) in control cabinet
- 11 MAX output contact
- 12 MIN output contact
- 13 Output contact for water level controller
- 14 Level electrode NRG 10-52, NRG 16-52 five-pole connector
- 15 Level electrode NRG 16-36
- 16 Level electrode ER 5.. four-pole connector
- 17 Level electrode ER 5.. five-pole connector

Supply in accordance with our general terms of business.

## Dimensions

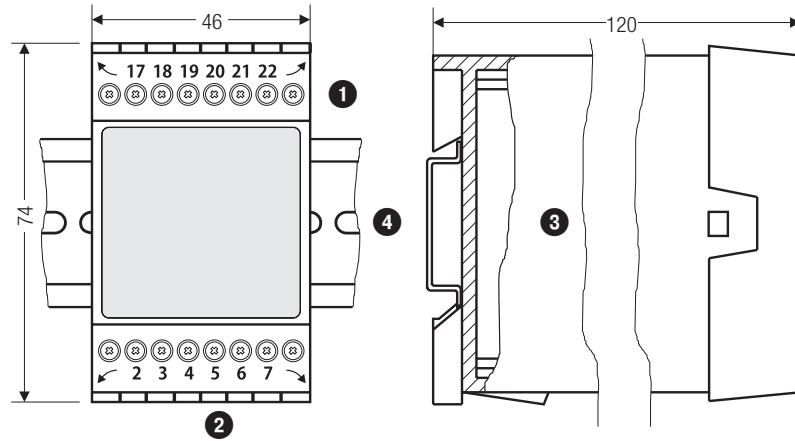


Fig. 1 NRS 1-54, NRS 1-55

## Electrical connection

### NRS 1-54

### MAX

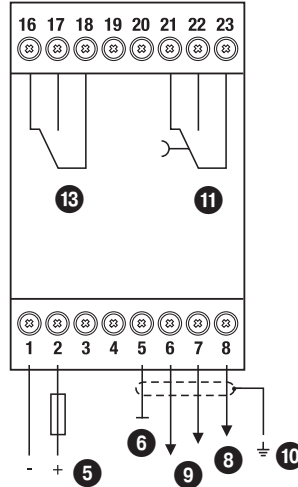


Fig. 2

### NRS 1-55

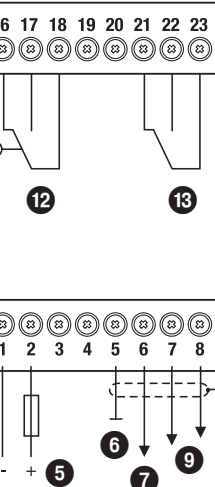
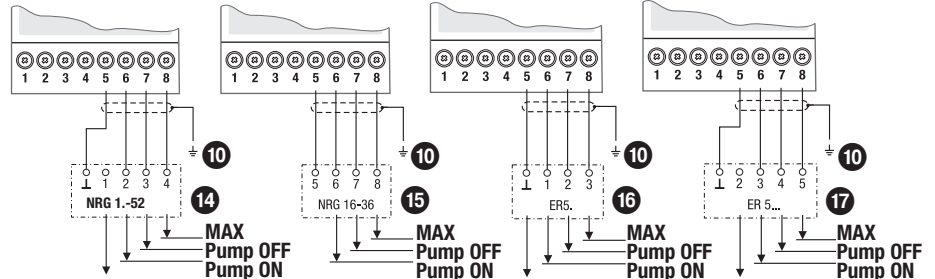


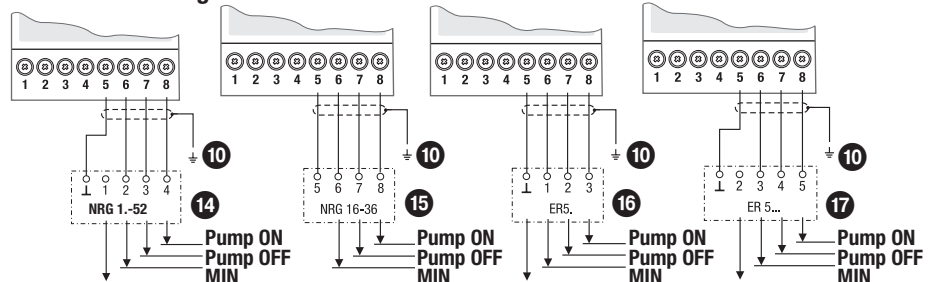
Fig. 3

## Connecting several level electrodes (fill control)

### NRS 1-54 Fill control



### NRS 1-55 Discharge control



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