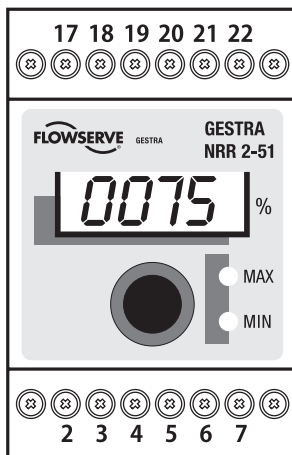


NRR 2-50



NRR 2-51

## Directives and standards

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

The level controller NRR 2-50 / NRR 2-51 in conjunction with level electrode NRG 2-... and level transmitter NRG 26-1 is type approved to VdTÜV Bulletin "Water Level 100".

Type approval no. TÜV - WR - 12-425 (see name plate).

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.

### Approvals for Marine Applications

The level controller NRR 2-5... in conjunction with level transmitter NRG 26-1 is approved for marine applications.

### 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.

## Level Controller

### NRR 2-50, NRR 2-51

#### Description

The level controller NRR 2-50 / NRR 2-51 in conjunction with level electrodes NRG 2-... and level transmitter NRG 26-1 is used as limit switch and water level controller, for instance in steam boilers, (pressurized) hot-water installations as well as condensate and feedwater tanks. The level controller indicates when the preset water level limit MIN or MAX is reached and opens or closes the control valve accordingly.

The level controller is designed to be used with level electrodes NRG 21-... and NRG 26-21 as well as the level transmitter NRG 26-1.

#### Function

The level controller NRR 2-50, NRR 2-51 uses the level-dependent voltage signal emitted by the level electrodes NRG 2-... or the level-dependent current signal emitted by the level transmitter NRG 26-1. These input signals are standardized by the controller to 0 and 100 % of the boiler measuring range and indicated as actual value by the seven-segment LED display.

Level controller NRR 2-50: The level controller works in conjunction with an electrically actuated control valve as three-position stepping controller with proportional-plus-integral control action (PI controller). In the event of a deviation from the setpoint, the electrical actuator is controlled by two output contacts and two flashing LEDs indicate whether the control valve opens or closes.

The controller can be configured for fill or discharge control.

An additional output contact indicates when the MIN or MAX water level is reached (the desired function is switch-selectable). After the de-energizing delay has elapsed, the output contact switches over and the LED for MIN or MAX is illuminated.

Level controller NRR 2-51: The level controller works in conjunction with an electro-pneumatically actuated control valve as continuous controller with proportional-plus-integral control action (PI controller) and, in the event of a deviation from the setpoint, outputs a current of 4-20 mA as manipulated variable Y.

The controller can be configured for fill or discharge control.

When the MIN or MAX water level is reached, the MIN or MAX output contact is switched over in the level controller after the de-energizing delay and the MIN or MAX LED is illuminated.

Level controller NRR 2-50, NRR 2-51: Any faults or malfunctions in the level electrode, the level transmitter, the electrical connection or the settings will be indicated as error code by the seven-segment LED display. In the event of a malfunction a MIN and MAX alarm will be triggered.

If errors occur only in the level controller NRR 2-50 / NRR 2-51, a MIN and MAX alarm is raised and the system is restarted.

Parameter settings can be changed or a MIN/MAX alarm be simulated by operating the rotary button.

For external level indication the level controller NRR 2-50 is optionally available with an actual-value output 4 - 20 mA.

#### Technical data

##### Supply voltage

24 VDC, + / -20 %, 0.1 A

##### Fuse

external 0.5 A (semi-delay)

##### Power consumption

2 VA

##### Connecting level electrode, level transmitter

(switch-selectable)

1 input for level electrode NRG 21-... and NRG 26-21, with 3 poles and screen or

1 analogue input 4-20 mA, e. g. for level transmitter NRG 26-1, with 2 poles and screen.

##### Supply voltage for level electrode

12 VDC

##### Outputs

**NRR 2-50:** 2 volt-free change-over contacts, 8 A 250 V AC / 30 V DC  $\cos \varphi = 1$  (control valve open/closed).

1 volt-free change-over contact, 8 A 250 V AC / 30 V DC  $\cos \varphi = 1$ .

De-energizing delay: 3 sec.

(MIN / MAX alarm, switch-selectable).

**NRR 2-51:** 2 volt-free change-over contacts, 8 A 250 V AC / 30 V DC  $\cos \varphi = 1$ .

De-energizing delay: 3 sec. (MIN / MAX alarm)

1 analogue output 4-20 mA, max. load 500 ohm (manipulated variable Y).

Provide inductive loads with RC combinations according to manufacturer's specification to ensure interference suppression.

**NRR 2-50:** 1 analogue output 4-20 mA, max. load 500 ohm, e. g. for actual-value indication (optional).

##### Indicators and adjusters

1 rotary button with integrated pushbutton "Test" for simulating MIN / MAX alarm and setting the parameter,

1 seven-segment LED display, four digits, green

2 LEDs red for MIN / MAX alarm,

2 LEDs amber for control valve opens/closes (only NRR 2-50)

1 four-pole code switch for configuration settings

##### Housing

Housing material: base: polycarbonate, black

Front: polycarbonate, grey.

Terminal strips separately detachable.

Fixing of housing: 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

##### 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

# Level Controller NRR 2-50, NRR 2-51

## Important Notes

The level controller NRR 2-50, NRR 2-51 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 / the level transmitter use screened multi-core control cable with a min. conductor size 0.5 mm<sup>2</sup>, e. g. LiYCY 4 x 0.5 mm<sup>2</sup>, max. length: 100 m.

Make sure that connecting cables between the equipment are segregated and run separately from power cables.

## Order & Enquiry Specification

### Level controller type NRR 2-50

GESTRA SPECTOR<sub>module</sub>

3-position stepping PI controller with MIN or MAX alarm.

Output:

- 1 volt-free change-over contact for MIN or MAX alarm
- 1 volt-free relay contact for valve open / stop / closed
- Supply voltage 24 V DC, 4 VA

### Level controller type NRR 2-51

GESTRA SPECTOR<sub>module</sub>

Continuous PI controller with MIN and MAX alarm.

Output: 1 current output 4-20mA for actuating the valve

1 volt-free change-over contact for MIN or MAX 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 semi-delay fuse 0.5 A (provided on site)
- 6 Level electrode NRG 21-...; NRG 26-21  
Up to three NRS/NRR 2-5.. can be connected. (parallel connection)
- 7 Level transmitter NRG 26-1, 4-20 mA, with earthing point. Up to three NRS/NRR 2-5.. can be connected. (series connection)
- 8 Central earthing point (CEP) in control cabinet
- 9 Output contact for activating the control valve
- 10 MIN / MAX output contact, De-energizing delay: 3 sec.
- 11 Actual value output 4-20 mA (optional)
- 12 MIN output contact, de-energizing delay: 3 sec.
- 13 MAX output contact, de-energizing delay: 3 sec.
- 14 Output 4-20 mA manipulated variable Y

Supply in accordance with our general terms of business.

## Dimensions

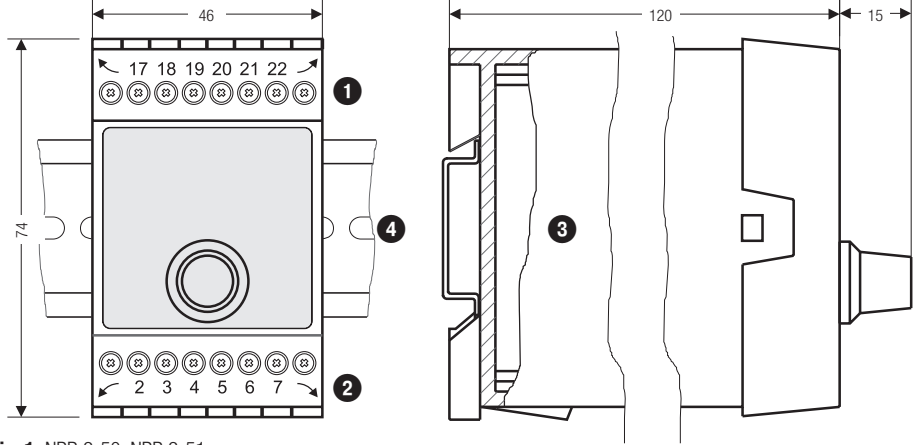


Fig. 1 NRR 2-50, NRR 2-51

## Electrical connection NRR 2-50

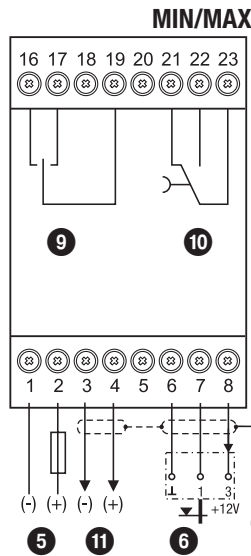


Fig. 2

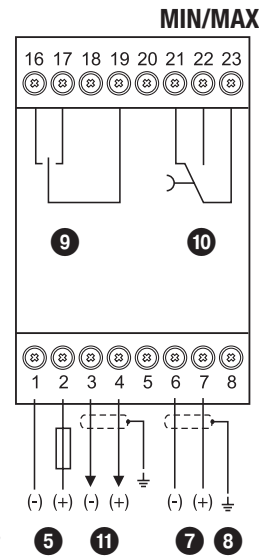


Fig. 3

## Electrical connection NRR 2-51

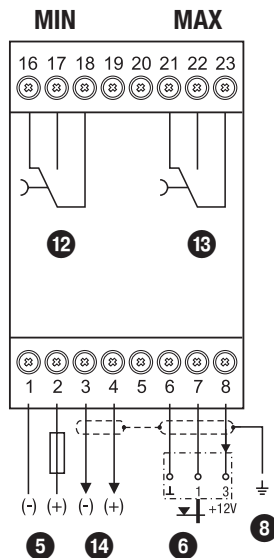


Fig. 4

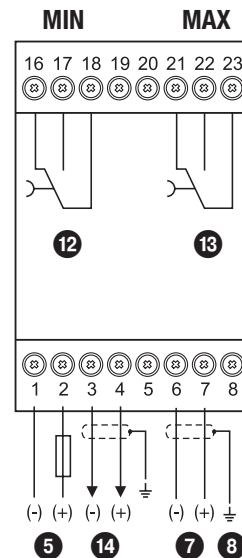


Fig. 5

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