GESTRA®

Level Controller NRR 2-52
Level Controller NRR 2-53
Operating & Display Unit URB 50

NRR 2-52
NRR 2-53
URB 50

EN
English

Original Installation Instructions

819222-03

Contents

Page

Contents - continued -

Page

Contents - continued -

Page

Important notes

Usage for the intended purpose

The functional unit consisting of the operating & display unit URB 50 and the level controller NRR 2-52 / NRR 2-53 in conjunction with level electrodes NRG 2.-.. or level transmitter NRGT 26-1 is used as water level controller and as limit switch, for instance in steam boilers, (pressurized) hot-water installations as well as condensate and feedwater tanks.

The functional unit consisting of the URB 50 and the level controller NRR 2-5.. is designed for use with level electrodes NRG 21-.. or NRG 26-21 as well as level transmitter NRGT 26-1.

Function

The **operating & display unit URB 50** and the **level controller NRR 2-52, NRR 2-53** form a functional unit featuring the following properties:

Level Controller	**NRR 2-52**	**NRR 2-53**
Evaluation of the voltage signal of the level electrode NRG 2-.. and standardized measuring range	X	X
Evaluation of current signal of level transmitter NRGT 26-1	X	X
3-position stepping controller with proportional-plus-integral control action **(PI controller)** and control of an electrically actuated control valve	X	
Continuous controller as **PI controller** for the control of an electro-pneumatically operated control valve		X
Indication of MIN / MAX water level limit	X	X
Current inputs for steam and feedwater flowrate (3-element control) (optional)	X	X
Indication of valve position if control valve is provided with a potentiometer	X	
Actual value output 4-20 mA (optional)	X	X
Operating & display unit		**URB 50**
Indication of actual value (indicated in percent and as bar graph)		X
Indication of valve position (indicated in percent and as bar graph)		X
Standardized measuring range if level electrode NRG 2.-.. is connected		X
Indication/adjustment of control parameters		X
Standardization and evaluation of current inputs for steam and feedwater flowrate (3-element control) (optional)		X
Trend record		X
Indication and listing of errors, alarms and warnings		X
Test of MIN / MAX output relays		X
Manual/automatic operation		X
Password protection		X

Important Notes - continued -

Safety note

The equipment must only be installed, wired and commissioned by qualified and competent staff.

Retrofitting and maintenance work must only be performed by qualified staff who - through adequate training - have achieved a recognised level of competence.

Danger

The terminal strips of the equipment are live during operation.
This presents the danger of electric shock!
Always cut off power supply to the equipment before mounting, removing or connecting the terminal strips!

Attention

The name plate specifies the technical features of the equipment. Note that any piece of equipment without its specific name plate must neither be commissioned nor operated.

Directives and standards

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

The functional unit consisting of the operating & display unit URB 50 / level controller NRR 2-52, NRR 2-53 in conjunction with level electrode NRG 2.-.. and level transmitter NRGT 26.-.. is type approved according to VdTÜV Bulletin "Wasserüberwachung (= Water Monitoring) 100".
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 2014/35/EU and the EMC Directive 2014/30/EU.

ATEX (Atmosphère Explosible)

According to the European Directive 2014/34/EU the equipment must **not** be used in explosion risk areas.

UL/cUL (CSA) Approval

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

Note on the Declaration of Conformity / Declaration by the Manufacturer CE

For details on the conformity of our equipment according to the European Directives see our Declaration of Conformity or our Declaration of Manufacturer.
The current Declaration of Conformity / Declaration of Manufacturer are available in the Internet under www.gestra.com/documents or can be requested from us.

Technical data

NRR 2-52, NRR 2-53

Supply voltage
24 VDC +/– 20%

Fuse
external 0.5 A (semi-delay)

Power consumption
5 VA

Connection of level electrode / level transmitter (switch-selectable)
1 input for level electrode NRG 21-.. or NRG 26-21, with 3 poles and screen or
1 analogue input 4-20 mA, e. g. for level transmitter NRGT 26-1, with 2 poles and screen

Supply voltage of level electrode
12 VDC

Input/output
Interface for data exchange with operating & display unit URB 50

Inputs
1 analogue input potentiometer 0 - 1000 Ω, two-wire connection
(indication of valve position, only NRR 2-52)
1 analogue input 4-20 mA (steam flowrate) (optional)
1 analogue input 4-20 mA (feedwater flowrate) (optional)

Outputs
NRR 2-52: 2 volt-free change-over contacts,
8 A 250 V AC / 30 V DC cos $\varphi = 1$ (control valve).
2 volt-free change-over contacts,
8 A 250 V AC / 30 V DC cos $\varphi = 1$,
De-energizing delay: 3 seconds (MIN/MAX alarm).

NRR 2-53: 4 volt-free change-over contacts, 8 A 250 V AC / 30 V DC cos $\varphi = 1$,
De-energizing delay: 3 seconds (MIN 1, MIN 2 / MAX 1, MAX 2 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 2-52, NRR 2-53: 1 analogue output 4-20 mA, max. load 500 ohm (e. g. for actual value indication) (optional)

Indicators and adjustors
1 tri-colour LED indicator (start-up = amber, power ON = green, malfunction = red)
1 code switch with four poles for configuration

Housing
Housing material: base: polycarbonate, black; front: polycarbonate, grey
Conductor size: 1 x 4,0 mm² solid per wire or
1 x 2.5 mm² per stranded wire with sleeve to DIN 46228 or
2 x 1.5 mm² per stranded wire with sleeve to DIN 46228 (min. ∅ 0.1 mm)
terminal strips can be detached separately
Fixing of housing: Mounting clip on supporting rail TH 35, EN 60715

Electrical safety
Pollution degree 2 for installation in control cabinet with protection IP 54, completely insulated

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

Technical data - continued -

NRR 2-52, NRR 2-53 - continued -

Weight
approx. 0.5 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:

TÜV certificate	VdTÜV Bulletin "Water Lever 100" (= Water Level 100): Requirements made on water level limiting & control equipment.
	Type approval no. TÜV · WR · XX-427 (see name plate).
UL/cUL (CSA) Approval	UL 508 and CSA C22.2 No. 14-13, Standards for Industrial Control Equipment. File E243189.

URB 50

Supply voltage
24 VDC +/– 20%

Fuse
internal automatic

Power consumption
8 VA

Input / output
Interface for data exchange.

User interface
Analogue resistive touch screen, resolution 480 x 271 pixels, illuminated.

Dimensions
Front panel: 147x107 mm
Panel cut-out: 136x96 mm
Depth: 56 + 4 mm

Electrical connection
1 connector with 3 poles,
1 D-SUB connector with 9 poles.

Technical data - continued -

URB 50 - continued -

Protection
Front panel: IP 65 to EN 60529
Back: IP 20 to EN 60529

Weight
approx. 1.0 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
5 - 85 %, no moisture condensation

Scope of supply

NRR 2-52
1 Level controller NRR 2-52
1 Installation manual

NRR 2-53
1 Level controller NRR 2-53
1 Installation manual

URB 50
1 Operating & display unit URB 50
1 Data line L = 5 m

In control cabinet: Mounting level controller

Dimensions NRR 2-52, NRR 2-53

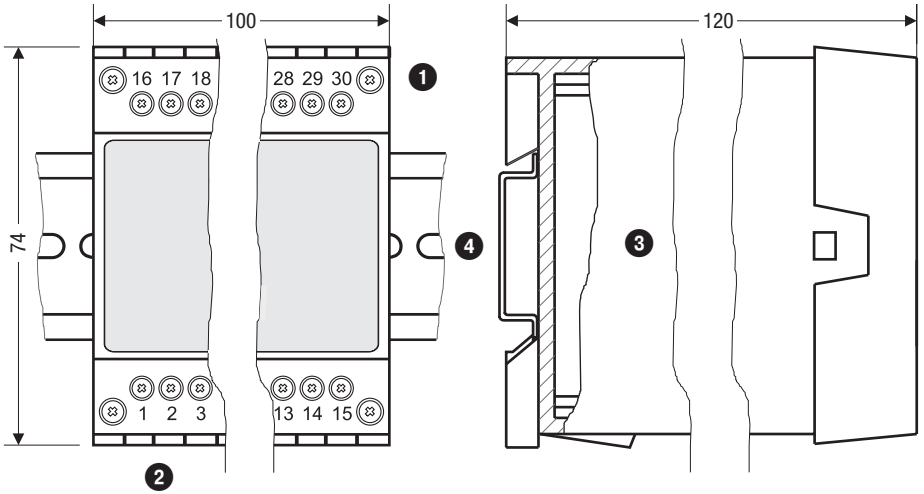


Fig. 1

Key

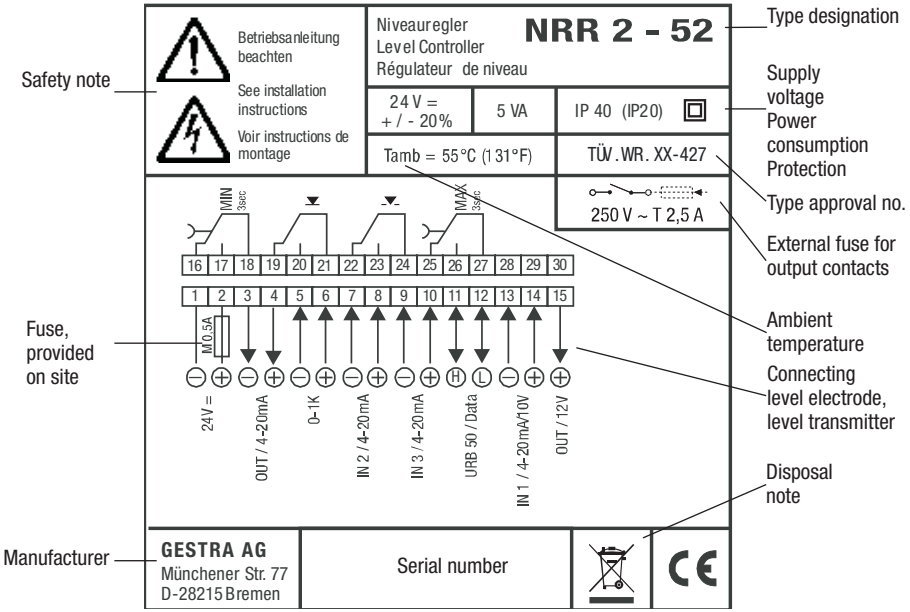
1. Upper terminal strip
2. Lower terminal strip
3. Housing
4. Supporting rail type TH 35, EN 60715

Installation in control cabinet

The level controller NRR 2-52, NRR 2-53 is clipped onto the support rail type TH 35, EN 60715 in the control cabinet. **Fig. 1** ❹

Name plate / marking

Name plate NRR 2-52



Name plate NRR 2-53

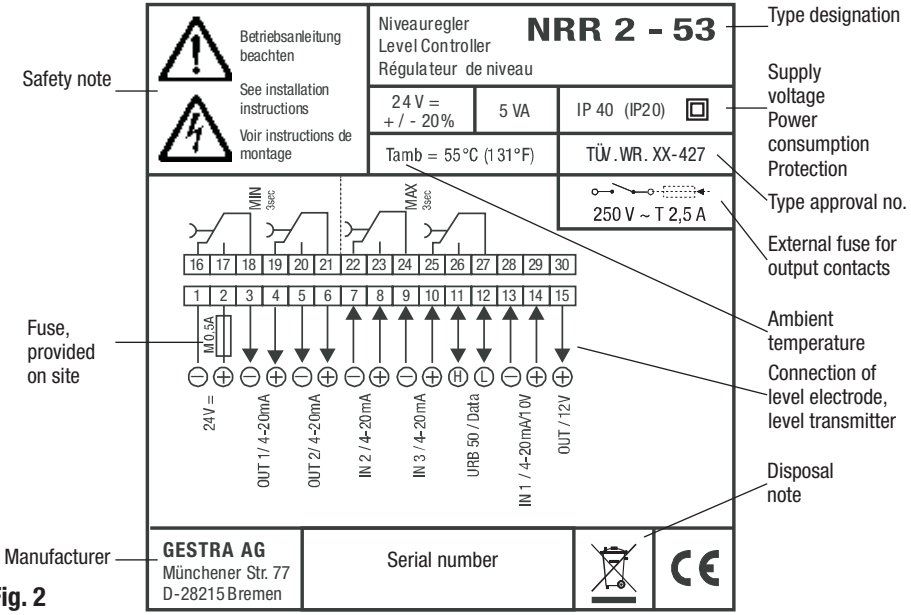
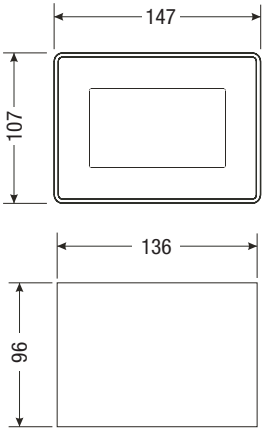


Fig. 2

In control cabinet: Installing the operating & display unit

Dimensions URB 50



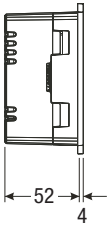


Fig. 3

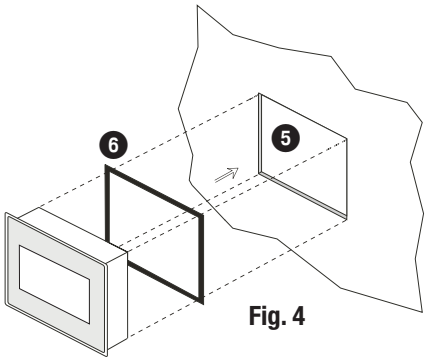


Fig. 4

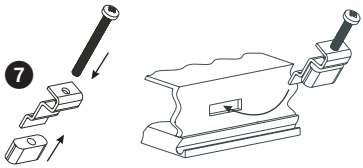


Fig. 5

Key

5 Cut-out in control cabinet 136x96 mm

6 Gasket

7 Fixing elements

Installation in control cabinet

- Provide a control panel cut-out with the dimensions indicated in **Fig. 3 and 4** .
- Insert the operating & display unit into the control panel cut-out. Make sure the gasket 6 is properly seated.
- Insert and fasten the screws **Fig. 5** until the edges of the frame are flush with the panel of the control cabinet.

Name plate / marking

Fig. 6

In control cabinet: Wiring level controller

Wiring diagram for level controller NRR 2-52

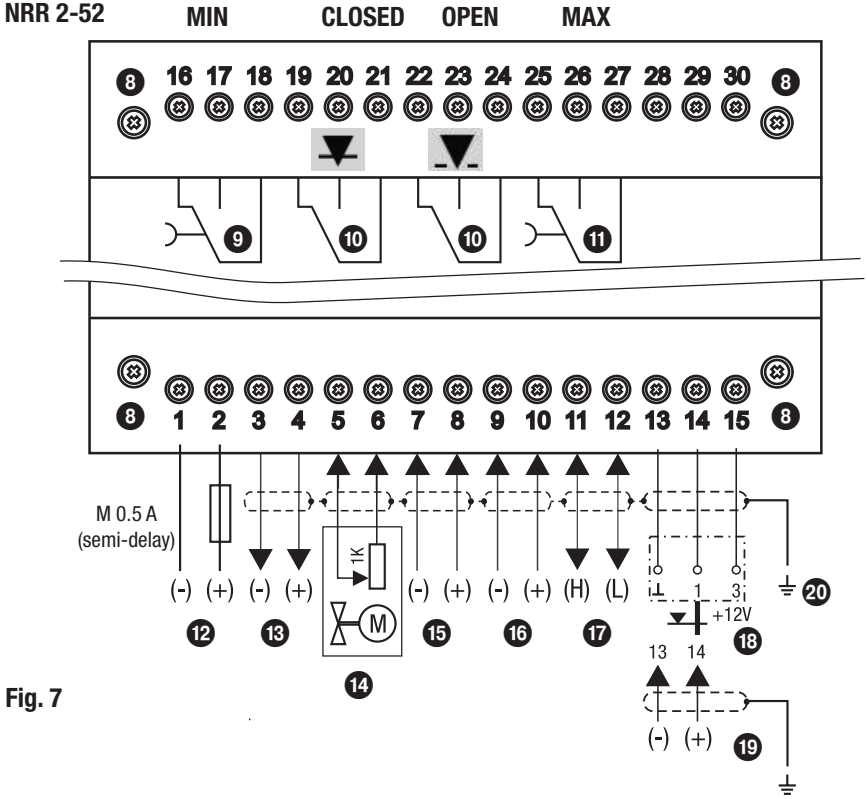


Fig. 7

Key

8 Fixing screws for terminal strip

9 MIN output contact, de-energizing delay: 3 sec.

10 Output contacts for activating the control valve

11 MAX output contact, de-energizing delay: 3 sec.

12 Connection of supply voltage **24 V DC** with fuse 0.5 A (semi-delay) provided on site

13 Actual value output 4-20 mA (optional)

14 Indication of valve position, potentiometer 0 - 1000 Ω

15 IN 2 / 4-20 mA for feedwater flowrate (optional)

16 IN 3 / 4-20 mA for steam flowrate (optional)

17 Data line for operating & display unit URB 50

18 Level electrode NRG 21.-.. NRG 26-21 (Fit a 6.8 kOhm resistor between terminals 13, 14 of the level electrode ER 96).

19 Level transmitter NRGT 26-1, 4-20 mA, with screen connected in terminal box.

20 Central earthing point (CEP) in control cabinet

In control cabinet: Wiring level controller - continued -

Wiring diagram for level controller NRR 2-53

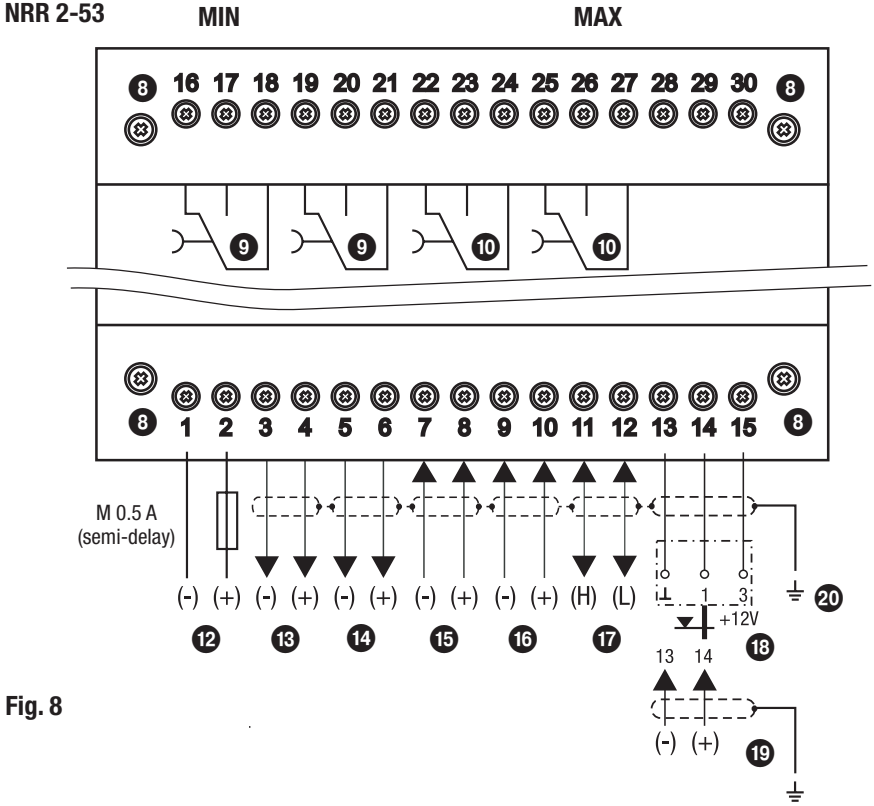


Fig. 8

Key

8 Fixing screws for terminal strip

9 MIN output contacts 1 and 2
De-energizing delay: 3 sec.

10 MAX output contacts 1 and 2
De-energizing delay: 3 sec.

12 Connection of supply voltage 24 V DC with fuse 0.5 A (semi-delay) provided on site

13 Actual value output 4-20 mA (optional)

14 Output 4-20 mA manipulated variable Y

15 IN 2 / 4-20 mA for feedwater flowrate (optional)

16 IN 3 / 4-20 mA for steam flowrate (optional)

17 Data line for operating & display unit URB 50

18 Level electrode NRG 21.-.. NRG 26-21 (Fit a 6.8 kOhm resistor between terminals 13, 14 of the level electrode ER 96).

19 Level transmitter NRGT 26-1, 4-20 mA, with screen connected in terminal box.

20 Central earthing point (CEP) in control cabinet

In control cabinet: Wiring the operating & display unit

Back of equipment, position of connector

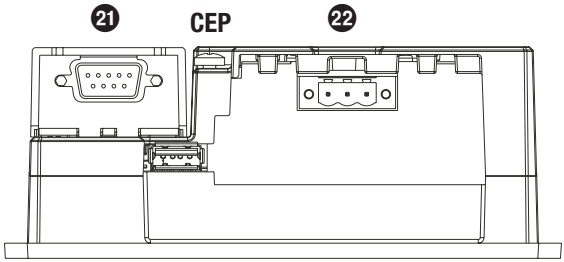


Fig. 9

Connection of supply voltage

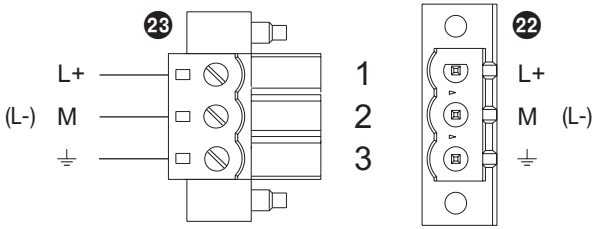
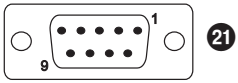


Fig. 10

Pin assignment for data line NRR 2-52, NRR 2-53 - URB 50



PIN 2	Data_L
PIN 7	Data_H

Fig. 11

Key

21 D-SUB connector with 9 poles for data line

22 Connector with 3 poles for supply voltage connection **24 V DC**

23 Connection for supply voltage **24 V DC,** pin assignment

In control cabinet: Wiring the level controller / the operating & display unit

Connection of supply voltage

The level controller and the operating unit are supplied with 24 V DC each and provided with an internal (URB) or external fuse (NRR 2-5.., semi-delay 0.5 A). The devices are separately supplied with 24 V DC and provided with an external semi-delay fuse 0.5 A. Please use a safety power supply unit with safe electrical isolation. 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.
After switching on the supply voltage and start-up of the equipment the LED of the level controller NRR 2-52, NRR 2-53 lights up green.

Connecting output contacts

Wire the upper terminal strip ❽ (terminals 16-23) according to the desired and ordered switching functions. Provide an external slow-blow fuse 2.5 A for the output contacts.
When switching off inductive loads, voltage spikes are produced that may impair the operation of control and measuring systems. Connected inductive loads must be provided with suppressors such as RC combinations as specified by the manufacturer.

Connecting level electrode, level transmitter

To connect the equipment use screened multi-core control cable with a min. conductor size 0.5 mm^2, e. g. LiYCY 4 x 0.5 mm^2, max. length 100 m.
Wire terminal strip in accordance with the wiring diagram. **Fig. 7, 8**
Wire screen in accordance with the wiring diagram.
Make sure that connecting cables leading to the equipment are segregated and run separately from power cables.

Connection of data line for the level controller / operating & display unit

For connecting the equipment preconfigured control cable assemblies (with female connector) are available as add-on equipment. Wire terminal strip in accordance with wiring diagram. **Fig. 7, 8**
If you do not use the above-mentioned control cable assembly, use screened multi-core control cable, e. g. LiYCY 2 x 0.25 mm^2, conductor size 0.25 mm^2, max. length 30 m.
Wire the terminal strips according to the wiring diagram **Fig. 7, 8.** Wire the 9-pole D-SUB connector according to **Fig. 11.**
Connect the earthing point of the housing (URB 50) to the central earthing point in the control cabinet.
Connect the screen **only once** to the central earthing point (CEP) in the control cabinet. Make sure that connecting cables leading to the equipment are segregated and run separately from power cables.

Connecting the potentiometer (for indication of valve positions), connections IN ../ OUT / 4-20 mA

To connect the equipment use screened multi-core control cable with a min. conductor size 0.5 mm^2, e. g. LiYCY 2 x 0.5 mm^2, max. length: 100 m.
Please observe the max. load of 500 ohm for the outputs.
Wire terminal strip in accordance with the wiring diagram. **Fig. 7, 8**
Connect the screen **only once** to the central earthing point (CEP) in the control cabinet.
Make sure that connecting cables are segregated and run separately from power cables.

Attention

- Do not use unused terminals as support point terminals.

In the plant:
Wiring level electrode / level transmitter

Connecting level electrode, level transmitter

The level controller NRR 2-52 / NRS 2-53 is designed to be used with level electrodes

NRG 21-.. or NRG 26-21 as well as the level transmitter NRGT 26-1.

To connect the equipment use screened multi-core control cable with a min. conductor size 0.5 mm^2, e. g. LiYCY 4 x 0.5 mm^2 , max. length: 100 m.

Wire screen in accordance with the wiring diagram.

Attention

- To put the equipment into operation follow the instructions given in the installation & operating manuals for NRG 21-.. , NRG 26-21 or NRGT 26-1.
- Make sure that connecting cables leading to the equipment are segregated and run separately from power cables.
- The level transmitter must be separately connected to its own voltage supply.

Level controller: Factory settings

Level controller NRR 2-52, NRR 2-53

The level controller features the following factory set default values:

- De-energizing delay 3 sec., factory set
- Voltage input for connecting a level electrode type NRG 21-.. or type NRG 26-21.
- Measuring range = 100%
- MAX switchpoint = 80 % (NRR 2-53: 80 %, 60 %)
- MIN switchpoint = 20 % (NRR 2-53: 40 %, 20 %)
- Setpoint = 50 %
- Proportional band Pb = +/– 20 % of setpoint
- Integral action time Ti = 0 sec.
- Neutral band = +/– 5% of setpoint
- Valve travel time tt = 40 s
- Function: fill control

Level controller NRR 2-52, NRR 2-53: Code switch ㉔: All switches are set to OFF

Level controller: Changing factory settings

Danger

The upper terminal strip ❽ of the equipment is live during operation.

This presents the danger of electric shock!

Always cut off power supply to the equipment before mounting, removing or connecting the terminal strips!

Changing function and input for level electrode/transmitter

The input and the function are determined by the code switch ㉔ setting.
To change the code switch setting proceed as follows:

- Switch off supply voltage.
- **Lower** terminal strip: Unscrew the left and right fixing screws. **Fig. 7, 8**
- Remove the terminal strip.

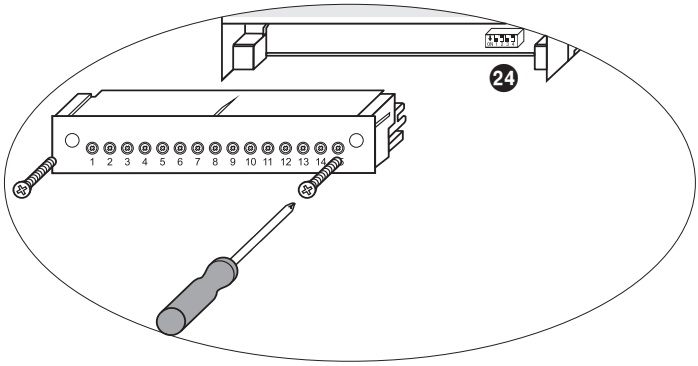


Fig. 12

After the new code switch settings have been established as new defaults:

- Attach lower terminal strip and fasten fixing screws.
- Apply supply voltage. Equipment is restarted.

Level controller: Changing factory settings - continued -

Changing function and input for level electrode/transmitter - continued -

If you want to change the input or the function, set the switches S2 and S3 of the code switch ㉔ as indicated in the following table **Fig. 12**.

Code switch ㉔  Toggle switch, white		
Level controller NRR 2-52, NRR 2-53	**S 2**	**S 3**
Input for connecting level electrode NRG 21-.. or NRG 26-21		OFF
Input for connecting level transmitter NRGT 26-1 *		ON
Fill control	OFF	
Discharge control	ON	

Fig. 13

grey = factory setting

Attention

* When connecting level transmitter NRGT 26-1 set the lower and the upper end of the measuring range **only** in the transmitter. For this purpose follow the instructions given in the installation & operating manual for the NRGT 26-1.

Do not change the code switch ㉔ settings of S1 and S4 **!**

Tools

- Screwdriver, size 3.5 x 100 mm, completely insulated according to VDE 0680-1.
- Screwdriver, size 2 x 100 mm, completely insulated according to VDE 0680-1.

Before putting the level control system into operation

Establishing measuring range

㉕ Lower end of measuring range, adjustable

㉖ Upper end of measuring range, adjustable

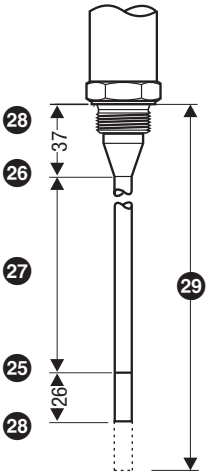
㉗ Measuring range [mm] = xxx %

㉘ Inactive area

㉙ Max. length of installation at 238 °C

Adjust the lower and upper end of the measuring range for level control. The resulting measuring range ㊴ is the active control range.

Please calculate the percentage value of the measuring range.



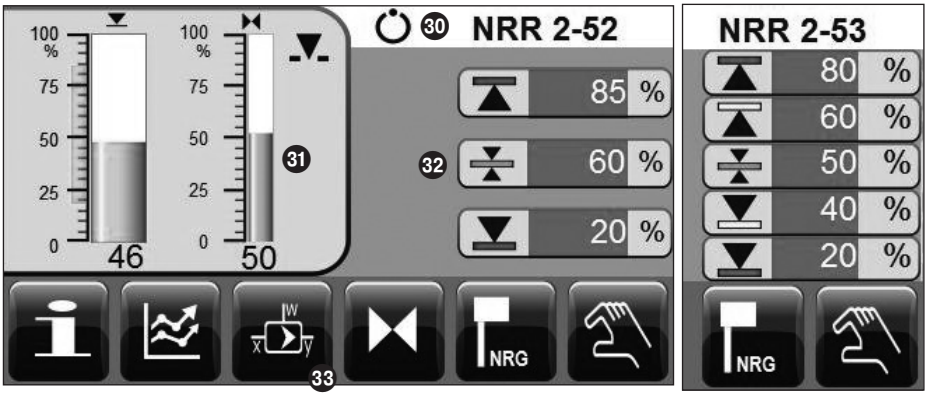
NRG 2.-..
NRGT 26-1

Attention

* When connecting level transmitter NRGT 26-1 set the lower and the upper end of the measuring range **only** in the transmitter.

Operating & display unit URB 50

User interface



Start window

Key

30 Status bar

31 Display field

32 Input field

33 Button bar

Switch on supply voltage

Switch on the supply voltage for the level controller NRR 2-5.. and for the operating & display unit URB 50. The LED of the level controller first turns amber and then green. The operating & display unit shows the start window.

Note

After approx. 2 minutes of user inactivity the display brightness automatically dims.

If you call up another screen display from the start window and you do not make an entry, the system automatically returns to the start window after approx. 5 minutes (time out).

The button  is only shown for level controller NRR 2-52 and if a potentiometer is provided for indicating the valve position.

Operating & display unit URB 50 - continued -

Explanation of icons

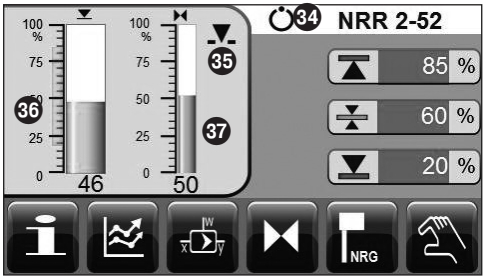
Icon	Description	Icon	Description
	MAX switchpoint		MAX switchpoint 2 (NRR 2-53)
	MIN switchpoint		MIN switchpoint 2 (NRR 2-53)
	Setpoint		Level
	Allowance made for influence of difference (steam flowrate - feedwater flowrate) on liquid level		Go to parameter setting window for level electrode. This button is not available if a level transmitter is connected.
	Go to parameter setting window for control valve. This button is only available for the level controller NRR 2-52 and if a potentiometer is provided for indicating the valve position.		Position of the control valve if a potentiometer is provided for indicating the valve position
			Position of control valve in case of internal feedback
	Calibration of upper end of level measuring range and valve CLOSED (indication of valve position via potentiometer)		Calibration of end of level measuring range
	Calibration of valve OPEN (indication of valve position via potentiometer)		
	Control valve is motored into OPEN position		Control valve is motored into CLOSED position
	Go to parameter setting window for controller		Proportional band, adjustable between 10 and 150 %, based on the setpoint,
	Integral action time: adjustable between 0 and 120 sec.		Neutral zone (dead band), adjustable between + / – 0 and 5%, based on the setpoint,
	Valve travel time: adjustable between 10 and 600 sec.		
	Go to parameter setting window for 3-element controller		Feedwater flowrate
			Steam flowrate
	Go to parameter setting window for analogue signal inputs 4-20 mA.		Go to trend log window.
	Move trend log window 1 hr forward		Move trend log window 1 hr backwards

Explanation of icons - continued -

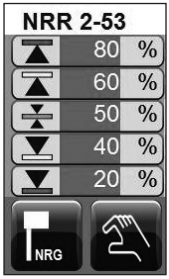
Icon	Description	Icon	Description
	Zooming out of trend curve (magnification decreases)		Get information
	Zooming in on trend curve (magnification increases)		
	Fill control activated		Discharge control activated
	Log in		Log out
	Relay test of MAX switchpoint		Relay test of MIN switchpoint
	Logged in		Logged out
	Enter new password		New password
	Deactivate password handling		Password
	Confirm password		Scroll back
	Switch to manual operating mode		Switch to automatic operating mode
	Hand slider for control valve		Time and date setting
	Alarm message / Go to alarm list		Go to alarm list
	Alarm message received		Alarm message gone
	Go to first line in alarm list		Scroll down alarm list
	Go to next active alarm		Scroll up alarm list

Commissioning procedure

Adjusting the MIN/MAX switchpoints and setpoint

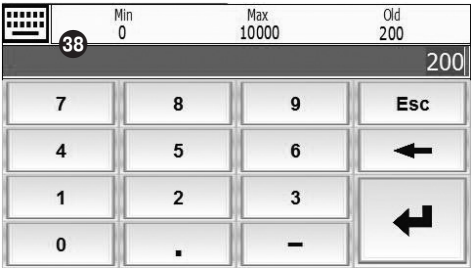


Screen display 1



For each setpoint press the green button. Use the on-screen numberpad **Screen display 2** to enter the desired percentage value.

Numberpad



Screen display 2

The green buttons in the following windows indicate that user input is possible. When you press on these green buttons a numberpad appears and you can enter the desired values and parameter settings.
The bar ㊳ shows the old value and the limit range.
To undo any incorrect data input press the **Backspace** key.
If you do not want to enter data press the **Esc** key The start window re-appears.
To confirm your data input press the **Enter** key. The start window re-appears again.

Key

㉞ Status indication: automatic operation

㉟ Control valve motored to OPEN position

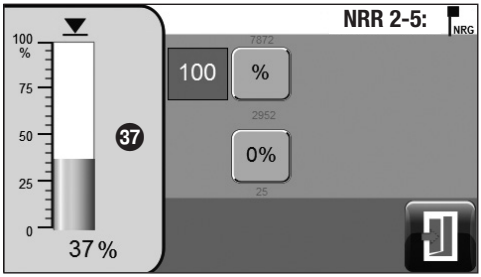
㊱ Bar chart indication of liquid level, actual value [in %]

㊲ Bar chart indication of control valve position [in %]

㊳ Bar showing the old value and the limit range

Establishing measuring range for level electrode NRG 2.-..

Press button NRG to open the parameter setting window for the level electrode.



Screen display 3

Press button to go back to the start window.

Only for level electrode NRG 2.-.. : Adjusting lower and upper end of measuring range. The sequence is irrelevant.

Calibrating lower end of measuring range:
Lower water level until the lower end of the measuring range ㉕ is reached.
Press button "0 %".
(actual-value output = 4 mA)

0%

Calibrating upper end of measuring range:
Fill tank until the upper end of the measuring range ㉕ is reached.
Press the green button and use the on-screen numberpad to enter 100.
Then press button "%".
(actual-value output = 20 mA)

%

OR

Calibrating upper end of measuring range:
Raise water level until at least 25 % of the measuring range is reached. Press the green button and use the on-screen numberpad to enter for instance "25 %". Press button "%" to interpolate the value to 100 % of the measuring range.
(actual-value output = 20 mA)

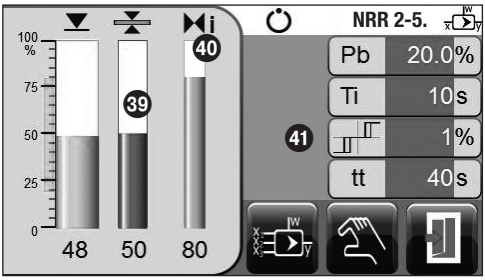
%

Note

Even though you can calibrate the measuring range in any order, do not forget to **calibrate the lower end of the measuring range!**

Setting the control parameters

Press button  to open the parameter setting window for the controller.



Screen display 4

For each parameter setting press the green button. Use the on-screen numberpad to enter the desired value.

Press button  to scroll back or

press button  to go to the parameter setting window of the 3-element control.

Additional information on control parameter settings

Parameter		Deviation	Control valve
Proportional band **Pb**	larger	large remaining deviation	responds slowly
	smaller	small remaining deviation	responds quickly and may open/closes all the time
	Example	Measuring range 100% = 200 mm of sightglass Setpoint SP = 80 % of measuring range = 160 mm Proportional band Pb = +/- 20% of setpoint = +/- 16% = +/- 32 mm If the measuring range is 100% (200 mm) and the setpoint 80% (160 mm), the proportional band will be +/- 16% (+/- 32 mm) or within the range of 128 to 192 mm.	
Integral action time **ti**	larger	slow correction of deviations	responds slowly
	smaller	fast correction of deviations, control system may tend to overshoot	responds quickly
Neutral band ㊶	larger	time-delayed correction of deviations	will not respond until the deviation exceeds the neutral band
	smaller	fast correction of deviations	
Valve travel time **tt** (only NRR 2-52)			Adjust the valve travel time specified by the valve manufacturer.

Key

㊴ Bar chart indication of setpoint [in %]

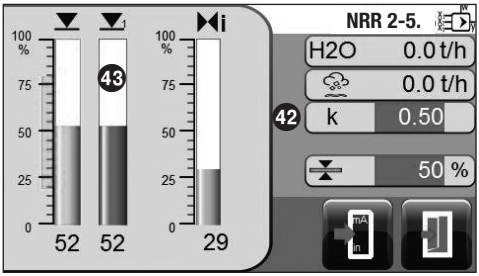
㊵ Bar chart indication of manipulated variable Y [in %], relative to valve lift

㊶ Neutral zone (dead band)

Setting the control parameters for 3-element control (optional)

The buttons for setting the control parameters for 3-element control are only available if the level controller NRR 2-5.. was factory set as 3-element controller.

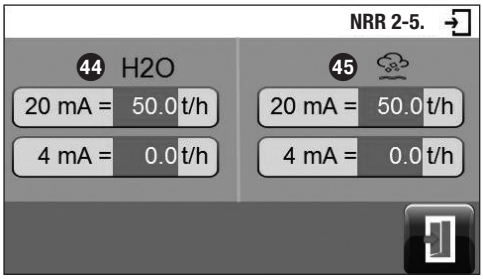
Press button  to open the parameter setting window for 3-element control.



To enter the evaluation factor press the green button. Use the on-screen numberpad to enter the desired value.
The factor evaluates the influence of the difference (steam flowrate - feedwater flowrate) on the measured level signal.

Screen display 5

Press button  to open the parameter setting window for analogue signal inputs 4-20 mA.



For each flowrate setting press the green button. Use the on-screen numberpad to enter the desired value.

Screen display 6

Press button  to go back to screen display 5.

Note

Controlled actual value = level - (steam flowrate - feedwater flowrate) x evaluation factor (only if steam flowrate - feedwater flowrate > 0)

Key

42 Evaluation factor

43 Controlled actual value, influence of difference (steam flowrate - feedwater flowrate) has been evaluated

44 Feedwater flowrate

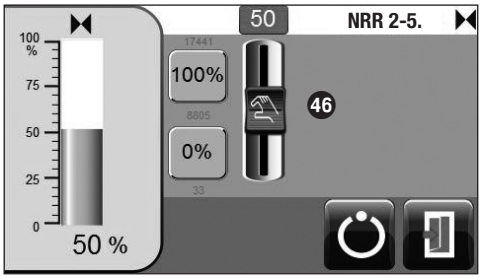
45 Steam flowrate

Commissioning - continued -

Only NRR 2-52: Calibrating the potentiometer for indication of valve position

Press button  to open the parameter setting window for the control valve.

Press button  to switch to manual operating mode.



Calibration of "Valve CLOSED"(0%):
Move the hand slider downwards until "0" is indicated in the green button.
Press the key "0 %".

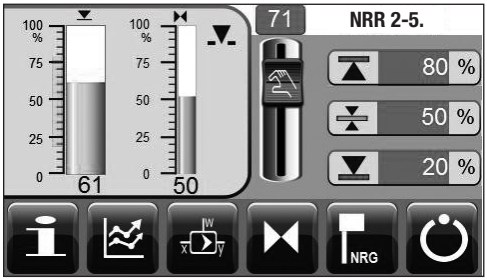
Calibration of "Valve OPEN"(100%):
Move the hand slider upwards until "100" is indicated in the green button.
Press the key "100 %".
Or press the green button and enter 100 in the numberpad.

Screen display 7
Switch back to automatic operating mode and scroll back.

Operation

Manual actuation of control valve

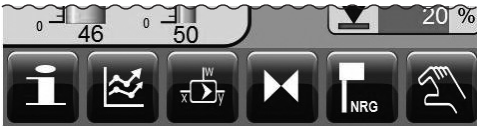
Press button  to switch to manual operating mode.



Use the hand slider to change the position of the control valve. The green button indicates the valve opening in %. Or press the green button and enter the desired valve opening in % in the numberpad.

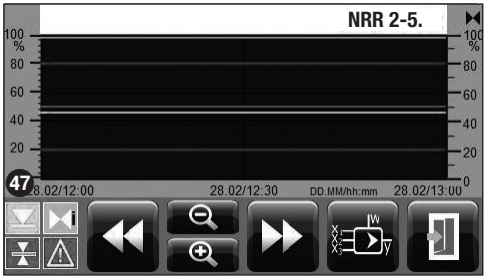
Screen display 8
Switch back to automatic operation.

Trending



Screen display 1

Press button  to open the trend log window.



Screen display 9

Screen display 10

Press button	
	to move 1 hour back in the trend log window
	to zoom out of trend curve (magnification decreases)
	to zoom in on the trend curve (magnification increases)
	to move 1 hour forward in the trend log window
	to go to the trend log window for 3-element control
	to go back to the trend log window for the control system (screen display 9)

Press button  to go back to screen display 4.

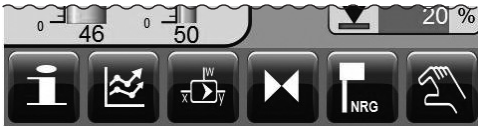
Key

46 Hand slider for control valve

47 Designation of trend curves

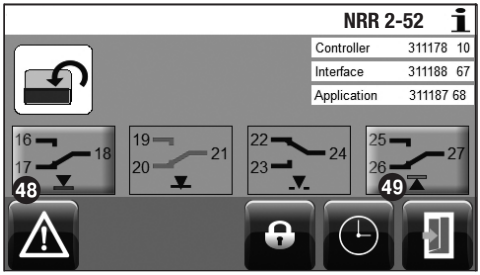
	Level, green curve
	Position of control valve, grey curve
	Setpoint, dark green curve
	Alarm message, red curves
H2O	Feedwater flowrate, blue curve
	Level, corrected, dark green curve
	Steam flowrate, red curve

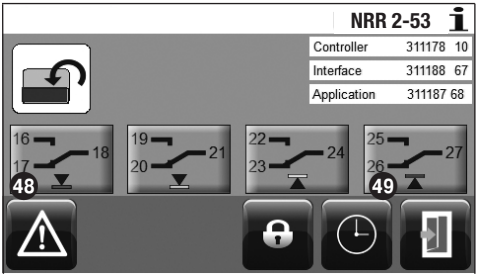
Testing MIN/MAX alarm, entering date and time



Screen display 1

Press button  to open the information window



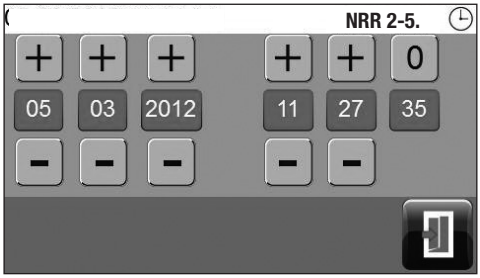


Screen display 11

Testing MIN alarm
Press and hold down button ㊽ for at least 3 sec. After the de-energizing delay the output contact 17-18 opens and the respective contact icon turns red.

Testing MAX alarm
Press and hold down button ㊾ for at least 3 sec. After the de-energizing delay the output contact 26-27 opens and the respective contact icon turns red.

Press button  to open the time/date window.



Screen display 12

Press the green button and use the on-screen numberpad to enter the day, month, year and hours, minutes and seconds. To change the date and time use the +/- keys.

Press button  to go back to screen display 11.

Setting up a password and logging in

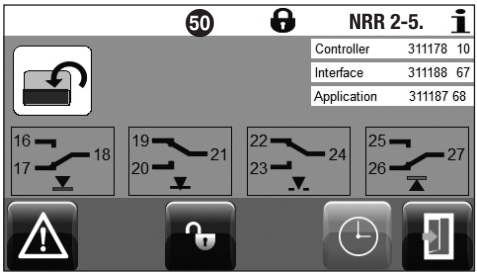
Screen display 11

You can allocate a password in order to protect the operating & display unit from unauthorized access and operation.

To log out press button 

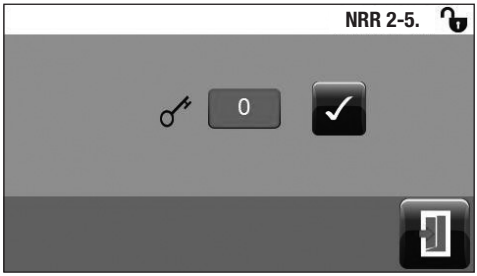
The following button(s) appear(s): 

Press again button 
Screen display 13 appears.



Screen display 13

Press button 
Screen display 14 appears.



Screen display 14

Press the green button and use the on-screen numberpad to enter "0" during first commissioning.

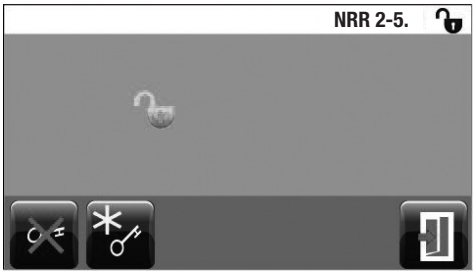
Press button  to confirm the password input.
Screen display 15 appears.

Key

48 Test button for MIN alarm

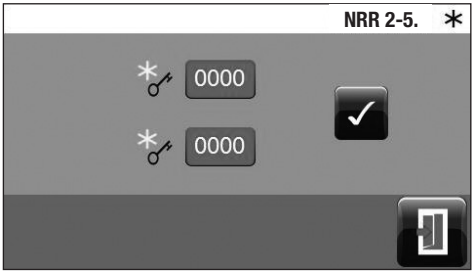
49 Test button for MAX alarm

50 Log out symbol in status bar



Screen display 15

Press button	
	to go to screen display 16 where you can enter a new password.
	to deactivate the password handling.
	to go back to the start window. All buttons and input options are now available



Screen display 16

Press the green button and use the on-screen numberpad to enter your new password twice.

Press button  to confirm the password and
go back to screen display 15.

Press button  to go back to screen display 15

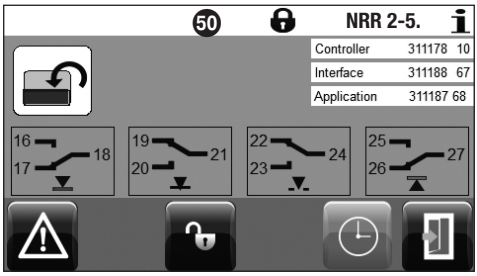
Log out

After having changed the parameters and settings you can log out again.

To log out press button 

The following button(s) appear(s). 

Press again button 
Screen display 17 appears.

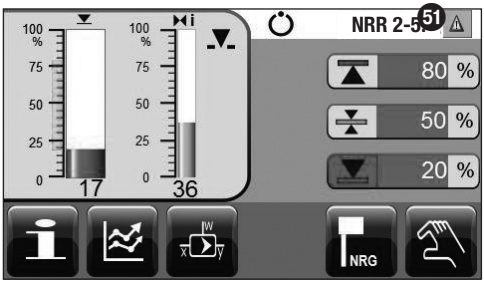


Screen display 17

Press button  to go back to the start window.

All buttons and input options are now unavailable. The symbol "Logged out" appears in the status bar.

Alarm & malfunction list

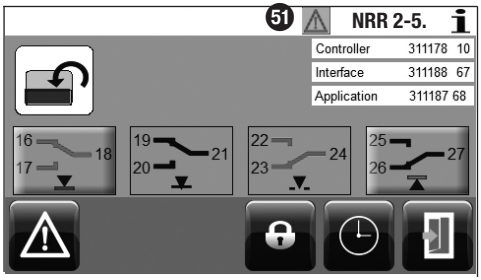


Screen display 18

Example:
Value below MIN switchpoint .
The warning triangle 51 and the change of colour indicate that there is an alarm message.

Press the button with the warning triangle 51 to view the alarm list (screen display 23).

Or press button  to open the information window



Screen display 19

Press button  to go back to the start window.

Press button  go to the alarm list.

Screen display 20

The active alarm or malfunction is highlighted in red. Press button	
	to call up the next active message.
 	to scroll forward in the alarm list (also possible by means of hand slider)
	to go to the first line.
	to go back to the start window.

Key

51 Malfunction or alarm message received

52 Hand slider

Error, alarm and warning messages

Indication, diagnosis and remedy

Attention

Before carrying out the fault diagnosis please check:

Supply voltage:
Is the equipment supplied with the voltage specified on the name plate?

Wiring:
Is the wiring in accordance with the wiring diagram?

Alarm list / window		
	Status / error	**Remedy**
	Communication NRR/URB disrupted	Check electrical connection. Switch supply voltage off and on again to re-start the equipment.
A.001	MAX switchpoint exceeded	
A.002	Value below MIN switchpoint	
E.005	Level electrode defective, measuring voltage < 0.5 VDC	Check level electrode and, if necessary, replace it. Check electrical connection.
	Level transmitter defective, measuring current < 4 mA	Check level transmitter and, if necessary, replace it. Check electrical connection.
E.006	Level electrode defective, measuring voltage > 7 VDC	Check level electrode and, if necessary, replace it. Check electrical connection.
	Level transmitter defective, measuring current > 20 mA	Check level transmitter and, if necessary, replace it. Check electrical connection.
E.101	If control valve is equipped with a potentiometer: Calibration values 0 and 100 % have been reversed.	Re-calibrate the potentiometer in the control valve.
E.102	Beginning and end of measuring range have been reversed.	Re-adjust the measuring range.
E.103	MIN switchpoint above MAX switchpoint	Re-adjust the switchpoints.
In the event of a malfunction (E. xxx) a MIN and MAX alarm will be triggered.		

Attention

- Please follow the instructions given in the installation & operating manual for the NRG 21-... , NRG 26-21 and NRGT 26-1 for further fault finding and troubleshooting.

Note

If a malfunction occurs in the level controller, MIN and MAX alarms will be triggered and the equipment is restarted.
Should this happen over and over again, replace the equipment with a new one.

Further Notes

Action against high frequency interference

High frequency interference can occur for example as a result of out-of-phase switching operations. Should such interference occur and lead to sporadic failures, we recommend the following actions in order to suppress any interference.

- Provide inductive loads with RC combinations according to manufacturer's specification to ensure interference suppression.
- Make sure that all connecting cables leading to the level electrode or to the level transmitter are segregated and run separately from power cables.
- Increase the distance to sources of interference.
- Check the connection of the screen to the central earthing point (CEP) in the control cabinet.
- HF interference suppression by means of hinged-shell ferrite rings.

Decommissioning / replacing the level controller NRR 2-5

- Switch off supply voltage and **cut off power supply** to the equipment.
- Remove the lower and upper terminal strips. Unscrew the left and right fixing screws. **Fig. 12**
- Release the white fixing slide at the bottom of the equipment and take the equipment off the supporting rail.

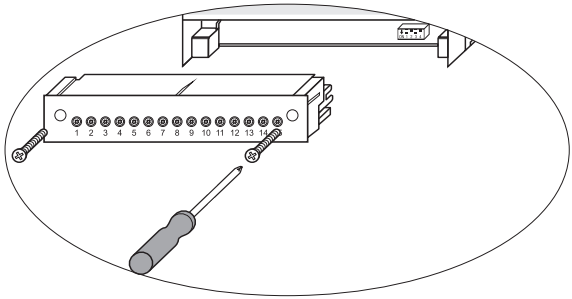


Fig. 12

Decommissioning / replacing the operating & display unit URB 50

- Switch off supply voltage and **cut off power supply** to the equipment.
- Unplug the connector **Fig. 10 and 11** .
- Unscrew screws **Fig. 5** and remove fixing elements..
- Push the equipment out of the control cabinet panel cut-out.

Disposal

For the disposal of the equipment observe the pertinent legal regulations concerning waste disposal.

If faults occur that are not listed above or cannot be corrected, please contact our service centre or authorized agency in your country.

For your Notes

For your Notes

For your Notes

Agencies all over the world: **www.gestra.de**

GESTRA AG
Münchener Straße 77
28215 Bremen
Germany
Telefon +49 421 3503-0
Telefax +49 421 3503-393
E-mail info@de.gestra.com
Web www.gestra.de

819222-03/06-2015cm (808865-04) · GESTRA AG · Bremen · Printed in Germany