GESTRA®

Level Controller

NRR 2-50
NRR 2-51

EN (USA)
English

Original Installation &
Operating Manual
850699-01

Contents

Contents

Content of this Manual

Product:

- Level controller NRR 2-50, NRR 2-51

First edition:

BAN 850699-00/08-2021cm

Scope of supply, product package

NRR 2-50
1 level controller NRR 2-50
1 Installation & Operating Manual

NRR 2-51
1 level controller NRR 2-51
1 Installation & Operating Manual

How to use this Manual

This Installation & Operating Manual describes the correct use of the NRR 2-50, NRR 2-51 level controller. It applies to persons who integrate this equipment in control systems, install, bring into service, operate, maintain and dispose of this equipment. Anyone carrying out the above-mentioned activities must have read this Installation & Operating Manual and understood its contents.

- Read this Manual in full and follow all instructions.
- Please also read the instructions for use of any accessories.
- The Installation & Operating Manual is part of the product package. Keep it in an easily accessible location.

Availability of this Installation & Operating Manual

- Make sure this Installation & Operating Manual is always available to the operator.
- If you pass on or sell the equipment to a third party, please also hand over the Installation & Operating Manual.

Illustrations and symbols used

1. Action to be taken
2.

- Lists
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Ⓐ Keys to illustrations

Additional information

Read the relevant Installation & Operating Manual

Hazard symbols in this Manual

Danger zone, dangerous situation

Types of warning

⚠ DANGER

Warning of a dangerous situation that results in death or serious injury.

⚠ WARNING

Warning of a dangerous situation that may possibly result in death or serious injury.

⚠ CAUTION

Warning of a situation that may result in minor or moderate injury.

⚠ ATTENTION

Warning of a situation that results in damage to property or the environment.

Specialist terms, abbreviations

Here, we explain some abbreviations, specialist terms, etc., which are used in this Manual.

NRGT .. / NRR.. / NRS.. / URS .. / URB .. / SRL .. / etc.

Equipment and type designations of GESTRA AG.

SELV

Safety Extra Low Voltage

Operating point (of the plant)

The operating point describes the operating parameters within which a plant or boiler is operated in its nominal range. In a steam boiler, for example, these parameters would be output, pressure, and temperature.

The design data may be a lot more stringent, however.

A boiler that is operated at 145 psi (10 bar) and 356°F (180°C) may be designed to withstand a pressure of 870 psi (60 bar) and a temperature of 527°F (275°C), for example, which is therefore not necessarily its operating point.

Usage for the intended purpose

The NRR 2-50, NRR 2-51 level controller is used in combination with the NRGT 26-2 level transmitter as a limit switch and water level controller, e.g., in steam boilers and hot water installations or in condensate and feedwater tanks. The level controller indicates when a MIN and MAX water level has been reached, and opens or closes a control valve.
The NRR 2-50 and NRR 2-51 are classified as operating controls in accordance with UL 60730-1.

When used as intended, the NRR 2-50, NRR 2-51 level controller can be combined in a circuit with an NRGT 26-2 level transmitter.

To ensure proper use in all applications, please also read the Installation & Operating Manuals for the system components used.

- You can find the latest Installation & Operating Manuals on our website: http://www.gestra.com

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.

Do not bring any equipment into service that does not have its own specific rating plate.

The rating plate indicates the technical features of the equipment.

Basic safety information

There is a risk of electric shock during work on electrical systems.

- Always switch off the voltage to the plant before performing connection work.
- Check that the plant is not carrying live voltage before commencing work.

Attempts to repair the equipment will cause the plant to become unsafe.

- The NRR 2-50, NRR 2-51 level controller may only be repaired by the manufacturer, GESTRA AG.
- Only replace faulty equipment with identical equipment from GESTRA AG.

Required personnel qualifications

Activity	Personnel	
Integration in control system	Specialist staff	Plant designer
Installation/electrical connection/ bringing into service	Specialist staff	The equipment may only be installed, wired and brought into service by qualified and competent staff.
Operation	Boiler service technician	Staff trained by the plant operator.
Maintenance work	Specialist staff	Fitting and maintenance work may only be performed by authorized staff who have undergone specific training.
Refits	Specialist staff	Persons trained by the plant operator to work with pressure and temperature.

Notes on product liability

The manufacturer cannot accept any liability for damages resulting from improper use of the equipment.

Function

The **NRR 2-50, NRR 2-51 level controller** processes the level-dependent current signal from the NRGT 26-2 level transmitter. In the controller, this input signal is standardized to 0 and 100% of the boiler measuring range and shown as an actual value on the 7-segment LED display.

Level controller NRR 2-50: The level controller works with an electrically actuated control valve as a 3-position stepping controller with proportional-plus-integral control action **(PI controller)**. If the actual value deviates from the set point, the electric actuator is triggered by two output contacts and two flashing LEDs indicate whether the control valve is opening or closing.

The controller can be configured for fill or drain control.

A further output contact indicates when a MIN or MAX water level is reached (the desired function is switch-selectable). After the off delay has elapsed, the output contact switches and the MIN or MAX LED lights up.

Level controller NRR 2-51: The level controller works with an electro-pneumatically actuated control valve as a continuous controller with proportional-plus-integral control action **(PI controller)**. In the event of deviations from the set point, it outputs a current of 4-20 mA as manipulated variable Y.

The controller can be configured for fill or drain control.

If the MIN or MAX water level is reached, after the off delay the MIN or MAX output contact switches in the level controller, and the MIN or MAX LED lights up.

Level controller NRR 2-50, NRR 2-51: Faults in the level transmitter or the electrical connection and setting errors are indicated as error codes on the 7-segment LED display. In the event of a malfunction, the MIN and MAX alarm is triggered.

If faults occur only in the **NRR 2-50, NRR 2-51 level controller**, the MIN and MAX alarm is triggered and the system is restarted.

Parameters can be changed or the MIN/MAX alarm simulated by turning the rotary knob.

To enable an external level display, the **NRR 2-50 level controller** is available with a 4 - 20 mA actual value output.

Technical data

Supply voltage
24 VDC +/– 20%; PELV / CLASS2

Fuse
External M0.5A (medium time-lag)

Power consumption
4 W

Connection of level electrode/level transmitter (switch-selectable)
1 analog input 4-20 mA, e.g., for the NRGT 26-2 level transmitter, 2-pole with shield.

Outputs:
NRR 2-50: 2 volt-free relay contacts, 8 A 250 V AC / 30 V DC cos $\varphi = 1$ (control valve open/closed).
1 volt-free relay contact, 8 A 250 V AC / 30 V DC cos $\varphi = 1$.
Off delay 3 seconds (MIN/MAX alarm, switch-selectable)

NRR 2-51: 2 volt-free relay contacts, 8 A 250 V AC / 30 V DC cos $\varphi = 1$.
Off delay 3 seconds (MIN/MAX alarm)
1 analog output 4-20 mA, max. output load 500 ohms (manipulated variable Y).

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

NRR 2-50: 1 analog output 4-20 mA, max. output load 500 ohms, e.g., for an actual value display.

Indicators and controls
1 rotary knob with integrated push-button for testing the MIN/MAX alarm and setting the parameters,
1 4-digit 7-segment LED display, green
2 red LEDs for MIN/MAX alarm,
2 yellow LEDs for control valve opening/closing (NRR 2-50 only)
1 4-pole code switch for configuration.

Terminal box
Terminal box material: base of black polycarbonate, front of gray polycarbonate
Wire size: 1 x AWG12 (4.0 mm^2) solid, or
1 x AWG14 (2.5 mm^2) stranded with sleeve acc. to DIN 46228, or
2 x AWG16 (1.5 mm^2) stranded with sleeve acc. to DIN 46228
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: IP40 according to EN 60529
Terminal strip: IP20 according to EN 60529
As a UL open type, the equipment must be installed in a control cabinet.

Weight
Approx. 0.44 lb (0.2 kg)

Technical data

Other information
Incorporated type 1 action operating control
Pollution degree 2, impulse voltage DC supply = 500 V, AC output = 2500 V

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

Transport temperature
-4 °F … 176 °F (-20 ° … +80 °C) (<100 hours), only switch on after a defrosting period of 24 hours.

Storage temperature
-4 ° … 158 °F (-20 ° … +70 °C), only switch on after a defrosting period of 24 hours.

Relative humidity
Max. 95%, non-condensing

Example rating plate/identification

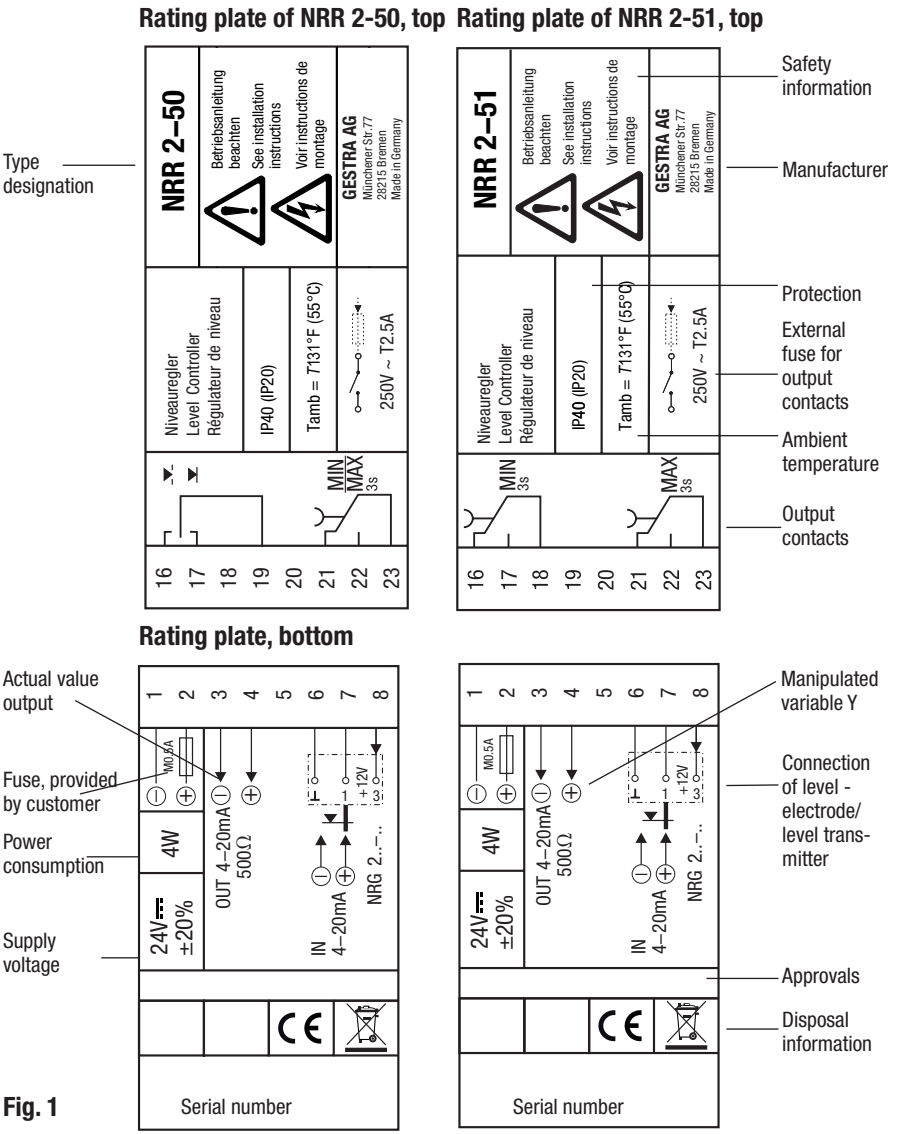


Fig. 1

c UL us OPERATING CONTROL E513189	Input rating: 24VDC, 4W
	Output rating : Pilot duty B300 / R300
	Ambient temperature: 32–131°F (0–55°C)
	Wiring: Use Copper Conductors Only, Use 60/75°C Conductors, Use No.18-16 AWG Wire Size Only, Tightening: Torque 0.79Nm or 7lb in.
	Use with accessory: NRGT 26–2

Fig. 2 NRR 2-50

c UL us OPERATING CONTROL E513189	Input rating: 24VDC, 4W
	Output rating : Pilot duty B300 / R300
	Ambient temperature: 32–131°F (0–55°C)
	Wiring: Use Copper Conductors Only, Use 60/75°C Conductors, Use No.18-16 AWG Wire Size Only, Tightening: Torque 0.79Nm or 7lb in.
	Use with accessory: NRGT 26–2

NRR 2-51

Factory default settings

Level controller NRR 2-50

- Off delay: 3 s (fixed setting)
- Input set as voltage input, please change using code switch S3.
- MAX switchpoint AL.Hi = 80%
- MIN switchpoint AL.Lo = 20%
- Set point SP = 50%
- Proportional band Pb = 20% of set point
- Integral action time ti = 0%
- Dead band = +/– 5% of set point
- Valve travel time tt = 40 s
- Fill control function
- MIN/MAX output contact set as MAX alarm
- Password PW: oFF

Code switch ⓭: S1, S2, S3, S4 OFF

Level controller NRR 2-51

- Off delay: 3 s (fixed setting)
- Input set as voltage input, please change using code switch S3.
- MAX switchpoint AL.Hi = 80%
- MIN switchpoint AL.Lo = 20%
- Set point SP = 50%
- Proportional band Pb = 20% of set point
- Integral action time ti = 0%
- Dead band = +/– 5% of set point
- Fill control function
- Password PW: oFF

Code switch ⓭: S1, S2, S3, S4 OFF

Changing the factory default settings

Danger

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

There is a risk of serious injury due to electric shock.

Always **cut off power** to the equipment before working on the terminal strip (installation, removal connecting cables).

Switching the level transmitter input and changing the function

The input and function are determined by the setting of code switch ⑬.
To make changes, you can access the code switch as follows:

▲ Switch off the supply voltage.

■ **Detach the lower** terminal strip. **Fig. 3**

- ■ Insert a screwdriver between the terminal strip and the front frame, to the right and left of the arrow markings.
- ■ Release the terminal strip on the right and left by turning the screwdriver in the direction of the arrow.
- ■ Detach the terminal strip.

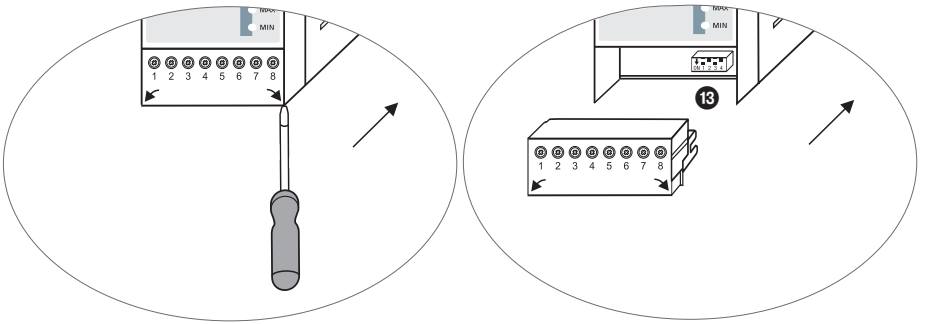


Fig. 3

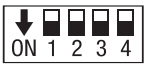
When your changes are complete:

- ■ Insert the terminal strip.
- ■ Switch the supply voltage back on. The equipment restarts

Changing the factory default settings

Switching the level transmitter input and changing the function

If you wish to change the input or the function, set code switch ⓭ switches S1 to S3 in accordance with the table in **Fig. 4**.

Code switch ⓭  White toggle switch			
Level controller NRR 2-50	**S 1**	**S 2**	**S 3**
Output contact set for MAX alarm	OFF		
Output contact set for MIN alarm	ON		
Level controller NRR 2-50, NRR 2-51			
Input for connection of level transmitter NRGT 26-2 *			ON
Fill control		OFF	
Drain control		ON	

gray = factory setting

Fig. 4

Attention

* When connecting the NRGT 26-2 level transmitter, please set the upper and lower bounds of the measuring range **only** on the transmitter. To do this, please pay attention to the NRGT 26-2 Installation & Operating Manual.

Do **not** move switch S4 on code switch ⓭!

Dimensions of the NRR 2-50, NRR 2-51

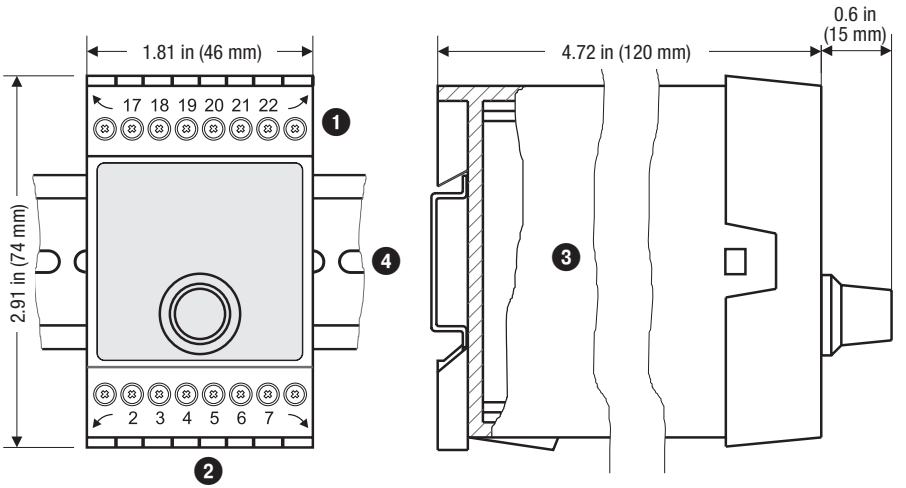


Fig. 5

Key

1. Upper terminal strip
2. Lower terminal strip
3. Terminal box
4. Support rail TH 35, EN 60715

Preparing for installation

If the control cabinet is to be installed outdoors, outside the protection of a building, environmental influences may adversely affect function.

- Pay attention to the admissible ambient conditions in the technical data, see page 13.
- Do not operate the equipment if the temperature is below freezing.
  - At temperatures below freezing, use a suitable heat source (e.g., control cabinet heater, etc.).
- Connect all parts of the plant to a central grounding point to prevent equalizing currents.
- Use UV-resistant cable ducts for routing the connecting cable.
- Take further measures to protect the equipment from lightning, insects and animals, and salty air.

You will need the following tools:

- Screwdriver size 1/8 inch (3.2 mm)

Installation

Installing in the control cabinet

The NRR 2-50, NRR 2-51 level controller is clipped onto a type TH 35, EN 60715 support rail in the control cabinet. **Fig. 5** ❹

In the control cabinet: Electrically connecting the level controller

Wiring diagram of level controller NRR 2-50

NRR 2-50

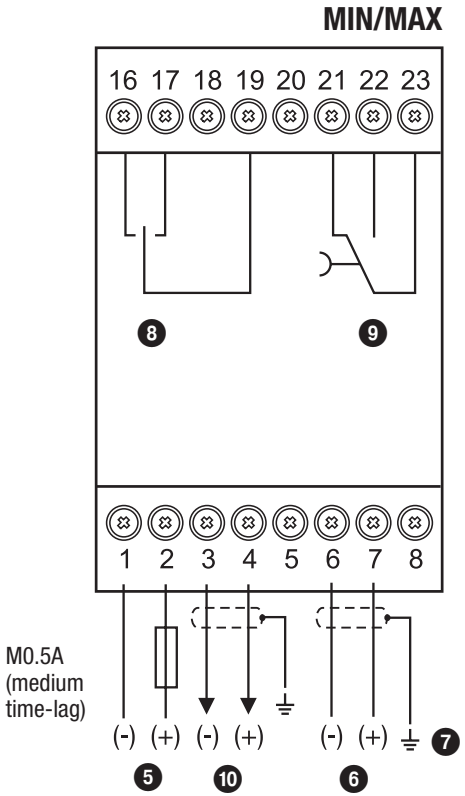


Fig. 6

Key

5 Connection of supply voltage 24 V DC with 0.5A medium time-lag fuse provided by customer

6 Level transmitter NRGT 26-2, 4-20 mA, with grounding point.
Max. 3 NRS/NRR 2-5.. units can be connected (series connection).

7 Central grounding point (CGP) in control cabinet

8 Output contact for control valve actuation

9 MIN/MAX output contact, off delay 3 seconds

10 Actual value output 4-20 mA

In the control cabinet: Electrically connecting the level controller

Wiring diagram of level controller NRR 2-51

NRR 2-51

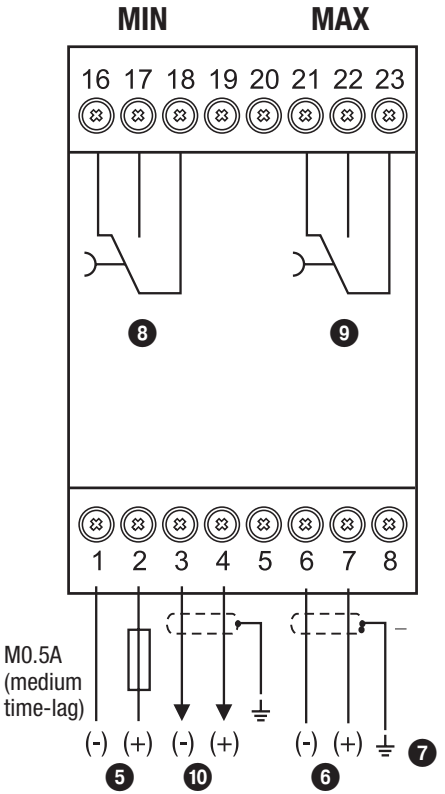


Fig. 7

Key

- ❺ Connection of supply voltage 24 V DC with 0.5A medium time-lag fuse provided by customer
- ❻ Level transmitter NRGT 26-2, 4-20 mA, with grounding point.
  Max. 3 NRS/NRR 2-5.. units can be connected (series connection).
- ❼ Central grounding point (CGP) in control cabinet
- ❽ MIN output contact, off delay 3 seconds
- ❾ MAX output contact, off delay 3 seconds
- ❿ Output 4-20 mA, manipulated variable Y

In the control cabinet: Electrically connecting the level controller

Supply voltage connection

The equipment is supplied with 24 V DC and has an external 0.5A medium time-lag fuse. Please use a safety power supply unit with protective electrical isolation (PELV / CLASS2).

This power supply unit must provide a level of isolation against dangerous contact voltages that at least meets the requirements for double or reinforced insulation in accordance with the following standard: UL 60730-1.

Connecting the output contacts

Connect the upper terminal strip ❶ (terminals 16-23) according to the desired switching functions.
Provide an external 2.5A slow-blow fuse for the output contacts.
When inductive loads are switched off, voltage spikes are produced that may have a major adverse effect on the operation of control and measuring systems. Connected inductive loads must therefore have interference suppression (RC combination) as specified by the manufacturer.

Connecting the level transmitter

Please use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 5G1, to connect the equipment. Max. length 328 ft (100 m).

Max. 3 NRS/NRR 2-5.. switches/controllers can be connected to one level transmitter.

Connect the terminal strip as shown in the wiring diagram. **Fig. 6, 7**
Connect the shield as shown in the wiring diagram.

Route the connecting cable between items of equipment separately from power lines.

Output of manipulated variable Y or connection of actual value output

Please use a shielded, multi-core control cable with minimum wire size AWG20, (0.5 mm^2), e.g., OELFLEX CONTROL TM CY 3G1, for connection. Max. length 328 ft (100 m).

Please note the maximum output load of 500 ohms.

Connect the terminal strip as shown in the wiring diagram. **Fig. 6, 7**
Connect the shield **just once** to the central grounding point (CGP) in the control cabinet.

Route the connecting cable between items of equipment separately from power lines.

Any item of equipment that you wish to connect to the terminals for the output of manipulated variable Y or actual value output 4-20 mA must be certified as having at least double or reinforced insulation according to UL 60730-1 between the current loop and live parts of the equipment that are not supplied with safety extra-low voltage (SELV).

Attention

- Do not use unused terminals as support terminals.

In the plant:
Electrically connecting the level transmitter

Connecting the level transmitter

When used as intended, the NRR 2-50, NRR 2-51 level controller can be combined in a circuit with the NRGT 26-2 level transmitter.

Please use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 5G1, to connect the equipment. Max. length 328 ft (100 m).

Connect the shield as shown in the wiring diagram.

Attention

- Please bring the equipment into service as described in the NRGT 26-2 Installation & Operating Manual.
- Route the connecting cable between items of equipment separately from power lines.
- The level control system must be connected to its own dedicated supply voltage.

Operating the level controller

Meaning of codes on the 7-segment display

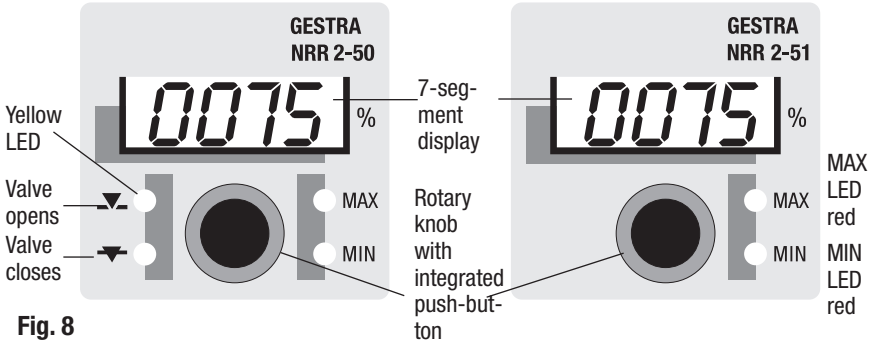


Fig. 8

Code	Meaning		
Indicated when rotary knob is turned clockwise:			
AL.Hi	Alarm High	MAX switchpoint	Adjustable between 0 and 100%
AL.Lo	Alarm Low	MIN switchpoint	
SP	Set point	Set point	
Pb	Proportional band	Adjustable between 0 and 100%	
ti	Time integral	Integral action time, adjustable between 0 and 100 seconds	
tt	Motor travel time	Valve travel time (NRR 2-50 only), adjustable between 10 and 600 seconds	
tESt	Test	Test of output relays	
PW	Password	on = password protection is enabled oFF = password protection is disabled	
	Factory default settings	1902 (cannot be changed)	

Indicated in parameterization mode		
quit	Quit	Entry is not confirmed
done	Done	Entry is confirmed

Indicated in the event of errors		
E.005	Error	Faulty level electrode/transmitter, measuring voltage/current too low
E.006	Error	Faulty level electrode/transmitter, measuring voltage/current too high
E.013	Error	MIN switchpoint higher than MAX switchpoint

Operating the level controller

Setting the measuring range (on the NRGT 26-2)

37 Lower bound of measuring range, adjustable

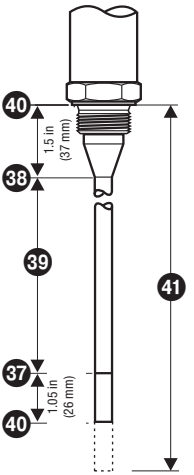
38 Upper bound of measuring range, adjustable

39 Measuring range [mm] = xxx%

40 Inactive ranges

41 Maximum electrode length at 460 °F (238 °C)

Set the lower and upper bounds of the measuring range for your fill level measurement. The result is measuring range 39.
Please convert the measuring range into percent.



Attention

If the NRGT 26-2 level transmitter is connected, please set the upper and lower bounds of the measuring range **only** on the transmitter.

Guide to setting control parameters

Parameter		Control deviation	Control valve
Proportional band **Pb**	Larger	Large remaining deviation	Reacts slowly
	Smaller	Small remaining deviation	Reacts quickly and may open/close continually
	Example	Measuring range 100% = 7.87 in (200 mm) from sight glass Set point SP = 80% of measuring range = 6.3 in (160 mm) Proportional band Pb = +/- 20% of set point = +/- 16% = +/- 1.26 in (32 mm) If the measuring range is 100% [7.87 in (200 mm)] and the set point is 80% (160 mm), the proportional band will be +/- 16% [+/- 1.26 in (32 mm)] or in the range from 5.04 in (128 mm) to 7.56 in (192 mm).	
Integral action time **ti**	Larger	Slow correction of deviations	Reacts slowly
	Smaller	Fast correction of deviations, control loop may tend to overshoot	Reacts quickly

Setting parameters

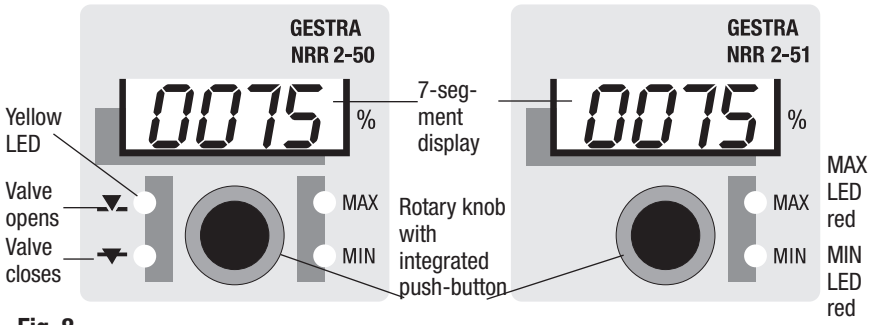


Fig. 8

Starting		
Action	**Indication**	**Function**
Switch on supply voltage. Water level between MIN and MAX.	7-segment display shows software and equipment version	System test, takes approx. 3 s.
	7-segment display shows actual value	System switches to operating mode

Setting parameters		
Action	**7-segment display**	**Function**
Turn rotary knob until desired parameter is shown	Display toggles between parameter and saved value.	The parameter is selected
Press and hold the push-button (on rotary knob)	First digit (000**0**) flashes.	Parameterization mode active. You can change the first digit.
Turn rotary knob	A new value is displayed.	Turning clockwise increases the value, turning counterclockwise reduces the value.
Briefly press push-button	2nd, 3rd or 4th digit flashes (from right to left).	2nd, 3rd or 4th digit can now be changed using the rotary knob. Turning clockwise increases the value, turning counterclockwise reduces the value
When your entries are complete: Press and hold the push-button within 3 s.	done is briefly displayed. Next, the display toggles between the parameter and the new value.	Your entry is confirmed. The system returns to parameter settings.
If you do not confirm your entry within 3 s or you do not make any further entries:	quit is briefly displayed. After this, the display toggles between the parameter and the old value.	If you do not confirm, your entries will not be applied. Please repeat the procedure. If you do not confirm, the system returns to parameter settings.
Turn the rotary knob until the next parameter is shown. Or turn the rotary knob until the actual value is displayed. Or after 30 s, the actual value is displayed automatically.		

If **password protection** is enabled, you must enter the password before changing a parameter. See section on password protection.

Operation, alarm and test

Setting switchpoints and control parameters

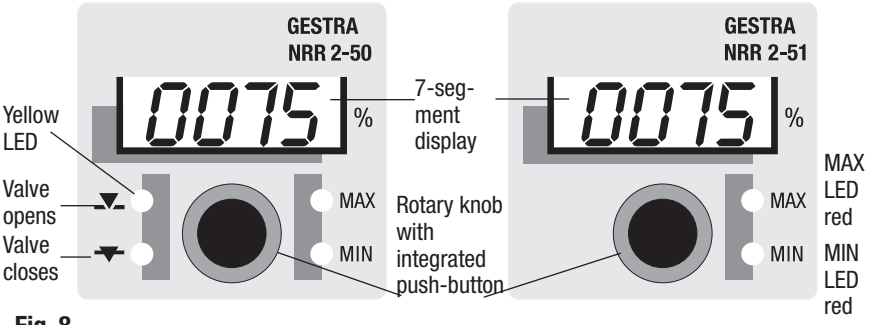


Fig. 8

Setting the MIN/MAX switchpoints	
Select parameter AL.Lo, enter and save the desired percentage.	The MIN switchpoint is set between 0-100%
Select parameter AL.Hi, enter and save the desired percentage.	The MAX switchpoint is set between 0-100%

Setting the set point	
Select parameter SP, enter and save the desired percentage.	The set point is set between 0-100%. Please take MIN/MAX switchpoint settings into consideration.

Setting the proportional band	
Select parameter Pb, enter and save the desired percentage.	The proportional band is set between 0-100%.

Setting the integral action time	
Select parameter ti, enter and save the desired time.	The integral action time is set between 0-100 s.

Setting the valve travel time (NRR 2-50 only)	
Select parameter tt, enter and save the desired time.	The integral action time is set between 10-600 s

Note

- The NRR 2-50 level controller is only equipped with **one** output contact for limit signaling. Therefore, please define its function (MAX or MIN alarm) using code switch ⓭ **Fig. 3, 4.**
- The actual value is shown on the 7-segment display.

Operation, alarm and test

Level controller NRR 2-50 Indications

Operation		
Action	**Indication**	**Function**
Actual value = set point	Valve and MIN/ MAX LEDs are not lit	Valve output contact 16/17/19 open. MIN/ MAX output contacts 21/23 open, 22/23 closed.

Value above or below set point		
Value above or below set point.	Valve OPEN LED flashes yellow	Control valve opens, valve output contact 16/19 closed.
	or	
	Valve CLOSED LED flashes yellow	Control valve closes, valve output contact 17/19 closed.

MAX alarm		
Water level at or above MAX switchpoint.	MAX LED flashes red	Off delay in progress.
	MAX LED lights up red	Off delay elapsed, output contacts 21/23 closed, 22/23 open.
or		
MIN alarm		
Water level at or below MIN switchpoint.	MIN LED flashes red	Off delay in progress.
	MIN LED lights up red	Off delay elapsed, output contacts 21/23 closed, 22/23 open.

Level controller NRR 2-51 Indications

Operation		
Action	**Indication**	**Function**
Actual value = set point	MIN and MAX LEDs are not lit	MIN output contacts 16/18 open, 17/18 closed. MAX output contacts 21/23 open, 22/23 closed.

MIN alarm		
Water level at or below MIN switchpoint.	MIN LED flashes red	Off delay in progress.
	MIN LED lights up red	Delay time elapsed, MIN output contacts 16/18 closed, 17/18 open.

MAX alarm		
Water level at or above MAX switchpoint.	MAX LED flashes red	Off delay in progress.
	MAX LED lights up red	Delay time elapsed, MAX output contacts 21/23 closed, 22/23 open.

Operation, alarm and test

Checking the function of the MIN/MAX output contacts

Test of MIN alarm and MAX alarm		
Action	**Indication**	**Function**
In operating mode: Water level between MIN and MAX Select Test parameter. Press and hold push-button.	MAX LED flashes red	Off delay in progress.
	MAX LED lights up red for 3 seconds	MAX output contact 21/23 closed, 22/23 open.
	MIN and MAX LEDs are not lit for 1 second	MIN output contact 16/18 open, 17/18 closed. MAX output contact 21/23 open, 22/23 closed.
	MIN LED flashes red	Off delay in progress.
	MIN LED lights up red for 3 seconds	MIN output contact 16/18 closed, 17/18 open.
Test complete, release push-button. Equipment switches to operating mode.	Note: If you continue holding the push-button, the test sequence will start again. You can cancel the test sequence at any time by releasing the push-button.	
Turn the rotary knob until the actual value is displayed. Or after 30 s, the actual value is displayed automatically.		

Note

The actual value is shown on the 7-segment display.

Operation, alarm and test

Password protection

The option of password protection for parameters is available as of software version “S-13”. The default password is 1902 and cannot be changed.

Enabling password protection		
Action	**Display**	**Function**
Turn rotary knob until PW is shown.	The display toggles between the parameter name and the parameter value.	Parameter is selected.
Press and hold the push-button (on rotary knob).	PASS	Password entry is required.
Release the push-button, then press and hold it again.	First digit (000**0**) flashes.	Enter the password, starting with the digit on the right.
Turn the rotary knob clockwise or counterclockwise to enter the required digit.	000X	Enter the first digit.
Briefly press the push-button.	The second digit from the right flashes (00**0**X).	You can enter the second digit.
Repeat the last two steps until the password has been entered in full.	The entered password (XXXX) is shown	Enter the password in full.
Press and hold the push-button.	donE	The correct password has been entered. The parameter can be edited.
	FAiL	The wrong password has been entered. The parameter is still password-protected.
	quit	Timeout. The system returns to parameter settings. Password entry is discontinued.
Once disabled, password protection is reactivated after 30 minutes of no activity (i.e., rotary knob is not turned), and the password must be entered again. The parameters are password-protected when the equipment is restarted, if password protection was previously enabled.		

Fault indications and troubleshooting

Indications, diagnosis and corrective action

Attention

Please check the following before fault diagnosis:

Supply voltage:
Is the level switch supplied with the voltage specified on the rating plate?

Wiring:
Does the wiring conform to the wiring diagram?

Error codes on the 7-segment display		
Error code	**Error**	**Corrective action**
E.005	Faulty level transmitter, measuring current < 4 mA	Check level transmitter and replace if necessary. Check electrical connection.
E.006	Faulty level transmitter, measuring current > 20 mA	Check level transmitter and replace if necessary. Check electrical connection.
E.013	MIN switchpoint higher than MAX switchpoint	Reset switchpoints
E.097	Walkthrough application error	Internal error. Replace equipment.
E.098	Walkthrough test error	Internal error. Replace equipment.
E.099	Internal test error	Internal error. Replace equipment.
In the event of a malfunction, the MIN and MAX alarm is triggered.		

Attention

- For further troubleshooting, please refer to the NRGT 26-2 Installation & Operating Manual.

Note

In the event of a level controller malfunction, the MIN and MAX alarm is triggered and the equipment restarts.
If the process repeats itself continuously, the equipment must be replaced.

Further information

Action against high-frequency interference

High-frequency interference can be caused by out-of-phase switching operations. If such interference occurs and results in sporadic failure, we recommend taking the following action to suppress interference:

- Provide inductive loads with RC combinations as specified by the manufacturer.
- Route the connecting cable to the level electrode or level transmitter separately from power lines.
- Increase the distance from sources of interference.
- Check the connection of the shield to the central grounding point (CGP) in the control cabinet.
- Suppress HF interference using hinged-shell ferrite rings.

Taking out of service

Proceed as follows:

- Switch off the supply voltage and **cut off power** to the equipment.
- Detach the upper and lower terminal strips. **Fig. 9**
  - Insert a screwdriver between the terminal strip and the front frame, to the right and left of the arrow markings.
  - Release the terminal strip on the right and left by turning the screwdriver in the direction of the arrow.
  - Detach the terminal strips.
- Release the white slider holder at the bottom of unit and detach the unit from the support rail

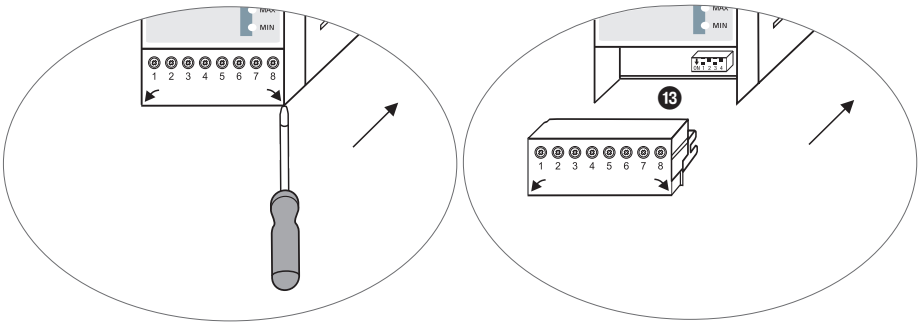


Fig. 9

Disposal

Dispose of the equipment in accordance with statutory waste disposal regulations.

UL components

NRR 2-50 and NRR 2-51 level controllers are registered under XACN.E513189.

Declaration of Conformity
Standards and directives

Please see our Declaration of Conformity and associated certificates for details on the conformity of our equipment and the applicable standards and directives.

You can download the Declaration of Conformity online at www.gestra.com or request certificates from the following address:

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Modifications to the equipment not approved by us will invalidate Declarations of Conformity and certificates.

For your notes

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