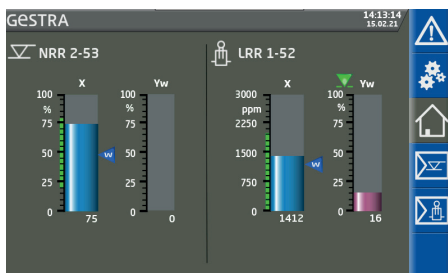
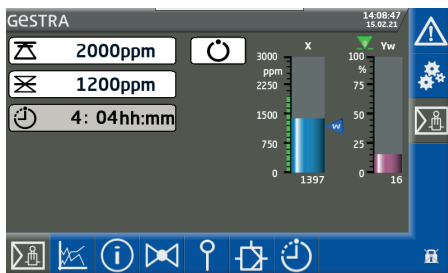


LRR 1-52, LRR 1-53



Home screen with overview of NRR 2-5x and LRR 1-5x



Home screen for LRR 1-5x only

## Directives and standards

### EU Pressure Equipment Directive 2014/68/EU

The conductivity control & monitoring equipment LRG 1-..., LRGT 1-..., LRR 1-5... meets the safety requirements of the EU Pressure Equipment Directive. The conductivity control and monitoring equipment is EC type-approved according to EN 12952/EN 12953. These Directives state, among other things, the requirements for limiting systems and equipment for pressurised steam and hot-water plants.

### VdTÜV Bulletin "Wasserüberwachung 100" (Water Monitoring 100)

The functional unit consisting of the URB 55 visual display and operating unit and LRR 1-52, LRR 1-53 conductivity controller in conjunction with the LRG 1-... conductivity electrode and LRGT 16-1, LRGT 16-2, LRGT 17-1, LRGT 16-3, LRGT 16-4 and LRGT 17-3 conductivity transmitters is type-approved in accordance with VdTÜV Bulletin "Wasserüberwachung 100" (Water Monitoring 100).

Type approval no.: TÜV · WÜL · xx-017  
(see name plate).

The VdTÜV Bulletin "Wasserüberwachung 100" describes the requirements for water monitoring equipment.

### LVD (Low Voltage Directive) and EMC (Electromagnetic Compatibility)

The equipment conforms to the requirements of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU.

### ATEX (Atmosphère Explosible)

The equipment must not be used in potentially explosive atmospheres, in accordance with European Directive 2014/34/EU.

### UL/cUL (CSA) approval

The equipment conforms to standards: UL 508 and CSA C22.2 No. 14-13, Standards for Industrial Control Equipment. File E243189.

## Conductivity Controller

### LRR 1-52, LRR 1-53

### Visual Display and Operating Unit

### URB 55

## Description

The functional unit consisting of the URB 55 visual display and operating unit and LRR 1-52, LRR 1-53 conductivity controller is used in combination with LRG 1-... conductivity electrodes and the LRGT 1-... conductivity transmitter as a conductivity controller and limiter, e.g. in pressurised steam and hot-water plants and in condensate and feedwater tanks. The conductivity controller indicates when MAX or MIN conductivity has been reached, opens or closes a continuous blowdown valve and can actuate an intermittent blowdown valve.

The conductivity controller can be combined in a circuit with conductivity electrodes or transmitters as follows: LRR 1-52 conductivity controller with LRG 12-2, LRG 16-4, LRG 16-9, LRG 17-1 and LRG 19-1 conductivity electrodes; LRR 1-53 conductivity controller with LRGT 16-1, LRGT 16-2, LRGT 16-3, LRGT 16-4, LRGT 17-3 and LRGT 17-1 conductivity transmitters.

If the system contains a level controller and a conductivity controller, they can both be operated with one URB 55.

## Function

The **URB 55 visual display and operating unit** and **LRR 1-52, LRR 1-53 conductivity controller** make up a unit with the following functions:

Conductivity controller	LRR 1-52	LRR 1-53
Conductivity measurement with an LRG 1-... conductivity electrode and separate Pt 100 resistance thermometer (TRG 5-...)	●	
or Conductivity measurement with an LRG 16-9 conductivity electrode with integrated resistance thermometer.		●
Evaluation of the temperature-compensated current signal of a connected LRGT 1x-x conductivity transmitter.		●
3-position stepping controller with proportional-plus-integral control action (PI controller) and control of an electrically actuated continuous blowdown valve.	●	●
MAX alarm when the conductivity limit is exceeded.	●	●
MIN alarm when conductivity drops below the minimum limit. Alternatively, MIN relay for automated intermittent blowdown.	●	●
Indication of the valve position is possible if a potentiometer is connected (in the continuous blowdown valve). The valve position is then indicated on the "URB 55" visual display and operating unit	●	●
Switchable (DIP3*) actual value/manipulated variable output, e.g. for separate indication of the actual value or direct connection to a continuous blowdown valve (manipulated variable output *)	●	●
Volt-free input 24 V DC (standby) for inputting an external command Control OFF / Valve CLOSED / Intermittent blowdown OFF	●	●
Visual display and operating unit	URB 55	
Indication of actual value (bar graph in µS/cm or ppm)	●	
Indication of valve position (bar graph in %)	●	
Setting of the measuring range	●	
Indication/setting of control parameters and values	●	
Trend log	●	
Indication and listing of errors, alarms and warnings	●	
Test of MIN/MAX output relays or actuation of intermittent blowdown valve	●	
Manual/automatic mode	●	
Password protection	●	
Level and conductivity controllers can be operated simultaneously *)	●	

\*) Controller software version 311178.13 or later

## Technical data, LRR 1-5x

### Supply voltage

24 VDC, + / - 20 %

### Fuse

external semi-delay M0.5A

### Power consumption

5 W

### Reset hysteresis

MAX limit: - 3 % of set MAX limit, factory default  
MIN limit: +3% of set MIN limit, (factory default)

### Input/output

Interface for data exchange with the URB 55 visual display and operating unit

# Conductivity Controller

## LRR 1-52, LRR 1-53

### Inputs

1 volt-free input, 24 V DC, for external command Control OFF, Valve CLOSED, Intermittent blowdown OFF (standby).  
1 analogue input for potentiometer 0 - 1000  $\Omega$ , 2-wire connection (indication of valve position)

### Outputs

2 volt-free changeover contacts,  
8 A 250 V AC / 30 V DC  $\cos \varphi = 1$   
(continuous blowdown valve).  
2 volt-free changeover contacts,  
8 A 250 V AC / 30 V DC  $\cos \varphi = 1$ ,  
or  
1 volt-free changeover contact,  
8 A 250 V AC / 30 V DC  $\cos \varphi = 1$ ,  
1 volt-free changeover contact,  
8 A 250 V AC / 30 V DC  $\cos \varphi = 1$   
(intermittent blowdown valve)

Inductive loads must have interference suppression (RC combination) as per the manufacturer's specification.  
1 analogue output 4-20 mA, max. load 500 ohms (actual value)

### Indicators and controls

1 multicolour LED (start-up = amber, power ON = green, communication failure = red)  
1 4-pole code switch for configuration.

### Housing

Housing material, base: black polycarbonate; front: grey polycarbonate, grey  
Conductor size: 1 x 4.0 mm<sup>2</sup> solid per wire, or  
1 x 2.5 mm<sup>2</sup> per stranded wire with sleeve to DIN 46228 or  
2 x 1.5 mm<sup>2</sup> per stranded wire with sleeve to DIN 46228 (min.  $\varnothing$  0.1 mm)  
Terminal strips can be removed separately  
Housing attachment: Mounting clip on support rail TH 35, EN 60715

### Electrical safety

Pollution degree 2 for installation in control cabinet with protection rating IP 54, fully insulated

### IP rating

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

### Weight

Approx. 0.5 kg

### Ambient temperature

when system is switched on 0 ... 55 °C  
in operation -10 ... 55 °C

### Transport temperature

-20 ... +80 °C (< 100 hours), only switch on after a defrosting period of 24 hours.

### Storage temperature

-20 ... +70 °C, only switch on after a defrosting period of 24 hours.

### Relative humidity

max. 95%, non-condensing

### LRR 1-52 conductivity controller only

#### Connecting a conductivity electrode

1 input for LRG 1... conductivity electrode (cell constant 1 cm-1), 3-pole with shield, or  
1 input for LRG 16-9 conductivity electrode (cell constant 0.5 cm-1), with integrated resistance thermometer Pt 100, 5-pole with shield.

#### Measuring voltage

0.8 V<sub>ss</sub>, pulse duty factor tv=0.5, frequency 20-10000 Hz.

#### Measuring range

1 to 10000  $\mu$ S/cm at 25 °C or 1 to 5000 ppm at 25 °C.

## Dimensions

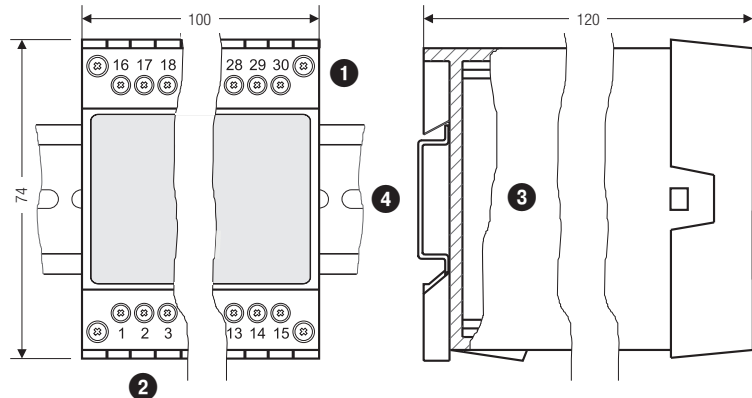


Fig. 1 LRR 1-52, LRR 1-53

## Electrical connection, LRR 1-52

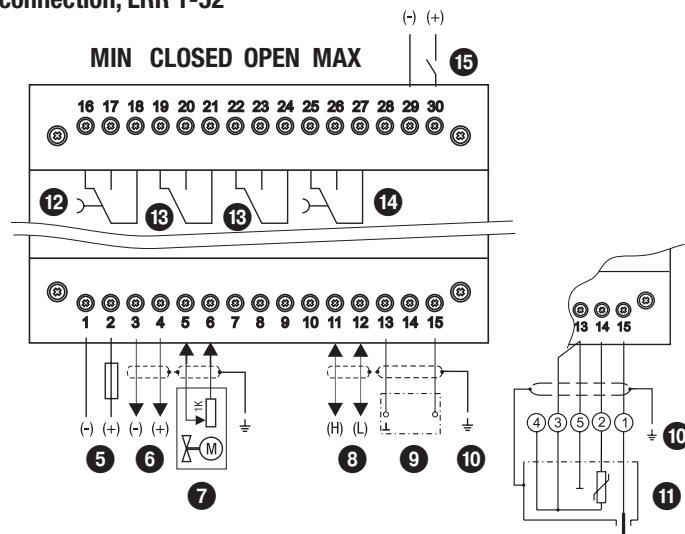


Fig. 2

## Electrical connection, LRR 1-53

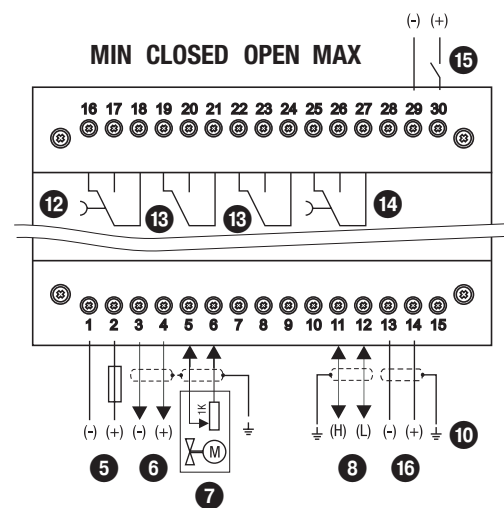


Fig. 3

## Key

- 1 Upper terminal strip
- 2 Lower terminal strip
- 3 Housing
- 4 Support rail TH 35, EN 60715
- 5 Connection of supply voltage 24 V DC with M0.5A semi-delay fuse provided by customer
- 6 Actual value output 4-20 mA
- 7 Indication of valve position, potentiometer 0 - 1000  $\Omega$
- 8 Data line for URB 55 visual display and operating unit
- 9 LRG 1... conductivity electrode
- 10 Central earthing point (CEP) in control cabinet
- 11 LRG 16-9 conductivity electrode with integrated resistance thermometer
- 12 MIN output contact or actuation of intermittent blowdown valve
- 13 Output contact for actuation of continuous blowdown valve
- 14 MAX output contact
- 15 Standby input, 24 VDC, for external command Control OFF, Valve CLOSED, Intermittent blowdown OFF
- 16 LRG 1... conductivity transmitter, 4-20 mA, with earthing point

# Conductivity Controller LRR 1-52, LRR 1-53

## Technical data

### LRR 1-53 conductivity controller only

#### Connection of conductivity transmitter

1 analogue input 4-20 mA, e.g. for LRGT 1-... conductivity transmitter, 2-pole with shield.

#### Beginning of measuring range SinL

0.0 - 0.5 - 100.0 µS/cm, adjustable.

#### End of measuring range SinH

20.0 - 100.0 - 200.0 - 500.0 - 1000.0 - 2000.0 - 3000.0 - 5000.0 - 6000.0 - 7000.0 - 10000.0 µS/cm, adjustable.

## Visual Display and Operating Unit URB 55

## Technical data

### Supply voltage

24 VDC +/- 20%

### Fuse

Internal, automatic

### Power consumption

Max. 14.4 W

### Input/output

Interface for data exchange.

### User interface

5" touch panel 800x480px with LED illumination

### Dimensions

Front panel 147 x 107 mm

Switch panel cut-out 136 x 96 mm

Depth 52 + 8 mm

### Electrical connection

1 3-pole connector,  
1 9-pole D-sub connector.

### IP rating

Front: IP 66 to EN 60529

Back: IP 20 to EN 60529

### Weight

Approx. 1.0 kg

### Service temperature

0 ° ... 60 °C

### Transport temperature

-20 ... +80 °C (< 100 hours), only switch on after a defrosting period of 24 hours.

### Storage temperature

-20 ... +70 °C, only switch on after a defrosting period of 24 hours.

### Relative humidity

5-85 %, non-condensing

## Key

**19** Cut-out in control cabinet door 136 x 96 mm

**20** 9-pole D-sub connector for data line

**21** 3-pole connector for supply voltage **24 V DC**

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

**CEP** Central earthing point (CEP) in control cabinet

Please note our general terms of business.

## Dimensions

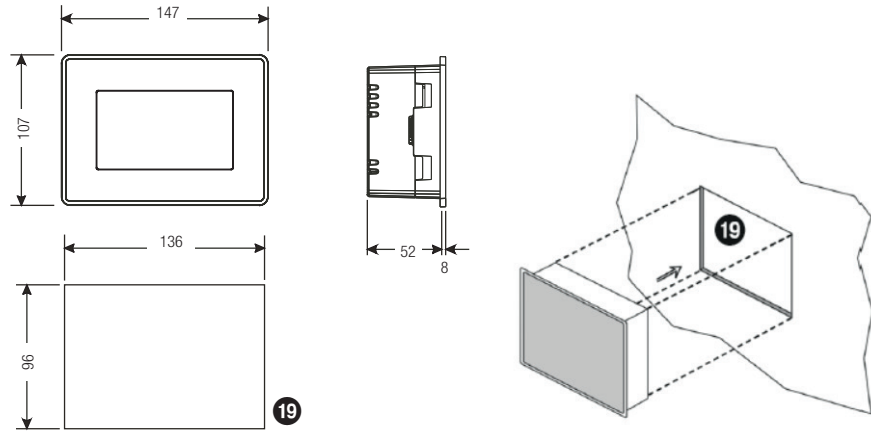
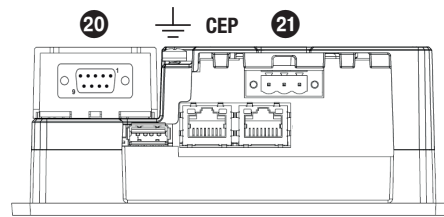


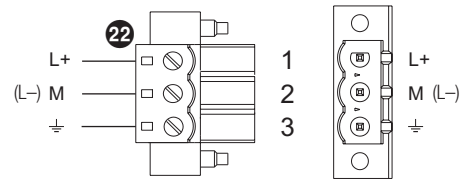
Fig. 4

## Electrical connection, URB 55

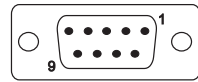
### Back of unit, location of connectors



### Supply voltage connection



### Pin assignment of data line for LRR 1-52, LRR 1-53 - URB 55



PIN 2	Data_L
PIN 7	Data_H

Fig. 5

## How to order and specify, LRR 1-5x

### Conductivity controller type LRR 1-52

GESTRA SPECTOR<sub>module</sub> – Touch

Continuous conductivity controller with MIN and MAX alarm

Input: 1 input for conductivity electrode

1 input for PT 100 sensor

Output: 1 switchable actual value/manipulated variable 4-20mA

2 volt-free changeover contacts for MIN/MAX alarm

2 volt-free changeover contacts for valve actuation incl.

1 separate URB 55 operating unit with touch panel

Supply voltage: 24 V DC, 14.4 W

### Conductivity controller type LRR 1-53

GESTRA SPECTOR<sub>module</sub> – Touch

Continuous conductivity controller with MIN and MAX alarm

Input: 1 input for LRGT conductivity transmitter (4-20 mA)

Output: 1 switchable actual value/manipulated variable 4-20mA

2 volt-free changeover contacts for MIN/MAX alarm

2 volt-free changeover contacts for valve actuation incl.

1 separate URB 55 operating unit with touch panel

Supply voltage: 24 V DC, 14.4 W

## Important notes

The LRR 1-52, LRR 1-53 conductivity controller is clipped onto a support rail in the control cabinet. The URB 55 visual display and operating unit is inserted into a cut-out in the control cabinet door.

The conductivity controller and operating unit are both supplied with 24 V DC and the fuses are internal (URB) and external semi-delay (LRR 1-5..., MO.5A).

To prevent the contacts from welding together, protect the output contacts with an external slow-blow T2.5A or T1A fuse (TRD 604, 72 hours of operation).

Switching off inductive loads produces surges that can severely impair the function of control systems. Connected inductive loads must therefore have interference suppression (RC combination) as per the manufacturer's specifications.

To connect the LRG 12-1, LRG 16-4, LRG 17-1 or LRG 19-1 conductivity electrode, please use a shielded, multi-core control cable with a minimum conductor size of 0.5 mm<sup>2</sup>, e.g. LiYCY 3 x 0.5 mm<sup>2</sup>.

To connect the LRG 16-9 conductivity electrode, a pre-wired control cable in various lengths is available as an accessory.

If you are not using the pre-wired control cable, use a 5-core shielded control cable as a connecting cable, e.g. LiYCY 5 x 0.5 mm<sup>2</sup>. In addition, connect a shielded socket to the control cable at the electrode end.

**The max. cable length between the conductivity electrode and controller is 30 m, or max. 10 m with a conductivity of 1-10 µS/cm.**

Route connecting cables between items of equipment separately from power lines.

If used as a conductivity limiter, the LRR 1-52, LRR 1-53 conductivity controller does not interlock automatically when the MAX limit is exceeded.

If the installation requires a lockout function, this must be implemented in the downstream (safety) circuit. This circuit must conform to the requirements of EN 50156.

# GESTRA AG

Münchener Straße 77, 28215 Bremen, Germany  
Tel. +49 421 3503-0, Fax +49 421 3503-393  
e-mail info@de.gestra.com, Web www.gestra.com

