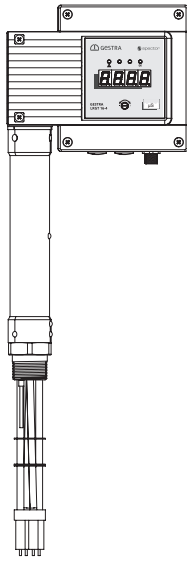
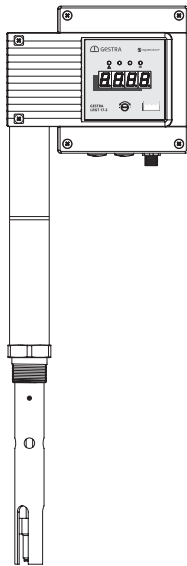


LRGT 16-3



LRGT 16-4



LRGT 17-3

Conductivity Transmitter

LRGT 16-3 LRGT 16-4 LRGT 17-3

Description

LRGT 16-3, LRGT 16-4 and LRGT 17-3 conductivity transmitters can be used as conductivity limiters and blow-down controllers to continually measure conductivity in steam boilers and hot water installations. They present a linear profile of conductivity in the parameterized measuring range via a 4 - 20 mA current output.

Function

Transmitter function

The transmitter function is the ability of the electrode to provide a scalable measuring range on the 4 - 20 mA current output interface, and to make this available to one or more recipients for analysis.

This equipment does not have any controlling or limiting functions.

Measuring process of the LRGT 16-3 and LRGT 17-3

LRGT 16-3 and LRGT 17-3 conductivity transmitters use the conductometric two-electrode measuring process. A measuring current with a suitable frequency for the measuring range is introduced into the fluid. This produces a potential gradient between the electrode and the measuring tube, which is analyzed as a measuring voltage.

Measuring process of the LRGT 16-4

The LRGT 16-4 conductivity transmitter uses the conductometric four-electrode measuring process. It consists of two current and two voltage electrodes. The current electrodes introduce a measuring current with a fixed frequency into the fluid. This gives rise to a potential gradient between these electrodes. This potential gradient is then picked up by the voltage electrodes and analyzed as measuring voltage.

Temperature compensation of readings based on a reference temperature (77 °F (25 °C))

The electrical conductivity changes as a function of the temperature. In order to base the readings on a reference temperature, an integrated resistance thermometer measures the temperature of the fluid. The electrical conductivity is calculated from the measuring current and measuring voltage, and then based on the reference temperature of 77 °F (25 °C) through temperature compensation.

Compensation process

Based on a set temperature coefficient, the conductivity reading is corrected to form a linear characteristic. The coefficient (default 2.1% per °C) is normally used for steam generating units with constant pressure.

Automatic self-test

An automatic self-test periodically monitors the safety and function of the conductivity transmitters and measured value acquisition. Faults in the electrical connection or electronic measuring equipment trigger an error code on the display, and the current output is set to 0 mA.

Behavior in the event of malfunctions

The error state or malfunction is shown by an error code, e.g., E.005, on the display.

Every malfunction produces 0 mA at the current output.

Technical data

Design and mechanical connection

- LRGT 16-3, LRGT 16-4, LRGT 17-3:
Thread 1" - 11.5 NPT

Admissible service pressure and temperature

- LRGT 16-3: 464 psi at 460 °F (32 bar at 238 °C)
- LRGT 16-4: 464 psi at 460 °F (32 bar at 238 °C)
- LRGT 17-3: 870 psi at 527 °F (60 bar at 275 °C)

Materials

- Terminal box: 3.2581 G AISI12, powder-coated
- Cover tube: 1.4301 X5 CrNi 18-10
- Measuring electrodes: 1.4571 X6CrNiMoTi17-12-2
- Electrode insulation: PTFE
- Screw-in body: 1.4404 / F316L
 - ◆ Measuring tube/screw of LRGT 16-3 and LRGT 17-3: 1.4571, X6CrNiMoTi17-12-2
 - ◆ Spacer of LRGT 16-3, LRGT 16-4 and LRGT 17-3: PEEK

Available electrode lengths (cannot be cut)

- LRGT 16-3, LRGT 17-3:
7.87/11.81/15.75/19.69/23.62/31.49/39.37 in
(200, 300, 400, 500, 600, 800, 1000 mm)
- LRGT 16-4:
7.08/11.81/14.36/19.59/23.62/31.49/39.37 in
(180, 300, 380, 500, 600, 800, 1000 mm)

Temperature sensor

- Resistance thermometer: Pt1000
- Measuring range for fluid temperature:
0 to 536 °F (0 to 280 °C)

Conductivity range at 77 °F (25 °C)

- LRGT 16-3, LRGT 17-3:
0.5 µS/cm to 6000 µS/cm, 0.25 - 3000 ppm *
 - ◆ Preferred measuring range up to 1000 µS/cm
 - LRGT 16-4:
50 µS/cm to 10,000 µS/cm, 25 - 5000 ppm *
 - ◆ Preferred measuring range from 500 µS/cm
- * Formula for converting µS/cm to ppm (parts per million): 1 µS/cm = 0.5 ppm

Measuring cycle

- 1 second

Temperature compensation

- The temperature compensation process is linear and set via parameter tC.

Supply voltage

- 24 V DC +/-20% SELV / PELV / CLASS2

Conductivity Transmitter

LRGT 16-3

LRGT 16-4

LRGT 17-3

Power consumption

- Max. 7 W

Current input

- Max. 0.35 A

Internal fuse

- T2A (slow blow)

Safety cutout at excessive ambient temperature

- The cutout takes place at an excessive ambient temperature of $T_{amb.} = 167\text{ °F}$ (75 °C)

Electrode voltage

- < 500 mV (RMS) at no load

Analog output

- 1 x actual value output 4 - 20 mA
- Maximum output load 500 Ω
- M12 connector, 5-pole, A-coded

Indicators and controls

- 1 x green 4-digit 7-segment display for showing readings and status information
- 1 x red LED for indicating the error state
- 3 x green LEDs for indicating the unit $\mu\text{S/cm}$ or ppm and OK status
- 1 x rotary knob IP65 with button for menu navigation and test function

Protection class

- III Safety Extra Low Voltage (SELV / PELV / CLASS2)

Protection

- NEMA type 3R, 3RX and 5
- IP65 according to EN 60529

Admissible ambient conditions

- Service temperature: $32\text{ °F} - 158\text{ °F}$ ($0\text{ °C} - 70\text{ °C}$)
- Storage temperature: $-40\text{ °F} - 176\text{ °F}$ ($-40\text{ °C} - 80\text{ °C}$)
- Transport temperature: $-40\text{ °F} - 176\text{ °F}$ ($-40\text{ °C} - 80\text{ °C}$)
- Air humidity: 10% - 95% (non-condensing)

Weight

- LRGT 16-3, LRGT 16-4, LRGT 17-3: Approx. 4.63 lb (2.1 kg)

Applicable directives:

LRGT 16-3, LRGT 16-4 and LRGT 17-3 conductivity electrodes have been tested and approved for use in the scope governed by the following directives and standards:

Standards:

- UL 60730-1 and CAN/CSA E60730-1
General Requirements for Automatic Electrical Controls

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.

Please note our general terms of business.

Important notes

Installation

■ LRGT 16-3, LRGT 17-3

Leave a distance of approx. 1.18 in (30 mm) between the lower end of the measuring tube and the boiler wall, the smoke tubes, any other metallic fittings, and the low water level (LW).

■ LRGT 16-4

Leave a distance of approx. 2.36 in (60 mm) between the lower end of the measuring electrodes and the boiler wall, the smoke tubes, any other metallic fittings, and the low water level (LW).

- Do **not shorten** the measuring electrode or measuring tube.

Electrical connection

Use a shielded, multi-core TC-ER control cable with minimum wire size AWG 18, e.g., ÖLFLEX CONTROL TM CY 5G1.

Pre-wired control cables (with plug and coupling) are available as accessories in various lengths.

The LRGT 16-3, LRGT 16-4 and LRGT 17-3 conductivity transmitter is supplied with 24 V DC.

A safety power supply unit that delivers a Safety Extra Low Voltage (SELV/PELV/CLASS2) and is isolated from connected loads must be used to supply the equipment with 24 V DC.

Connecting the actual value output (4 - 20 mA)

Please note the maximum output load of 500 Ω

Maximum cable length = 328 feet (100 m)

Cable jack Binder series 713 99-0436-58-05

How to order/specify:

GESTRA conductivity transmitter LRGT 16-3

Connection 1" - 11.5 NPT

2-electrode measuring system

Measuring range: 0.25 to 3000 ppm (0.5 to 6000 $\mu\text{S/cm}$)

Actual value output: 4 - 20 mA

Measuring length and installed length.....[inch (mm)]*

GESTRA conductivity transmitter LRGT 17-3

Connection 1" - 11.5 NPT

2-electrode measuring system

Measuring range: 0.25 to 3000 ppm (0.5 to 6000 $\mu\text{S/cm}$)

Actual value output: 4 - 20 mA

Measuring length and installed length.....[inch (mm)]*

GESTRA conductivity transmitter LRGT 16-4

Connection 1" - 11.5 NPT

4-electrode measuring system

Measuring range: 25 to 5000 ppm (50 to 10,000 $\mu\text{S/cm}$)

Actual value output: 4 - 20 mA

Measuring length and installed length.....[inch (mm)]*

* see Fig. 1

Type:

- LRGT 16-3

- LRGT 16-4

- LRGT 17-3

Order solely via material number

Electrode length X (mm)	xx
7.08 in (180 mm)	43
11.81 in (200 mm)	43
14.36 in (300 mm)	44
19.59 in (380 mm)	45
23.62 in (400 mm)	45
31.49 in (500 mm)	46
39.37 in (600 mm)	47
31.5 in (800 mm)	48
39.37 in (1000 mm)	50

Fig. 1

Additional modules:

- Conductivity controller: LRR 1-51 or LRR 1-53 with URB 55

- Power supply unit: SITOP PSU100C 24 V/0.6 A

Dimensions (LRGT 16-3 is the example here)

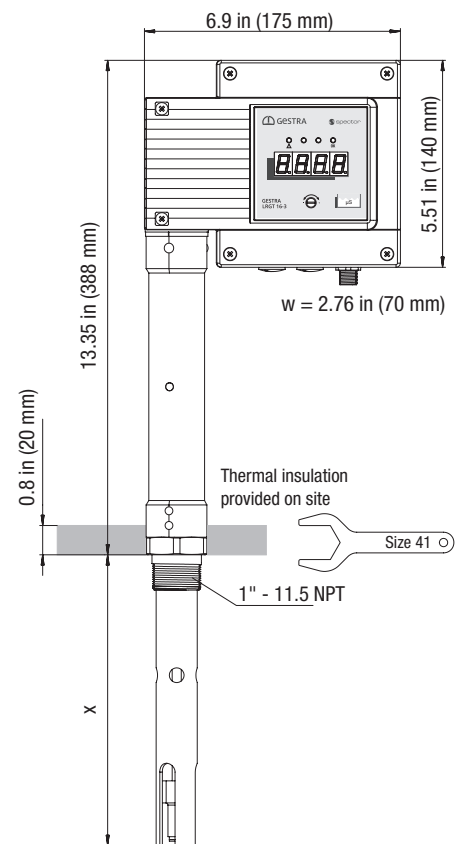


Fig. 2

Connections

- M12 connector, 5-pole, A-coded

GESTRA AG

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

