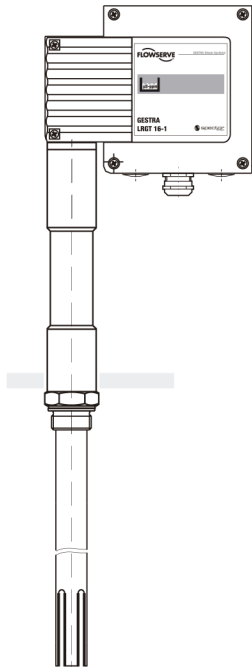
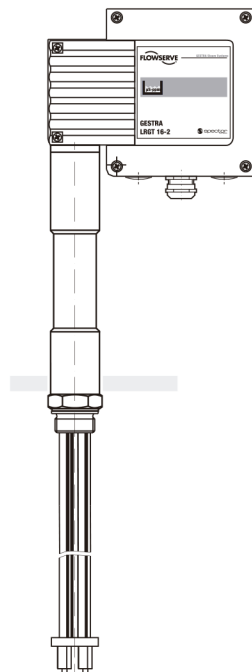


## Electrodo de Conductividad Salida 4-20 MA LRGT16-2



LRGT 16-1, LRGT 17-1



LRGT 16-2



### Conductivity Monitoring

#### LRGT 16-1 LRGT 16-2 LRGT 17-1

##### Description

The compact-design conductivity transmitter LRGT 16-1, LRGT 16-2, LRGT 17-1 consists of a conductivity electrode, a temperature sensor for detecting the fluid temperature and a conductivity transmitter unit incorporated in the terminal box.

The conductivity transmitters LRGT 16-1 and LRGT 17-1 work according to the conductometric measuring method using two measuring electrodes and the conductivity transmitter LRGT 16-2 works according to the conductometric measuring method using four measuring electrodes. The equipment measures the electrical conductivity of electrically conductive fluids (TDS = Total Dissolved Solids content) and provides a 4 – 20 mA measuring current as a function of the detected conductivity value.

The conductivity transmitters are designed for use with the industrial controller KS 90-1 for conductivity limiting and continuous boiler blowdown in steam boilers or for conductivity monitoring in condensate and feedwater systems.

The conductivity transmitters LRGT 16-1, LRGT 17-1 are mainly used in steam boilers operating with low TDS content, e.g. steam regenerators, high-pressure boilers or condensate tanks.

The conductivity transmitter LRGT 16-1 is also approved for feedwater monitoring on ships.

The conductivity transmitter LRGT 16-2 is mainly used in industrial boiler plants operating with pressures up to PN 40 and max. admissible conductivities acc. to TRD/EN of 8000/6000  $\mu\text{S}/\text{cm}$ .

##### Function

###### LRGT 16-1, LRGT 17-1

A measuring current of variable frequency passes through the fluid, creating a potential gradient between the measuring electrode and the reference tube which is then used as measuring voltage  $U_U$ .

###### LRGT 16-2

The conductivity electrode consists of two current and two voltage electrodes. The current electrodes direct the measuring current  $I_U$  with a fixed frequency into the fluid, thereby creating a potential gradient between these electrodes. This potential difference is then picked up by the voltage electrodes and evaluated as measuring voltage  $U_U$ .

###### LRGT 16-1, LRGT 17-1 and LRGT 16-2

The electrical conductivity is a function of temperature. A resistance thermometer integrated in the electrode measures the fluid temperatures in order to relate the measured values to the reference temperature.

The electrical conductivity is calculated from the measuring voltages  $U_U$  and  $U_T$  and – as a function of the adjusted temperature coefficient  $T_k$  – linearly based on the reference temperature of 25 °C. Once converted into a conductivity-dependent current signal, an output current of 4 – 20 mA is available for external use.

The cables leading to the measuring electrode, the reference tube and the resistance thermometer are monitored and checked for interruptions and short circuits. In addition, the circuit board is protected against excess temperatures in the terminal box. In the event of a malfunction, the LEDs will light up or flash and the current signal is set to 0 or 0.5 mA. As a consequence, the controller KS 90-1 will signal sensor break.

##### Function – continued –

The code switch enables the parameterisation of the transmitter, the adaptation of the cell constant and the activation of a performance test. The electrical conductivity is measured in  $\mu\text{S}/\text{cm}$ . In some countries ppm (parts per million) is used instead.  $1\mu\text{S}/\text{cm} = 0.5\text{ ppm}$ .

##### Technical data

###### Type approval no.

TÜV . WÜL . xx-003  
GL 33254-06 HH

###### Service pressure

LRGT 16-1, LRGT 16-2: 32 bar at 238 °C  
LRGT 17-1: 60 barg at 275 °C

###### End connection

Screwed 1", ISO 228-1

###### Materials

Electrode screw-in body: 1.4571, X6CrNiMoTi 17-12-2  
Measuring electrode(s): 1.4571, X6CrNiMoTi 17-12-2  
Electrode insulation: PTFE  
Terminal box: 3.2161 G AISI8Cu3  
LRGT 16-1, LRGT 17-1: measuring tube/screw: 1.4571, X6CrNiMoTi 17-12-2  
LRGT 16-1, LRGT 16-2: Spacer disks PEEK  
LRGT 17-1: Spacer disks PEEK HT

###### Measuring length and length of installation

LRGT 16-1, LRGT 17-1:  
200, 300, 400, 500, 600, 800, 1000 mm  
(max. 400 mm for marine applications)  
LRGT 16-2: 180, 300, 380, 500, 600, 800, 1000 mm

###### Adjustable measuring ranges \*) ( $\mu\text{S}/\text{cm}$ at 25 °C)

LRGT 16-1, LRGT 17-1	LRGT 16-2
0.5 to 20	100 to 3000
0.5 to 100	100 to 5000
0.5 to 200	100 to 7000
0.5 to 500	100 to 10000
<b>Preferred measuring ranges</b>	
0.5 to 1000	
0.5 to 2000	
0.5 to 6000	
0.5 to 12000	
*) Conversion $\mu\text{S}/\text{cm}$ in ppm (parts per million): $1\mu\text{S}/\text{cm} = 0.5\text{ ppm}$	

###### Temperature sensor

Resistance thermometer Pt 1000

###### Cycle of measurement

1 sec.

###### Temperature compensation

Linear,  $T_k$  adjustable via code switch

n 0 % per °C,  
n 1.6 – 3.0 % per °C in steps of 0.1.

###### Time constant T

(measured according to two-bath process)  
Temperature: 9 sec., conductivity: 14 sec.

###### Indicators and adjustors

Two LEDs for status messages  
One 10-pole code switch for setting:

n measuring range  
n temperature coefficient  
n cell constant  
n functional test

P. T. O.

## Conductivity Monitoring

### LRGT 16-1 LRGT 16-2 LRGT 17-1

#### Technical Data – continued –

**Supply voltage**  
24 V DC (18-36 V DC)

**Power consumption**  
4.5 W

**Fuse**  
Electronic thermal fuse Tmax = 85 °C, hysteresis – 2 K

**Cable entry**  
EMC cable gland with integrated cable clamp, M 20 x 1.5 5-pole screw-type terminal strip, detachable, conductor size 1,5 mm<sup>2</sup>

**Protection**  
IP 65 to DIN EN 60529

**Admissible ambient temperature**  
Max. 70 °C

**Storage and transport temperature**  
–40 up to +80 °C

**Weight**  
Approx. 2.5 kg

#### Important Notes

To supply the conductivity transmitter with 24 V DC, a safety power supply unit (PSU), e.g. Siemens SITOP power 05, must be used; this must provide a level of isolation against voltages that at least meets the requirements for double or reinforced insulation as per DIN EN 50178 or DIN EN 61010-1 or DIN EN 60730-1 or DIN EN 60950 (electrically protective separation). The PSU must be equipped with a protective device to DIN EN 61010-1.

Cable required for wiring: Flexible, screened control cable, min. conductor size 0.75 mm<sup>2</sup>, max. cable length: 250 m.

#### Order & Enquiry Specification

GESTRA Conductivity Transmitter LRGT 16-1  
PN 40, screwed 1"  
Two-electrodes measuring system  
Measuring length / length of installation .....mm

GESTRA Conductivity Transmitter LRGT 17-1  
PN 63, screwed 1"  
Two-electrodes measuring system  
Measuring length / length of installation .....mm

GESTRA Conductivity Transmitter LRGT 16-2  
PN 40, screwed 1"  
Four-electrodes measuring system  
Measuring length / length of installation .....mm

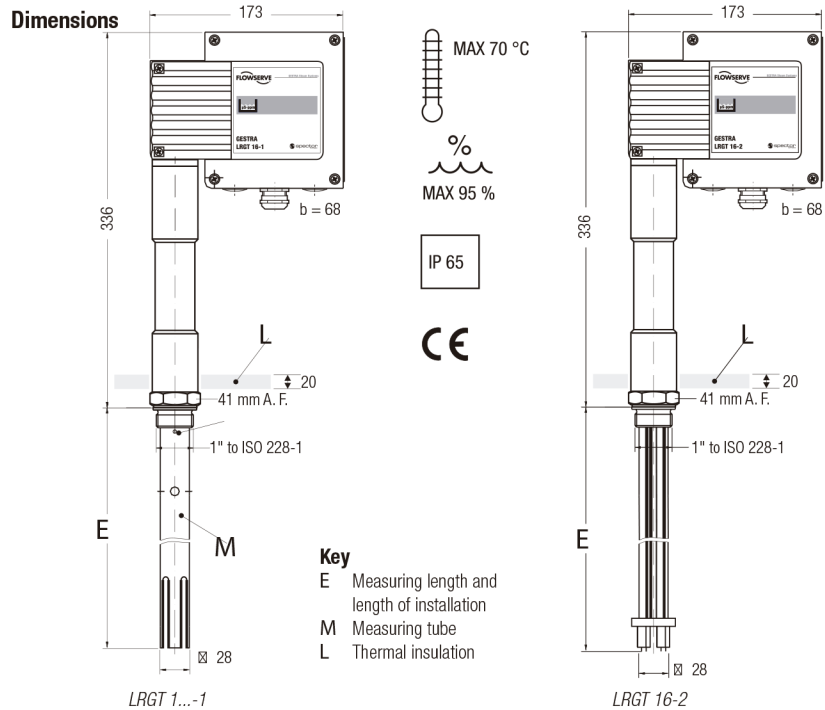
#### Associated Controller and PSU

n GESTRA control unit KS 90-1  
n Power supply unit SITOP power 05

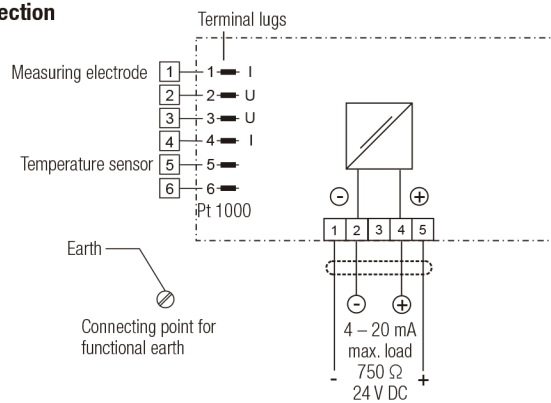
#### ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must not be used in potentially explosive areas.

Supply in accordance with our general terms of business.



#### Electrical Connection



#### Example of Installation LRGT 16-1, LRGT 16-2, LRGT 17-1 used for continuous blowdown control

