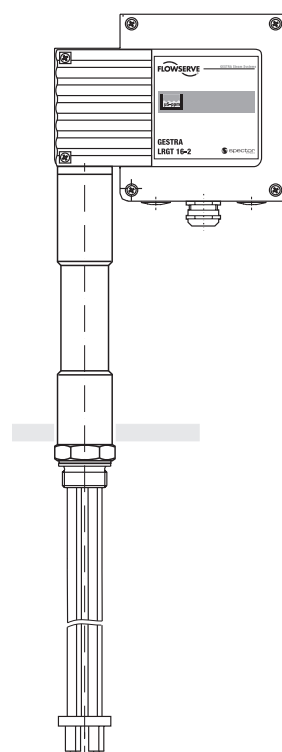


LRG T 16-1, LRG T 17-1



LRG T 16-2



Conductivity Monitoring

LRG T 16-1

LRG T 16-2

LRG T 17-1

Description

The compact-design conductivity transmitter LRG T 16-1, LRG T 16-2, LRG T 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 LRG T 16-1 and LRG T 17-1 work according to the conductometric measuring method using two measuring electrodes and the conductivity transmitter LRG T 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 LRG T 16-1, LRG T 17-1 are mainly used in steam boilers with low TDS content, e.g. steam regenerators, high-pressure boilers or condensate tanks.

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

The conductivity transmitter LRG T 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

LRG T 16-1, LRG T 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_J .

LRG T 16-2

The conductivity electrode consists of two current and two voltage electrodes. The current electrodes direct the measuring current I_J 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_J .

LRG T 16-1, LRG T 17-1 and LRG T 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_J 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 ppm.

Technical data

Type approval no.

TÜV . WÜL . xx-003

GL 33254-06 HH

Service pressure

LRG T 16-1, LRG T 16-2: 32 bar at 238 °C

LRG T 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

LRG T 16-1, LRG T 17-1: measuring tube/screw: 1.4571,

X6CrNiMoTi 17-12-2

LRG T 16-1, LRG T 16-2: Spacer disks PEEK

LRG T 17-1: Spacer disks PEEK HT

Measuring length and length of installation

LRG T 16-1, LRG T 17-1:

200, 300, 400, 500, 600, 800, 1000 mm

(max. 400 mm for marine applications)

LRG T 16-2: 180, 300, 380, 500, 600, 800, 1000 mm

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

LRG T 16-1, LRG T 17-1	LRG T 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
Preferred measuring ranges	
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 ppm

Temperature sensor

Resistance thermometer Pt 1000

Cycle of measurement

1 sec.

Temperature compensation

Linear, T_k adjustable via code switch

■ 0 % per °C,

■ 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:

■ measuring range

■ temperature coefficient

■ cell constant

■ functional test

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 $T_{max} = 85\text{ }^{\circ}\text{C}$, 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 mm²

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 mm², 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 installationmm

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

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

Associated Controller and PSU

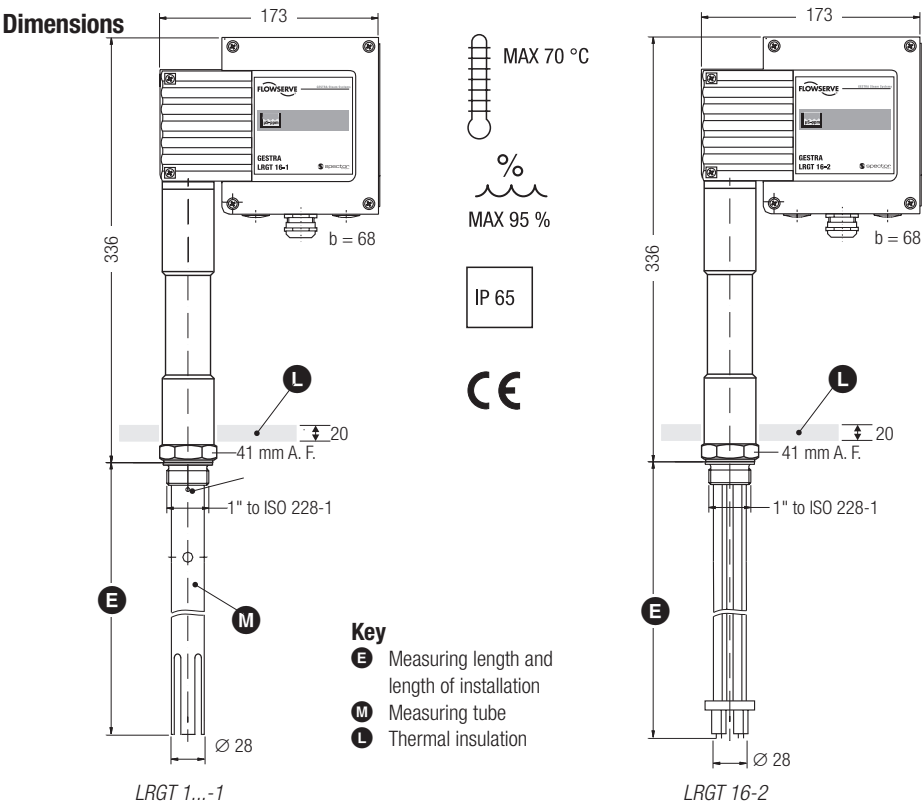
- GESTRA control unit KS 90-1
- Power supply unit SITOP power 05

ATEX (Atmosphère Explosible)

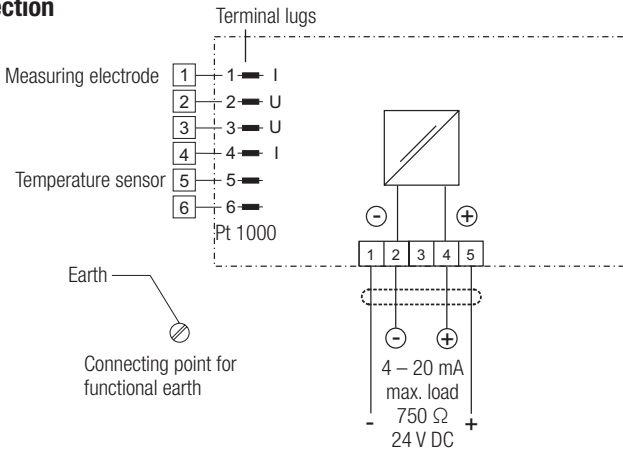
According to the European Directive 94/9/EC the equipment must not be used in potentially explosive areas.

Supply in accordance with our general terms of business.

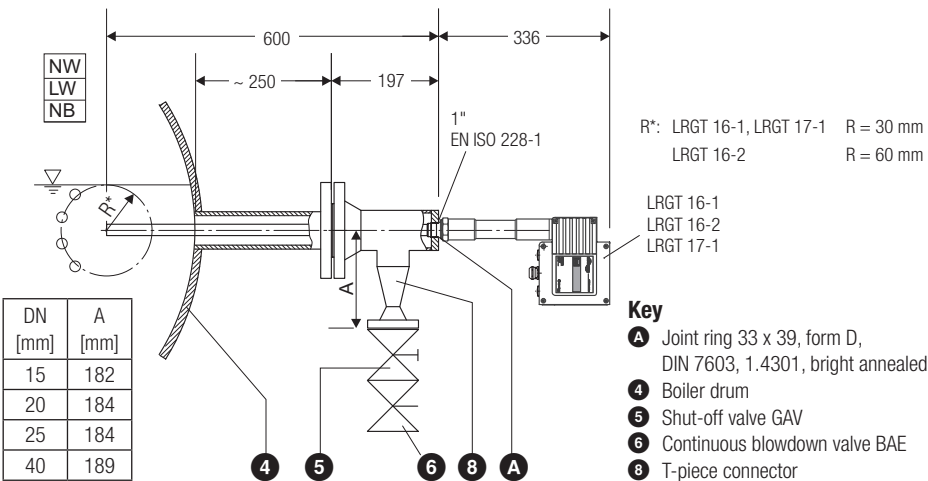
Dimensions



Electrical Connection



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



GESTRA AG

P. O. Box 10 54 60, D-28054 Bremen
Münchener Str. 77, D-28215 Bremen
Telephone 0049 (0) 421 35 03-0, Fax 0049 (0) 421 35 03-393
E-mail gestra.ag@flowserve.com, Web www.gestra.de



GESTRA