

Original operating manual: LTG-AAA-0AA-TF

Laser distance sensor



SEV 20 ATEX 0370 X


 Ex db [op is Ga] IIC T4 Gb
Ex tb [op is Da] IIIC T135°C Db

- Precise distance measurement with a reproducibility of < 10µm
- High measuring rate up to 2 kHz
- Measuring range 100mm, 50mm < x < 150mm
- Stable measured values regardless of the color and brightness of the measurement object
- Analogue output signal 4 - 20mA and data interface RS422
- Easy alignment thanks to visible laser light
- Die-cast aluminum housing

Technical Data	Type	LTG-AAA-0AA-TF
Gas Ex protection designation		II 2(1)G Ex db [op is Ga] IIC T4 Gb
Dust Ex protection designation		II 2(1)D Ex tb [op is Da] IIIC T135°C Db
For use in Ex Zones		Zones (0), 1, (20), 21
Measurement methods		Optical triangulation
Light Source		Class 2 laser according to EN 60825-1: 2008-05, P≤1mW; λ = 670nm
Measuring range		100 mm, 50mm < x < 150mm
Range start		50 mm
Measurement center		100 mm
Measuring range		150 mm
Linearity		≤ 0,1 % d.M.
Reproducibility		10 µm
Temperature stability		± 0,03 % d.M./°C
Measuring rate		0.25kHz
Permissible ambient light		20000 lx
Spot size		750 x 1100 µm
Interface		RS422 / 16 Bit
START input, function		"low" active, 0V starts measurement
Supply voltage, Ue		+24VDC +/-10%
Power consumption		< 2W
Analog current outputs, operating range		4 - 20mA / 12 Bit
Analog output, fault messages		3 mA: Outside the measuring range
Housing		Die-cast aluminum housing
Enclosure rating		IP65
Ambient working temperature range, T _{amb}		0°C up to +50°C
Storage temperature range		-20°C up to +70°C
Connection cable		Length 3 m, shielded

ATEX related markings

CE 0158

Typ: LTG-AAA-0AA-TF

Gas: II 2(1)G Ex db [op is Ga] IIC T4 Gb

ATEX:

IECEx:

Tamb:

Manufacturing date:

Manufacturer with Address

Electrical data according table

Dust: II 2(1)D Ex tb [op is Da] IIIC T135°C Db

SEV 20 ATEX 0370 X

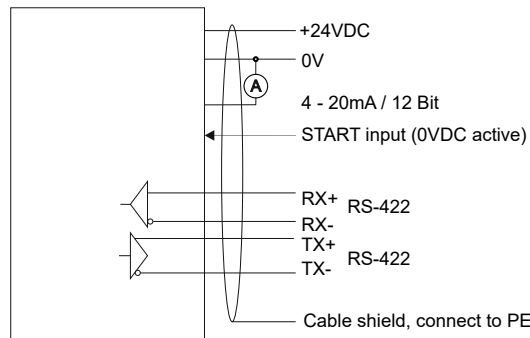
IECEx SEV 20.0004X

0°C up to +50°C

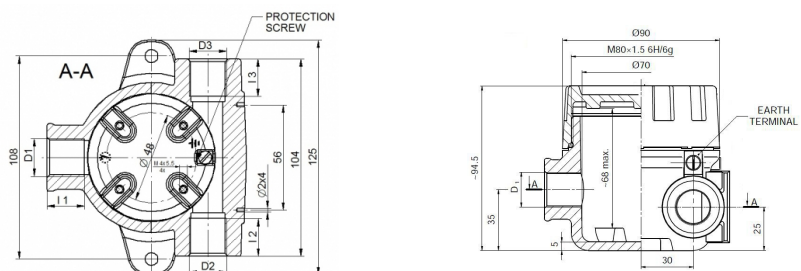
Number 5 to 8 of the Serial Number (Year / CW)

Wiring and Connection

red +24VDC +/-10%
blue 0V (GND)
white 4 - 20mA / 12 Bit
black START input
green RX+
yellow RX-
grey TX+
pink TX-

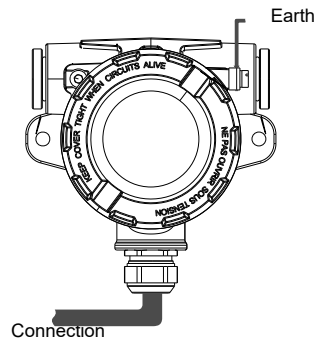


Dimensions in mm



LTG-AAA-0AA-TF_e3/2021-02-05/PDL

Earth Connection



Operating Manual / EC-/EU-declaration of conformity

Intended Use

The distance sensor is used for the contactless measurement of distances. It must be planned, installed and operated accordingly.

General assembly instructions

The electrical connections must be exactly as shown in the connection diagram. The sensor cables must not be laid parallel to high-current and/or high-voltage cables. The maximum limit values must not be exceeded.

Installation prescriptions for Ex hazardous locations

It is necessary to take into consideration all the valid international and national rules and regulations (DIN EN 60079-14:2014-10). Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the wiring diagram. The local equipotential bonding connection is corrosion-resistant and durable to connect. The protective earth (PE) has to be connected solid with the housing. The cable shield should be connected to the protection earth (PE). Do not connect the cable shield to PE if it is not identical to the PE connected to the housing. The cable has to be installed and protected against damages. Install cables with termination fittings or putted in cable tray systems in a manner to avoid tensile stress at the termination fittings. Adequate strain relief must be provided. The end of the cable must either be installed within a certificated Ex housing or must be installed outside of any Ex area. **The housing must be installed in such a way that the risk of propagation of brush discharges when used in an explosive dust atmosphere can be avoided.** Type LTG-AAA-0AA-TF: Allowed to be installed and operated within Ex zones 1, 2. The limited optical radiation of the laser can operate into hazardous locations zone 0.

Function

The device uses the principle of optical triangulation, that is, a visible, modulated point of light is projected onto the target surface. The diffuse part of the reflection of this point of light is displayed depending on distance on a position-resolving element (CMOS) by an receiver optic which is arranged to the optical axis of the laser beam in a defined angle. A signal processor in the sensor calculates the distance of the point of light on the measuring object to the sensor by means of the output signal of the CMOS elements. The distance value is linearized and output by means of the analog or RS422 interface.

Analog output

Output current 4... 20mA:	Measure object
Output current 3mA:	No object in the measuring range

Serial data output

The serial data output RS422 provides the distance of the measurement object from the sensor in digital form.


START input

The measuring process is started by applying 0VDC to the START input. If there is + 24V or "open" at the start input, the measurement is ended. We recommend planning this "START input" in the application. Use this input to select or deselect the laser. As a result, stray laser beams can be avoided when measurement is not required and the lifespan of the laser can be extended accordingly.

Maintenance

The sensor is maintenance-free. If it becomes dirty, the light passage must be cleaned carefully. No aggressive cleaning agents may be used. Repairs may only be carried out by the manufacturer.

Safety instructions for class 2 laser equipment

 The standard "Safety of laser devices" EN 60825-1 must be followed during assembly, commissioning and use. Do not look into the laser beam!

General safety instructions

The sensor is to be used in such a way that in the event of malfunction or total failure of the sensor, no people endangered or machinery damaged. The relevant EU and national regulations and guidelines must be observed during assembly, operation and maintenance. The sensors comply with the following standards: EN 61000-6-2, EN 61000-6-3, EN 61326-1.

General, disposal

We reserve the right to make technical changes. The sensors are built to be as environmentally friendly as possible. Irreparable or no longer used devices must be disposed of in accordance with the applicable regulations.

EU-Declaration of Conformity


The product is conform to the following standards: EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-28:2015, EN 60079-31:2014, EN 60825-1:2006, EN 60825-2:2004; EN 60529, EN 61000-4-2 bis EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4, ATEX directive: 2014/34/EG, Machine directive: 2006/42/EG, EMC directive: 2004/108/EG, RoHS directive: 2011/65/EU.

ATEX certification: SEV 20 ATEX 0370 X, IECEx CoC: IECEx SEV 20.0004X, NB: Eurofins Electric & Electronic Product Testing AG, Luppmenstrasse 3, CH-8320 Fehraltorf Schweiz.

ATEX certification of quality management system, type of production of Ex devices, according to the directive 2014/34/EU No: BVS 18 ATEX ZQS/E118, QAR No. DE/BVS/QAR13.0004/04, Dekra Testing and Certification GmbH, Notify Body, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, CE: 0158.

The conformity of the devices with all used standards and directives and the EC-type examination certificate and the observation of the Quality Management System ISO 9001:2015 with the ATEX module "Production", declares:

Ehrendingen, 5.2.2021


Pablo Ledergerber, Matrix Elektronik AG

LTG-AAA-0AA-TF_e3/2021-02-05/PDL

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