

1 Application

When used in connection with a measuring transducer of the series LOF 500 ..., the level detector detects liquid levels.

The prism and the probe tube can be set up in Zone 0.

2 Function

The functional principle of the level detector is based on the different refraction of light in a prism located in a gaseous or liquid environment.

The light is transmitted from a transmitter (infrared LED) via an optical waveguide (OWG) to the prism, and from there via a second OWG to the receiver (phototransistor). If the prism is not wetted with liquid, the light beam is reflected and transmitted to the receiver. When the prism is submerged in water, only a very small amount of light reaches the receiver.

3 Device versions

Level detector type LOF 1.1. Ex .SP

The level detector with the additional designation "P" is equipped with a testing unit that enables a true inspection of the functional efficiency of the total overflow prevention system, from the sensor tip to the signalling and controlling unit, without having to remove the level detector first.

Level detector type LOF 1.11 Ex .

The level detector type LOF 1.11 Ex . is the standard device and covers virtually all application cases. The probe electronics are installed in a stainless steel housing located directly on the probe tube.

Level detector type LOF 1.12 Ex .

With this level detector, the probe electronics are separated from the level detector in a die-cast aluminium housing. The connection is provided using a standard 1-metre-long cable.

This version is selected whenever confined space conditions exist or the probe electronics could become too hot (max. temperature of the probe electronics = 60 °C).

Level detector type LOF 1.13 Ex .

With this level detector, the coupler and the probe electronics are separated from the level detector. The connection is provided using a standard 1 m long stainless steel tube with internal glass fibres.

This version is selected whenever very low or very high temperatures could occur at the coupler or at the probe electronics (max. temperature of the coupler electronics = 120 °C).

3.1 Type code

Type designation	Probe tube	Type designation	Probe tube
LOF 1.11 Ex E	∅ 10 x 2	LOF 1.12 Ex FS	* ∅ 24 x 2
LOF 1.11 Ex ESP	∅ 24 x 2	LOF 1.12 Ex ESP	∅ 24 x 2 1
LOF 1.11 Ex FP	∅ 10 x 1.5	LOF 1.12 Ex FP	∅ 10 x 1.5
LOF 1.11 Ex F	* ∅ 10 x 1.5	LOF 1.13 Ex E	∅ 10 x 1.5
LOF 1.11 Ex ES	∅ 24 x 2	LOF 1.13 Ex F	* ∅ 10 x 1.5
LOF 1.11 Ex FS	* ∅ 24 x 1.5	LOF 1.13 Ex ES	∅ 24 x 2
LOF 1.12 Ex E	∅ 10 x 1.5	LOF 1.13 Ex FS	* ∅ 24 x 2
LOF 1.12 Ex F	* ∅ 10 x 1.5	LOF 1.13 Ex ESP	∅ 24 x 2
LOF 1.12 Ex ES	∅ 24 x 2	LOF 1.13 Ex FP	∅ 10 x 1.5

* E-CTFE (Halar) coating possible

all level detectors type LOF 1.11 Ex . can also be manufactured with an electric plug-in connection; the type designation is then supplemented by the additional term "Plug-in", e.g. LOF 1.11 E Ex . Plug-in.

Type code explanation:

E = screw-in unit

F = flange

S = probe tube ∅ 24 x 2

P = test connection

Plug-in = plugable electric connection, the necessary counter plug type S-28 is not included in the scope of delivery.

4 Application

The level detectors may, under the following conditions, be part of the equipment included in tanks used for the storage of flammable liquids of the hazard class A1, AII and B and of the temperature class T1 to T6.

The probe tube and the prism can be set up in Zone 0. The connection and the electronics are located in Zone 1.

Use in case of non-atmospheric conditions

II 1/2 G EEx

T_A	T_{Medium}	Temperature class
+60 °C	+60 °C	T6
+110 °C	+60 °C	T4
+180 °C	+60 °C	T3

II 2 G EEx

T_A	T_{Medium}	Temperature class
+60 °C	+80 °C	T6
+110 °C	+130 °C	T4
+180 °C	+180 °C	T3

Pressure

Standard pressure range:

0 to 4 bar

Special version:

0 to 400 bar

5 Materials

Materials of the level detectors (medium-contacted parts)

Material no.:	Designation
1.4301 to 1.4571	stainless steel in accordance with DIN 17 440
aluminium oxide 99,9%	industrial sapphire
FFKM	perfluoroelastomer (Kalrez)
2.4602, 2.4610, 2.4617	stainless steel in accordance with DIN 17 744

Flanges can also be made of steel with clad sealing surfaces from the materials mentioned above.

Standard materials of the medium-contacted parts

Material no. 1.4571, FFKM and aluminium oxide 99 %

In the case of level detectors in the flange version, all medium-contacted, metallic materials can be coated with E-CTFE (Halar).

6 Installation regulations

During any work carried out on the level detectors, the relevant technical safety regulations, in particular the BetrSichV (German plant safety directive) regulations, and the VDE (German association of electricians) regulations for electrical connection work must be observed.

6.1 Electrical connection

For overflow prevention sensors with plug-on sensors, no additional wiring is required. For overflow prevention sensors with long-distance installation, a two-core connecting cable (at least 2 x 1 mm², max. 500 m) must be laid between the overflow protection sensor and the fittings.

6.2 Technical data

Temperature range:	Ambient temperature	-25 ... +60 °C
	Media temperature	-25 ... +60 °C
Inductance (outward acting):	negligibly small	
Capacitance (outward acting):	negligibly small	
Connection data:	The level detector may only be connected to certified circuits and to the following "Ex"-related maximum values.	
	U ₀ :	24 V
	I ₀ :	150 mA
	P ₀ :	600 mW

7 Labelling

EC prototype certificate no. TÜV 03 ATEX 2171

In compliance with EC Guideline 94/9:  0032  II 1/2 G EEx ia IIB/IIC T6
II 2 G EEx ia IIB/IIC T6

For level detector with E-CTFE (Halar) coating.

In compliance with EC Guideline 94/9:  0032  II 1/2 G EEx ib IIB T6