



KONGSBERG

GL-3D/..

Capacitive Level Switch

Features

- No moving parts
- Easy installation
- Wetted parts in AISI 316 and PTFE (Teflon)
- Built in temperature sensor (Pt100)

Description

Application and general description

The GL-3D is a high quality level switch with capacitive element, and built in temperature sensor.

The switch can be used as a sensing device in most liquids with low or medium conductivity. This will include all oil products and most chemicals.

Limitations: The level switch is not recommended for good conducting liquids making deposits on the tip of the sensor.

NOTE! Not to be used in polluted seawater!

Mechanical design

The mechanical design is shown in Fig. 3. The level switch can be delivered in two mechanical versions, see Fig. 5 and 6. Connection box in Al-alloy with protection grade IP56 to be used in engine room or equivalent, see Fig. 5. Connection box in AISI 316 and protection grade IP67 to be used in more rough conditions, see Fig. 6.

Installation

Important! Minimum 15 mm free space in all directions from Teflon tip to tank wall or other obstacles!

The level switch can be installed both vertically and horizontally. Fig. 4 shows an application for starting a pump at minimum level and stopping the pump at maximum level. The level switch is installed horizontally from the side of the tank.

Fasten coupling must be ordered separately. As a standard we recommend: FS12-B12 with ISO228-G1/2 or FS12-B34 with ISO228-G3/4.



Measuring principle

Capacitive measurement

The tip is made of Teflon, see Fig. 3. In the Teflon tip there is an electrode, where the capacitance is measured.

Temperature measurement

Temperature measurements is done by using a Pt100 element, located close to the tip of the sensors, see Fig. 3. Connection to the monitoring system is 3-wire.

Electrical connection

A Cu-screened cable, with intact screen, must always be used between the switch and monitoring system.

Minimum cross section of the cable is 0.5 mm². The Cu-screen must be grounded in the cable gland, see Fig. 1.

On the monitoring side, the screen must be grounded as near the inlet to the monitoring cabinet as possible.

Test after installation, "short pins for test"

The level switch is delivered in two functional versions, the GL-3D/N and the GL-3D/R.

Description of the normal version, the GL-3D/N:

- 1) With dry sensor tip, the relay will be disconnected and the light emitting diode (LED) will be dark. No reaction by shorting the test pins.
- 2) When a liquid reaches the tip, the relay will be operated and the LED will be illuminated.
- 3) With the sensor tip wet, perform functional test by shorting the test pins (Fig. 2).

When “shorting test pins” are performed, dry condition is simulated and the level switch will

respond, see table below. The GL-3D/R will have the opposite function, see table below.

Type	Condition sensor tip	Light emitting diode (LED)	Relay
GL-3D/N	Dry	Dark	Disconnected (not operated)
	Wet	Illuminated	Operated
	Wet, test pins shorted, dry condition simulated	Dark	Disconnected
GL-3D/R	Dry	Illuminated	Operated
	Wet	Dark	Disconnected
	Dry, test pins shorted, wet condition simulated	Dark	Disconnected

Drawings

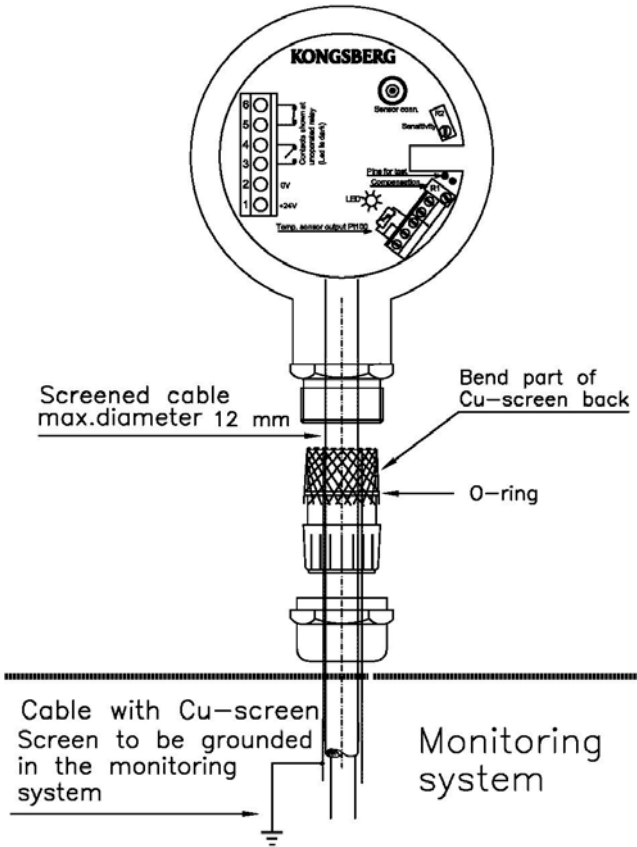


Fig. 1 Electrical connection

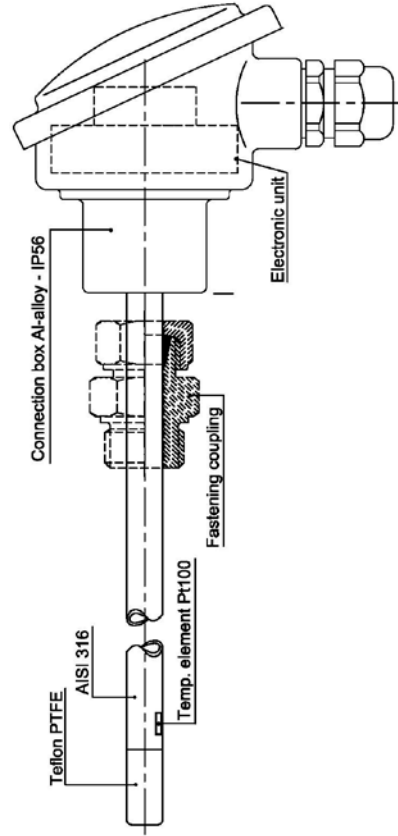


Fig. 3 Mechanical design

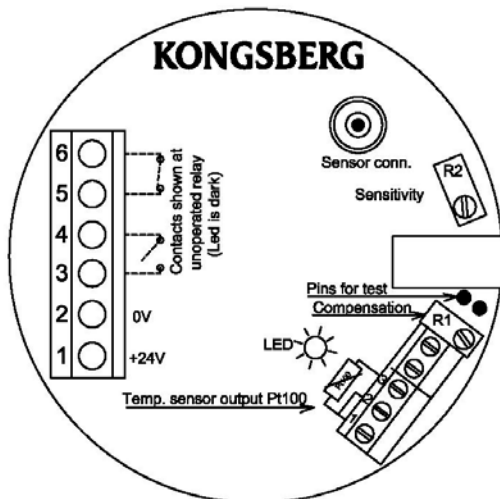


Fig. 2 Electrical connection
Power, relay, Pt100

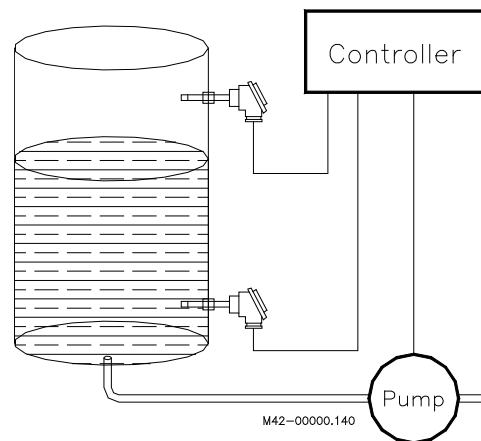


Fig. 4 Installation example

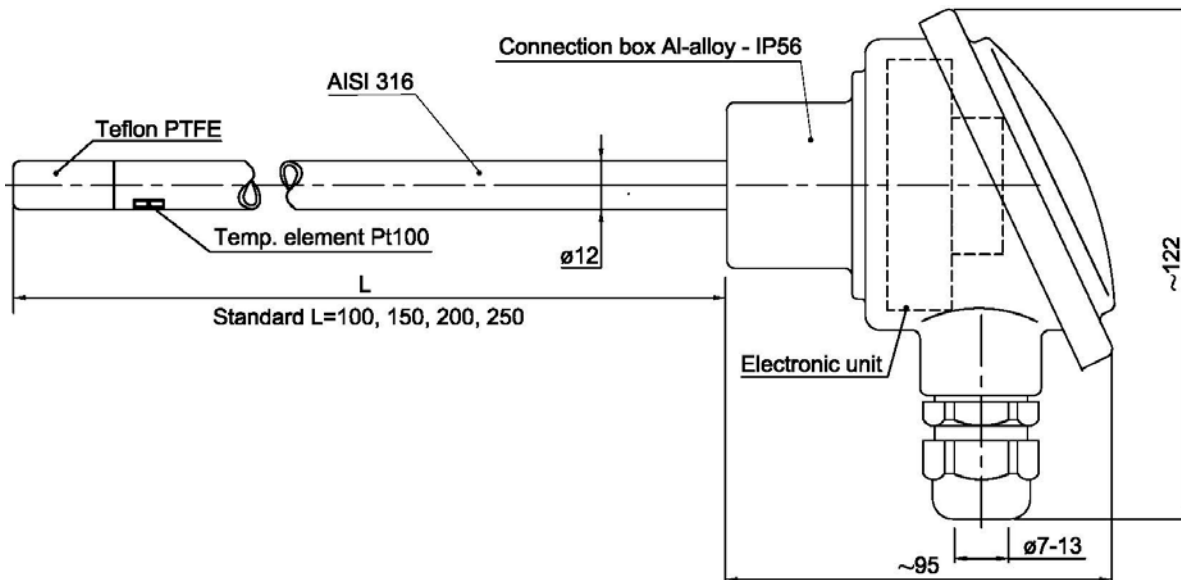


Fig. 5 The level switch GL-3D/x-0-x Dimensional sketch (IP56)

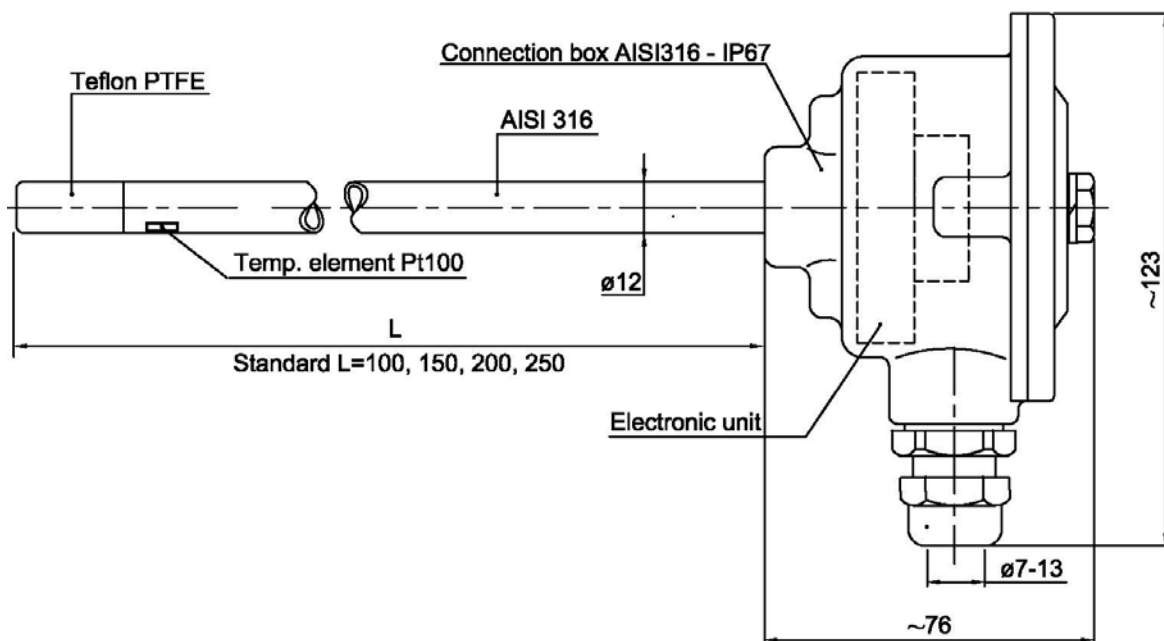
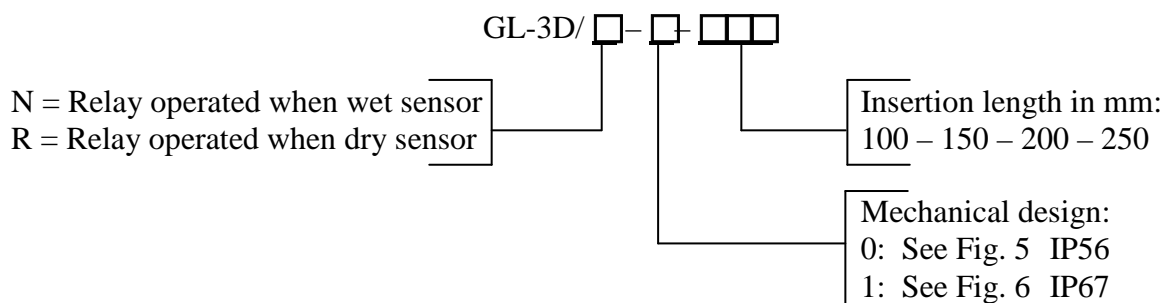


Fig. 6 The level switch GL-3D/x-1-x Dimensional sketch (IP67)

Ordering key

The insertion length and type of connection head must be specified:



Technical specifications

Power supply:	24 VDC nominal (19 to 32 VDC)
Normal current consumption:	Approximately 25 mA
Maximum current consumption:	Approximately 40 mA
Relay alarm output:	2 potential free contacts 120 V/0.5 A or 32 VDC/0.5 A

NOTE! Not to be used in polluted water!

Installation	Accuracy, vertical installation	Accuracy, horizontal installation
Switching accuracy oil	8 mm up on tip ± 2 mm	3 mm up on diameter ± 2 mm
Switching accuracy water	0.5 mm up on tip ± 0.2 mm	0.5 mm up on diameter ± 0.2 mm

Operating ambient temperature:	-25 to 85 °C
Storage temperature:	-45 to 100 °C
Sensor tip continuous temperature:	-45 to 150 °C
Sensor tip short time:	-45 to 190 °C
Minimum distance from Teflon tip:	15 mm
Material sensor tip, wetted part:	AISI 316 and Teflon
Cable gland connection:	M20 x 1.5 (7 – 13 mm)

Type	The GL-3D/x-0-xxx	The GL-3D/x-1-xxx
Material connection box	Al-alloy painted	AISI 316
Weight	0.5 kg	1.2 kg
Protection grade	IP56	IP67

Temperature element

Element type	Standard	Connection
Pt100 $\Omega/0^\circ\text{C}$	IEC60751/ITS90 Class B	3-wire

Vibration:	6 g at 1.5 to 100 Hz
EMC standard:	IEC 60945 & IACS E10
Switch sensor length (mm):	100, 150, 200 and 250
Cable inlet:	M20 for cables from 8 to 15 mm

Fastening coupling (must be ordered separately)

Description threads	Material	Ordering key
ISO228-G1/2	AISI316	FS12-B12
ISO228-G3/4	AISI316	FS12-B34

KONGSBERG MARITIME AS

NO-7005 Trondheim Norway km.sales@kongsberg.com

Telephone: +47 73 58 10 00 Telefax: +47 73 58 10 01 www.km.kongsberg.com



KONGSBERG