

Instruction manual**2284 Ultrasonic level switch**

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**Observe instruction manual**

The instruction manual is part of the product and an important element within the safety concept.

- ▶ Read and observe the instruction manual.
- ▶ Always have the instruction manual available at the product.
- ▶ Pass on the instruction manual to all subsequent users of the product.

1 Intended use

Ultrasonic level switch 2284 is used to monitor the level of liquids to which the material used is resistant.

2 About this document

This document contains all necessary information for the installation and operation of the product.

Abbreviations

BSPT	British Standard Pipe Taper
EMC	Electromagnetic compatibility
PPS	Polyphenylene sulfide
PVC	Polyvinyl chloride
SPCO	Single pole, centre off / Switch with stable, contactless middle position

3 Safety and responsibility

- ▶ Only use the product as intended, see intended use.
- ▶ Do not use the product if it is damaged or faulty. Throw out the product immediately if it is damaged.
- ▶ Make sure that the piping system has been installed professionally and that it is inspected regularly.
- ▶ The product must only be installed by persons who have the required training, knowledge, and experience.
- ▶ Regularly train personnel on all questions pertaining to the locally accepted regulations on occupational safety and environmental protection, especially on pressure-retaining pipelines.

The personnel is responsible for the following measures:

- ▶ Know, understand and follow the instruction manual and the advices therein.

4 Delivery Contents

- ▶ 2282 Ultrasonic level switch
- ▶ Instruction Manual

5 Transport and storage

- ▶ Protect the product against external force during transport (impact, stroke, vibrations, etc.).
- ▶ Transport and/or store the product in unopened, undamaged original packaging.
- ▶ Protect the product from dust, dirt, moisture as well as heat and ultraviolet radiation.
- ▶ Ensure that the product has not been damaged by either mechanical or thermal influences.
- ▶ Check the product for transport damage before assembly.

6 Function

Ultrasonic level switch 2284 is made entirely out of PPS, which is noncorrosive in most liquids. A piezoelectric crystal is embedded in each of the two sensor points. The transmitting crystal emits an ultrasonic signal but the receiving crystal only receives this signal at the sufficient strength when the gap between the transmitter and receiver is filled with a liquid. The integrated electronics evaluate the signal that is received and close the relay contact when the signal is detected (liquid between the transmitter and receiver).

- ▶ Light, no moving parts, and maintenance-free apart from a few exceptions.
- ▶ Can be mounted in any position in the tank.
- ▶ The sensor body has a tapered thread on both sides of the hexagonal collar. It can therefore be mounted either inside or outside the tank.
- ▶ The connection cable for the integrated printed circuit board is sealed in the sensor body.
- ▶ Suitable for high/low-level applications which signal an alarm via a potential-free contact or contactless transistor output or which form part of a pump control.

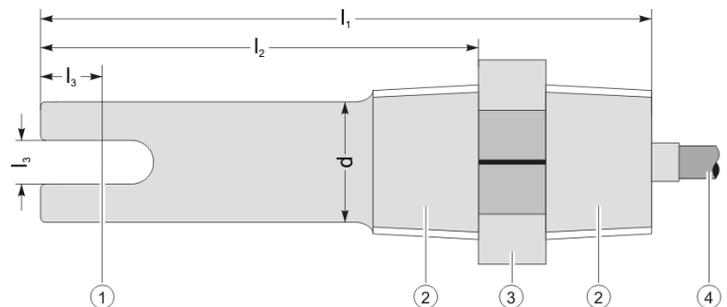
7 Technical Data

Category	Value	
Material	Polyphenylene sulfide (PPS)	
Working pressure	5 bar	
Working/ambient temperature	-20°C to +70°C	
Minimum SG	0.50	
Maximum viscosity	5,000 cST at 20°C	
Switching behavior	50 ms from dry to wet	
	500 ms from wet to dry	
Hysteresis	< 4 mm	
Reproducibility	±2 mm	
Total length	110 mm	
Length within the tank	79 mm (plus width of hexagonal collar when mounted inside tank)	
Sensor diameter	22 mm	
Pipe thread	¾" BSPT, 1" BSP, 1" NPT	
Switching function	SPCO relay, activated when wet	
Maximum current to be switched	1 A at 30 V resistive	
	0.25 A at 30 V inductive	
Maximum switching voltage	30 V	
Voltage supply	18 – 30 V AC or DC	
	Current consumption	Dry 10 mA nominal Wet 25 mA maximum
Cable length and type	3 m, 5-wire 7/0.2 mm	
Cable sheath	PVC	
Protection rating	IP66/IP68 for cable length of 3 m	

Meets the requirements of EMC Directive 2014/30/EC and standard EN 61326 (Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements)

Not suitable for use in intrinsically safe circuits.

Not suitable to directly start larger motors.

8 Dimensions

l ₁	l ₂	l ₃	l ₄	d	ø	1	2	3	4
110 mm	79 mm	6 mm	7 mm		22 mm	1	2	3	4

9 Installation**Checking the installation conditions**

- ▶ Are the working pressure and temperature values being observed?

Checking the mounting position

The ultrasonic level switch can be mounted at almost any angle in the tank. The requirements are as follows:

- ▶ The liquid can flow out of the sensor gap.
- ▶ The distance between the sensor gap and tank walls (other fittings in the tank) must be at least 25 mm to ensure that no pockets of air or liquid can form.
- ▶ Turbulence from around inlet/outlet valves or agitators must be avoided.
- ▶ Do not install the product directly in the flow path. Install baffles, if necessary.

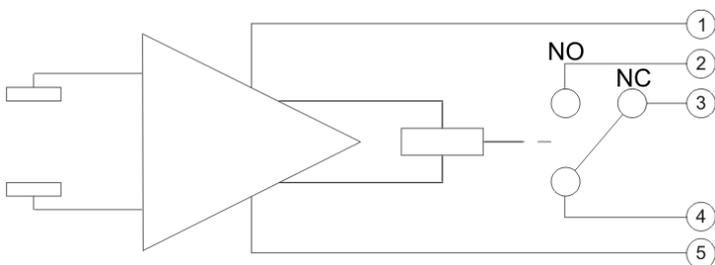
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Installing the ultrasonic level switch mechanically

- ▶ The cable for the ultrasonic level switch must be able to be turned during assembly; it must not be connected or secured in any other way.
- ▶ Make sure that the thread in the tank is free of contamination.
- ▶ If necessary, use PTFE tape or an equivalent pipe sealing tape.
- ▶ Make sure that the cable does not become twisted, kinked, or damaged.
- ▶ Carefully insert the ultrasonic level switch into the opening and tighten it hand-tight.
- ▶ Tighten the ultrasonic level switch an additional 1/6 of a revolution on the hexagonal collar so that the gap is as vertical as possible. Use the marking on the hexagonal collar as a guide.
- ▶ Check whether the connection is tight.

Connecting the ultrasonic level switch electrically



1	Red, +V _e	3	Green, NC contact	5	Blue, -V _e
2	Yellow, NO contact	4	White, common		

- ▶ Ensure that the voltage values for the ultrasonic level switch correspond to those for the system.
- ▶ Make sure that the supply cable is de-energized.
- ▶ Make sure that the minimum bending radius of 50 mm is observed when installing the connection cable.
- ▶ Make sure that the cables used do not cause a high voltage drop.
- ▶ Route the cables to the connection point and secure them at regular intervals using cable ties or similar.
- ▶ Connect the connection cable for the ultrasonic level switch to the supply cable or a weatherproof connection box.
- ▶ The ultrasonic level switch is operational once the supply voltage has been switched on.
- ▶ The switching process can be tested as follows:
 - Immerse the sensor into a cup with water.
 - This causes the switching output to switch.

10 Maintenance



The ultrasonic level switch must be cleaned regularly if the liquid contains particulate matter that may obstruct the gap in the switch.
The ultrasonic level switch is not suitable for steam cleaning.

WARNING

Risk of injury due to failure to carry out maintenance work correctly!

The occupational safety regulations must be observed if hazardous, flammable, or explosive media are used.

Only perform maintenance on depressurized systems.

Pay attention to the level of the medium in the tank.

11 Ordering information

Art. no.	Type	Designation
159 300 270	2284-Q-4BC	PPS enclosure, cable, 3/4" BSP
159 300 272	2284-Q-4NC	PPS enclosure, cable, 1" NPT
159 300 274	2284-Q-4BC	PPS enclosure, cable, 1" BSP

12 Dismantling

- ▶ Make sure that the connection cable is de-energized and can be freely rotated.
- ▶ Make sure that the tank is depressurized and has been drained to a level that is at least below that of the sensor mounting position.

CAUTION

Media that is detrimental to people's health and the environment may escape!

Risk of personal injury or damage to the environment caused by these media.

- ▶ Wear the prescribed protective clothing.
- ▶ Collect any media that escapes and dispose of it in accordance with local regulations. Consult the safety data sheet.

13 Disposal

- ▶ Before disposing of the different materials, separate them into recyclables, normal waste, and special waste.
- ▶ Comply with local legal regulations and provisions when recycling or disposing of the product, the individual components, and the packaging.
- ▶ Comply with national regulations, standards, and guidelines.

CAUTION

Parts of the product may be contaminated with media that are harmful to health and the environment meaning that simple cleaning is not sufficient!

Risk of personal injury and damage to the environment caused by these media.

Prior to disposing of the product:

- ▶ Collect leaking media and dispose of it according to the local regulations. Consult the safety data sheet.
- ▶ Neutralize any media residue that is present in the product.
- ▶ Separate materials (plastics, metals, etc.) and dispose of them according to the local regulations.



A product marked with this symbol must be sent for separate collection of electrical and electronic devices.

If you have questions regarding the disposal of the product, please contact your national GF Piping Systems representative.

14 Disclaimer

The technical data are not binding. They neither constitute expressly warranted characteristics nor guaranteed properties nor a guaranteed durability. They are subject to modification. Our General Terms of Sale apply.