

Mobrey Ultrasonic liquid level switch

003C Integral sensor series

71307/2044/1

71307/2044/2

Operation

The sensor contains two piezo-electric crystals, one each side of a gap at the tip of the sensor. An ultrasonic signal is transmitted from one crystal into the gap, but if there is air or gas in the sensor gap then the signal is not received by the other crystal. However, if there is a liquid present, the signal will be transmitted and the integral electronics will switch the output circuitry to signal the presence of a liquid.

Description

Manufactured in stainless steel the 003C sensor can be mounted in any position using the 1" BSPP thread.

The stainless steel body with an integral pcb, is factory sealed and supplied with a connector for customer connection. The 003C switch is designed for level alarm duty to give an 8-16mA output for liquid level alarm signalling.


Installation

The sensor must be handled with care - it is a measuring instrument. Before installation check that the sensor has not been damaged in transit. The 003C sensor may be mounted at any angle in the vessel, although care should be taken to ensure that the liquid is free to drain out of the sensor gap.

Parallel threaded : when fitting to mounting bracket, use back nut provided to clamp sensor into bracket.

The sensor has a 1" BSPP thread mounting. Note the position of the markings on the hexagon flats of the sensor which show the orientation of the sensor gap. Gap sensors are usually mounted with the gap vertical to avoid any build up of sediment on sensor faces.

The sensor is supplied with a connector which must be used on installation wiring.

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Head Office (UK)

Delta Mobrey Limited

Riverside Business Park, Dogflud Way,
Farnham, GU9 7SS, UK

+44 (0)1252 729140

+44 (0)1252 729168

mobrey@delta-mobrey.com

Wiring

The unit must be connected using the supplied connector. In accordance with assembly drawing Figure 2 (page 3)

WARNING

1) Any testing of installed sensors will cause alarm conditions to occur, these must be allowed for as part of the overall test routine.

2) When working on I.S. systems, ensure methods of work regulations for I.S. systems are adhered to.

Testing sensor for function

Each sensor can have its operation tested in situ.

With the sensor DRY, check the output from its associated MTL5314 barrier is correct for a sensor DRY condition. Then immerse the sensor gap in water and check the barrier output is correct for a sensor WET condition. If the barrier output is incorrect, check that the barrier trip levels are set and that it is working correctly (see warning 2). Repeat sensor test, if still not working, test sensor for current levels.

Testing sensor for current levels

More detailed sensor testing can be undertaken.

On 71307/2044/1 (Non I.S. units), the wire to terminal 1 on the MTL5314 can be disconnected and an ammeter* inserted between terminal 1 and the wire. The current with the sensor DRY must be between 7 and 9mA and the current with the sensor WET must be between 14.5 and 17.5mA.

On 71307/2044/2 (I.S. units), If an I.S. approved ammeter* is available the sensor can be tested in the same way as for the 71307/2044/1 (see warning 2).

If this is not available the sensor can be removed from the hazardous area and tested by connecting it to a spare MTL5314 barrier via a suitable adapter lead and testing as though it was a 71307/2044/1. Refer to drawings Figure 2, Figure 3 and Figure 4 for lead assembly information.

If either or both the sensor currents are outside the limits, the unit must be replaced.

* = Ammeter must be capable of reading up to 25mA with a resolution of at least 0.1mA.

Electrical characteristics

	Non I.S. models	I.S. models
Manufacturer Part No.	71307/2044/1	71307/2044/2
Max. switched voltage	30v	30v
Power supply	18-30v dc	18-30v dc
Dry current drawn	8mA nom.	8mA nom.
Wet current drawn	16mA nom.	16mA nom.
IP rating of sensor	IP66	IP66

Mechanical / operating characteristics

Sensor material	Stainless steel
Operating pressure	20 bar
Operating Temp.	-20°C to +70°C
Ambient temperature	As operating temp.
Minimum S. G.	0.50
Max. viscosity	5000cSt. at 20°C
Switching response	50ms dry-wet 0.5s wet-dry
Hysteresis	< 4mm
Repeatability	+/- 2mm
Length into tank	56mm
Thread size	1" BSPP

Maintenance

The sensor is factory sealed, contains no moving parts and requires no maintenance in most applications. The sensor may need to be cleaned periodically when used with liquids which could cause a build-up on the sensor surfaces. Note : the sensor is not suitable for steam cleaning.

Spare parts

There are no spare parts for this factory sealed switch. A complete new switch should be fitted.

