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# Mobrey

## Ultrasonic liquid level switch

### 003S Integral sensor series

**Description**

Manufactured in Polyphenylene Sulphide (PPS) for corrosion resistance in most liquids, the 003 range of sensors can be mounted in any position in a tank using either a 1" or 3/4" thread available in BSPP, BSPT and NPT thread forms.

A thread is provided on each side of a hexagonal boss to allow either external or internal / pole mounting of the sensor.

Comprising a one piece moulded body with an integral pcb, the 003 switch is factory sealed and supplied with a 3m flying lead for customer connection. The Mobrey 003 switch is designed for high or low level alarm duties to give a voltage free changeover contact or dual solid state transistor output for alarm signalling or as part of a pump control system.

**Operation**

The moulded body 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.

## Installation

The 003 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. Position the sensor away from entry or exit points to avoid areas of excessive turbulence or aeration, and avoid installation in the direct flow of liquid. Baffle plates may be used if necessary.

Ensure a clearance of at least 25mm from all sensor surfaces to vessel wall to avoid forming air pockets or sludge traps.

The sensor has a dual thread mounting to allow either internal or external mounting. A thread may be tapped in the vessel wall or, if the vessel has thin walls or is pressurised, a threaded boss brazed, welded or otherwise attached to the vessel wall will be required. Note the position of the markings on the hexagon flats of the sensor which show the orientation of the sensor gap, then install in

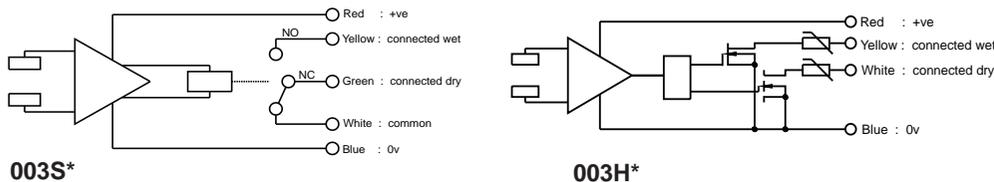
the vessel as follows :-

Parallel threaded models : ensure that the flat nitrile sealing gasket is in place over the chosen thread to effect a seal between the hexagon surface and the vessel. Screw the sensor into the vessel, taking care not to twist the sensor cable, until the joint is finger tight. Using the hexagon, carefully complete the seal by tightening the sensor a further 1/6 of a turn only, such that the sensor gap is as near vertical as possible.

Taper threaded models : use PTFE or equivalent pipe seal tape wound around the sensor threads to effect the seal. Screw the sensor into the vessel, taking care not to twist the sensor cable, until the joint is finger tight. Using the hexagon, carefully complete the seal by tightening the sensor, aligning the sensor gap as near vertical as possible. Track the cable to the connection point or a junction box, securing at regular intervals. Take care not to bend the cable tighter than a 50mm radius.

## Wiring

The sensor is factory fitted with a flying lead. Extensions may be made using a suitably weatherproof junction box and a choice of cable that does not introduce excessive voltage drop. Connections are as follows :-



## Electrical characteristics

	003S* models	003H* models
Switching function	SPCO relay (energised wet)	2 x FET open drain (short circuit protected.)
Max. switched current	1A at 30v res. 0.25A at 30v ind.	100mA max.
Max. switched voltage	30v	30v
Power supply	18-30v dc or ac	18-30v dc
Dry current drawn	10mA nom.	8mA nom. (4mA min.)
Wet current drawn	25mA max.	16mA nom. (20mA max.)
Cable length	3m : 5 core 7/0.2mm	3m : 4 core 7/0.2mm
Cable sheathing	PVC	PVC
IP rating of sensor	IP66/IP68 (3m)	IP66/IP68 (3m)

Not suitable for use in intrinsically safe circuits.  
Not suitable for the direct starting of large motors.

## Mechanical / operating characteristics

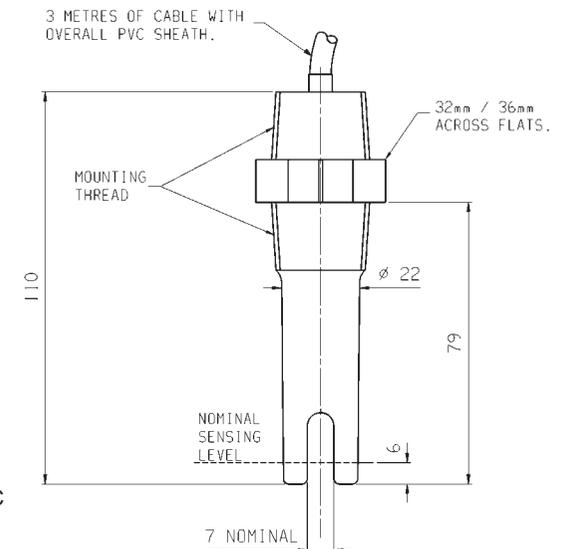
	003S* models	003H* models
Sensor material	PPS	PPS
Operating pressure	5 bar	5 bar
Operating Temp.	-20°C to +70°C	-40°C to +105°C
Ambient temperature	As operating temp.	-40°C to +70°C
Minimum S. G.	0.50	0.50
Max. viscosity	5000cSt. at 20°C	5000cSt. at 20°C
Switching response	50ms dry-wet 0.5s wet-dry	50ms dry-wet 0.5s wet-dry
Hysteresis	< 4mm	< 4mm
Repeatability	+/- 2mm	+/- 2mm
Overall length	110mm	110mm
Length into tank :		
external mount	79mm	79mm
Body diameter	22mm	22mm
Thread size	003*0 003*2 003*5	¾" BSPT 1" BSPT 1" NPT

## 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.



Meets the requirements of the EMC  
European Directive 89/336/EEC  
Light Industrial EN61326