

Mobrey 003

Ultrasonic Liquid Level Switch



- Self-contained liquid level alarm
- No moving parts
- Manufactured in Polyphenylene Sulphide (PPS) for corrosion resistance in most liquids
- European Directive compliance
- Threaded process connections for tank mounting

Overview of the Mobrey 003 Level Switch

The Mobrey 003 Ultrasonic Level Switch are manufactured in Polyphenylene Sulphide (PPS) for corrosion resistance in most liquids. This range of sensors can be mounted in any position in a tank using either a 1-in. or ¾-in. thread available in 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 level switch is factory sealed and supplied with a 10 ft. (3 m) flying lead for customer connection.

The Mobrey 003 switch is designed for high or low level alarm duties to give a voltage free contact or 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 across the gap and the integral electronics will switch the output circuitry to signal the presence of a liquid.

Typical applications

- Low level alarms in header tanks
- Pump control duty in feeder tanks
- High and low alarms in storage tanks
- Level and pump control in storage tanks
- Small or thin wall tanks
- Bund level detection
- Steering gear oil

Features and benefits

- Relay or solid-state output
- Corrosion resistant PPS construction
- 1-in. or ¾-in. threaded mounting
- Small in-tank dimensions
- 24 Vac or dc powered
- Lightweight
- No moving parts

Installation

The 003 sensor may be mounted at an 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. Ensure a clearance of at least 1 in. (25 mm) from all sensor surfaces to vessel wall to avoid forming air pockets or sludge traps.

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Mobrey 003 Level Switch Ordering Information

Table 1. Mobrey 003 ordering information

Model	Product Description
003	Integral ultrasonic level sensor, polyphenylene sulphide construction
Output Type	
S	Integral SPCO relay (energised when sensor is wet)
H	Two open-drain FET transistors (one conducting when sensor is wet; and the other conducting when the sensor is dry)
Mounting Thread	
0	³ / ₄ -in. BSPT dual
2	1-in. BSPT dual
5	1-in. NPT dual
Cable Length	
/ M03 ⁽¹⁾	PVC sheathed, 10 ft. (3 m), 5-core 7 / 0.2 mm
Typical Model Number: 003 S 2 / M03	

(1) 3 m of cable supplied as standard. Contact the factory if other lengths are required. The maximum cable length is 50 m.

Figure 1. Schematic for 003S* models

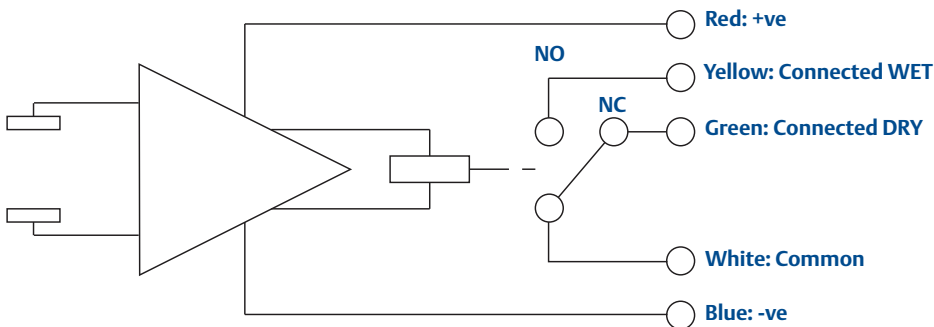
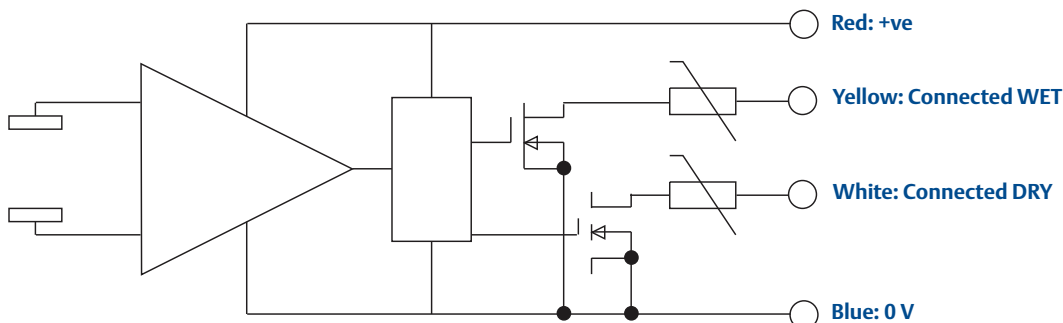


Figure 2. Schematic for 003H* models



Specification

Mobrey 003S*

Operating pressure

- 72.5 psi (5 bar)

Operating temperature

- -4 to 158°F (-20 to 70 °C)
- *Ambient temperature is same as operating temperature*

Minimum liquid specific gravity

- 0.50

Maximum viscosity

- 5000 cSt. at 68 °F (20 °C)

Switching response

- 50 ms dry-to-wet; 0.5 s wet-to-dry

Hysteresis

- < 0.12 in. (4 mm)

Repeatability

- ±0.08 in. (2 mm)

Overall length

- 4.33 in. (110 mm)

Length into tank (external mount)

- 3.11 in. (79 mm)

Body diameter

- 0.87 in. (22 mm)

Switching function

- SPCO relay (energized wet)
- Maximum switched current:
1 A at 30 V residual; 0.25 A at 30 V inductive
- 30 V maximum switched voltage

Power supply

- 18 to 30 Vdc or ac

Current drawn when dry

- 10 mA nominal

Current drawn when wet

- 25 mA maximum

Cable

- 10 ft. (3 m); 5-core 7/0.2 mm(0.008 in.),
PVC cable sheathing

IP Rating of Sensor

- NEMA 6P (10 ft.) / IP66/IP68 (3 m)

Note: The 003 level switch is not suitable for use in intrinsically safe circuits or for the direct starting of large motors.

Mobrey 003H*

Operating pressure

- 72.5 psi (5 bar)

Operating temperature

- -40 to 221 °F (-40 to 105 °C)
- *Same as operating temperature*

Minimum liquid specific gravity

- 0.50

Maximum viscosity

- 5000 cSt. at 68 °F (20 °C)

Switching response

- 50 ms dry-to-wet; 0.5 s wet-to-dry

Hysteresis

- < 0.12 in. (4 mm)

Repeatability

- ±0.08 in. (2 mm)

Overall length

- 4.33 in. (110 mm)

Length into tank (external mount)

- 3.11 in. (79 mm)

Body diameter

- 0.87 in. (22 mm)

Switching function

- 2 x FET open drain (short-circuit protected)
- 100 mA maximum switched current
- 30 V maximum switched voltage

Power supply

- 18 to 30 Vdc or ac

Current drawn when dry

- 8 mA nominal (4 mA minimum)

Current drawn when wet

- 16 mA nominal (20 mA maximum)

Cable

- 10 ft. (3 m); 5-core 7/0.2 mm(0.008 in.),
PVC cable sheathing

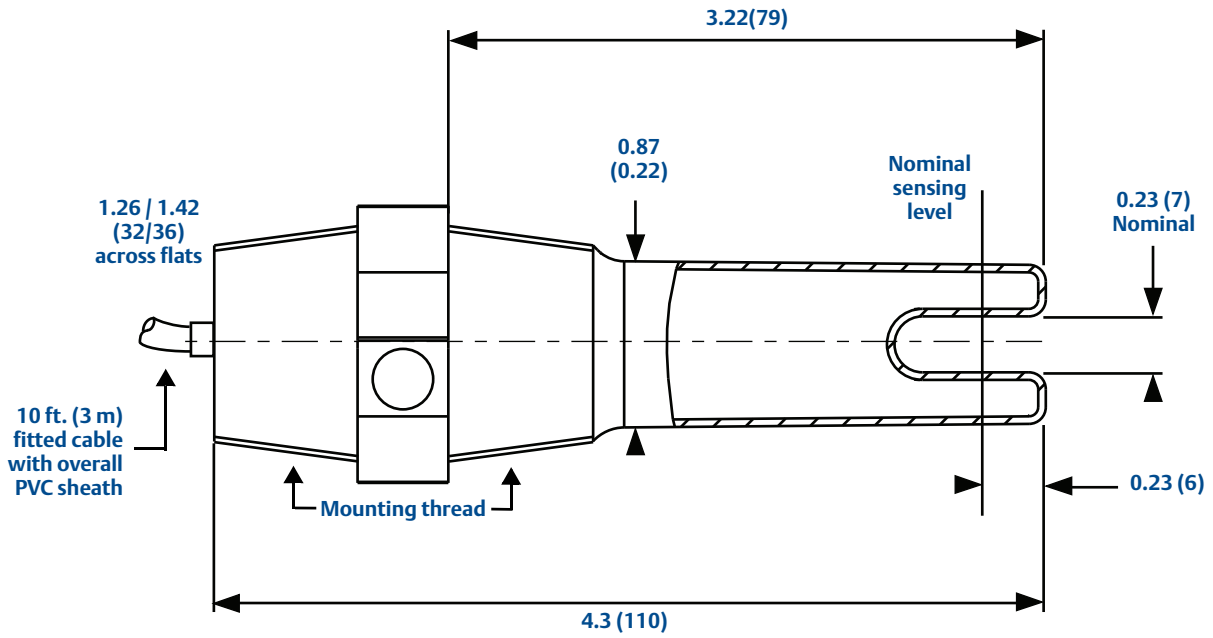
IP Rating of Sensor

- NEMA 6P (10 ft.) / IP66/IP68 (3 m)

Dimensions

Figure 3. Mobrey 003 dimensions

Note: Dimensions are in inches (mm) unless otherwise stated.



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