

Mobrey 003 Ultrasonic Liquid Level Switch

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



Contents

The Mobrey 003 Level Switch	page 2
Mobrey 003 Ordering Information	page 3
Specifications	page 4
Dimensions	page 4

Mobrey 003 Level Switch

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.

Product Data Sheet

IP117, Rev BA
March 2012

Mobrey 003 Level Switch

Mobrey 003 Level Switch



- Corrosion resistant PPS construction
- Choice of either the Relay Output version (Figure 1) or the Solid-state Output version (Figure 2)
- 1-in. or 3/4-in. threaded mounting
- 24 Vac or dc powered

Additional Information

Specifications: page 4
Dimensions: page 4

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
Typical Model Number: 003 S 2	

Figure 1. Schematic for 003S* models

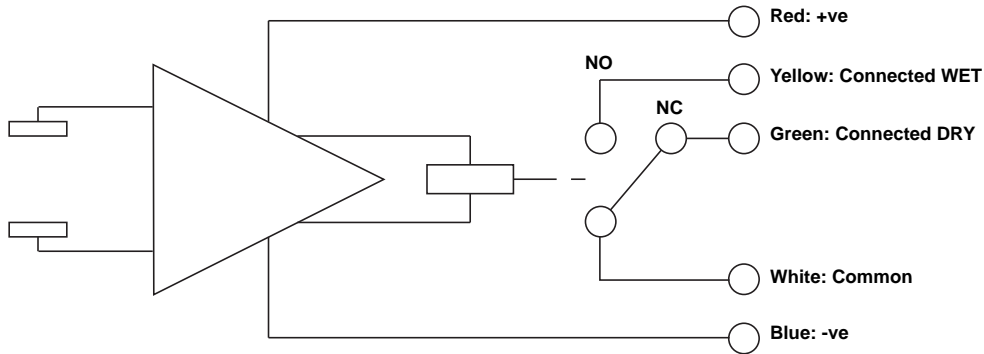
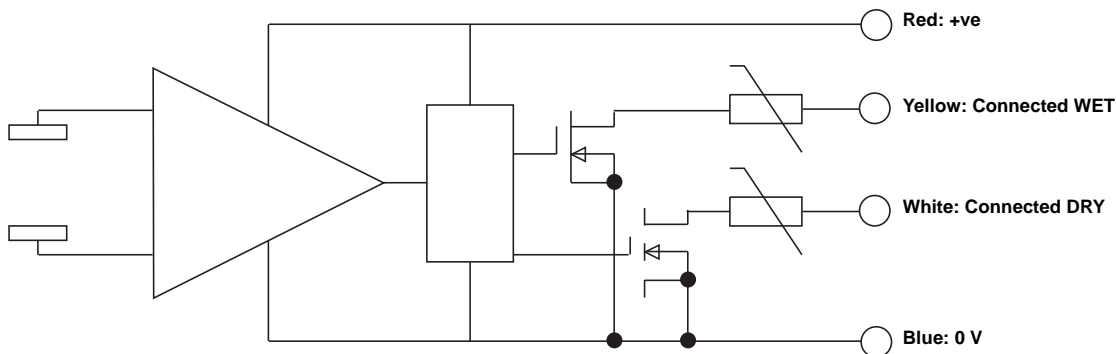


Figure 2. Schematic for 003H* models



Mobrey 003 Level Switch

Specifications

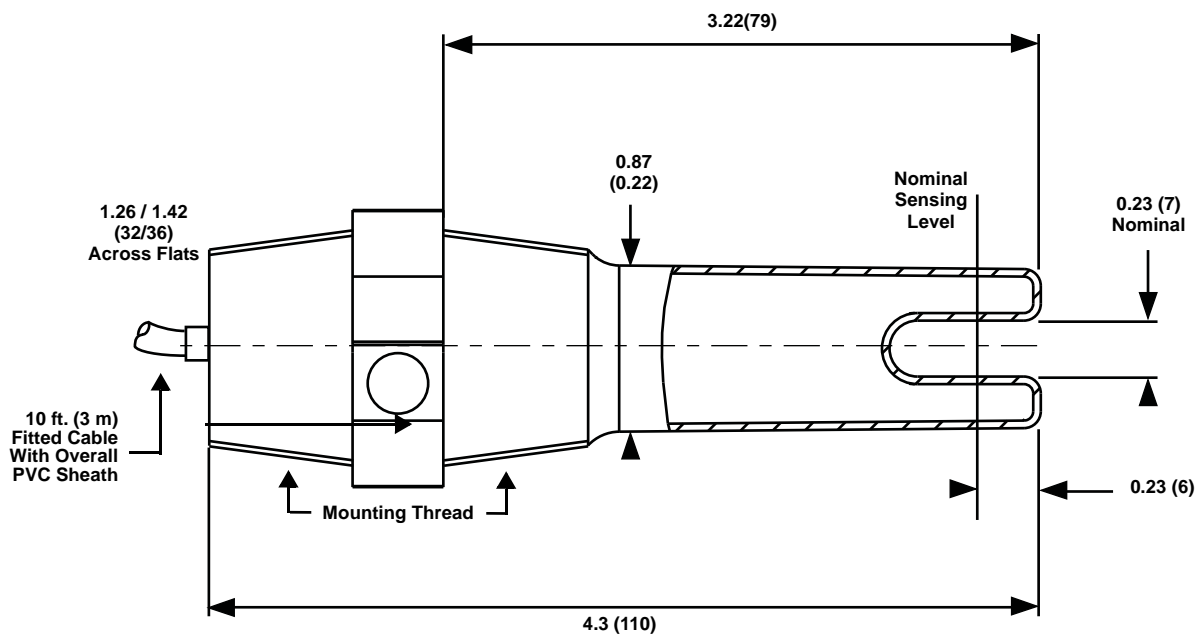
Technical Specification	003S* Models	003H* Models
Operating Pressure	72.5 psi (5 bar)	72.5 psi (5 bar)
Operating Temperature	-4 to 158°F (-20 to 70 °C)	-40 to 221 °F (-40 to 105 °C)
Ambient Temperature	As Operating Temperature	As Operating Temperature
Minimum S.G.	0.50	0.50
Maximum Viscosity	5000 cSt. at 68 °F (20 °C)	5000 cSt. at 68 °F (20 °C)
Switching Response	50 ms dry-to-wet; 0.5 s wet-to-dry	50 ms dry-to-wet; 0.5 s wet-to-dry
Hysteresis	< 0.12 in. (4 mm)	< 0.12 in. (4 mm)
Repeatability	±0.08 in. (2 mm)	±0.08 in. (2 mm)
Overall Length	4.33 in. (110 mm)	4.33 in. (110 mm)
Length Into Tank (External mount)	3.11 in. (79 mm)	3.11 in. (79 mm)
Body Diameter	0.87 in. (22 mm)	0.87 in. (22 mm)
Switching Function	SPCO relay (energised wet)	2 x FET open drain (short-circuit protected)
Maximum Switched Current	1 A at 30 V residual; 0.25 A at 30 V inductive	100 mA maximum
Maximum Switched Voltage	30 V	30 V
Power Supply	18 to 30 Vdc or ac	18 to 30 Vdc or a
Current Drawn When Dry	10 mA nominal	8 mA nominal (4 mA minimum)
Current Drawn When Wet	25 mA maximum	16 mA nominal (20 mA maximum)
Cable Length	10 ft. (3 m); 5-core 7/0.2 mm(0.008 in.)	10 ft. (3 m); 5-core 7/0.2 mm(0.008 in.)
Cable Sheathing	PVC	PVC
IP Rating of Sensor	NEMA 6P (10 ft.) / IP66/IP68 (3 m)	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.

Dimensions

Figure 3. 003 Dimensions

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



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IP117, Rev BA
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Mobrey Level Solutions

Emerson provides a wide range of Mobrey products for level measurement applications.

POINT LEVEL DETECTION

Vibrating Fork Liquid Level Switches

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

- Mobrey Mini-Squing (Compact)
- Mobrey Squing 2 (Full-featured)

Ultrasonic Gap Sensor Liquid Level Switches

For use in non-hazardous industrial processes to detect high or low liquid levels and liquid interface. Immune to changing density, and wide dielectric and pH variations. Suitable for use in most clean and non-aerated liquids, with options for sludges and slurries.

Float and Displacer Liquid Level Switches

Mobrey electromechanical float and displacer level switches are ideal for alarm and pump control duties, especially in critical applications or hazardous areas.

- Mobrey Horizontal Level Switches
- Mobrey Vertical Level Switches

Chambers are available for external mounting of these level switches on process vessels.

Dry Products Level Switches

For high and low level alarms. Including threaded mounting connections, extended lengths, high temperature capability, and multiple detection techniques. Suitable for a wide variety of powders, granules, and free flowing solids with wide variations in bulk densities.

- Mobrey VLS Series – Vibrating Rod Level Switch
- Mobrey PLS Series – Paddle Level Switch
- Mobrey CLS Series – Capacitance Level Switch

CONTINUOUS MEASUREMENT

Ultrasonic Continuous Level Transmitters and Controllers

Top mounted, non-contacting for simple tank and open-air process level measurements. Unaffected by fluid properties such as density, viscosity, dirty coating, and corrosiveness. Intrinsically Safe versions are available for operating in hazardous areas.

- Mobrey MSP Series Ultrasonic Level and Flow Transmitters
- Mobrey MCU900 Series Universal Controllers

Ultrasonic Sludge Density Blanket Monitoring and Control

Ultrasonic in-line pipe or tank mounted sensors for sludge density measurement and control, and top mounted ultrasonic sensors for continuous measurement of sludge blanket level in Industrial and Municipal effluent treatment processes.

- Mobrey MSM400 – Sludge Density Monitor
- Mobrey MSL600 – Sludge Blanket Level Monitor

Displacer Continuous Level Measurement

Top mounted in a vessel or externally mounted in a vertical chamber. For use in hazardous areas.

- Mobrey MLT100 – Displacer Level Transmitter

Hydrostatic Continuous Level Transmitter

For level measurements in non-pressurized tanks where in-tank problems such as foaming, vapor layers, and temperature gradients prohibit the use of other instrumentation.

- Mobrey 9700 Series hydrostatic electronic level transmitters

SPECIALIZED CONDUCTIVITY

Conductivity Water and Steam Interface Monitoring

Steam/water interface level gauges using specialized, high performance conductivity probes in external columns and manifolds, ideal for steam plants where reliable and redundant indication of boiler water level and turbine protection is critical.

- Hydratec 2462 – Water/Steam detection Systems
- Hydrastep 2468 – Water/Steam Monitoring Systems

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Emerson Process Management

Mobrey Measurement

158 Edinburgh Avenue
Slough, Berks, SL1 4UE, UK
Tel: +44 (0)1753 756600
Fax: +44 (0)1753 823589
www.mobrey.com