

# Mobrey M-Switch

## Float Operated Liquid Level Switch



- Reliably detects the liquid level to give a voltage free contact operation for alarm signalling or as part of a pump control system
- Small in-tank dimensions, suitable for use where space in a vessel is limited
- Available for side mounting with either a flanged or 2-in. threaded connection
- Tough industrial build quality with 316 Stainless steel construction throughout
- European directive compliance
- ATEX and IECEx flameproof models (Ex d)

# Overview of Mobrey M-Switch



Vertical cylindrical tank  
with two M-Switches fitted



The advent of wireless communications allows process plant managers to save up to 90% of installation cost compared with wired technologies.

## Introduction

Manufactured in 316 stainless steel throughout, the M-Switch is available for side mounting with either a flange or 2-in. thread.

Comprising a small float on the wet side and a body containing a micro-switch on the dry side, the Mobrey M-Switch reliably detects liquid level to give a voltage-free contact operation for alarm signalling or as part of a pump control system.

## Operating principle

One permanent magnet forms part of a float assembly which rises and falls with changing liquid level. A second permanent magnet is positioned within the switch so that the adjacent poles of the two magnets repel each other through the nonmagnetic wall of the switch body.

A change of liquid level which moves the float through its permissible travel will cause the float magnet to move and repel the switch magnet to operate the micro-switch contacts.

## Wireless option

All the models in the Mobrey range of float switches are available for use with the Rosemount 702 wireless discrete transmitter, allowing plant managers to cost-effectively access valuable data about the performance and safety of their plant.

## Typical applications

- Low level alarms in lubricating oils and fuel oils
- Pump control duty in header tanks
- High and low alarms in condensate tanks
- Level and pump control in storage tanks

## Installation

The M-Switch is designed for side mounting either direct into a vessel or in an external chamber.

Choose a position where the effects of turbulence caused by agitators or inlets are minimized. The switch should be positioned so that the float may move freely over its full travel and not foul the sides, bottom, or top of the tank.

A flange or threaded boss is recommended for pressurised applications, designed such that the float is free to move over its full travel.

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# Mobrey M-Switch Ordering Information

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [Material selection](#) below for more information.

**Table 1. M-Switch ordering information**

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

| Model                                      | Product Description                           |                 |
|--------------------------------------------|-----------------------------------------------|-----------------|
| SM                                         | M-Switch, 316 Stainless steel construction    |                 |
| <b>Mounting Arrangement <sup>(1)</sup></b> |                                               |                 |
| <b>Standard</b>                            |                                               | <b>Standard</b> |
| A                                          | Mobrey 'A' flange                             | ★               |
| D <sup>(2)</sup>                           | Mobrey 'D' flange                             | ★               |
| B                                          | 2-in. BSPT threaded                           | ★               |
| N                                          | 2-in. NPT threaded                            | ★               |
| <b>Enclosure</b>                           |                                               |                 |
| <b>Standard</b>                            |                                               | <b>Standard</b> |
| 1                                          | Weatherproof IP66/67 (NEMA 4)                 | ★               |
| 2 <sup>(3)</sup>                           | Flameproof ATEX and IECEx, IP66/IP67 (NEMA 4) | ★               |
| <b>Typical Model Number: SM B 1</b>        |                                               |                 |

(1) See [Table 2 on page 4](#) for the maximum pressure rating of each mounting arrangement.

(2) Not available on the flameproof version of the M-Switch.

(3) See ["Specifications" on page 4](#) for the ATEX and IECEx approval codings.

## Material selection

Emerson provides a variety of Mobrey products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Mobrey product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson Process Management is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

# Specifications

| General                           |                                                                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product                           | M-Switch Float Operated Liquid Level Switch                                                                                                                                                                                                                                    |
| Minimum liquid specific gravity   | 0.75                                                                                                                                                                                                                                                                           |
| Differential                      | 1 in. (25 mm)                                                                                                                                                                                                                                                                  |
| Length into tank                  | 6 in. (153 mm)                                                                                                                                                                                                                                                                 |
| Float diameter                    | Ø1.9 in. (Ø48 mm)                                                                                                                                                                                                                                                              |
| Maximum float swing               | 4.4 in. (112 mm)                                                                                                                                                                                                                                                               |
| Switching function (See Figure 1) | SPCO (Single-Pole-Change-Over) relay                                                                                                                                                                                                                                           |
| Construction materials            |                                                                                                                                                                                                                                                                                |
| Wetside material                  | 316 Stainless steel                                                                                                                                                                                                                                                            |
| Body material                     | 316 Stainless steel                                                                                                                                                                                                                                                            |
| End cover material                | 316 Stainless steel                                                                                                                                                                                                                                                            |
| Gasket                            | Non-asbestos for Mobrey 'A' flange<br>Ethylene propylene for Mobrey 'D' flange                                                                                                                                                                                                 |
| Electrical                        |                                                                                                                                                                                                                                                                                |
| Conduit entry                     | M20 for flanged and BSPT threaded versions<br>½-in. NPT for NPT threaded versions                                                                                                                                                                                              |
| Maximum voltage and current       | See Table 3 for the maximum voltage and current<br>The microswitch contacts are gold-plated and are suitable for use in low-power circuits.<br>Switching high-power circuits can permanently damage the gold-plating.<br>Not suitable for the direct starting of large motors. |
| Environment                       |                                                                                                                                                                                                                                                                                |
| Operating temperature             | 32 to 266 °F (0 to 130 °C)                                                                                                                                                                                                                                                     |
| Ambient temperature               | 32 to 140 °F (0 to 60 °C)                                                                                                                                                                                                                                                      |
| Operating pressure                | See Table 2 for the maximum pressure ratings                                                                                                                                                                                                                                   |
| Approvals                         |                                                                                                                                                                                                                                                                                |
| Enclosure ratings                 | Weatherproof M-Switch:<br>IP66/67 (NEMA 4)<br><br>Flameproof M-Switch:<br>ATEX: II 1/2G Ex d IIC T6 Ga/Gb<br>IECEX: Ex d IIC T6 Ga/Gb<br>IP66/IP67 (NEMA 4)                                                                                                                    |
| Marine                            | Germanischer Lloyd                                                                                                                                                                                                                                                             |

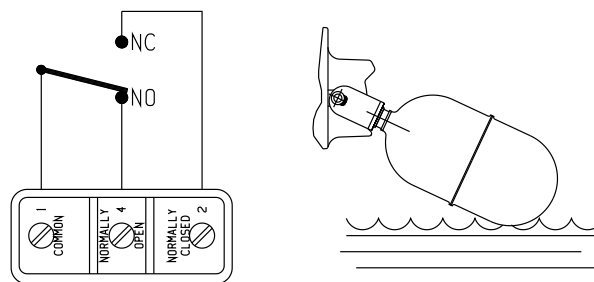
**Table 2. Maximum pressure ratings**

| Mounting Arrangement | Maximum P @ T <sub>room</sub> |        |                |          |
|----------------------|-------------------------------|--------|----------------|----------|
|                      | Weatherproof                  |        | Flameproof     |          |
| Mobrey 'A' flange    | 275 psi                       | 19 bar | 362 psi        | 25 bar   |
| Mobrey 'D' flange    | 43 psi                        | 3 bar  | Not applicable |          |
| 2-in. BSPT threaded  | 275 psi                       | 19 bar | 720 psi        | 49.6 bar |
| 2-in. NPT threaded   | 275 psi                       | 19 bar | 720 psi        | 49.6 bar |

**Table 3. Maximum voltage and current**

| Maximum voltage and current | AC  | DC (Resistive) | DC (Conductive) |
|-----------------------------|-----|----------------|-----------------|
| Max. voltage (V)            | 250 | 250            | 250             |
| Max. current (A)            | 15  | 0.25           | 15              |

**Figure 1. Switching function**

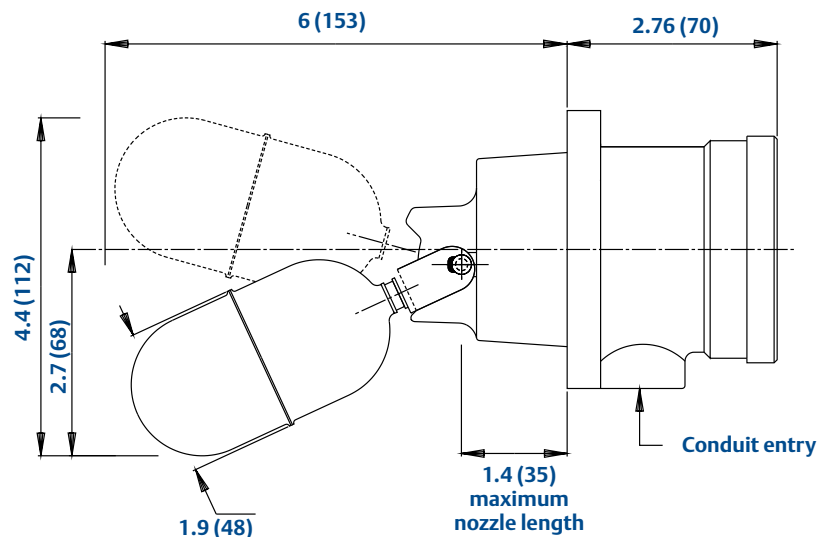


**NO (Normally Open) is made on a falling level.  
NC (Normally Closed) is made on a rising level.**

# Dimensional Drawings

## M-Switch dimensions

Note: Dimensions are in inches (mm).



## Mobrey 'A' and 'D' flange dimensions

Note: See Table 4 for dimensions.

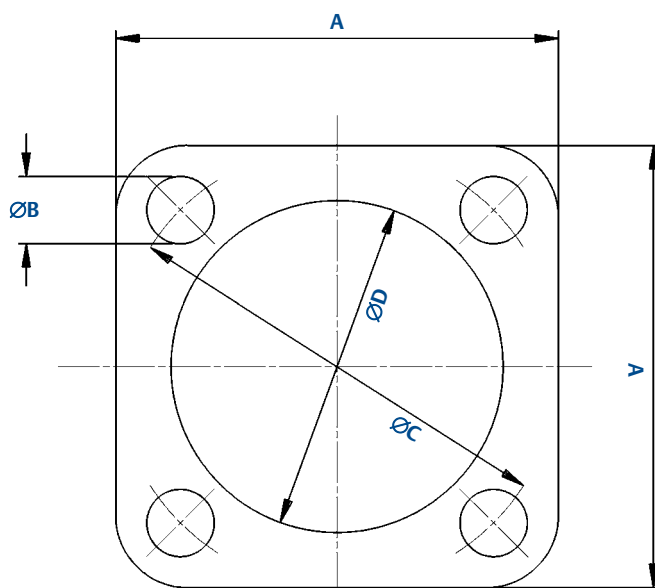


Table 4. Mobrey flange dimensions<sup>(1)</sup>

| Mobrey Flange     | A        | B         | C        | D <sup>(2)</sup> |
|-------------------|----------|-----------|----------|------------------|
| Mobrey 'A' Flange | 3.6 (92) | 0.55 (14) | 3.6 (92) | 2.6 (66)         |
| Mobrey 'D' Flange | 3.6 (92) | 0.35 (9)  | 3.3 (83) | 2.0 (50)         |

(1) Dimensions are in inches (mm)

(2) Mounting hole diameter D to be  $\pm 0.4$  in. (1 mm).

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