

## Level Switch Series

### Floating Roof Tank Alarm Switch

Series: D

#### Key Features

- Unique 3 magnet latching switch mechanism
- No spring in switching mechanism
- Based on the highly reliable and popular mechanism used for liquid level switches with long trouble-free operation background
- Secondary switch for safety installation in case of failing of the first contact

#### Series Overview

This Mobrey switch is designed specifically for use on floating roof tanks to signal an alarm if the roof rises too high

Operation is based on the popular Mobrey switching mechanism. In the basic construction, a dead weight is suspended on a cable attached to the extension spring of a switch head. Attached to the bottom of the spring is a vertical rod which carries a magnet that sits below a switching mechanism in the switch head.

As the floating roof rises and comes into contact with the dead weight, the extension spring contracts to lift the rod magnet in the support tube. As the rod magnet passes the switching mechanism, it interacts with the mechanism magnets and drives the contacts to change-over.

It is also available for applications where there can be liquid on the floating roof. A displacer element is fitted instead of the dead weight, to detect the liquid and prevent an overspill. As the liquid rises to cover the displacer element, a buoyancy force is created equal to the displaced liquid weight.

This force is seen by the spring as a weight reduction, causing the spring to contract to lift the rod magnet inside the support tube and actuate the switch mechanism. On a falling liquid level, the displacer element is uncovered and the spring extends to move the rod magnet and reset the switch mechanism. The displacer element has a flat end to ensure it still engages with the floating roof, in the same manner as the dead weight, even when there is no liquid present.

#### Other products

Other products we can offer :

- horizontal and vertical level switches



#### Product applications

- High level alarms on float roof tanks
- Dry roof or wet roof (liquids above the roof) applications

#### How can we help you?

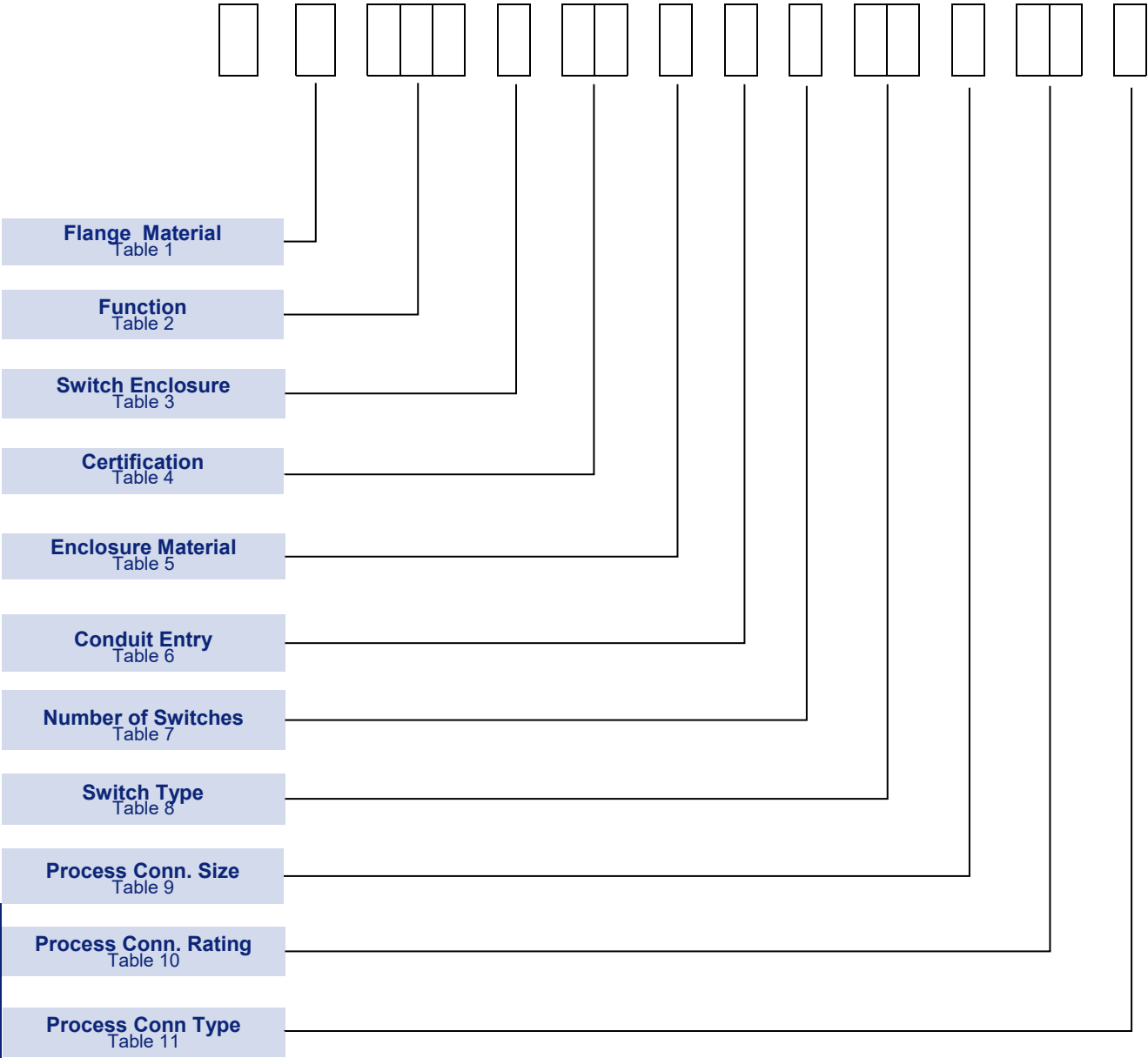
Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at [www.delta-mobrey.com](http://www.delta-mobrey.com) to find your local support centre or call us on:

**+44 (0)1252 729140**

How to order

Instruments can be configured by selecting codes representing the desired features from the tables that follow.

The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



## Flange Material

TABLE 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
Carbon Steel												C	
316L Stainless Steel												S	

## Function

TABLE 2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
Floating roof detection (dry)												20D	
Floating roof and overflow detection (wet)												21D	

## Switch Enclosure

TABLE 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
150mm (fits up to 4 switch mechanism)												S	

## Certification

TABLE 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
ATEX/IECEX Flameproof												KN	

## Enclosure Material

TABLE 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
Aluminium Alloy												A	
Cast Iron												I	

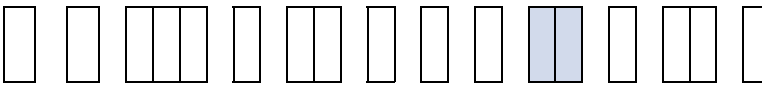
## Conduit Entry

TABLE 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
1 in. NPTF												A	
20mm Thread												B	

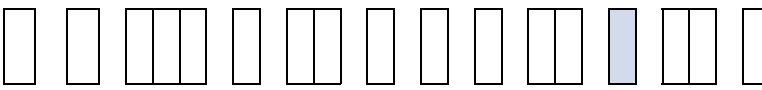
## Number of Switch Mechanisms

TABLE 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Description												Code	
One Switch												1	
Two Switches												2	

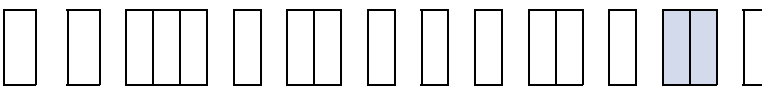
## Switch Mechanism

TABLE 8	
Description	Code
4 Contact : 2 x SPST, General purpose switch mechanism	<b>D4</b>
4 Contact : 2 x SPST, Gold plated contacts for low power (e.g. Intrinsically Safe) circuits	<b>P4</b>
4 Contact : 2 x SPST, High current switch mechanism	<b>X4</b>
4 Contact : 2 x SPST, Hermetically sealed in inert gas and gold plated contacts	<b>H4</b>
8 Contact : DPDT, General purpose switch mechanism	<b>D8</b>
8 Contact : DPDT, Gold plated contacts for low power (e.g. Intrinsically Safe) circuits	<b>P8</b>
8 Contact : DPDT, High current switch mechanism	<b>X8</b>
8 Contact : DPDT, Hermetically sealed in inert gas and gold plated contacts	<b>H8</b>

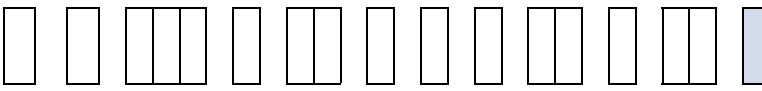
## Process Connection Size

TABLE 9	
Description	Code
1 in. / 25mm	<b>1</b>
3 in. / 80mm	<b>3</b>
4 in. / 100mm	<b>4</b>

## Process Connection Rating

TABLE 10	
Description	Code
ASME B 16.5 class 150	<b>AA</b>
ASME B 16.5 class 300	<b>AB</b>
ASME B 16.5 class 600	<b>AC</b>
NPT Thread, 316 Stainless Steel	<b>NN</b>

## Process Connection Type

TABLE 11	
Description	Code
Raised Face (RF) Flange	<b>R</b>
NPT Thread, 316 Stainless Steel	<b>N</b>

## Special Engineering

Our company can evaluate customized constructions according to specific requirements and special applications. Please contact your sales team for further information.

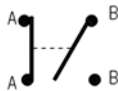
## Technical Specification

Explosion Proof enclosure type "S" suitable for up to 2 switching mechanism



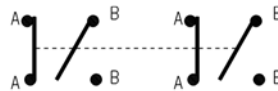
### Electric contacts

4 Contact types: D4, X4, P4, H4



2 × independent SPST  
AA make on rise: BB Make on fall

8 Contact types: D8, X8, P8, H8



Double pole double throw (4 × independent SPST)  
AA make on rise, BB make on fall

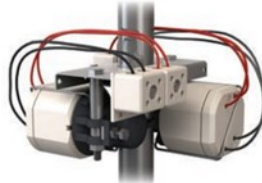
4-contact types D4, X4, and P4  
(unsealed, single switch):



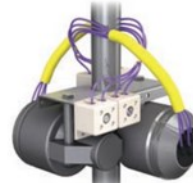
4-contact type H4  
(hermetically-sealed, single switch):



8-contact types D8, X8, and P8  
(unsealed, two switches):



8-contact type H8  
(hermetically-sealed, two switches):



Type	Max wet-side temperature	Low Temperature use	AC maximum values			DC maximum values			
			VA	Volts	Amps	Watts	Volts	Resistive Amps	Inductive Amps
D4 or D8	400 degC	No	2000	440	5	50	250	5	0.5
X4 or X8	250 degC	No	2000	440	10	50	250	10	0.5
P4 or P8	400 degC	No	6	250	0.25	3.6	250	0.25	0.1
H4 or H8	250 degC	-50 degC	2000	440	5	50	250	5	0.5

**Electrical entry**

1" NPTF or 20mm thread according to table 6

**Paint finish**

black stove paint

**Operating temperature**

see table above

**Contact type and rating**

see table above

**Enclosure**

NEMA 7 / IP66

**Process Connection**

see options on table 9, 10 and 11

## Approvals

### EUROPEAN DIRECTIVES



#### **Low voltage Directive (LVD) 2014/35/EU.**

Compliant to LVD

#### **Pressure Equipment Directive (PED) 2014/68/EU:**

This product has a process connection size  $\leq$ DN25 and is therefore categorised as Sound Engineering Practice (SEP) under Article 4.3

#### **ATEX Directive 2014/34/EU**

FLAMEPROOF

Certificate No. Sira 03ATEX1189X



II 1/2G Ex d IIC T6...T1 Ga/Gb (-50 °C  $\leq$  Ta  $\leq$  60 °C)

### GLOBAL CERTIFICATION

#### **IECEX Certified**

FLAMEPROOF

Certificate No. IECEX SIR 09.0038X

Ex d IIC T6...T1 Ga/Gb (-50 °C  $\leq$  Ta  $\leq$  60 °C)

#### **Factory Mutual (FM) approval:**



EXPLOSION-PROOF/DUST IGNITION-PROOF

Certificate No. FM19US0147X

Class I, Div 1, Groups B, C, and D

Class II/III, Div 1, Groups E, F, and G

Class I, Zone 0/1, AEx d IIC, (-50 °C  $\leq$  Ta  $\leq$  60 °C); Type 4, IP66



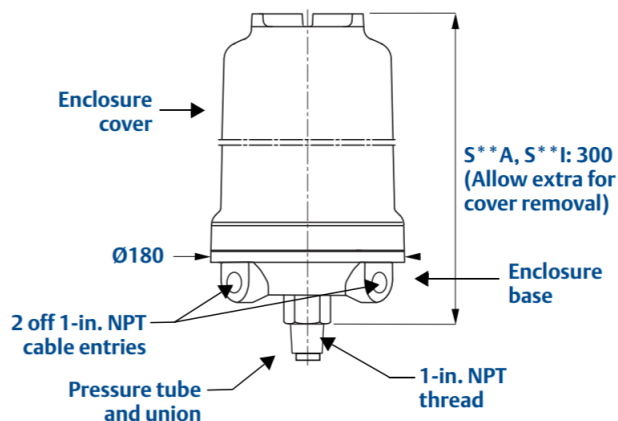
#### **CSA approval:**

EXPLOSION-PROOF

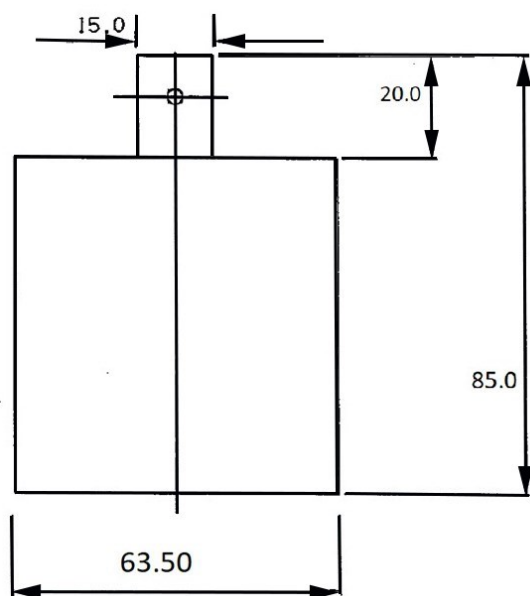
Class 1, Div 1, Groups B, C, and D; Encl 4

## Dimensions

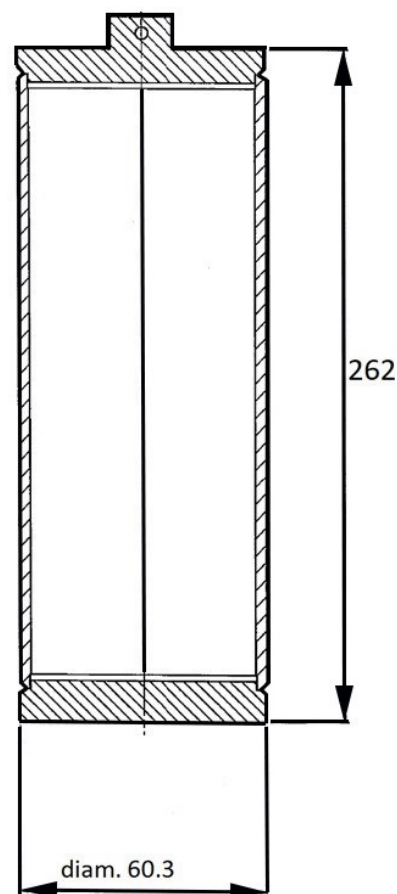
Enclosure type S in Aluminium (code A) or Cast Iron (code I)



Dead weight float for roof detection (function 20D)



Displacer float for overflow detection (function 21D)



*In the interest of development and improvement Delta Mobrey Ltd, reserves the right to amend, without notice, details contained in this publication. No legal liability will be accepted by Delta Mobrey Ltd for any errors, omissions or amendments.*

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ISO9001

FM00720