

# Mobrey magnetic level switches

for liquid level alarm and pump control duties



**mobrey**

  
**EMERSON**  
Process Management

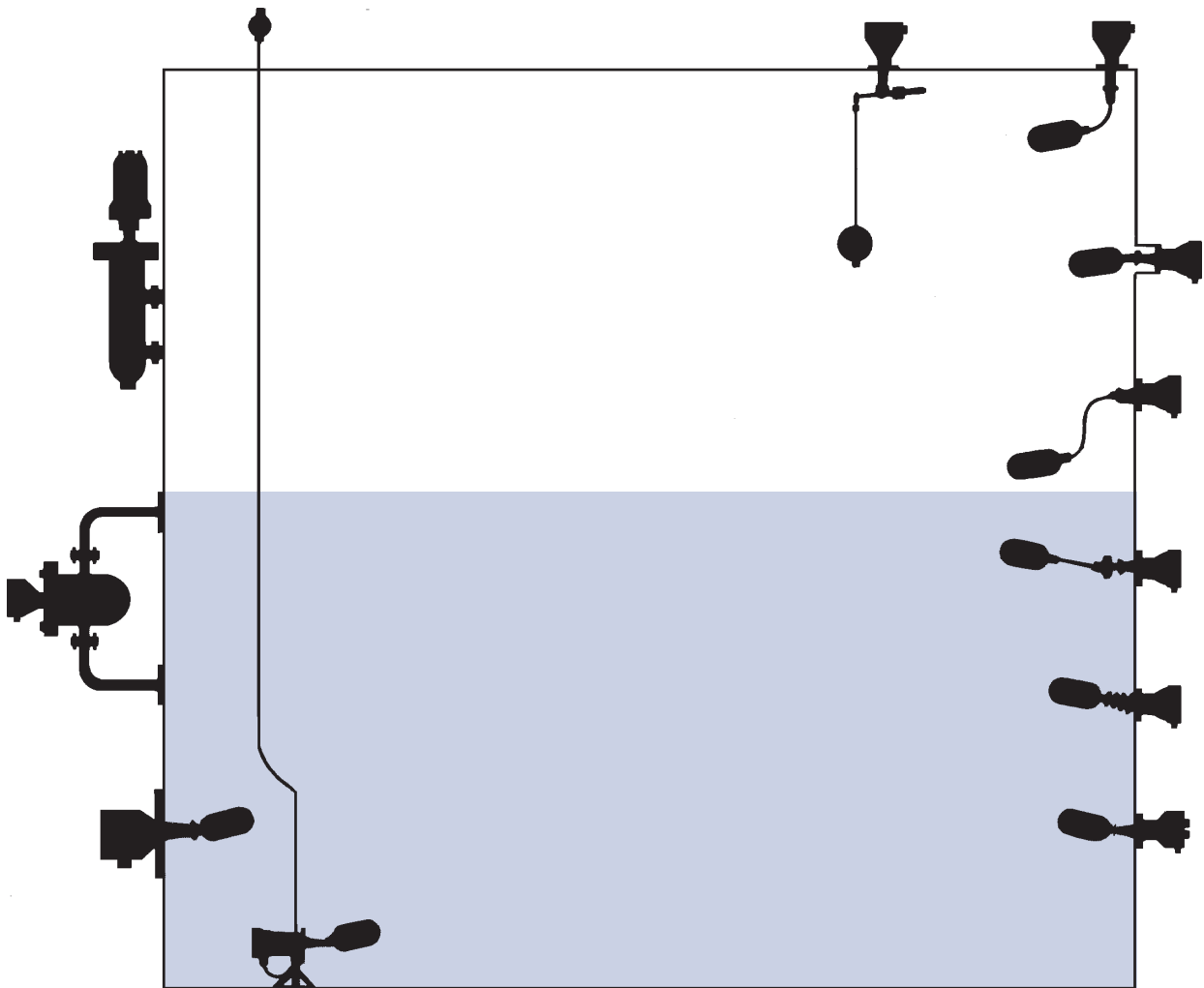
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**sira**  
Certification Service



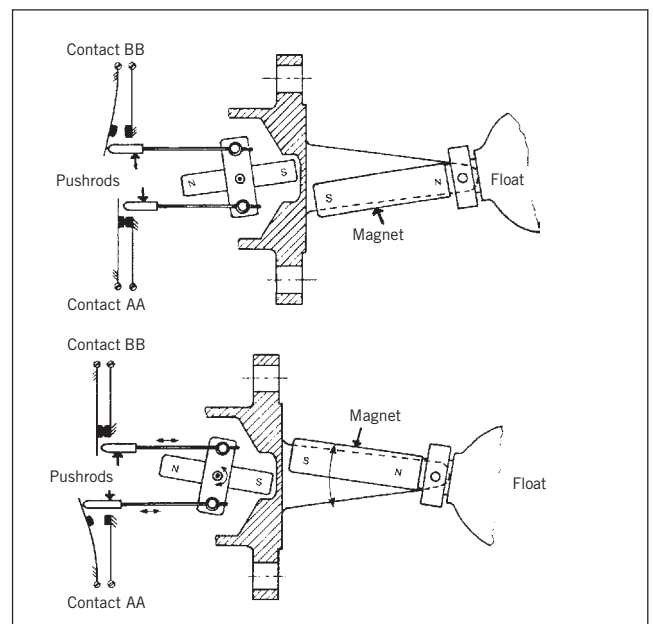
## The complete Mobrey horizontal float switch range



### Operation

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 or air pilot valve so that the adjacent poles of the two magnets repel each other through a non-magnetic diaphragm. 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 give the snap action operation.

Switching is accomplished by the angular movement of the switch magnet being used to operate "push-rods". These rods bear on contact blades and break one set of contacts whilst allowing the other set to make. The benefit of this arrangement is that contact force is independent of the magnet.



## Switch selection

### Alarm switching - Electrical or Pneumatic

#### Horizontal or vertical:

High or low alarm switches are of robust construction, making them ideal for a wide range of liquids in industrial applications.

#### Dirty liquid applications:

The shrouded model should be specified, thus eliminating fouling of the float movement due to deposits or large particles becoming wedged.

#### Viscous liquids

Cranked arm float units should be specified to enable the operating mechanism to be kept clear of the liquid. Rod extensions shaped to individual requirements are available to fit all Mobrey level switches.

#### Submersion:

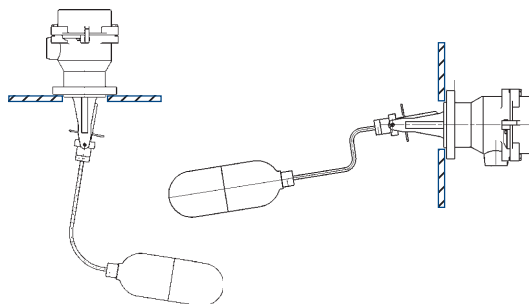
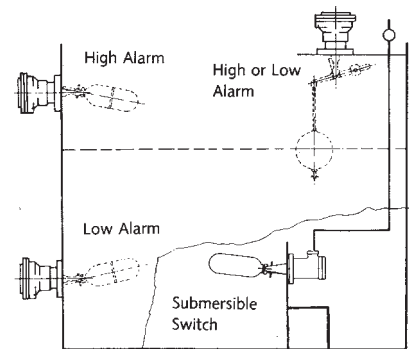
For those applications where the equipment may be subject to occasional or continuous submersion the submersible model should be specified.

#### Hoseproof marine applications:

Switches have been specifically designed for the requirements of these markets & approval authorities, (for details of approvals contact the factory).

#### Vacuum applications:

All metallic floats are capable of operating in full vacuum conditions.



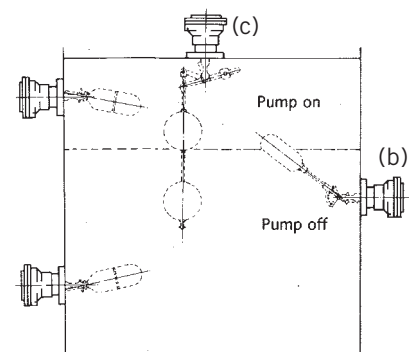
### Pump control - Electrical or Pneumatic

#### Horizontal mounting:

- (a) Horizontal large differential, two switches are used to control the pump for emptying or filling requirements.
- (b) Horizontal limited differential, (555mm maximum) can be controlled with one switch and a variable differential float unit.

#### Vertical mounting:

- (c) Vertical variable differential, controlled by using one switch vertically mounted and the appropriate adjustable variable differential vertical float unit.



### Low temperature applications

Mobrey level switches are suitable for below 0°C applications.

Standard switch mechanisms type D, P, D6, P6 may be specified for low temperature duty down to -30°C ambient and wet side, except in flameproof switches, when H6 must be specified, allowing use down to -60°C.

**Note:** If the wet side temperature remains below that of the switch enclosure for any extended period, then there is the possibility of gradual build up of frozen condensation. This is due to the breathing which will naturally occur through any degree of enclosure protection (IP67 or less) and will eventually impair the correct movement of the operating magnet.

To prevent this, we strongly recommend the use of the hermetically sealed switch mechanism type H6, B6, suitable for use down to -60°C ambient.

#### Gasket Materials:

Mobrey switches with flanges ANSI Class 600, Class 900 and BS EN 1092-1 PN64 are fitted with spiral wound non-asbestos filled gaskets rated to 400°C.

All other switches are fitted with non-asbestos sheet material gaskets to BS 7531 Grade X, which has upper temperature limits of 250°C for gas, vapour & steam, and 440°C for liquids. If the switch will experience gas vapour or steam temperatures above 250°C, then a suitable alternative gasket must be fitted.

#### Cable gland:

A cable gland is supplied in the box with the S01DB, S179, Mini-switch, and S36 range.

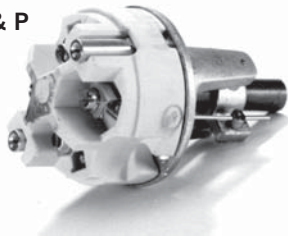
It is a brass cable gland, nickel plated, with a fully insulated neoprene seal and with clamping range to suit 8mm to 13mm OD cable.

The cable gland has type IP68 protection to 5m head of water (0.5 bar), and maximum 80°C as a permanent temperature on application. For submersible switches in applications greater than 5m (0.5 bar) submersion, the fitting and testing of customer supplied cable and gland is the customer's responsibility.

## Choice of switch mechanisms

### Electrical

Type D & P

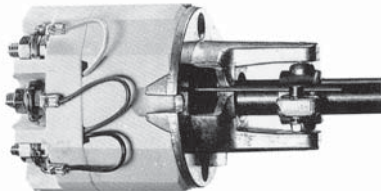


#### Type D

For alternative make and break circuits.

**Function:** 2 independent single pole single throw contact sets: "Snap Action". May be wired S.P.C.O. on site.

Type D6 & P6



#### Type D6

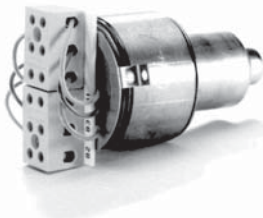
For switching two independent circuits.

**Function:** Double pole change over (2 independent circuits): "Snap Action".

#### Type P & P6

As type D & D6 but with gold plated contacts for switching low power (e.g. intrinsically safe) electrical circuits.

Type H6 & B6



#### Type H6

For use in corrosive area and/or low temperature applications. As type D6 but with gold plated contacts and all moving parts housed in an inert gas filled hermetically sealed enclosure.

#### WARNING

The plating of gold contact switches may be permanently damaged if this mechanism is used to switch circuits above the following limits:

|       |                      |
|-------|----------------------|
| 300V: | 12mA Resistive       |
| 24V:  | 2mH/200mA Inductive  |
| 24V:  | 250mA Resistive      |
| 24V:  | 750mH/10mA Inductive |

#### LVD - Low Voltage Directive

Standards applied: EN60947 Parts 1 and 5.1

### Rating

| Mechanism Type   |                | D & D6                                     | P & P6      | H6 & B6           |
|------------------|----------------|--------------------------------------------|-------------|-------------------|
| Contact material |                | Fine silver                                | Gold plated | Gold plated       |
| Temp.            | Medium         | -30°C to + 400°C                           |             | -100°C to + 250°C |
|                  | Ambient        | -30°C to + 70°C                            |             | -60°C to + 70°C   |
| Insulation Value |                | (live to earth) > 100 MEG OHM              |             |                   |
| Terminals        | D,P            | M4 screws with non-rotational clamp plates |             |                   |
|                  | D6, P6, H6, B6 | 6 way terminal block with pressure plates  |             |                   |

|                | AC                   | DC Inductive | DC Resistive |
|----------------|----------------------|--------------|--------------|
| Max. Voltage V | 440                  | 240          | 240          |
| Max. Current A | 5.0*                 | 1.0          | 2.0          |
| Max. Power     | 2000VA               | 35 Watts     | 70 Watts     |
|                | Power factor 0.4 Min | Time         |              |

\* Note : Max. current for Type D is 8.0A up to 210°C

### Pneumatic

Type AP & AM



#### Type AP

For switching air circuits.

**Function:** Change over.

#### Air pressure

Max. air pressure through valve: 7 bar (100psi). Max. air flow through valve: 66 litres/min at 7 bar. Air must be clean and dry. Nominal leakage rate 0.2%.

#### Connections

Brass compression couplings to suit 6.0mm copper or nylon pipe (coupling thread ¼" BSP).

#### Type AM

For modulating air controlled circuits.

**Function:** Continuous modulation.

#### Air pressure

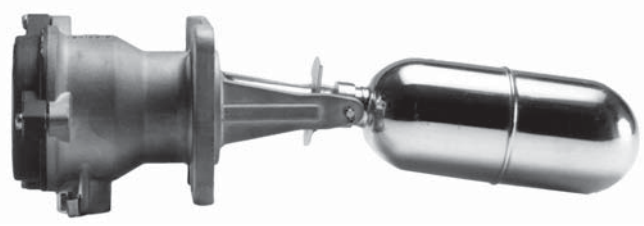
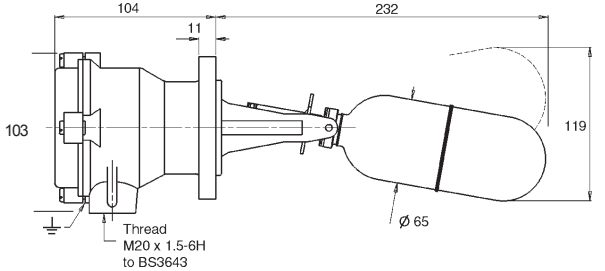
Max. air pressure through valve: 1.4 bar (20psi).  
Modulation: linear: 0 bar to 1.4 bar  
0.2 bar to 1.4 bar available on request

#### Temperature

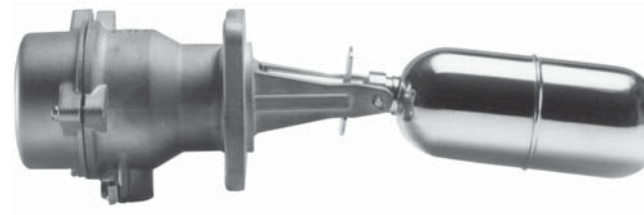
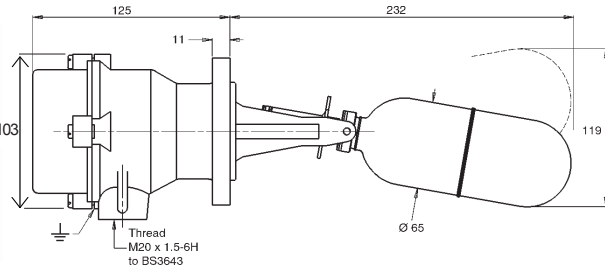
Medium +1°C + 400°C  
Ambient +1°C + 60°C  
Lower ambient temp. can be tolerated provided the air supply is 100% dry.

## General purpose applications

### Aluminium bronze wetside models

**S01DB/F84     4 Contact switch**

**S01D6B/F84     6 Contact switch**

**Weatherproof to EN60529 : - IP66**

### Specifications

| Electrical models                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Enclosure &amp; wetside:</b><br><b>End cap     Short</b><br><b>End cap     Long</b><br><b>Maximum temp:</b>       | Aluminium bronze to BS1400 - AB1 max. iron content 2.5%<br>e.g. S01DB Aluminium BS1490 - grade LM24<br>e.g. S01D6B Brass BS1400 - DCB3<br>210°C except shrouded float. F93 = 180°C                                |
| Air pilot valve models                                                                                               |                                                                                                                                                                                                                   |
| <b>Enclosure:</b><br><b>Valve block:</b><br><b>Finish:</b><br><b>(air pilot valves only)</b><br><b>Maximum temp:</b> | Aluminium Alloy to BS 1490 : Grade LM24<br>Aluminium alloy to BS 1490 : Grade LM25<br>All external aluminium surfaces are chromate phosphate treated then externally painted.<br><br>See page 5 for switch insert |

Maximum temperature : dependent upon switch mechanism, gasket and gland - see pages 4 and 5

### Approvals

|                                                                                                                                                                  |                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>UK</b><br><b>Germany</b><br><b>Canada</b><br><b>USA</b><br><b>France</b><br><b>Italy</b><br><b>Russia</b><br><b>Norway</b><br><b>Finland</b><br><b>Poland</b> | Lloyds Register of Shipping<br>Germanischer Lloyd, TÜV<br>CSA<br>ABS<br>BV<br>RINA<br>RM<br>DNV<br>SAL<br>UDT |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|

Other approvals available. Please contact us with your requirements.

## Ordering Information

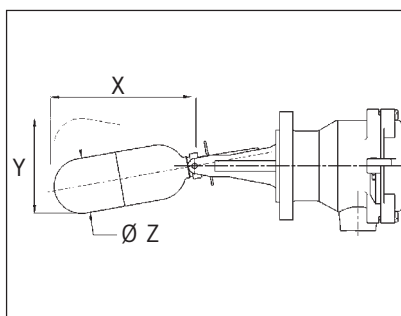
| Code | General purpose aluminium bronze wetside models |                                                                                                                                                                                                                              |                                                                                                |
|------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| S    | Switch                                          |                                                                                                                                                                                                                              |                                                                                                |
|      | Code                                            | Flange (Head)                                                                                                                                                                                                                |                                                                                                |
|      | 01                                              | Size                                                                                                                                                                                                                         | Rating      Standard                                                                           |
|      |                                                 | Mobrey A                                                                                                                                                                                                                     | 18 bar      Mobrey                                                                             |
|      | Code                                            | Switch mechanism                                                                                                                                                                                                             |                                                                                                |
|      | DB<br>PB<br>D6B<br>P6B<br>APA<br>AMA            | 4 Contact - general ⇒ short end cap<br>4 Contact - gold plated contacts ⇒ short end cap<br>6 Contact - general ⇒ long end cap<br>6 Contact - gold plated contacts ⇒ long end cap<br>Pneumatic on/off<br>Pneumatic modulating |                                                                                                |
|      |                                                 | CODE                                                                                                                                                                                                                         | Float - application information                                                                |
|      |                                                 | F84                                                                                                                                                                                                                          | High or low alarm or 2 off                                                                     |
|      |                                                 | F185                                                                                                                                                                                                                         | for pump control wide differential                                                             |
|      |                                                 | F68/+<br>F264                                                                                                                                                                                                                | Horizontal pump control<br>Horizontal limited differential                                     |
|      |                                                 | F21/+                                                                                                                                                                                                                        | Vertical: pump control or alarm                                                                |
|      |                                                 | F104/+                                                                                                                                                                                                                       | Cranked arm vertical or horizontal ( See page 19 for arm lengths)                              |
|      |                                                 | F93                                                                                                                                                                                                                          | Shrouded for dirty liquids    Silicone rubber gaiter with 316 stainless steel shroud and float |
| S    | 01                                              | DB / F84                                                                                                                                                                                                                     | Typical ordering information                                                                   |

+ Refer to pages 18, 19 & 20 for technical float details and length options  
Refer to page 14 for nozzle and stud lengths.

### Switch / Float combination chart

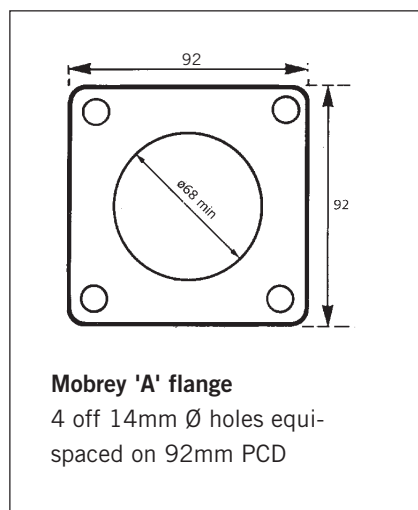
|       | S01 |
|-------|-----|
| F84   | ★   |
| F185  | ★   |
| F68/+ | ★   |
| F264  | ★   |
| F21/+ | ★   |
| F104  | ★   |
| F93   | ★   |

★ Preferred combination



This is the most popular switch in the Mobrey range. Its size and robust construction make it ideal for a wide range of general purpose and industrial applications such as pump control and high or low level alarm on tanks and pressure vessels. The dimensions for the float in the diagram left can be found on fold out page 20.

### Flange dimensions

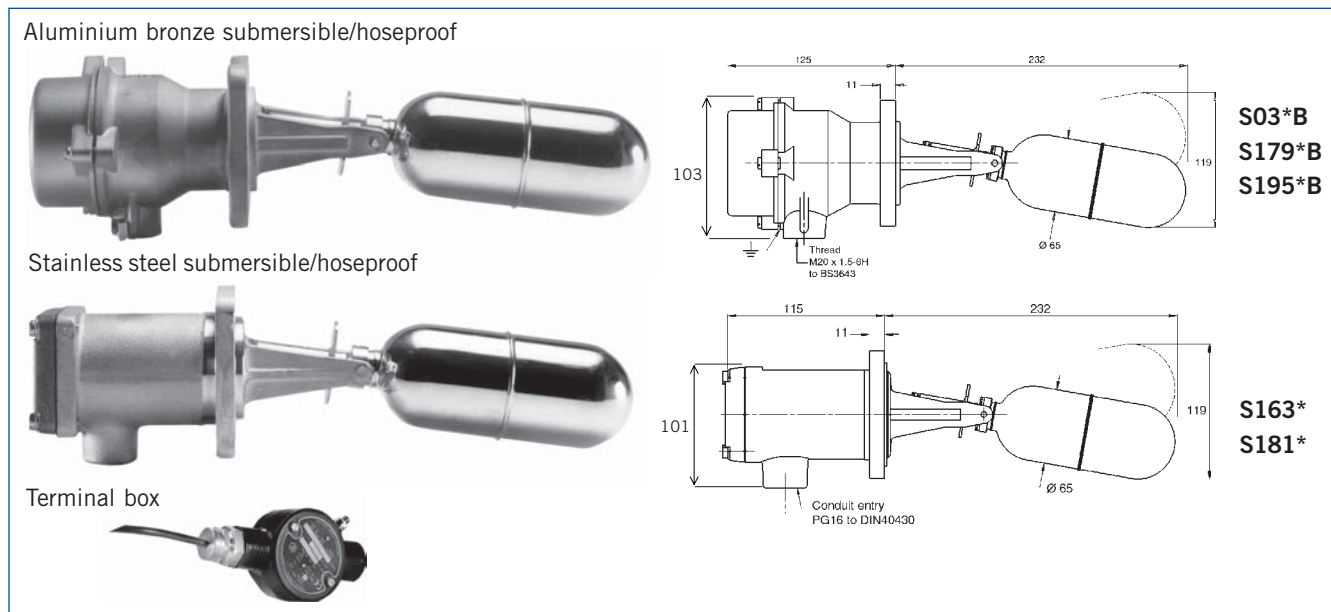


### Stock availability

| Models available from stock |                                                                                                                 |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------|
|                             | S01DB/F84<br>S01DB/F185<br>S01DB/F93<br>S01DB/F68/1<br>S01DB/F68/4<br>S01DB/F21/1<br>S01DB/F21/2<br>S01DB/F21/3 |

## Marine applications

### Submersible - Hoseproof - Marine



### Specifications

| Aluminium bronze wetside models |                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------|
| Enclosure & wetside:            | Aluminium bronze to BS1400 - AB1 max. iron content 2.5%                                       |
| End cap                         | Brass BS1400 - DCB3                                                                           |
| Maximum temp:                   | 210°C except shrouded float. F93 = 180°C                                                      |
| Stainless steel wetside models  |                                                                                               |
| Enclosure & wetside:            | Type 316 Stainless steel                                                                      |
| Endcap :                        | Aluminium bronze BS1400 AB1/C                                                                 |
| <b>Cable specification</b>      | 3m standard where fitted. Longer lengths available upon request up to max. submersion depths. |
| <b>MICC</b>                     | Temperature limit 80°C<br>600V light duty grade mineral insulated copper clad cable.          |
| <b>CSP</b>                      | Temperature limit 50°C<br>600/1000V grade ethylene-propylene rubber insulated flexible cable. |

Maximum temperature : dependent upon switch mechanism and gasket - see pages 4 and 5

### Marine Approvals

|                                                                      |
|----------------------------------------------------------------------|
| Lloyds Register of Shipping                                          |
| Germanischer Lloyd                                                   |
| CSA                                                                  |
| DNV                                                                  |
| ABS                                                                  |
| BV                                                                   |
| RINA                                                                 |
| RM                                                                   |
| SAL                                                                  |
| UDT                                                                  |
| Other approvals available. Please contact us with your requirements. |

| Aluminium bronze wetside/enclosure models |             |                  |             |             |                 |
|-------------------------------------------|-------------|------------------|-------------|-------------|-----------------|
| Type No.                                  | Duty        | Head I.P. rating | Max temp °C | Cable       | T box IP rating |
| S03                                       | Submersible | 68 (30m)         | 210†        | MICC (3m)   | 44              |
| S179                                      | Hoseproof   | 66★              | 210         | None fitted | -               |
| S195                                      | Submersible | 68 (30m)         | 210†        | CSP (3m)    | 44              |
| Stainless steel wetside/enclosure models  |             |                  |             |             |                 |
| S163                                      | Submersible | 68 (30m)         | 210†        | MICC (3m)   | 44              |
| S181                                      | Hoseproof   | 66★              | 210         | None fitted | -               |

\* May be submerged to 30m head of water with temperatures between 1°C and 100°C.

Fitting and testing of customers supplied cable and gland is the customer's responsibility.

† Totally submerged applications.

## Ordering Information

| Code | General purpose, submerisble, hoseproof & marine applications |                                                                               |                                                                                       |        |          |
|------|---------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------|----------|
| S    | Switch                                                        |                                                                               |                                                                                       |        |          |
|      | Code                                                          | Flange (head)                                                                 | Size                                                                                  | Rating | Standard |
|      | 03                                                            | Mobrey A                                                                      |                                                                                       | 18 bar | Mobrey   |
|      | 179                                                           | Mobrey A                                                                      |                                                                                       | 18 bar | Mobrey   |
|      | 195                                                           | Mobrey A                                                                      |                                                                                       | 18 bar | Mobrey   |
|      | 163                                                           | Mobrey A                                                                      |                                                                                       | 18 bar | Mobrey   |
|      | 181                                                           | Mobrey A                                                                      |                                                                                       | 18 bar | Mobrey   |
|      | Code                                                          | Switch mechanism                                                              |                                                                                       |        |          |
|      | D                                                             | 4 contact - general                                                           |                                                                                       |        |          |
|      | P                                                             | 4 contact - gold plated contacts                                              |                                                                                       |        |          |
|      | D6                                                            | *6 contact - general                                                          |                                                                                       |        |          |
|      | P6                                                            | *6 contact - gold plated contacts                                             |                                                                                       |        |          |
|      |                                                               | * Note: not for use with stainless steel wetside/enclosure models S163 & S181 |                                                                                       |        |          |
|      | Code                                                          | Enclosure housing                                                             |                                                                                       |        |          |
|      | B                                                             | Aluminium bronze: no code letter with S163 or S181 stainless steel models     |                                                                                       |        |          |
|      |                                                               | Code                                                                          | Float - application information                                                       |        |          |
|      |                                                               | F84                                                                           | General purpose high or low alarm<br>or 2 off for pump control                        |        |          |
|      |                                                               | F185                                                                          |                                                                                       |        |          |
|      |                                                               | F98                                                                           |                                                                                       |        |          |
|      |                                                               | F68/+                                                                         | Horizontal pump control                                                               |        |          |
|      |                                                               | F21/+                                                                         | Vertical pump control or alarm                                                        |        |          |
|      |                                                               | F264                                                                          | Horizontal limited differential                                                       |        |          |
|      |                                                               | F104+                                                                         | Cranked arm vertical or horizontal                                                    |        |          |
|      |                                                               | F93                                                                           | Shrouded for use with dirty liquids, silicone rubber gaiter with 316SS shroud & float |        |          |

S03DB / F84

Typical ordering information

+ refer to pages 18, 19 and 20 for technical float details and lengths options.  
Refer to page 14 for nozzle and stud lengths.

## Switch/float combination chart

| S<br>No. | S03 | S163 | S179 | S181 | S195 |
|----------|-----|------|------|------|------|
| F<br>No. |     |      |      |      |      |
| F84      | ★   | ★    | ★    | ★    | ★    |
| F185     | ★   |      | ★    |      | ★    |
| F98      |     | ★    |      | ★    |      |
| F68/+    | ★   | ★    | ★    | ★    | ★    |
| F21/+    | ★   | ★    | ★    | ★    | ★    |
| F264     | ★   | ★    | ★    | ★    | ★    |
| F104/+   | ★   | ★    | ★    | ★    | ★    |
| F93      | ★   |      | ★    |      | ★    |

Shrouded floats type F93 may be fitted to any of the aluminium bronze wetside switches type S03, S179 & S195.

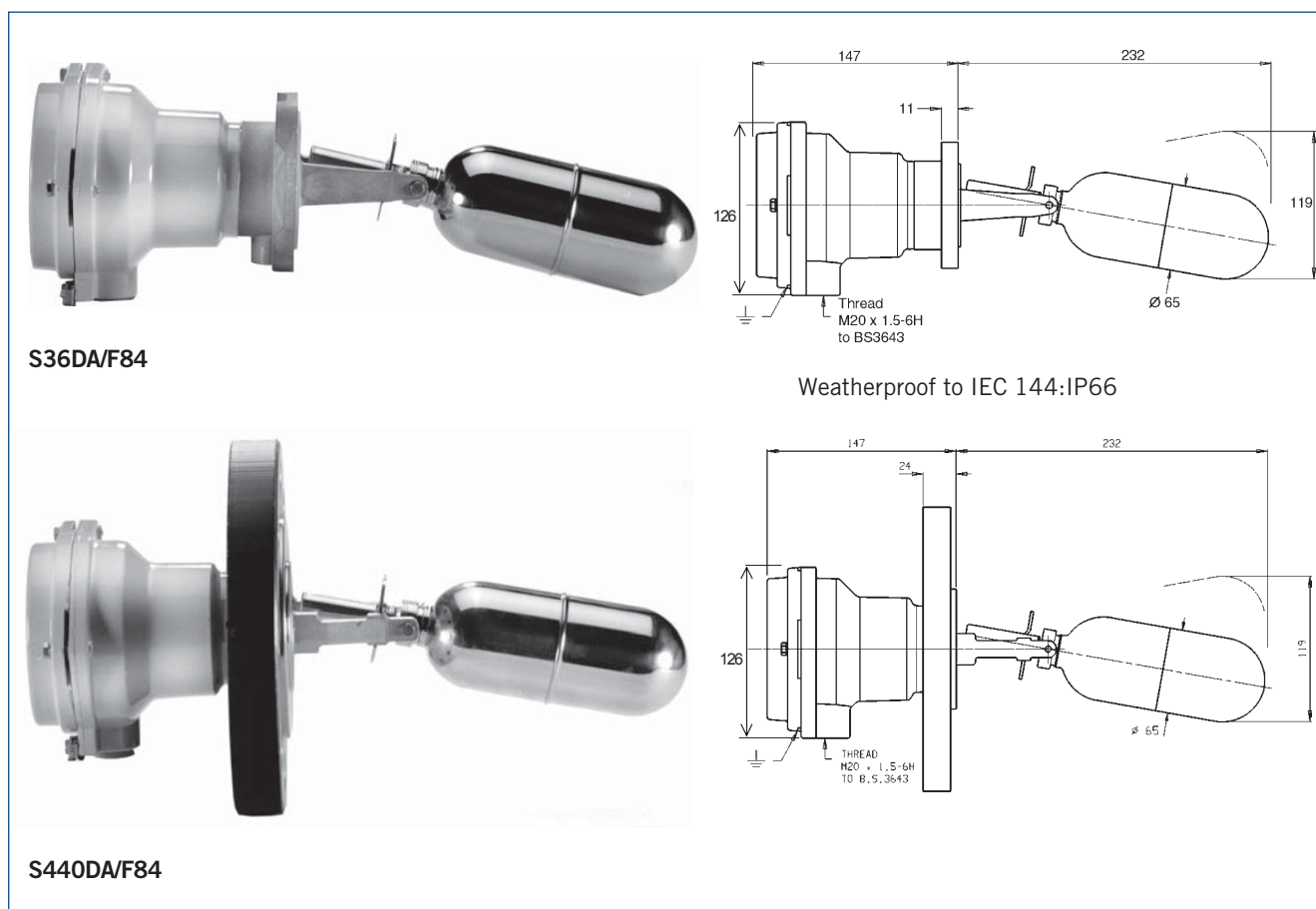
Shrouded floats for stainless steel switches S163 & S181 are available only on request.

## Stock availability

| Models available from stock | Hoseproof                                                             | Submersible                                                                   |
|-----------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------|
|                             | S179DB/F84<br>S179DB/F185<br>S179DB/F93<br>S179DB/F104/1<br>S181D/F84 | S03DB/F84<br>S03DB/F185<br>S03DB/F93<br>S195DB/F93<br>S195DB/F84<br>S163D/F84 |

## General purpose applications

### Stainless steel wetside models



### Specifications

| Electrical models           |                                                                                                                                                                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Back flange (where fitted)  | Carbon steel to BS 1501: 224 Grade 430B LT50. This material has guaranteed properties at both high (400°C) and low (-50°C) temperatures. Painted surfaces are stove paint finish. All unpainted surfaces are corrosive protected. |
| Wetside material            | Stainless steel to type 316 to Mobrey standard                                                                                                                                                                                    |
| Enclosure housing material: | Stainless steel type 316S33 (S489 & S490 models only)                                                                                                                                                                             |
|                             | Aluminium alloy to BS1490: Grade LM24                                                                                                                                                                                             |
| Air pilot valve models      |                                                                                                                                                                                                                                   |
| Valve block                 | Aluminium alloy to BS 1490: Grade LM25 - chromate phosphate treated.                                                                                                                                                              |
| Finish:                     | All surfaces are chromate phosphate treated then externally stove painted.                                                                                                                                                        |

Maximum temperature dependent on switch mechanism, gasket and gland - see pages 4 and 5

### Approvals

|                             |
|-----------------------------|
| Lloyds Register of Shipping |
| Germanischer Lloyd          |
| CSA                         |
| DNV                         |
| ABS                         |
| RM                          |
| SAL                         |
| UDT                         |

### Stock availability

| Models available from stock | General purpose | S440DA/F84  |
|-----------------------------|-----------------|-------------|
|                             | S36DA/F84       | S36DA/F68/1 |
|                             | S36DA/F104/1    | S36DA/F68/4 |
|                             | S190DA/F93      | S36DA/F21/1 |
|                             | S428DA/F84      | S36DA/F21/2 |
|                             | S429DA/F84      | S36DA/F21/3 |

Other approvals available.  
Please contact us with your requirements.

### 3.1.1. Ordering information

| CODE | General purpose stainless steel wetside models |                                                                                            |          |                                     |
|------|------------------------------------------------|--------------------------------------------------------------------------------------------|----------|-------------------------------------|
| S    | Switch                                         |                                                                                            |          |                                     |
|      | CODE                                           | Flange (Head)<br>Size                                                                      | Rating   | Standard                            |
|      | 36                                             | Mobrey A                                                                                   | 33.8 bar | Mobrey                              |
|      | 190                                            | Mobrey A                                                                                   | 33.8 bar | Mobrey : Use float F93 only         |
|      | 440                                            | 3"                                                                                         | 150 RF   | To BS 1560<br>or<br>ASMEI<br>B 16.5 |
|      | 441                                            | 4"                                                                                         | 150 RF   |                                     |
|      | 424                                            | 3"                                                                                         | 300 RF   |                                     |
|      | 425                                            | 4"                                                                                         | 300 RF   |                                     |
|      | 489                                            | 3"                                                                                         | 600 RF   |                                     |
|      | 490                                            | 3"                                                                                         | 900 RF   |                                     |
|      | 428                                            | DN 65                                                                                      | PN 16    | BS EN 1092-1                        |
|      | 429                                            | DN 80                                                                                      |          |                                     |
|      | 430                                            | DN 100                                                                                     |          |                                     |
|      | 431                                            | DN 125                                                                                     |          |                                     |
|      | 432                                            | DN 150                                                                                     |          |                                     |
|      | 417                                            | DN 65                                                                                      | PN 40    | BS EN 1092-1                        |
|      | 418                                            | DN 80                                                                                      |          |                                     |
|      | 419                                            | DN 100                                                                                     |          |                                     |
|      | 433                                            | DN 125                                                                                     |          |                                     |
|      | 434                                            | DN 150                                                                                     |          |                                     |
|      | 488                                            | DN 80                                                                                      | PN 64    | BS EN 1092-1                        |
|      | 435                                            | DN 100                                                                                     |          |                                     |
|      | 436                                            | DN 125                                                                                     |          |                                     |
|      | 437                                            | DN 150                                                                                     |          |                                     |
|      | CODE                                           | Switch Mechanism                                                                           |          |                                     |
|      | D                                              | 4 Contact - General                                                                        |          |                                     |
|      | P                                              | 4 Contact - Gold Plated Contacts                                                           |          |                                     |
|      | D6                                             | 6 Contact - General                                                                        |          |                                     |
|      | P6                                             | 6 Contact - Gold Plated Contacts                                                           |          |                                     |
|      | H6                                             | 6 Contact - Hermetically Sealed                                                            |          |                                     |
|      | B6                                             | 6 Contact - Zone 2 Areas                                                                   |          |                                     |
|      | AP                                             | Pneumatic - On/Off                                                                         |          |                                     |
|      | AM                                             | Pneumatic - Modulating                                                                     |          |                                     |
|      | CODE                                           | Enclosure / Housing                                                                        |          |                                     |
|      | A                                              | Aluminium alloy                                                                            |          |                                     |
|      | CODE                                           |                                                                                            |          |                                     |
|      | F84                                            | General Purpose                                                                            |          |                                     |
|      | F96                                            | High alarm or                                                                              |          |                                     |
|      | F98                                            | Low Alarm or                                                                               |          |                                     |
|      | F106                                           | 2 off for Pump                                                                             |          |                                     |
|      | F107                                           | Control Wide, Differential                                                                 |          |                                     |
|      | F68/+                                          | Pump Control Horizontal                                                                    |          |                                     |
|      | F21/+                                          | Vertical : Pump Control or Alarm                                                           |          |                                     |
|      | F104/+                                         | Cranked Arm : Horizontal or Vertical                                                       |          |                                     |
|      | F88                                            | Interface Duty                                                                             |          |                                     |
|      | F93                                            | Shrouded for dirty liquids (S190 only) Silicone rubber gaiter with 316SS shroud and float. |          |                                     |
| S    | 36                                             | D                                                                                          | A        | / F84                               |

+ Refer to pages 18, 19 and 20 for technical float details and length options

Refer to page 14 for nozzle and stud lengths.

#### Switch/float combination chart

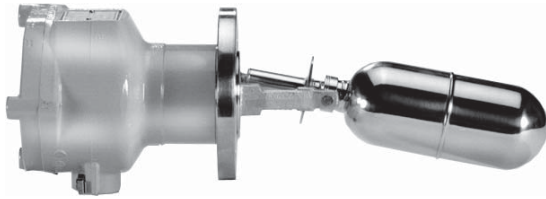
| S No.  | S36 | S190 | S417 | S418 | S419 | S424 | S425 | S428 | S429 | S430 | S431 | S432 | S433 | S434 | S435 | S436 | S437 | S440 | S441 | S488 | S489 | S490 |
|--------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| F No.  | S36 | S190 | S417 | S418 | S419 | S424 | S425 | S428 | S429 | S430 | S431 | S432 | S433 | S434 | S435 | S436 | S437 | S440 | S441 | S488 | S489 | S490 |
| F84    | ★   |      | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    |
| F96    | ●   |      | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ★    | ●    | ●    |
| F98    | ★   |      | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    |
| F106   | ●   |      | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ★    | ●    | ●    |
| F107   | ●   |      | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ★    | ★    |
| F68/+  | ★   |      | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    |
| F21/+  | ★   |      | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    |
| F104/+ | ★   |      | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    |
| F88    | ★   |      | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ●    | ●    |
| F93    |     | ★    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

Notes: ★ Preferred combination

● Non-preferred combination

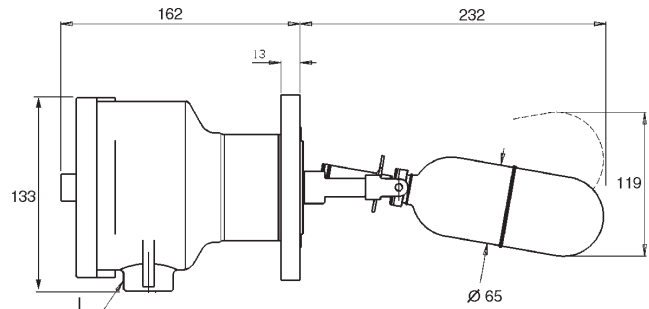
## Hazardous area applications

### Flame proof zone 1 gas group IIC models



#### S250DA/F84

Weatherproof to IEC 144: IP66



#### Conduit entry thread

Gunmetal body 25mm

Aluminium body 20mm

### Specifications

|                                       |                                                                                                                                                                                                                                                                                             |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Back flange<br/>(where fitted)</b> | Carbon steel to BS 1501 : 224 : Grade 430B LT50. This material has guaranteed properties at both high (400°C) and low (-50°C) temperatures. Painted surfaces are stove paint finish whilst all unpainted surfaces are corrosion protected.                                                  |
| <b>Wetside material</b>               | Stainless steel to type 316 to Mobrey standard<br>Stainless steel type 316S33 (S260 & S261 models only)<br>Max. working temp*: Aluminium body <b>400°C</b><br>Gunmetal body <b>350°C</b><br>Gunmetal to BS 1400: Grade LG2.<br>Max. working temp*: S275 <b>200°C</b>                        |
| <b>Enclosure/housing material</b>     | Aluminium alloy to BS1490: LM25<br>Finish is chromate phosphate treated and externally stove painted<br>Gunmetal to BS1400: LG2<br>Natural finish                                                                                                                                           |
| <b>Ambient temperatures below 0°C</b> | i) Down to -20° C<br>standard enclosure/housing codes A or G are suitable.<br>ii) Down to -60°C<br>Specify enclosure/housing codes AX or GX which are as standard but with ATEX certification to use to -60°C. Note : -50° C unless 'G' flange or low temperature back flange is specified. |

\*See page 4 for gasket temperature limits.

### Certification

| <b>Zone 1 Gas group IIC</b>                                                |                                                                                                               |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>SIRA / ATEX</b>                                                         | II 1/2 G, EExd IIC T6 (-20°C ≤ Ta ≤ +60°C)<br>Housing code AX or GX II 1/2G, EExd IIC T6 (-60°C ≤ Ta ≤ +60°C) |
| <b>P.T.B.</b>                                                              | Physikalish Technische Bundedsanstalt Certificate No. P.T.B. IIIB/S 1678. E Exd IIC T6 (Float in Zone 0)      |
| <b>C.S.A.</b>                                                              | Canadian Standards Association Guide No 184-N-90.8 File No. LR 12965 Class 1: Group CD                        |
| <b>S.A.A.</b>                                                              | Standards Association of Australia Certificate No. EX 186 Exd IIB T6.                                         |
| <b>L.R.S.</b>                                                              | Lloyds Register of Shipping Certificate No. 88/0226                                                           |
| <b>J.I.S.</b>                                                              | Certificate No. 39056 Code 3nG4                                                                               |
| Note:<br>CSA, SAA, PTB, GME certified products available to special order. |                                                                                                               |

## Ordering information

| CODE S | Switch for hazardous area applications, flameproof zone 1 gas group I and IIc models |                    |        |                                    |
|--------|--------------------------------------------------------------------------------------|--------------------|--------|------------------------------------|
|        | CODE                                                                                 | Flange (head) size | Rating | Wetside                            |
|        | 250                                                                                  | Mobrey G           | 21 bar | Stainless steel                    |
|        | 275                                                                                  | Mobrey G           | 21 bar | Gunmetal                           |
|        | 256                                                                                  | 3"                 | 150 RF | To BS 1560<br>or<br>ASME<br>B 16.5 |
|        | 257                                                                                  | 4"                 | 150 RF |                                    |
|        | 278                                                                                  | 6"                 | 150 RF |                                    |
|        | 251                                                                                  | 3"                 | 300 RF |                                    |
|        | 254                                                                                  | 4"                 | 300 RF |                                    |
|        | 260                                                                                  | 3"                 | 600 RF |                                    |
|        | 261                                                                                  | 3"                 | 900 RF |                                    |
|        | 253                                                                                  | DN 80              | PN40   | BS EN 1092-1                       |
|        | 255                                                                                  | DN 100             |        |                                    |
|        | 269                                                                                  | DN 125             |        |                                    |
|        | 272                                                                                  | DN 80              | PN 64  | BS EN 1092-1                       |
|        | 268                                                                                  | DN 100             |        |                                    |
|        | 270                                                                                  | DN 125             |        |                                    |
|        | 271                                                                                  | DN 150             |        |                                    |
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|        |                                                                                      |                    |        |                                    |
|        |                                                                                      |                    |        |                                    |

|   |     |   |   |   |     |                              |
|---|-----|---|---|---|-----|------------------------------|
| S | 251 | D | A | / | F96 | Typical ordering information |
|---|-----|---|---|---|-----|------------------------------|

+ Refer to pages 18, 19 and 20 for technical float details  
Refer to page 14 for nozzle and stud lengths.

## Switch/float combination chart

| F No.         | S No. | S250 | S275 | S256 | S257 | S278 | S251 | S254 | S260 | S261 | S253 | S255 | S269 | S272 | S268 | S270 | S271 |
|---------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| F84           |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F185          |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F98           |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F106          |       | ●    | ★    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ★    | ★    |
| F107          |       | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F68/+<br>F264 |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F21/+         |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F104/+        |       | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |
| F88           |       | ★    | ★    | ★    | ★    | ★    | ★    | ★    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ★    | ★    |
| F96           |       | ●    | ●    | ●    | ●    | ●    | ★    | ★    | ●    | ●    | ★    | ★    | ★    | ★    | ★    | ★    | ★    |
| F264          |       | ●    | ★    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    | ●    |

★ Preferred combination

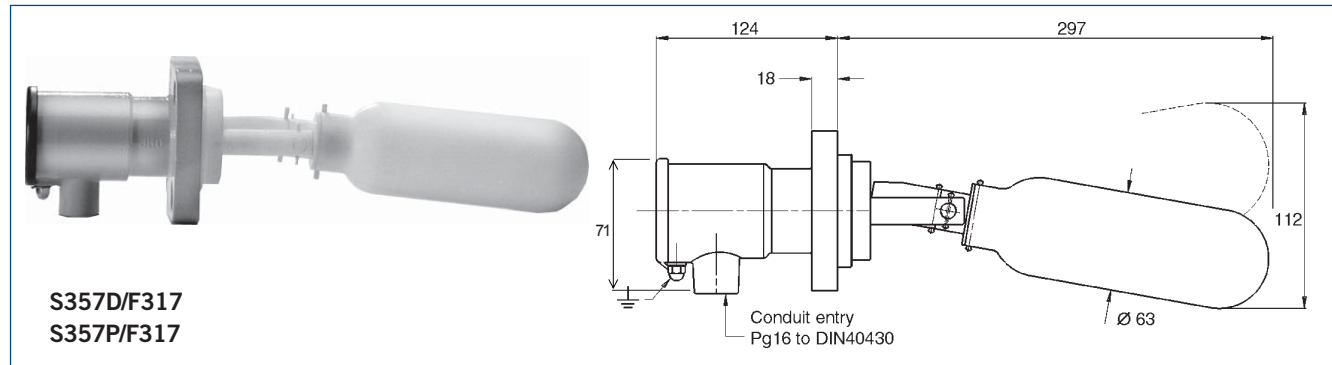
● Non-preferred combination

## Popular combinations

|                      |                             |                          |
|----------------------|-----------------------------|--------------------------|
| Popular combinations | S250DA/F84<br>S250DA/F104/1 | S275DA/F84<br>S275DG/F84 |
|----------------------|-----------------------------|--------------------------|

## Chemical applications

### P.T.F.E. Wetside



### Specifications

| Type number      | S357D/F317            | S357P/F317            |
|------------------|-----------------------|-----------------------|
| Switch mechanism | General               | Gold plated           |
| Housing material | Aluminium alloy       | Aluminium alloy       |
| Wetside material | PTFE                  | PTFE                  |
| Finish           | Chromate phos/painted | Chromate phos/painted |
| IP rating        | IP66                  | IP66                  |

### Notes:

1. S357D level switch has a combined Mobrey A & E flange and may be used with either mounting flange.
2. Mobrey offers a wide range of "Engineer to order" level switches for chemical applications with higher pressures or temperatures. Consult factory for details.

### Stock availability

|                             |                          |
|-----------------------------|--------------------------|
| Models available from stock | S357D/F317<br>S357P/F317 |
|-----------------------------|--------------------------|

### Nozzle and stud lengths

Maximum nozzle length allowable (dimension 'A').

Please refer to page 21 for companion flanges and accessories.

| Minimum stud projection | A mm | Float Flange |  | F68/+ | F84 | F185 | F88 | F93 | F96 | F98 | F106 | F107 | F264 |
|-------------------------|------|--------------|--|-------|-----|------|-----|-----|-----|-----|------|------|------|
|                         |      |              |  | F68/+ | F84 | F185 | F88 | F93 | F96 | F98 | F106 | F107 | F264 |
|                         |      | Mobrey A     |  | 65    | 75  | 75   | 135 | 75  | 75  | 90  | 92   | -    | 75   |
|                         |      | DN65         |  | 65    | 75  | 75   | 135 | -   | 75  | 90  | 92   | -    | 75   |
|                         |      | DN80         |  | 70    | 80  | 80   | 170 | -   | 80  | 90  | 98   | -    | 90   |
|                         |      | DN100        |  | 95    | 105 | 105  | 200 | -   | 105 | 105 | 110  | -    | 100  |
|                         |      | DN125        |  | 105   | 140 | 140  | 200 | -   | 140 | 140 | 140  | -    | 140  |
|                         |      | DN150        |  | 224   | 180 | 180  | 200 | -   | 180 | 170 | 200  | -    | 190  |
|                         |      | 3" 300 & 150 |  | 70    | 80  | 80   | 170 | -   | 80  | 90  | 98   | -    | 90   |
|                         |      | 4" 300 & 150 |  | 95    | 105 | 105  | 200 | -   | 105 | 105 | 110  | -    | 100  |
|                         |      | 3" 600       |  | 62    | 70  | 70   | 130 | -   | 70  | 85  | 89   | -    | 70   |
|                         |      | 3" 900       |  | 62    | 70  | 70   | 130 | -   | 70  | 85  | 89   | 118  | 70   |
|                         |      | Mobrey G     |  | 65    | 75  | 75   | 135 | -   | 75  | 90  | 92   | -    | 75   |
|                         |      | 6" 150       |  | 224   | -   | -    | 200 | -   | -   | -   | -    | -    | 190  |

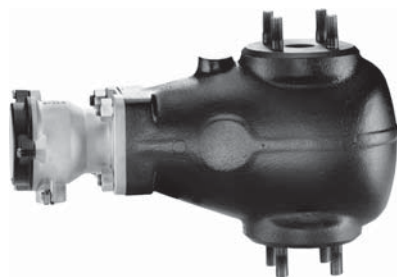
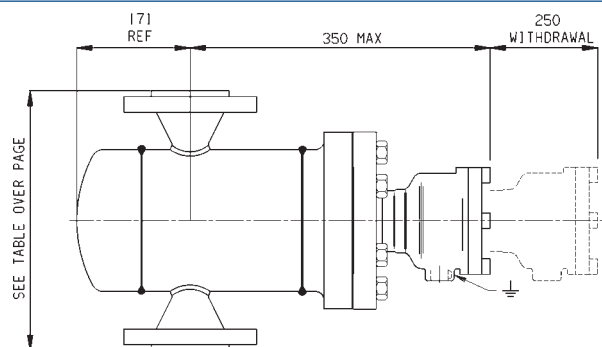
### Minimum stud projection (mm)

| Rating | G  | A  | PN16 |    |     |     |     | PN40 |    |     |     |     | PN64 |     |     |     |    | 150 |    | 300 |    | 600 | 900 |
|--------|----|----|------|----|-----|-----|-----|------|----|-----|-----|-----|------|-----|-----|-----|----|-----|----|-----|----|-----|-----|
| Size   | -  | -  | 65   | 80 | 100 | 125 | 150 | 65   | 80 | 100 | 125 | 150 | 80   | 100 | 125 | 150 | 3" | 4"  | 3" | 4"  | 3" | 3"  |     |
| Stud   | 35 | 30 | 40   | 40 | 40  | 40  | 44  | 42   | 42 | 46  | 52  | 54  | 52   | 55  | 62  | 67  | 46 | 46  | 54 | 56  | 64 | 74  |     |

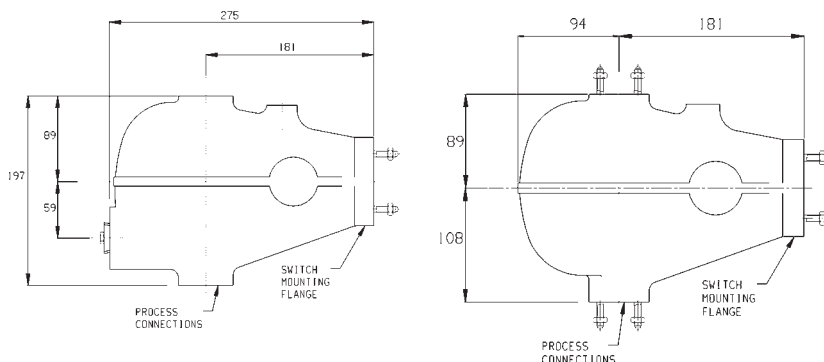
## Float chambers



**Fabricated chambers**



**Cast chambers**



## Introduction

Float chambers are used to facilitate the external mounting of a Mobrey Magnetic level switch on to a tank or pressure vessel, particularly where space inside the vessel is restricted or where the control must be isolated for routine maintenance whilst the plant is in operation.

A wide range of cast or fabricated chambers is available. Process connections may be specified top and bottom or side and side, and can be flanged, screwed or butt welded in a choice of sizes to suit most plant installations. Exotic materials are also available.

### Standard finish

Black stove paint. 2 pack epoxy or hot dip galvanised available at extra cost.

### Pressure testing

All chambers are full pressure tested at the relevant connection flange test pressure.

### Operating pressure

Note that the pressure/temperature ratings of the switches and chambers are not always compatible so that the lower rating will be the governing factor in selection.

### Low temperature use

The lowest operating temperature for the fabricated carbon steel chambers is  $-7^{\circ}\text{C}$  and the cast iron chambers is  $0^{\circ}\text{C}$ . If use at temperatures below these limits is required, LT50, LT100 or stainless steel can be specified.

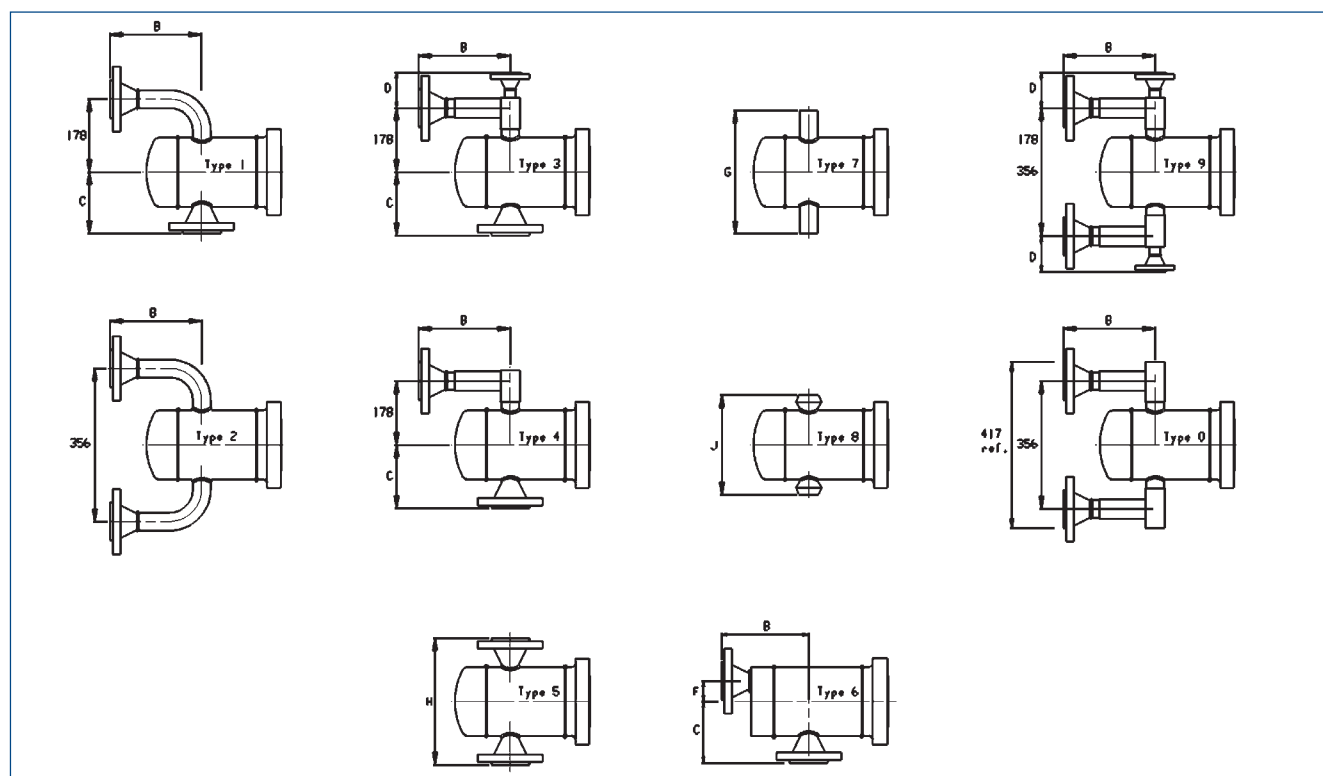
## Selection

The choice of chamber will depend on the type of Mobrey Magnetic level switch to be used and the form of connections required. For example, if S424DA/F96 is selected then a 145 chamber can be used with the connections of your choice in respect of pipe size, flange rating and connection arrangement.

### Features

- ▶ Relevant chambers are supplied CE marked and fully compliant with the Pressure Equipment Directive (97/23/EC)
- ▶ Variety of connection configurations available.
- ▶ Welding procedures approved to BSEN 288-3 & ASME IX
- ▶ Welders approved to BSEN 287-1
- ▶ All materials used for fabricated chambers are to ASME specifications
- ▶ Material certification, BS. EN10204.3.1B
- ▶ Chambers can be manufactured in a wide variety of materials, including 321 and 316 stainless steel, Incoloy Monel, CrMo steels and other more exotic materials
- ▶ Paint finish to customers specifications
- ▶ Chambers may be supplied in accordance with NACE recommendations for sour service
- ▶ NDT to CSWIP and ASNT is available for radiographic, ultrasonic, mag particle and dye penetrant
- ▶ Customers and nominated inspection agencies are welcome to witness pressure testing.
- ▶ Switches and chambers are individually pressure tested at the relevant flange test pressure. They are supplied loosely assembled for transit and flange bolts must be tightened on site before commissioning.

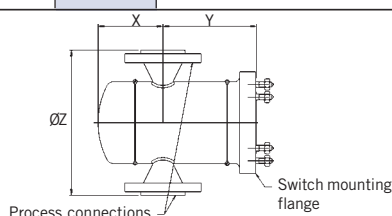
## Fabricated chamber dimensions



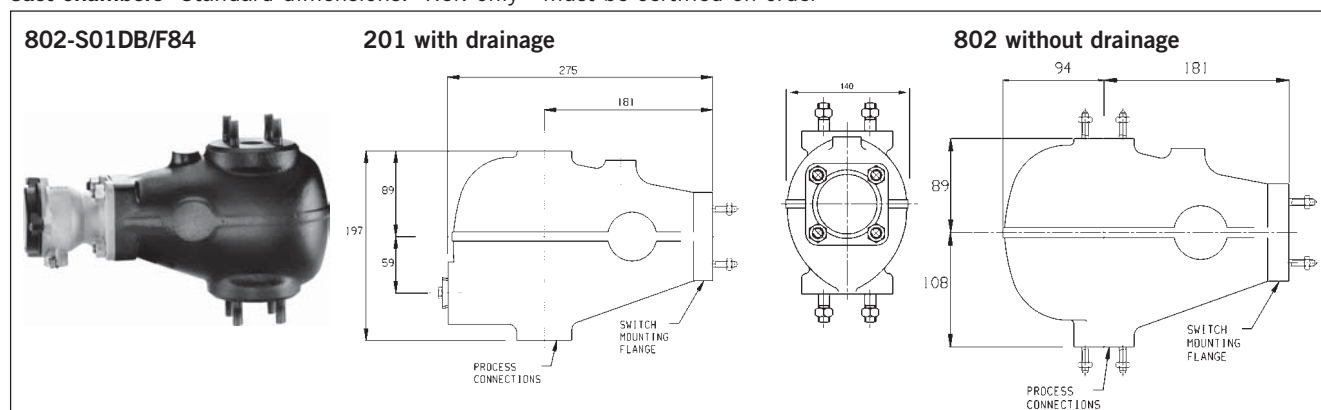
**Fabricated chambers** Standard dimensions: Ref. only - must be certified on order

| Model | Sw Mounting Flg | Pressure | X   | Y   | Z   | Model | Sw Mounting flg      | Pressure | X   | Y   | Z   |
|-------|-----------------|----------|-----|-----|-----|-------|----------------------|----------|-----|-----|-----|
| 144C  | ANSI 3" # 150   | 19.6 bar | 143 | 185 | 168 | 305C  | BSEN1092-1 DN80 PN64 | 64 bar   | 143 | 183 | 168 |
| 145C  | ANSI 3" # 300   | 51 bar   | 143 | 185 | 168 | 306C  | BSEN1092-1 DN65 PN40 | 40 bar   | 143 | 162 | 168 |
| 148C  | MOBREY 'A'      | 18 bar   | 143 | 169 | 168 | 307C  | ANSI 3" Class 600    | 102 bar  | 143 | 162 | 168 |
| 151C  | MOBREY 'G'      | 21 bar   | 143 | 169 | 168 | 308C  | ANSI 3" Class 900    | 153 bar  | 143 | 164 | 168 |

**Nominal ref. dimensions**



**Cast chambers** Standard dimensions: Ref. only - must be certified on order



| Type no. | Material<br>Cast iron          | Process connections       | Maximum working conditions for chamber |          | Suitable Mobrey level switches |                     | Drainage |
|----------|--------------------------------|---------------------------|----------------------------------------|----------|--------------------------------|---------------------|----------|
|          |                                |                           | Pressure                               | Temp.    | Switch flange                  | Typical combination |          |
| 201      | BS EN 1561<br>Grade EN GJL 250 | Screwed 1" BSP            | 13 bar                                 | at 210°C | Mobrey A                       | 201-S01DB/F84       | With     |
| 802      | BS EN 1561<br>Grade EN GJL 250 | BS EN 1092-1<br>DN20 PN16 | 13 bar                                 | at 210°C | Mobrey A                       | 802-S01DB/F84       | Without  |

Minimum working temperature 0°C

## Fabricated chambers : ordering information

| Code | Material switch flange              | max. Pressure 20°C | Max Temp °C | See page 4 for gasket limits |
|------|-------------------------------------|--------------------|-------------|------------------------------|
| 144C | Carbon steel/ANSI 3" Class 150      | 19.6 bar           | 400°C       |                              |
| 145C | Carbon steel/ANSI 3" Class 300      | 51 bar             | 400°C       |                              |
| 148C | Carbon steel/Mobrey 'A'             | 18 bar             | 400°C       |                              |
| 151C | Carbon steel/Mobrey 'G'             | 21 bar             | 400°C       |                              |
| 305C | Carbon steel/BS EN 1092-1 DN80 PN64 | 64 bar             | 400°C       |                              |
| 306C | Carbon steel/BS EN 1092-1 DN65 PN40 | 40 bar             | 400°C       |                              |
| 307C | Carbon steel/ANSI 3" Class 600      | 102 bar            | 400°C       |                              |
| 308C | Carbon steel/ANSI 3" Class 900      | 153 bar            | 400°C       |                              |

| CODE | Process connection style                                        |
|------|-----------------------------------------------------------------|
| 1    | Side & top or side & bottom Flanged                             |
| 2    | Side & side Flanged                                             |
| 3    | Side & top or side & bottom Flanged with ¾" flanged vent/drain  |
| 4    | Side & top or side & bottom Flanged with ¾" threaded vent/drain |
| 5    | Top & bottom Flanged                                            |
| 6    | Side & top or side & bottom Flanged (close centres)             |
| 7    | Top & bottom stub pipe                                          |
| 8    | Top & bottom threadolet or sockolet                             |
| 9    | Side & side Flanged with ¾" flanged vent/drain                  |
| 0    | Side & side Flanged with ¾" threaded vent/drain                 |

| CODE | Process connection size/rating       |
|------|--------------------------------------|
| 00   | 1" NB Sockolet                       |
| 01   | 1" NPT threaded (female)             |
| 02   | 1 ½" NPT threaded (female)           |
| 03   | 2" NPT threaded (female)             |
| 04   | 1" BSPT threaded (female)            |
| 08   | 1" NB Sch 80 stub pipe               |
| 10   | 2" NB Sch 80 stub pipe               |
| 11   | ANSI 1" Class 150 RF weld neck       |
| 12   | ANSI 1" Class 300 RF weld neck       |
| 13   | ANSI 1" Class 600 RF weld neck       |
| 15   | BS EN 1092-1 DN25 PN16 RF weld neck  |
| 16   | BS EN 1092-1 DN25 PN25 RF weld neck  |
| 17   | BS EN 1092-1 DN25 PN40 RF weld neck  |
| 18   | BS EN 1092-1 DN25 PN64 RF weld neck  |
| 19   | BS EN 1092-1 DN25 PN100 RF weld neck |
| 21   | ANSI 1 ½" Class 150 RF weld neck     |
| 22   | ANSI 1 ½" Class 300 RF weld neck     |
| 25   | BS 4504 DN 40 PN16 RF weld neck      |
| 31   | ANSI 2" Class 150 RF weld neck       |
| 32   | ANSI 2" Class 300 RF weld neck       |
| 33   | ANSI 2" Class 600 RF weld neck       |
| 34   | ANSI 2" Class 900 RF weld neck       |
| 35   | BS EN 1092-1 DN50 PN16 RF weld neck  |
| 36   | BS EN 1092-1 DN50 PN25 RF weld neck  |
| 37   | BS EN 1092-1 DN50 PN40 RF weld neck  |

### Chamber options to customer order

- Chambers can be manufactured in a wide variety of materials, including 321 & 316 stainless steel, Incoloy Monel CrMo steels & other more exotic materials.
- Paint finish to customer specifications.
- NDT to CSWIP and ASNT is available for radiographic ultrasonic, mag particle and dye penetrant.
- Chambers may be supplied in accordance with NACE recommendations for sour service.

|             |                              |
|-------------|------------------------------|
| 145C / 5 12 | Typical ordering information |
|-------------|------------------------------|

| Process connection sizes and dimensions for fabricated chambers |         |       |       |      |      |      |       |            |     |       |                        |       |       |     |      |      |      |           |
|-----------------------------------------------------------------|---------|-------|-------|------|------|------|-------|------------|-----|-------|------------------------|-------|-------|-----|------|------|------|-----------|
|                                                                 | 1"      |       |       | DN25 |      |      |       | 1.5"       |     | DN40  | 2"                     |       |       |     | DN50 |      |      | Tolerance |
| Dim                                                             | 150     | 300   | 600   | PN16 | PN25 | PN40 | PN100 | 150        | 300 | PN16  | 150                    | 300   | 600   | 900 | PN16 | PN25 | PN40 |           |
| B                                                               | 212     | 218.5 | 225   | 196  | 198  | 198  | 216   | 218.5      | 225 | 200   | 220                    | 226   | 236   | 265 | 203  | 206  | 206  | 0 3       |
| C                                                               | 139     | 145.5 | 152.5 | 123  | 125  | 125  | 143.5 | 143.5      | 150 | 125.5 | 144                    | 150.5 | 161.5 | 190 | 127  | 130  | 130  | 0 1.5     |
| D*                                                              | 108     | 112   | 117   | -    | -    | -    | -     | 108        | 112 | -     | 108                    | 112   | 117   | 133 | -    | -    | -    | 0 2       |
| E                                                               | 212     | 218.5 | 225   | 196  | 198  | 198  | 216   | 218.5      | 225 | 200   | 220                    | 226   | -     | -   | 203  | 206  | 206  | 0 2       |
| F                                                               | 60      | 60    | 60    | 60   | 60   | 60   | 60    | 54         | 54  | 54    | 48                     | 48    | -     | -   | 48   | 48   | 48   | 1 1       |
| H                                                               | 278     | 291   | 305   | 246  | 250  | 250  | 287   | 287        | 300 | 251   | 288                    | 301   | 323   | 380 | 254  | 260  | 260  | 0 3       |
|                                                                 | Screwed |       |       |      |      |      |       | Screwed/SW |     |       | Screwed or socket weld |       |       |     |      |      |      |           |
| J                                                               | NPT     |       |       | BSP  |      |      |       | NPT        |     |       | NPT                    |       |       |     |      |      |      | 0 3       |
|                                                                 | 240     |       |       | 240  |      |      |       | 244        |     |       | 250                    |       |       |     |      |      |      |           |

\* ¾" N.B. Vent/drain flange of relevant rating as shown. All dimensions shown are nominal and should be certified on order.



## Cranked arm floats F104



**How to order: Specify - F104 float with:**

1. A and B or V and W dims.
2. Liquid in contact
3. Specific gravity of liquid
4. Mobrey magnetic switch head type no. (eg. S01DB/F)
5. State land or marine application

For straight arm float, suffix float number with 'B' dimension as required

## Horizontally mounted switches A and B dimensions with relevant minimum specific gravity

### For land application

| A \ B  | 75  | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 425 | 450 | 475 | 500 | 525 | 550 | 575 | 600 | 625 | 650 | 675 | B'min |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 0&75   | .64 | .64 | .65 | .66 | .67 | .67 | .68 | .69 | .70 | .71 | .72 | .73 | .74 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .81 | .82 | .83 | .84 | .85 |       |
| 100    | .64 | .65 | .66 | .67 | .68 | .69 | .70 | .71 | .72 | .73 | .74 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 |     |       |
| 125    | .65 | .66 | .67 | .68 | .69 | .70 | .71 | .72 | .73 | .74 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 | .88 |     |       |
| 150    | .65 | .67 | .68 | .69 | .70 | .71 | .72 | .73 | .74 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 | .88 | .89 |     |       |
| 175    | .66 | .67 | .69 | .70 | .71 | .72 | .73 | .74 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 | .88 | .89 | .90 |     |       |
| 200    | .66 | .68 | .70 | .71 | .72 | .73 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 | .88 | .89 | .90 | .91 |     |     |       |
| 225    | .67 | .69 | .70 | .72 | .73 | .75 | .76 | .77 | .78 | .79 | .80 | .81 | .82 | .84 | .85 | .86 | .87 | .88 | .89 |     |     |     |     |     |     |       |
| 250    | .67 | .69 | .71 | .73 | .74 | .76 | .77 | .78 | .80 | .81 | .82 | .83 | .84 | .85 | .86 | .87 | .88 | .89 |     |     |     |     |     |     |     |       |
| 275    | .68 | .70 | .72 | .74 | .76 | .77 | .78 | .80 | .81 | .82 | .83 | .85 | .86 | .87 | .88 | .89 | .90 |     |     |     |     |     |     |     |     |       |
| 300    | .68 | .71 | .73 | .75 | .77 | .78 | .80 | .81 | .82 | .84 | .85 | .86 | .87 | .88 | .89 | .90 |     |     |     |     |     |     |     |     |     |       |
| 325    | .69 | .71 | .74 | .76 | .78 | .80 | .81 | .83 | .84 | .85 | .86 | .88 | .89 | .90 | .91 |     |     |     |     |     |     |     |     |     |     |       |
| 350    | .69 | .72 | .75 | .77 | .79 | .81 | .82 | .84 | .85 | .87 | .88 | .89 | .90 | .92 |     |     |     |     |     |     |     |     |     |     |     |       |
| 375    | .70 | .72 | .76 | .78 | .80 | .82 | .84 | .85 | .87 | .88 | .90 | .91 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 400    | .71 | .73 | .76 | .79 | .81 | .83 | .85 | .87 | .88 | .90 | .91 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 425    | .71 | .74 | .77 | .80 | .83 | .85 | .87 | .88 | .90 | .91 | .93 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 450    | .72 | .74 | .78 | .81 | .84 | .86 | .88 | .90 | .91 | .93 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 475    | .72 | .75 | .79 | .82 | .85 | .87 | .89 | .91 | .93 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 500    | .73 | .76 | .80 | .83 | .86 | .89 | .91 | .93 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 525    | .74 | .77 | .81 | .85 | .88 | .90 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 550    | .74 | .77 | .81 | .86 | .89 | .92 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 575    | .75 | .78 | .82 | .87 | .90 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 600    | .76 | .79 | .83 | .88 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 625    | .76 | .80 | .84 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 650    | .77 | .80 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 675    | .78 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |
| 'A' mm |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |

### For marine application

| A \ B  | 75  | 100 | 125 | 150 | 175 | 200 | 225  | 250  | 275  | 300  | 325  | 350  | 375  | 400  | 425  | 450  | 475  | 500 | 525 | 550  | 575  | 600  | 625  | 650  | 675 | B'min |
|--------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|-----|-----|------|------|------|------|------|-----|-------|
| 0&75   | .67 | .67 | .68 | .68 | .69 | .69 | .70  | .71  | .72  | .73  | .73  | .74  | .75  | .76  | .77  | .78  | .79  | .80 | .81 | .82  | .83  | .84  | .85  | .86  | .87 |       |
| 100    | .68 | .68 | .69 | .70 | .71 | .72 | .73  | .74  | .74  | .75  | .76  | .77  | .78  | .79  | .80  | .81  | .82  | .83 | .84 | .85  | .86  | .87  | .88  | .89  |     |       |
| 125    | .69 | .70 | .71 | .71 | .72 | .73 | .74  | .75  | .76  | .76  | .77  | .78  | .79  | .80  | .81  | .82  | .83  | .84 | .85 | .86  | .87  | .88  | .89  | .90  |     |       |
| 150    | .71 | .72 | .73 | .74 | .75 | .76 | .77  | .78  | .79  | .80  | .81  | .82  | .83  | .84  | .85  | .86  | .87  | .88 | .89 | .90  | .91  | .92  | .93  | .94  |     |       |
| 175    | .73 | .74 | .75 | .76 | .77 | .78 | .79  | .80  | .81  | .82  | .83  | .84  | .85  | .86  | .87  | .88  | .89  | .90 | .91 | .92  | .93  | .94  | .95  | .96  |     |       |
| 200    | .76 | .77 | .78 | .79 | .80 | .81 | .82  | .83  | .84  | .85  | .86  | .87  | .88  | .89  | .90  | .91  | .92  | .93 | .94 | .95  | .96  | .97  | .98  | .99  |     |       |
| 225    | .79 | .80 | .81 | .82 | .83 | .84 | .85  | .86  | .86  | .87  | .88  | .89  | .90  | .91  | .92  | .93  | .94  | .95 | .96 | .97  | .98  | .99  | 1.00 | 1.01 |     |       |
| 250    | .83 | .84 | .85 | .86 | .87 | .87 | .88  | .89  | .90  | .91  | .91  | .92  | .93  | .94  | .95  | .96  | .97  | .98 | .99 | 1.00 | 1.01 | 1.02 |      |      |     |       |
| 275    | .88 | .88 | .89 | .90 | .91 | .91 | .92  | .93  | .94  | .95  | .96  | .97  | .98  | .99  | 1.00 | 1.01 | 1.02 |     |     |      |      |      |      |      |     |       |
| 300    | .93 | .93 | .93 | .93 | .94 | .95 | .95  | .96  | .97  | .98  | .99  | 1.00 | 1.01 | 1.02 |      |      |      |     |     |      |      |      |      |      |     |       |
| 325    | .98 | .98 | .98 | .98 | .99 | .99 | 1.00 | 1.01 | 1.02 | 1.03 | 1.03 | 1.04 | 1.04 |      |      |      |      |     |     |      |      |      |      |      |     |       |
| 350    |     |     |     |     |     |     | 1.04 | 1.03 | 1.02 | 1.03 | 1.03 | 1.03 | 1.04 | 1.04 |      |      |      |     |     |      |      |      |      |      |     |       |
| 375    |     |     |     |     |     |     |      | 1.09 | 1.08 | 1.07 | 1.07 | 1.07 | 1.08 |      |      |      |      |     |     |      |      |      |      |      |     |       |
| 400    |     |     |     |     |     |     |      |      | 1.15 | 1.13 | 1.12 | 1.12 |      |      |      |      |      |     |     |      |      |      |      |      |     |       |
| 425    |     |     |     |     |     |     |      |      |      | 1.20 | 1.18 |      |      |      |      |      |      |     |     |      |      |      |      |      |     |       |
| 'A' mm |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |     |     |      |      |      |      |      |     |       |

For intermediate dimensions select next longer size on chart

## Vertically mounted switches V and W dimensions with relevant minimum specific gravity

### For land application

| V \ W  | 75  | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 425 | 450 | 475 | 500 | 525 | 550 | 575 | 600 | 625 | 650 | 675 | 'W' min |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|
| 75     | .67 | .67 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .70 | .71 | .72 | .73 | .73 | .74 | .75 | .76 | .77 | .77 | .78 | .79 | .80 |         |
| 100    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .70 | .71 | .72 | .73 | .73 | .74 | .75 | .76 | .77 | .77 | .78 | .79 |     |         |
| 125    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .70 | .71 | .72 | .73 | .74 | .74 | .75 | .76 | .77 | .77 | .78 | .79 |     |         |
| 150    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .71 | .72 | .73 | .74 | .74 | .75 | .76 | .77 | .77 | .78 | .79 |     |         |
| 175    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .71 | .72 | .73 | .74 | .75 | .75 | .76 | .77 |     |     |     |     |         |
| 200    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .72 | .72 | .73 | .74 | .75 | .75 | .76 |     |     |     |     |     |         |
| 225    | .66 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .72 | .72 | .73 | .74 | .75 | .76 |     |     |     |     |     |     |         |
| 250    | .66 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .72 | .73 | .73 | .74 | .75 |     |     |     |     |     |     |     |         |
| 275    | .67 | .66 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .72 | .73 | .74 |     |     |     |     |     |     |     |     |     |         |
| 300    | .67 | .67 | .66 | .66 | .66 | .66 | .67 | .67 | .68 | .68 | .69 | .70 | .71 | .72 | .73 |     |     |     |     |     |     |     |     |     |     |         |
| 325    | .67 | .67 | .67 | .67 | .67 | .67 | .68 | .68 | .68 | .69 | .70 | .71 | .72 | .72 |     |     |     |     |     |     |     |     |     |     |     |         |
| 350    | .67 | .67 | .67 | .67 | .67 | .67 | .68 | .68 | .68 | .69 | .70 | .71 | .72 | .72 |     |     |     |     |     |     |     |     |     |     |     |         |
| 375    | .68 | .67 | .67 | .67 | .67 | .67 | .68 | .68 | .68 | .69 | .70 | .71 | .72 |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 400    | .68 | .67 | .67 | .67 | .67 | .67 | .68 | .68 | .68 | .69 | .70 | .71 |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 425    | .68 | .68 | .68 | .68 | .68 | .68 | .69 | .69 | .69 | .70 | .71 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 450    | .68 | .68 | .68 | .68 | .68 | .68 | .69 | .69 | .69 | .70 | .71 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 475    | .69 | .68 | .68 | .68 | .68 | .68 | .69 | .69 | .69 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 500    | .69 | .69 | .68 | .68 | .68 | .68 | .69 | .69 | .69 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 525    | .69 | .69 | .69 | .69 | .69 | .69 | .70 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 550    | .70 | .69 | .69 | .69 | .69 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 575    | .70 | .70 | .69 | .69 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 600    | .70 | .70 | .70 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 625    | .71 | .70 | .70 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 650    | .71 | .71 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 675    | .72 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |
| 'V' mm |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |

A + B } Must not exceed 750mm  
V + W }

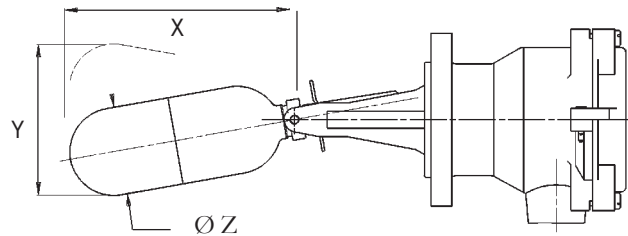
A or V } Should not be less than 75mm  
B or W }

### For marine application

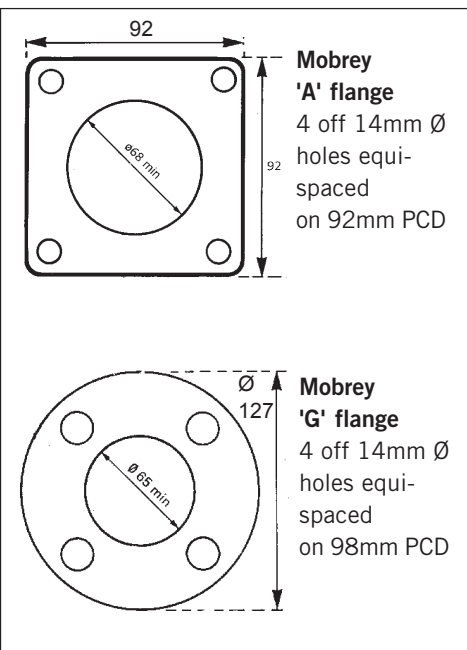
| V \ W | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 4 |
|-------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
|-------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|

## Floats for use with stainless steel wetside switches

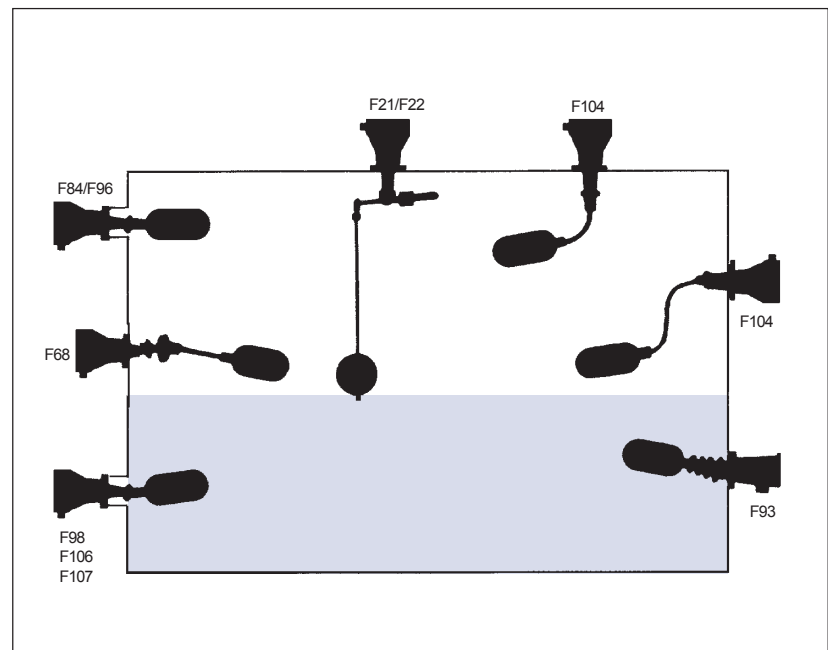
| Float Type | Min. S.G.    | Max. Pressure at 20°C (BAR) | Temperature °C Maximum | Differential (mm) | Dimension X Length from Pivot Point | Dimension Y Maximum Travel | Dimension Z Max. External Diameter | Float Material      |
|------------|--------------|-----------------------------|------------------------|-------------------|-------------------------------------|----------------------------|------------------------------------|---------------------|
| F84        | 0.65         | 34.5                        | 400                    | 13                | 164                                 | 119                        | 65                                 | 316 Stainless Steel |
| F96        | 0.60         | 74.0                        | 400                    | 13                | 164                                 | 119                        | 65                                 |                     |
| F98        | 0.45         | 34.5                        | 400                    | 14                | 184                                 | 127                        | 65                                 |                     |
| F106       | 0.51         | 74.0                        | 400                    | 13                | 185                                 | 108                        | 65                                 |                     |
| F107       | 0.71         | 200.0                       | 400                    | 13                | 172                                 | 120                        | 65                                 |                     |
| F68/+      | 0.72 to 0.82 | 34.5                        | 400                    | 15 to 483         | 294 to 522                          | 204 to 736                 | 65                                 |                     |
| F21/+      | 0.70         | 30.0                        | 400                    | 13 to 4420        | Variable                            |                            | 129                                |                     |
| F104/+     | Various      | 34.5                        | 400                    | -                 | As ordered                          | -                          | 65                                 |                     |
| F88        | 0.8/1.0      | 74.0                        | 400                    | 26                | 359                                 | 198                        | 65                                 |                     |
| F93        | 0.75         | Atmospheric                 | 180                    | 13                | 183                                 | 124                        | 65                                 |                     |
| F317       | 0.7          | 0.6                         | 60                     | 13                | 229                                 | 112                        | 67                                 | PTFE Monel Monel    |
| F185       | 0.65         | 34.5                        | 210                    | 13                | 164                                 | 119                        | 65                                 |                     |
| F264       | 0.85         | 32.0                        | 210                    | 23, 29 or 33      | 179                                 | Variable                   | 63.5                               |                     |



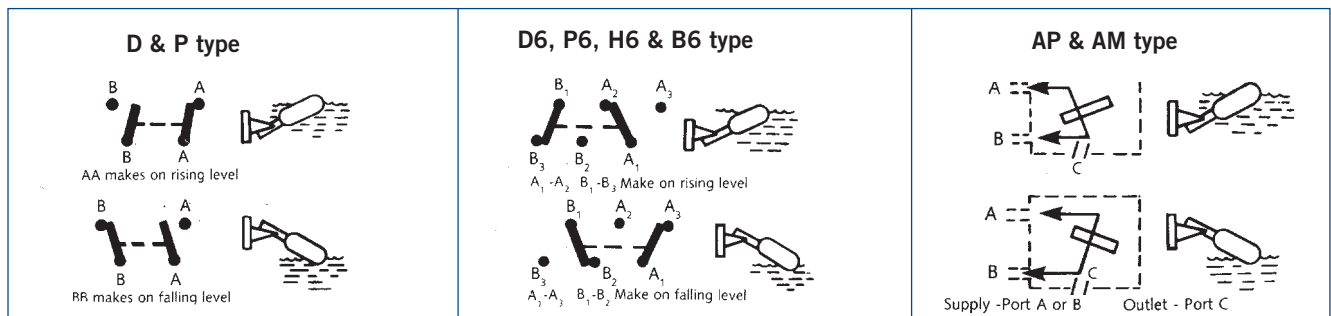
## Mobrey flanges



## Float switch range

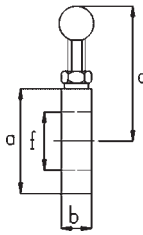


## Switch mechanisms

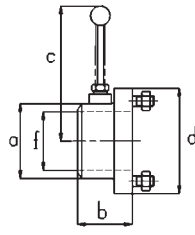


## Accessories

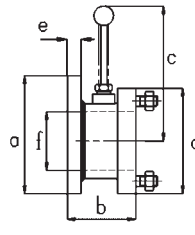
Test devices for Mobrey 'A' flanged switches to facilitate mechanical testing of electrical circuit.



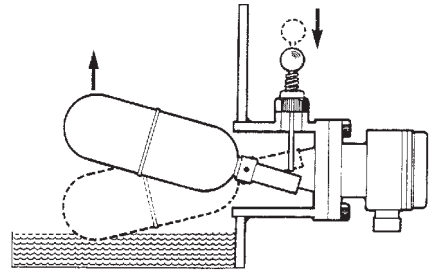
TD 100/A  
(Sandwich)



TD 101/A  
(Weld)



TD 102/10 & /16  
(Flange)



| Type      | Vessel Flange | Max. Pressure Bar | Max. Temp. °C | a   | b  | c   | d  | e  | f    |
|-----------|---------------|-------------------|---------------|-----|----|-----|----|----|------|
| TD 100/A  | Mobrey 'A'    | 18                | 120           | 120 | 35 | 155 | -  | -  | 67.5 |
| TD 101/A  | Weld on       | 18                | 120           | 85  | 64 | 155 | 92 | -  | 67.5 |
| TD 102/10 | PN 10 DN80    | 10                | 120           | 200 | 85 | 155 | 92 | 21 | 67.5 |
| TD 102/16 | PN 16 DN80    | 16                | 120           | 200 | 85 | 155 | 92 | 21 | 67.5 |

Note: Maximum temperature can be increased to 210°C with Fluorocarbon (FPM/FKM) 'O' ring. Please state when ordering.

## Materials

### TD 100/A

Carbon steel  
BS1501-151-360

### TD 101/A

Cast steel  
BS1504-161-430A

### TD 102/10 and TD 102/16

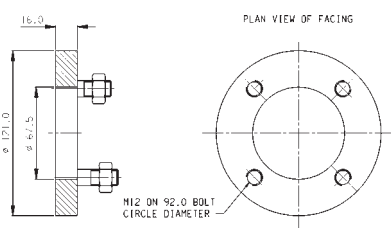
Cast steel body - BS1504-161-430A  
Carbon steel flange - BS1503-221-430

## Companion flanges

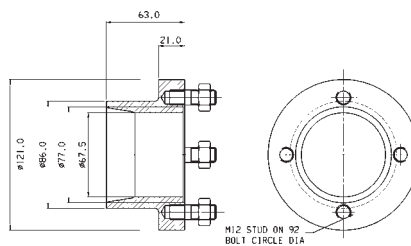
Welding and backing companion flanges are available as extra items to facilitate the direct mounting of mobrey A and G flange switches.

### 'A' flange models

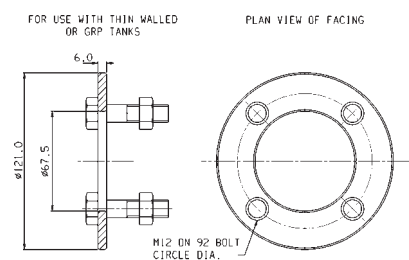
#### Welding pad J184



#### Welding nozzle J786



#### Backing flange J863

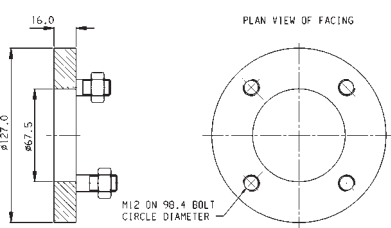


J184 in 316SS: 71020/107 (Not suitable with Mobrey 'M' switch SMA\*)

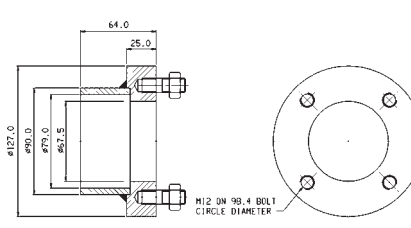
J863 in 316SS: 71030/900

### 'G' flange models

#### Welding pad J800

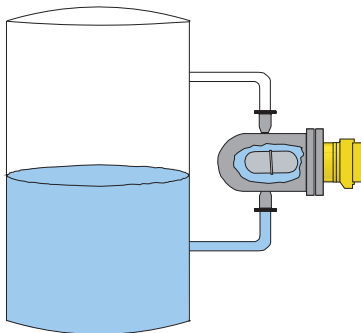
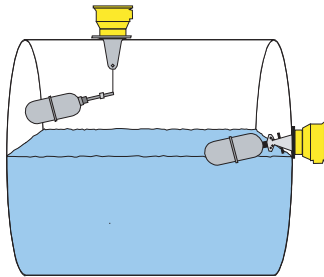
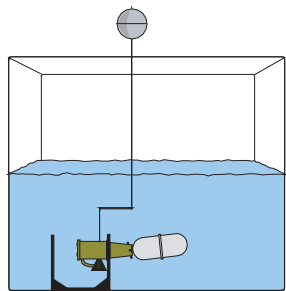
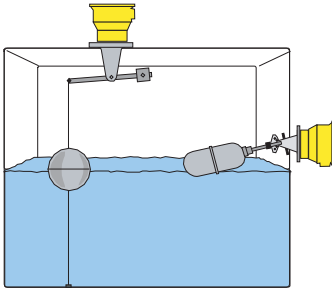
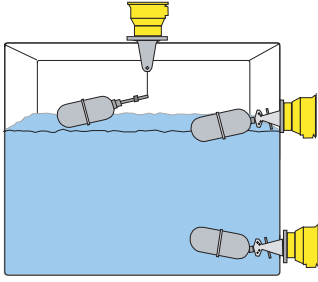


#### Welding nozzle J799



- All flanges manufactured in mild steel.
- Backing flange zinc plated and passivated.
- Welding types supplied complete with studs and nuts.
- Backing type supplied with bolts, sealing washers and full face gasket.
- Welding Pad J800 in 316SS: 71020/111
- Other materials available upon request.

# Applications



## Alarm duty

Perhaps the most common application for the original Mobrey float switch is liquid level detection for alarm duty. Whether for high or low alarm, the “Mobrey” is one of the most reliable and cost effective instruments available today. Using the time proven principle of magnetic coupling, the switch is glandless, snap-acting and suitable for almost any liquid. Manufactured with a range of wetside materials and with a choice of electrical or pneumatic output, side or top mounting models have a tough IP66 weatherproof housing and are flange mounted to provide the “fit and forget” solution for liquid level alarm.

*Rugged, Reliable, Glandless, Weatherproof*

## Pump control

Mobrey switches may be specified with pump control float mechanisms which can be site adjusted to give control over the required liquid differential. Side mounting models operate over 500mm – ideal for small header or filling tanks, and vertical mounting models with differentials up to 4500mm are commonly used in sumps and storage tanks.

*Side mount, Top mount, Site adjustable*

## Submersed applications

If it is not possible to side or top mount a switch, then specify the Submersible model. This switch is watertight IP68 to 30m submersion, and may be tank floor mounted to provide low level alarm or pump cut-off/pump protection in sumps and pits. For heavily fouled liquids, a shrouded model is ideal as all the moving parts are protected inside an anti-fouling shroud. Switches may be supplied with or without factory fitted and tested cable, with the option of Rubber or copper Pyrotex cable to suit.

These models are also ideal for applications exposed to pressure hosing or occasional submersion, and as such have become an industry standard for shipboard use.

*IP68 / 30m, Factory fitted cable, Hoseproof*

## Hazardous area use - ATEX

Mobrey switches are classed as simple switching apparatus and may be used in Intrinsically Safe circuits when wired to a suitably protected supply. In these cases, specify Gold Plated contacts which are suited to the low power in such circuits. A range of switches is also available with Flameproof (Explosionproof) approval, certified by most of the world's leading authorities.

Mobrey certification covers use in all Gas Groups

Pressures to 350bar and temperatures to 400°C are possible with Mobrey float switches.

*International approvals, High pressure, High temperature*

## Chamber mounting

If it is required to mount the float switch outside of the main vessel, for example to facilitate isolation for routine maintenance or simply because the vessel is too small to accommodate the float, then specify a Mobrey chamber. Available in almost any conceivable shape and process connection arrangement, chambers are designed, manufactured and tested in accordance with international standards. Approved welders will construct a chamber from the material of your choice, including Stainless, LT Carbon, Incolloy, Monel and High Chrome steels, certified and identified to your instructions.

*Custom design, Coded construction, N.A.C.E.*

## Mobrey Measurement

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