

process measurement solutions



Mobrey magnetic level switches for liquid level alarm and pump control duties

Data sheet
IP101



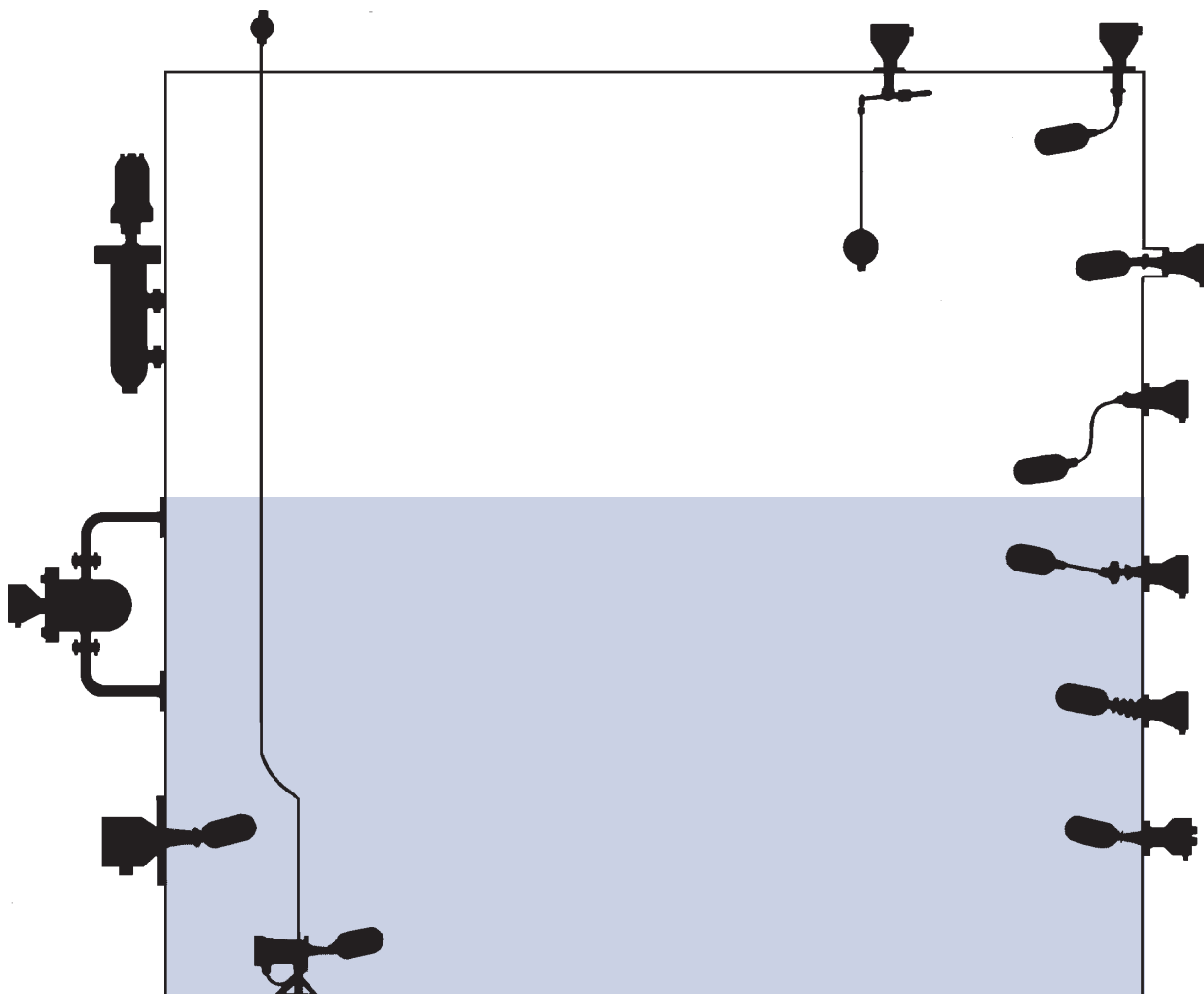
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Certification Service



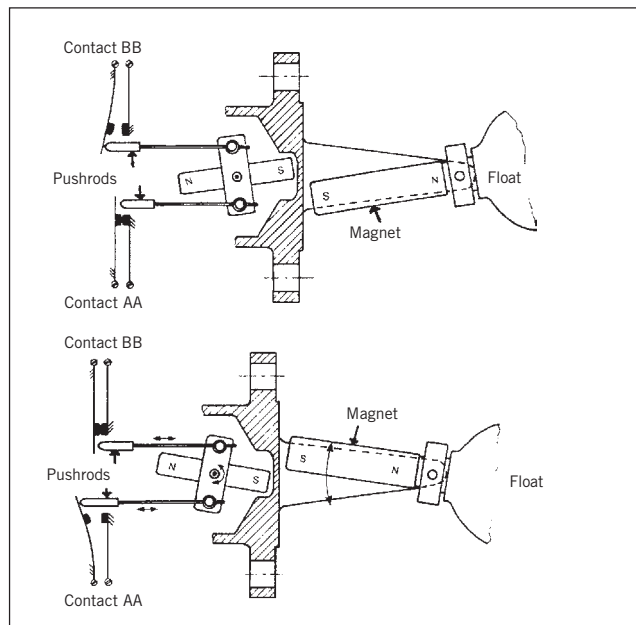
The complete Mobrey horizontal float switch range



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.

Submersion:

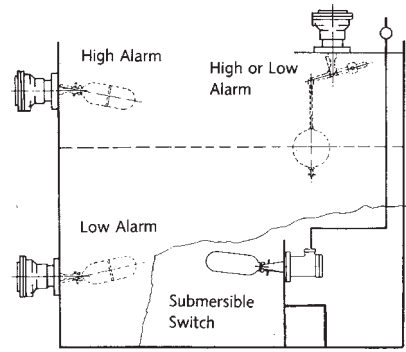
For those applications where the equipment may be subject to occasional or continuous submersion the submersible model should be specified.

Hoseproof marine applications:

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

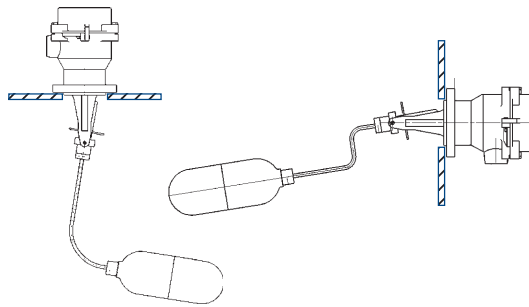
Vacuum applications:

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



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.



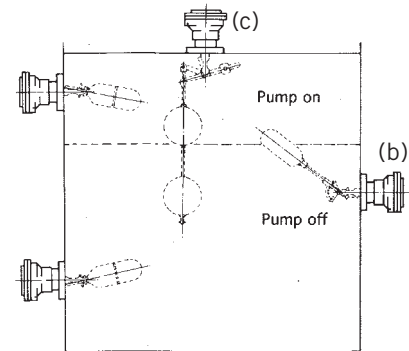
Pump control - Electrical or Pneumatic

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:

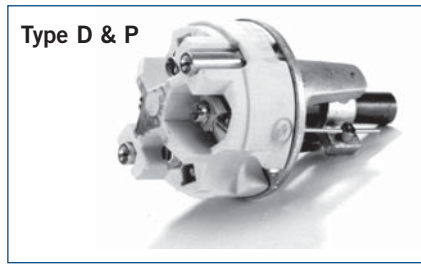
A cable gland is supplied in the box with the S01DB, S179, Mini-switch, and S36 range.

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.

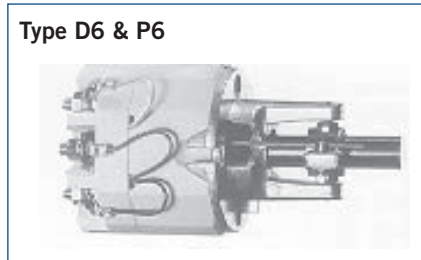
The cable gland has type IP68 protection to 5m head of water (0.5 bar), and maximum 80°C as a permanent temperature on application. For submersible switches in applications greater than 5m (0.5 bar) submersion, the fitting and testing of customers supplied cable and gland is the customer's responsibility.

Choice of switch mechanisms

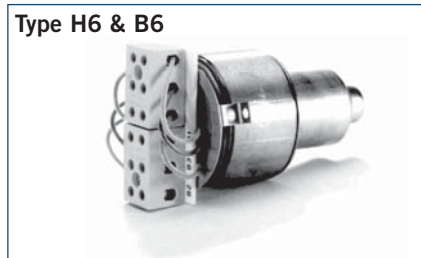
Electrical



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
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
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

Type B6

For use in Zone 2 Hazardous Areas. As type H6 but coded ATEX II 3 G, EExnC IIC T6 (-60°C ≤ Ta ≤ +60°C)

Rating

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

<p>S01DB/F84 4 Contact switch</p>	
<p>S01D6B/F84 6 Contact switch</p>	<p>Weatherproof to EN60529 : - IP66</p>

Specifications

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

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

Approvals

<p>UK Germany Canada USA France Italy Russia Norway Finland Poland</p>	<p>Lloyds Register of Shipping Germanischer Lloyd, TÜV CSA ABS BV RINA RM DNV SAL UDT</p>
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Other approvals available. Please contact us with your requirements.

Ordering Information

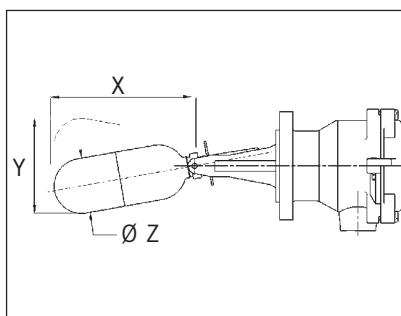
Code	General purpose aluminium bronze wetside models		
S	Switch		
	Code	Flange (Head)	
		Size	Rating Standard
	01	Mobrey A	18 bar Mobrey
		Code	Switch mechanism
		DB	4 Contact - general ⇒ short end cap
		PB	4 Contact - gold plated contacts ⇒ short end cap
		D6B	6 Contact - general ⇒ long end cap
		P6B	6 Contact - gold plated contacts ⇒ long end cap
		APA	Pneumatic on/off
		AMA	Pneumatic modulating
		CODE	Float - application information
		F84	High or low alarm or 2 off
		F185	for pump control wide differential
		F68/+	Horizontal pump control
		F264	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

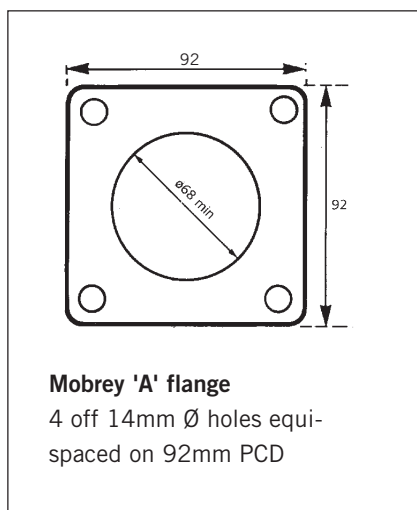
	S01
F84	★
F185	★
F68/+	★
F264	★
F21/+	★
F104	★
F93	★

★ 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

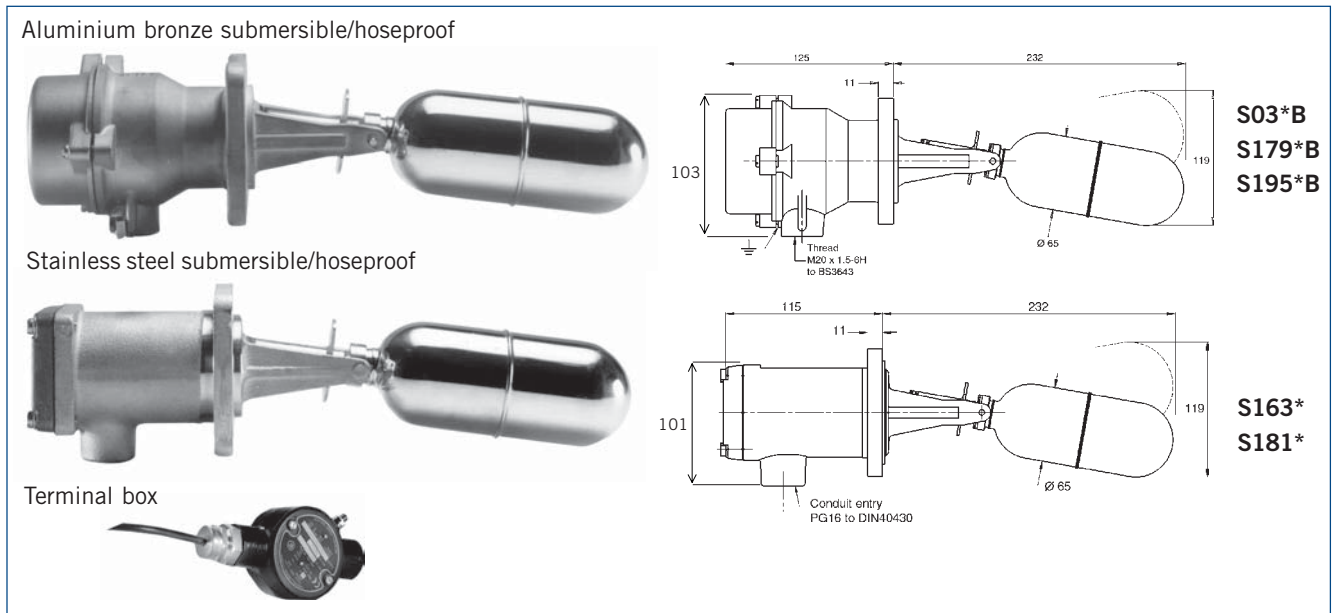


Stock availability

Models available from stock	S01DB/F84
	S01DB/F185
	S01DB/F93
	S01DB/F68/1
	S01DB/F68/4
	S01DB/F21/1
	S01DB/F21/2
	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
Cable specification	3m standard where fitted. Longer lengths available upon request up to max. submersion depths.
MICC	Temperature limit 80°C 600V light duty grade mineral insulated copper clad cable.
CSP	Temperature limit 50°C 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, submersible, hoseproof & marine applications			
S	Switch			
	Code	Flange (head)	Size	Rating
	03	Mobrey A		18 bar
	179	Mobrey A		18 bar
	195	Mobrey A		18 bar
	163	Mobrey A		18 bar
	181	Mobrey A		18 bar
	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 or 2 off for pump control		
	F185			
	F98	Horizontal pump control		
	F68/+			
	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		
	S	03	D	B / 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

F No.	S No.	S03	S163	S179	S181	S195
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.

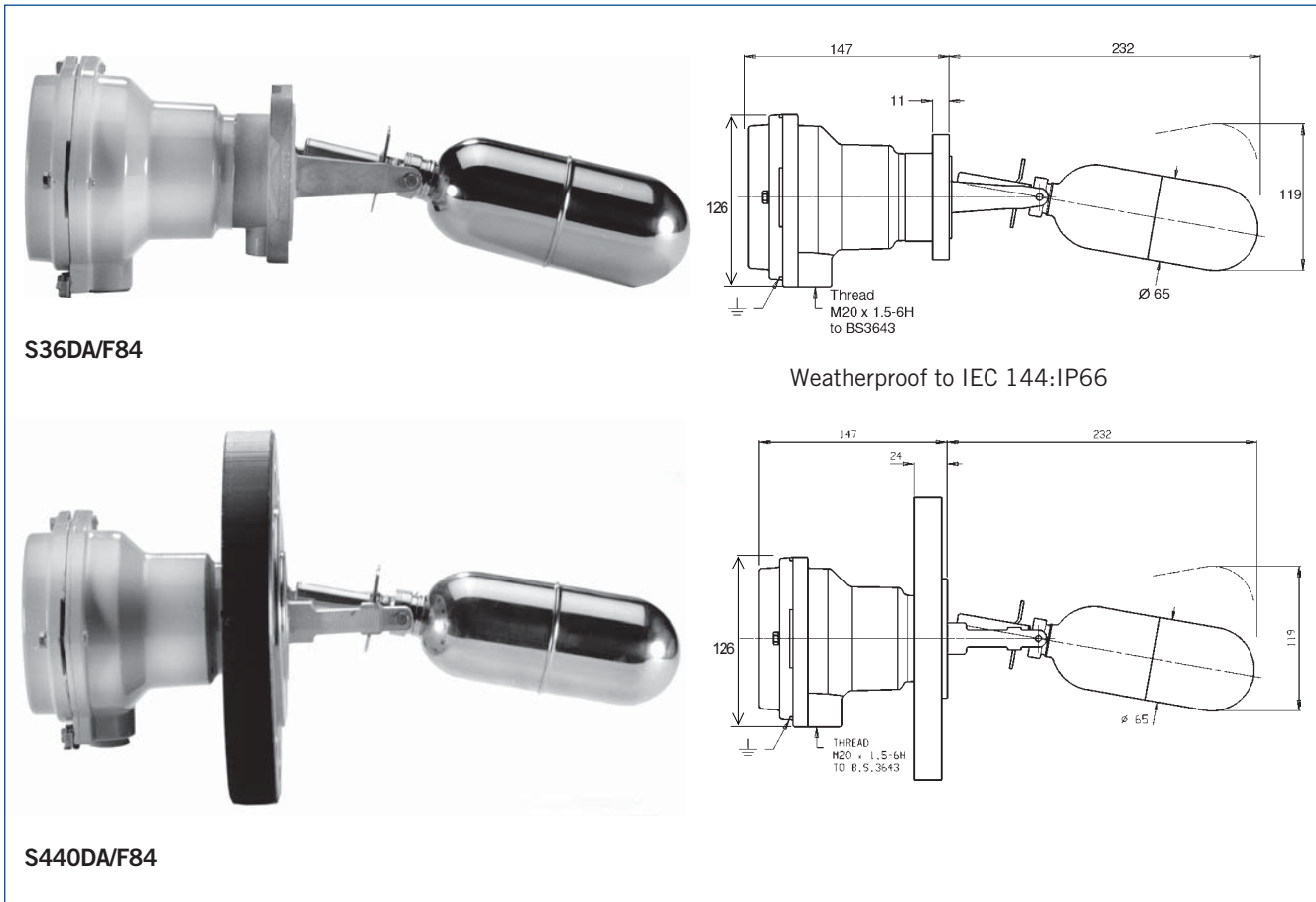
Shrouded floats for stainless steel switches S163 & S181 are available only on request.

Stock availability

Models available from stock	Hoseproof	Submersible
	S179DB/F84 S179DB/F185 S179DB/F93 S179DB/F104/1 S181D/F84	S03DB/F84 S03DB/F185 S03DB/F93 S195DB/F93 S195DB/F84 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.
Wetside material	Painted surfaces are stove paint finish. All unpainted surfaces are corrosive protected.
Enclosure housing material:	Stainless steel to type 316 to Mobrey standard Stainless steel type 316S33 (S489 & S490 models only)
Air pilot valve models	Aluminium alloy to BS1490: Grade LM24
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
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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) 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 or ASMEI 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

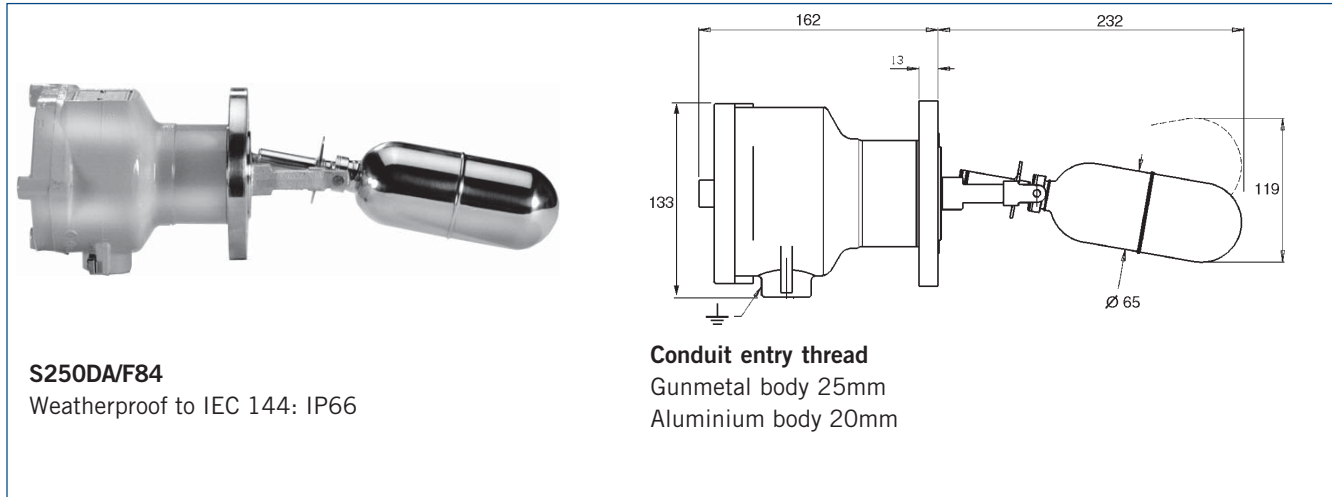
S No. / F No.	S36	S190	S417	S418	S419	S424	S425	S428	S429	S430	S431	S432	S433	S434	S435	S436	S437	S440	S441	S488	S489	S490
F84	★		●	●	●	●	●	★	★	★	★	●	●	●	●	●	●	★	★	●	●	●
F96	●		★	★	★	★	★	●	●	●	●	★	★	★	★	★	★	●	●	★	●	●
F98	★		●	●	●	●	●	★	★	★	★	●	●	●	●	●	●	★	★	●	●	●
F106	●		★	★	★	★	★	●	●	●	●	★	★	★	★	★	★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

Notes: ★ Preferred combination

● Non-preferred combination

Hazardous area applications

Flame proof zone 1 gas group IIC models



Specifications

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 whilst all unpainted surfaces are corrosion protected.
Wetside material	Stainless steel to type 316 to Mobrey standard Stainless steel type 316S33 (S260 & S261 models only) Max. working temp*: Aluminium body 400°C Gunmetal body 350°C Gunmetal to BS 1400: Grade LG2. Max. working temp*: S275 200°C
Enclosure/housing material	Aluminium alloy to BS1490: LM25 Finish is chromate phosphate treated and externally stove painted Gunmetal to BS1400: LG2 Natural finish
Ambient temperatures below 0°C	i) Down to -20° C standard enclosure/housing codes A or G are suitable. ii) Down to -60°C 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

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

Note:
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 or ASME B 16.5	
257	4"	150 RF		
278	6"	150 RF		
251	3"	300 RF		
254	4"	300 RF	BS EN 1092-1	
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			

CODE	Switch Mechanism	Note: The ATEX certification covering use -20°C to -60°C ambient temperature requires the hermetically sealed switch mechanism type H6 to be fitted.
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	

CODE	Enclosure / Housing
A	Aluminium alloy
G	Gunmetal
X	Suffix X must be specified for applications with ambient temperatures -20°C to -60°C

CODE	Float - Application information
F84	General purpose high alarms or low alarms or 2 off for pump control
F185	
F98	
F106	
F107	
F96	Horizontal pump control Horizontal limited differential
F68/+ F264	
F21/+	Vertical pump control or alarm
F104/+	Cranked arm: horizontal or vertical
F88	Interface duties

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	S276	S277	S256	S257	S278	S251	S254	S260	S261	S253	S255	S269	S272	S268	S270	S271
F84	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F185	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F98	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F106	●	★	●	★	●	●	●	★	★	●	●	★	★	★	★	★	★	★
F107	●	●	●	●	●	●	●	●	●	★	★	●	●	●	●	●	●	●
F68/+	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F21/+	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F104/+	★	★	★	★	★	★	★	●	●	●	●	●	●	●	●	●	●	●
F88	★	★	★	★	★	★	★	★	★	●	●	★	★	★	★	★	★	★
F96	●	●	●	●	●	●	●	★	★	●	●	★	★	★	★	★	★	★
F264	●	★	●	★	●	●	●	●	●	●	●	●	●	●	●	●	●	●

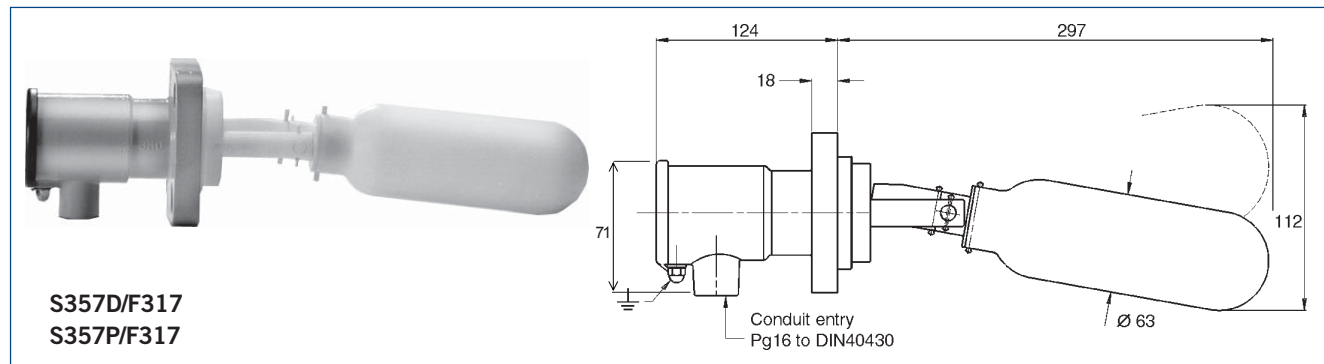
★ Preferred combination ● Non-preferred combination

Popular combinations

Popular combinations	S250DA/F84 S250DA/F104/1 S276DG/F84	S275DA/F84 S275DG/F84 S277DG/F84
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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:

- S357D level switch has a combined Mobrey A & E flange and may be used with either mounting flange.
- 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 S357P/F317
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Nozzle and stud lengths

Maximum nozzle length allowable (dimension 'A').

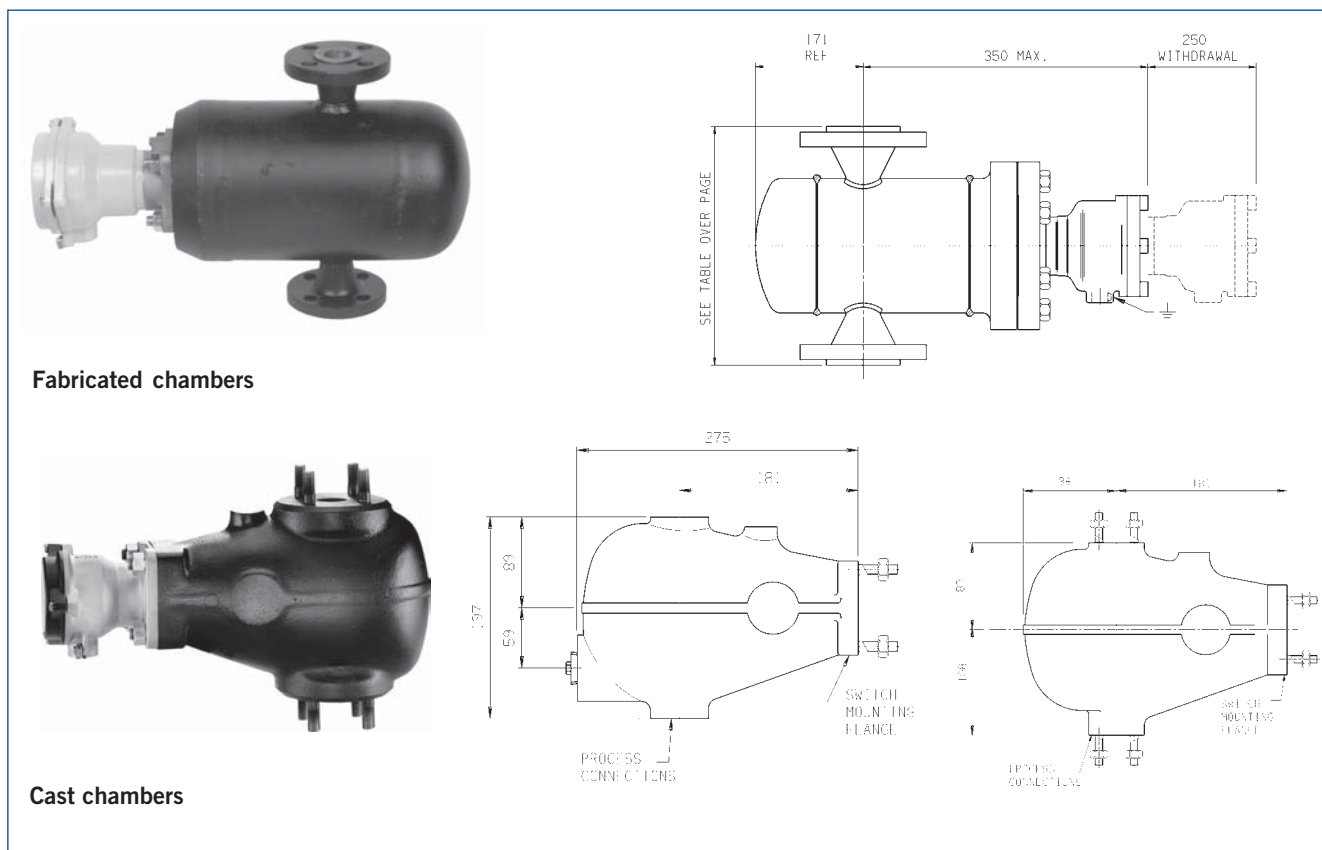
Please refer to page 21 for companion flanges and accessories.

Minimum stud projection	A mm	Float										
		Flange	F68/+	F84	F185	F88	F93	F96	F98	F106	F107	F264
		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



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°C and the cast iron chambers is 0°C . If use at temperatures below these limits is required, LT50, LT100 or stainless steel can be specified.

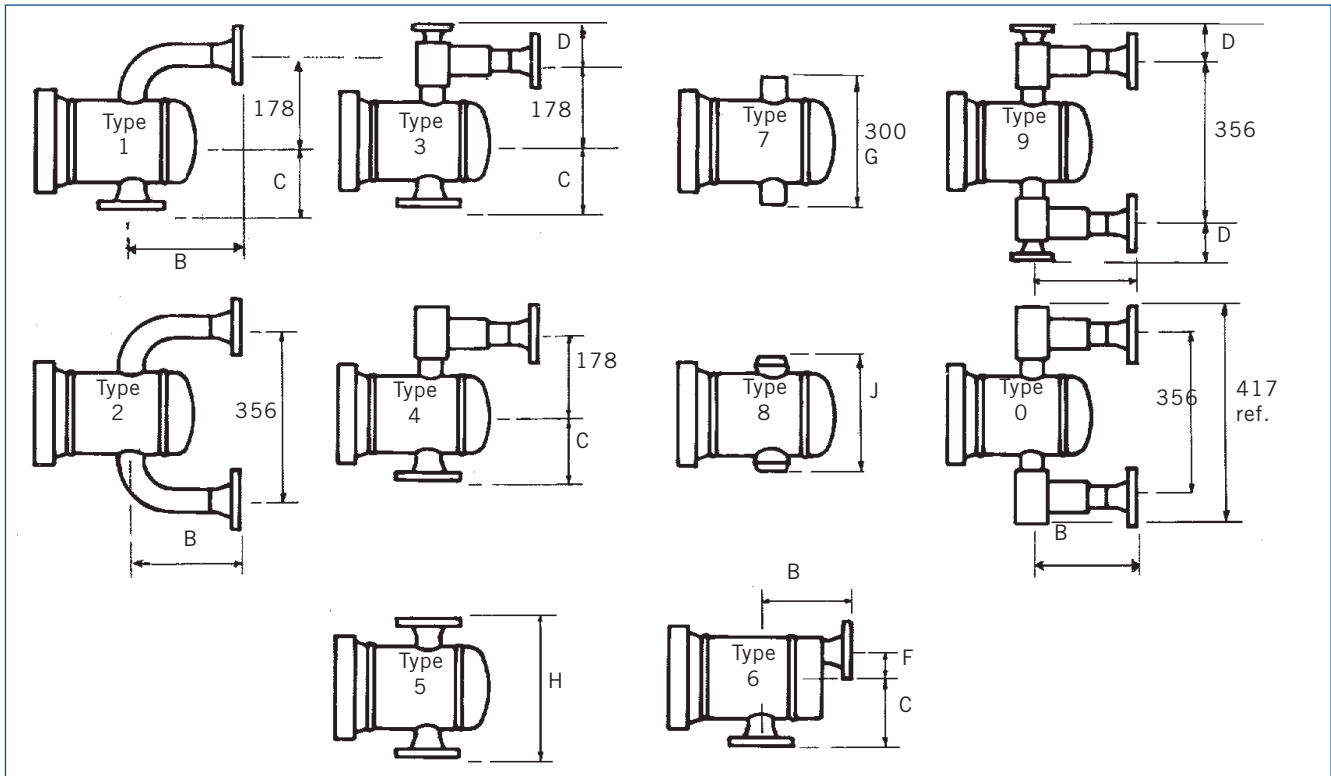
Selection

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.

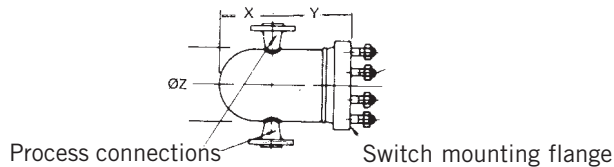
Fabricated chamber dimensions



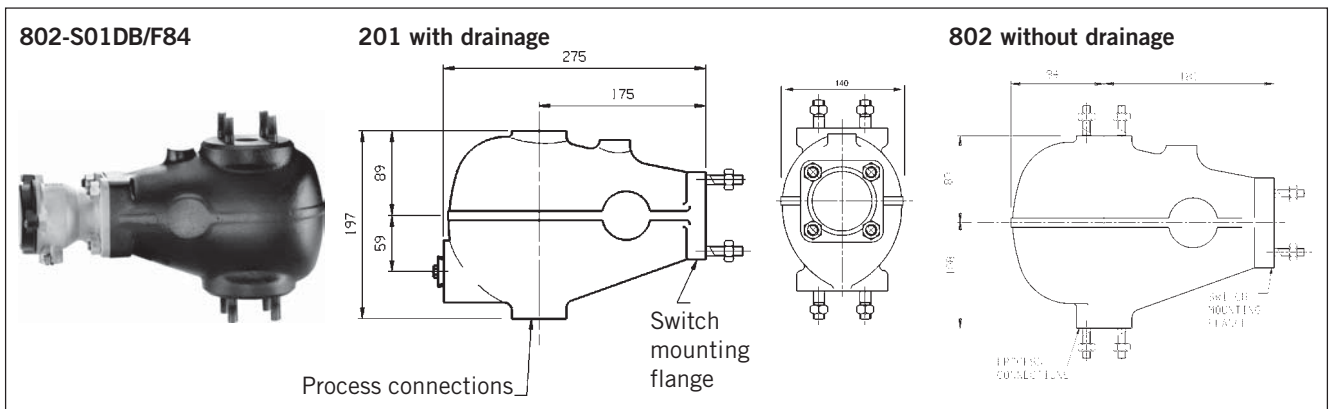
Fabricated chambers Standard dimensions: Ref. only - must be certified on order

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 Cast iron	Process connections	Maximum working conditions for chamber		Suitable Mobrey level switches		Drainage
			Pressure	Temp.	Switch flange	Typical combination	
201	BS EN 1561 Grade EN GJL 250	Screwed 1" BSP	13 bar	at 210°C	Mobrey A	201-S01DB/F84	With
802	BS EN 1561 Grade EN GJL 250	BS EN 1092-1 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.

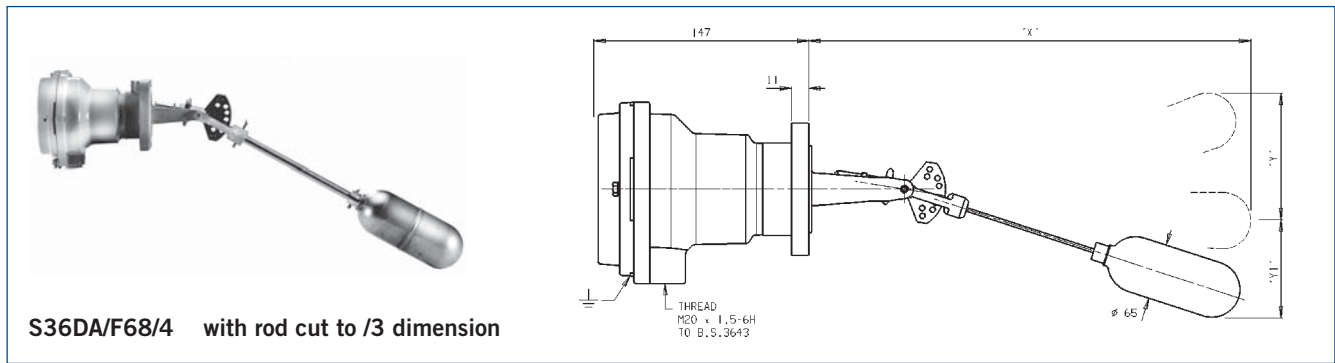
145C / 5 12	Typical ordering information
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Process connection sizes and dimensions for fabricated chambers																				
Dim	1"			DN25				1.5"		DN40		2"				DN50			Tolerance	
	150	300	600	PN16	PN25	PN40	PN100	150	300	PN16	150	300	600	900	PN16	PN25	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.

Float specification

Horizontal f68 pump control and alarm float



Switches fitted with F68 type float unit may be adjusted on site to meet pump control differential requirements.

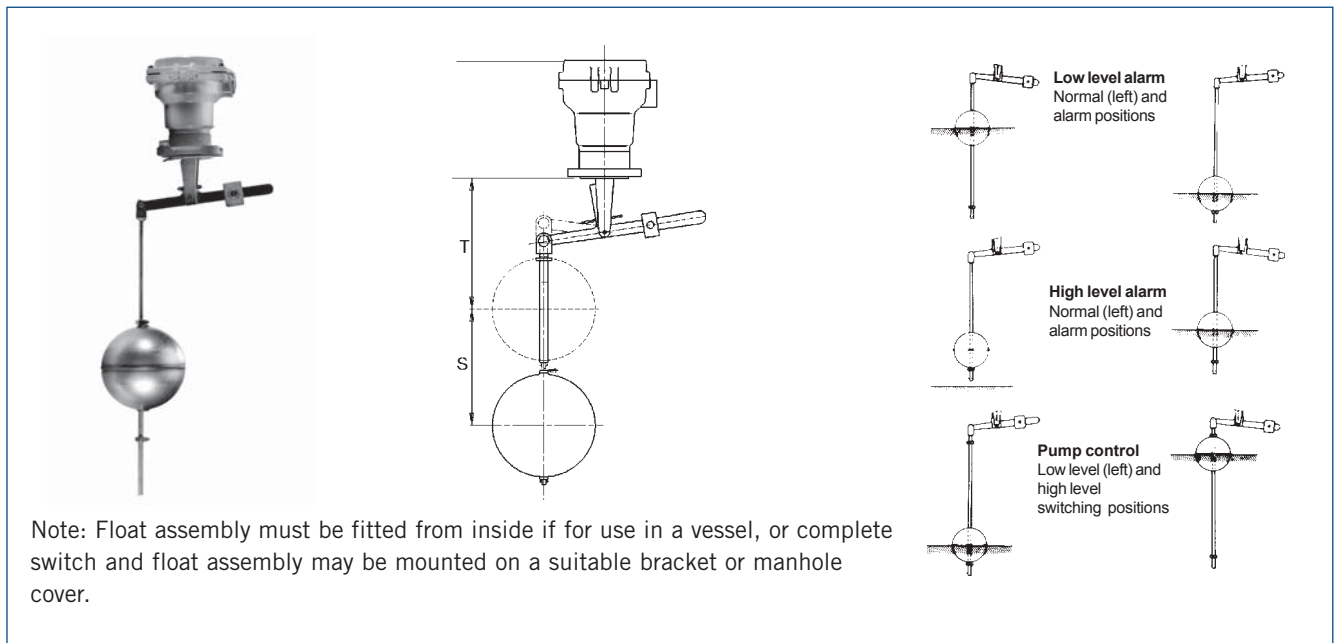
The float is available as a F68/1 or F68/4.

The F68/4 has pre-drilled holes along the rod to allow the user to achieve the 1/2 and 1/3 differentials in the table below:

Maximum intrusion	F68/1	F68/2	F68/3	F68/4
Wetside (mm) x	360	470	590	643
Minimum SG	0.72	0.8	0.82	0.85
Minimum tank dimension above/below centre line (mm)	216	292	368	406
Maximum differential (mm)	247	360	483	555

Full details of the operating levels and differentials are in the manual. Note, these dimensions are approximate for cold water and will vary for liquids of different SG.

Vertical F21 pump control and alarm float



Float rod lengths available : F21/1: 1524mm (5')
 F21/2: 3048mm (10')
 F21/3: 4570mm (15') max.

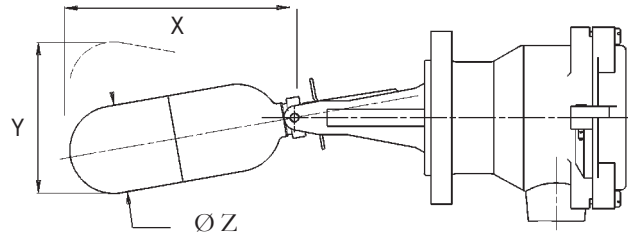
Float rods may be cut to length on site and switches set to operate at required level in either pump control or alarm mode by following the setting instructions supplied.

Type Number	Pump Differential "S"	Alarm Levels	
		Minimum "T"	Maximum "S"
F21/*	13-4420*	172	4400*

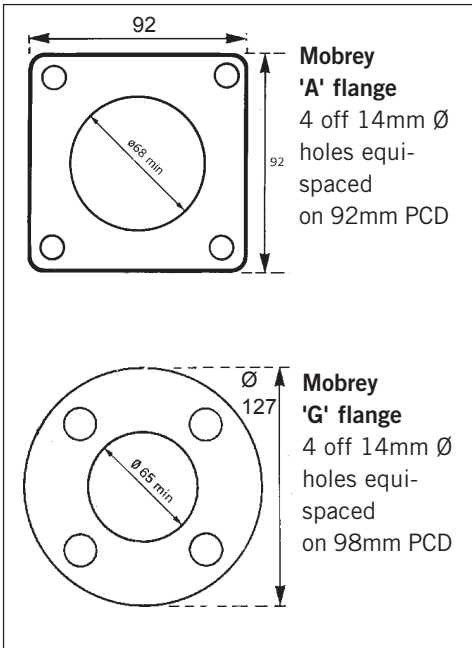
* When maximum rod length specified

Floats for use with stainless steel wetside switches

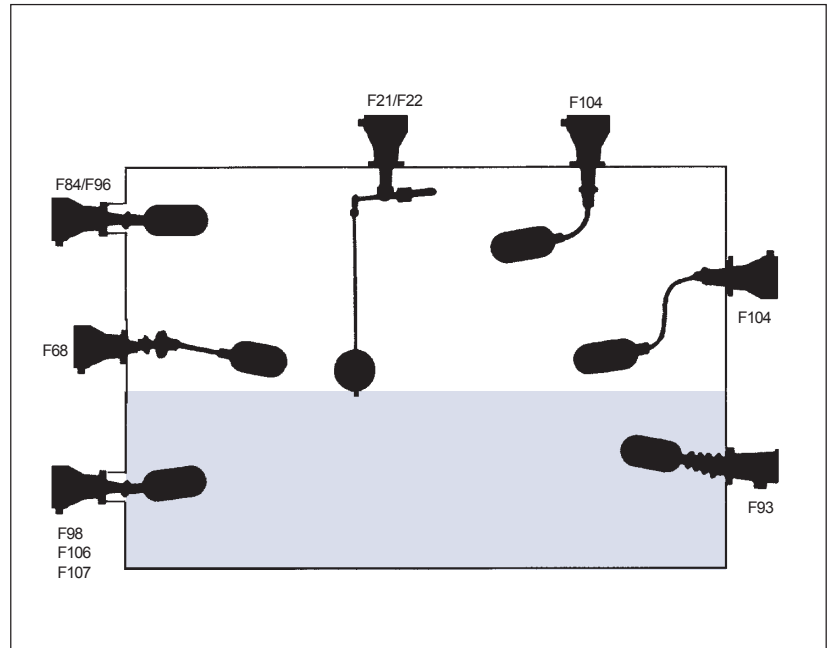
Float Type	Min. S.G.	Max. Pressure at 20°C (BAR)	Temperature °C Maximum	Differential (mm)	Dimension X Length from Pivot Point	Dimension Y Maximum Travel	Dimension Z Max. External Diameter	Float Material
F84	0.65	34.5	400	13	164	119	65	316 Stainless Steel
F96	0.60	74.0	400	13	164	119	65	
F98	0.45	34.5	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	



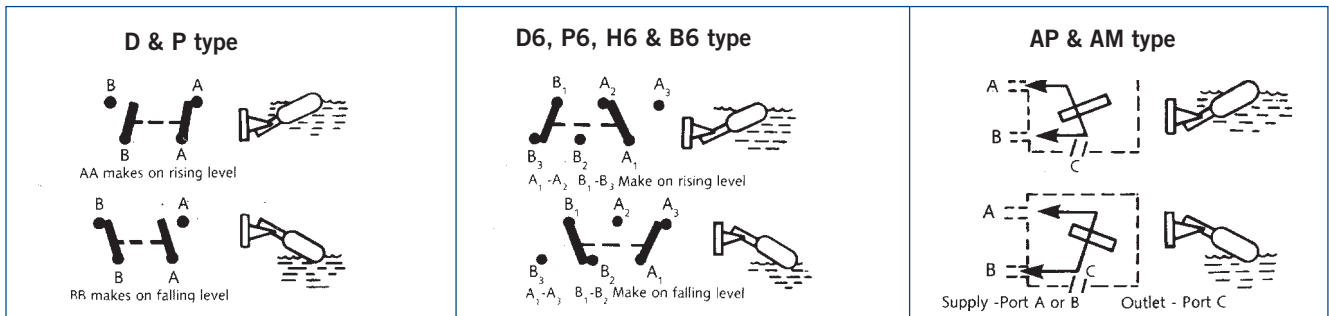
Mobrey flanges



Float switch range

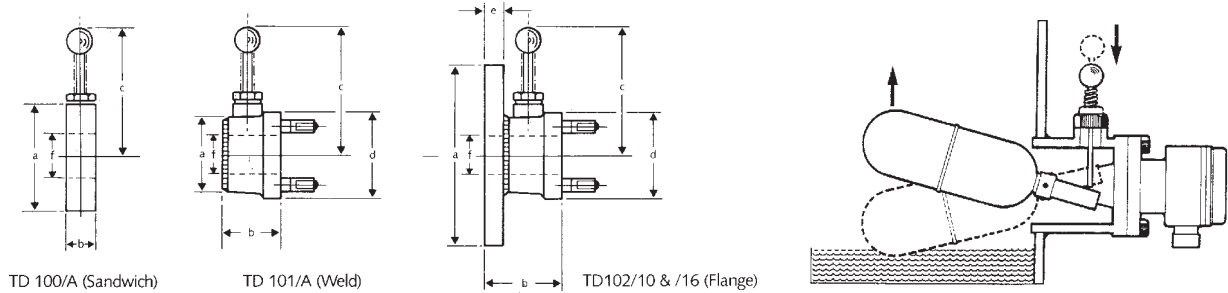


Switch mechanisms



Accessories

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



Type	Vessel Flange	Max. Pressure Bar	Max. Temp. °C	a	b	c	d	e	f
				Ø mm					
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 Viton '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

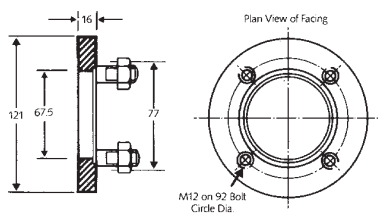
Cast steel body - BS1504-161-430A
Carbon steel flange - BS1503-221-430

Companion flanges

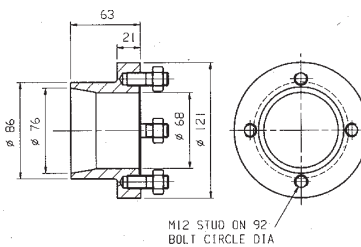
Welding and backing companion flanges are available as extra items to facilitate the direct mounting of mobrey A and G flange switches.

'A' flange models

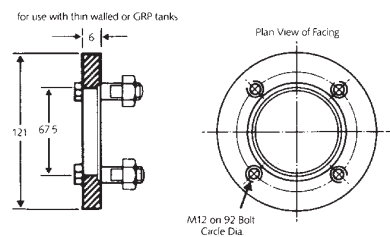
Welding pad J184



Welding nozzle J786



Backing flange J863

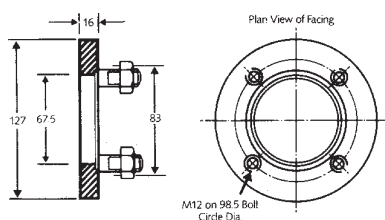


J184 in 316SS: 71020/107 (Not suitable with Mobrey 'M' switch SMA*)
900

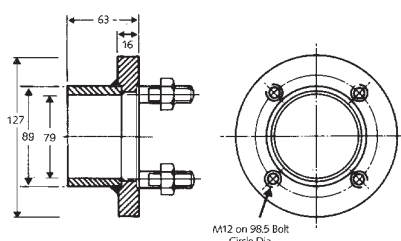
J863 in 316SS: 71030/
900

'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 Pyrotenax 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 Ex

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

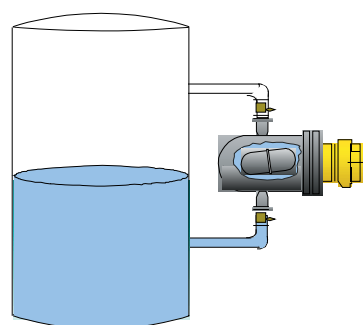
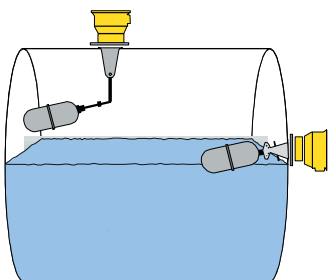
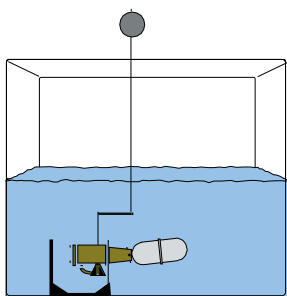
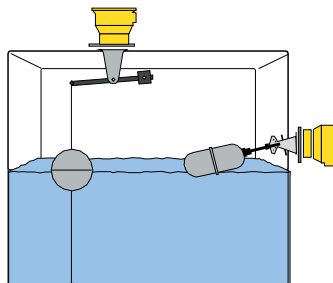
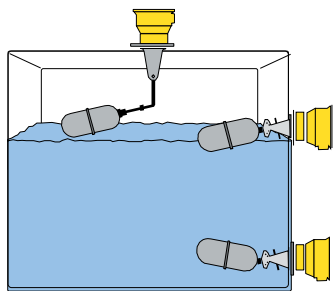
Pressures to 350bar and temperatures to 400°C are possible with Mobrey float switches.

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.



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