

TOP MOUNTING

Liquid Displacer Level Switches

DESCRIPTION

Magnetrol's displacement type level switches offer the industrial user a wide choice of alarm and control configurations. Each unit utilizes a simple buoyancy principle and is well suited for simple or complex applications, such as foaming or surging liquids or agitated fluids, and usually costs less than other types of level switches.

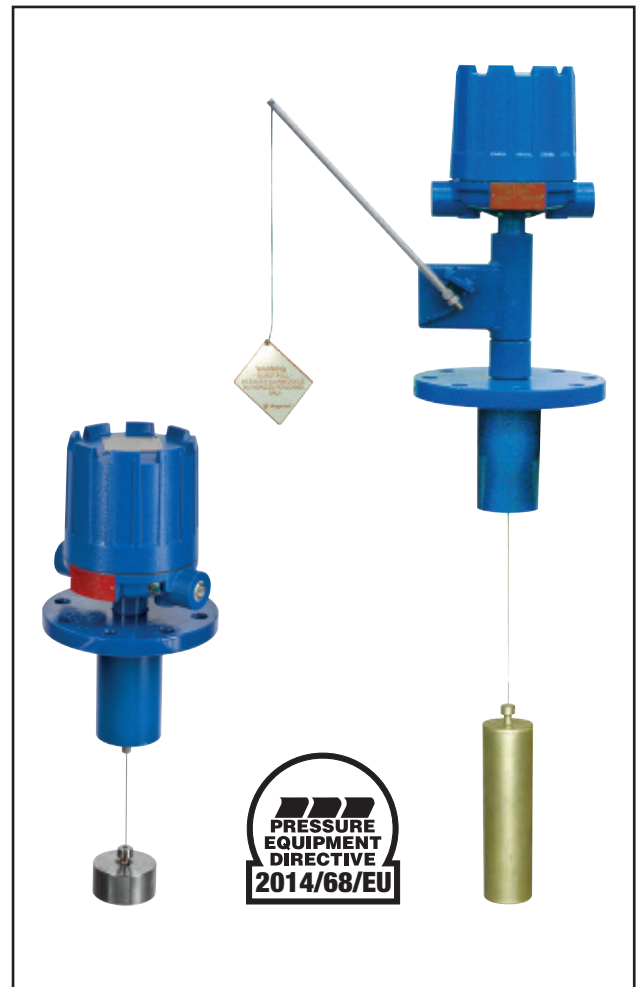
FEATURES

- Narrow or wide level ranges achieved through multiple switch mechanism capability
- Maximum process temperature: +260 °C (500 °F).
- Maximum process pressure: 55,1 bar (800 psi).
- S.G. as low as 0.4 kg/dm³.
- Displacers adjustable at any point along the suspension cable.
- Anti-surge design eliminates the possibility of switch short cycling.
- Standard 3 m (10 ft) of suspension cable, included for all models.
- Field adjustable set point and switch differential.
- Wide choice of displacer materials.
- Wide choice of housings and switch mechanisms
- Standard anti-corrosive protection.
- Proof-er® ground check
- Floating roof models
- NACE construction
- Optional:
 - high temperature models
 - high pressure models
 - models for interface
 - suspension cable > 3 m (10 ft)
 - special exterior surface preparation and finish.

APPLICATIONS

- | | |
|------------------------------|-----------------------|
| • Foaming or surging liquids | • Paints |
| • Agitated fluids | • Varnishes |
| • Sewage handling | • Heavy oils |
| • Dirty liquids | • Liquids with solids |

Displacer level switches for single or multiple pump control/level alarm



PRINCIPLE OF OPERATION

Standard controls

Operation is based upon simple buoyancy, whereby a spring is loaded with weighted displacers which are heavier than the liquid. Immersion of the displacers in the liquid results in buoyancy force change, which moves the spring upward. Since the spring moves only when the level moves on a displacer, spring movement (1) is always a small fraction of the level travel between displacers (2).

A magnetic sleeve (3) is connected to the spring and operates within a non-magnetic barrier tube (4). Spring movement causes the magnetic sleeve to attract a pivoted magnet (5), actuating a switch mechanism (6) located outside the barrier tube. Built-in limit stops, prevent over stroking of the spring under level surge conditions.

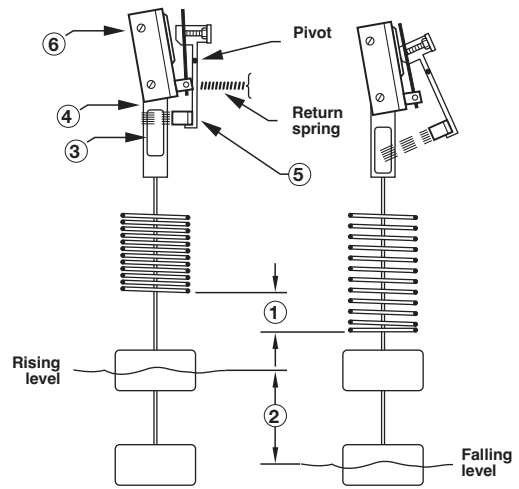
Proof-er® controls

The purpose of the PROOF-ER is to check the operation of a displacer control without having to raise the level in the tank. This is accomplished by pulling downward on the PROOF-ER cable. A spring-loaded lever arm then lifts the switch actuator simulating a high or high-high level condition. When the cable is released, the PROOF-ER returns the actuator to its previous position to resume normal operation.

Floating roof controls

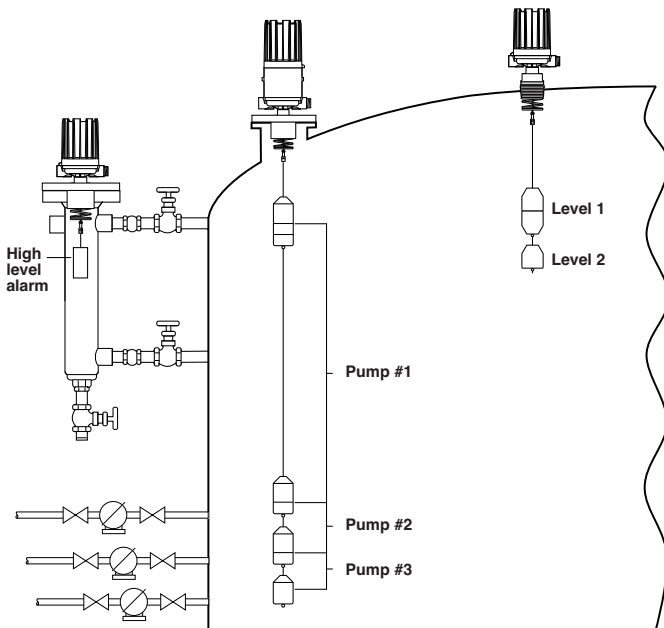
The floating roof control is designed for installation on 'barrier' (floating roof) tanks. The control may be furnished with

a brass displacer to prevent sparking. A hollow brass displacer is required if the control is to actuate in liquid as well as by the barrier. A stainless steel displacer is also available. Consult factory for other options.

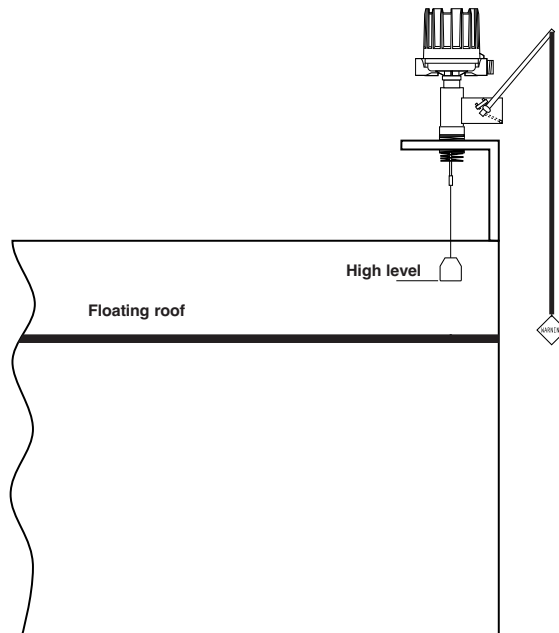


MOUNTING








Standard models



Floating roof models (with Proof-er® as shown below)



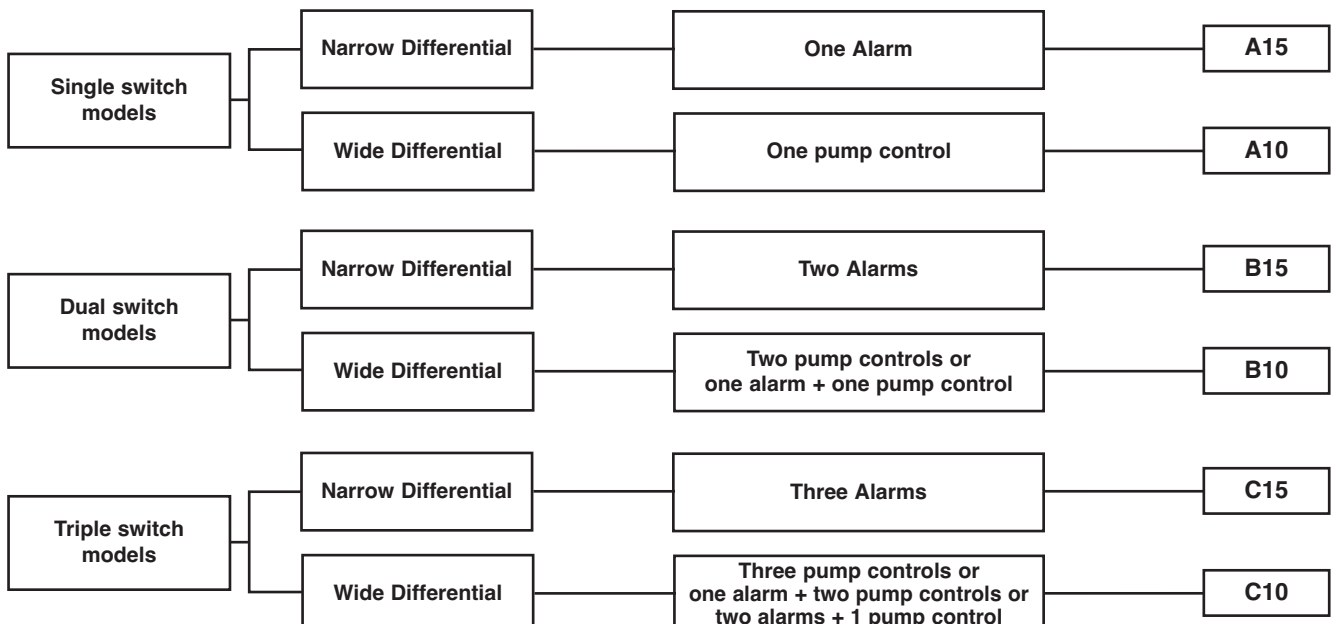
AGENCY APPROVALS

| AGENCY | APPROVED MODEL | AREA CLASSIFICATION |
|--|--|---|
| ATEX  | All with electric switch mechanism and housing listed as ATEX Ex d | ATEX II 2 G Ex d IIC T6 Gb |
| | All with electric switch mechanism and housing listed as ATEX Ex ia | ATEX II 1 G Ex ia IIC T6 Ga |
| FM  | All with electric switch mechanism and housing listed as NEMA 7/9 | Class I, Div 1, groups C & D Class II, Div 1, Groups E, F & G |
| | Consult factory for proper model numbers | Class I, Div 1, groups B, C & D Class II, Div 1, Groups E, F & G |
| IECEX  | All with electric switch mechanism and housing listed as IECEX Ex d | Ex d IIC T6 |
| | All with electric switch mechanism and housing listed as IECEX Ex ia | Ex ia IIC T6 Ga |
| CSA  | Consult factory for proper model numbers | Class I, Div 1, groups C & D Class II, Div 1, Groups E, F & G |
| | Consult factory for proper model numbers | Class I, Div 1, groups B, C & D Class II, Div 1, Groups E, F & G |
| EAC (Russia, Kazakhstan, Belarus)  | All with electric switch mechanism and housing listed as ATEX Ex d | 1Ex d IIC T6 Gb |
| | All with electric switch mechanism and housing listed as ATEX Ex ia | 0Ex ia IIC T4 Ga |
| LRS  | Lloyds Register of Shipping | Marine approval |
| CE  | The units conform to the ATEX directive 2014/34/EU, PED directive 2014/68/EU, Low Voltage Directive 2014/35/EU and RoHS directive 2011/65/EU | |
| Other approvals are available, consult factory for more details | | |

SELECTION DATA

Narrow Differential: for actuation of an alarm or system shutdown - up to 3 setpoints.

Wide Differential: switch differential for valve or pump control - up to 3 pump control functions.



SWITCH MODELS

Single switch models

Models A15 – Level alarm applications Narrow differential type

These instruments are factory calibrated to operate over a narrow level differential band and are ideally suited for liquid level alarm applications, on either high or low level.

The operating level is fully adjustable by simply repositioning the displacer along its suspension cable.

The differential band is ± 51 mm (2") in water and varies with liquid specific gravity.



Models A10 – Pump or valve control Wide differential type

These wide differential units are factory calibrated to actuate as a liquid level reaches a given displacer and to deactivate when the level reaches a second displacer.

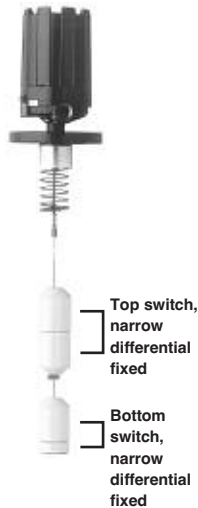
The minimum differential band is approximately 152 mm (6") in water and varies with liquid specific gravity. The maximum differential is determined by the length of the displacer suspension cable.



Dual switch models

Models B15 Narrow differential type

These instruments utilize two switches, each actuated at a different level and each calibrated with a narrow differential band.



Models B10 Wide differential type

These wide differential tandem units are factory calibrated with a choice of several operating sequences.



Triple switch models

Models C15 Narrow differential type

These instruments are factory calibrated to operate over a narrow level differential band while providing three electrically separate control signals in sequence as liquid level varies.



Models C10 Wide differential type

These wide differential type switches are designed to provide three electrically separate control signals in sequence as liquid level varies.

These units are factory calibrated with a choice of several sequences combining wide and narrow level differential.



SWITCH MECHANISMS AND HOUSINGS



Series B, C, D, O, Q & U Dry contact switches ①

- Series B, C, O and Q switches are general purpose units with a selection of maximum liquid temperature ratings
- Series D switch is designed for high DC current applications
- Series U switches have gold alloy contacts



Series HS ②, F, W, X & 8 Hermetically sealed switches

- Entire mechanism and contacts are contained within a positively pressurized capsule with series HS
- Ideal for use in salt and other corrosive atmospheres



Series J & K Pneumatic switches ③

- Suited for process industry applications in hazardous locations or where electrical power is not available
- Series J bleed type switch is intended for general purpose applications
- Series K switch is specially designed to provide non-bleed operation with a high degree of vibration resistance



Switch housings ④

- Die cast aluminium housings
- Cast iron housings
- Stainless steel housings
- Optional housing heaters and drains available for some housings
- Pneumatic switch mechanisms available with alu base/cold rolled steel cover



Series V Inductive Proximity switch ④

- Series V switches are inductive proximity switches type SJ3,5-SN with a maximum liquid temperature rating of +100 °C (+210 °F)

Basic electrical ratings ①

| Voltage | Switch Series and Non-Inductive Ampere Rating | | | | | | | | | | |
|----------|---|-------|-------|------|------|-------|-------|------|------|------|------|
| | B | C | D | F | HS | O | Q | U | W | X | 8 |
| 120 V AC | 15.00 | 15.00 | 10.00 | 2.50 | 5.00 | 15.00 | 15.00 | 1.00 | 1.00 | 0.50 | 1.00 |
| 240 V AC | 15.00 | 15.00 | — | — | 5.00 | 15.00 | 15.00 | — | 1.00 | 0.50 | — |
| 24 V DC | 6.00 | 6.00 | 10.00 | 4.00 | 5.00 | 6.00 | 6.00 | 1.00 | 3.00 | 0.50 | 3.00 |
| 120 V DC | 0.50 | 1.00 | 10.00 | 0.30 | 0.50 | 1.00 | 0.50 | — | 0.50 | 0.50 | — |
| 240 V DC | 0.25 | 0.50 | 3.00 | — | 0.25 | 0.50 | 0.25 | — | — | — | — |

① For more details see bulletin BE 42-683

② For more details on HS Hermetically sealed switches, see bulletin BE 42-694

③ For more details on J & K Pneumatic switches, see bulletin BE 42-685 and bulletin BE 42-686

④ For more details on V Inductive Proximity switches, see bulletin BE 42-798

QUICK RESPONSE CELL (QRC)

Several models are available for extra quick shipment, within max. 15 days after factory receipt of purchase order, through the Quick Response Cell (QRC). To take advantage of QRC, simply match the green model number codes.

QRC delivery is limited to a maximum of 10 units per order. Contact your local representative for lead times on larger volume orders, as well as other products and options.

EXPEDITE SHIP PLAN (ESP)

Several models are available for quick shipment, within max. 4 weeks after factory receipt of purchase order, through the Expedite Ship Plan (ESP). To take advantage of ESP, simply match the blue (or combination of green and blue) model number codes.

ESP delivery is limited to a maximum of 10 units per order. Contact your local representative for lead times on larger volume orders, as well as other products and options.

SELECTION DATA SINGLE SWITCH MODEL

A complete measuring system consists of:

Order code for **standard** models (each unit is factory calibrated to operate on a given specific gravity within the min and the max values listed per model)

1 - 3 | PART NUMBER CODE AND SPECIFIC GRAVITY LIMITS

| Part Number Code | Function | Liquid Temp. | Displacer Type | |
|------------------|--|--------------|----------------|-----------------|
| | | °C (°F) | Porcelain | Stainless Steel |
| A15 | One adjustable set point (fixed narrow differential) | 40 (100) | 0.60 to 2.40 | 0.40 to 1.65 |
| | | 95 (200) | 0.62 to 2.40 | 0.40 to 1.65 |
| | | 150 (300) | 0.65 to 2.40 | 0.50 to 1.65 |
| | | 200 (400) | 0.70 to 2.40 | 0.55 to 1.65 |
| | | 260 (500) | 0.75 to 2.40 | 0.60 to 1.65 |
| A10 | One adjustable wide differential | 40 (100) | 0.60 to 1.20 | 0.60 to 1.20 |
| | | 95 (200) | 0.70 to 1.20 | 0.70 to 1.20 |
| | | 150 (300) | 0.80 to 1.20 | 0.80 to 1.20 |
| | | 200 (400) | 1.00 to 1.20 | 0.90 to 1.20 |
| | | 260 (500) | 1.10 to 1.20 | 1.00 to 1.20 |

4 | MATERIALS OF CONSTRUCTION (3 m (10') of suspension cable is standard supplied)

| Code | Spring | Trim | Process connections | Displacer clamps and cable | Magnetic sleeve | Construction |
|------|--------------|------------------|---------------------|----------------------------|------------------|--|
| A | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 400 series SST | Standard |
| B | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| D | Inconel 600 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| E | Inconel 600 | 316 SST (1.4401) | carbon steel | Monel (2.4360) | 400 series SST | Standard |
| F | Inconel 600 | 316 SST (1.4401) | carbon steel | Hastelloy C (2.4819) | 400 series SST | Standard |
| K | Inconel X750 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |
| L | Inconel X750 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |

5 - 6 | PROCESS CONNECTION

– threaded

| | |
|-----|------------|
| E 2 | 2 1/2" NPT |
|-----|------------|

– ASME flanges

| | |
|-----|--------------------|
| G 3 | 3" 150 lbs ASME RF |
| G 4 | 3" 300 lbs ASME RF |
| G 5 | 3" 600 lbs ASME RF |
| H 3 | 4" 150 lbs ASME RF |
| H 4 | 4" 300 lbs ASME RF |
| H 5 | 4" 600 lbs ASME RF |
| K 3 | 6" 150 lbs ASME RF |
| K 4 | 6" 300 lbs ASME RF |

– EN flanges

| | | |
|-----|------------------|-------------------|
| 8 A | DN 80, PN 16 | EN 1092-1 Type B1 |
| 8 B | DN 80, PN 25/40 | EN 1092-1 Type B1 |
| 1 A | DN 100, PN 16 | EN 1092-1 Type B1 |
| 1 B | DN 100, PN 25/40 | EN 1092-1 Type B1 |

7 | DISPLACER MATERIAL AND PROOF-ER® OPTION

(for pressure ratings, refer to physical specifications table)

– without Proof-er®

can be used for NACE

| | |
|---|------------------|
| A | Porcelain |
| B | 316 SST (1.4401) |

– with low pressure Proof-er®^①

not for NACE

| | |
|---|------------------|
| D | Porcelain |
| E | 316 SST (1.4401) |

– with medium pressure Proof-er®^①

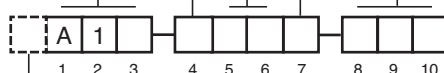
not for NACE

| | |
|---|------------------|
| G | Porcelain |
| H | 316 SST (1.4401) |

^① Proof-er® is available in carbon steel only

8 - 10 | SWITCH MECHANISM & HOUSING

Refer to table selections per displacer type models A15-A10 (next page)



complete order code for **standard** models

SELECT ELECTRIC SWITCH MECHANISM & HOUSING: MODEL A15

| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | ATEX - IECEx (IP 66) | | | | | | FM (IP 66) |
|--|--|----------|-----------------------|--------|----------------------|--------|-----------------------|----------|-----------------------|--------|------------|
| | | | | | II 2G Ex d IIC T6 Gb | | | | II 1G Ex ia IIC T6 Ga | | NEMA 7/9 |
| | | | Cast Aluminium | | Cast Aluminium | | Cast Iron (ATEX only) | | Cast Aluminium | | Cast Alu. |
| | | | M20x1,5 | 1" NPT | M20x1,5 | 1" NPT | M20x1,5 | 3/4" NPT | M20x1,5 | 1" NPT | 1" NPT |
| Series B Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | B2Q | BAQ | BH9 | BA9 | BK5 | BU5 | – | – | BKQ |
| | | 1x DPDT | B8Q | BDQ | BJ9 | BB9 | BD5 | BW5 | – | – | BNQ |
| Series C Snap switch | -40 to +230 (-40 to +450) | 1x SPDT | C2Q | CAQ | CH9 | CA9 | CK5 | CU5 | C2S | CAS | CKQ |
| | | 1x DPDT | C8Q | CDQ | CJ9 | CB9 | CD5 | CW5 | C8S | CDS | CNQ |
| Series D DC Current Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | D2Q | DAQ | DH9 | DA9 | DK5 | DU5 | – | – | DKQ |
| | | 1x DPDT | D8Q | DDQ | DJ9 | DB9 | DD5 | DW5 | – | – | DNQ |
| Series F Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | F2Q | FAQ | FH9 | FA9 | FK5 | FU5 | – | – | FKQ |
| | | 1x DPDT | F8Q | FDQ | FJ9 | FB9 | FD5 | FW5 | – | – | FNQ |
| Series HS Hermetically sealed Snap switch | -45 to +260 ② (-50 to +500) | 1x SPDT | H7A | HM2 | HFC | HA9 | HB3 | HB4 | – | – | HM3 |
| | | 1x DPDT | H7C | HM6 | HGC | HB9 | HB7 | HB8 | – | – | HM7 |
| Series U Gold alloy contacts Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | U2Q | UAQ | UH9 | UA9 | UK5 | UU5 | U2S | UAS | UKQ |
| | | 1x DPDT | U8Q | UDQ | UJ9 | UB9 | UD5 | UW5 | U8S | UDS | UNQ |
| Series V Inductive Proximity switch | -40 to +100 (-40 to +210) | – | – | – | – | – | – | V5S | VBS | – | |
| Series W Hermetically sealed Silver plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | W2Q | WAQ | WH9 | WA9 | WK5 | WU5 | W2S | WAS | WKQ |
| | | 1x DPDT | W8Q | WDQ | WJ9 | WB9 | WD5 | WW5 | W8S | WDS | WNQ |
| Series X Hermetically sealed Gold plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | X2Q | XAQ | XH9 | XA9 | XK5 | XU5 | X2S | XAS | XKQ |
| | | 1x DPDT | X8Q | XDQ | XJ9 | XB9 | XD5 | XW5 | X8S | XDS | XNQ |
| Series 8 Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | 82Q | 8AQ | 8H9 | 8A9 | 8K5 | 8U5 | – | – | 8KQ |
| | | 1x DPDT | 88Q | 8DQ | 8J9 | 8B9 | 8D5 | 8W5 | – | – | 8NQ |

SELECT ELECTRIC SWITCH MECHANISM & HOUSING: MODEL A10

| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | ATEX - IECEx (IP 66) | | | | | | FM (IP 66) |
|--|--|----------|-----------------------|--------|----------------------|--------|-----------------------|----------|-----------------------|--------|------------|
| | | | | | II 2G Ex d IIC T6 Gb | | | | II 1G Ex ia IIC T6 Ga | | NEMA 7/9 |
| | | | Cast Aluminium | | Cast Aluminium | | Cast Iron (ATEX only) | | Cast Aluminium | | Cast Alu. |
| | | | M20x1,5 | 1" NPT | M20x1,5 | 1" NPT | M20x1,5 | 3/4" NPT | M20x1,5 | 1" NPT | 1" NPT |
| Series B Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | B2B | BAB | BK9 | BC9 | BK5 | BU5 | – | – | BKB |
| | | 1x DPDT | B8B | BDB | BN9 | BF9 | BD5 | BW5 | – | – | BNB |
| Series C Snap switch | -40 to +230 (-40 to +450) | 1x SPDT | C2B | CAB | CK9 | CC9 | CK5 | CU5 | C2T | CAT | CKB |
| | | 1x DPDT | C8B | CDB | CN9 | CF9 | CD5 | CW5 | C8T | CDT | CNB |
| Series D DC Current Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | D2B | DAB | DK9 | DC9 | DK5 | DU5 | – | – | DKB |
| | | 1x DPDT | D8B | DDB | DN9 | DF9 | DD5 | DW5 | – | – | DNB |
| Series F Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | FCB | FAB | FK9 | FC9 | FK5 | FU5 | – | – | FKB |
| | | 1x DPDT | FGB | FDB | FN9 | FF9 | FD5 | FW5 | – | – | FNB |
| Series HS Hermetically sealed Snap switch | -45 to +260 ② (-50 to +500) | 1x SPDT | H7A | HM2 | HFC | HA9 | HB3 | HB4 | – | – | HM3 |
| | | 1x DPDT | H7C | HM6 | HGC | HB9 | HB7 | HB8 | – | – | HM7 |
| Series U Gold alloy contacts Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | U2B | UAB | UK9 | UC9 | UK5 | UU5 | U2T | UAT | UKB |
| | | 1x DPDT | U8B | UDB | UN9 | UF9 | UD5 | UW5 | U8T | UDT | UNB |
| Series V Inductive Proximity switch | -40 to +100 (-40 to +210) | – | – | – | – | – | – | VCS | VES | – | |
| Series W Hermetically sealed Silver plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | W2B | WAB | WK9 | WC9 | WK5 | WU5 | W2T | WAT | WKB |
| | | 1x DPDT | W8B | WDB | WN9 | WF9 | WD5 | WW5 | W8T | WDT | WNB |
| Series X Hermetically sealed Gold plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | X2B | XAB | XK9 | XC9 | XK5 | XU5 | X2T | XAT | XKB |
| | | 1x DPDT | X8B | XDB | XN9 | XF9 | XD5 | XW5 | X8T | XDT | XNB |
| Series 8 Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | 82B | 8AB | 8K9 | 8C9 | 8K5 | 8U5 | – | – | 8KB |
| | | 1x DPDT | 88B | 8DB | 8N9 | 8F9 | 8D5 | 8W5 | – | – | 8NB |

SELECT PNEUMATIC SWITCH MECHANISM & HOUSING: MODEL A15 — MODEL A10 TYPE DISPLACER SWITCHES

| Switch Description | Max supply pressure bar (psi) | Max process temperature ① °C (°F) | Bleed orifice ø mm (inches) | A15 codes | A10 codes |
|---------------------------|----------------------------------|--------------------------------------|--------------------------------|-----------------|-----------------|
| | | | | NEMA 3R (IP 53) | NEMA 3R (IP 53) |
| Series J (open air) | 6,9 (100) | 200 (400) | 1,60 (0.063) | JDE | JGF |
| | 4,1 (60) | 200 (400) | 2,39 (0.094) | JEE | JHF |
| | 4,1 (60) | 260 (500) | 1,40 (0.055) | JFE | JJF |
| Series K (closed circuit) | 6,9 (100) | 200 (400) | – | KOE | KOF |

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

② On steam applications, temperature down-rated to +200 °C (+400 °F) process at +40 °C (+100 °F) ambient.

SELECTION DATA DUAL SWITCH MODEL

A complete measuring system consists of:

Order code for **standard** models (each unit is factory calibrated to operate on a given specific gravity within the min and the max values listed per model)

1 - 3 | PART NUMBER CODE AND SPECIFIC GRAVITY LIMITS

| Part Number Code | Function | Liquid Temp. | Displacer Type | |
|------------------|---|--------------|----------------|-----------------|
| | | °C (°F) | Porcelain | Stainless Steel |
| B15 | Two adjustable set points (fixed narrow differential) | 40 (100) | 0.95 to 1.20 | 0.70 to 1.20 |
| | | 95 (200) | 1.10 to 1.20 | 0.80 to 1.20 |
| | | 150 (300) | - | 0.90 to 1.20 |
| | | 200 (400) | - | 1.00 to 1.20 |
| | | 260 (500) | - | 1.04 to 1.20 |
| B10 ① | Two adjustable wide differentials | 40 (100) | 0.60 to 1.20 | 0.50 to 1.00 |
| | | 95 (200) | 0.64 to 1.50 | 0.50 to 1.00 |
| | | 150 (300) | 0.80 to 1.50 | 0.60 to 1.00 |
| | | 200 (400) | 1.00 to 1.50 | 0.72 to 1.00 |
| | | 260 (500) | 1.10 to 1.50 | 0.84 to 1.00 |

① When ordering B10 units, an operating sequence and specific gravity must be provided.

4 | MATERIALS OF CONSTRUCTION (3 m (10') of suspension cable is standard supplied)

| Code | Spring | Trim | Process connections | Displacer clamps and cable | Magnetic sleeve | Construction |
|------|--------------|------------------|---------------------|----------------------------|------------------|--|
| A | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 400 series SST | Standard |
| B | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| D | Inconel 600 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| E | Inconel 600 | 316 SST (1.4401) | carbon steel | Monel (2.4360) | 400 series SST | Standard |
| F | Inconel 600 | 316 SST (1.4401) | carbon steel | Hastelloy C (2.4819) | 400 series SST | Standard |
| K | Inconel X750 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |
| L | Inconel X750 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |

5 - 6 | PROCESS CONNECTION

– threaded

| | |
|-----|------------|
| E 2 | 2 1/2" NPT |
|-----|------------|

– ASME flanges

| | |
|-----|--------------------|
| G 3 | 3" 150 lbs ASME RF |
| G 4 | 3" 300 lbs ASME RF |
| G 5 | 3" 600 lbs ASME RF |
| H 3 | 4" 150 lbs ASME RF |
| H 4 | 4" 300 lbs ASME RF |
| H 5 | 4" 600 lbs ASME RF |
| K 3 | 6" 150 lbs ASME RF |
| K 4 | 6" 300 lbs ASME RF |

– EN flanges

| | | |
|-----|------------------|-------------------|
| 8 A | DN 80, PN 16 | EN 1092-1 Type B1 |
| 8 B | DN 80, PN 25/40 | EN 1092-1 Type B1 |
| 1 A | DN 100, PN 16 | EN 1092-1 Type B1 |
| 1 B | DN 100, PN 25/40 | EN 1092-1 Type B1 |

7 | DISPLACER MATERIAL AND PROOF-ER® OPTION

(for pressure ratings, refer to physical specifications table)

– without Proof-er®

can be used for NACE

| | |
|---|------------------|
| A | Porcelain |
| B | 316 SST (1.4401) |

– with low pressure Proof-er®²

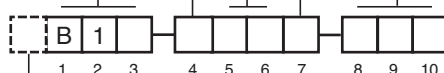
not for NACE

| | |
|---|------------------|
| D | Porcelain |
| E | 316 SST (1.4401) |

² Proof-er® is available in carbon steel only

8 - 10 | SWITCH MECHANISM & HOUSING

Refer to table selections per displacer type models B10-B15 (next page)



complete order code for **standard** models

X = product with a specific customer requirement

SELECT ELECTRIC SWITCH MECHANISM AND HOUSING: MODELS B10 & B15

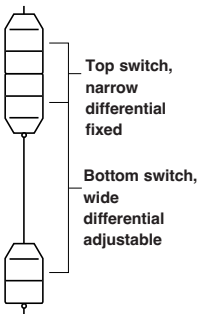
| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | ATEX - IECEx (IP 66) | | | | | | FM (IP 66) |
|--|--|----------|-----------------------|--------|----------------------|--------|-----------------------|----------|-----------------------|--------|------------|
| | | | | | II 2G Ex d IIC T6 Gb | | | | II 1G Ex ia IIC T6 Ga | | NEMA 7/9 |
| | | | Cast Aluminium | | Cast Aluminium | | Cast Iron (ATEX only) | | Cast Aluminium | | Cast Alu. |
| | | | M20x1,5 | 1" NPT | M20x1,5 | 1" NPT | M20x1,5 | 3/4" NPT | M20x1,5 | 1" NPT | 1" NPT |
| Series B Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | B4B | BBB | BL9 | BD9 | BL5 | BV5 | – | – | BLB |
| | | 2x DPDT | B1B | BEB | BP9 | BG9 | BO5 | BY5 | – | – | BOB |
| Series C Snap switch | -40 to +230 (-40 to +450) | 2x SPDT | C4B | CBB | CL9 | CD9 | CL5 | CV5 | C4T | CBT | CLB |
| | | 2x DPDT | C1B | CEB | CP9 | CG9 | CO5 | CY5 | C1T | CET | COB |
| Series D DC Current Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | D4B | DBB | DL9 | DD9 | DL5 | DV5 | – | – | DLB |
| | | 2x DPDT | D1B | DEB | DP9 | DG9 | DO5 | DY5 | – | – | DOB |
| Series F Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 2x SPDT | FFB | FBB | FL9 | FD9 | FL5 | FV5 | – | – | FLB |
| | | 2x DPDT | FHB | FEB | FP9 | FG9 | FO5 | FY5 | – | – | FOB |
| Series U Gold alloy contacts Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | U4B | UBB | UL9 | UD9 | UL5 | UV5 | U4T | UBT | ULB |
| | | 2x DPDT | U1B | UEB | UP9 | UG9 | UO5 | UY5 | U1T | UET | UOB |
| Series W Hermetically sealed Silver plated contacts Snap switch | -45 to +230 (-50 to +450) | 2x SPDT | W4B | WBB | WL9 | WD9 | WL5 | WV5 | W4T | WBT | WLB |
| | | 2x DPDT | W1B | WEB | WP9 | WG9 | WO5 | WY5 | W1T | WET | WOB |
| Series X Hermetically sealed Gold plated contacts Snap switch | -45 to +230 (-50 to +450) | 2x SPDT | X4B | XBB | XL9 | XD9 | XL5 | XV5 | X4T | XBT | XLB |
| | | 2x DPDT | X1B | XEB | XP9 | XG9 | XO5 | XY5 | X1T | XET | XOB |
| Series 8 Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 2x SPDT | 84B | 8BB | 8L9 | 8D9 | 8L5 | 8V5 | – | – | 8LB |
| | | 2x DPDT | 81B | 8EB | 8P9 | 8G9 | 8O5 | 8Y5 | – | – | 8OB |

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

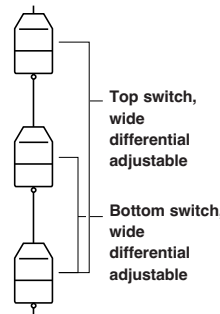
OPERATING SEQUENCES

Model B10 units are available factory calibrated with a choice of switch operating sequence. Five of the most popular sequences are described below.

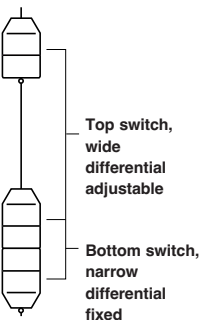
When ordering B10 units, an operating sequence and specific gravity must be provided.



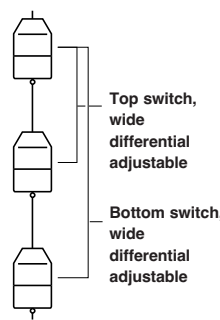
PUMP CONTROL PLUS ALARM
Arrangement N° 1 – fill with high level alarm
 At the lowest level the pump starts. When the level rises to the middle displacer, the pump stops. If the level continues to rise, the upper displacer actuates the alarm switch which remains actuated until the level drops to the middle displacer.



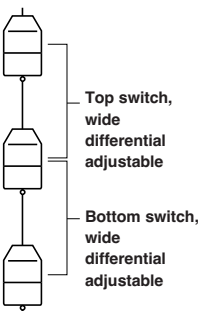
CONTROL OF 2 PUMPS
Arrangement N° 4 – drain
 In this sequence N° 1 pump starts as the level rises to the middle displacer. Should the level continue to rise to the upper displacer, N° 2 pump is actuated. Both pumps operate until the level is dropped to the lower displacer.



Arrangement N° 2 – drain with low level alarm
 At the highest level, the pump starts. When the level falls to the middle displacer, the pump stops. If the level continues to fall, the lower displacer actuates the alarm switch which remains actuated until the level raises to the middle displacer.



Arrangement N° 5 – fill
 In this sequence N° 1 pump starts as the level falls to the middle displacer. Should the level continue to fall to the bottom displacer, N° 2 pump is actuated. Both pumps operate until the level is raised to the upper displacer.



CONTROL OF 2 PUMPS OF DIFFERENT CAPACITY
Arrangement N° 3 – two switch, wide differential or drain
 The top switch cycles with level between the top and middle displacer. The bottom switch cycles with level between the middle and bottom displacer.

SELECTION DATA TRIPLE SWITCH MODEL

Note: Each C10 and C15 instrument is factory calibrated to operate for a given specific gravity within the minimum and maximum values listed.

1 - 3 | PART NUMBER CODE AND SPECIFIC GRAVITY LIMITS

| Part Number Code | Function | Liquid Temp. | Displacer Type | |
|------------------|---------------------------------|--------------|----------------|-----------------|
| | | °C (°F) | Porcelain | Stainless Steel |
| C15 ① | Narrow differential, 3 switches | 55 (130) | 0.80 to 1.25 | 0.65 to 1.00 |
| C10 ② | Wide differential, 3 switches | 40 (100) | 0.65 to 1.20 | 0.58 to 1.20 |
| | | 95 (200) | 0.95 to 1.10 | 0.76 to 1.00 |
| | | 150 (300) | - | 0.82 to 1.00 |

① When ordering C15 units, an operating specific gravity must be provided.

② When ordering C10 units, an operating sequence and operating specific gravity must be provided.

4 | MATERIALS OF CONSTRUCTION (3 m (10') of suspension cable is standard supplied)

| Code | Spring | Trim | Process connections | Displacer clamps and cable | Magnetic sleeve | Construction |
|------|--------------|------------------|---------------------|----------------------------|------------------|--|
| A | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 400 series SST | Standard |
| B | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| D | Inconel 600 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| E | Inconel 600 | 316 SST (1.4401) | carbon steel | Monel (2.4360) | 400 series SST | Standard |
| F | Inconel 600 | 316 SST (1.4401) | carbon steel | Hastelloy C (2.4819) | 400 series SST | Standard |
| K | Inconel X750 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |
| L | Inconel X750 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | NACE (not available with Proof-er® option) |

5 - 6 | PROCESS CONNECTION

- threaded

| | |
|-----|------------|
| E 2 | 2 1/2" NPT |
|-----|------------|

- ASME flanges

| | |
|-----|--------------------|
| G 3 | 3" 150 lbs ASME RF |
| G 4 | 3" 300 lbs ASME RF |
| G 5 | 3" 600 lbs ASME RF |
| H 3 | 4" 150 lbs ASME RF |
| H 4 | 4" 300 lbs ASME RF |
| H 5 | 4" 600 lbs ASME RF |
| K 3 | 6" 150 lbs ASME RF |
| K 4 | 6" 300 lbs ASME RF |

- EN flanges

| | | |
|-----|------------------|-------------------|
| 8 A | DN 80, PN 16 | EN 1092-1 Type B1 |
| 8 B | DN 80, PN 25/40 | EN 1092-1 Type B1 |
| 1 A | DN 100, PN 16 | EN 1092-1 Type B1 |
| 1 B | DN 100, PN 25/40 | EN 1092-1 Type B1 |

7 | DISPLACER MATERIAL (proof-er® option not available)

(for pressure ratings, refer to physical specifications table)

- without Proof-er®

can be used for NACE

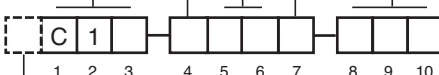
| | |
|---|------------------|
| A | Porcelain |
| B | 316 SST (1.4401) |

8 - 10 | SWITCH MECHANISM & HOUSING

| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | FM (IP 66) |
|----------------------|-------------------------------------|----------|-----------------------|--------|----------------|
| | | | Cast Aluminium | | NEMA 7/9 |
| | | | M20 x 1,5 | 1" NPT | Cast Aluminium |
| Series O Snap Switch | -40 to +150 ② (-40 to +300) | 3x SPDT | O6B | OCB | OMB |
| | | 3x DPDT | O1B | OEB | OKB |
| Series Q Snap Switch | -40 to +120 ② (-40 to +250) | 3x SPDT | Q6B | QCB | QMB |
| | | 3x DPDT | Q1B | QEB | QKB |

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

② Model C15 limited to 55 °C (130 °F) max.

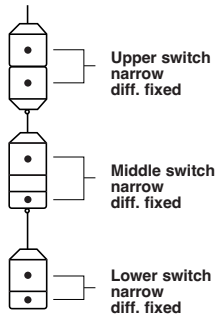


complete order code for **standard** models

X = product with a specific customer requirement

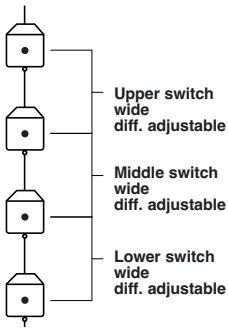
OPERATING SEQUENCES

When ordering C15 units, a specific gravity MUST be provided.

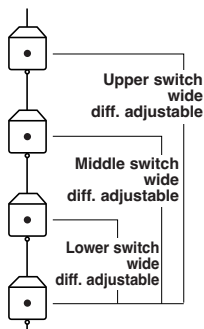


Model C10 units are available factory calibrated with a choice of switch operating sequence. Seven of the most popular sequences are described below.

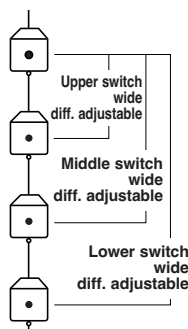
When ordering C10 units, an operating sequence and specific gravity MUST be provided.



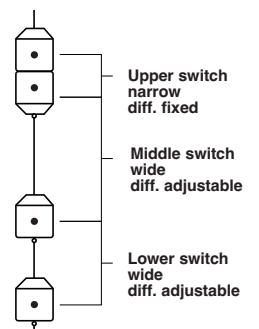
Arrangement A



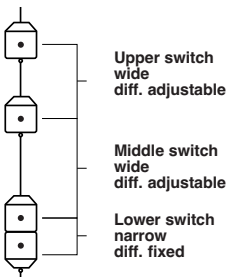
Arrangement B



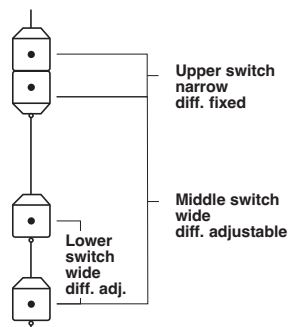
Arrangement C



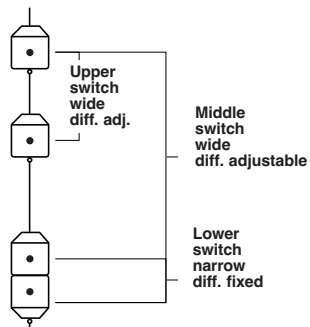
Arrangement D



Arrangement E



Arrangement F



Arrangement G

SELECTION DATA SINGLE SWITCH FLOATING ROOF MODEL

1 - 3 | BASIC MODEL NUMBER – units for ALARM use ONLY

| | |
|-------|--|
| A 1 5 | One adjustable set point (fixed narrow differential) |
|-------|--|

4 | MATERIAL OF CONSTRUCTION (3 m (10') of suspension cable is standard supplied)

| Code | Spring | Trim | Process connections | Displacer clamps and cable | Magnetic sleeve | Construction |
|------|-------------|------------------|---------------------|----------------------------|------------------|--------------|
| A | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 400 series SST | Standard |
| B | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| D | Inconel 600 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | Standard |

5 - 6 | PROCESS CONNECTION – size rating – threaded

| | |
|-----|------------|
| E 2 | 2 1/2" NPT |
|-----|------------|

– ASME flanges

| | |
|-----|--------------------|
| G 3 | 3" 150 lbs ASME RF |
| G 4 | 3" 300 lbs ASME RF |
| H 3 | 4" 150 lbs ASME RF |
| H 4 | 4" 300 lbs ASME RF |
| K 3 | 6" 150 lbs ASME RF |
| K 4 | 6" 300 lbs ASME RF |

– EN flanges

| | | |
|-----|------------------|-------------------|
| 8 A | DN 80, PN 16 | EN 1092-1 Type B1 |
| 8 B | DN 80, PN 25/40 | EN 1092-1 Type B1 |
| 1 A | DN 100, PN 16 | EN 1092-1 Type B1 |
| 1 B | DN 100, PN 25/40 | EN 1092-1 Type B1 |

7 | DISPLACER MATERIAL AND PROOF-ER® OPTION (for pressure ratings, refer to physical specifications table) – without Proof-er®

| | |
|---|---|
| P | Brass |
| R | Hollow brass (roof and liquid) ^① |
| M | Stainless steel |

– with low pressure Proof-er^{®②}

| | |
|---|---|
| Q | Brass |
| T | Hollow brass (roof and liquid) ^① |
| N | Stainless steel |

^① Suitable for process liquids with SG ≥ 0,4.

^② Proof-er[®] is available in carbon steel only.

8 - 10 | SWITCH MECHANISM & HOUSING

Refer to table selections per displacer type model A15 (next page)



complete order code for floating roof models

→ X = product with a specific customer requirement

SELECT ELECTRIC SWITCH MECHANISM & HOUSING: MODEL A15

| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | ATEX - IECEx (IP 66) | | | | | | FM (IP 66) |
|--|--|----------|-----------------------|--------|----------------------|--------|-----------------------|----------|-----------------------|--------|------------|
| | | | | | II 2G Ex d IIC T6 Gb | | | | II 1G Ex ia IIC T6 Ga | | NEMA 7/9 |
| | | | Cast Aluminium | | Cast Aluminium | | Cast Iron (ATEX only) | | Cast Aluminium | | Cast Alu. |
| | | | M20x1,5 | 1" NPT | M20x1,5 | 1" NPT | M20x1,5 | 3/4" NPT | M20x1,5 | 1" NPT | 1" NPT |
| Series B Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | B2Q | BAQ | BH9 | BA9 | BK5 | BU5 | – | – | BKQ |
| | | 1x DPDT | B8Q | BDQ | BJ9 | BB9 | BD5 | BW5 | – | – | BNQ |
| Series C Snap switch | -40 to +230 (-40 to +450) | 1x SPDT | C2Q | CAQ | CH9 | CA9 | CK5 | CU5 | C2S | CAS | CKQ |
| | | 1x DPDT | C8Q | CDQ | CJ9 | CB9 | CD5 | CW5 | C8S | CDS | CNQ |
| Series D DC Current Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | D2Q | DAQ | DH9 | DA9 | DK5 | DU5 | – | – | DKQ |
| | | 1x DPDT | D8Q | DDQ | DJ9 | DB9 | DD5 | DW5 | – | – | DNQ |
| Series F Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | F2Q | FAQ | FH9 | FA9 | FK5 | FU5 | – | – | FKQ |
| | | 1x DPDT | F8Q | FDQ | FJ9 | FB9 | FD5 | FW5 | – | – | FNQ |
| Series HS Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | H7A | HM2 | HFC | HA9 | HB3 | HB4 | – | – | HM3 |
| | | 1x DPDT | H7C | HM6 | HGC | HB9 | HB7 | HB8 | – | – | HM7 |
| Series U Gold alloy contacts Snap switch | -40 to +120 (-40 to +250) | 1x SPDT | U2Q | UAQ | UH9 | UA9 | UK5 | UU5 | U2S | UAS | UKQ |
| | | 1x DPDT | U8Q | UDQ | UJ9 | UB9 | UD5 | UW5 | U8S | UDS | UNQ |
| Series V Inductive Proximity switch | -40 to +100 (-40 to +210) | – | – | – | – | – | – | – | V5S | VBS | – |
| Series W Hermetically sealed Silver plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | W2Q | WAQ | WH9 | WA9 | WK5 | WU5 | W2S | WAS | WKQ |
| | | 1x DPDT | W8Q | WDQ | WJ9 | WB9 | WD5 | WW5 | W8S | WDS | WNQ |
| Series X Hermetically sealed Gold plated contacts Snap switch | -45 to +230 (-50 to +450) | 1x SPDT | X2Q | XAQ | XH9 | XA9 | XK5 | XU5 | X2S | XAS | XKQ |
| | | 1x DPDT | X8Q | XDQ | XJ9 | XB9 | XD5 | XW5 | X8S | XDS | XNQ |
| Series 8 Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 1x SPDT | 82Q | 8AQ | 8H9 | 8A9 | 8K5 | 8U5 | – | – | 8KQ |
| | | 1x DPDT | 88Q | 8DQ | 8J9 | 8B9 | 8D5 | 8W5 | – | – | 8NQ |

SELECT PNEUMATIC SWITCH MECHANISM & HOUSING: MODEL A15 TYPE DISPLACER SWITCHES

| Switch Description | Max supply pressure bar (psi) | Max process temperature ① °C (°F) | Bleed orifice ø mm (inches) | A15 codes |
|---------------------------|----------------------------------|--------------------------------------|--------------------------------|-----------------|
| | | | | NEMA 3R (IP 53) |
| Series J (open air) | 6,9 (100) | 200 (400) | 1,60 (0.063) | JDE |
| | 4,1 (60) | 200 (400) | 2,39 (0.094) | JEE |
| | 4,1 (60) | 260 (500) | 1,40 (0.055) | JFE |
| Series K (closed circuit) | 6,9 (100) | 200 (400) | – | KOE |

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

SELECTION DATA DUAL SWITCH FLOATING ROOF MODEL

1 - 3 | BASIC MODEL NUMBER – units for ALARM use ONLY

| | | | |
|---|---|---|--|
| B | 1 | 5 | Two adjustable set points (fixed narrow differentials) |
|---|---|---|--|

4 | MATERIAL OF CONSTRUCTION (3 m (10') of suspension cable is standard supplied)

| Code | Spring | Trim | Process connections | Displacer clamps and cable | Magnetic sleeve | Construction |
|------|-------------|------------------|---------------------|----------------------------|------------------|--------------|
| A | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 400 series SST | Standard |
| B | Inconel 600 | 316 SST (1.4401) | carbon steel | 316 SST (1.4401) | 316 SST (1.4401) | Standard |
| D | Inconel 600 | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | 316 SST (1.4401) | Standard |

5 - 6 | PROCESS CONNECTION – size rating – threaded

| | | |
|---|---|------------|
| E | 2 | 2 1/2" NPT |
|---|---|------------|

– ASME flanges

| | | |
|---|---|--------------------|
| G | 3 | 3" 150 lbs ASME RF |
| G | 4 | 3" 300 lbs ASME RF |
| H | 3 | 4" 150 lbs ASME RF |
| H | 4 | 4" 300 lbs ASME RF |
| K | 3 | 6" 150 lbs ASME RF |
| K | 4 | 6" 300 lbs ASME RF |

– EN flanges

| | | | |
|---|---|------------------|-------------------|
| 8 | A | DN 80, PN 16 | EN 1092-1 Type B1 |
| 8 | B | DN 80, PN 25/40 | EN 1092-1 Type B1 |
| 1 | A | DN 100, PN 16 | EN 1092-1 Type B1 |
| 1 | B | DN 100, PN 25/40 | EN 1092-1 Type B1 |

7 | DISPLACER MATERIAL AND PROOF-ER® OPTION (for pressure ratings, refer to physical specifications table) – without Proof-er®

| | |
|---|-----------------|
| P | Brass |
| M | Stainless steel |

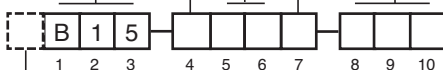
– with low pressure Proof-er®^①

| | |
|---|-----------------|
| Q | Brass |
| N | Stainless steel |

^① Proof-er® is available in carbon steel only

8 - 10 | SWITCH MECHANISM & HOUSING

Refer to table selections per displacer type model B15 (next page)



complete order code for floating roof models

→ X = product with a specific customer requirement

SELECT ELECTRIC SWITCH MECHANISM AND HOUSING: MODEL B15

| Switch Description | Process ① Temperature Range °C (°F) | Contacts | Weather proof (IP 66) | | ATEX - IECEx (IP 66) | | | | | | FM (IP 66) |
|---|--|----------|-----------------------|--------|----------------------|--------|-----------------------|----------|-----------------------|--------|------------|
| | | | | | II 2G Ex d IIC T6 Gb | | | | II 1G Ex ia IIC T6 Ga | | NEMA 7/9 |
| | | | Cast Aluminium | | Cast Aluminium | | Cast Iron (ATEX only) | | Cast Aluminium | | Cast Alu. |
| | | | M20x1,5 | 1" NPT | M20x1,5 | 1" NPT | M20x1,5 | 3/4" NPT | M20x1,5 | 1" NPT | 1" NPT |
| Series B Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | B4B | BBB | BL9 | BD9 | BL5 | BV5 | – | – | BLB |
| | | 2x DPDT | B1B | BEB | BP9 | BG9 | BO5 | BY5 | – | – | BOB |
| Series C Snap switch | -40 to +230 (-40 to +450) | 2x SPDT | C4B | CBB | CL9 | CD9 | CL5 | CV5 | C4T | CBT | CLB |
| | | 2x DPDT | C1B | CEB | CP9 | CG9 | CO5 | CY5 | C1T | CET | COB |
| Series D DC Current Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | D4B | DBB | DL9 | DD9 | DL5 | DV5 | – | – | DLB |
| | | 2x DPDT | D1B | DEB | DP9 | DG9 | DO5 | DY5 | – | – | DOB |
| Series F Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 2x SPDT | FFB | FBB | FL9 | FD9 | FL5 | FV5 | – | – | FLB |
| | | 2x DPDT | FHB | FEB | FP9 | FG9 | FO5 | FY5 | – | – | FOB |
| Series U Gold alloy contacts Snap switch | -40 to +120 (-40 to +250) | 2x SPDT | U4B | UBB | UL9 | UD9 | UL5 | UV5 | U4T | UBT | ULB |
| | | 2x DPDT | U1B | UEB | UP9 | UG9 | UO5 | UY5 | U1T | UET | UOB |
| Series W Hermetically sealed Silver plated contacts Snap switch | -45 to +230 (-50 to +450) | 2x SPDT | W4B | WBB | WL9 | WD9 | WL5 | WV5 | W4T | WBT | WLB |
| | | 2x DPDT | W1B | WEB | WP9 | WG9 | WO5 | WY5 | W1T | WET | WOB |
| Series X Hermetically sealed Gold plated contacts Snap switch | -45 to +230 (-50 to +450) | 2x SPDT | X4B | XBB | XL9 | XD9 | XL5 | XV5 | X4T | XBT | XLB |
| | | 2x DPDT | X1B | XEB | XP9 | XG9 | XO5 | XY5 | X1T | XET | XOB |
| Series 8 Hermetically sealed Snap switch | -45 to +260 (-50 to +500) | 2x SPDT | 84B | 8BB | 8L9 | 8D9 | 8L5 | 8V5 | – | – | 8LB |
| | | 2x DPDT | 81B | 8EB | 8P9 | 8G9 | 8O5 | 8Y5 | – | – | 8OB |

① Process temperature based on max. 40 °C (100 °F) ambient temperature and for non steam applications.

PHYSICAL SPECIFICATIONS

| Description | | Specification |
|--|---|---|
| Measured variable | | Liquid level |
| Physical range | | Standard 3 m (10 ft) cable (field adjustable) |
| Process temperature Process pressure (for higher ratings consult factory) | Threaded models ^② Flanged models ^② | <u>Porcelain displacers:</u> ^① 55,1 bar @ 40 °C (800 psi @ 100 °F) – for threaded tank connections 260 °C @ 17,2 bar (500 °F @ 250 psi) – for threaded tank connections 96,5 bar @ 40 °C (1400 psi @ 100 °F) – for flanged 600 lbs rated tank connections <u>Stainless steel displacers:</u> 49,6 bar @ 40 °C (720 psi @ 100 °F) 260 °C @ 34,5 bar (500 °F @ 500 psi) Flanged models are downrated to the design pressure of the selected flange <u>Hollow brass displacers:</u> 6,9 bar @ 40 °C (100 psi @ 100 °F) |
| | Medium pressure Proof-er® models | 8,6 bar @ 150 °C (125 psi @ 300 °F) |
| | Low pressure Proof-er® models | 1,7 bar @ 90 °C (25 psi @ 200 °F) |
| Wetted materials | Spring | Inconel 600 or Inconel X750 (NACE) |
| | Displacer(s) | Porcelain ^① , 316 SST (1.4401) or brass |
| | Cable and clamps | 316 SST (1.4401), Monel (2.4360) or Hastelloy C (2.4819) |
| Process connection material | | Carbon steel or stainless steel |

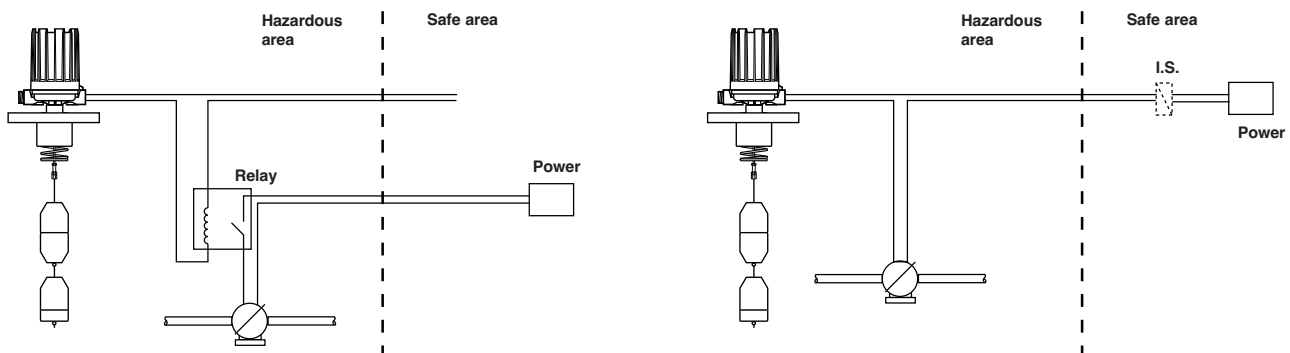
^① Do not use porcelain displacers on non-vented boiler water condensate systems over 90 °C (200 °F).

^② Cryogenic construction available upon request. Consult factory with application details.

ELECTRICAL SPECIFICATIONS

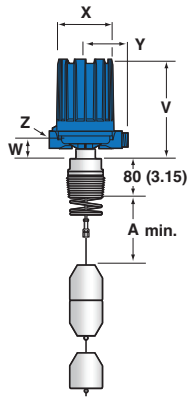
| Description | Specification |
|---------------------------|---|
| Switch ratings | Up to 15 A @ 240 V AC (depending on switch mechanism) Up to 10 A @ 120 V DC (depending on switch mechanism) |
| Signal output | Single, dual or triple SPDT or DPDT contacts or single pneumatic |
| Switch types (see page 5) | Dry contact with standard or gold alloy contacts, Hermetically sealed, Hermetically sealed with gold or silver plated contacts, Proximity switch, or single pneumatic bleed and non bleed |

ELECTRICAL CONNECTION

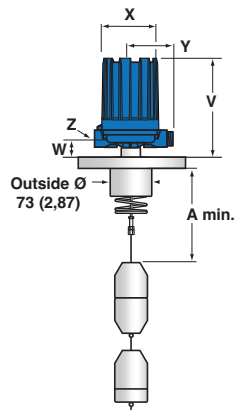


DIMENSIONS IN mm (inches) – housings

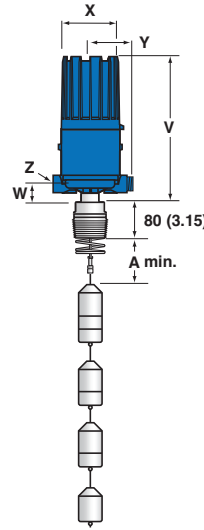
Models A10/A15/B10/B15
Threaded mounting



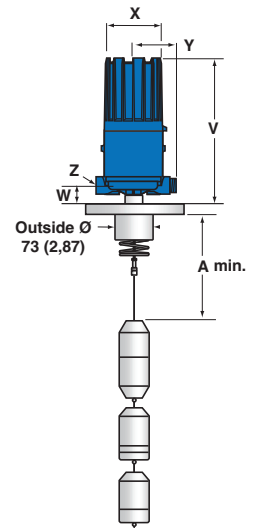
Models A10/A15/B10/B15
Flanged mounting



Models C10/C15
Threaded mounting



Models C10/C15
Flanged mounting



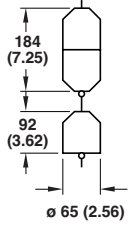
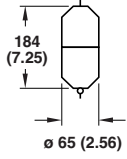
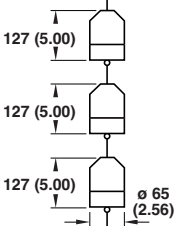
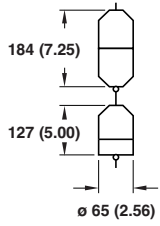
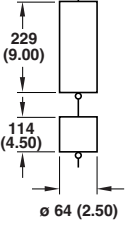
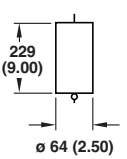
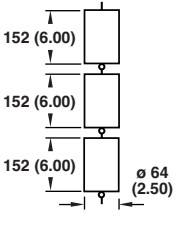
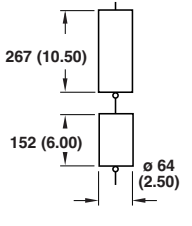
| Housing type | Models | V | W | ø X | Y | Z |
|--|-----------------------|-------------|-------------|-------------|-------------|---|
| | | mm (inches) | mm (inches) | mm (inches) | mm (inches) | |
| Weatherproof - FM (NEMA 7/9) - ATEX (Cast Alu) | A10 | 257 (10.12) | 45 (1.77) | 151 (5.93) | 109 (4.29) | M20 x 1,5 (*) or 1" NPT (2 entries - 1 plugged) (* not for FM (NEMA 7/9)) |
| | A15 with HS-switch | | | | | |
| | B10 | | | | | |
| | B15 | | | | | |
| | A15 excl. HS-switch | | | | | |
| Weatherproof | C10 / C15 | 376 (14.81) | | | | |
| ATEX (Cast Iron) | A10 / A15 / B10 / B15 | 249 (9.80) | 45 (1.77) | 143 (5.63) | 110 (4.33) | M20 x 1,5 or 3/4" NPT (single entry - 2 entries at request) |
| Pneumatics Switch Module J | A10 | 216 (8.50) | 39 (1.54) | 118 (4.65) | 110 (4.33) | 1/4" NPT (1 entry) |
| | A15 | 165 (6.50) | | | | |
| Pneumatics Switch Module K | A10 | 216 (8.50) | | | 130 (5.12) | 1/4" NPT (2 entries) |
| | A15 | 165 (6.50) | | | | |

Allow 200 mm (7.87") overhead clearance / All housings are 360 ° rotatable

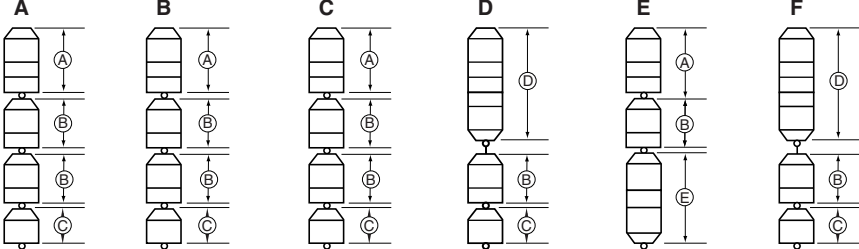
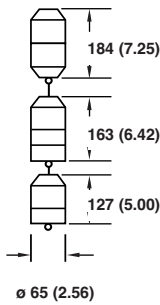
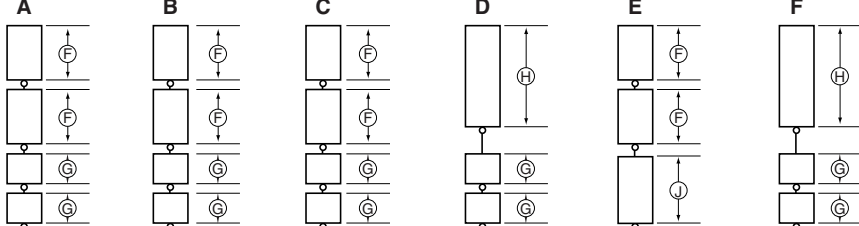
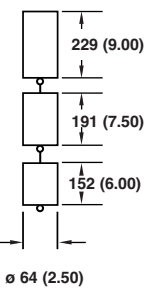
| Min. distance between mounting connection and top of displacer | | A | |
|--|-----------------|-------------------------|------------------------|
| | | Threaded mm (inches) | Flanged mm (inches) |
| Models | Displacer Type | | |
| | | | |
| A10 | Porcelain | 127 (5.00) | 178 (7.00) |
| | Stainless steel | 121 (4.75) | 171 (6.75) |
| A15 | Porcelain | 143 (5.62) | 194 (7.62) |
| | Stainless steel | 143 (5.62) | 194 (7.62) |
| B10 | Porcelain | 124 (4.88) | 175 (6.88) |
| | Stainless steel | 121 (4.75) | 171 (6.75) |
| B15 | Porcelain | 140 (5.50) | 191 (7.50) |
| | Stainless steel | 149 (5.88) | 200 (7.88) |
| C10 | Porcelain | 162 (6.38) | 213 (8.38) |
| | Stainless steel | 146 (5.75) | 197 (7.75) |
| C15 | Porcelain | 197 (7.75) | 248 (9.75) |
| | Stainless steel | 184 (7.25) | 235 (9.25) |

DIMENSIONS IN mm (inches) – displacers

Models A10/A15/B10/B15 - Standard models

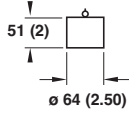
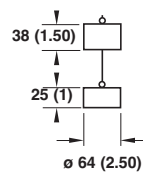
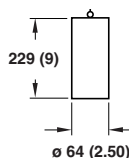
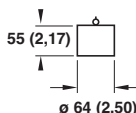
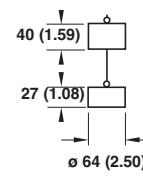
| | A10 | A15 | B10 | B15 |
|-----------------|---|---|--|---|
| Porcelain |  |  |  |  |
| Stainless steel |  |  |  |  |

Models C10 & C15 - Standard models

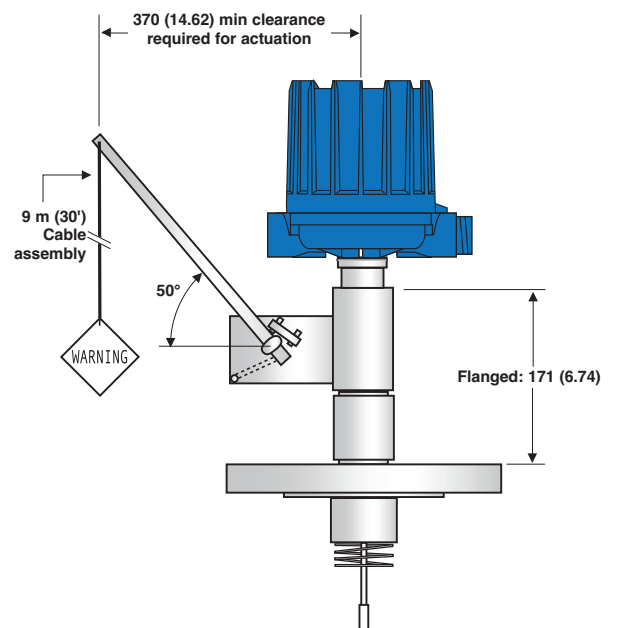
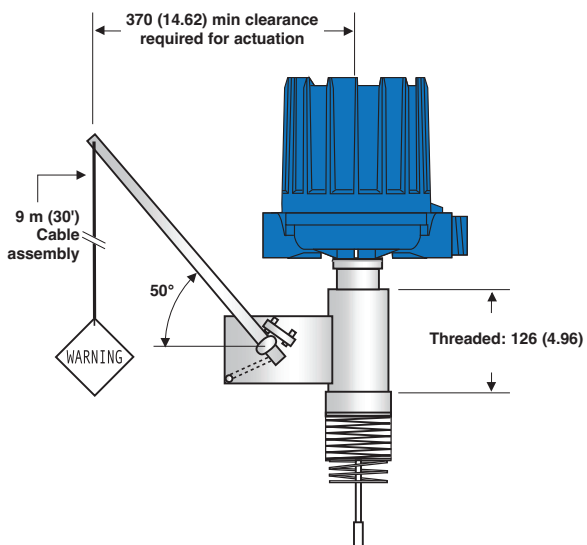
| | C10 operating sequence | C15 operating sequence |
|-----------------|--|---|
| Porcelain | <p>Arrangements (see page 11)</p>  <p>Ⓐ 163 (6.42) Ⓑ 127 (5.00) Ⓒ 92 (3.62) Ⓓ 291 (11.44) Ⓔ 219 (8.64)</p> <p>Note: All displacers \varnothing 65 (2.56).</p> |  <p>\varnothing 65 (2.56)</p> |
| Stainless steel | <p>Arrangements (see page 11)</p>  <p>Ⓕ 152 (6.00) Ⓖ 114 (4.50) Ⓗ 305 (12.00) Ⓙ 229 (9.00)</p> <p>Note: All displacers \varnothing 64 (2.50).</p> |  <p>\varnothing 64 (2.50)</p> |

DIMENSIONS IN mm (inches) – displacers

Models A15/B15 - Floating roof models

| | A15 | B15 |
|-----------------|---|--|
| Brass |  |  |
| Hollow Brass |  | not applicable |
| Stainless steel |  |  |

DIMENSIONS IN mm (inches) – Proof-er®





QUALITY ASSURANCE - ISO 9001

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UNDER RESERVE OF MODIFICATIONS

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EFFECTIVE: JUNE 2021
SUPERSEDES: April 2018

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