Electric Switch Mechanisms

Installation and Operating Manual

Series
B, C, D, F,
O, Q, S, U, W,
and X
with
Aluminum,
Carbon Steel,
or
Cast Iron
Housings

MAGNETROL®

Read this Manual Before Installing

This manual provides information on Electric Switch Mechanisms. It is important that all instructions are read carefully and followed in sequence. Detailed instructions are included in the Installation section of this manual.

Conventions Used in this Manual

Certain conventions are used in this manual to convey specific types of information. General technical material, support data, and safety information are presented in narrative form. The following styles are used for notes, cautions, and warnings.

NOTES

Notes contain information that augments or clarifies an operating step. Notes do not normally contain actions. They follow the procedural steps to which they refer.

Cautions

Cautions alert the technician to special conditions that could injure personnel, damage equipment, or reduce a component's mechanical integrity. Cautions are also used to alert the technician to unsafe practices or the need for special protective equipment or specific materials. In this manual, a caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

WARNINGS

Warnings identify potentially dangerous situations or serious hazards. In this manual, a warning indicates an imminently hazardous situation which, if not avoided, could result in serious injury or death.

WARNING! Explosion hazard. Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Low Voltage Directive

For use in Installation Category II, Pollution Degree 2. If equipment is used in a manner not specified by manufacturer, protection provided by equipment may be impaired.

Notice of Copyright and Limitations

Performance specifications are effective with date of issue and are subject to change without notice.

Magnetrol reserves the right to make changes to the products described in this manual at any time without notice. Magnetrol makes no warranty with respect to the accuracy of the information in this manual.

Warranty

All Magnetrol mechanical level and flow controls are warranted free of defects in materials or workmanship for five full years from the date of original factory shipment.

If returned within the warranty period; and, upon factory inspection of the control, the cause of the claim is determined to be covered under the warranty; then, Magnetrol will repair or replace the control at no cost to the purchaser (or owner) other than transportation.

Magnetrol shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of equipment. There are no other warranties expressed or implied, except special written warranties covering some Magnetrol products.

Quality Assurance

The quality assurance system in place at Magnetrol guarantees the highest level of quality throughout the company. Magnetrol is committed to providing full customer satisfaction both in quality products and quality service.

The Magnetrol quality assurance system is registered to ISO 9001 affirming its commitment to known international quality standards providing the strongest assurance of product/service quality available.

MAGNETROL®

Electric Switch Mechanisms

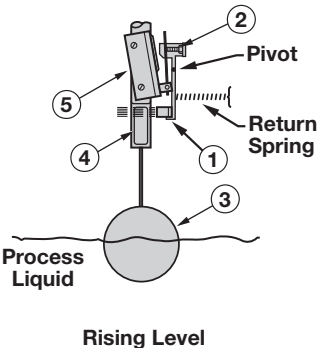
Table of Contents

1.0 Reference Information

1.1 Principle of Operation

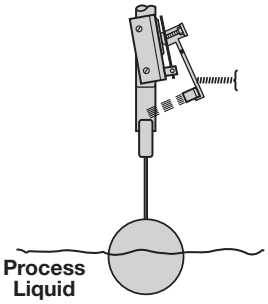
Figures 1 & 2 illustrate the simple, reliable operating principle of a float level switch. Switching action is obtained through the use of a magnetic sleeve (4) and a float (3), displacer or flow sensing element and a switching mechanism (2). These two basic component assemblies are separated by a non-magnetic, pressure tight enclosing tube (5). The switch (2) and magnet (1) are assembled to a mechanism with a swinging arm which operates on precision stainless steel pivots.

1.2 Operating Cycle



Rising Level

Figure 1
Rising Level



Falling Level

Figure 2
Falling Level

As level of a liquid in a vessel rises (Figure 1), the float rides on the liquid surface moving the magnetic sleeve upward in the enclosing tube and into the field of the switch mechanism magnet. As a result, the magnet is drawn in tightly to the enclosing tube moving the switch adjusting screw and allowing the activating arm of the snap switch to move, making or breaking the electrical circuit. As the liquid level recedes (Figure 2), the float and magnetic sleeve moves downward until the switch magnet releases and is drawn outward, away from the enclosing tube by a tension spring. This in turn allows the activating arm of the snap switch to move, thus reversing switch action.

Switch mechanisms may include a single switch or multiple switches, depending on operational requirements and switching action desired.

1.3 Description

Magnetrol level controls are available with a range of different switch mechanisms—each designed for specific service conditions. A brief description of the individual switch mechanisms and their applications are given below.

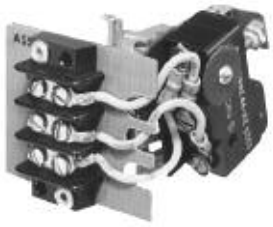


Figure 3
Series B, C, D, O and Q Dry Contact Switches

Figure 4
Series S
Snap Switch

Figure 5
Series F
Hermetically Sealed Switch

1.3.1 Dry Contact Switches B, C, D, O, Q, S and U

- **Series B** switches are general purpose with a maximum liquid temperature rating of +250° F (+121° C), see Figure 3.
- **Series C** switches are general purpose with a maximum liquid temperature rating of +450° F (+232° C), see Figure 3.
- **Series D** switches are designed for DC current applications with a maximum liquid temperature rating of +250° F (+121° C), see Figure 3.
- **Series O** switches are general purpose with a maximum liquid temperature rating of +300° F (+149° C), used only in model C10 and C15 units, see Figure 3.
- **Series Q** switches are general purpose with a maximum liquid temperature rating of +250° F (+121° C), used only in model C10 and C15 units, see Figure 3.
- **Series S** switches are general purpose with a maximum liquid temperature rating of +550° F (+288° C), or designed for DC current applications with a maximum liquid temperature of +250° F (+121° C), used only in model B40 units, see Figure 4.
- **Series U** switches have gold alloy contacts and are suitable for applications with a maximum liquid temperature of +250° F (+121° C).

1.3.2 Hermetically Sealed Switches F, W and X

Hermetically sealed switches are for use in special applications where hermetically sealed contacts are required.

- **Series F** switches are well suited for use in process temperatures up to +750° F (+399° C), see Figure 5.
- **Series W** switches are suitable for applications with a maximum liquid temperature of +450° F (+232° C).
- **Series X** switches have gold-plated contacts and are suitable for applications with a maximum liquid temperature of +450° F (+232° C).

NOTE: See bulletin 42-694 for series HS & H1 hermetically sealed switches.

2.0 Installation

2.1 Replacing Switch Mechanism

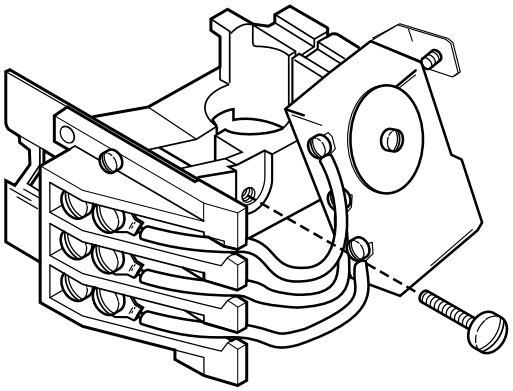


Figure 6
Mounting Screw

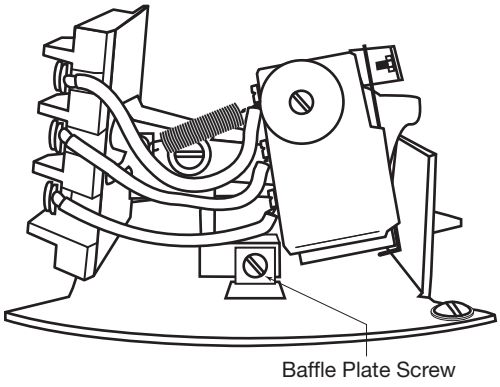


Figure 7
Baffle Plate Screw

Caution: Before attempting to remove a switch mechanism, be certain to pull disconnect switch or otherwise assure that electrical circuit through control is de-energized.

1. Disconnect wiring from supply side of terminal block on switch mechanism. Note and record lead wire terminal locations.
2. Loosen screw in split mounting clamp until mechanism slides freely on enclosing tube, refer to Figure 6.
3. Remove small round head screw securing lower switch mechanism to baffle plate, refer to Figure 7.
4. Slide switch mechanism off of enclosing tube. If mechanism is to be reused, ensure that it is placed on a clean surface, free of metallic particles that may be attracted to the switch magnet.

Caution: Always handle the switch mechanisms about or around the terminal block. Replacement switch mechanisms are precision instruments which have been factory-calibrated to operate with the level control specified. Extreme care should be taken: 1) when handling the switch mechanism; 2) to assure that the magnet does not come in contact with any magnetic materials; and, 3) that the switch mechanism is always placed on a clean, non-magnetic surface free of metal particles which may be attracted to the switch mechanism magnet. DO NOT attempt to make any adjustments to switch mechanisms.

5. Loosen mounting screw so that switch frame will fit over e-tube. Install switch mechanism by sliding it over the enclosing tube. Slide mechanism down until the bottom of the frame and terminal block are resting on the baffle plate. The baffle plate should be resting on the hub of the housing base.
6. Install and tighten baffle plate screw so that the switch mechanism may not be separated from the baffle plate. Tighten the mechanism mounting screw so that the mechanism is firmly clamped to the enclosing tube.
7. Swing magnet assembly in and out by hand, checking carefully for any signs of binding.
8. Reattached supply-side wiring to the terminal block and check switch function by varying liquid level in the vessel.

2.2 Replacing Dry Contact Switches

2.2.1 Series B, C, D, F, O, Q, S, U, W and X

1. Disconnect control from power supply.
2. Disconnect switch leads from terminal block. Note and record terminal connections of switch to be replaced.
3. Remove two mounting screws holding existing switch, refer to Figure 8.
4. Remove existing switch and install replacement switch in the same position, tightening mounting screws securely.

NOTE: For proper operation of the replacement switch, it must actuate in the middle portion of the pivoted magnet's swing.

5. Check switch action and adjust as follows:
   a. Slowly rotate the pivoted magnet by hand, back and forth through its angle of swing, listening closely for the actuating click of the switch in each direction.
   b. Check to see if there is equal overtravel of magnet in its swing after the switch click in either direction.
   c. If switch actuation is not correct, change adjustment of actuating screw using a 1/16" hexagon key wrench, refer to Figure 8.

NOTE: If a single switch is being replaced on a DPDT mechanism, lever of second switch must be depressed and held to allow for the audible adjustment of new switch, as described above.

   d. With new switch in adjustment, release lever of second switch and perform fine-tuning of both switches to provide simultaneous actuation (clicks).
6. Reconnect power supply and test switch action by varying liquid level in the vessel or by "gently blowing down" float chamber.

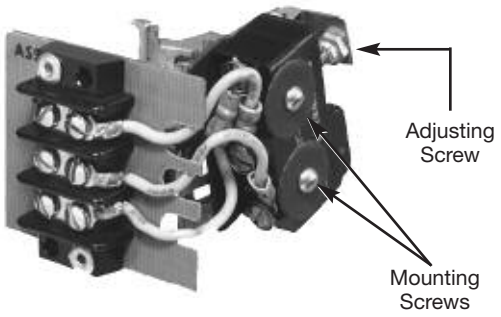


Figure 8
Dry Contact Switch Mechanism

2.3 Vibration Service Adjustment

Level controls are frequently used in applications where vibration is encountered, such as on scrubbers or compressors. Switch mechanisms may require repositioning to prevent unwanted magnet movement. This position is usually best at right angles to the direction of vibration. The direction of vibration may be determined by the arrangement of connections to the vessel or the vessels mounting method. Accordingly, the vibration will tend to be in one direction only.

Upon determining the vibration direction, switch mechanism(s) may be rotated from an incorrect position (as shown in Figure 9, illustration is shown as looking at a control from above), to a correct position as follows:

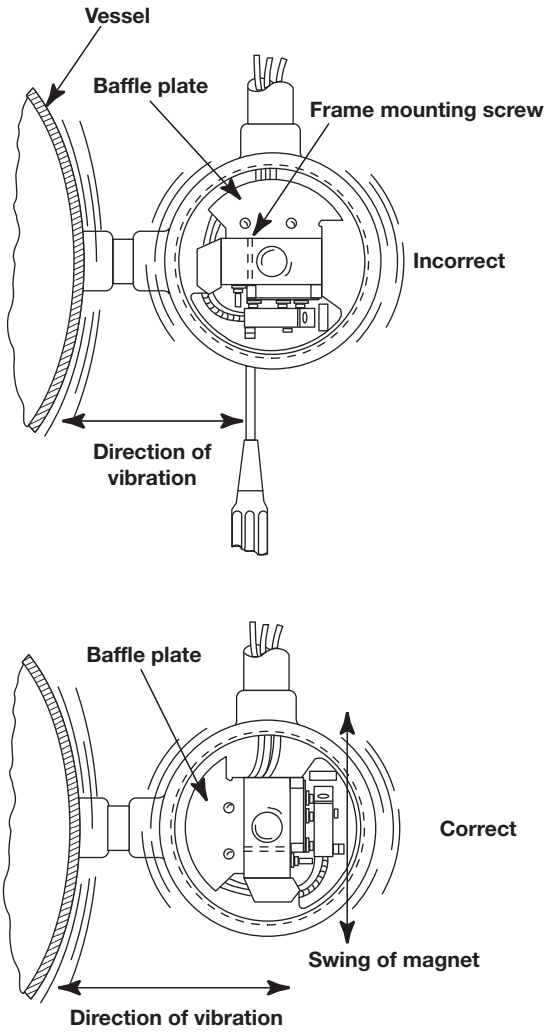


Figure 9
Rotation of Switch Mechanism in Vibration

Caution: Before attempting to remove a switch mechanism, be certain to pull disconnect switch or otherwise assure that electrical circuit through control is de-energized.

1. Disconnect control from power supply.
2. Loosen screw in split mounting clamp until mechanism turns freely on enclosing tube, refer to Figure 6 on page 6.
3. Rotate entire mechanism and bottom baffle plate together to the correct position.

Caution: Be certain power supply wires retain some slack at new position. Do not pull wires taut.

NOTE: Amount of rotation required will vary with each installation and may not be as much as shown in illustration.

4. Check action of switch magnet at new position. When magnet vibrates from side to side, instead of front to back, correct position has been attained.
5. Tighten clamp screw on switch mechanism.
6. Reconnect power supply, and test switch action under operating conditions.

3.0 Wiring

Circuits shown are for direct-acting level switches and are reversed in side mounting float-in-tank models, which utilize a reversing float pivot.

NOTE: See bulletin 42-694 for wiring diagrams for "HS" Series hermetically sealed switches.

3.1 SPDT Terminal Connections

3.1.1 Single float with one switch or single stage displacer

1. Rising level closes contacts 5 & 6, see Figure 10.
2. Falling level closes contacts 4 & 5.
3. Wiring Diagram is reversed (high level actuation becomes low level actuation, etc.) when this switch mechanism is used on side mounted float switches employing a reversing pivot (Models B40, T52, T62, T63, etc.).

3.1.2 Single float with two switches or dual stage displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 11.
2. Falling level closes contacts 4 & 5 and 1 & 2.
3. Wiring diagram is reversed (high level actuation becomes low level actuation, etc.) when this switch mechanism is used on side mounted float switches employing a reversing pivot (Models B40, T52, T62, T63, etc.).
4. On units with tandem floats, the top float operates the bottom mechanism while the bottom float actuates the top mechanism.

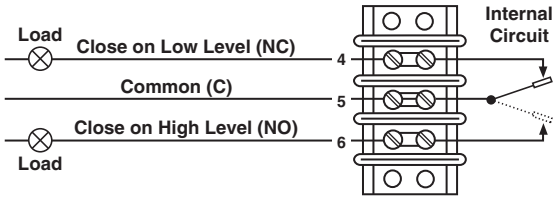


Figure 10
Single Float with One Switch or Single Stage Displacer

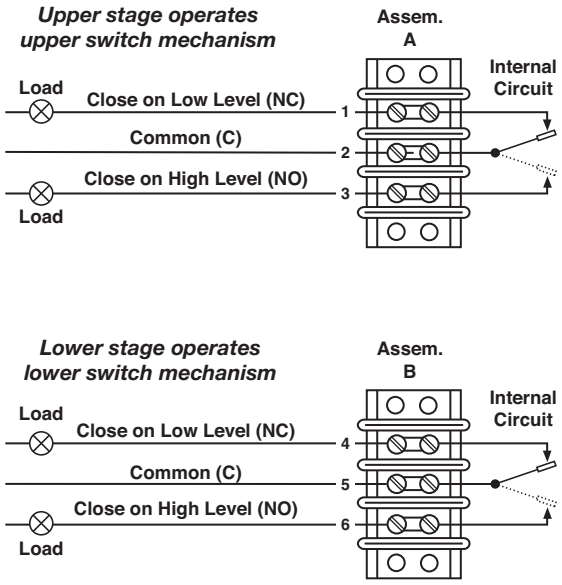


Figure 11
Single Float with Two Switches or Dual Stage Displacer

3.1.3 Single float with three switches or three stage displacer:

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 12.
2. Falling level closes contacts 4 & 5 and 1 & 2.
3. Unit is shipped with switches positioned for proper function. Do not change switch spacing.

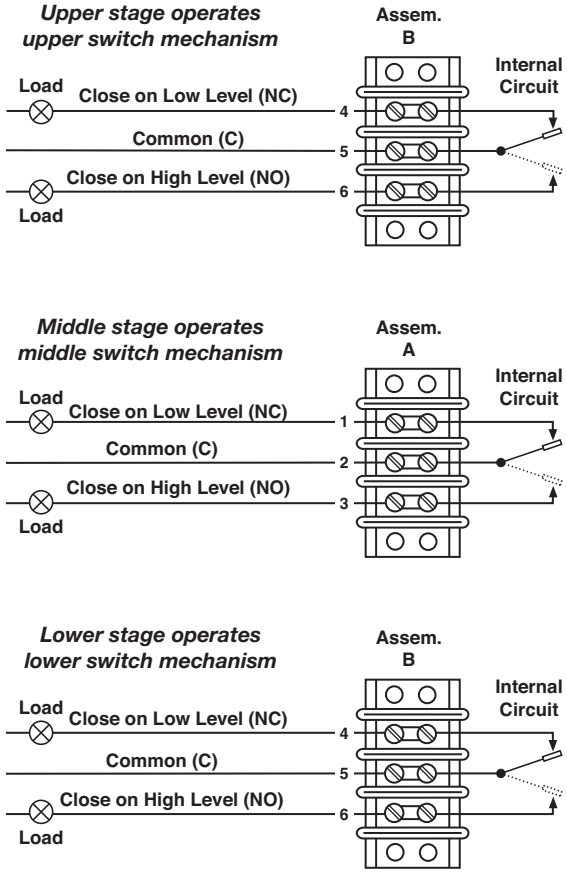


Figure 12
Single Float with Three Switches or Three Stage Displacer

3.2 DPDT Terminal Connections

3.2.1 Single float with one switch or single stage displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure13.
2. Falling level closes contacts 4 & 5 and 1 & 2.
3. Double pole action is obtained by simultaneous operation of the right and left side single pole double throw switches.
4. Wiring diagram is reversed (close on high becomes close on low, etc.) when this switch mechanism is used on side mounted float switches employing a reversing pivot. (Models B40, T52, T62, T63, etc.)

3.2.2 Single float with two switches or dual stage displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 14.
2. Falling level closes contacts 4 & 5 and 1 & 2.
3. Double pole action is obtained by simultaneous operation of the right and left side single pole switches.
4. Wiring diagram is reversed (close on high becomes close on low, etc.) when this switch mechanism is used on side mounted float switches employing a reversing pivot. (Models B40, T52, T62, T63, etc.)
5. On units with tandem floats, the top float operates the bottom mechanism while the bottom float actuates the top mechanism.

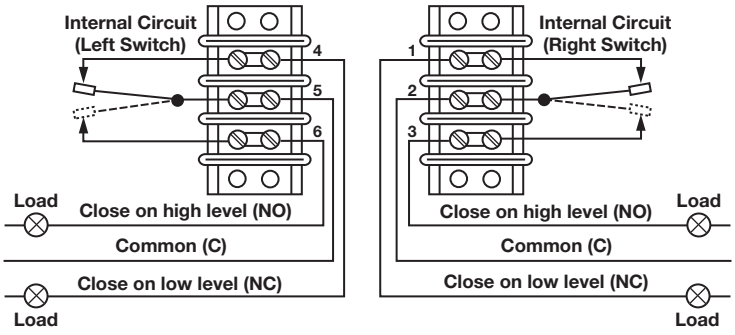
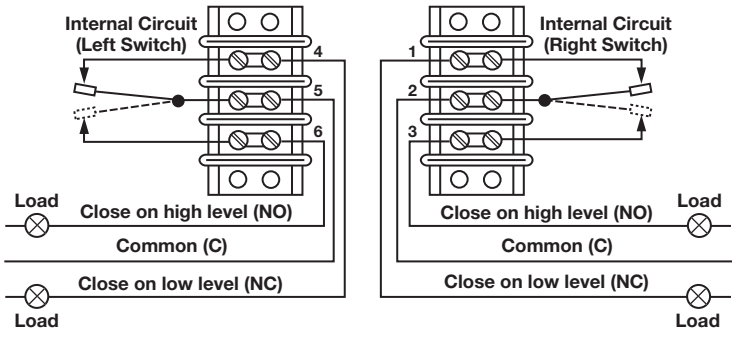


Figure 13

Single Float with One Switch or Single Stage Displacer

Lower stage operates lower switch mechanism



Upper stage operates upper switch mechanism

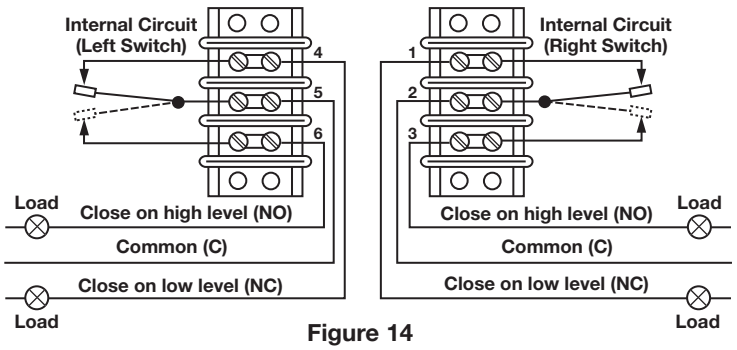


Figure 14

Single Float with Two Switches or Dual Stage Displacer

3.2.3 Three Stage Displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 15.
2. Falling level closes contacts 4 & 5 and 1 & 2.
3. Double pole action is obtained by simultaneous operation of the right and left side single pole switches.

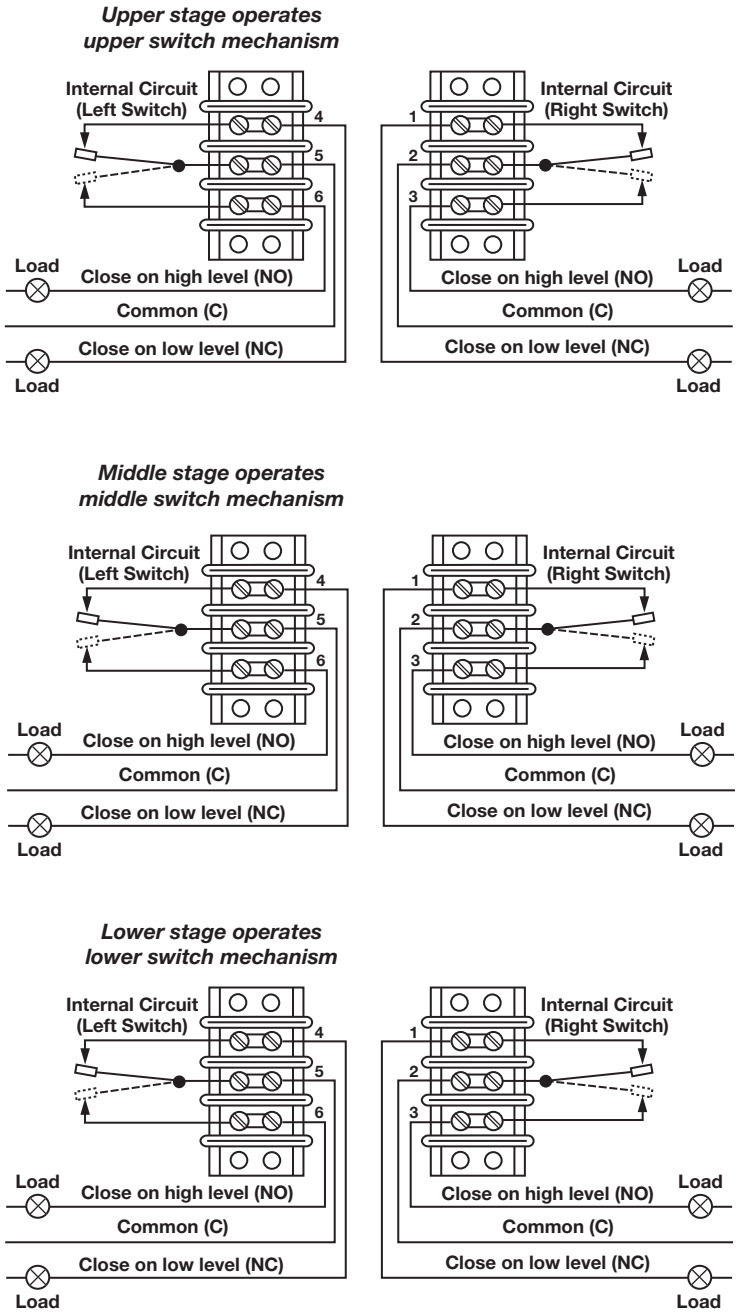


Figure 15
Three Stage Displacer

4.0 Preventative Maintenance

Inspect switch mechanisms, terminals and connections regularly. Proof test interval to be determined by application requirements (required reliablity, operating conditions, site requirements, etc.).

4.1 Inspect Switch Mechanisms, Terminals and Connections

1. Dry contact switches should be inspected for excessive wear on actuating lever or misalignment of adjustment screw at point of contact between screw and lever. Such wear can cause false switch actuating levels.
2. DO NOT operate your control with defective or mal-adjusted switch mechanisms.
3. Level controls may sometimes be exposed to excessive heat or moisture. Under such conditions, insulation on electrical wiring may become brittle, eventually breaking or peeling away. The resulting "bare" wires can cause short circuits.

NOTE: Check wiring carefully and replace at the first sign of brittle insulation.

4. Vibration may sometimes cause terminal screws to loosen. Check all terminal connections to be certain that screws are tight.

NOTE: Spare switches should be kept on hand at all times.

5.0 Switch Specifications

SWITCH SERIES ①	SWITCH TYPE	PROCESS TEMP. RANGE ② ° F (° C)	LOAD	RATING					
				Volts AC			Volts DC		
				120	240	480	24	120	240
B	Snap	-40 to +250 (-40 to +121)	Non-Inductive Amp Inductive Amp Horsepower	15.00 15.00 ⅛	15.00 15.00 ¼	15.00 15.00 —	6.00 5.00 —	0.50 0.05 —	0.25 0.03 —
C	Snap	-40 to +450 (-40 to +232)	Non-Inductive Amp Inductive Amp Horsepower	15.00 15.00 1/10	15.00 15.00 ⅛	15.00 15.00 —	6.00 5.00 —	1.00 — —	0.50 — —
D	Snap	-40 to +250 (-40 to +121)	Non-Inductive Amp Inductive Amp Horsepower	10.00 3.80 ⅛	— — —	— — —	10.00 — —	10.00 2.20 ⅛	1.50 min. 3.00 max. — —
F (followed by letter)	Hermetic	-50 to +750 (-46 to +399)	Resistive Amp Inductive Amp	2.50 2.50	— —	— —	4.00 ③ 2.00 ③	0.30 0.10	— —
F (followed by number)	Hermetic	-50 to +250 (-46 to +121)	Resistive Amp Inductive Amp	1.00 1.00	— —	— —	15.00 ③ 10.00 ③	— —	— —
O	Snap	-40 to +450 (-40 to +232)	Non-Inductive Amp Inductive Amp Horsepower	15.00 15.00 1/10	15.00 15.00 ⅛	15.00 15.00 —	— — —	1.00 — —	0.50 — —
Q	Snap	-40 to +250 (-40 to +121)	Non-Inductive Amp Inductive Amp Horsepower	15.00 15.00 ⅛	15.00 15.00 ¼	15.00 15.00 —	6.00 5.00 —	0.50 0.05 —	0.25 0.30 —
SA SD SK SN	Snap	-40 to +550 (-40 to +288)	Non-Inductive Amp Inductive Amp Horsepower	15.00 15.00 1/10	15.00 15.00 ⅛	15.00 15.00 —	— — —	1.00 0.50 —	0.50 — —
SB SE SL SO	Snap	-40 to +250 (-40 to +121)	Non-Inductive Amp Inductive Amp Horsepower	10.00 3.80 ⅛	— — —	— — —	10.00 — —	10.00 2.20 ⅛	1.50 min. 3.00 max. — —
(X) B (x=gold contacts)	Snap Gold Contacts	-40 to +250 (-40 to +121)	Non-inductive Inductive	1.00 1.00	— —	— —	— —	— —	— —
(X) F (x=gold contacts)	Hermetic Snap Gold Contacts	-50 to +750 (-46 to +399)	Non-inductive Inductive	— —	— —	— —	1.00 0.25	— —	— —
(X) HS (x=gold contacts)	Hermetic Snap Gold Contacts	-50 to +550 (-46 to +288) ④	Non-inductive Inductive	1.00 —	— —	— —	2.00 1.00	— —	— —
U	Snap Gold Contacts	-40 to +250 (-40 to +121)	Non-inductive Amp Inductive Amp Horsepower	1.00 — —	— — —	— — —	— — —	1.00 1.00 —	— — —
W	Hermetic Snap	-50 to +450 (-46 to +232)	Non-inductive Amp Inductive Amp Horsepower	1.00 — —	1.00 0.80 —	— — —	3.00 ③ — —	0.50 — —	— — —
X	Hermetic Snap Gold Contacts	-50 to +450 (-46 to +232)	Non-inductive Amp Inductive Amp Horsepower	0.50 0.15 —	0.50 — —	— — —	0.50 — —	0.50 — —	0.50 — —

① For currents under 100 mA, gold contact switches should be used.

② Process temperatures based on +100 °F (+38 °C) ambient temperature.

③ 28 VDC

④ On steam applications, temperature down-rated to +400 °F (+204 °C) at +100 °F (+38 °C) ambient.

6.0 Replacement Switch Mechanisms

6.0.1 Magnet strength

Switch mechanisms are provided with different strength magnets as determined by the characteristics of the level switch. A red, red/yellow or yellow dot is visible on each magnet. When ordering replacement switch mechanisms, be certain to determine the color dot on the magnet. For these types of switches, the tenth digit of the model number identifies the magnet used on the control. The correct magnet dot color may be chosen by finding the tenth digit of your model number at the top of the chart. Any model numbers preceded with an "X" are specially modified controls. Contact the factory for replacement part numbers.

6.1 Yellow Dot Magnet Replacement Mechanisms

6.1.1 Series B, C, D, F, O, Q, S, U, W & X – Yellow

Switch Series	Contacts	Quantity	8th & 9th Digit	10th Digit			Switch Only
				E, F, Y, M, W, Q, B, S, K			
				Bottom Mech	Middle Mech	Top Mech	
B	SPDT	1	**BA, BK**	089-7401-104	N/A	N/A	089-7101-020
		2	**BB, BL**		089-7401-103		
		3	**BC, BM**			089-7401-104	
	DPDT	1	**BD, BN**	089-7401-122	N/A	N/A	
		2	**BE, BO**			089-7401-122	
C	SPDT	1	**CA, CK**	089-7401-110	N/A	N/A	089-7101-022
		2	**CB, CL**		089-7401-109		
		3	**CC, CM**			089-7401-110	
	DPDT	1	**CD, CN**	089-7401-125	N/A		
		2	**CE, CO**			089-7401-125	
D	SPDT	1	**DA, DK**	089-7401-106	N/A	N/A	089-7101-024
		2	**DB, DL**		089-7401-105		
		3	**DC, DM**			089-7401-106	
	DPDT	1	**DD, DN**	089-7401-123	N/A	N/A	
		2	**DE, DO**			089-7401-123	
F	SPDT	1	**FA, FK**	089-7401-095	N/A	N/A	089-7101-041
		2	**FB, FL**			089-7401-096	
	DPDT	1	**FD, FN**	089-7401-098	N/A	N/A	
		2	**FE, FO**			089-7401-098	
O	SPDT	3	**OC, OM**	089-7401-110	089-7401-109	089-7401-110	089-7101-022
	DPDT	3	**OE, OK**	089-7401-125	089-7401-125	089-7401-125	
Q	SPDT	3	**QC, QM**	089-7401-104	089-7401-103	089-7401-104	089-7101-020
	DPDT	3	**QE, QK**	089-7401-122	089-7401-122	089-7401-122	
S	SPDT	1	**SA, SK**	089-7401-126	N/A		089-7101-022
	DPDT	1	**SD, SN**	089-7401-128			
S (DC volt)	SPDT	1	**SB, SL**	089-7401-129	N/A		089-7101-024
	DPDT	1	**SE, SO**	089-7401-127			

Continued on next page.

6.1.1 Series B, C, D, F, O, Q, S, U, W & X – Yellow (cont.)

Switch Series	Contacts	Quantity	8th & 9th Digits	10th Digit E, F, Y, M, W, Q, B, S, K			Switch Only
				Bottom Mech	Middle Mech	Top Mech	
U	SPDT	1	UA, UK, UU	047-5534-001	N/A	N/A	037-4630-001
		2	UB, UL, UV	047-5534-001	047-5535-001	N/A	
		3	UC, UM, UW	047-5534-001	047-5535-001	047-5534-001	
	DPDT	1	UD, UN, UX	047-6520-001	N/A	N/A	
		2	UE, UO, UY	047-6520-001	047-6520-001	N/A	
W	SPDT	1	WA, WK, WU	089-7410-004	N/A	N/A	037-9101-001
		2	WB, WL, WV	089-7410-004	089-7410-003	N/A	
		3	WC, WM, WW	089-7410-004	089-7410-003	089-7410-004	
	DPDT	1	WD, WN, WX	089-7410-005	N/A	N/A	
		2	WE, WO, WY	089-7410-005	089-7410-005	N/A	
X	SPDT	1	XA, XK, XU	089-7412-004	N/A	N/A	037-9102-001
		2	XB, XL, XV	089-7412-004	089-7412-003	N/A	
		3	XC, XM, XW	089-7412-004	089-7412-003	089-7412-004	
	DPDT	1	XD, XN, XX	089-7412-005	N/A	N/A	
		2	XE, XO, XY, X4	089-7412-005	089-7412-005	N/A	

6.2 Red Dot Magnet Replacement Mechanisms

6.2.1 Series B, C, F, U, W & X – Red, Red/Yellow

Switch Series	Contacts	Quantity	8th & 9th Digits	10th Digit G, H, R, D, V, P, A, T, J			Switch Only
				Bottom Mech	Middle Mech	Top Mech	
B	SPDT	1	BA, BK	089-7401-102	N/A	N/A	089-7101-020
		2	BB, BL		089-7401-101		
		3	BC, BM			089-7401-102	
	DPDT	1	BD, BN	089-7401-121	N/A	N/A	
		2	BE, BO			089-7401-121	
C	SPDT	1	CA, CK	089-7401-108	N/A	N/A	089-7101-022
		2	CB, CL		089-7401-107		
		3	CC, CM			089-7401-108	
	DPDT	1	CD, CN	089-7401-124	N/A	N/A	
		2	CE, CO			089-7401-124	
F	SPDT	1	FA, FK	089-7401-093	N/A	N/A	089-7101-041
		2	FB, FL			089-7401-094	
	DPDT	1	FD, FN	089-7401-097		N/A	
		2	FE, FO			089-7401-097	
U	SPDT	1	UA, UK, UU	047-5533-001	N/A	N/A	037-4630-001
		2	UB, UL, UV	047-5533-001	047-5536-001	N/A	
		3	UC, UM, UW	047-5533-001	047-5536-001	047-5533-001	
	DPDT	1	UD, UN, UX	047-6519-001	N/A	N/A	
		2	UE, UO, UY	047-6519-001	047-6519-001	N/A	

Continued on next page.

6.2.1 Series B, C, F, U, W & X – Red, Red/Yellow (cont.)

Switch Series	Contacts	Quantity	8th & 9th Digits	10th Digit G, H, R, D, V, P, A, T, J			Switch Only
				Bottom Mech	Middle Mech	Top Mech	
W	SPDT	1	**WA, WK, WU**	089-7410-002	N/A	N/A	089-7411-001
		2	**WB, WL, WV**	089-7410-002	089-7410-001	N/A	
		3	**WC, WM, WW**	089-7410-002	089-7410-001	089-7410-002	
	DPDT	1	**N/A**	N/A			
		2	**N/A**				
X	SPDT	1	**XA, XK, XU**	089-7412-002	N/A	N/A	089-7413-001
		2	**XB, XL, XV**	089-7412-002	089-7412-001	N/A	
		3	**XC, XM, XW**	089-7412-002	089-7412-001	089-7412-002	
	DPDT	1	**N/A**	N/A			
		2	**N/A**				

7.0 Switch Housing Replacement Assemblies

When ordering replacement parts for an existing Magnetrol instrument, please specify:

1. Model and serial numbers of control.
2. Description and part number of replacement kit.

The proper replacement switch housing kit and parts can be determined by the last three characters of the model number. In section 6.1.1 on page 18, locate the eighth and ninth digits of your model number at the left side of the chart. Follow the appropriate row across the page while locating the tenth digit of your model number at the top of the chart. In section 6.1.2 on page 18, the chart lists the replacement housing kits according to description.

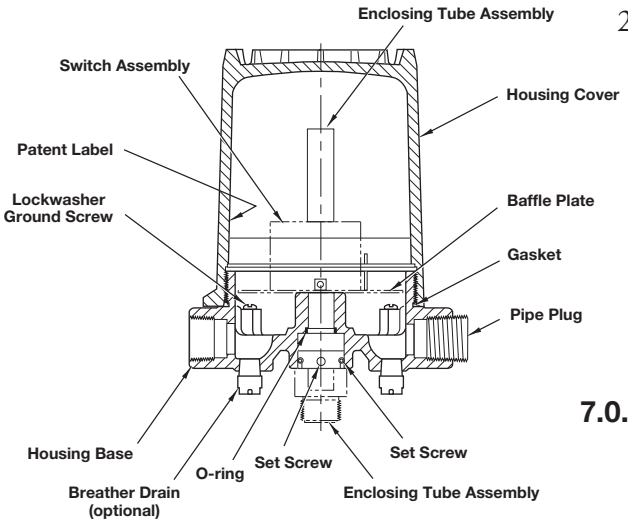


Figure 16
Aluminum Housing Assembly

7.0.1 Aluminum Housings

Die cast aluminum TYPE 4X housing replacements are available for general purpose or weatherproof installations. Explosion proof TYPE 4X/7/9 and Class I, Div 1, Group B housing replacements are available for hazardous atmosphere locations. Die cast aluminum housings are finished with a baked-on polyester powder coat paint.

NOTE: Consult your local representative on applications to meet other codes or approvals not covered in this bulletin.

7.0.2 Cast Iron Housings

Cast Iron TYPE 7/9 housing replacements are available for hazardous atmosphere locations. Both Class I, Div. 1, Groups C & D and Group B versions are available. The grey iron cover and base are finished with a baked-on polyester powder coat paint.

NOTE: Consult your local representative on applications to meet NEMA and other codes not covered in this bulletin.

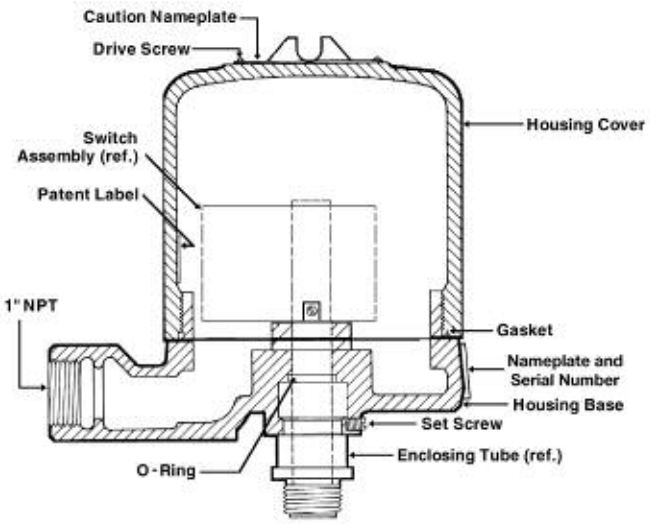


Figure 17
Cast Iron Housing Assembly

7.0.3 Carbon Steel Housings

Carbon steel TYPE 4X switch housings are available for general purpose and weatherproof installations. The housing base is cast from aluminum while the cover is made from cold rolled steel. The housings are finished with a baked-on polyester powder coat paint.

NOTE: Consult your local representative on applications to meet other codes or approvals not covered in this bulletin.

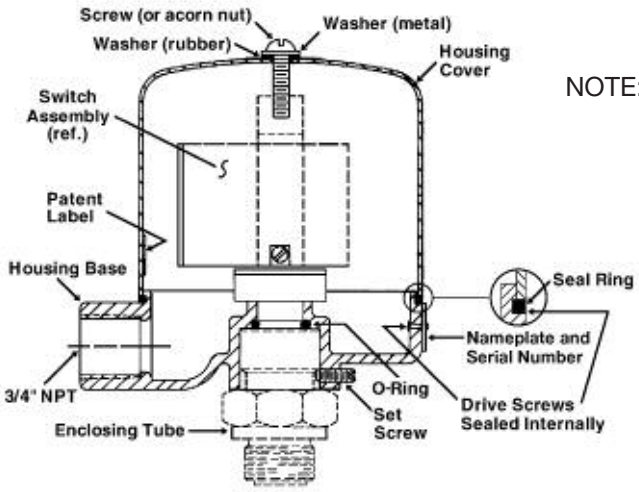


Figure 18
Carbon Steel Housing Assembly

7.1 Replacement Housing Kits ①

7.1.1 Referenced by eighth, ninth and tenth digit

Eighth Digit	Ninth Digit	Tenth Digit						
		E, G, Y, R	P, Q	S, T	F, H, D, M	A, B	J, K, G	V, W
B, C, D, F, G, H, I, S	A, B, C, D, E	089-6509-003②	089-6582-023	N/A	089-6510-003②	089-6582-024	N/A	N/A
	K, L, M, N, O	089-6582-002	089-6582-023	089-6582-032	089-6582-005	089-6582-024	089-6582-033	089-6582-008
	U, V, W, X, Y	089-6582-003	089-6582-028	N/A	089-6582-006	089-6582-029	N/A	N/A
O, Q	A, B, C, D, E	N/A	N/A		089-6528-003	089-6582-025		
	K, L, M, N, O				089-6578-001	089-6582-025		

① Housing kits include o-rings and hardware. Baffle plate not included.
② Cover kit only. Housing base must be ordered separately by P/N 089-6505-003.

7.1.2 Referenced by description

Cover Height	Housing Material	TYPE 1	TYPE 4X	TYPE 4X/7/9	TYPE 7/9	Group B	TYPE 4X/7/9 with drain	TYPE 7/9 with drain
Short	CS cover, aluminum base	089-6511-003②	089-6509-003②	N/A	N/A	N/A		N/A
	Cast aluminum	N/A	089-6582-023	089-6582-023		089-6582-032	089-6582-028	
	Cast Iron		N/A		089-6582-002	N/A		089-6582-003
Tall	CS cover, aluminum base	089-6512-003②	089-6510-003②	N/A	N/A	N/A		N/A
	Cast aluminum	N/A	089-6582-024	089-6582-024		089-6582-033	089-6582-029	
	Cast Iron		N/A		089-6582-005	089-6582-008	N/A	089-6582-006
X-Tall	CS cover, aluminum base	N/A	089-6528-003	N/A	N/A	N/A	N/A	N/A
	Cast aluminum		089-6582-025	089-6582-025				
	Cast Iron		N/A		089-6578-001			

Lexan Cover Kit	089-6522-001②

7.1.3 ATEX Housing Replacements

Housing Material	Part Description	Short		Tall	
		XP	IS	XP	IS
Cast Alum	Cover	089-6582-035	089-6582-036	089-6582-037	089-6582-038
	Base w/ 1" NPT conduit entry	089-6582-041	089-6582-043	089-6582-041	089-6582-043
	Base w/ M20 × 1.5 conduit entry	089-6582-040	089-6582-042	089-6582-040	089-6582-042
Cast Iron	Cover	C/F			
	Base w/ ¾" NPT conduit entry				
	Base w/ M20 × 1.5 conduit entry				

7.2 Replacement Gaskets and Hardware

Housing Material	Enclosure Type	9th Digit	10th Digit	3/4" O-ring	Cover Gasket	Baffle Plate③	Cover Hardware
CS cover, aluminum base	Type 4, 4X	**A, B, C, D, E**	**D, E, F, H, R, Y, M, G**	012-2201-116	012-1318-001	036-5303-001	089-6508-001
Cast Iron	Type 7/9, 4X/7/9	**K, L, M, N, O**	**D, R, Y, M**		012-2201-249	036-5303-001	N/A
Cast Iron	Group B	**K, L, M, N, O**	**V, W**		012-2201-222	005-6603-135	
Cast Aluminum	Type 4X	**A, B, C, D, E**	**A, B, P, Q**		012-2201-253	005-6657-001	
	Type 4X/7/9, 7/9	**K, L, M, N, O**	**A, B, P, Q**				
	Group B	**K, L, M, N, O**	**J, K, S, T**				
	ATEX XP	**A, B, C, D, E, F, G**	**C, 9**				
	ATEX IS	**A, B, C, D, E**	**S, T**				
Cast Iron	ATEX XP	**U, V, W, Y, 7**	**5, 7**	N/A	012-1301-005	036-5303-001	

③ For models with manual reset options, see page 23 for parts.

8.0 Manual Reset Option

8.1 Parts Breakdown and Identification

Part No. 089-6507-001, on Boiler Controls Equipped with Manual Reset (*denotes included in kit)

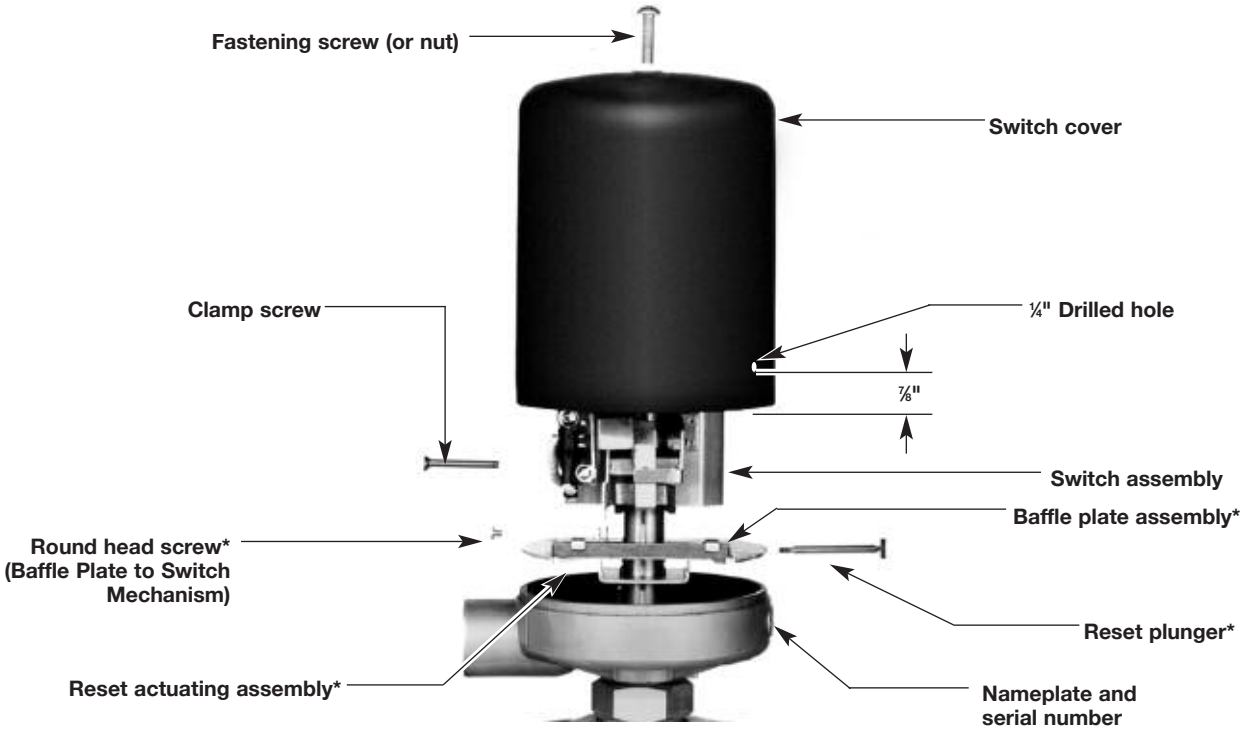


Figure 19

8.2 Field Installation Instructions

Caution: Before attempting work on any level control, be certain to pull disconnect switch or otherwise assure that electrical circuit through control is de-energized.

1. Remove switch cover by loosening fastening screw (or nut).
2. Drill a ¼" diameter hole in cover at ⅞" up from bottom edge, as shown.
3. Disconnect wiring from supply side of terminal strip on switch mechanisms.

NOTE: Measure location of switch mechanism(s) on enclosing tube and record for reference use during reassembly. (Measure from top of enclosing tube to top of mounting clamp on switch mechanism[s]).

4. Loosen screw in split mounting clamp of switch mechanism(s) until assembly moves freely on enclosing tube.
5. Remove small round head screw securing baffle plate to switch mechanism.
6. Carefully lift off switch mechanism(s) and baffle plate. Place on a clean surface, free of any metal particles that may be attracted onto the magnet(s).
7. Install a new baffle plate assembly, with manual reset mechanism, and carefully replace switch mechanism(s) in reverse of steps 3 through 6 above.
8. Replace switch cover, lining up drilled hole with hole in reset actuating mechanism. Do not tighten cover fastening screw (or nut) at this point.
9. Thread reset plunger into actuating mechanism through drilled hole in switch cover and thumb tighten securely. Reposition switch cover as necessary to be certain it does not bind reset plunger.
10. Tighten fastening screw (or nut) on switch cover and check action of plunger to see that it moves freely.
11. Vary level in float chamber to test operation of manual reset mechanism.

NOTE: Boiler level controls should not start firing equipment when boiler water level has returned to normal (safe point) until reset plunger has been manually depressed. If control starts firing equipment, magnet stop arm on switch mechanism must be bent out on switch frame 1/32" allowing magnet to swing further from enclosing tube arm and into the field of the reset magnet.

Caution: If it is necessary to reposition manual reset plunger, entire switch mechanism(s) must be loosened and rotated on enclosing tube to desired position (refer to step 4). **Do not** attempt to position plunger by twisting switch cover or damage to switch mechanism(s) will result.

9.0 Switch and Housing Model Codes

The following charts identify the switch and housing model codes used with the buoyancy products. The eighth, ninth and tenth digit combinations may be used to identify the type and number of switches, number of contacts, switch magnet strength as well as housing type, size and options. The switch and housing codes in **bold** are currently valid and available in combination with various buoyancy products. The unbolded codes are no longer valid and should be replaced by the appropriate valid code. Mercury switches are no longer available. All mercury switch mechanisms should be replaced by dry contact mechanisms with the appropriate process temperature rating. See switch specifications, page 13.

example model number:

☐☐☐-☐☐☐☐-[B][K][A]

9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
Mercury	Short	SPDT	1	Yellow	AAE	AAY	AKY	AAQ	A2Q	AKQ	—	AKS
				Red	AAG	AAR	AKR	AAP	A2P	AKP	—	AKT
	Tall			Yellow	AAF	AAM	AKM	AAB	A2B	AKB	AKW	AKK
				Red	AAH	AAD	AKD	AAA	A2A	AKA	AKV	AKJ
			2	Yellow	ABF	ABM	ALM	ABB	A4B	ALB	ALW	ALK
				Red	ABH	ABD	ALD	ABA	A4A	ALA	ALV	ALJ
			3	Yellow	ACF	ACM	AMM	ACB	A6B	AMB	AMW	AMK
				Red	ACH	ACD	AMD	ACA	A6A	AMA	AMV	AMJ
	Short	DPDT	1	Yellow	ADE	ADY	ANY	ADQ	A8Q	ANQ	—	ANS
				Red	ADG	ADR	ANR	ADP	A8P	ANP	—	ANT
	Tall			Yellow	ADF	ADM	ANM	ADB	A8B	ANB	ANW	ANK
				Red	ADH	ADD	AND	ADA	A8A	ANA	ANV	ANJ
			2	Yellow	AEF	AEM	AOM	AEB	A1B	AOB	AOW	AOK
				Red	AEH	AED	AOD	AEA	A1A	AOA	AOV	AOJ
	Short w/ Drain	SPDT	1	Yellow	—	—	AUY	—	—	AUQ	—	—
				Red	—	—	AUR	—	—	AUP	—	—
	Tall w/ Drain			Yellow	—	—	AUM	—	—	AUB	—	—
				Red	—	—	AUD	—	—	AUA	—	—
			2	Yellow	—	—	AVM	—	—	AVB	—	—
				Red	—	—	AVD	—	—	AVA	—	—
			3	Yellow	—	—	AWM	—	—	AWB	—	—
				Red	—	—	AWD	—	—	AWA	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	AXY	—	—	AXQ	—	—
				Red	—	—	AXR	—	—	AXP	—	—
	Tall w/ Drain			Yellow	—	—	AXM	—	—	AXB	—	—
				Red	—	—	AXD	—	—	AXA	—	—
			2	Yellow	—	—	AYM	—	—	AYB	—	—
				Red	—	—	AYD	—	—	AYA	—	—
	Short w/ Heater	SPDT	1	Yellow	AFE	AFY	APY	AFQ	—	APQ	—	—
				Red	AFG	AFR	APR	AFP	—	APP	—	—
	Tall w/ Heater			Yellow	AFF	AFM	APM	AFB	—	APB	—	—
				Red	AFH	AFD	APD	AFA	—	APA	—	—
			2	Yellow	AGF	AGM	AQM	AGB	—	AQB	—	—
				Red	AGH	AGD	AQD	AGA	—	AQA	—	—
			3	Yellow	AHF	AHM	ARM	AHB	—	ARB	—	—
				Red	AHH	AHD	ARD	AHA	—	ARA	—	—
	Short w/ Heater	DPDT	1	Yellow	AIE	AIY	ASY	AIQ	—	ASQ	—	—
				Red	AIG	AIR	ASR	AIP	—	ASP	—	—
	Tall w/ Heater			Yellow	AIF	AIM	ASM	AIB	—	ASB	—	—
				Red	AIH	AID	ASD	AIA	—	ASA	—	—
			2	Yellow	AJF	AJM	ATM	AJB	—	ATB	—	—
				Red	AJH	AJD	ATD	AJA	—	ATA	—	—

The switch and housing codes in bold are currently valid and available. Those not in bold are no longer valid.

9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
Dry Contact	Short	SPDT	1	Yellow	BAE	**BAY**	**BKY**	BAQ	B2Q	**BKQ**	—	**BKS**
				Red	BAG	**BAR**	**BKR**	BAP	B2P	**BKP**	—	**BKT**
	Tall			Yellow	BAF	**BAM**	**BKM**	BAB	B2B	**BKB**	**BKW**	**BKK**
				Red	BAH	**BAD**	**BKD**	BAA	B2A	**BKA**	**BKV**	**BKJ**
			2	Yellow	BBF	**BBM**	**BLM**	BBB	B4B	**BLB**	**BLW**	**BLK**
				Red	BBH	**BBD**	**BLD**	BBA	B4A	**BLA**	**BLV**	**BLJ**
			3	Yellow	BCF	**BCM**	**BMM**	BCB	B6B	**BMB**	**BMW**	**BMK**
				Red	BCH	**BCD**	**BMD**	BCA	B6A	**BMA**	**BMV**	**BMJ**
	Short	DPDT	1	Yellow	BDE	**BDY**	**BNY**	BDQ	B8Q	**BNQ**	—	**BNS**
				Red	BDG	**BDR**	**BNR**	BDP	B8P	**BNP**	—	**BNT**
	Tall			Yellow	BDF	**BDM**	**BNM**	BDB	B8B	**BNB**	**BNW**	**BNK**
				Red	BDH	**BDD**	**BND**	BDA	B8A	**BNA**	**BNV**	**BNJ**
			2	Yellow	BEF	**BEM**	**BOM**	BEB	B1B	**BOB**	**BOW**	**BOK**
				Red	BEH	**BED**	**BOD**	BEA	B1A	**BOA**	**BOV**	**BOJ**
	Short w/ Drain	SPDT	1	Yellow	—	—	**BUY**	—	—	**BUQ**	—	—
				Red	—	—	**BUR**	—	—	**BUP**	—	—
	Tall w/ Drain			Yellow	—	—	**BUM**	—	—	**BUB**	—	—
				Red	—	—	**BUD**	—	—	**BUA**	—	—
			2	Yellow	—	—	**BVM**	—	—	**BVB**	—	—
				Red	—	—	**BVD**	—	—	**BVA**	—	—
			3	Yellow	—	—	**BWM**	—	—	**BWB**	—	—
				Red	—	—	**BWD**	—	—	**BWA**	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	**BXY**	—	—	**BXQ**	—	—
				Red	—	—	**BXR**	—	—	**BXP**	—	—
	Tall w/ Drain			Yellow	—	—	**BXM**	—	—	**BXB**	—	—
				Red	—	—	**BXD**	—	—	**BXA**	—	—
			2	Yellow	—	—	**BYM**	—	—	**BYB**	—	—
				Red	—	—	**BYD**	—	—	**BYA**	—	—
	Short w/ Heater	SPDT	1	Yellow	BFE	**BFY**	**BPY**	BFQ	—	**BPQ**	—	—
				Red	BFG	**BFR**	**BPR**	BFP	—	**BPP**	—	—
	Tall w/ Heater			Yellow	BFF	**BFM**	**BPM**	BFB	—	**BPB**	—	—
				Red	BFH	**BFD**	**BPD**	BFA	—	**BPA**	—	—
			2	Yellow	BGF	**BGM**	**BQM**	BGB	—	**BQB**	—	—
				Red	BGH	**BGD**	**BQD**	BGA	—	**BQA**	—	—
			3	Yellow	BHF	**BHM**	**BRM**	BHB	—	**BRB**	—	—
				Red	BHH	**BHD**	**BRD**	BHA	—	**BRA**	—	—
	Short w/ Heater	DPDT	1	Yellow	BIE	**BIY**	**BSY**	BIQ	—	**BSQ**	—	—
				Red	BIG	**BIR**	**BSR**	BIP	—	**BSP**	—	—
	Tall w/ Heater			Yellow	BIF	**BIM**	**BSM**	BIB	—	**BSB**	—	—
				Red	BIH	**BID**	**BSD**	BIA	—	**BSA**	—	—
			2	Yellow	BJF	**BJM**	**BTM**	BJB	—	**BTB**	—	—
				Red	BJH	**BJD**	**BTD**	BJA	—	**BTA**	—	—
	Short	SPDT	1	Yellow	CAE	**CAY**	**CKY**	CAQ	C2Q	**CKQ**	—	**CKS**
				Red	CAG	**CAR**	**CKR**	CAP	C2P	**CKP**	—	**CKT**
	Tall			Yellow	CAF	**CAM**	**CKM**	CAB	C2B	**CKB**	**CKW**	**CKK**
				Red	CAH	**CAD**	**CKD**	CAA	C2A	**CKA**	**CKV**	**CKJ**
			2	Yellow	CBF	**CBM**	**CLM**	CBB	C4B	**CLB**	**CLW**	**CLK**
				Red	CBH	**CBD**	**CLD**	CBA	C4A	**CLA**	**CLV**	**CLJ**
			3	Yellow	CCF	**CCM**	**CMM**	CCB	C6B	**CMB**	**CMW**	**CMK**
				Red	CCH	**CCD**	**CMD**	CCA	C6A	**CMA**	**CMV**	**CMJ**
	Short	DPDT	1	Yellow	CDE	**CDY**	**CNY**	CDQ	C8Q	**CNQ**	—	**CNS**
				Red	CDG	**CDR**	**CNR**	CDP	C8P	**CNP**	—	**CNT**
	Tall			Yellow	CDF	**CDM**	**CNM**	CDB	C8B	**CNB**	**CNW**	**CNK**
				Red	CDH	**CDD**	**CND**	CDA	C8A	**CNA**	**CNV**	**CNJ**
			2	Yellow	CEF	**CEM**	**COM**	CEB	C1B	**COB**	**COW**	**COK**
				Red	CEH	**CED**	**COD**	CEA	C1A	**COA**	**COV**	**COJ**

The switch and housing codes in bold are currently valid and available. Those not in bold are no longer valid.

9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
Dry Contact	Short w/ Drain	SPDT	1	Yellow	—	—	**CUY**	—	—	**CUQ**	—	—
				Red	—	—	**CUR**	—	—	**CUP**	—	—
	Tall w/ Drain			Yellow	—	—	**CUM**	—	—	**CUB**	—	—
				Red	—	—	**CUD**	—	—	**CUA**	—	—
			2	Yellow	—	—	**CVM**	—	—	**CVB**	—	—
				Red	—	—	**CVD**	—	—	**CVA**	—	—
			3	Yellow	—	—	**CWM**	—	—	**CWB**	—	—
				Red	—	—	**CWD**	—	—	**CWA**	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	**CXY**	—	—	**CXQ**	—	—
				Red	—	—	**CXR**	—	—	**CXP**	—	—
	Tall w/ Drain			Yellow	—	—	**CXM**	—	—	**CXB**	—	—
				Red	—	—	**CXD**	—	—	**CXA**	—	—
			2	Yellow	—	—	**CYM**	—	—	**CYB**	—	—
				Red	—	—	**CYD**	—	—	**CYA**	—	—
	Short w/ Heater	SPDT	1	Yellow	CFE	**CFY**	—	CFQ	—	—	—	—
				Red	CFG	**CFR**	—	CFP	—	—	—	—
	Tall w/ Heater			Yellow	CFF	**CFM**	—	CFB	—	—	—	—
				Red	CFH	**CFD**	—	CFA	—	—	—	—
			2	Yellow	CGF	**CGM**	—	CGB	—	—	—	—
				Red	CGH	**CGD**	—	CGA	—	—	—	—
			3	Yellow	CHF	**CHM**	—	CHB	—	—	—	—
				Red	CHH	**CHD**	—	CHA	—	—	—	—
	Short w/ Heater	DPDT	1	Yellow	CIE	**CIY**	—	CIQ	—	—	—	—
				Red	CIG	**CIR**	—	CIP	—	—	—	—
	Tall w/ Heater			Yellow	CIF	**CIM**	—	CIB	—	—	—	—
				Red	CIH	**CID**	—	CIA	—	—	—	—
			2	Yellow	CJF	**CJM**	—	CJB	—	—	—	—
				Red	CJH	**CJD**	—	CJA	—	—	—	—
DC Voltage Dry Contact	Short	SPDT	1	Yellow	DAE	**DAY**	**DKY**	DAQ	D2Q	**DKQ**	**—**	**DKS**
	Tall			Yellow	DAF	**DAM**	**DKM**	DAB	D2B	**DKB**	**DKW**	**DKK**
			2	Yellow	DBF	**DBM**	**DLM**	DBB	D4B	**DLB**	**DLW**	**DLK**
			3	Yellow	DCF	**DCM**	**DMM**	DCB	D6B	**DMB**	**DMW**	**DMK**
	Short	DPDT	1	Yellow	DDE	**DDY**	**DNY**	DDQ	D8Q	**DNQ**	**—**	**DNS**
	Tall			Yellow	DDF	**DDM**	**DNM**	DDB	D8B	**DNB**	**DNW**	**DNK**
			2	Yellow	DEF	**DEM**	**DOM**	DEB	D1B	**DOB**	**DOW**	**DOK**
	Short w/ Drain	SPDT	1	Yellow	—	—	**DUY**	—	—	**DUQ**	—	—
	Tall w/ Drain			Yellow	—	—	**DUM**	—	—	**DUB**	—	—
			2	Yellow	—	—	**DVM**	—	—	**DVB**	—	—
			3	Yellow	—	—	**DWM**	—	—	**DWB**	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	**DXY**	—	—	**DXQ**	—	—
	Tall w/ Drain			Yellow	—	—	**DXM**	—	—	**DXB**	—	—
			2	Yellow	—	—	**DYM**	—	—	**DYB**	—	—
	Short w/ Heater	SPDT	1	Yellow	DFE	**DFY**	**DPY**	DFQ	—	**DPQ**	—	—
	Tall w/ Heater			Yellow	DFF	**DFM**	**DPM**	DFB	—	**DPB**	—	—
			2	Yellow	DGF	**DGM**	**DQM**	DGB	—	**DQB**	—	—
			3	Yellow	DHF	**DHM**	**DRM**	DHB	—	**DRB**	—	—
	Short w/ Heater	DPDT	1	Yellow	DIE	**DIY**	**DSY**	DIQ	—	**DSQ**	—	—
	Tall w/ Heater			Yellow	DIF	**DIM**	**DSM**	DIB	—	**DSB**	—	—
			2	Yellow	DJF	**DJM**	**DTM**	DJB	—	**DTB**	—	—

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9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
Vibration Resistant Mercury	Short	SPDT	1	Yellow	EAE	EAY	EKY	EAQ	—	EKQ	—	EKS
				Red	EAG	EAR	EKR	EAP	—	EKP	—	EKT
	Tall			Yellow	EAF	EAM	EKM	EAB	—	EKB	EKW	EKK
				Red	EAH	EAD	EKD	EAA	—	EKA	EKV	EKJ
			2	Yellow	EBF	EBM	ELM	EBB	—	ELB	ELW	ELK
				Red	EBH	EBD	ELD	EBA	—	ELA	ELV	ELJ
			3	Yellow	ECF	ECM	EMM	ECB	—	EMB	EMW	EMK
				Red	ECH	ECD	EMD	ECA	—	EMA	EMV	EMJ
	Short	DPDT	1	Yellow	EDE	EDY	ENY	EDQ	—	ENQ	—	ENS
				Red	EDG	EDR	ENR	EDP	—	ENP	—	ENT
	Tall			Yellow	EDF	EDM	ENM	EDB	—	ENB	ENW	ENK
				Red	EDH	EDD	END	EDA	—	ENA	ENV	ENJ
			2	Yellow	EEF	EEM	EOM	EEB	—	EOB	EOW	EOK
				Red	EEH	EED	EOD	EEA	—	EOA	EOV	EOJ
	Short w/ Drain	SPDT	1	Yellow	—	—	EUY	—	—	EUQ	—	—
				Red	—	—	EUR	—	—	EUP	—	—
	Tall w/ Drain			Yellow	—	—	EUM	—	—	EUB	—	—
				Red	—	—	EUD	—	—	EUA	—	—
			2	Yellow	—	—	EVM	—	—	EVB	—	—
				Red	—	—	EVD	—	—	EVA	—	—
			3	Yellow	—	—	EWM	—	—	EWB	—	—
				Red	—	—	EWD	—	—	EWA	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	EXY	—	—	EXQ	—	—
				Red	—	—	EXR	—	—	EXP	—	—
	Tall w/ Drain			Yellow	—	—	EXM	—	—	EXB	—	—
				Red	—	—	EXD	—	—	EXA	—	—
			2	Yellow	—	—	EYM	—	—	EYB	—	—
				Red	—	—	EYD	—	—	EYA	—	—
	Short w/ Heater	SPDT	1	Yellow	EFE	EFY	EPY	EFQ	—	EPQ	—	—
				Red	EFG	EFR	EPR	EFP	—	EPP	—	—
	Tall w/ Heater			Yellow	EFF	EFM	EPM	EFB	—	EPB	—	—
				Red	EFH	EFD	EPD	EFA	—	EPA	—	—
			2	Yellow	EGF	EGM	EQM	EGB	—	EQB	—	—
				Red	EGH	EGD	EQD	EGA	—	EQA	—	—
			3	Yellow	EHF	EHM	ERM	EHB	—	ERB	—	—
				Red	EHH	EHD	ERD	EHA	—	ERA	—	—
	Short w/ Heater	DPDT	1	Yellow	EIE	EIY	ESY	EIQ	—	ESQ	—	—
				Red	EIG	EIR	ESR	EIP	—	ESP	—	—
	Tall w/ Heater			Yellow	EIF	EIM	ESM	EIB	—	ESB	—	—
				Red	EIH	EID	ESD	EIA	—	ESA	—	—
			2	Yellow	EJF	EJM	ETM	EJB	—	ETB	—	—
				Red	EJH	EJD	ETD	EJA	—	ETA	—	—
Herm. Sealed Dry Contact	Short	SPDT	1	Yellow	FAE	**FAY**	**FKY**	FAQ	F2Q	**FKQ**	**—**	**FKS**
				Red	FAG	**FAR**	**FKR**	FAP	F2P	**FKP**	**—**	**FKT**
	Tall			Yellow	FAF	**FAM**	**FKM**	FAB	FCB	**FKB**	**FKW**	**FKK**
				Red	FAH	**FAD**	**FKD**	FAA	FCA	**FKA**	**FKV**	**FKJ**
			2	Yellow	FBF	**FBM**	**FLM**	FBB	FFB	**FLB**	**FLW**	**FLK**
				Red	FBH	**FBD**	**FLD**	FBA	FFA	**FLA**	**FLV**	**FLJ**
	Short	DPDT	1	Yellow	FDE	**FDY**	**FNY**	FDQ	F8Q	**FNQ**	**—**	**FNS**
				Red	FDG	**FDR**	**FNR**	FDP	F8P	**FNP**	**—**	**FNT**
	Tall			Yellow	FDF	**FDM**	**FNM**	FDB	FGB	**FNB**	**FNW**	**FNK**
				Red	FDH	**FDD**	**FND**	FDA	FGA	**FNA**	**FNV**	**FNJ**
			2	Yellow	FEF	**FEM**	**FOM**	FEB	FHB	**FOB**	**FOW**	**FOK**
				Red	FEH	**FED**	**FOD**	FEA	FHA	**FOA**	**FOV**	**FOJ**

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9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
Dual Magnet Dry Contact	Tall	SPDT	1	Yellow	GAF	**GAM**	**GKM**	—	—	—	**GKW**	—
				Red	GAH	**GAD**	**GKD**	—	—	—	**GKV**	—
		DPDT		Yellow	GDF	**GDM**	**GNM**	—	—	—	**GNW**	—
				Red	GDH	**GDD**	**GND**	—	—	—	**GNV**	—
	Tall w/ Drain	SPDT		Yellow	—	—	**GUM**	—	—	—	—	—
				Red	—	—	**GUD**	—	—	—	—	—
		DPDT		Yellow	—	—	**GXM**	—	—	—	—	—
				Red	—	—	**GXD**	—	—	—	—	—
Dual Magnet Dry Contact	Tall	SPDT	1	Yellow	HAF	**HAM**	**HKM**	—	—	—	**HKW**	—
				Red	HAH	**HAD**	**HKD**	—	—	—	**HKV**	—
		DPDT		Yellow	HDF	**HDM**	**HNM**	—	—	—	**HNW**	—
				Red	HDH	**HDD**	**HND**	—	—	—	**HNV**	—
	Tall w/ Drain	SPDT		Yellow	—	—	**HUM**	—	—	—	—	—
				Red	—	—	**HUD**	—	—	—	—	—
		DPDT		Yellow	—	—	**HXM**	—	—	—	—	—
				Red	—	—	**HXD**	—	—	—	—	—
DC Voltage Dual Magnet Dry Contact	Tall	SPDT	1	Yellow	IAF	**IAM**	**IKM**	—	—	—	**IKW**	—
				Red	IAH	**IAD**	**IKD**	—	—	—	**IKV**	—
		DPDT		Yellow	IDF	**IDM**	**INM**	—	—	—	**INW**	—
				Red	IDH	**IDD**	**IND**	—	—	—	**INV**	—
	Tall w/ Drain	SPDT		Yellow	—	—	**IUM**	—	—	—	—	—
				Red	—	—	**IUD**	—	—	—	—	—
		DPDT		Yellow	—	—	**IXM**	—	—	—	—	—
				Red	—	—	**IXD**	—	—	—	—	—
High Temp Mercury for B40	Tall	SPDT	1	Yellow	LAF	LAM	LKM	LAB	L2B	LKB	LKW	LKK
		DPDT			LDF	LDM	LNM	LDB	L8B	LNB	LNW	LNK
		SPDT			LBF	LBM	LLM	LBB	—	LLB	LLW	LLK
		DPDT			LEF	LEM	LOM	LEB	—	LOB	LOW	LOK
High Temp Mercury with Manual Reset* *All Housing on manual reset switches Type/NEMA 1 only.	Short	SPDT	1	Yellow	MAE	MAY	—	—	—	—	—	—
				Red	MAG	MAR	—	—	—	—	—	—
	Tall			Yellow	MAF	MAM	—	—	—	—	—	—
				Red	MAH	MAD	—	—	—	—	—	—
			2	Yellow	MBF	MBM	—	—	—	—	—	—
				Red	MBH	MBD	—	—	—	—	—	—
				R/B	—	MBE	—	—	—	—	—	—
			3	Yellow	MCF	MCM	—	—	—	—	—	—
				Red	MCH	MCD	—	—	—	—	—	—
				R/B/B	—	MCE	—	—	—	—	—	—
	Short	DPDT	1	Yellow	MDE	MDY	—	—	—	—	—	—
				Red	MDG	MDR	—	—	—	—	—	—
	Tall			Yellow	MDF	MDM	—	—	—	—	—	—
				Red	MDH	MDD	—	—	—	—	—	—
			2	Yellow	MEF	MEM	—	—	—	—	—	—
				Red	MEH	MED	—	—	—	—	—	—
Mercury for C10/C15	X-Tall	SPDT	3	Yellow	NCF	NCM	NMM	NCB	—	NMB	NMI	NMN
		DPDT			NEF	NEM	NKM	NEB	—	NKB	NKI	NKN
	X-Tall w/ Heater	SPDT			NHF	NHM	NRM	NHB	—	NRB	—	—
		DPDT			NJF	NJM	NLM	NJB	—	NLB	—	—
	X-Tall w/ Drain	SPDT			—	—	NWM	—	—	NWB	—	—
		DPDT			—	—	NNM	—	—	NNB	—	—
Dry Contact for C10/C15	X-Tall	SPDT	3	Yellow	OCF	OCM	OMM	OCB	—	**OMB**	OMI	**OMN**
		DPDT			OEF	OEM	OKM	OEB	—	**OKB**	OKI	**OKN**
	X-Tall w/ Heater	SPDT			OHF	OHM	ORM	OHB	—	ORB	—	—
		DPDT			OJF	OJM	OLM	OJB	—	OLB	—	—
	X-Tall w/ Drain	SPDT			—	—	OWM	—	—	OWB	—	—
		DPDT			—	—	ONM	—	—	ONB	—	—

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Dry Contact for C10/C15	X-Tall	SPDT	3	Yellow	QCF	**QCM**	**QMM**	QCB	—	**QMB**	**QMI**	**QMN**
		DPDT			QEF	**QEM**	**QKM**	QEB	—	**QKB**	**QKI**	**QKN**
	X-Tall w/ Heater	SPDT			QHF	**QHM**	**QRM**	QHB	—	**QRB**	—	—
		DPDT			QJF	**QJM**	**QLM**	QJB	—	**QLB**	—	—
	X-Tall w/ Drain	SPDT			—	—	**QWM**	—	—	**QWB**	—	—
		DPDT			—	—	**QNM**	—	—	**QNB**	—	—
Dry Contact for B40	Tall	SPDT	1	Yellow	SAF	**SAM**	**SKM**	SAB	S2B	**SKB**	**SKW**	**SKK**
		DPDT			SDF	**SDM**	**SNM**	SDB	S8B	**SNB**	**SNW**	**SNK**
DC Dry Contact for B40		SPDT			SBF	**SBM**	**SLM**	SBB	S2R	**SLB**	**SLW**	**SLK**
		DPDT			SEF	**SEM**	**SOM**	SEB	S8R	**SOB**	**SOW**	**SOK**
Vibration Resistant Mercury For C10/C15	X-Tall	SPDT	3	Yellow	TCF	TCM	TMM	TCB	—	TMB	TMI	TMN
		DPDT			TEF	TEM	TKM	TEB	—	TKB	TKI	TKN
	X-Tall w/ Heater	SPDT			THF	THM	TRM	THB	—	TRB	—	—
		DPDT			TJF	TJM	TLM	TJB	—	TLB	—	—
	X-Tall w/ Drain	SPDT			—	—	TWM	—	—	TWB	—	—
		DPDT			—	—	TNM	—	—	TNB	—	—
Dry Contact w/Gold Alloy Contacts	Short	SPDT	1	Yellow	UAE	**UAY**	**UKY**	UAQ	U2Q	**UKQ**	—	—
				Red	UAG	**UAR**	**UKR**	UAP	U2P	**UKP**	—	—
	Tall			Yellow	UAF	**UAM**	**UKM**	UAB	U2B	**UKB**	**UKW**	—
				Red	UAH	**UAD**	**UKD**	UAA	U2A	**UKA**	—	—
			2	Yellow	UBF	**UBM**	**ULM**	UBB	U4B	**ULB**	**ULW**	—
				Red	UBH	**UBD**	**ULD**	UBA	U4A	**ULA**	—	—
			3	Yellow	UCF	**UCM**	**UMM**	UCB	U6B	**UMB**	**UMW**	—
				Red	UCH	**UCD**	**UMD**	UCA	U6A	**UMA**	—	—
	Short	DPDT	1	Yellow	UDE	**UDY**	**UNY**	UDQ	U8Q	**UNQ**	—	—
				Red	UDG	**UDR**	**UNR**	UDP	U8P	**UNP**	—	—
	Tall			Yellow	UDF	**UDM**	**UNM**	UDB	U8B	**UNB**	**UNW**	—
				Red	UDH	**UDD**	**UND**	UDA	U8A	**UNA**	—	—
			2	Yellow	UEF	**UEM**	**UOM**	UEB	U1B	**UOB**	**UOW**	—
				Red	UEH	**UED**	**UOD**	UEA	U1A	**UOA**	—	—
	Short w/ Drain	SPDT	1	Yellow	—	—	—	—	—	**UUQ**	—	—
				Red	—	—	—	—	—	—	—	—
	Tall w/ Drain			Yellow	—	—	**UUM**	—	—	**UUB**	—	—
				Red	—	—	**UUD**	—	—	—	—	—
			2	Yellow	—	—	**UVM**	—	—	**UVB**	—	—
				Red	—	—	**UVD**	—	—	—	—	—
			3	Yellow	—	—	**UWM**	—	—	**UWB**	—	—
				Red	—	—	**UWD**	—	—	—	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	—	—	—	**UXQ**	—	—
				Red	—	—	—	—	—	—	—	—
	Tall w/ Drain			Yellow	—	—	**UXM**	—	—	**UXB**	—	—
				Red	—	—	**UXD**	—	—	—	—	—
			2	Yellow	—	—	**UYM**	—	—	**UYB**	—	—
				Red	—	—	**UYD**	—	—	—	—	—
Hermetically Sealed Dry Contact	Short	SPDT	1	Yellow	WAE	**WAY**	**WKY**	WAQ	W2Q	**WKQ**	—	**WKS**
				Red	WAG	**WAR**	**WKR**	WAP	W2P	**WKP**	—	**WKT**
	Tall			Yellow	WAF	**WAM**	**WKM**	WAB	W2B	**WKB**	**WKW**	**WKK**
				Red	WAH	**WAD**	**WKD**	WAA	W2A	**WKA**	—	—
			2	Yellow	WBF	**WBM**	**WLM**	WBB	W4B	**WLB**	**WLW**	**WLK**
				Red	WBH	**WBD**	**WLD**	WBA	W4A	**WLA**	—	—
			3	Yellow	WCF	**WCM**	**WMM**	WCB	W6B	**WMB**	**WMW**	**WMK**
				Red	WCH	**WCD**	**WMD**	WCA	W6A	**WMA**	—	—
	Short	DPDT	1	Yellow	WDE	**WDY**	**WNY**	WDQ	W8Q	**WNQ**	—	**WNS**
	Tall			Yellow	WDF	**WDM**	**WNM**	WDB	W8B	**WNB**	**WNW**	**WNK**
			2	Yellow	WEF	**WEM**	**WOM**	WEB	W1B	**WOB**	**WOW**	**WOK**

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Hermetically Sealed Dry Contact	Short w/ Drain	SPDT	1	Yellow	—	—	—	—	—	**WUQ**	—	—
				Red	—	—	—	—	—	**WUP**	—	—
	Tall w/ Drain			Yellow	—	—	**WUM**	—	—	**WUB**	—	—
				Red	—	—	**WUD**	—	—	**WUA**	—	—
			2	Yellow	—	—	**WVM**	—	—	**WVB**	—	—
				Red	—	—	**WVD**	—	—	**WVA**	—	—
			3	Yellow	—	—	**WWM**	—	—	**WWB**	—	—
				Red	—	—	**WWD**	—	—	**WWA**	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	—	—	—	**WXQ**	—	—
	Tall w/ Drain				—	—	**WXM**	—	—	**WXB**	—	—
			2		—	—	**WYM**	—	—	—	—	—
Hermetically Sealed Dry Contact w/Gold	Short	SPDT	1	Yellow	XAE	**XAY**	**XKY**	XAQ	X2Q	**XKQ**	—	**XKS**
				Red	XAG	**XAR**	**XKR**	XAP	X2P	**XKP**	—	**XKT**
	Tall			Yellow	XAF	**XAM**	**XKM**	XAB	X2B	**XKB**	**XKW**	**XKK**
				Red	XAH	**XAD**	**XKD**	XAA	X2A	**XKA**	—	—
			2	Yellow	XBF	**XBM**	**XLM**	XBB	X4B	**XLB**	**XLW**	**XLK**
				Red	XBH	**XBD**	**XLD**	XBA	X4A	**XLA**	—	—
			3	Yellow	XCF	**XCM**	**XMM**	XCB	X6B	**XMB**	**XMW**	**XMK**
				Red	XCH	**XCD**	**XMD**	XCA	X6A	**XMA**	—	—
	Short	DPDT	1	Yellow	XDE	**XDY**	**XNY**	XDQ	X8Q	**XNQ**	—	**XNS**
	Tall				XDF	**XDM**	**XNM**	XDB	X8B	**XNB**	**XNW**	**XNK**
			2		XEF	**XEM**	**XOM**	XEB	X1B	**XOB**	**XOW**	**XOK**
	Short w/ Drain	SPDT	1	Yellow	—	—	—	—	—	**XUQ**	—	—
				Red	—	—	—	—	—	**XUP**	—	—
	Tall w/ Drain			Yellow	—	—	**XUM**	—	—	**XUB**	—	—
				Red	—	—	**XUD**	—	—	**XUA**	—	—
			2	Yellow	—	—	**XVM**	—	—	**XVB**	—	—
				Red	—	—	**XVD**	—	—	**XVA**	—	—
			3	Yellow	—	—	**XWM**	—	—	**XWB**	—	—
				Red	—	—	**XWD**	—	—	**XWA**	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	—	—	—	**XXQ**	—	—
	Tall w/ Drain				—	—	**XXM**	—	—	**XXB**	—	—
			2		—	—	**XYM**	—	—	**X4B**	—	—
High Temp Vibration Resistant Mercury	Short	SPDT	1	Yellow	2AE	2AY	2KY	2AQ	22Q	2KQ	—	2KS
				Red	2AG	2AR	2KR	2AP	22P	2KP	—	2KT
	Tall			Yellow	2AF	2AM	2KM	2AB	22B	2KB	2KW	2KK
				Red	2AH	2AD	2KD	2AA	22A	2KA	2KV	2KJ
			2	Yellow	2BF	2BM	2LM	2BB	24B	2LB	2LW	2LK
				Red	2BH	2BD	2LD	2BA	24A	2LA	2LV	2LJ
				R/B	—	—	—	2BE	24E	2LE	—	2LG
			3	Yellow	2CF	2CM	2MM	2CB	26B	2MB	2MW	2MK
				Red	2CH	2CD	2MD	2CA	26A	2MA	2MV	2MJ
				R/B/B	—	—	—	2CE	26E	2ME	—	2MG
	Short	DPDT	1	Yellow	2DE	2DY	2NY	2DQ	28Q	2NQ	—	2NS
				Red	2DG	2DR	2NR	2DP	28P	2NP	—	2NT
	Tall			Yellow	2DF	2DM	2NM	2DB	28B	2NB	2NW	2NK
				Red	2DH	2DD	2ND	2DA	28A	2NA	2NV	2NJ
			2	Yellow	2EF	2EM	2OM	2EB	21B	2OB	2OW	2OK
				Red	2EH	2ED	2OD	2EA	21A	2OA	2OV	2OJ

The switch and housing codes in bold are currently valid and available. Those not in bold are no longer valid.

9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
High Temp Vibration Resistant Mercury	Short w/ Drain	SPDT	1	Yellow	—	—	2UY	—	—	2UQ	—	—
				Red	—	—	2UR	—	—	2UP	—	—
	Tall w/ Drain			Yellow	—	—	2UM	—	—	2UB	—	—
				Red	—	—	2UD	—	—	2UA	—	—
			2	Yellow	—	—	2VM	—	—	2VB	—	—
				Red	—	—	2VD	—	—	2VA	—	—
				R/B	—	—	—	—	—	2VE	—	—
			3	Yellow	—	—	2WM	—	—	2WB	—	—
				Red	—	—	2WD	—	—	2WA	—	—
				R/B/B	—	—	—	—	—	2WE	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	2XY	—	—	2XQ	—	—
				Red	—	—	2XR	—	—	2XP	—	—
	Tall w/ Drain			Yellow	—	—	2XM	—	—	2XB	—	—
				Red	—	—	2XD	—	—	2XA	—	—
			2	Yellow	—	—	2YM	—	—	2YB	—	—
				Red	—	—	2YD	—	—	2YA	—	—
	Short w/ Heater	SPDT	1	Yellow	2FE	2FY	2PY	2FQ	—	2PQ	—	—
				Red	2FG	2FR	2PR	2FP	—	2PP	—	—
	Tall w/ Heater			Yellow	2FF	2FM	2PM	2FB	—	2PB	—	—
				Red	2FH	2FD	2PD	2FA	—	2PA	—	—
			2	Yellow	2GF	2GM	2QM	2GB	—	2QB	—	—
				Red	2GH	2GD	2QD	2GA	—	2QA	—	—
				R/B	—	—	—	—	—	2QE	—	—
			3	Yellow	2HF	2HM	2RM	2HB	—	2RB	—	—
				Red	2HH	2HD	2RD	2HA	—	2RA	—	—
				R/B/B	—	—	—	—	—	2RE	—	—
	Short w/ Heater	DPDT	1	Yellow	2IE	2IY	2SY	2IQ	—	2SQ	—	—
				Red	2IG	2IR	2SR	2IP	—	2SP	—	—
	Tall w/ Heater			Yellow	2IF	2IM	2SM	2IB	—	2SB	—	—
				Red	2IH	2ID	2SD	2IA	—	2SA	—	—
			2	Yellow	2JF	2JM	2TM	2JB	—	2TB	—	—
				Red	2JH	2JD	2TD	2JA	—	2TA	—	—
High Temp Mercury	Short	SPDT	1	Yellow	3AE	3AY	3KY	3AQ	32Q	3KQ	—	3KS
				Red	3AG	3AR	3KR	3AP	32P	3KP	—	3KT
	Tall			Yellow	3AF	3AM	3KM	3AB	32B	3KB	3KW	3KK
				Red	3AH	3AD	3KD	3AA	32A	3KA	3KV	3KJ
			2	Yellow	3BF	3BM	3LM	3BB	34B	3LB	3LW	3LK
				Red	3BH	3BD	3LD	3BA	34A	3LA	3LV	3LJ
				R/B	—	—	—	3BE	34E	3LE	—	3LG
			3	Yellow	3CF	3CM	3MM	3CB	36B	3MB	3MW	3MK
				Red	3CH	3CD	3MD	3CA	36A	3MA	3MV	3MJ
				R/B/B	—	—	—	3CE	36E	3ME	—	3MG
	Short	DPDT	1	Yellow	3DE	3DY	3NY	3DQ	38Q	3NQ	—	3NS
				Red	3DG	3DR	3NR	3DP	38P	3NP	—	3NT
	Tall			Yellow	3DF	3DM	3NM	3DB	38B	3NB	3NW	3NK
				Red	3DH	3DD	3ND	3DA	38A	3NA	3NV	3NJ
			2	Yellow	3EF	3EM	3OM	3EB	31B	3OB	3OW	3OK
				Red	3EH	3ED	3OD	3EA	31A	3OA	3OV	3OJ

The switch and housing codes in bold are currently valid and available. Those not in bold are no longer valid.

9.1 Type 4, 4X, 7, 9 and Group B Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	Type 4 Carbon Steel	Type 4X Carbon Steel	Type 7/9 Cast Iron	Type 4X Cast Alum 1" NPT	Type 4X Cast Alum M20 × 1.5	Type 4X/7/9 Cast Alum	Group B Cast Iron	Type 4X/7/9 Group B Cast Alum
High Temp Mercury	Short w/ Drain	SPDT	1	Yellow	—	—	3UY	—	—	3UQ	—	—
				Red	—	—	3UR	—	—	3UP	—	—
	Tall w/ Drain			Yellow	—	—	3UM	—	—	3UB	—	—
				Red	—	—	3UD	—	—	3UA	—	—
			2	Yellow	—	—	3VM	—	—	3VB	—	—
				Red	—	—	3VD	—	—	3VA	—	—
				R/B	—	—	—	—	—	3VE	—	—
			3	Yellow	—	—	3WM	—	—	3WB	—	—
				Red	—	—	3WD	—	—	3WA	—	—
				R/B/B	—	—	—	—	—	3WE	—	—
	Short w/ Drain	DPDT	1	Yellow	—	—	3XY	—	—	3XQ	—	—
				Red	—	—	3XR	—	—	3XP	—	—
	Tall w/ Drain			Yellow	—	—	3XM	—	—	3XB	—	—
				Red	—	—	3XD	—	—	3XA	—	—
			2	Yellow	—	—	3YM	—	—	3YB	—	—
				Red	—	—	3YD	—	—	3YA	—	—
	Short w/ Heater	SPDT	1	Yellow	3FE	3FY	3PY	3FQ	—	3PQ	—	—
				Red	3FG	3FR	3PR	3FP	—	3PP	—	—
	Tall w/ Heater			Yellow	3FF	3FM	3PM	3FB	—	3PB	—	—
				Red	3FH	3FD	3PD	3FA	—	3PA	—	—
			2	Yellow	3GF	3GM	3QM	3GB	—	3QB	—	—
				Red	3GH	3GD	3QD	3GA	—	3QA	—	—
				R/B	—	—	—	—	—	3QE	—	—
			3	Yellow	3HF	3HM	3RM	3HB	—	3RB	—	—
				Red	3HH	3HD	3RD	3HA	—	3RA	—	—
				R/B/B	—	—	—	—	—	3RE	—	—
	Short w/ Heater	DPDT	1	Yellow	3IE	3IY	3SY	3IQ	—	3SQ	—	—
				Red	3IG	3IR	3SR	3IP	—	3SP	—	—
	Tall w/ Heater			Yellow	3IF	3IM	3SM	3IB	—	3SB	—	—
				Red	3IH	3ID	3SD	3IA	—	3SA	—	—
			2	Yellow	3JF	3JM	3TM	3JB	—	3TB	—	—
				Red	3JH	3JD	3TD	3JA	—	3TA	—	—

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9.2 ATEX Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	ATEX XP Cast Iron 3/4" NPT	ATEX XP Cast Iron M20 × 1.5	ATEX XP Cast Alum 1" NPT	ATEX XP Cast Alum M20 × 1.5	ATEX IS Cast Alum 1" NPT	ATEX IS Cast Alum M20 × 1.5
Mercury	Short	SPDT	1	Yellow	—	—	AA9	AH9	—	—
				Red	—	—	AAC	AHC	—	—
	Tall			Yellow	AU5	AK5	AC9	AK9	—	—
				Red	AU7	AK7	ACC	AKC	—	—
			2	Yellow	AV5	AL5	AD9	AL9	—	—
				Red	AV7	AL7	ADC	ALC	—	—
			3	Yellow	A75	A65	AE9	AM9	—	—
				Red	A77	A67	AEC	AMC	—	—
	Short	DPDT	1	Yellow	—	—	AB9	AJ9	—	—
				Red	—	—	ABC	AJC	—	—
	Tall			Yellow	AW5	AD5	AF9	AN9	—	—
				Red	AW7	AD7	AFC	ANC	—	—
			2	Yellow	AY5	AO5	AG9	AP9	—	—
				Red	AY7	AO7	AGC	APC	—	—
Dry Contact	Short	SPDT	1	Yellow	**—**	**—**	**BA9**	**BH9**	—	—
				Red	**—**	**—**	**BAC**	**BHC**	—	—
	Tall			Yellow	**BU5**	**BK5**	**BC9**	**BK9**	—	—
				Red	**BU7**	**BK7**	**BCC**	**BKC**	—	—
			2	Yellow	**BV5**	**BL5**	**BD9**	**BL9**	—	—
				Red	**BV7**	**BL7**	**BDC**	**BLC**	—	—
			3	Yellow	**B75**	**B65**	**BE9**	**BM9**	—	—
				Red	**B77**	**B67**	**BEC**	**BMC**	—	—
	Short	DPDT	1	Yellow	**—**	**—**	**BB9**	**BJ9**	—	—
				Red	**—**	**—**	**BBC**	**BJC**	—	—
	Tall			Yellow	**BW5**	**BD5**	**BF9**	**BN9**	—	—
				Red	**BW7**	**BD7**	**BFC**	**BNC**	—	—
			2	Yellow	**BY5**	**BO5**	**BG9**	**BP9**	—	—
				Red	**BY7**	**BO7**	**BGC**	**BPC**	—	—
Dry Contact	Short	SPDT	1	Yellow	**—**	**—**	**CA9**	**CH9**	**CAS**	**C2S**
				Red	**—**	**—**	**CAC**	**CHC**	**CAL**	**C2L**
	Tall			Yellow	**CU5**	**CK5**	**CC9**	**CK9**	**CAT**	**C2T**
				Red	**CU7**	**CK7**	**CCC**	**CKC**	**CAX**	**C2X**
			2	Yellow	**CV5**	**CL5**	**CD9**	**CL9**	**CBT**	**C4T**
				Red	**CV7**	**CL7**	**CDC**	**CLC**	**CBX**	**C4X**
			3	Yellow	**C75**	**C65**	**CE9**	**CM9**	**—**	**—**
				Red	**C77**	**C67**	**CEC**	**CMC**	**—**	**—**
	Short	DPDT	1	Yellow	**—**	**—**	**CB9**	**CJ9**	**CDS**	**C8S**
				Red	**—**	**—**	**CBC**	**CJC**	**CDL**	**C8L**
	Tall			Yellow	**CW5**	**CD5**	**CF9**	**CN9**	**CDT**	**C8T**
				Red	**CW7**	**CD7**	**CFC**	**CNC**	**CDX**	**C8X**
			2	Yellow	**CY5**	**CO5**	**CG9**	**CP9**	**CET**	**C1T**
				Red	**CY7**	**CO7**	**CGC**	**CPC**	**CEX**	**C1X**
DC Voltage Dry Contact	Short	SPDT	1	Yellow	**—**	**—**	**DA9**	**DH9**	—	—
	Tall			Yellow	**DU5**	**DK5**	**DC9**	**DK9**	—	—
			2	Yellow	**DV5**	**DL5**	**DD9**	**DL9**	—	—
			3	Yellow	**D75**	**D65**	**DE9**	**DM9**	—	—
	Short	DPDT	1	Yellow	**—**	**—**	**DB9**	**DJ9**	—	—
	Tall			Yellow	**DW5**	**DD5**	**DF9**	**DN9**	—	—
			2	Yellow	**DY5**	**DO5**	**DG9**	**DP9**	—	—
Vibration Resistant Mercury	Short	SPDT	1	Yellow	—	—	EA9	EH9	—	—
				Red	—	—	EAC	EHC	—	—
	Tall			Yellow	EU5	EK5	EC9	EK9	—	—
				Red	EU7	EK7	ECC	EKC	—	—
			2	Yellow	EV5	EL5	ED9	EL9	—	—
				Red	EV7	EL7	EDC	ELC	—	—
			3	Yellow	E75	E65	EE9	EM9	—	—
				Red	E77	E67	EEC	EMC	—	—

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9.2 ATEX Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	ATEX XP Cast Iron 3/4" NPT	ATEX XP Cast Iron M20 × 1.5	ATEX XP Cast Alum 1" NPT	ATEX XP Cast Alum M20 × 1.5	ATEX IS Cast Alum 1" NPT	ATEX IS Cast Alum M20 × 1.5
Vibration Resistant Mercury	Short	DPDT	1	Yellow	—	—	EB9	EJ9	—	—
				Red	—	—	EBC	EJC	—	—
	Tall			Yellow	EW5	ED5	EF9	EN9	—	—
				Red	EW7	ED7	EFC	ENC	—	—
			2	Yellow	EY5	EO5	EG9	EP9	—	—
				Red	EY7	EO7	EGC	EPC	—	—
Herm. Sealed Dry Contact	Short	SPDT	1	Yellow	**—**	**—**	**FA9**	**FH9**	—	—
				Red	**—**	**—**	**FAC**	**FHC**	—	—
	Tall			Yellow	**FU5**	**FK5**	**FC9**	**FK9**	—	—
				Red	**FU7**	**FK7**	**FCC**	**FKC**	—	—
			2	Yellow	**FV5**	**FL5**	**FD9**	**FL9**	—	—
				Red	**FV7**	**FL7**	**FDC**	**FLC**	—	—
			3	Yellow	**—**	**—**	**—**	**—**	—	—
				Red	**—**	**—**	**—**	**—**	—	—
	Short	DPDT	1	Yellow	**—**	**—**	**FB9**	**FJ9**	—	—
				Red	**—**	**—**	**FBC**	**FJC**	—	—
	Tall			Yellow	**FW5**	**FD5**	**FF9**	**FN9**	—	—
				Red	**FW7**	**FD7**	**FFC**	**FNC**	—	—
			2	Yellow	**FY5**	**FO5**	**FG9**	**FP9**	—	—
				Red	**FY7**	**FO7**	**FGC**	**FPC**	—	—
High Temp Mercury for B40	Tall	SPDT	1	Yellow	—	—	LC9	LK9	—	—
		DPDT			—	—	LF9	LN9	—	—
		SPDT			—	—	LA9	LH9	—	—
		DPDT			—	—	LB9	LJ9	—	—
Dry Contact for B40	Tall	SPDT	1	Yellow	—	—	**SA9**	**SH9**	—	—
		DPDT			—	—	**SB9**	**SJ9**	—	—
DC Dry Contact for B40		SPDT			—	—	**SC9**	**SK9**	—	—
		DPDT			—	—	**SF9**	**SN9**	—	—
Dry Contact w/Gold Alloy Contacts	Short	SPDT	1	Yellow	**—**	**—**	**UA9**	**UH9**	**UAS**	**U2S**
				Red	**—**	**—**	**UAC**	**UHC**	**UAL**	**U2L**
	Tall			Yellow	**UU5**	**UK5**	**UC9**	**UK9**	**UAT**	**U2T**
				Red	**UU7**	**UK7**	**UCC**	**UKC**	**UAX**	**U2X**
			2	Yellow	**UV5**	**UL5**	**UD9**	**UL9**	**UBT**	**U4T**
				Red	**UV7**	**UL7**	**UDC**	**ULC**	**UBX**	**U4X**
			3	Yellow	**U75**	**U65**	**UE9**	**UM9**	**UCT**	**ULT**
				Red	**U77**	**U67**	**UEC**	**UMC**	**UCX**	**ULX**
	Short	DPDT	1	Yellow	**—**	**—**	**UB9**	**UJ9**	**UDS**	**U8S**
				Red	**—**	**—**	**UBC**	**UJC**	**UDL**	**U8L**
	Tall			Yellow	**UW5**	**UD5**	**UF9**	**UN9**	**UDT**	**U8T**
				Red	**UW7**	**UD7**	**UFC**	**UNC**	**UDX**	**U8X**
			2	Yellow	**UY5**	**UO5**	**UG9**	**UP9**	**UET**	**U1T**
				Red	**UY7**	**UO7**	**UGC**	**UPC**	**UEX**	**U1X**

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9.2 ATEX Enclosure Codes

Switch Type	Housing Height & Options	Switch Contacts	Set Points	Magnet Dot Color	ATEX XP Cast Iron 3/4" NPT	ATEX XP Cast Iron M20 × 1.5	ATEX XP Cast Alum 1" NPT	ATEX XP Cast Alum M20 × 1.5	ATEX IS Cast Alum 1" NPT	ATEX IS Cast Alum M20 × 1.5
Herm. Sealed Dry Contact	Short	SPDT	1	Yellow	—	—	**WA9**	**WH9**	**WAS**	**W2S**
				Red	—	—	**WAC**	**WHC**	**WAL**	**W2L**
	Tall			Yellow	**WU5**	**WK5**	**WC9**	**WK9**	**WAT**	**W2T**
				Red	**WU7**	**WK7**	**WCC**	**WKC**	**WAX**	**W2X**
			2	Yellow	**WV5**	**WL5**	**WD9**	**WL9**	**WBT**	**W4T**
				Red	**WV7**	**WL7**	**WDC**	**WLC**	**WBX**	**W4X**
			3	Yellow	**W75**	**W65**	**WE9**	**WM9**	—	—
				Red	**W77**	**W67**	**WEC**	**WMC**	—	—
	Short	DPDT	1	Yellow	—	—	**WB9**	**WJ9**	**WDS**	**W8S**
	Tall			Yellow	**WW5**	**WD5**	**WF9**	**WN9**	**WDT**	**W8T**
			2	Yellow	**WY5**	**WO5**	**WG9**	**WP9**	**WET**	**W1T**
Herm. Sealed Dry Contact w/ Gold	Short	SPDT	1	Yellow	—	—	**XA9**	**XH9**	**XAS**	**X2S**
				Red	—	—	**XAC**	**XHC**	**XAL**	**X2L**
	Tall			Yellow	**XU5**	**XK5**	**XC9**	**XK9**	**XAT**	**X2T**
				Red	**XU7**	**XK7**	**XCC**	**XKC**	**XAX**	**X2X**
			2	Yellow	**XV5**	**XL5**	**XD9**	**XL9**	**XBT**	**X4T**
				Red	**XV7**	**XL7**	**XDC**	**XLC**	**XBX**	**X4X**
			3	Yellow	**X75**	**X65**	**XE9**	**XM9**	—	—
				Red	**X77**	**X67**	**XEC**	**XMC**	—	—
	Short	DPDT	1	Yellow	—	—	**XB9**	**XJ9**	**XDS**	**X8S**
	Tall			Yellow	**XW5**	**XD5**	**XF9**	**XN9**	**XDT**	**X8T**
			2	Yellow	**XY5**	**XO5**	**XG9**	**XP9**	**XET**	**X1T**
High Temp Vibration Resistant Mercury	Short	SPDT	1	Yellow	—	—	2A9	2H9	—	—
				Red	—	—	2AC	2HC	—	—
	Tall			Yellow	2U5	2K5	2C9	2K9	—	—
				Red	2U7	2K7	2CC	2KC	—	—
			2	Yellow	2V5	2L5	2D9	2L9	—	—
				Red	—	—	2DC	2LC	—	—
				R/B	2V7	2L7	2DE	29E	—	—
			3	Yellow	275	265	2E9	2M9	—	—
				Red	—	—	2EC	2MC	—	—
				R/B/B	277	267	2EE	28E	—	—
	Short	DPDT	1	Yellow	—	—	2B9	2J9	—	—
				Red	—	—	2BC	2JC	—	—
	Tall			Yellow	2W5	2D5	2F9	2N9	—	—
				Red	2W7	2D7	2FC	2NC	—	—
			2	Yellow	2Y5	2O5	2G9	2P9	—	—
				Red	2Y7	2O7	2GC	2PC	—	—
High Temp Mercury	Short	SPDT	1	Yellow	—	—	3A9	3H9	—	—
				Red	—	—	3AC	3HC	—	—
	Tall			Yellow	3U5	3K5	3C9	3K9	—	—
				Red	3U7	3K7	3CC	3KC	—	—
			2	Yellow	3V5	3L5	3D9	3L9	—	—
				Red	—	—	3DC	3LC	—	—
				R/B	3V7	3L7	3DE	39E	—	—
			3	Yellow	375	365	3E9	3M9	—	—
				Red	—	—	3EC	3MC	—	—
				R/B/B	377	367	3EE	38E	—	—
	Short	DPDT	1	Yellow	—	—	3B9	3J9	—	—
				Red	—	—	3BC	3JC	—	—
	Tall			Yellow	3W5	3D5	3F9	3N9	—	—
				Red	3W7	3D7	3FC	3NC	—	—
			2	Yellow	3Y5	3O5	3G9	3P9	—	—
				Red	3Y7	3O7	3GC	3PC	—	—

The switch and housing codes in bold are currently valid and available. Those not in bold are no longer valid.

NOTES

NOTES

Service Policy

Owners of Magnetrol may request the return of a control or any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Controls returned under our service policy must be returned by Prepaid transportation. Magnetrol will repair or replace the control at no cost to the purchaser (or owner) other than transportation if:

1. Returned within the warranty period; and
2. The factory inspection finds the cause of the claim to be covered under the warranty.

If the trouble is the result of conditions beyond our control; or, is NOT covered by the warranty, there will be charges for labor and the parts required to rebuild or replace the equipment.

In some cases it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labor, direct or consequential damage will be allowed.

Return Material Procedure

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorization" (RMA) number be obtained from the factory, prior to the material's return. This is available through your Magnetrol local representative or by contacting the factory. Please supply the following information:

1. Company Name
2. Description of Material
3. Serial Number
4. Reason for Return
5. Application

Any unit that was used in a process must be properly cleaned in accordance with OSHA standards, before it is returned to the factory.

A Material Safety Data Sheet (MSDS) must accompany material that was used in any media.

All shipments returned to the factory must be by prepaid transportation.

All replacements will be shipped F.O.B. factory.

MAGNETROL®

705 Enterprise Street • Aurora, Illinois 60504-8149 • 630.969.4000
info@magnetrol.com • magnetrol.com

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