

# High Temperature Electric Switch Mechanisms

Installation and Operating Manual

*Series F, R, 8 & 9  
with aluminum,  
carbon steel, or  
cast iron housings*



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## 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.

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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.

Magnetrol's 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.

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## Series F, R, 8 & 9 Electric Switch Mechanisms

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## 1.0 Reference Information

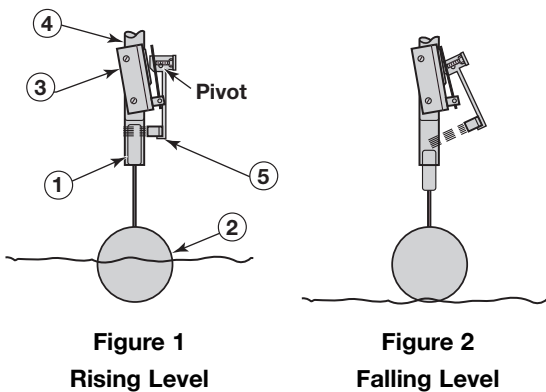
### 1.1 Principle of Operation

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 ① and a float ②, displacer or flow sensing element and a switching mechanism ③. These two basic component assemblies are separated by a non-magnetic, pressure retaining enclosing tube ④. The switch ③ and magnet ⑤ are assembled to a mechanism with a swinging arm which operates on precision stainless steel pivots.

### 1.2 Operating Cycle

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 causing the set screw on the swinging arm to move the actuating lever of a snap action switch, making or breaking the electrical circuit. As the liquid level recedes (Figure 2), the float and magnetic sleeve move downward until the switch magnet releases and is drawn outward, away from the enclosing tube by a tension spring. This, in turn, moves the actuating arm of the switch in the opposite direction, reversing switch action.

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



### 1.3 Description

The Series F, R, 8 & 9 dry contact switches are specifically designed for use in applications with extremely high process temperatures. These switches are available on most of Magnetrol's buoyancy products and can also be retrofitted onto many existing controls. Designed to Magnetrol's usual high standards, these high temperature switches will provide reliable, repeatable service in the toughest of applications.

These switches are available with SPDT or DPDT contacts. Some models can be configured with multiple switch mechanisms for several actuation levels. FM, CSA and ATEX approval for hazardous and non-hazardous locations on approved models.

#### 1.3.1 +750 °F (+399 °C) Dry Contact Switches

- Series 8 & F switches are designed for high temperature applications and are hermetically sealed.

### 1.3.2 +1000° F (+538° C) Dry Contact Switches

- Series R switches are designed for the highest temperature installations and have a 1.0 amp contact rating for both AC & DC voltages.
- Series 9 switches are hermetically sealed and designed for the highest temperature installations.

### 1.3.3 Basic Switch Ratings

| Switch Series<br>① | Switch Type              | Process Temp Range F (C) ② | Load          | Rating (amps) |      |     |          |      |      |     |
|--------------------|--------------------------|----------------------------|---------------|---------------|------|-----|----------|------|------|-----|
|                    |                          |                            |               | Volts AC      |      |     | Volts DC |      |      |     |
|                    |                          |                            |               | 120           | 240  | 480 | 24       | 48   | 120  | 240 |
| 8                  | Hermetically Sealed Snap | -50 to +750 (-46 to +398)  | Non-Inductive | 1.00          | —    | —   | 3.00     | —    | —    | —   |
|                    |                          |                            | Inductive     | 1.00          | —    | —   | 1.00     | —    | —    | —   |
| 9                  | Hermetically Sealed Snap | -50 to +1000 (-46 to +538) | Non-Inductive | 1.00          | —    | —   | 1.00 ③   | —    | —    | —   |
|                    |                          |                            | Inductive     | 1.00          | —    | —   | 1.00 ③   | —    | —    | —   |
| F                  | Hermetically Sealed Snap | -50 to +750 (-46 to +398)  | Non-Inductive | 2.50          | —    | —   | 4.00 ③   | —    | 0.30 | —   |
|                    |                          |                            | Inductive     | 2.50          | —    | —   | 2.00 ③   | —    | 0.10 | —   |
| R                  | Snap                     | -40 to +1000 (-46 to +538) | Non-Inductive | 1.00          | 1.00 | —   | 1.00     | —    | 0.40 | —   |
|                    |                          |                            | Inductive     | 1.00          | 1.00 | —   | 1.00     | 1.00 | 0.40 | —   |

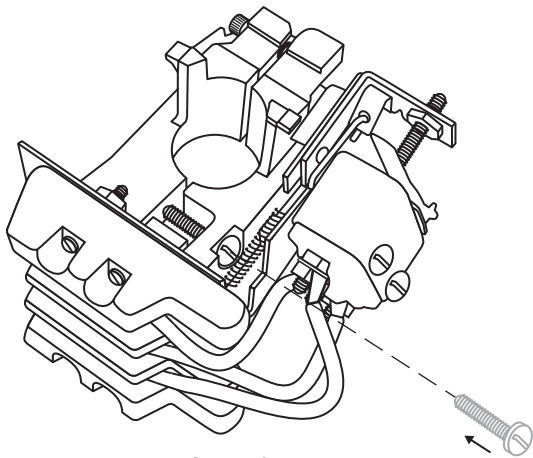
- ① For currents under 100 mA, gold contact switches should be used.  
 ② Process temperature based on +100° F (+38° C) ambient temperature  
 ③ 28 VDC

## 2.0 Installation

### 2.1 Replacing Switch Mechanism

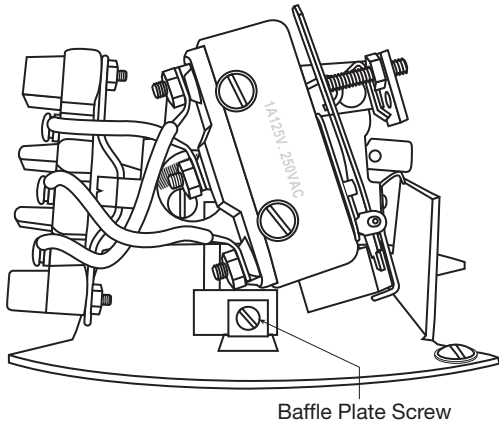
**Caution:** Before attempting to remove a switch mechanism, be certain to pull disconnect switch or otherwise assure that electrical circuit through control is de-energized.

1. Disconnect wiring from supply side of terminal block on switch mechanism. Note and record lead wire terminal locations.
2. Loosen mounting screw in split mounting clamp until mechanism slides freely on enclosing tube, refer to Figure 3.
3. Remove small round head screw securing lower switch mechanism to baffle plate, refer to Figure 4.
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.



**Figure 3**  
Mounting Screw

**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.



**Figure 4**  
**Baffle Plate Screw**

## 2.1 Replacing Switch Mechanism (cont.)

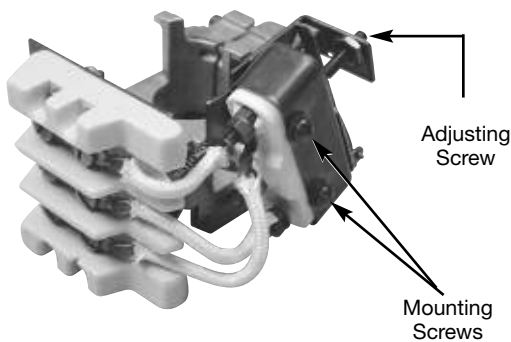
5. Loosen mounting screw so that switch frame will fit over e-tube. Install switch mechanism by sliding it over the enclosing tube. Slide mechanism down until the bottom of the frame and terminal block are resting on the baffle plate. The baffle plate should be resting on the hub of the housing base.
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

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 5.
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.

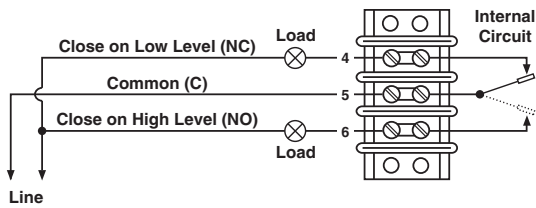
5. Check switch action and adjust as follows:
  - a. Slowly rotate the pivoted magnet by hand, back and forth through its angle of swing, listening closely for the actuating click of the switch in each direction.
  - b. Check to see if there is equal overtravel of magnet in its swing after the switch click in either direction.
  - c. If switch actuation is not correct, change adjustment of actuating screw using a  $\frac{1}{16}$ " hexagon key wrench, refer to Figure 5.
6. Reconnect power supply and test switch action by varying liquid level in the vessel.



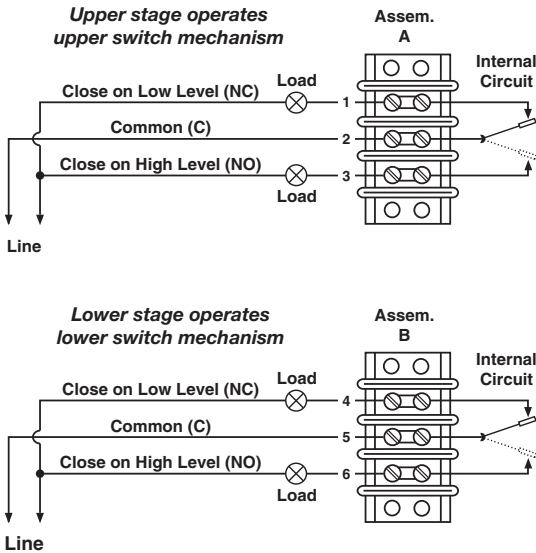
**Figure 5**  
**Dry Contact Switch Mechanism**

## 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.



**Figure 6**  
**Single Float with One Switch**



**Figure 7**  
**Single Float with Two Switches**

### 3.1 SPDT Terminal Connections

#### 3.1.1 Single float with one switch

1. Rising level closes contacts 5 & 6, see Figure 6.
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

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 7.
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.

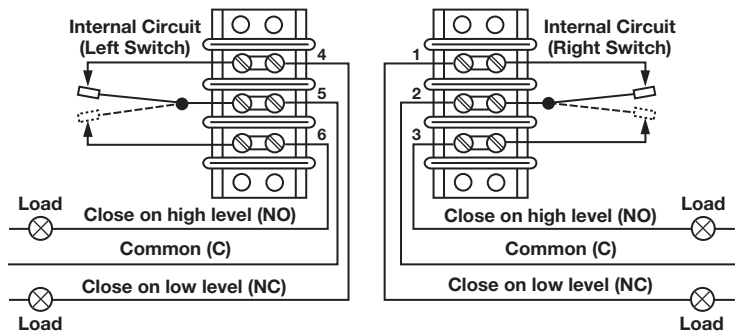
### 3.2 DPDT Terminal Connections

#### 3.2.1 Single float with one switch or single stage displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 8 (following page).
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.)

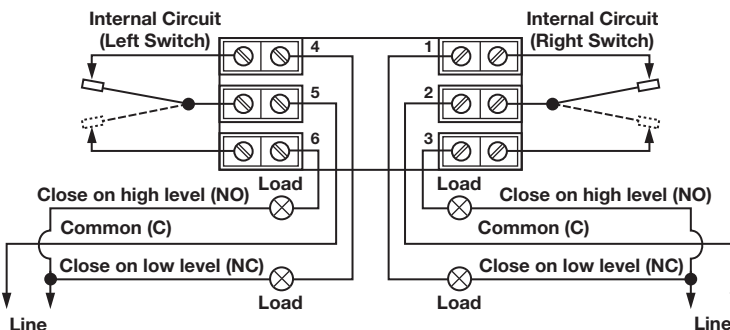
#### 3.2.2 Single float with two switches or dual stage displacer

1. Rising level closes contacts 5 & 6 and 2 & 3, see Figure 9 (following page).
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.

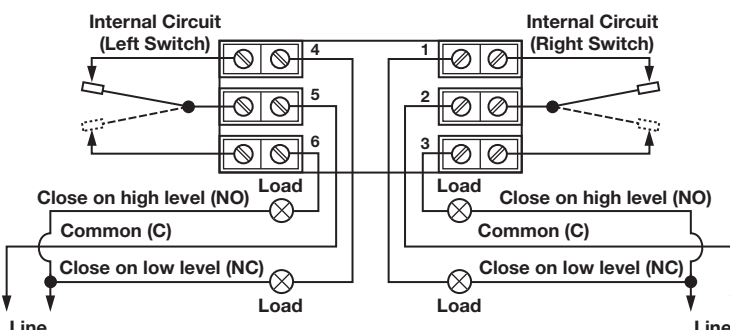


**Figure 8**  
Single Float with One Switch  
or Single Stage Displacer

*Upper stage operates upper switch mechanism*



*Lower stage operates lower switch mechanism*



**Figure 9**  
Single Float with Two Switches or Dual Stage Displacer

## 4.0 Replacement Switch Part Numbers

### Red Dot Magnets

| Switch Series 8th Digit | Contacts      | Quantity                           | 9th & 10th Digits  | Bottom Mech  | Top Mech     |
|-------------------------|---------------|------------------------------------|--|--------------|--------------|
| 8                       | SPDT          | 1                                  | AC, AD, AR, CC, HC, KA, KC, KD, KJ, KP, KR, KT, KV, K7, U7 | 089-7401-183 | —            |
|                         |               | 2                                  | BD, DC, LA, LC, LD, LJ, LV, L7, V7                         |              | 089-7401-184 |
|                         | DPDT          | 1                                  | BC, DD, DR, D7, FC, JC, NA, NC, ND, NJ, NP, NR, NT, NV, W7 | 089-7401-191 | —            |
|                         |               | 2                                  | ED, GC, OA, OD, OJ, OV, O7, PC, Y7                         |              | 089-7401-191 |
|                         | SPDT Group IV | 1                                  | HD, MC, M7, SA, SD, SJ, SV                                 | 089-7401-187 | —            |
| DPDT Group IV           | 1             | JD, TA, TD, TJ, TV, ZC, Z7         | 089-7401-189   | —            |              |
| 9                       | SPDT          | 1                                  | AC, AD, AR, CC, HC, KA, KC, KD, KJ, KP, KR, KT, KV, K7, U7 | 089-7401-193 | —            |
|                         |               | 2                                  | BD, DC, LA, LC, LD, LJ, LV, L7, V7                         |              | 089-7401-194 |
|                         | DPDT          | 1                                  | BC, DD, DR, D7, FC, JC, NA, NC, ND, NJ, NP, NR, NT, NV, W7 | 089-7401-195 | —            |
|                         |               | 2                                  | ED, GC, OA, OD, OJ, OV, O7, PC, Y7                         |              | 089-7401-195 |
|                         | SPDT Group IV | 1                                  | HD, MC, M7, N7, SA, SD, SJ, SV, YC                         | 089-7401-196 | —            |
| DPDT Group IV           | 1             | JD, SC, P7, TA, TD, TJ, TV, ZC, Z7 | 089-7401-197   | —            |              |
| F                       | SPDT          | 1                                  | AC, AD, AR, CC, HC, KA, KC, KD, KJ, KP, KR, KT, KV, K7, U7 | 089-7401-093 | —            |
|                         |               | 2                                  | BD, DC, LA, LC, LD, LJ, LV, L7, V7                         |              | 089-7401-094 |
|                         | DPDT          | 1                                  | BC, DD, DR, D7, FC, JC, NA, NC, ND, NJ, NP, NR, NT, NV, W7 | 089-7401-097 | —            |
|                         |               | 2                                  | ED, GC, OA, OD, OJ, OV, O7, PC, Y7                         |              | 089-7401-097 |



## 4.0 Replacement Switch Part Numbers (cont.)

### Yellow Dot Magnets

| Switch Series<br>8th Digit | Contacts         | Quantity   | 9th & 10th Digits  | Bottom Mech  | Top Mech     |
|----------------------------|------------------|--|--|--------------|--------------|
| 8                          | SPDT             | 1  | AM, AY, A9, C9, H9, KB, KK, KM, KQ, KS, KW, KY, K5, K9, U5 | 089-7401-185 | —            |
|                            |                  | 2  | BM, D9, LB, LK, LM, LW, L5, L9, V5                         |              | 089-7401-186 |
|                            | DPDT             | 1  | B9, DM, DY, D5, F9, J9, NB, NK, NM, NQ, NS, NW, NY, N9, W5 | 089-7401-192 | —            |
|                            |                  | 2  | EM, G9, OB, OK, OM, OW, O5, P9, Y5                         |              | 089-7401-192 |
|                            | SPDT<br>Group IV | 1  | HM, M5, M9, SB, SK, SM, SW                                 | 089-7401-188 | —            |
| DPDT<br>Group IV           | 1                | JM, TB, TK, TM, TW, Z5, Z9                                 | 089-7401-190   | —            |              |
| 9                          | SPDT             | 1  | AM, AY, A9, C9, H9, KB, KK, KM, KQ, KS, KW, KY, K5, K9, U5 | 089-7401-198 | —            |
|                            |                  | 2  | BM, D9, LB, LK, LM, LW, L5, L9, V5                         |              | 089-7401-199 |
|                            | DPDT             | 1  | B9, DM, DY, D5, F9, J9, NB, NK, NM, NQ, NS, NW, NY, N9, W5 | 089-7401-200 | —            |
|                            |                  | 2  | EM, G9, OB, OK, OM, OW, O5, P9, Y5                         |              | 089-7401-200 |
|                            | SPDT<br>Group IV | 1  | HM, M5, M9, N5, SB, SK, SM, SW, Y9                         | 089-7401-201 | —            |
| DPDT<br>Group IV           | 1                | JM, P5, S9, TB, TK, TM, TW, Z5, Z9                         | 089-7401-202   | —            |              |
| F                          | SPDT             | 1  | AM, AY, A9, C9, H9, KB, KK, KM, KQ, KS, KW, KY, K5, K9, U5 | 089-7401-095 | —            |
|                            |                  | 2  | BM, D9, LB, LK, LM, LW, L5, L9, V5                         |              | 089-7401-096 |
|                            | DPDT             | 1  | B9, DM, DY, D5, F9, J9, NB, NK, NM, NQ, NS, NW, NY, N9, W5 | 089-7401-098 | —            |
|                            |                  | 2  | EM, G9, OB, OK, OM, OW, O5, P9, Y5                         |              | 089-7401-098 |
| R                          | SPDT             | 1  | A9, C9, H9, KB, KK, KM, KQ, KS, KW, KY, K5, K9, U5, 1M, 1Y | 089-7401-179 | —            |
|                            |                  | 2  | D9, LB, LK, LM, LW, L5, L9, V5, 3M                         |              | 089-7401-178 |
|                            | DPDT             | 1  | B9, DM, DY, F5, F9, J9, NB, NK, NM, NQ, NS, NW, NY, N5, N9 | 089-7401-181 | —            |
|                            |                  | 2  | EM, G5, G9, OB, OK, OM, OW, O5                             |              | 089-7401-181 |
|                            | SPDT<br>Group IV | 1  | WM, WW, W5, W9, YB, YK, Y5, Y9, 5M                         | 089-7401-180 | —            |
| DPDT<br>Group IV           | 1                | JM, M5, M9, SB, SK, SM, SW, S5, S9, RK, RM, JB, RW, J9, J5 | 089-7401-182   | —            |              |

## 5.0 Switch Housing Replacement Assemblies

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

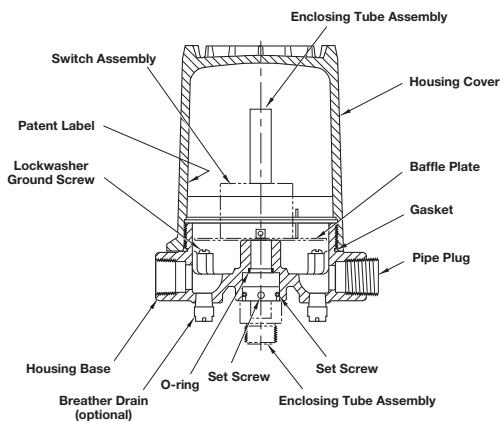
1. Model and serial numbers of control.
2. Description and part number of replacement kit.

Use the chart on the following page to choose the correct replacement housing kit.

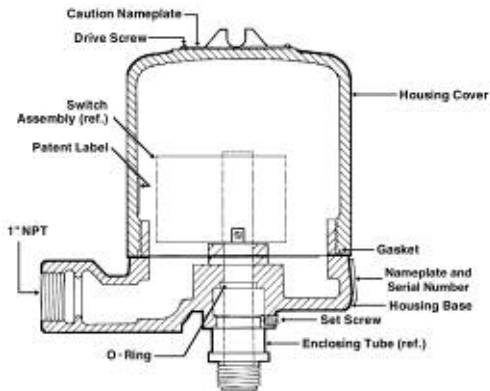
### 5.1 Aluminum Housings

Die cast aluminum NEMA 4X housing replacements are available for general purpose or weather proof installations. Explosion proof NEMA 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.

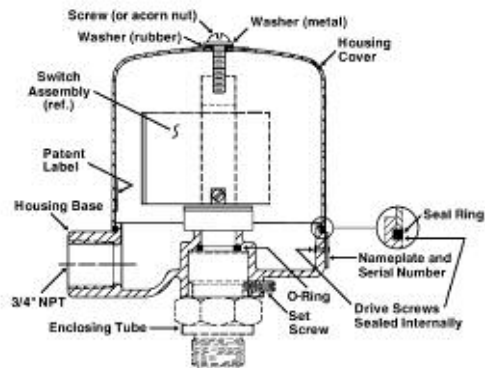
NOTE: Consult your local representative on applications to meet NEMA and other codes not covered in this bulletin.



**Figure 10**  
**Aluminum Housing Assembly**



**Figure 11**  
**Cast Iron Housing Assembly**



**Figure 12**  
**Carbon Steel Housing Assembly**

## 5.2 Cast Iron Housings

Cast Iron NEMA 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.

## 5.3 Carbon Steel Housings

Carbon steel NEMA 4X switch housings are available for general purpose and weather proof 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 NEMA and other codes not covered in this bulletin.

## 5.4 Replacement Housing Kits, Gaskets and Hardware

|                  | Cover Height | CS/Alum TYPE 4X<br>Old Style | Cast Alum<br>TYPE 4X/7/9 | Cast Iron<br>TYPE 7/9 | Cast Alum<br>Group B | Cast Iron<br>Group B |
|------------------|--------------|------------------------------|--------------------------|-----------------------|----------------------|----------------------|
| Housing Kit      | Short (4")   | —                            | 089-6582-023             | 089-6582-002          | 089-6582-032         | —                    |
|                  | Tall (6")    | —                            | 089-6582-024             | 089-6582-005          | 089-6582-033         | 089-6582-008         |
|                  | X-tall (12") | 089-6528-003                 | 089-6582-025             | 089-6582-001          | 089-6582-025         | —                    |
| Cover Kit        | Short (4")   | 089-6509-003                 | —                        | —                     | —                    | —                    |
|                  | Tall (6")    | 089-6510-003                 | 089-6582-031             | 089-6582-014          | 089-6582-031         | 089-6582-014         |
| Base Kit         |              | 089-6505-003                 | 089-6582-030             | 089-6582-013          | 089-6582-030         | 089-6582-015         |
| Baffle Plate     |              | 036-5303-001                 | 005-6657-001             | 036-5303-001          | 005-6657-001         | 089-6582-008         |
| Cover Hardware   |              | 089-6508-001                 | —                        | —                     | —                    | —                    |
| Cover Gasket     |              | 012-1318-001                 | 012-2201-253             | 012-2201-249          | 012-2201-253         | 012-2201-249         |
| Base O-Ring      |              | 012-2201-116                 | 012-2201-116             | 012-2201-116          | 012-2201-116         | 012-2201-116         |
| Gland Nut O-Ring |              | —                            | —                        | —                     | —                    | 012-2201-222         |

## 5.5 Wiring Kit

|                    |              |
|--------------------|--------------|
| SPDT HT Wiring Kit | 089-8304-001 |
| DPDT HT Wiring Kit | 089-8304-002 |

NOTE: Assemblies rated to +1000 °F (+538 °C) process temperature at +100 °F (+38 °C) ambient temperature.

## 6.0 Switch and Housing Model Codes

The mechanical level switches are identified by a ten digit alphanumeric model numbering system. The eighth, ninth and tenth digit combinations (called switch and housing codes) are 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 for the high temperature switches are below.

EXAMPLE MODEL NUMBER:

□ □ □ - □ □ □ □ - **R K B**

| Switch Description  | Contacts    | Housing Height | Number of Switches | Magnet Dot Color | Cast Aluminum |     |             |                  |         |     | CS/Alum |             | Cast Iron        |         |     |  |
|---|-------------|----------------|--------------------|------------------|---------------|-----|-------------|------------------|---------|-----|---------|-------------|------------------|---------|-----|--|
|   |             |                |                    |                  | TYPE 4X*      |     | TYPE 4X/7/9 | CI I Div 1 Grp B | ATEX XP |     | TYPE 4X | TYPE 4X/7/9 | CI I Div 1 Grp B | ATEX XP |     |  |
|   |             |                |                    |                  | 1" NPT        | M20 | 1" NPT      | 1" NPT           | 1"NPT   | M20 | ¾" NPT  | 1" NPT      | 1" NPT           | ¾" NPT  | M20 |  |
| Series '8' High Temperature Hermetically Sealed Snap Switch | SPDT        | Short          | 1                  | Red              | 8AP           | 82P | 8KP         | 8KT              | 8AC     | 8HC | 8AR     | 8KR         | —                | —       | —   |  |
|   |             |                |                    | Yellow           | 8AQ           | 82Q | 8KQ         | 8KS              | 8A9     | 8H9 | 8AY     | 8KY         | —                | —       | —   |  |
|   |             |                |                    | Red              | 8AA           | 82A | 8KA         | 8KJ              | 8CC     | 8KC | 8AD     | 8KD         | 8KV              | 8U7     | 8K7 |  |
|   |             |                | Yellow             | 8AB              | 82B           | 8KB | 8KK         | 8C9              | 8K9     | 8AM | 8KM     | 8KW         | 8U5              | 8K5     |     |  |
|   |             |                | Red                | 8BA              | 84A           | 8LA | 8LJ         | 8DC              | 8LC     | 8BD | 8LD     | 8LV         | 8V7              | 8L7     |     |  |
|   |             |                | Yellow             | 8BB              | 84B           | 8LB | 8LK         | 8D9              | 8L9     | 8BM | 8LM     | 8LW         | 8V5              | 8L5     |     |  |
|   |             | Tall           | 2                  | Red              | 8CA           | 86A | 8MA         | 8ML              | 8EC     | 88C | 8CD     | 8MD         | 8MV              | 877     | 867 |  |
|   |             |                |                    | Yellow           | 8CB           | 86B | 8MB         | 8MK              | 8E9     | 889 | 8CM     | 8MM         | 8MW              | 875     | 865 |  |
|   |             |                |                    | Red              | —             | —   | 8SA         | 8SJ              | 8MC     | —   | 8HD     | 8SD         | 8SV              | 8M7     | —   |  |
|   |             |                | 3                  | Yellow           | —             | —   | 8SB         | 8SK              | 8M9     | —   | 8HM     | 8SM         | 8SW              | 8M5     | —   |  |
|   |             |                |                    | Red              | 8DP           | 88P | 8NP         | 8NT              | 8BC     | 8JC | 8DR     | 8NR         | —                | —       | —   |  |
|   |             |                |                    | Yellow           | 8DQ           | 88Q | 8NQ         | 8NS              | 8B9     | 8J9 | 8DY     | 8NY         | —                | —       | —   |  |
|   | Grp IV SPDT | Short          | 1                  | Red              | 8DA           | 88A | 8NA         | 8NJ              | 8FC     | 8NC | 8DD     | 8ND         | 8NV              | 8W7     | 8D7 |  |
|   |             |                |                    | Yellow           | 8DB           | 88B | 8NB         | 8NK              | 8F9     | 8N9 | 8DM     | 8NM         | 8NW              | 8W5     | 8D5 |  |
|   |             |                |                    | Red              | 8EA           | 81A | 8OA         | 8OJ              | 8GC     | 8PC | 8ED     | 8OD         | 8OV              | 8Y7     | 8O7 |  |
|   |             | Tall           | 2                  | Yellow           | 8EB           | 81B | 8OB         | 8OK              | 8G9     | 8P9 | 8EM     | 8OM         | 8OW              | 8Y5     | 8O5 |  |
|   |             |                |                    | Red              | —             | —   | 8TA         | 8TJ              | 8ZC     | —   | 8JD     | 8TD         | 8TV              | 8Z7     | —   |  |
|   |             |                |                    | Yellow           | —             | —   | 8TB         | 8TK              | 8Z9     | —   | 8JM     | 8TM         | 8TW              | 8Z5     | —   |  |
|   | Grp IV DPDT | Short          | 1                  | Red              | 9AP           | 92P | 9KP         | 9KT              | 9AC     | 9HC | 9AR     | 9KR         | —                | —       | —   |  |
|   |             |                |                    | Yellow           | 9AQ           | 92Q | 9KQ         | 9KS              | 9A9     | 9H9 | 9AY     | 9KY         | —                | —       | —   |  |
|   |             |                |                    | Red              | 9AA           | 92A | 9KA         | 9KJ              | 9CC     | 9KC | 9AD     | 9KD         | 9KV              | 9U7     | 9K7 |  |
|   |             | Tall           | 2                  | Yellow           | 9AB           | 92B | 9KB         | 9KK              | 9C9     | 9K9 | 9AM     | 9KM         | 9KW              | 9U5     | 9K5 |  |
|   |             |                |                    | Red              | 9BA           | 94A | 9LA         | 9LJ              | 9DC     | 9LC | 9BD     | 9LD         | 9LV              | 9V7     | 9L7 |  |
|   |             |                |                    | Yellow           | 9BB           | 94B | 9LB         | 9LK              | 9D9     | 9L9 | 9BM     | 9LM         | 9LW              | 9V5     | 9L5 |  |
| Grp IV SPDT   | Short       | 1              | Red                | 9CA              | 96A           | 9MA | 9KJ         | 9EC              | 98C     | 9CD | 9MD     | 9MV         | 977              | 967     |     |  |
|   |             |                | Yellow             | 9CB              | 96B           | 9MB | 9MK         | 9E9              | 989     | 9CM | 9MM     | 9MW         | 975              | 965     |     |  |
|   |             |                | Red                | 9FA              | 93A           | 9SA | 9SJ         | 9MC              | 9YC     | 9HD | 9SD     | 9SV         | 9M7              | 9N7     |     |  |
|   | Tall        | 2              | Yellow             | 9FB              | 93B           | 9SB | 9SK         | 9M9              | 9Y9     | 9HM | 9SM     | 9SW         | 9M5              | 9N5     |     |  |
|   |             |                | Red                | 9DP              | 98P           | 9NP | 9NT         | 9BC              | 9JC     | 9DR | 9NR     | —           | —                | —       |     |  |
|   |             |                | Yellow             | 9DQ              | 98Q           | 9NQ | 9NS         | 9B9              | 9J9     | 9DY | 9NY     | —           | —                | —       |     |  |
| Grp IV DPDT   | Short       | 1              | Red                | 9DA              | 98A           | 9NA | 9NJ         | 9FC              | 9NC     | 9DD | 9ND     | 9NV         | 9W7              | 9D7     |     |  |
|   |             |                | Yellow             | 9DB              | 98B           | 9NB | 9NK         | 9F9              | 9N9     | 9DM | 9NM     | 9NW         | 9W5              | 9D5     |     |  |
|   |             |                | Red                | 9EA              | 91A           | 9OA | 9OJ         | 9GC              | 9PC     | 9ED | 9OD     | 9OV         | 9Y7              | 9O7     |     |  |
|   | Tall        | 2              | Yellow             | 9EB              | 91B           | 9OB | 9OK         | 9G9              | 9P9     | 9EM | 9OM     | 9OW         | 9Y5              | 9O5     |     |  |
|   |             |                | Red                | 9GA              | 97A           | 9TA | 9TJ         | 9ZC              | 9SC     | 9JD | 9TD     | 9TV         | 9Z7              | 9P7     |     |  |
|   |             |                | Yellow             | 9GB              | 97B           | 9TB | 9TK         | 9Z9              | 9S9     | 9JM | 9TM     | 9TW         | 9Z5              | 9P5     |     |  |
| Series 'F' High Temperature Hermetically Sealed Snap Switch | SPDT        | Short          | 1                  | Red              | FAP           | F2P | FKP         | FKT              | FAC     | FHC | FAR     | FKR         | —                | —       | —   |  |
|   |             |                |                    | Yellow           | FAQ           | F2Q | FKQ         | FKS              | FA9     | FH9 | FAY     | FKY         | —                | —       | —   |  |
|   |             |                |                    | Red              | FAA           | FCA | FKA         | FKJ              | FCC     | FKC | FAD     | FKD         | FKV              | FU7     | FK7 |  |
|   |             | Tall           | 2                  | Yellow           | FAB           | FCB | FKB         | FKK              | FC9     | FK9 | FAM     | FKM         | FKW              | FU5     | FK5 |  |
|   |             |                |                    | Red              | FBA           | FFA | FLA         | FLJ              | FDC     | FLC | FBD     | FLD         | FLV              | FV7     | FL7 |  |
|   |             |                |                    | Yellow           | FBB           | FFB | FLB         | FLK              | FD9     | FL9 | FBM     | FLM         | FLW              | FV5     | FL5 |  |
|   | Grp IV SPDT | Short          | 1                  | Red              | FDP           | F8P | FNP         | FNT              | FBC     | FJC | FDR     | FNR         | —                | —       | —   |  |
|   |             |                |                    | Yellow           | FDQ           | F8Q | FNQ         | FNS              | FB9     | FJ9 | FDY     | FNY         | —                | —       | —   |  |
|   |             |                |                    | Red              | FDA           | FGA | FNA         | FNJ              | FFC     | FNC | FDD     | FND         | FNV              | FW7     | FD7 |  |
|   |             | Tall           | 2                  | Yellow           | FDB           | FGB | FNB         | FNK              | FF9     | FN9 | FDM     | FNM         | FNW              | FW5     | FD5 |  |
|   |             |                |                    | Red              | FEA           | FHA | FOA         | FOJ              | FGC     | FPC | FED     | FOD         | FOV              | FY7     | FO7 |  |
|   |             |                |                    | Yellow           | FEB           | FHB | FOB         | FOK              | FG9     | FP9 | FEM     | FOM         | FOW              | FY5     | FO5 |  |
| Grp IV DPDT   | Short       | 1              | Yellow             | R1Q              | R2Q           | RKQ | RKS         | RA9              | RH9     | R1Y | RKY     | —           | —                | —       |     |  |
|   |             |                | Yellow             | R1B              | R2B           | RKB | RKK         | RC9              | RK9     | R1M | RKM     | RKW         | RU5              | RK5     |     |  |
|   |             |                | Yellow             | R3B              | R4B           | RLB | RLK         | RD9              | RL9     | R3M | RLM     | RLW         | RV5              | RL5     |     |  |
|   | Tall        | 1              | Yellow             | R5B              | R6B           | RYB | RYK         | RW9              | RY9     | R5M | RWM     | RWW         | RW5              | RY5     |     |  |
|   |             |                | Yellow             | RDQ              | R8Q           | RNQ | RNS         | RB9              | RJ9     | RDY | RNY     | —           | —                | —       |     |  |
|   |             |                | Yellow             | RDB              | RGB           | RNB | RNK         | RF9              | RN9     | RDM | RNM     | RNW         | RF5              | RN5     |     |  |
| Grp IV DPDT   | Tall        | 2              | Yellow             | REB              | RHB           | ROB | ROK         | RG9              | RP9     | REM | ROM     | ROW         | RG5              | RO5     |     |  |
|   |             |                | Yellow             | RFB              | RJB           | RSB | RSK         | RM9              | RS9     | RJM | RSM     | RSW         | RM5              | RS5     |     |  |

\* Shaded codes for reference only. Not valid for sale.

### **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 Magnetrol's 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.



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