# MINIATURE POSITIVE ACTION SWITCHES

## Series—8866, 8867, 8868, 8869 MIL-S-8834 Miniature Positive Action Switches Printed Circuit Terminals



### FEATURES

- Sealed bushing
- Dry circuit (logic level loads) to power switching levels
- Two bushing and toggle lever sizes
- 1 and 2 pole circuitry
- Non-teasible mechanism for all but center "ON" circuits
- Wiping action contacts
- Positive make and break action
- Small and large size bushings and acutators
- Printed circuit board termination
- Two types of printed circuit board terminals
  - straight
  - formed

### SPECIFICATIONS

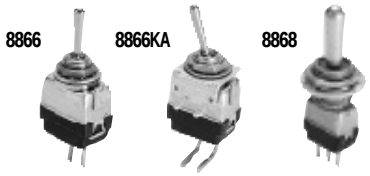
- Bushing seal or bonded seal per MIL-S-8834
- MS approved and QPL'd to MIL-S-8834
- Temperature range: -67°F to +160°F (-55°C to +71°C)
- Life: 20,000 operations at rated load 40,000 operations mechanical life
- "O" ring panel seal on 1/4"-40 type bushing size

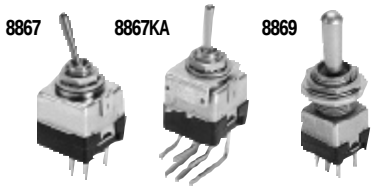
### CURRENT RATINGS

| No. of Poles | Catalog Number | Type of Operation | 28 and 50VDC (Amperes per pole) | | | | 115VAC 60Hz and 400Hz (Amperes per pole) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Resistive Load | | Inductive Load | | Resistive Load | | Inductive Load | |
| | | | 28VDC | 50VDC | 28VDC | 50VDC | 60Hz | 400Hz | 60Hz | 400Hz |
| 1 | 8866 and 8868 | Maintained and Momentary | 5 | 1 | 1 | – | 2 | 3 | 1 | 2 |
| 2 | 8867 and 8869 | Maintained and Momentary | 5 | 1 | 1 | – | 2 | 3 | 1 | 2 |

Minimum Rating: 25 μA at 5 millivolts or less.

### SELECTION TABLE




CIRCUIT WITH LEVER IN...

| Up Position | Center Position | Down Position (Keyway) | Small Lever with Straight Mount PC Terminals | | Small Lever with Formed Mount PC Terminals | | Large Lever with Straight Mount PC Terminals | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | MS Part Number | Catalog ② Number | MS Part Number | Catalog ② Number | MS Part Number | Catalog ② Number | MS Part ③ Number | Catalog ② Number |
| **ONE POLE** | | | | | | | | | | **BONDED SEAL** |
| ON | OFF | ON | MS21354-211 | 8866K61 | MS21433-211 | 8866KA61 | MS21356-211 | 8868K61 | Feature Not Available In Single Pole Switches | |
| ON | NONE | OFF | -221 | K67 | -221 | KA67 | -221 | K67 | | |
| ON | NONE | ON | -231 | K64 | -231 | KA64 | -231 | K64 | | |
| ON | OFF | NONE | -241 | K65 | -241 | KA65 | -241 | K65 | | |
| ✱ ON | OFF | ON✱ | MS21354-271 | 8866K62 | MS21433-271 | 8866KA62 | MS21356-271 | 8868K62 | | |
| NONE | OFF | ON✱ | -281 | K66 | -281 | KA66 | -281 | K66 | | |
| ON | OFF | ON✱ | -311 | K63 | -311 | KA63 | -311 | K63 | | |
| NONE | ON | ON✱ | -321 | K68① | -321 | KA68① | -321 | K68① | | |
| **TWO POLE** | | | | | | | | | | **BONDED SEAL** |
| ON | OFF | ON | MS21355-211 | 8867K61 | MS21434-211 | 8867KA61 | MS21357-211 | 8869K61 | MS21357-711 | 8869K61X |
| ON | NONE | OFF | -221 | K67 | -221 | KA67 | -221 | K67 | -721 | K67X |
| ON | NONE | ON | -231 | K64 | -231 | KA64 | -231 | K64 | -731 | K64X |
| ON | OFF | NONE | -241 | K65 | -241 | KA65 | -241 | K65 | -741 | K65X |
| ✱ ON | OFF | ON✱ | MS21355-271 | 8867K62 | MS21434-271 | 8867KA62 | MS21357-271 | 8869K62 | MS21357-771 | 8869K62X |
| NONE | OFF | ON✱ | -281 | K66 | -281 | KA66 | -281 | K66 | -781 | K66X |
| ON | OFF | ON✱ | -311 | K63 | -311 | KA63 | -311 | K63 | -811 | K63X |
| NONE | ON | ON✱ | MS21355-321 | 8867K68① | MS21434-321 | 8867KA68① | MS21357-321 | 8869K68① | MS21357-821 | 8869K68X① |
| ON | ON | ON | -331 | K69① | -331 | KA69① | -331 | K69① | -831 | K69X① |
| ON | ON | ON✱ | -351 | K610① | -351 | KA610① | -351 | K610① | -851 | K610X① |
| ✱ ON | ON | ON✱ | -341 | K611① | -341 | KA611① | -341 | K611① | -841 | K611X① |

✱ Momentary contact.

See page 77 for special circuit diagrams.

① Dielectric per MIL-S-8834 except limited to 1250 volts. Delayed action of the switch toggle lever may cause circuit to close or open before snap action mechanism trips.

② Caution should be exercised during soldering and flux removal. See page 62 for details.

③ Furnished with Bonded Seal Feature. (Meets 15' head of water sealing level.)

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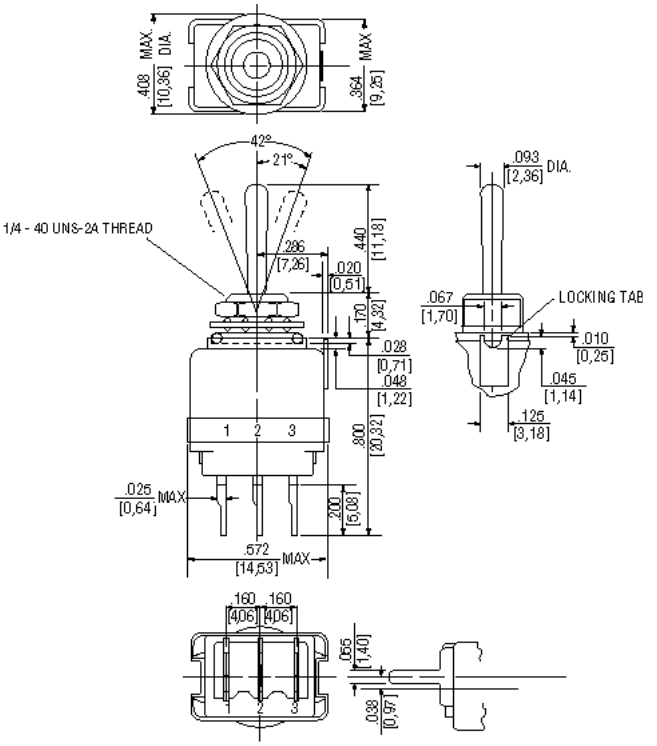
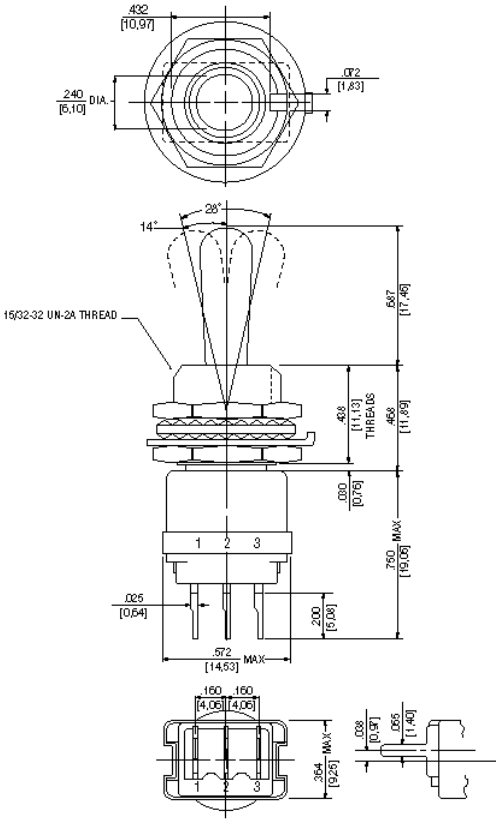
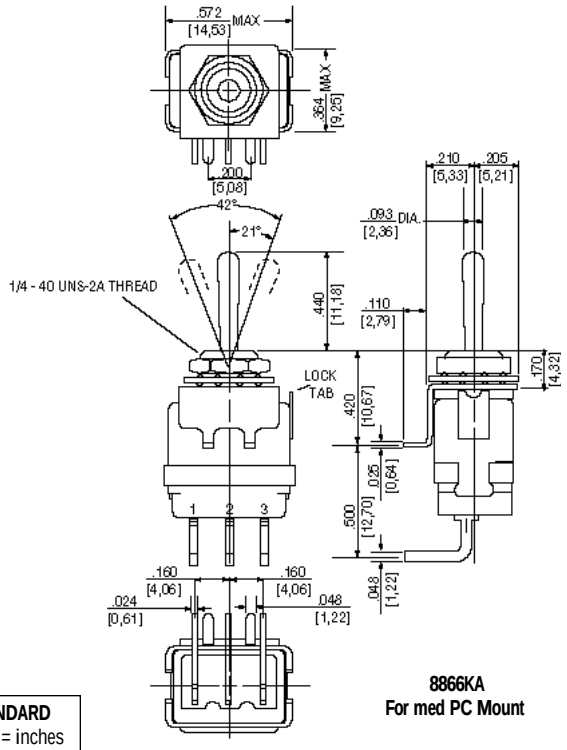
## MOUNTING DIMENSIONS—ONE POLE



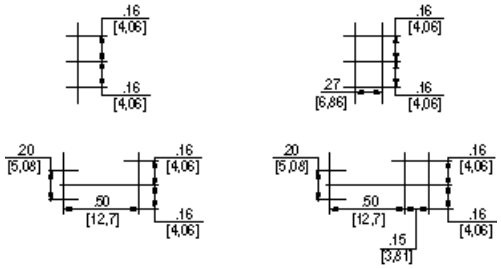

**8866**
**Straight PC Mount**




**8868**
**Straight PC Mount**




**8866KA**
**For med PC Mount**




**Terminal Identification**

**STANDARD**
0.00 = inches
[0,0] = mm

**Mounting dimensions for reference only.**

**Non-functional terminals not supplied.**

# MINIATURE POSITIVE ACTION SWITCHES

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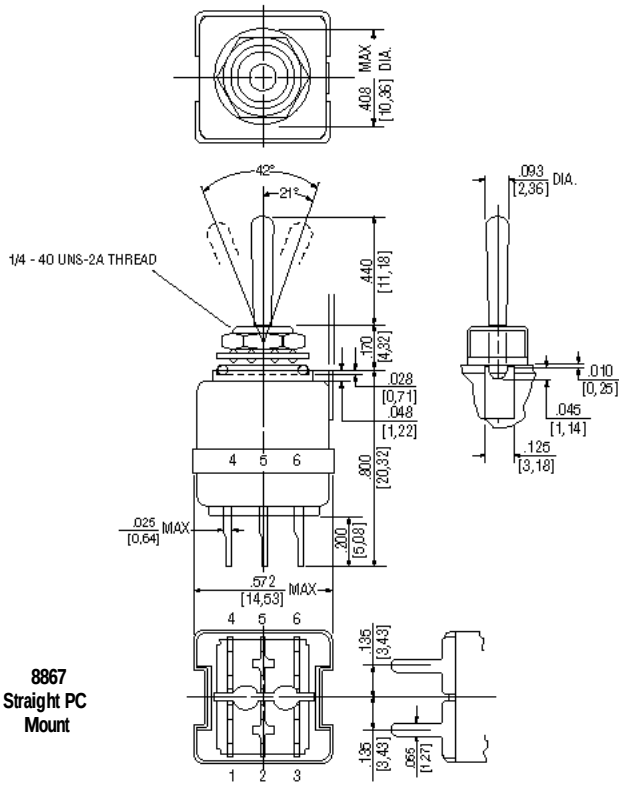
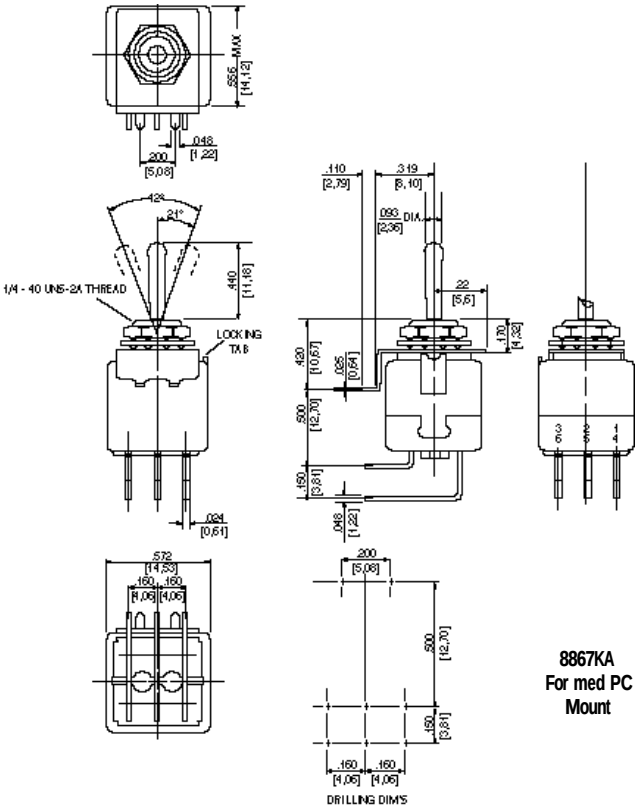
MIL-S-8834 Miniature Positive Action Switches
Printed Circuit Terminals



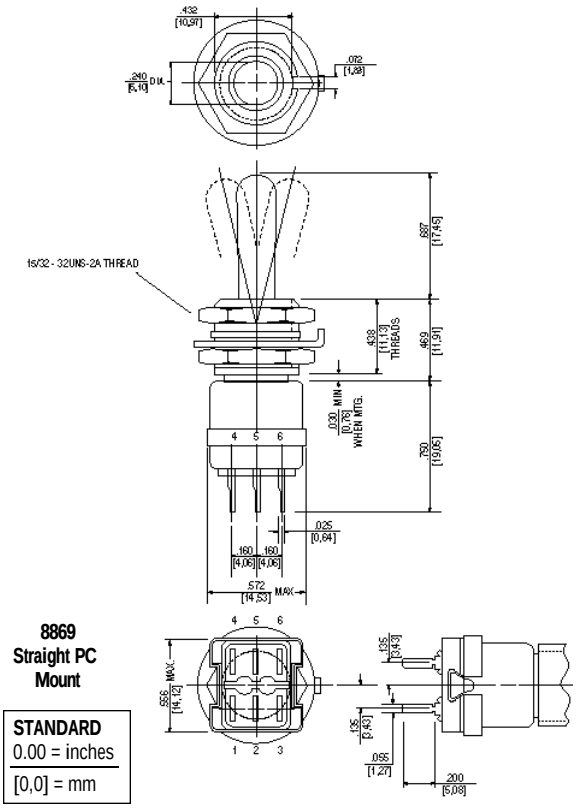
## MOUNTING DIMENSIONS—TWO POLE



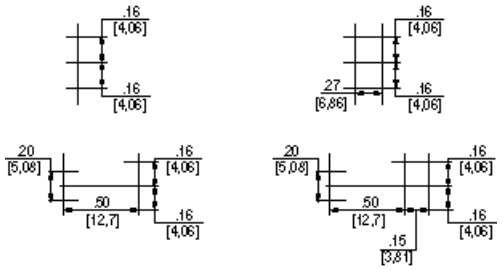

**8867**
**Straight PC Mount**




**8867KA**
**For med PC Mount**




**8869**
**Straight PC Mount**




**STANDARD**
0.00 = inches
[0,0] = mm

**Terminal Identification**

**Mounting dimensions for reference only.**

**Non-functional terminals not supplied.**

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### CAUTION AND RECOMMENDATION FOR CLEANING AND SOLDERING

Contamination of the contacts of miniature switches is the most common cause of problems in low energy circuits, resulting in the inability of current to flow through the increased resistance of the switch contacts. As most contamination occurs during the installation and cleaning of the switch, proper care when installing the switch can reduce problems in this area. The following procedures should be followed to reduce the possibility of switch contact conamination.

**Hand Solder**

1. Use rosin core solder .030" – .040" diameter.
2. A small soldering iron in the 30 to 40 watt range should be used.
3. The solder joint should not be overheated.
4. Do not position switch with terminations straight up.
5. No clean up should be necessary. However if used, do not allow solvents to enter non-sealed areas of switches.

**Wave Solder – Miniature Switches**

Do not immerse or spray with solvents to remove flux except for switches designed for this type of cleaning.

The use of wave solder oil is not advised.

### OPTIONS/ACCESSORIES

- Special mounting hardware
- Special marking
- Mounting hardware furnished assembled
- Panel seal, Part Number 32-341 (15/32" - 32 bushing only)
- Special circuits
- Special bushing and lever plating
- Mounting adapter nut
- Custom wire harnesses
- EMI/RFI capability on two pole (15/32" - 32 bushing only)
- Gold plated contacts

### PANEL CUTOUT DIMENSIONS