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Sensing and Control  
**Interactive  
Catalog...**

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### Sensing and Control

Honeywell Inc.

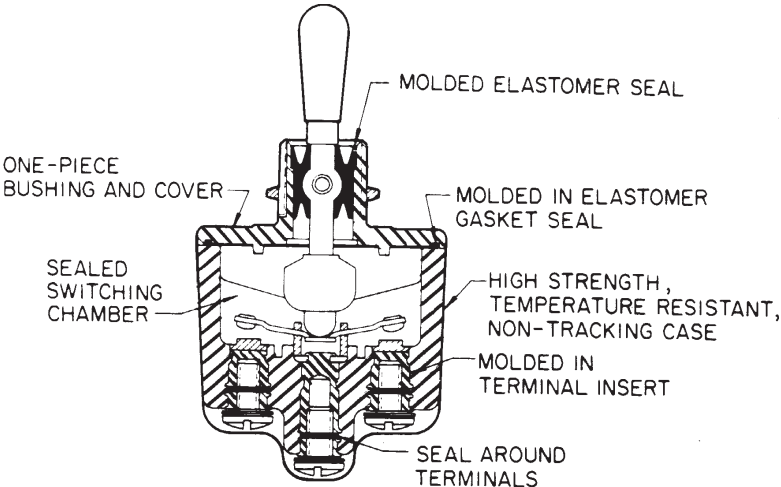
11 West Spring Street

Freeport, IL 61032

[www.honeywell.com/sensing](http://www.honeywell.com/sensing)

Manual Switches  
Toggle Switches

TL Series



ELECTRICAL RATINGS  
(In amperes)

| Elec. Rating Code | 28 VDC |      |      | 115 VDC | 250 VDC | 115 VAC<br>60 & 400 Hz |      |      | 230 VAC |
|-------------------|--------|------|------|---------|---------|------------------------|------|------|---------|
|                   | Ind.   | Res. | Lamp | Res.    | Res.    | Ind.                   | Res. | Lamp | Res.    |
| 1                 | 15     | 20   | 5    | 0.75    | 0.5     | 10                     | 15   | 3    | 6       |
| 2                 | 10     | 15   | 4    | 0.75    | 0.5     | 7                      | 15   | 2    | 6       |
| 3                 | 15     | 20   | 7    | 0.75    | 0.5     | 15                     | 15   | 4    | 6       |
| 4                 | 10     | 18   | 5    | 0.75    | 0.5     | 8                      | 11   | 2    | 6       |
| 5                 | 12     | 20   | 5    | 0.75    | 0.5     | 15                     | 15   | 4    | 6       |
| 6                 | 10     | 18   | 4    | 0.75    | 0.5     | 8                      | 11   | 2    | 6       |

| UL/CSA Rating Code | Electrical Rating                                                                |
|--------------------|----------------------------------------------------------------------------------|
| L192               | 10 amps-125, 250, 277 VAC; ¼ Hp-125 VAC; ½ Hp-250, 277 VAC<br>3 amps-125 VAC "L" |
| L191               | 15 amps-125, 250, 277 VAC; ½ Hp-125 VAC; 1 Hp-250, 277 VAC<br>5 amps-120 VAC "L" |

**Application Note:** Honeywell MICRO SWITCH does *not* recommend the use of silver cadmium oxide switch contacts in non-arcing loads. Non-arcing loads are generally loads less than 12 volts and/or 0.5 amp. TL switches use silver cadmium oxide contacts. For other options, contact the MICRO SWITCH Application Center at 1-800-537-6945.

FEATURES

- Qualified to MIL-S-3950
- Environment-proof sealing
- 1, 2, and 4 pole circuitry.
- Standard and pull to unlock levers.
- 2 and 3 position, maintained, and momentary toggle action.
- Temperature range: -85°F to +160°F (-65°C to +71°C).
- UL recognized, CSA certified.
- CE approved

CONSTRUCTION

TL's have high strength, temperature resistant, non-tracking case material and silver cadmium oxide contacts.

ACTUATOR OPTIONS

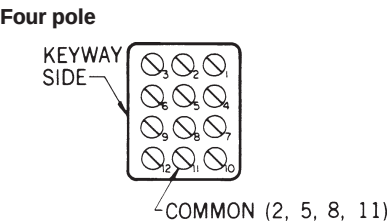
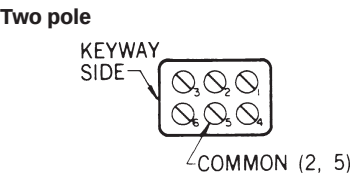
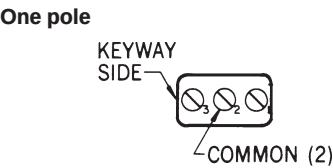
Standard toggle lever operates on a direct action spring loaded toggle mechanism to provide excellent tactile feedback in both the momentary and maintained toggle positions. The toggle lever is approximately .68 in. (16 mm) long and has a non-glare matte nickel plated finish.

Pull-to-unlock toggle levers prevent accidental toggle movement. The knobbed toggle lever must be pulled out approximately .09 in. (2,3 mm) to change positions. Thirteen different locking configurations are available. This lever style also has a non-glare matte nickel finish.

Colored tab levers (not shown) can also be furnished. They have the same appearance as the tab lever shown in the TW photo on page 119. Call the 800 number.

TERMINAL CIRCUIT IDENTIFICATION

Terminal identifications are referred to in the order guides to indicate which circuits are made in each toggle position (i.e., 1-2 refers to circuit closure through terminals 1 and 2).



TERMINALS

In addition to the screw terminal switches listed in the order guides, IWTS Integrated Wire Termination System versions (covered in MICRO SWITCH Catalog 80) and solder turret terminals are available. Contact the 800 number.

SPECIAL CIRCUITRIES

Catalog listings with -10, -50, and -70 suffix numbers shown in the order guides have special “On-On-On” circuits, as illustrated. TLs with -12 suffix are the same as -50 except the keyway position is maintained, and in the center position circuits 2-3 and 4-5 are made; -72 is the same as -50 except that the opposite keyway position is momentary, and in the center position circuits 2-3 and 4-5 are made.

-10 CIRCUITRY

| No. of Poles | Keyway Side Maint. Position | Center Maint. Position | Opposite Keyway Maint. Position |
|--------------|-----------------------------|------------------------|---------------------------------|
| 2            |                             |                        |                                 |
| 4            |                             |                        |                                 |

-50 CIRCUITRY

| No. of Poles | Keyway Side Mom. Position | Center Maint. Position | Opposite Keyway Maint. Position |
|--------------|---------------------------|------------------------|---------------------------------|
| 2            |                           |                        |                                 |
| 4            |                           |                        |                                 |

-70 CIRCUITRY

| No. of Poles | Keyway Side Mom. Position | Center Maint. Position | Opposite Keyway Mom. Position |
|--------------|---------------------------|------------------------|-------------------------------|
| 2            |                           |                        |                               |
| 4            |                           |                        |                               |

ACCESSORIES

Colored lever sleeves, decorative mounting hardware, and panel seal accessories are shown on page 135.

Toggle/Rockers

2-POSITION ORDER GUIDE

|                                                                                   | No. of Poles | Circuit(s) Made With Toggle At:                   |                                                     | Electrical Rating Code | UL/CSA Rating Code                   | Standard Toggle                                |                                                                    | Pull-to-Unlock Toggle                 |                                                                    |
|-----------------------------------------------------------------------------------|--------------|---------------------------------------------------|-----------------------------------------------------|------------------------|--------------------------------------|------------------------------------------------|--------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------|
|                                                                                   |              | Keyway Position                                   | Opposite Keyway                                     |                        |                                      | Catalog Listing                                | Military Number                                                    | Add Suffix to Standard Toggle Listing | Military Number **                                                 |
|   | 1            | OFF<br>OFF*<br>1-2*<br>1-2<br>1-2*                | 2-3<br>2-3<br>OFF<br>2-3<br>2-3                     | 1<br>2<br>2<br>1<br>2  | L191<br>L192<br>L192<br>L191<br>L192 | 1TL1-2<br>1TL1-4<br>1TL1-6<br>1TL1-3<br>1TL1-8 | MS24523-22<br>MS24523-29<br>MS24523-30<br>MS24523-23<br>MS24523-26 | D, F, G<br>F<br>F<br>D, F, G<br>F     | MS24658-22<br>MS24658-29<br>MS24658-30<br>MS24658-23<br>MS24658-26 |
|   | 2            | OFF<br>OFF*<br>1-2, 4-5*<br>1-2, 4-5<br>1-2, 4-5* | 2-3, 5-6<br>2-3, 5-6<br>OFF<br>2-3, 5-6<br>2-3, 5-6 | 3<br>4<br>4<br>3<br>4  | L191<br>L192<br>L192<br>L191<br>L192 | 2TL1-2<br>2TL1-4<br>2TL1-6<br>2TL1-3<br>2TL1-8 | MS24524-22<br>MS24524-29<br>MS24524-30<br>MS24524-23<br>MS24524-26 | D, F, G<br>F<br>F<br>D, F, G<br>F     | MS24659-22<br>MS24659-29<br>MS24659-30<br>MS24659-23<br>MS24659-26 |
|  | 4            | OFF                                               | 2-3, 5-6<br>8-9, 11-12                              | 5                      | L191                                 | 4TL1-2                                         | MS24525-22                                                         | D, F, G                               | MS24660-22                                                         |
|                                                                                   |              | OFF*                                              | 2-3, 5-6<br>8-9, 11-12                              | 6                      | L192                                 | 4TL1-4                                         | MS24525-29                                                         | F                                     | MS24660-29                                                         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*                           | OFF                                                 | 6                      | L192                                 | 4TL1-6                                         | MS24525-30                                                         | F                                     | MS24660-30                                                         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11                            | 2-3, 5-6<br>8-9, 11-12                              | 5                      | L191                                 | 4TL1-3                                         | MS24525-23                                                         | D, F, G                               | MS24660-23                                                         |
|                                                                                   |              | 1-2, 4-5*<br>7-8, 10-11                           | 2-3, 5-6<br>8-9, 11-12                              | 6                      | L192                                 | 4TL1-8                                         | MS24525-26                                                         | F                                     | MS24660-26                                                         |

\* These positions only are momentary. All others are maintained.  
\*\* Also add the appropriate suffix letter to the Military number.

PULL-TO-UNLOCK OPTION

When ordering pull-to-unlock toggle listings, add the suffix letter shown in the chart below to the standard toggle listing and the MS number. For example, to order a 1TL1-1 pull-to-unlock toggle switch with the lever locked in the center position, add the letter **E**; i.e., 1TL1-1**E**, MS-24658-21**E**.

LOCKING CONFIGURATIONS

|                                                                                                                                                               |                                                                                                                                                            |                                                                                                                                                 |                                                                                                                                                              |                                                                                                                                                      |                                                                                                                                                            |                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b><br><br>Locked In Three Positions                                   | <b>B</b><br><br>Locked In Center and Extreme Position (Keyway Side)     | <b>D</b><br><br>Locked Out Of Center Position                | <b>E</b><br><br>Locked In Center Position                                 | <b>F</b><br><br>Locked In Extreme Position (Opposite Keyway)      | <b>G</b><br><br>Locked In Extreme Position (Keyway Side)              | <b>H</b><br><br>Locked Out Of Center And Extreme Position (Keyway Side) |
| <b>J</b><br><br>Locked Out Of Center And Extreme Position (Opposite Keyway) | <b>K</b><br><br>Locked In Center And Extreme Position (Opposite Keyway) | <b>L</b><br><br>Locked Out Of Extreme Position (Keyway Side) | <b>M</b><br><br>Locked Out Of And Into Extreme Position (Opposite Keyway) | <b>N</b><br><br>Locked Out Of Extreme Position (Opposite Keyway) | <b>P</b><br><br>Locked Out Of And Into Extreme Position (Keyway Side) |                                                                                                                                                              |

3-POSITION ORDER GUIDE

|   | No. of Poles | Circuit(s) Made With Toggle At: |                        |                         | Elec. Rating Code | UL/CSA Rating Code | Standard Toggle |                    | Pull-to-Unlock Toggle                 |                    |
|-----------------------------------------------------------------------------------|--------------|---------------------------------|------------------------|-------------------------|-------------------|--------------------|-----------------|--------------------|---------------------------------------|--------------------|
|                                                                                   |              | Keyway Position                 | Center Position        | Opposite Keyway         |                   |                    | Catalog Listing | Military Number*** | Add Suffix to Standard Toggle Listing | Military Number*** |
|   | 1            | 1-2                             | OFF                    | 2-3                     | 1                 | L191               | 1TL1-1          | MS24523-21         | ALL TYPES                             | MS24658-21         |
|                                                                                   |              | 1-2*                            | OFF                    | 2-3                     | 2                 | L192               | 1TL1-5          | MS24523-31         | E, F, K, L, M, N                      | MS24658-31         |
|                                                                                   |              | 1-2*                            | OFF                    | 2-3*                    | 2                 | L192               | 1TL1-7          | MS24523-27         | E, L, N                               | MS24658-27         |
|                                                                                   |              | None**                          | OFF                    | 2-3                     | 1                 | L191               | 1TL1-21         | MS24523-24         | E, F, K, M                            | MS24658-24         |
|                                                                                   |              | None**                          | 1-2                    | 2-3                     | 1                 | L192               | 1TL1-31         | MS24523-33         | E, F, K, M                            | MS24658-33         |
|                                                                                   |              | None**                          | 1-2                    | 2-3*                    | 2                 | L192               | 1TL1-51         | MS24523-32         | E                                     | MS24658-32         |
|                                                                                   |              | 1-2*                            | OFF                    | None**                  | 2                 | L192               | 1TL1-61         | MS24523-28         | E                                     | MS24658-28         |
|   | 2            | 1-2, 4-5                        | OFF                    | 2-3, 5-6                | 3                 | L191               | 2TL1-1          | MS24524-21         | ALL TYPES                             | MS24659-21         |
|                                                                                   |              | 1-2, 4-5*                       | OFF                    | 2-3, 5-6                | 4                 | L192               | 2TL1-5          | MS24524-31         | E, F, K, L, M, N                      | MS24659-31         |
|                                                                                   |              | 1-2, 4-5*                       | OFF                    | 2-3, 5-6*               | 4                 | L192               | 2TL1-7          | MS24524-27         | E, L, N                               | MS24659-27         |
|                                                                                   |              | None**                          | OFF                    | 2-3, 5-6                | 3                 | L191               | 2TL1-21         | MS24524-24         | E, F, K, M                            | MS24659-24         |
|                                                                                   |              | None**                          | 1-2, 4-5               | 2-3, 5-6                | 3                 | L191               | 2TL1-31         | MS24524-33         | E, F, K, M                            | MS24659-33         |
|                                                                                   |              | None**                          | 1-2, 4-5               | 2-3, 5-6*               | 4                 | L192               | 2TL1-51         | MS24524-32         | E                                     | MS24659-32         |
|                                                                                   |              | 1-2, 4-5*                       | OFF                    | None**                  | 4                 | L192               | 2TL1-61         | MS24524-28         | E                                     | MS24659-28         |
|                                                                                   |              | 1-2, 4-5                        | 1-2, 5-6               | 2-3, 5-6                | 3                 | L191               | 2TL1-10         | MS27407-4          | ALL TYPES                             | MS27408-4          |
|                                                                                   |              | 1-2, 4-5*                       | 1-2, 5-6               | 2-3, 5-6                | 4                 | L192               | 2TL1-50         | MS27407-5          | E, F, K, L, M, N                      | MS27408-5          |
|                                                                                   |              | 1-2, 4-5*                       | 1-2, 5-6               | 2-3, 5-6*               | 4                 | L192               | 2TL1-70         | MS27407-6          | E, L, N                               | MS27408-6          |
|  | 4            | 1-2, 4-5<br>7-8, 10-11          | OFF                    | 2-3, 5-6<br>8-9, 11-12  | 5                 | L191               | 4TL1-1          | MS24525-21         | ALL TYPES                             | MS24660-21         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | OFF                    | 2-3, 5-6<br>8-9, 11-12  | 6                 | L192               | 4TL1-5          | MS24525-31         | E, F, K, L, M, N                      | MS24660-31         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | OFF                    | 2-3, 5-6<br>8-9, 11-12* | 6                 | L192               | 4TL1-7          | MS24525-27         | E, L, N                               | MS24660-27         |
|                                                                                   |              | None**                          | OFF                    | 2-3, 5-6<br>8-9, 11-12  | 5                 | L191               | 4TL1-21         | MS24525-24         | E, F, K, M                            | MS24660-24         |
|                                                                                   |              | None**                          | 1-2, 4-5<br>7-8, 10-11 | 2-3, 5-6<br>8-9, 11-12  | 5                 | L191               | 4TL1-31         | MS24525-33         | E, F, K, M                            | MS24660-33         |
|                                                                                   |              | None**                          | 1-2, 4-5<br>7-8, 10-11 | 2-3, 5-6<br>8-9, 11-12* | 6                 | L192               | 4TL1-51         | MS24525-32         | E                                     | MS24660-32         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | OFF                    | None**                  | 6                 | L192               | 4TL1-61         | MS24525-38         | E                                     | MS24660-28         |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11          | 2-3, 4-5               | 2-3, 5-6<br>8-9, 11-12  | 5                 | L191               | 4TL1-10         | —                  | ALL TYPES                             | —                  |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | 2-3, 4-5<br>7-8, 11-12 | 2-3, 5-6<br>8-9, 11-12  | 6                 | L192               | 4TL1-50         | MS27406-2          | E, F, K, L, M, N                      | MS27409-2          |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | 2-3, 4-5               | 2-3, 5-6<br>8-9, 11-12* | 6                 | L192               | 4TL1-70         | —                  | E, L, N                               | —                  |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11          | 2-3, 4-5<br>7-8, 11-12 | 2-3, 5-6<br>8-9, 11-12  | 5                 | L191               | 4TL1-12         | MS27406-1          | ALL TYPES                             | MS27409-1          |
|                                                                                   |              | 1-2, 4-5<br>7-8, 10-11*         | 2-3, 4-5<br>7-8, 11-12 | 2-3, 5-6<br>8-9, 11-12* | 6                 | L192               | 4TL1-72         | MS27406-3          | E, L, N                               | MS27409-3          |

\* These positions only are momentary. All others are maintained.  
\*\* Toggle lever is blocked from these positions. Toggle becomes two position, with center being one extreme position.  
\*\*\*Also add appropriate suffix letter to the Military Number.

SOLDER TURRET TERMINAL VERSION



**HOW TO ORDER**  
11TL, 12TL, and 14TL type switches with solder turret terminals are qualified to MIL-S-3950. They have the same circuitry and electrical ratings as their 1TL, 2TL, and 4TL counterparts. For example, 11TL1-2 is the same as 1TL1-2, except it has solder turret terminals instead of screw terminals. The complete MS drawing numbers are shown in data sheet 204.

| Circuitry | Type  | Std. Lever | Lever Lock |
|-----------|-------|------------|------------|
| One Pole  | 11TL  | MS27734    | MS27737    |
| Two Pole  | 612TL | MS27735    | MS27738    |
| Four Pole | 14TL  | MS27736    | MS27739    |

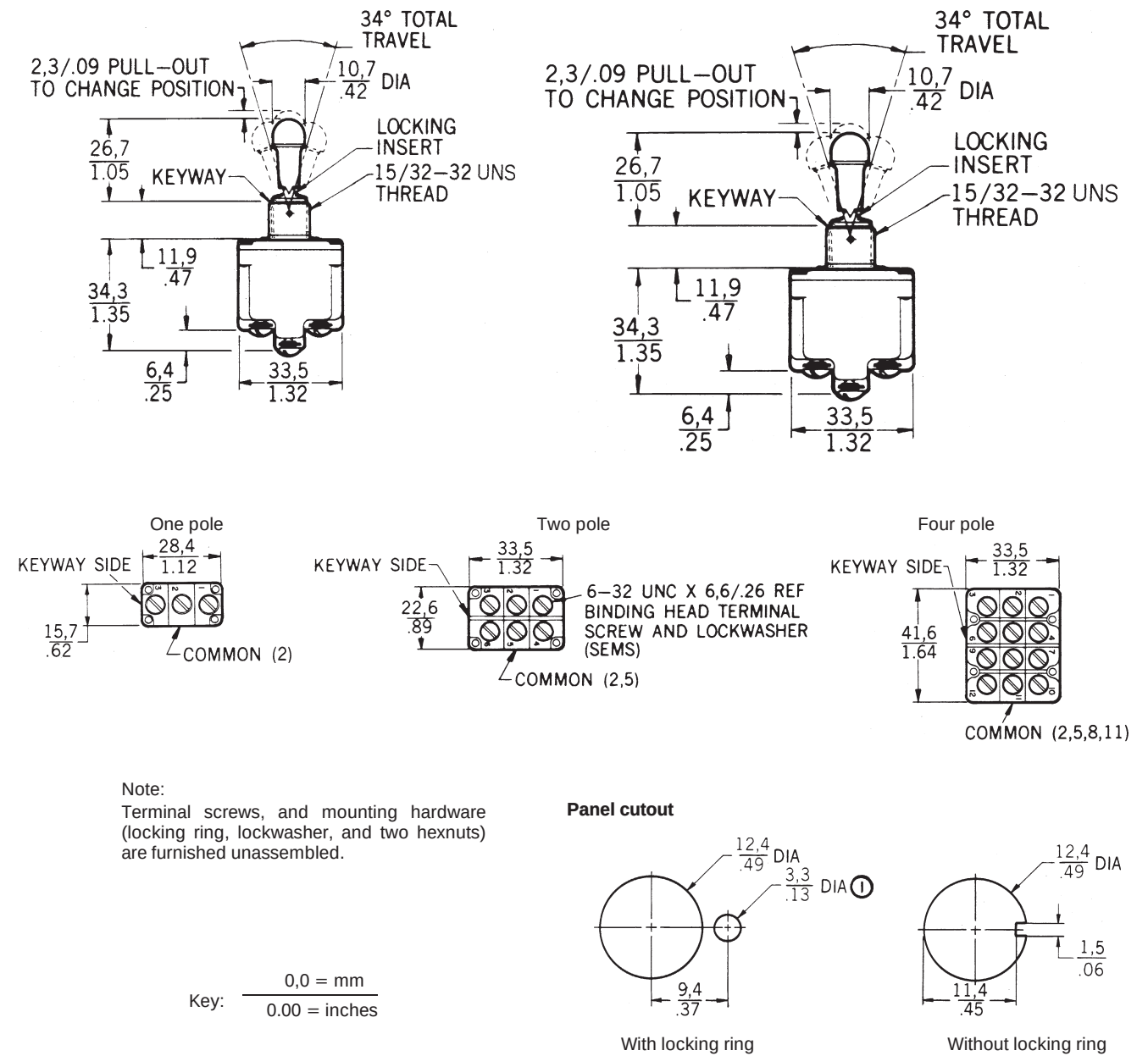
Toggle/Rockers

# Manual Switches

## Toggle Switches

TL Series

**MOUNTING DIMENSIONS** (For reference only)



Bushing mounting torque is 10-15 in./lbs.  
Terminal screw mounting torque is 5 in./lbs. max.

**Note:**  
 ① 1,4/.06 MIN DEEP TO ACCOMMODATE LOCKING RING. 15PA87 PANEL SEAL REQUIRES BLIND HOLE TO INSURE SEAL INTEGRITY