

## Pushbutton Switches, 16mm, Illuminated

### FEATURES:

Command Series Illuminated Pushbuttons are instrument-grade switches having snap-acting double break contacts, silver clad and gold plated to satisfy the requirements of logic level and power switching. **Contacts are electrically independent of one another and are isolated from the lamp circuit.** Tactile feel is excellent and maintained models have latching feature for visible indication of status. Uses T1-3/4 midget flanged base lamp, relampable from front of panel. Legends may be provided using printed transparent tape affixed to inner button. UL Recognized, File E-51302, CSA LR-20479

Note: Recommended panel thickness 4mm max.

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate over silver clad

### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
5 A @ 250 VAC or 24 VDC (Resistive)  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC  
Life Expectancy .....100,000 Operations @ rated current

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +122°F (-20°C to +50°C)  
Oiltight .....IP65, NEMA 1, 12 & 13  
Non-oiltight.....IP40

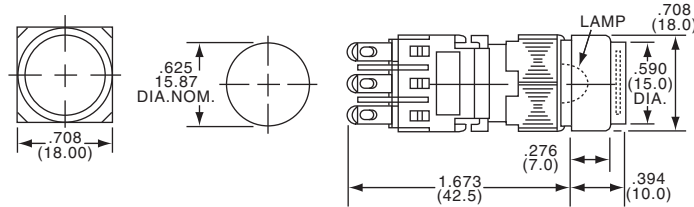
### ROUND

Lens set and lamps not supplied.



164EL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 1437569-2        | 164EL11    | 4-1437569-2      | 165EL11    | 1 N.O. & N.C. | Momentary        |
| 1437569-3        | 164EL22    | 4-1437569-3      | 165EL22    | 2 N.O. & N.C. | Momentary        |
| —                | 164EL33    | —                | 165EL33    | 3 N.O. & N.C. | Momentary        |
| 1437569-5        | 164EL511   | 4-1437569-4      | 165EL511   | 1 N.O. & N.C. | Push on/Push off |
| 1437569-6        | 164EL522   | 4-1437569-5      | 165EL522   | 2 N.O. & N.C. | Push on/Push off |
| 1437569-7        | 164EL533   | —                | 165EL533   | 3 N.O. & N.C. | Push on/Push off |

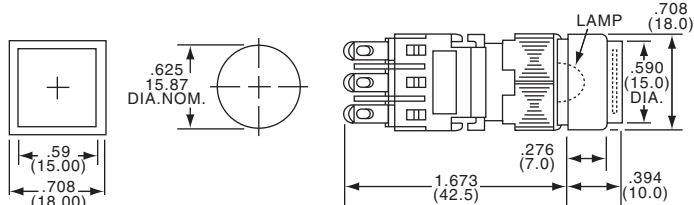
### SQUARE

Lens set and lamps not supplied.



164SL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 2-1437569-5      | 164SL11    | 4-1437569-9      | 165SL11    | 1 N.O. & N.C. | Momentary        |
| 2-1437569-6      | 164SL22    | 5-1437569-0      | 165SL22    | 2 N.O. & N.C. | Momentary        |
| 2-1437569-7      | 164SL33    | —                | 165SL33    | 3 N.O. & N.C. | Momentary        |
| 2-1437569-9      | 164SL511   | 5-1437569-1      | 165SL511   | 1 N.O. & N.C. | Push on/Push off |
| 3-1437569-0      | 164SL522   | 5-1437569-2      | 165SL522   | 2 N.O. & N.C. | Push on/Push off |
| 3-1437569-1      | 164SL533   | —                | 165SL533   | 3 N.O. & N.C. | Push on/Push off |

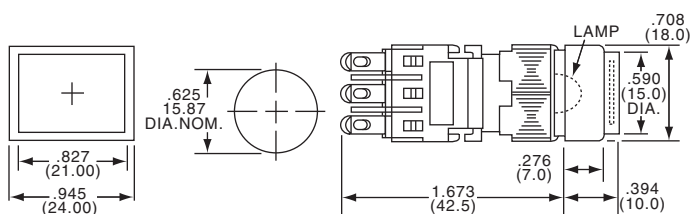
### RECTANGULAR

Lens set and lamps not supplied.



164TL11

Application Note: For lens sets, accessories and lamps, see page I18 to I20



| Non-Oiltight     |            | Oiltight         |            | Contact       | Action           |
|------------------|------------|------------------|------------|---------------|------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |               |                  |
| 3-1437569-4      | 164TL11    | 5-1437569-4      | 165TL11    | 1 N.O. & N.C. | Momentary        |
| 3-1437569-5      | 164TL22    | 5-1437569-5      | 165TL22    | 2 N.O. & N.C. | Momentary        |
| 3-1437569-6      | 164TL33    | —                | 165TL33    | 3 N.O. & N.C. | Momentary        |
| 3-1437569-8      | 164TL511   | 5-1437569-6      | 165TL511   | 1 N.O. & N.C. | Push on/Push off |
| 3-1437569-9      | 164TL522   | 5-1437569-7      | 165TL522   | 2 N.O. & N.C. | Push on/Push off |
| 4-1437569-0      | 164TL533   | 5-1437569-8      | 165TL533   | 3 N.O. & N.C. | Push on/Push off |

## Selector or Keylock Switches, 16mm

### FEATURES:

Command Series Selector & Keylock Switches are 2 & 3-position rotary types with snap-acting double break contacts. All models have 90° throw. Contacts are silver-clad and gold-plated to provide reliable operation at logic levels as well as for power switching applications. Contacts are electrically isolated from one another. Keylock types are supplied with two keys. Oiltight models meet NEMA 1, 12 & 13 requirements.

UL Recognized File E-51302

CSA LR-20479

### MATERIAL SPECIFICATIONS:

Contacts .....Gold plate over silver clad

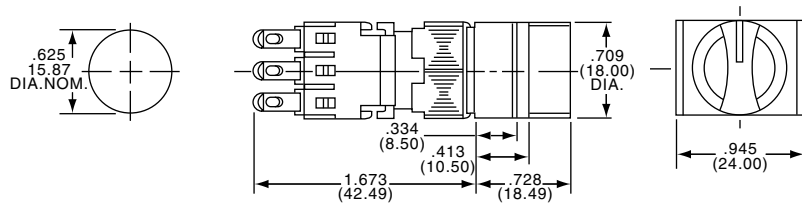
### TYPICAL PERFORMANCE CHARACTERISTICS:

Contact Rating .....0.4 VA @ 20 VDC or Peak AC  
5 A @ 250 VAC or 24 VDC (Resistive)  
Initial Contact Resistance .....20 Milliohms max.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC  
Life Expectancy .....100,000 Operations at rated current

### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +158°F (-20°C to +70°C)

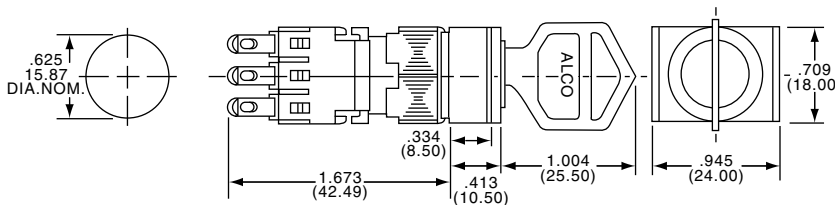
### SELECTORS



164P2B11

| Non-Oiltight     |            | Oiltight         |            | Contact      | Action                       |
|------------------|------------|------------------|------------|--------------|------------------------------|
| Tyco Electronics | Alcoswitch | Tyco Electronics | Alcoswitch |              |                              |
| 2-1437569-0      | 164P2B11   | 4-1437569-8      | 165P2B11   | 1N.O. & N.C. | 2 Pos. Maintained            |
| 2-1437569-1      | 164P2B22   | —                | 165P2B22   | 2N.O. & N.C. | 2 Pos. Maintained            |
| —                | 164P2B33   | —                | 165P2B33   | 3N.O. & N.C. | 2 Pos. Maintained            |
| 1-1437569-9      | 164P0B22   | —                | —          | 2N.O. & N.C. | 2 Pos. Momentary Right       |
| —                | 164P0B33   | —                | —          | 3N.O. & N.C. | 2 Pos. Momentary Right       |
| 2-1437569-2      | 164P3B22   | —                | 165P3B22   | 2N.O. & N.C. | 3 Pos. Center Off/Maintained |
| 2-1437569-3      | 164P3B33   | —                | 165P3B33   | 3N.O. & N.C. | 3 Pos. Center Off            |

### KEYLOCKS



164J2A11

| 2 Position Keylocks |            |                  |            |              |                                | 3 Position Keylocks |            |                  |            |              |                                |
|---------------------|------------|------------------|------------|--------------|--------------------------------|---------------------|------------|------------------|------------|--------------|--------------------------------|
| Non-Oiltight        |            | Oiltight         |            | Contact      | Action                         | Non-Oiltight        |            | Oiltight         |            | Contact      | Action                         |
| Tyco Electronics    | Alcoswitch | Tyco Electronics | Alcoswitch |              |                                | Tyco Electronics    | Alcoswitch | Tyco Electronics | Alcoswitch |              |                                |
| 1-1437569-1         | 164J2A11   | 4-1437569-7      | 165J2A11   | 1N.O. & N.C. | Maintained, key pull left      | —                   | 164J3A22   | —                | 165J3A22   | 2N.O. & N.C. | Maintained, key pull left      |
| 1-1437569-2         | 164J2A22   | —                | 165J2A22   | 2N.O. & N.C. | Maintained, key pull left      | 1-1437569-5         | 164J3A33   | —                | 165J3A33   | 3N.O. & N.C. | Maintained, key pull left      |
| —                   | 164J2A33   | —                | 165J2A33   | 3N.O. & N.C. | Maintained, key pull left      | —                   | 164J3E22   | —                | 165J3E22   | 2N.O. & N.C. | Maintained, key pull center    |
| 1-1437569-3         | 164J2B11   | —                | 165J2B11   | 1N.O. & N.C. | Maintained, key pull both      | —                   | 164J3E33   | —                | 165J3E33   | 3N.O. & N.C. | Maintained, key pull center    |
| 1-1437569-4         | 164J2B22   | —                | 165J2B22   | 2N.O. & N.C. | Maintained, key pull both      | 1-1437569-6         | 164J3C22   | —                | 165J3C22   | 2N.O. & N.C. | Maintained, key pull all       |
| —                   | 164J2B33   | —                | 165J2B33   | 3N.O. & N.C. | Maintained, key pull both      | —                   | 164J3C33   | —                | 165J3C33   | 3N.O. & N.C. | Maintained, key pull all       |
| 1437569-9           | 164J0A11   | —                | —          | 1N.O. & N.C. | Momentary right, key pull left | —                   | 164J7A22   | —                | 165J7A22   | 2N.O. & N.C. | Momentary right, key pull left |
| 1-1437569-0         | 164J0A22   | —                | —          | 2N.O. & N.C. | Momentary right, key pull left | 1-1437569-8         | 164KA      | —                | —          | —            | Spare Keys                     |
| —                   | 164J0A33   | —                | —          | 3N.O. & N.C. | Momentary right, key pull left | —                   | —          | —                | —          | —            | —                              |

## Pilot Light Indicators or Lens Sets, 16mm

### FEATURES

Command Series Pilot Light Indicators match the appearance of both lighted and unlighted Command Series pushbuttons. The same lens buttons are snapped into place and legends may be easily inserted. Illumination is from T - 1 3/4 midget flange based lamps, which are installed from the front panel. Lenses and lamps are ordered separately. Oiltight models meet NEMA 1, 12 & 13 requirements. UL File No. E-51302  
CSA LR-20479

### TYPICAL PERFORMANCE CHARACTERISTICS:

LAMP DISSIPATION 1.2W MAX.  
Insulation Resistance .....100 Megohms min.  
Dielectric Strength .....1,500 VAC

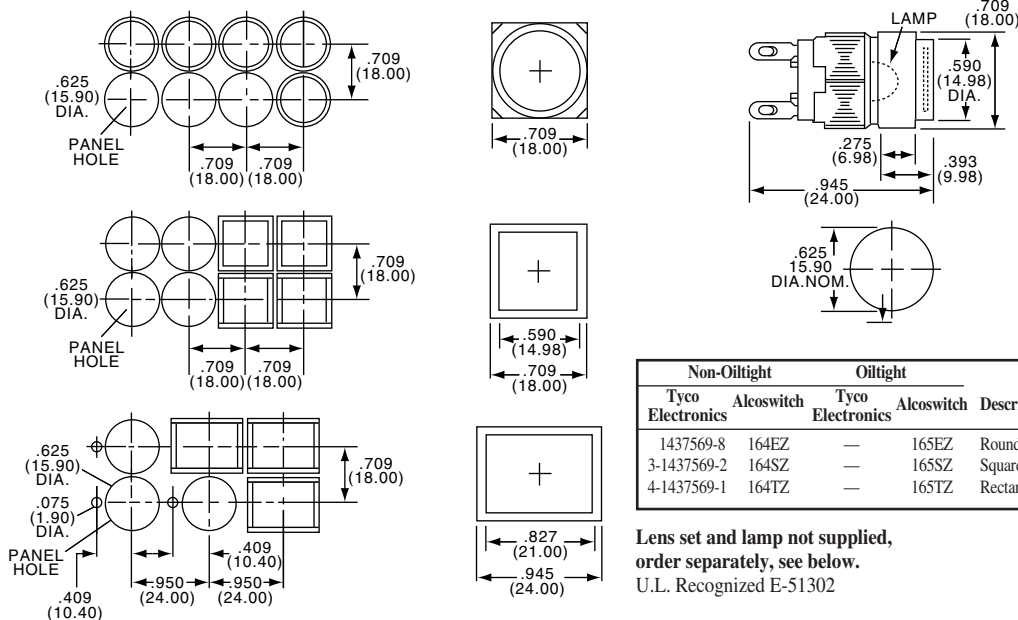
### ENVIRONMENTAL SPECIFICATIONS:

Operating Temperature.....-4°F to +122°F (-20°C to +50°C)

### PILOT LIGHT INDICATORS



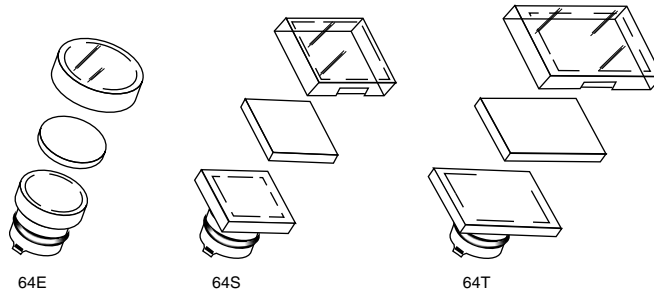
164EZ



### LENS SET



64E



| Model                                                                                                             | Description          |
|-------------------------------------------------------------------------------------------------------------------|----------------------|
| 64E(*)                                                                                                            | Round lens set       |
| 64S(*)                                                                                                            | Square lens set      |
| 64T(*)                                                                                                            | Rectangular lens set |
| All fit oiltight and non-oiltight indicators.                                                                     |                      |
| (*) Specify color by adding suffix number: (2) Red, (3) Orange, (4) Yellow, (5) Green, (6) Blue, (9) White/Clear. |                      |

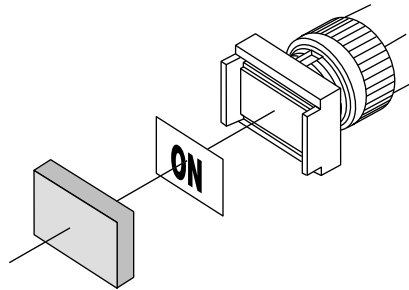
**Application Note:**  
Lens sets include, button, diffuser and cap.

## Accessories and Tools, 16mm

### FEATURES:

Standard Legends on Transparent Adhesive Tape are available for Illuminated Command Series switches and pilot lights. Legends are easily affixed to the translucent white button and are protected by the lens cap. The black lettering is back-lit by the lamp and the inscription is visible through the lens cap. This method of providing legends is also suitable in some applications using non-illuminated white (clear), yellow or orange lens caps.

Standard legends, listed below, are intended to be used with round, square or rectangular pushbuttons and pilot lights. Sold only in sheets of 10 identical legends.



| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 6-1437569-3      | 616 On     |
| 6-1437569-2      | 616 Off    |

Note: Model numbers must include complete legend nomenclature.

### LEGEND MODEL NUMBERS



Legend (film)

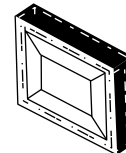
### Accessories

#### MOUNTING WRENCH

Sturdy tubular brass wrench fits mounting nuts on all Command Series switches.



| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 6-1437569-0      | 601-AG     |



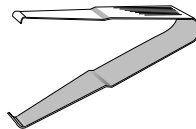
#### SPLASH PROOF SEAL

Flexible clear seal fits all rectangular pushbuttons and pilot lights.

| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 9-1437569-2      | 668        |

#### LENS REMOVER

Dual purpose metal tool facilitates removal of lenses, buttons.

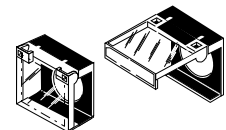


| Tyco Electronics | Alcoswitch |
|------------------|------------|
| 6-1437569-9      | 618-AG     |

#### FLIP COVER SWITCH GUARD

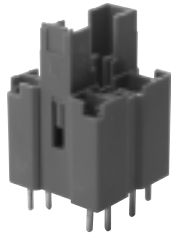
669 used with rectangular series pushbutton switches.  
671 used with square and round series pushbutton switches.

| Tyco Electronics | Alcoswitch              |
|------------------|-------------------------|
| 9-1437569-4      | 669 Rectangular         |
| 9-1437569-3      | 671-AG Square and Round |

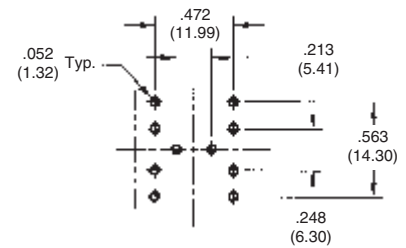
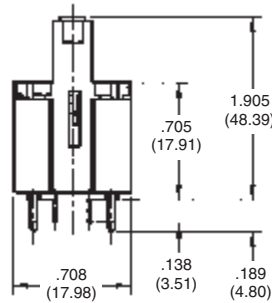


## Socket for 16mm Command Series Switches

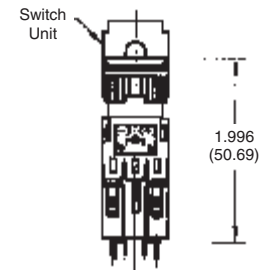
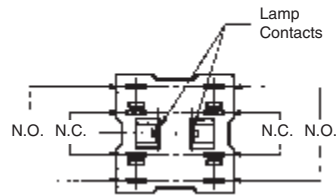
697-PL



9-1437569-5



**Recommended PCB Footprint**



## T1 3/4 Series Midget Incandescent Lamps

Average Life ratings indicate the lamp life obtained in controlled laboratory conditions while operating lamps at the design voltage (AC) (DC will shorten life by 50%). The life of a subminiature lamp is inversely proportional to the 12th power of the applied voltage.

ALCOSWITCH subminiature lamps are a "T" class, meaning that the envelopes are made of glass tubing, the "T" number indicating the diameter of the tubing in eighths of an inch.

| Tyco Electronics | Alcoswitch | Rated Volts | Design Amps | Rated MSCP | Average Rated Hours |
|------------------|------------|-------------|-------------|------------|---------------------|
| 9-1437620-6      | 7333       | 5.0         | .060        | .05        | 40,000              |
| 1-1437620-8      | 815-AG     | —           | .115        | .147       | 40,000              |
| 1437620-7        | 381-AG     | 6.3         | .20         | .40        | 50,000              |
| 1437620-8        | 382-AG     | 14.0        | .08         | .30        | 50,000              |
| 1437620-9        | 385        | 28.0        | .04         | .20        | 50,000              |
| 1-1437620-1      | 387        | 28.0        | .04         | .30        | 25,000              |
| 1437620-5        | 327-AG     | 28.0        | .04         | .34        | 7,000               |

**FLANGE BASE- T1 3/4**

