

# 6.1

## Pushbuttons

AC Rated

### Non-Illuminated

#### Medium-Duty, Momentary Contact

##### One-Hole

##### One-Hole Mounted



| Rating                                                                                                            | Poles and Throw | Contacts | Circuit Number <sup>①</sup> | Button Construction | Color | Button Extension Dimensions "B" in Inches (mm) | Typical Max. Operating Force | Mounting or Bushing Length Dimensions "A" in Inches (mm) | Catalog Number                 |
|-------------------------------------------------------------------------------------------------------------------|-----------------|----------|-----------------------------|---------------------|-------|------------------------------------------------|------------------------------|----------------------------------------------------------|--------------------------------|
| <b>Screw Terminals</b>                                                                                            |                 |          |                             |                     |       |                                                |                              |                                                          |                                |
| 15A, 125 Vac<br>10A, 250 Vac<br>1/3 hp, 125–250 Vac                                                               | 1PST            | NO       | A                           | Metal               | —     | 0.531 (13.49)<br>0.250 (6.35)                  | 0.9 lbs<br>0.9 lbs           | 0.687 (17.45)<br>0.343 (8.71)                            | <b>8444K3</b><br><b>8444K4</b> |
| 15A, 125 Vac, NO<br>10A, 125 Vac, NC<br>10A, 250 Vac, NO<br>5A, 250 Vac, NC<br>1/2 hp, 250 Vac<br>1/4 hp, 125 Vac | 1PDT            | NO, NC   | B                           | Metal               | —     | 0.531 (13.49)                                  | 2.0 lbs                      | 0.687 (17.45)                                            | <b>8434K2</b>                  |
|                                                                                                                   |                 |          | B                           | Bakelite            | Black | 0.531 (13.49)                                  | 2.0 lbs                      | 0.687 (17.45)                                            | <b>8435K2</b>                  |
| 15A, 125 Vac<br>10A, 250 Vac                                                                                      | 2PST            | NO       | C                           | Metal               | —     | 0.250 (6.35)                                   | —                            | 0.343 (8.71)                                             | <b>8448K2</b> <sup>②</sup>     |
| <b>Spade Terminals (0.250 in)</b>                                                                                 |                 |          |                             |                     |       |                                                |                              |                                                          |                                |
| 15A, 125 Vac<br>10A, 250 Vac<br>1/3 hp, 125–250 Vac                                                               | 1PST            | NO       | A                           | Metal               | —     | 0.531 (13.49)                                  | 0.9 lbs                      | 0.687 (17.45)                                            | <b>8444K2</b>                  |
| 15A, 125 Vac, NO<br>10A, 125 Vac, NC<br>10A, 250 Vac, NO<br>5A, 250 Vac, NC<br>1/2 hp, 250 Vac<br>1/4 hp, 125 Vac | 1PDT            | NO, NC   | B                           | Metal               | —     | 0.531 (13.49)                                  | 2.0 lbs                      | 0.687 (17.45)                                            | <b>8434K1</b>                  |
|                                                                                                                   |                 |          | B                           | Bakelite            | Black | 0.531 (13.49)                                  | 2.0 lbs                      | 0.687 (17.45)                                            | <b>8435K1</b>                  |
| 15A, 125 Vac<br>10A, 250 Vac                                                                                      | 2PST            | NO       | C                           | Metal               | —     | 0.250 (6.35)                                   | —                            | 0.343 (8.71)                                             | <b>8448K1</b> <sup>②</sup>     |

## Technical Data and Specifications

### AC Rated

| Description                   | Specification                                                                                                                                                                                                            |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ratings                       | See Product Selection tables on <b>Page V11-T6-3</b> and the table above.                                                                                                                                                |
| Contact material              |                                                                                                                                                                                                                          |
| 3–6A rated                    | Movable, silver-plated copper<br>Stationary, silver-plated copper                                                                                                                                                        |
| 10–15A rated                  | Movable, silver-plated copper with fine or coin silver contact face button<br>Stationary, copper with fine or coin silver contact face button                                                                            |
| Wire leads                    | 18 gauge, 6 in (152 mm) long, skinned 0.75 in (19 mm)<br>Lengths beyond 6 in (152 mm) are additional charge                                                                                                              |
| Mounting means—One-hole mount | Threaded bushing—0.468 in dia. 32 threads/inch (11.90 mm)<br>Keyway—0.068 W x 0.035 D in (1.73 W x 0.89 D mm); provides anti-rotation feature<br>Keyway on 7835/7836 Series is 0.080 W x 0.040 D in (2.03 W x 1.01 D mm) |
| Operating temperature range   | 0° to 150°F (–17.8° to 65.6°C)                                                                                                                                                                                           |

#### Notes

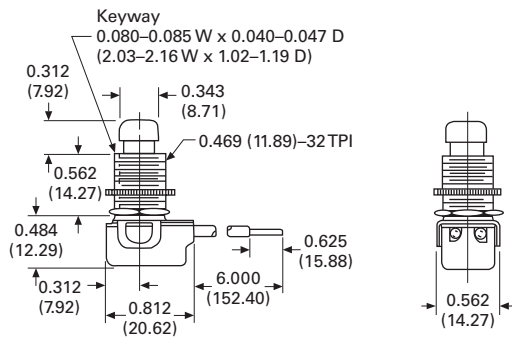
<sup>①</sup> For circuit number detail, see table on **Page V11-T6-18**.

<sup>②</sup> UL and CSA Listing not applicable.

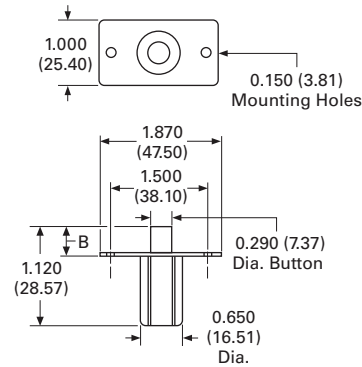
## Dimensions

Approximate Dimensions in Inches (mm)

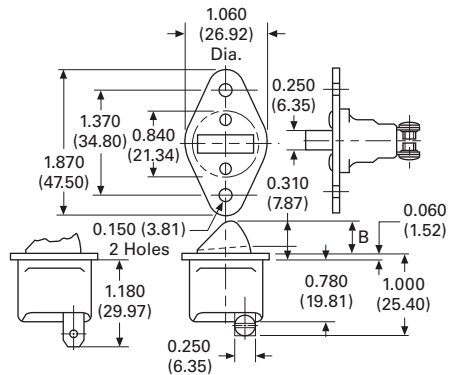
### 7835K12A



### 8410



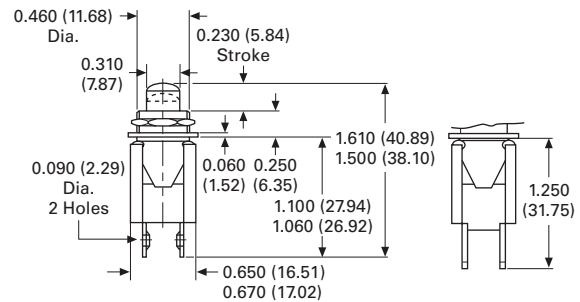
### 8406



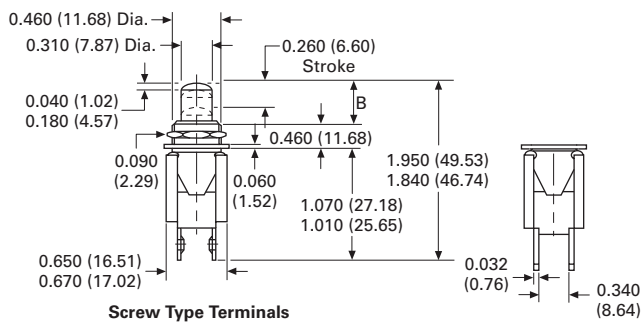
Spade Terminal

Screw Type Terminal

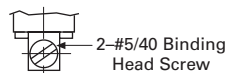
### 8411K5 and 8411K13



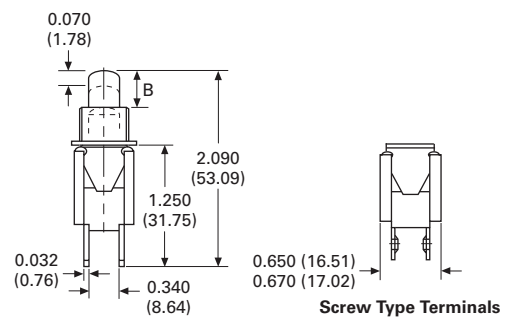
### 8411K7 and 8411K8



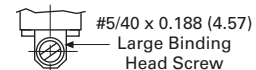
Screw Type Terminals



### 8411K11 and 8411K12



Screw Type Terminals



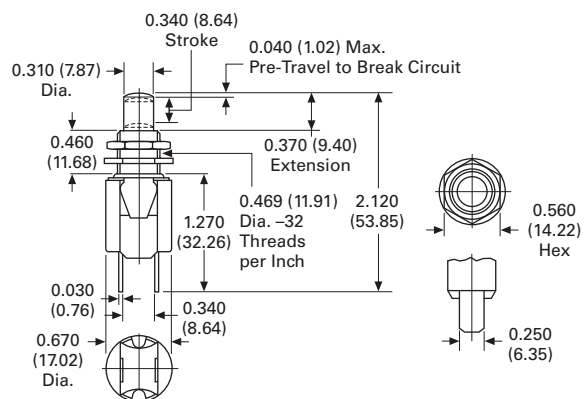
# 6.1

## Pushbuttons

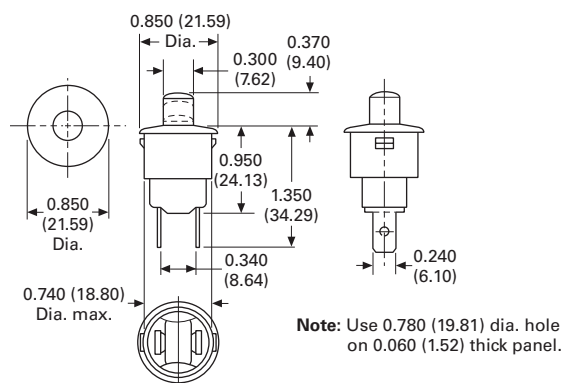
AC Rated

Approximate Dimensions in Inches (mm)

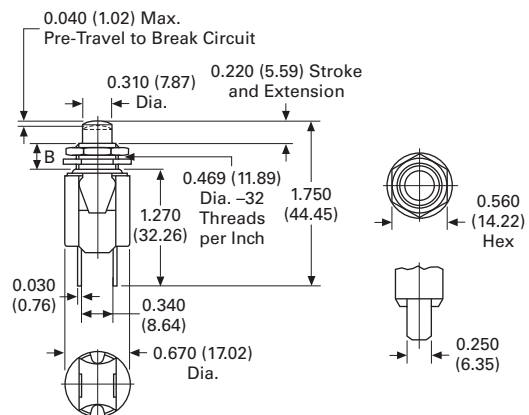
### 8411K10 and 8418K12



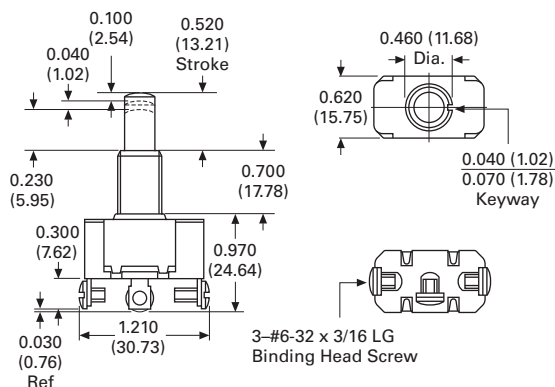
### 8423 and 8424



### 8418K1

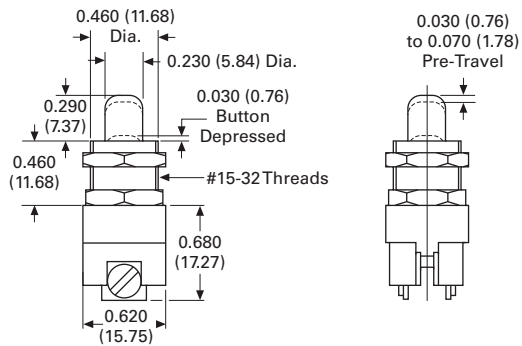


### 8434K2 and 8435K2

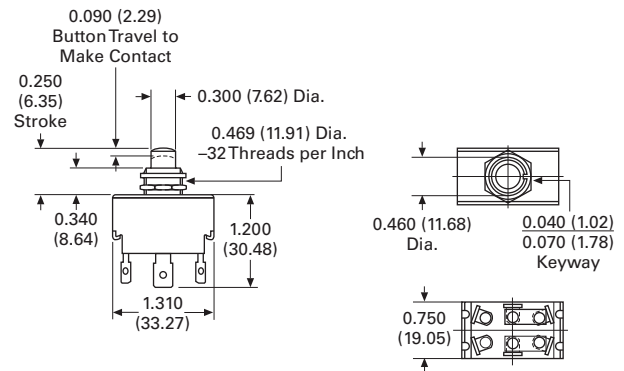


Approximate Dimensions in Inches (mm)

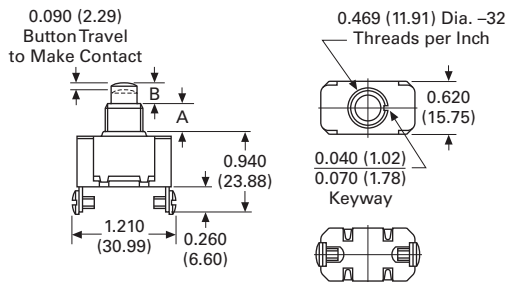
## 8440



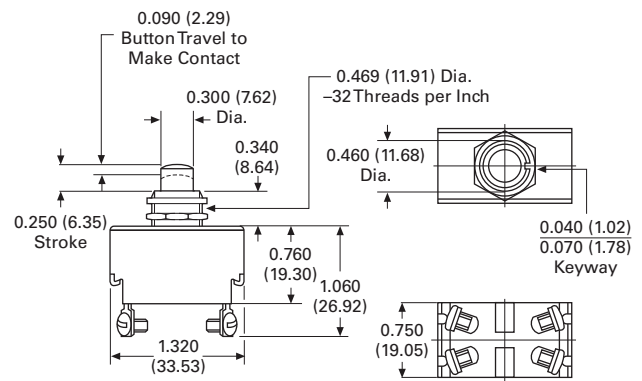
## 8448K1



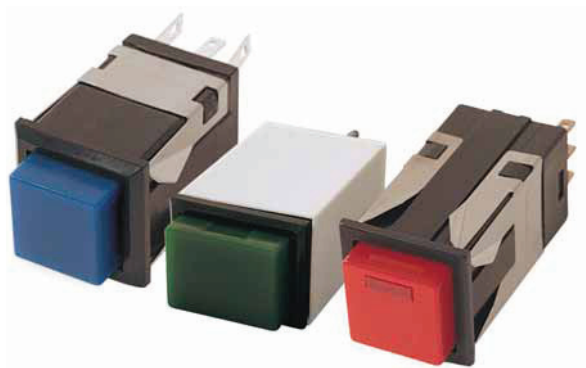
## 8442 and 8444 (Screw Terminals)



## 8448K2



## Illuminated AC/DC Rated



6

## Contents

## Description

Illuminated AC/DC Rated

| Description                       | Page      |
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| Accessories                       | V11-T6-16 |
| Technical Data and Specifications | V11-T6-17 |
| Terminal Identification           | V11-T6-18 |
| Circuit Diagrams                  | V11-T6-18 |
| Legends                           | V11-T6-18 |
| Dimensions                        | V11-T6-19 |

## Product Description

Eaton offers a wide range of pushbutton switches for standard industry applications such as appliances, electronics, medical and test instrumentation, office equipment and many other commercial applications.

A variety of options are available such as illuminated and non-illuminated versions, colored lens caps, lamp styles and mounting styles.

Each pushbutton series offers a matching indicator for a consistent look. See the Product Overview tables to quickly identify the required product. Then, refer to the Catalog Number Selection and Product Selection tables to determine the catalog number.

Standards and Certifications<sup>①</sup>

- UL Recognized
- CSA Certified
- RoHS<sup>②</sup>



## Notes

<sup>①</sup> Except where noted.

<sup>②</sup> Visit [www.eaton.com/vcbu](http://www.eaton.com/vcbu) for the most up-to-date list of verified part numbers.

## Product Selection Guide

## General Purpose Pushbuttons and Indicators—Illuminated and Non-Illuminated

| Series                                      | 206/208                                                                             | Page      | 220/221/224                                                                         | Page      | 231/234                                                                              | Page      | 580/581/586                                                                           | Page      |
|---------------------------------------------|-------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------|-----------|
| Pushbutton Selection—Switch                 |                                                                                     | V11-T6-9  |                                                                                     | V11-T6-9  |                                                                                      | V11-T6-9  |                                                                                       | V11-T6-10 |
| Pushbutton Selection—Indicator              |  | V11-T6-9  |  | V11-T6-9  |  | V11-T6-9  |  | V11-T6-10 |
| Pushbutton Cap Selection                    |                                                                                     | V11-T6-13 |                                                                                     | V11-T6-13 |                                                                                      | V11-T6-13 |                                                                                       | V11-T6-13 |
| Circuit Diagram Letter (See Page V11-T6-18) |                                                                                     | K, N      |                                                                                     | K, N      |                                                                                      | K, N      |                                                                                       | J, L, M   |
| Series                                      | 770/775                                                                             | Page      | 810/815                                                                             | Page      | 820/825                                                                              | Page      | 860/861/845                                                                           | Page      |
| Pushbutton Selection—Switch                 |                                                                                     | V11-T6-11 |                                                                                     | V11-T6-12 |                                                                                      | V11-T6-12 |                                                                                       | V11-T6-12 |
| Pushbutton Cap Selection                    |  | V11-T6-11 |  | V11-T6-12 |  | V11-T6-12 |  | V11-T6-12 |
| Pushbutton Selection—Indicator              |                                                                                     | V11-T6-13 |                                                                                     | V11-T6-13 |                                                                                      | V11-T6-13 |                                                                                       | V11-T6-13 |
| Circuit Diagram Letter (See Page V11-T6-18) |                                                                                     | Q         |                                                                                     | K, N      |                                                                                      | K, N      |                                                                                       | J, L      |



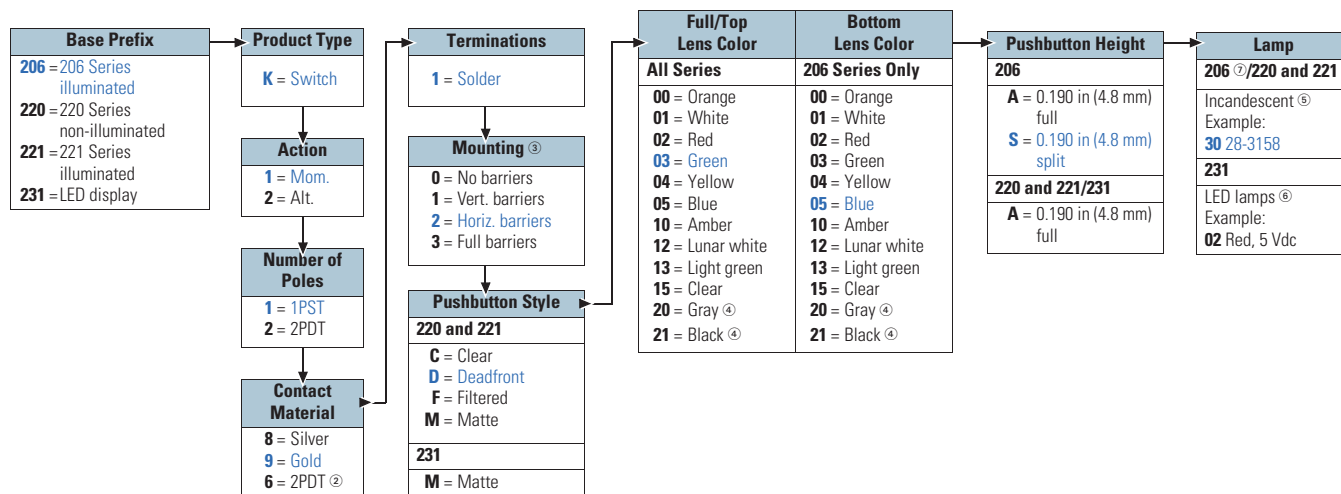
**Series 206/208, 220 and 221/224, 231/234**

## Catalog Number Selection

### How To Order—Series 206/220 ① and 221 ②/231 ①, Switch

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

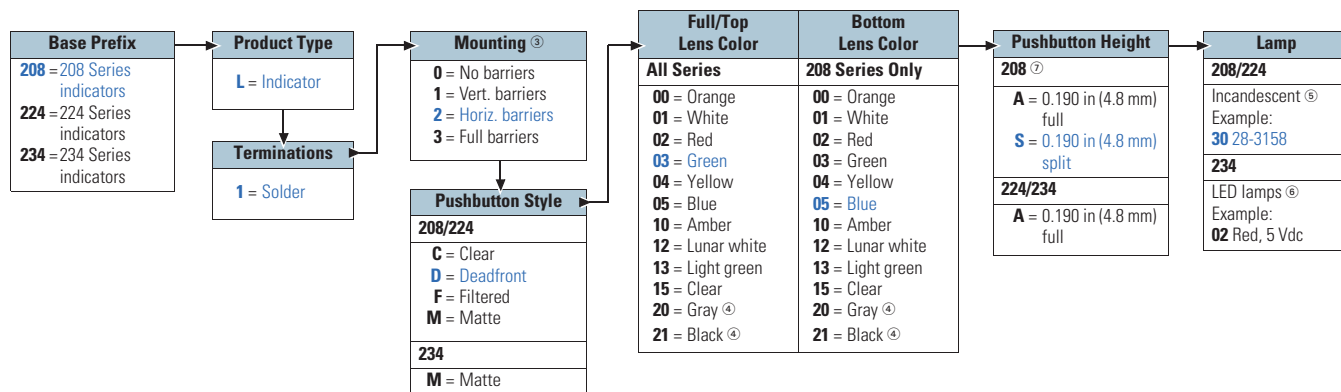
**Example:** 206 K 1 1 9 1 2 D 03 05 S 30



### How To Order—Series 208/224 ①/234 ①, Indicator

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

**Example:** 208 L 1 2 D 03 05 S 30



#### Notes

- ① Full cap style does not require a bottom lens code.
- ② Pole one is silver, pole two is gold.
- ③ Refer to **Page V11-T6-16** for barrier information.
- ④ Not available with lighted display.
- ⑤ Use two-digit item number, 30–37, from Incandescent Lamps table on **Page V11-T6-14**.
- ⑥ Use two-digit item number, 01–19, from LED Lamps table on **Page V11-T6-15**.
- ⑦ Accepts two bulbs



Series 580/581/586

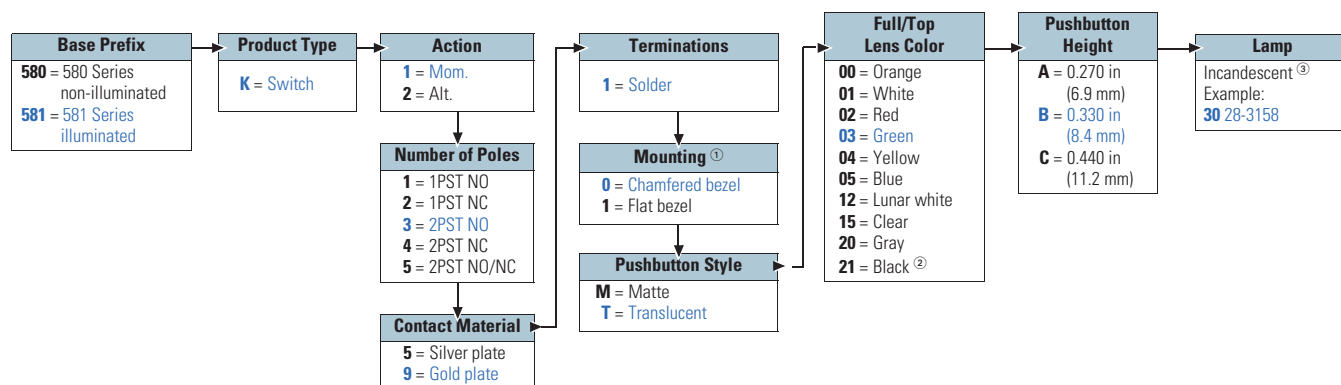
## Catalog Number Selection

6

## How To Order—Series 580/581, Switch

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

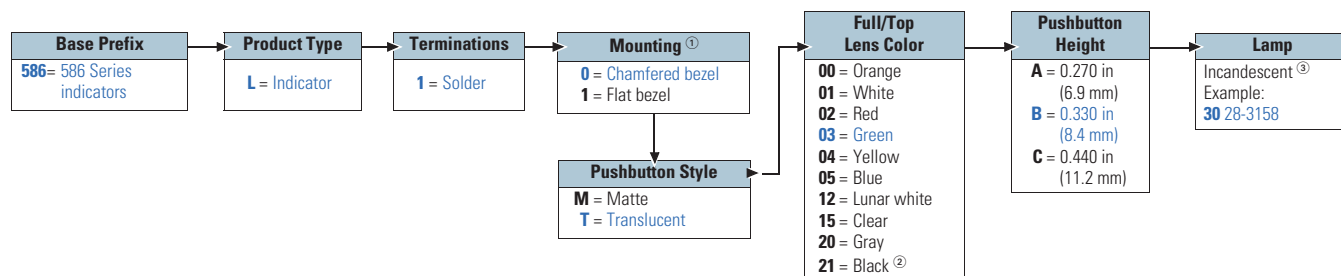
Example: **581 K 1 3 9 1 0 T 03 B 30**



## How To Order—Series 586, Indicator

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Example: **586 L 1 0 T 03 B 30**



## Notes

- ① Flush with bezel.
- ② Not available with lighted display.
- ③ Use two-digit item number, 30–37, from Incandescent Lamps table on Page V11-T6-14.



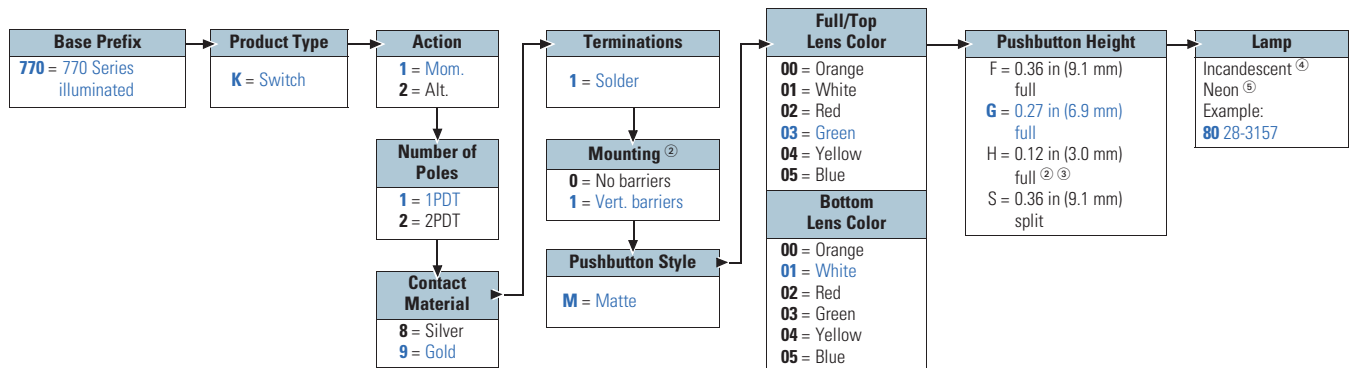
**Series 770/775**

### Catalog Number Selection

#### How To Order—Series 770<sup>①</sup>, Switch

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

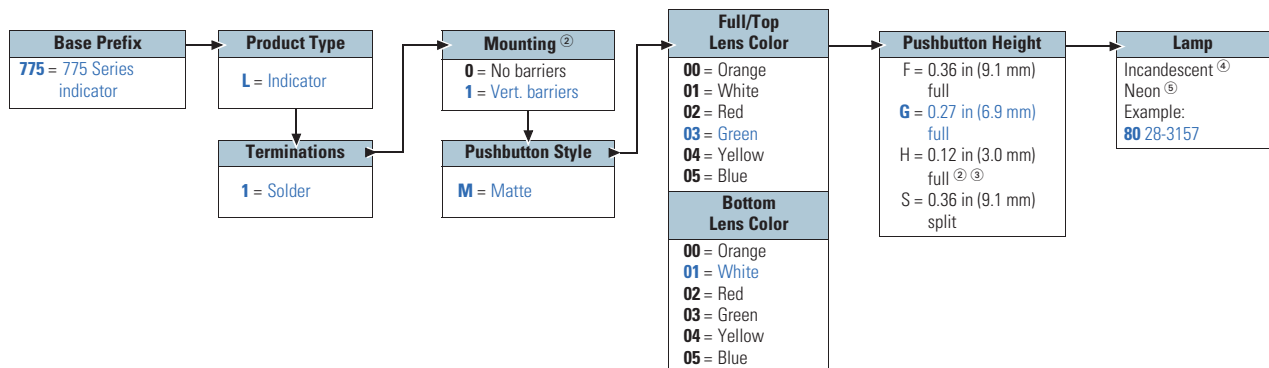
**Example:** 770 K 1 1 9 1 1 M 03 01 G 80



#### How To Order—Series 775<sup>①</sup>, Indicator

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

**Example:** 775 L 1 1 M 03 01 G 80



#### Notes

- ① Full or split cap style available.
- ② Flush with bezel.
- ③ Not available with lighted display.
- ④ Use two-digit item number, 51–59, from Incandescent Lamps table on **Page V11-T6-14**.
- ⑤ Use two-digit item number, 80 or 81, from Neon Lamps table on **Page V11-T6-15**.



Series 860 and 861/845, 810/815, 820/825

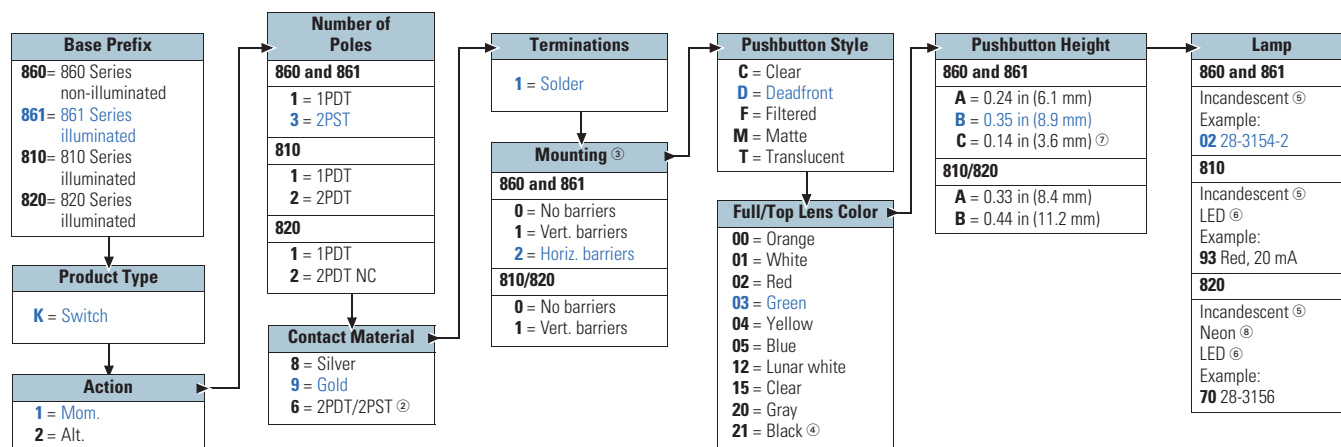
## Catalog Number Selection

6

How To Order—Series 860 and 861/810/820, Switch<sup>①</sup>

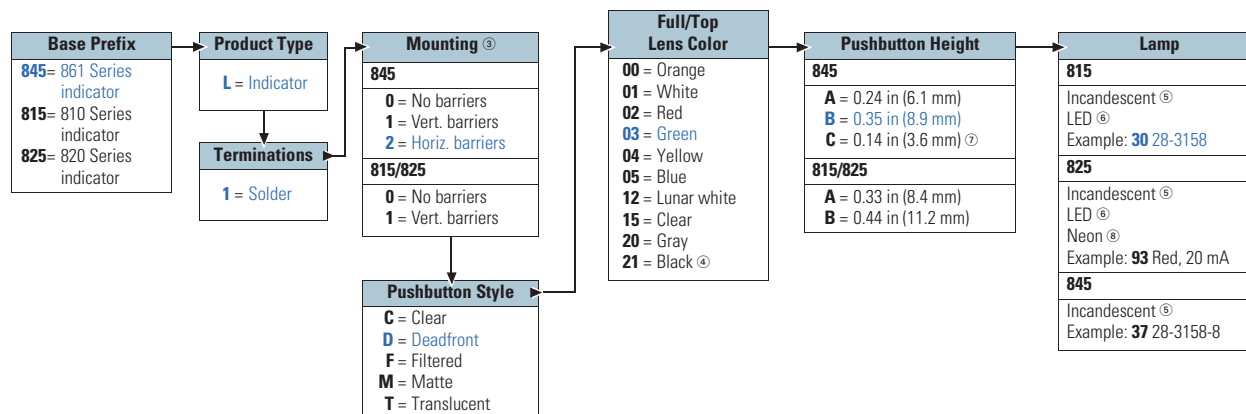
To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Example: **861 K 1 3 9 1 2 D 03 B 02**

How To Order—Series 845/815/825, Indicator<sup>①</sup>

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Example: **845 L 1 2 D 03 B 30**



## Notes

- ① Full cap style does not require a bottom lens code.
- ② Pole one is silver, pole two is gold.
- ③ Flush with bezel.
- ④ Not available with lighted display.
- ⑤ Use two-digit item number, 02–14, from Incandescent Lamps table on Page V11-T6-14.
- ⑥ Use two-digit item number, 93–97, from LED Lamps table on Page V11-T6-15.
- ⑦ Not available with lighted display. Available only on "M."
- ⑧ Use two-digit item number, 70, from Neon Lamps table on Page V11-T6-15.

## Illuminated and Non-Illuminated Pushbutton Caps



Series 206/220/231 and Series 580/770/810/820/849

### Catalog Number Selection

#### How To Order—Series 206/220/231, Pushbutton Caps

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Example: **206 P C 03 04 S**

| Base Prefix                                                                                                                                                                                    | Product Type          | Display Legend/Style                                                                                                                                                                                                                                   | Full/Top Lens Color                                                                                                                                                                                                                                                                          | Bottom Lens Color                                                                                                                                                                                                                                                                            | Cap Height <sup>⑤</sup>                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>206</b> = 2 lamp display (Series 206/208) <sup>①</sup><br><b>220</b> = Non-illuminated Series 220 and illuminated Series 221, 224 and 234<br><b>231</b> = LED display on Series 231 and 234 | <b>P</b> = Pushbutton | <b>C</b> = Clear cap and color insert, transmitted color <sup>②</sup><br><b>D</b> = Deadfront, smoky gray cap and color insert<br><b>F</b> = Filtered color, white cap and color insert <sup>②</sup><br><b>M</b> = Matte, no insert, transmitted color | <b>00</b> = Orange<br><b>01</b> = White<br><b>02</b> = Red<br><b>03</b> = Green<br><b>04</b> = Yellow<br><b>05</b> = Blue<br><b>10</b> = Amber<br><b>12</b> = Lunar white<br><b>13</b> = Light green<br><b>15</b> = Clear<br><b>20</b> = Gray <sup>④</sup><br><b>21</b> = Black <sup>④</sup> | <b>00</b> = Orange<br><b>01</b> = White<br><b>02</b> = Red<br><b>03</b> = Green<br><b>04</b> = Yellow<br><b>05</b> = Blue<br><b>10</b> = Amber<br><b>12</b> = Lunar white<br><b>13</b> = Light green<br><b>15</b> = Clear<br><b>20</b> = Gray <sup>④</sup><br><b>21</b> = Black <sup>④</sup> | <b>A</b> = 0.19 in (4.8 mm), full<br><b>S</b> = 0.19 in (4.8 mm), split |

#### How To Order—Series 580/770/810/820/849, Pushbutton Caps

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Example: **580 P C 03 04 B**

| Base Prefix                                                                                                                                                                                      | Product Type          | Display Legend/Style                                                                                                                                                                                                                                                                                                | Full/Top Lens Color                                                                                                                                                                                                              | Bottom Lens Color                                                                                                                                                                                                                | Cap Height <sup>⑤</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>580</b> = Series 580, 581, 586 <sup>⑥</sup><br><b>770</b> = Series 770, 775 <sup>③</sup><br><b>810</b> = Series 810, 815<br><b>820</b> = Series 820, 825<br><b>849</b> = Series 845, 860, 861 | <b>P</b> = Pushbutton | <b>C</b> = Clear cap and color insert, transmitted color <sup>②</sup><br><b>D</b> = Deadfront, smoky gray cap and color insert<br><b>F</b> = Filtered color, white cap and color insert <sup>②</sup><br><b>M</b> = Matte, no insert, transmitted color<br><b>T</b> = Transmitted color, smooth surface, solid color | <b>00</b> = Orange<br><b>01</b> = White<br><b>02</b> = Red<br><b>03</b> = Green<br><b>04</b> = Yellow<br><b>05</b> = Blue<br><b>10</b> = Amber<br><b>12</b> = Lunar white<br><b>15</b> = Clear<br><b>21</b> = Black <sup>④</sup> | <b>00</b> = Orange<br><b>01</b> = White<br><b>02</b> = Red<br><b>03</b> = Green<br><b>04</b> = Yellow<br><b>05</b> = Blue<br><b>10</b> = Amber<br><b>12</b> = Lunar white<br><b>15</b> = Clear<br><b>21</b> = Black <sup>④</sup> | <b>580</b><br><b>A</b> = 0.27 in (6.9 mm)<br><b>B</b> = 0.33 in (8.4 mm)<br><b>C</b> = 0.44 in (11.2 mm)<br><b>770</b><br><b>F</b> = Full, 0.36 in (9.1 mm)<br><b>G</b> = 0.27 in (6.9 mm)<br><b>H</b> = 0.12 in (3.0 mm)<br><b>S</b> = Split, 0.36 in (9.1 mm)<br><b>810/820</b><br><b>A</b> = 0.33 in (8.4 mm)<br><b>B</b> = 0.44 in (11.2 mm)<br><b>849</b><br><b>A</b> = 0.24 in (6.1 mm)<br><b>B</b> = 0.35 in (8.9 mm)<br><b>C</b> = 0.14 in (3.6 mm) |

#### Notes

- <sup>①</sup> For a high degree of illumination, a full cap may be used with two lamp devices.
- <sup>②</sup> Available only with colors red, green, yellow and blue.
- <sup>③</sup> Available in matte only.
- <sup>④</sup> Not available for lighted display.
- <sup>⑤</sup> Measured from panel of top of pushbutton cap.
- <sup>⑥</sup> Available in translucent and matte only.
- <sup>⑦</sup> For two lamps, two colored inserts with divider.

## Lamp Selection

## Incandescent Lamps

## Bi-Pin Base for 800 Series

| Item Number <sup>①</sup> | To Order Lamp Separately | ASA Lamp Number | Designed Volts | Design Amps | Brightness (MSCP) <sup>②</sup> | Brightness (Lumens) | Lab Average Life (Hours) <sup>③</sup> |
|--------------------------|--------------------------|-----------------|----------------|-------------|--------------------------------|---------------------|---------------------------------------|
| 02                       | 28-3154-2                | 7361            | 5              | 0.06        | 0.05                           | 0.63                | 100,000                               |
| 03                       | 28-3154-3                | 7945            | 6              | 0.04        | 0.03                           | 0.38                | 10,000                                |
| 07                       | 28-3154-7                | 7381            | 6.3            | 0.20        | 0.40                           | 5.03                | 50,000                                |
| 08                       | 28-3154-8                | 7371            | 12             | 0.04        | 0.12                           | 1.51                | 10,000                                |
| 09                       | 28-3154-9                | 7330            | 14             | 0.08        | 0.50                           | 6.29                | 750                                   |
| 10                       | 28-3154-10               | 7382            | 14             | 0.08        | 0.30                           | 3.77                | 50,000                                |
| 11                       | 28-3154-11               | 7370            | 18             | 0.04        | 0.15                           | 1.89                | 10,000                                |
| 12                       | 28-3154-12               | 7327            | 28             | 0.04        | 0.34                           | 4.27                | 7,000                                 |
| 13                       | 28-3154-13               | 7387            | 28             | 0.04        | 0.30                           | 3.77                | 25,000                                |
| 14                       | 28-3154-14               | 7876            | 28             | 0.06        | 0.34                           | 4.27                | 25,000                                |

## Midget Flange Base for 770 Series

| Item Number <sup>①</sup> | To Order Lamp Separately | ASA Lamp Number | Designed Volts | Design Amps | Brightness (MSCP) <sup>②</sup> | Brightness (Lumens) | Lab Average Life (Hours) <sup>③</sup> |
|--------------------------|--------------------------|-----------------|----------------|-------------|--------------------------------|---------------------|---------------------------------------|
| 51                       | 28-3155-2                | 345             | 6              | 0.04        | 0.03                           | 0.38                | 10,000                                |
| 54                       | 28-3155-5                | 394             | 12             | 0.04        | 0.12                           | 1.51                | 10,000                                |
| 55                       | 28-3155-6                | 330             | 14             | 0.08        | 0.50                           | 6.29                | 750                                   |
| 56                       | 28-3155-7                | 382             | 14             | 0.08        | 0.30                           | 3.77                | 50,000                                |
| 57                       | 28-3155-8                | 370             | 18             | 0.04        | 0.15                           | 1.89                | 10,000                                |
| 58                       | 28-3155-9                | 327             | 28             | 0.04        | 0.34                           | 4.27                | 7,000                                 |
| 59                       | 28-3155-10               | 387             | 28             | 0.04        | 0.30                           | 3.77                | 25,000                                |

## Subminiature Wedge Base for 200 and 500 Series

| Item Number <sup>①</sup> | To Order Lamp Separately | ASA Lamp Number | Designed Volts | Design Amps | Brightness (MSCP) <sup>②</sup> | Brightness (Lumens) | Lab Average Life (Hours) <sup>③</sup> |
|--------------------------|--------------------------|-----------------|----------------|-------------|--------------------------------|---------------------|---------------------------------------|
| 30                       | 28-3158                  | 56              | 5              | 0.115       | 0.15                           | 1.89                | 20,000                                |
| 31                       | 28-3158-2                | 79              | 6              | 0.20        | 0.60                           | 7.92                | 1,000                                 |
| 32                       | 28-3158-3                | 84              | 6.3            | 0.04        | 0.03                           | 0.38                | 20,000                                |
| 33                       | 28-3158-4                | 86              | 6.3            | 0.20        | 0.40                           | 5.03                | 20,000                                |
| 34                       | 28-3158-5                | 18              | 14             | 0.04        | 0.13                           | 1.63                | 5,000                                 |
| 35                       | 28-3158-6                | 73              | 14             | 0.08        | 0.30                           | 3.77                | 15,000                                |
| 36                       | 28-3158-7                | 85              | 28             | 0.04        | 0.30                           | 3.77                | 7,000                                 |
| 37                       | 28-3158-8                | 17              | 28             | 0.06        | 0.65                           | 8.17                | 5,000                                 |

## Notes

① Use this two-digit number for installation in switches and indicators.

② Standard tolerance for MSCP is  $\pm 25\%$ .

③ Average life is for AC operation. DC life will be approximately 50% less. Operating incandescent lamps at 5–10% below rated voltage will generally increase lamp life 200–400%.

**Neon Lamps** <sup>①</sup>**T 1-3/4 Bi-Pin Base Neon Lamp for All 800 Series “Shorty” Switches and Indicators** <sup>②</sup>

| Item Number <sup>③</sup> | To Order Lamp Separately | CLC Lamp Number | Circuit Volts |     | Nominal Current MA | Average Useful Life (Hours) | External Resistance Required | Ignition Voltage |     | Bulb Size | Lamp Length | Lead Length |
|--------------------------|--------------------------|-----------------|---------------|-----|--------------------|-----------------------------|------------------------------|------------------|-----|-----------|-------------|-------------|
|                          |                          |                 | AC            | DC  |                    |                             |                              | AC               | DC  |           |             |             |
| 70                       | 28-3156                  | 7A1H            | 105–125       | 150 | 1.5                | 25,000                      | 47K (1/4 W)                  | 95               | 135 | T-2       | 0.60        | 0.25        |

**T 1-3/4 Midget Flange Base Neon Lamps for All 700 Series Switches and Indicators** <sup>②</sup>

| Item Number <sup>③</sup> | To Order Lamp Separately | CLC Lamp Number | Circuit Volts |     | Nominal Current MA | Average Useful Life (Hours) | External Resistance Required | Built-In Resistance | Ignition Voltage |     | Bulb Size | Maximum Overall Length |
|--------------------------|--------------------------|-----------------|---------------|-----|--------------------|-----------------------------|------------------------------|---------------------|------------------|-----|-----------|------------------------|
|                          |                          |                 | AC            | DC  |                    |                             |                              |                     | AC               | DC  |           |                        |
| 80                       | 28-3157                  | A1H             | 105–125       | 150 | 1.5                | 25,000                      | 35K (1/4 W)                  | None                | 95               | 135 | T-2       | 0.67                   |
| 81                       | 28-3157-2                | C-24            | 105–125       | 150 | 4.2                | 8,000                       | None                         | 35K                 | 95               | 135 | T-2       | 0.67                   |

**LED Lamps** <sup>④</sup>

LEDs are sold installed only.

**LEDs for Series 231 through 235 Switches and Indicators**

| Color  | Voltage <sup>⑤</sup> | Without Diode Protection Item Number | With Diode Protection Item Number |
|--------|----------------------|--------------------------------------|-----------------------------------|
|        |                      |                                      |                                   |
| Red    | Vdc <sup>⑥</sup>     | 01                                   | 11                                |
|        | 5 Vdc                | 02                                   | 12                                |
|        | 15 Vdc               | 03                                   | 13                                |
| Yellow | Vdc <sup>⑥</sup>     | 04                                   | 14                                |
|        | 5 Vdc                | 05                                   | 15                                |
|        | 15 Vdc               | 06                                   | 16                                |
| Green  | Vdc <sup>⑥</sup>     | 07                                   | 17                                |
|        | 5 Vdc                | 08                                   | 18                                |
|        | 15 Vdc               | 09                                   | 19                                |

**T 1-3/4 Wire LEDs for All 800 Series Switches and Indicators**

| Item Number <sup>③</sup> | Color  | Forward Current (MA) <sup>⑤</sup> | Luminous Intensity (MCD) |         | Forward Voltage (V) Typical | Diffused or Undiffused |
|--------------------------|--------|-----------------------------------|--------------------------|---------|-----------------------------|------------------------|
|                          |        |                                   | Minimum                  | Typical |                             |                        |
| 93                       | Red    | 20                                | 80                       | 160     | 1.7                         | Undiffused             |
| 95                       | Green  | 20                                | 80                       | 160     | 1.7                         | Undiffused             |
| 96                       | Yellow | 20                                | 80                       | 160     | 1.7                         | Undiffused             |
| 97                       | Amber  | 20                                | 80                       | 160     | 1.7                         | Undiffused             |

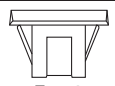
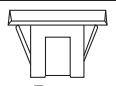
**Notes**

- ① Neon lamps are not recommended for use with colored caps or inserts, especially those colored green or blue.
- ② Recommended external series resistor values shown for indicated average useful life are for lamp and resistor combinations used across 110–125 Vac, 1/4 W, ±10% tolerance.
- ③ Use this two-digit number for installation in switches and indicators.
- ④ For use with clear or white cap only.
- ⑤ 5 Vdc and 15 Vdc include internal current limiting resistor. Other voltages available—contact your local Eaton Sales Representative.
- ⑥ External current limiting required. User must include in circuit—to give current of 20 mA to LED.

**Mounting Barriers Ordering Guide**Catalog Number Example: **200B1**

When switches are individually mounted, add 0.10 in (2.54 mm) per switch to the appropriate bezel dimension. When switches are gang mounted, add 0.05 in (1.27 mm) to the appropriate bezel dimension for each switch mounted plus an additional 0.05 in (1.27 mm) to compensate for gang mounting.

**Series 200 and 300 Mounting Barriers** <sup>①②</sup>

| Product Series | Product Type | Code | Barrier Type and Description | Code |                                                                                   |                                                                                    |
|----------------|--------------|------|------------------------------|------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 200            | Barrier      | B    | End—Short ③                  | 1    |  |  |
|                |              |      | Center—Short ③               | 2    |                                                                                   |                                                                                    |
|                |              |      | End—Long ④                   | 3    |  |  |
|                |              |      | Center—Long ④                | 4    |                                                                                   |                                                                                    |
|                |              |      |                              |      | Type 1                                                                            | Type 2                                                                             |
|                |              |      |                              |      | Type 3                                                                            | Type 4                                                                             |

**Legending**

All legend markings are pad printed in accordance with the limitations below. Standard markings are of condensed gothic type, 1/8 in high characters, with white letters on blue, red and green translucent pushbuttons and black letters on white, yellow, orange and all filtered pushbuttons.

**Legending**

| Pushbutton Size                                   | Standard Pad Print Limitations |
|---------------------------------------------------|--------------------------------|
| 1/2 in square pushbuttons                         | 2 lines, 4 characters per line |
| 5/8 in square pushbuttons—full legend             | 3 lines, 6 characters per line |
| 5/8 in square pushbuttons—split legend            | 2 lines, 6 characters per line |
| 3/4 in square pushbuttons                         | 3 lines, 7 characters per line |
| 3/4 in x 1 in rectangular pushbutton—full legend  | 3 lines, 9 characters per line |
| 3/4 in x 1 in rectangular pushbutton—split legend | 2 lines, 9 characters per line |

**Accessories**

These snap-on pushbutton caps are made of molded plastic for use with grooved style switches. They are ordered separately for user assembly.

**Snap-On Pushbutton Caps—Standard**

| Description  | Button Diameter in Inches (mm) | Catalog Number   |
|--------------|--------------------------------|------------------|
| Black molded | 0.625 (15.88)                  | <b>53-3338</b>   |
| Red molded   | 0.625 (15.88)                  | <b>53-3338-2</b> |

**Notes**

- ① The full guard barrier is molded as an integral part of the switch body and is specified as a part of the complete switch catalog number.
- ② An end barrier is attached to each side of housing. The center barrier is used between devices when gang mounting in a slot array.
- ③ For use with square devices and short side of rectangular devices.
- ④ For use with long side of rectangular devices. Use a center—long between switches if gang mounting.

## Technical Data and Specifications

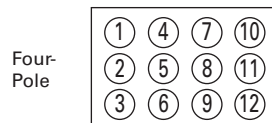
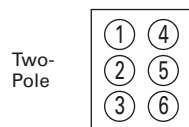
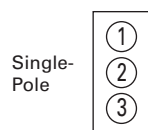
### General Purpose Pushbuttons and Indicators—Illuminated and Non-Illuminated

| Series                   | 206/208                                                                                                                                                    | 220/221/224                                                                                                                                                | 231/234                                                                                                                                                    | 580/581/586                                                                                                                                                            |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ratings—</b>          |                                                                                                                                                            |                                                                                                                                                            |                                                                                                                                                            |                                                                                                                                                                        |
| <b>Silver Contacts</b>   | 5A at 125 Vac or 250 Vac                                                                                                                                   | 5A at 125 Vac or 250 Vdc                                                                                                                                   | 5A at 125 Vac or 250 Vdc                                                                                                                                   | Silver or Gold: 1A at 125 Vac                                                                                                                                          |
| <b>Gold Contacts</b>     | 0.1A at 125 Vac/Vdc                                                                                                                                        | 0.1A at 125 Vac/Vdc                                                                                                                                        | 0.1A at 125 Vac/Vdc                                                                                                                                        | Gold-plated contacts for low level                                                                                                                                     |
| <b>Action</b>            | Momentary<br>Alternate with positive latch down                                                                                                            | Momentary<br>Alternate with positive latch down                                                                                                            | Momentary<br>Alternate with positive latch down                                                                                                            | Momentary<br>Alternate with positive latch down                                                                                                                        |
| <b>Switch Circuitry</b>  | Break before make<br>1PDT or 2PDT<br>2-independent lamp circuits                                                                                           | Break before make<br>1PDT or 2PDT                                                                                                                          | Break before make<br>1PDT or 2PDT                                                                                                                          | Double break<br>1PST or 2PST                                                                                                                                           |
| <b>Termination Types</b> | 0.02 x 0.11 in (0.51 x 2.79 mm)                                                                                                                            | 0.02 x 0.11 in (0.51 x 2.79 mm) <sup>①</sup>                                                                                                               | 0.02 x 0.110 in (0.51 x 2.79 mm) <sup>①</sup>                                                                                                              | 0.01 x 0.11 in (0.31 x 2.79 mm) <sup>①</sup>                                                                                                                           |
| <b>Pushbuttons</b>       | 0.62 x 1.00 in (15.87 x 25.40 mm)<br>Rectangular<br>Full or horizontal split lens<br>Plain, engraved or hot stamped <sup>②</sup>                           | 0.63 in (15.87 mm)<br>Square<br>Plain, engraved or hot stamped <sup>②</sup>                                                                                | 0.63 in (15.87 mm)<br>Square<br>Plain, engraved or hot stamped <sup>②</sup>                                                                                | 0.50 in (12.70 mm)<br>Square<br>3 heights above panel E <sup>③</sup><br>Plain, engraved or hot stamped <sup>②</sup>                                                    |
| <b>Mounting</b>          | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.03 to 0.19 in<br>(0.76 to 4.76 mm)<br>Barrier mount available <sup>④</sup> | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.03 to 0.19 in<br>(0.76 to 4.76 mm)<br>Barrier mount available <sup>④</sup> | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.03 to 0.19 in<br>(0.76 to 4.76 mm)<br>Barrier mount available <sup>④</sup> | Snap-in panel mounting<br>Choice of two bezel styles:<br>Chamfered or Flat<br>Stainless steel retaining clips<br>Panel thickness: 0.06 to 0.19 in<br>(1.59 to 4.76 mm) |
| <b>Lamps</b>             | Two T 1-3/4 wedge base lamps<br>Incandescent<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                              | Two T 1-3/4 wedge base lamps<br>Incandescent<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                              | One rectangular LED flush with cap<br>Various voltages available<br>Diode protection available                                                             | Two T 1-3/4 wedge base lamps<br>Incandescent<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                                          |
| <b>Pushbutton Travel</b> | 0.19 in (2.29 mm)                                                                                                                                          | 0.19 in (2.29 mm)                                                                                                                                          | 0.19 in (2.29 mm)                                                                                                                                          | 0.17 in (4.32)                                                                                                                                                         |

| Series                   | 770/775                                                                                                                                                                                                                                                              | 810/815                                                                                                                                                    | 820/825                                                                                                                                                    | 860/861/845                                                                                                                                                                  |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ratings—</b>          |                                                                                                                                                                                                                                                                      |                                                                                                                                                            |                                                                                                                                                            |                                                                                                                                                                              |
| <b>Silver Contacts</b>   | 10.5A at 125 Vac or 250 Vac                                                                                                                                                                                                                                          | 3A at 125 Vac or 250 Vac                                                                                                                                   | 3A at 125 Vac or 250 Vac                                                                                                                                   | 6A at 125 Vac or 3A at 250 Vac                                                                                                                                               |
| <b>Gold Contacts</b>     | 0.25A at 125 Vac or 30 Vdc                                                                                                                                                                                                                                           | 0.25A at 125 Vac or 30 Vdc                                                                                                                                 | 0.25A at 125 Vac or 30 Vdc                                                                                                                                 | 0.25A at 125 Vac or 30 Vdc                                                                                                                                                   |
| <b>Action</b>            | Momentary<br>Alternate with positive latch down                                                                                                                                                                                                                      | Momentary<br>Alternate with positive latch down                                                                                                            | Momentary<br>Alternate with positive latch down                                                                                                            | Momentary<br>Alternate with positive latch down                                                                                                                              |
| <b>Switch Circuitry</b>  | 1PDT or 2PDT (2 circuit)<br>2-independent lamp circuits                                                                                                                                                                                                              | Break before make<br>1PDT or 2PDT                                                                                                                          | Break before make<br>1PDT or 2PDT                                                                                                                          | Double break<br>1PST or 2PST, NO                                                                                                                                             |
| <b>Termination Types</b> | 0.02 x 0.125 in (0.25 x 3.18 mm) <sup>①</sup><br>Epoxy sealed                                                                                                                                                                                                        | 0.02 x 0.11 in (0.64 x 2.79 mm) <sup>①</sup><br>Epoxy sealed                                                                                               | 0.02 x 0.11 in (0.64 x 2.79 mm) <sup>①</sup><br>Epoxy sealed                                                                                               | 0.02 x 0.11 in (0.64 x 2.79 mm) <sup>①</sup>                                                                                                                                 |
| <b>Pushbuttons</b>       | 0.73 x 0.97 in (18.54 x 24.64 mm)<br>Rectangular<br>Plain, engraved or hot stamped <sup>②</sup>                                                                                                                                                                      | 0.75 x 1 in (19.05 x 25.40 mm)<br>Rectangular<br>2 heights above panel <sup>③</sup><br>5 styles<br>Plain, engraved or hot stamped <sup>②</sup>             | 0.75 in (19.05 mm)<br>Square<br>2 heights above panel <sup>③</sup><br>5 styles<br>Plain, engraved or hot stamped <sup>②</sup>                              | 0.62 in (15.87 mm)<br>Square<br>Horizontal split legend<br>(indicator only)<br>3 heights above bezel <sup>③</sup><br>5 styles<br>Plain, engraved or hot stamped <sup>②</sup> |
| <b>Mounting</b>          | Panel mounting retained by molded<br>sleeve and nut<br>May be individually mounted<br>or gang mounted in horizontal<br>or vertical rows<br>Panel thickness from 0.03 to 0.25 in<br>(0.76 to 6.35 mm)<br>Barrier mount available <sup>④</sup><br>Snap mount available | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.06 to 0.19 in<br>(1.59 to 4.76 mm)<br>Barrier mount available <sup>④</sup> | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.06 to 0.19 in<br>(1.59 to 4.76 mm)<br>Barrier mount available <sup>④</sup> | Snap-in panel mounting<br>Stainless steel retaining clips<br>Panel thickness: 0.06 to 0.19 in<br>(1.59 to 4.76 mm)<br>Barrier mount available <sup>④</sup>                   |
| <b>Lamps</b>             | Accepts two T 1-3/4 midjet flange<br>base lamps<br>Incandescent or neon<br>Front relampable                                                                                                                                                                          | One T 1-3/4 bi-pin base<br>Incandescent, neon or LED<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                      | One T 1-3/4 bi-pin base<br>Incandescent, neon or LED<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                      | One T 1-3/4 bi-pin base<br>Incandescent, neon or LED<br>Front relampable<br>Lamp stationary to reduce<br>mechanical shock to filament                                        |
| <b>Pushbutton Travel</b> | 0.22 in (5.59 mm)                                                                                                                                                                                                                                                    | 0.22 in (5.59 mm)                                                                                                                                          | 0.22 in (5.59 mm)                                                                                                                                          | 0.22 in (5.59 mm)                                                                                                                                                            |

#### Notes

- <sup>①</sup> Terminations are suitable for solder or female 110 connectors. Series 770: Solder only.  
<sup>②</sup> See Engraving and Hot Stamping table on **Page V11-T6-16** for more information.  
<sup>③</sup> See Product Selection tables on **Pages V11-T6-9–V11-T6-12** for more information.  
<sup>④</sup> See Series 200 and 300 Mounting Barriers table on **Page V11-T6-16** for more information.



### Terminal Identification

When specified on order, switches will have the terminals identified as shown in the illustration at right. Terminal markings will be ink-stamped on the side of the switch case and unused terminal positions will not be identified.

All views are rear of switch with keyway or at down as applicable. Terminal numbers 2, 2 and 5 and 5 and 8 are considered inboard terminals for single-, two- and four-pole switches respectively. All others are considered outboard.

## Circuit Diagrams

### Pushbutton Circuit Diagrams

| Circuit Letter     | Schematic | Circuit Letter          | Schematic |
|--------------------|-----------|-------------------------|-----------|
| <b>A</b><br>1PST   |           | <b>I</b><br>2 circuit ⑤ |           |
| <b>B</b><br>1PDT   |           | <b>J</b><br>1PST        |           |
| <b>C</b><br>2PST   |           | <b>K</b><br>1PDT        |           |
| <b>D</b><br>2PDT   |           | <b>L</b><br>2PST        |           |
| <b>E</b><br>4PST ① |           | <b>M</b><br>2PST        |           |
| <b>F</b><br>4PDT ② |           | <b>N</b> ⑥<br>2PDT      |           |
| <b>G</b> ③<br>1PST |           | <b>P</b><br>1PDT        |           |
| <b>H</b> ④<br>1PDT |           | <b>Q</b> ⑦<br>2 circuit |           |

## Legends

### Pushbutton Legend

| Legend | Rocker Switch Type                                   |
|--------|------------------------------------------------------|
| ●      | Contact terminal—will make contact with switch lever |
| ○      | Isolated terminal—does not make contact with lever   |
| ⌵      | Center terminal and switch lever                     |
| ⊗      | Bulb                                                 |
| ↔      | Momentary contact                                    |
| ●      | Denotes mechanical contact portion                   |

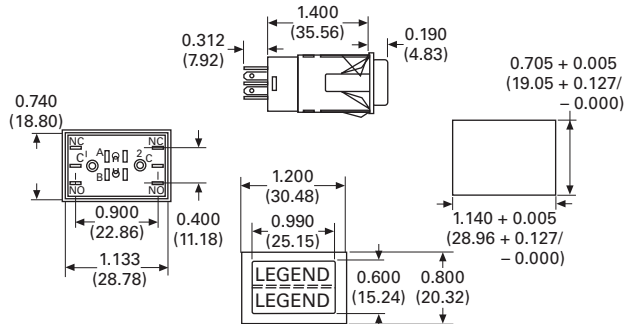
### Notes

- ① Poles 11 and 12 may be eliminated for three-pole devices.
- ② Poles 10, 11 and 12 may be eliminated for three-pole devices.
- ③ Dependent lamp.
- ④ Independent lamp.
- ⑤ Two circuit—indicates a special type of double-throw switch in which the two circuits being controlled may be independent of each other.
- ⑥ For 206 Series, an additional lamp is available.
- ⑦ Available in 1PDT or 2PDT.

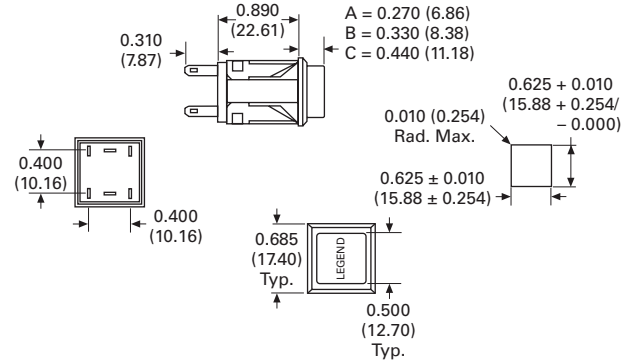
### Dimensions

Approximate Dimensions in Inches (mm)

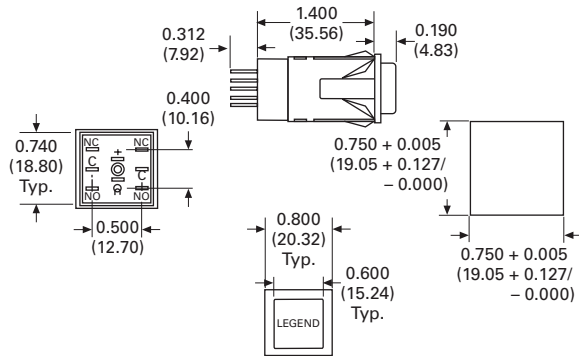
#### 206 Series



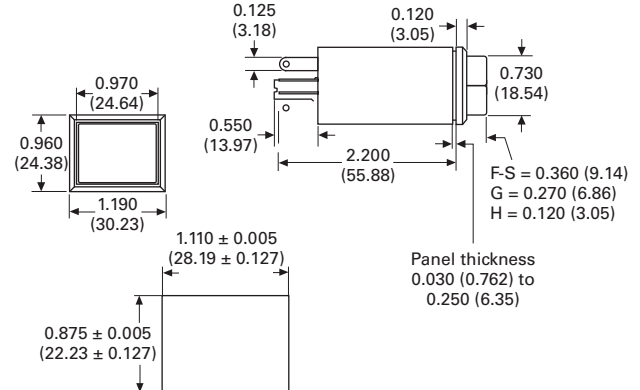
#### 580 Series



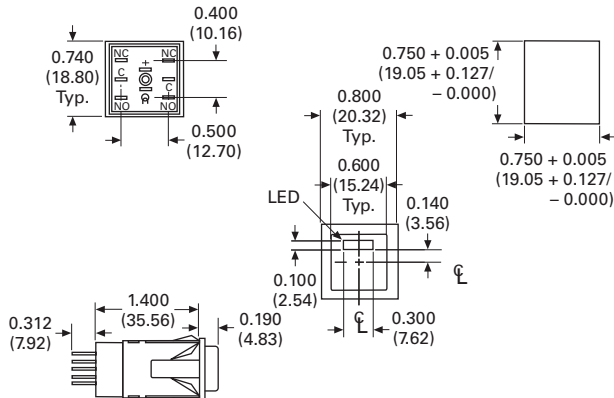
#### 220 Series



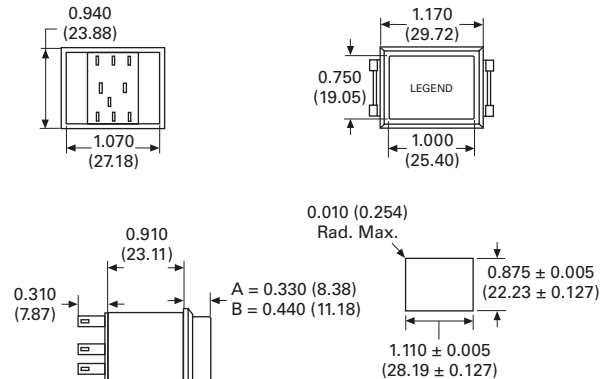
#### 770 Series



#### 231 Series



#### 810 Series



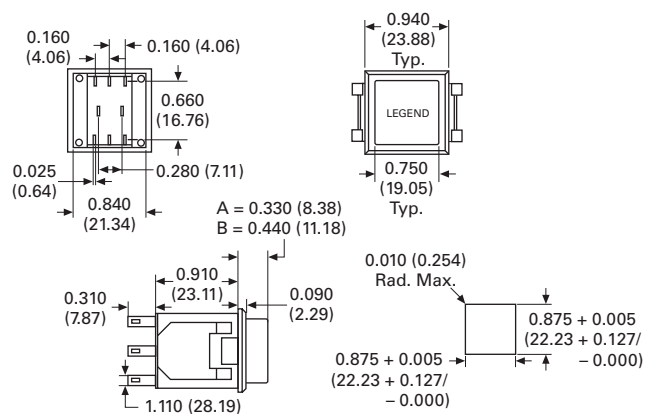
# 6.2

## Pushbuttons

Illuminated AC/DC Rated

Approximate Dimensions in Inches (mm)

### 820 Series



### 860 Series

