

# 22MM NEMA PILOT DEVICES



c3controls' durable line of 22mm NEMA devices are for all those tight fitting places. Our non-illuminated momentary and maintained push buttons, toggle switches, pilot lights and selector switches are compact and ready for field wiring in almost any environment. This is the most rugged 22mm pilot device product line in the world!



|                   |     |
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## PROVEN



### Conformity to Standards:

UL 508  
CSA C22.2 No. 14  
IEC 60947-1, 60947-5-1

### Certifications:





UL File #: E68568 (Guide NKCR, NKCR7)  
CSA File #: LR47446-1  
CE Marked (per EU Low Voltage Directive 2006/95/EC and  
RoHS Directive 2011/65/EU)

Visit [www.c3controls.com](http://www.c3controls.com) to download product certifications.

# 22MM NEMA PILOT DEVICES

Every c3controls product is designed and manufactured to meet the needs of the machine builder, including our comprehensive line of 22mm NEMA Pilot Devices. Check out all the features of our Series 22 NEMA below!

## DELIVERING THE MOST RUGGED 22MM NEMA DEVICES IN THE INDUSTRY.

|  |   |
|--|---|
| ✓ <b>Proven</b>                        | Our 22mm NEMA operators are UL Listed, CSA Certified and CE marked meeting global standards requirements.     |
| ✓ <b>Simple Customization</b>          | Our light modules come with various lens color options for appropriate operator interface and are available in incandescent, neon, or our LED lamps with leakage protection.  |
| ✓ <b>Rugged Design</b>                 | Optional polyester or aluminum clamps rings with coarse 16 pitch threads for quick and easy utilization that won't cross thread or strip.   |
| ✓ <b>Visible Certifications</b>        | Our product certifications and electrical ratings are clearly marked on the outside of the contact blocks for easy reference during installation.   |
| ✓ <b>Heavy Duty</b>                    | Polyester construction provides superior durability, corrosion resistance, moisture rejection and electrical insulation.  |
| ✓ <b>Flexible</b>                      | Our "Add-On" Contact Blocks can be added to the basic operator to increase the number and type of contacts. Up to 3 blocks with 2 circuits each may be added, giving a total of 8 contacts per operator.  |
| ✓ <b>Convenient</b>                    | Reduce inventory with our interchangeable modular design, providing endless options for appropriate operator interface.   |
| ✓ <b>Environmentally Secure</b>        | With 4/4X and IP65 ratings, our 22mm line of Pilot Devices are built to last and withstand dust, corrosion, ice, and rain.  |
| ✓ <b>Limited Lifetime Warranty*</b>    | Every product is backed by our limited lifetime warranty—unmatched in the industry—bringing you quality components that perform in the most demanding applications.   |
| ✓ <b>Guaranteed Same-Day Shipping*</b> | Product availability reduces inventory, and improves cash-flow—saving you money. With c3controls any order for standard catalog items received by 6:00pm ET is guaranteed to ship same-day.   |
| ✓ <b>Advantage Pricing</b>             | Our approach to product development, manufacturing, and focus on servicing the OEM and Electrical Equipment Builder reduces cost. The result—the best value in the industry.  |

\*See c3controls Terms & Conditions

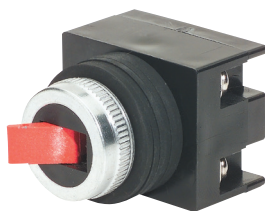
“Our circulation equipment is exposed to elements ranging from extreme heat and humidity, to rain, to freezing snow and ice. Therefore we chose c3controls to provide durable, reliable NEMA 4X switches for our machines.”

Jon Zent, Mechanical Engineer • **SolarBee, Inc.**

Momentary Push Button



Maintained Toggle Switch



Push-To-Test Pilot Light

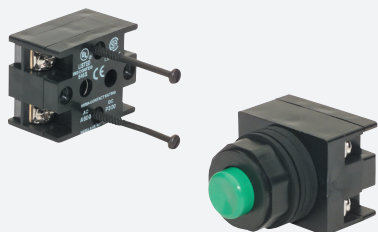


Selector Switch



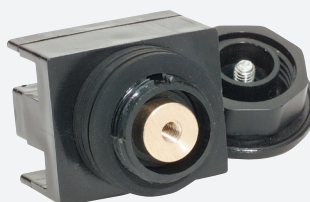
**UNIQUE PRODUCT LINE FEATURES**

**COMPACT DESIGN**



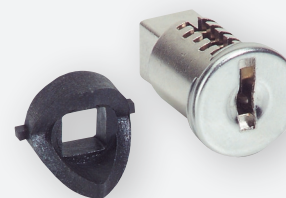
Our compact, thin pilot devices are designed with up to two integral circuits. Additional contact blocks are available.

**METAL ON THE INSIDE**



c3controls Maintained Push Buttons contain a solid brass detent mechanism ensuring reliable operation in emergency stop applications, and providing safe interruption of circuits and longer life.

**ONE CAM DESIGN**



Our single cam design eliminates the need for multiple cam and selector switch configurations, reducing inventory and saves you labor time and costs.

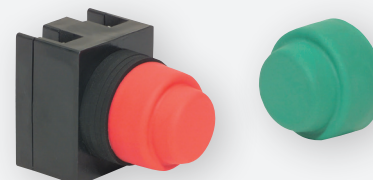
**INTERNAL SELF-LUBRICANT & U-CUP SEAL**



All frictional parts are molded with an internal self-lubricant to provide outstanding wear without troublesome greases used by others.

Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions and keeps water, oils, and dust away from the contact blocks.

**RUBBER BOOTS**



Our state-of-the-art rubber boots protect both the operators and the circuits behind them from harsh chemicals and climates. They feature a built-in clamp ring that is molded with Neoprene and has been modified to provide added pliability and protection against dust, freezing and thawing environments.

**FIND IT FAST**

22mm NEMA Pilot Devices



- Certifications
- Specifications
- Dimension Drawings
- Installation Instructions
- Easy to Buy

[www.c3controls.com](http://www.c3controls.com)

**IT'S EASY TO BUILD YOUR OWN PUSH BUTTON**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Momentary Push Buttons (Non-Illuminated)**

**22PB** I - II III IV V

Example: To build one of our most popular Push Buttons, the part number would be **22PB + II + III + IV + V** or **22PBNO-XXGN**



| I. OPERATOR TYPE |                      |         |
|------------------|----------------------|---------|
| CODE             | DESCRIPTION          | LIST    |
| 22PB             | Push Button Operator | \$23.00 |

| II. CONTACT BLOCK CONFIGURATION |   |         |
|---------------------------------|---|---------|
| CODE                            | DESCRIPTION   | LIST    |
| NO                              | 1 Normally Open Contact Block                         | —       |
| NC                              | 1 Normally Closed Contact Block                       | —       |
| NONC                            | Contact Block w/1 Normally Open and 1 Normally Closed | \$11.00 |
| 2NO                             | Contact Block w/2 Normally Open                       | \$11.00 |
| 2NC                             | Contact Block w/2 Normally Closed                     | \$11.00 |
| NOEM                            | Contact Block w/1 Normally Open and 1 Early Make      | \$15.00 |

| III. CLAMP RING   |                      |         |
|---|----------------------|---------|
| CODE  | DESCRIPTION          | LIST    |
| <b>FOR USE WITH ALL CAP TYPES (EXCLUDES RUBBER BOOTS)</b> |                      |         |
| X   | Polyester (Type 4X)  | —       |
| M   | Aluminum (Type 4)    | \$ 3.90 |
| <b>FOR USE WITH RUBBER BOOTS</b>                          |                      |         |
| (Blank)   | Clamp Ring Included* | —       |

\*NOTE: Rubber boots come standard with a built-in clamp ring and thrust washer. When installing operator we recommend that the thrust washer be placed behind the panel to prevent rotation.

| IV. CAP TYPE |   |         |
|--------------|---|---------|
| CODE         | DESCRIPTION   | LIST    |
| (Blank)      | Operator less Cap   | —       |
| F            | Flush*  | \$ 5.80 |
| X            | Extended*   | \$ 5.80 |
| 1            | Mushroom (1" Dia.)  | \$ 7.80 |
| M            | Mushroom (1-5/32" Dia.)   | \$16.00 |
| J            | Jumbo Mushroom (1-21/64" Dia.)  | \$16.00 |
| S1           | Shrouded Mushroom (1" Dia.)<br>Note: Only available with a Polyester Clamp Ring.      | \$ 9.70 |
| SM           | Shrouded Mushroom (1-5/32" Dia.)<br>Note: Only available with a Polyester Clamp Ring. | \$19.00 |
| XR           | Neoprene Rubber Boot†   | \$18.00 |

\*NOTE: These caps can also be used with our Mechanical Interlock. See page 370.  
†NOTE: Rubber boots come standard with a built-in clamp ring and thrust washer. When installing operator we recommend that the thrust washer be placed behind the panel to prevent rotation.

| V. CAP COLOR                                 |                   |
|--|-------------------|
| CODE   | COLOR             |
| <b>ALL CAP TYPES (EXCLUDES RUBBER BOOTS)</b> |                   |
| (Blank)                                      | Operator less Cap |
| BK   | Black             |
| BE   | Blue              |
| GN   | Green             |
| GY   | Grey              |
| RD   | Red               |
| WE   | White             |
| YW   | Yellow            |
| <b>RUBBER BOOTS</b>                          |                   |
| BK   | Black             |
| GN   | Green             |
| RD   | Red               |
| YW   | Yellow            |

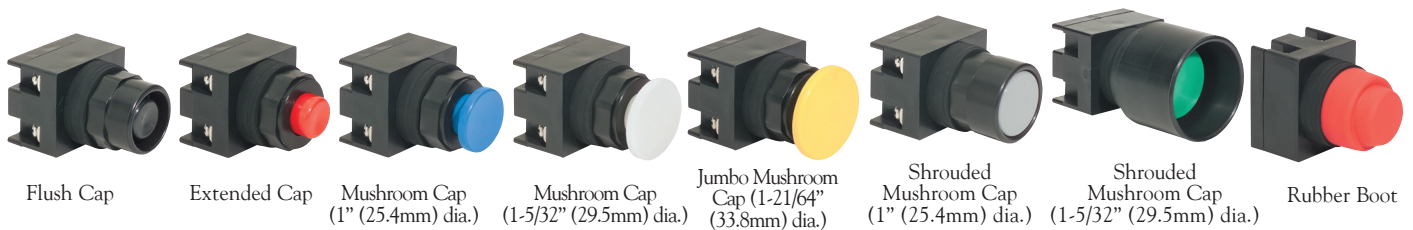
CONTACT BLOCKS ARE AVAILABLE TO ADD TO BASIC OPERATORS TO INCREASE THE NUMBER AND TYPE OF CONTACTS. UP TO THREE BLOCKS WITH TWO CIRCUITS EACH MAY BE ADDED GIVING A TOTAL OF EIGHT CONTACTS PER OPERATOR. BLOCKS SIMPLY SCREW ON THE BACK OF THE OPERATOR. REFER TO PAGE 370 FOR DETAILS.

Our 22mm Momentary Push Buttons come with integral contacts ready for field wiring.

DISCOUNT SCHEDULE **E**

**LEGEND PLATES** in almost any size & color are available for same day shipping. See pages 372-373 for complete selection.

**MIX AND MATCH ANY COLOR AND MOMENTARY NON-ILLUMINATED PUSH BUTTON CAP**



## 22MM NEMA MOMENTARY NON-ILLUMINATED PUSH BUTTONS

c3controls goes the extra step to make sure that our products outlast the competition. Our 22mm NEMA Momentary Non-Illuminated Push Buttons are durable and flexible for a variety of uses. All c3controls 22mm NEMA operators are UL Listed and are rated Type 4/4X as standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Octagonal polyester or polished aluminum clamp rings.
- #6 terminal screws with self-lifting captive wire clamps accommodate #22 through two #12 AWG wires (0.5 - 4mm<sup>2</sup>) per terminal.
- Operators conveniently mount in a round 7/8" (22.5mm) hole that is directly interchangeable with competitors units and eliminates the labor required for notching.
- A600 (7,200 VA Make and 720 VA Break), 600V AC Maximum, Maximum Continuous Thermal Current, Ith: 10A
- P300 (138 VA Make and 138 VA Break), 250V DC Maximum, Maximum Continuous Thermal Current, Ith: 5A



22MM NEMA PILOT DEVICES

### UNIQUE PRODUCT FEATURES



1. Compact, thin design comes with integral circuits for field wiring.
2. Our push buttons modular design provides endless options for appropriate operator interface by alternating cap types and colors which ultimately will save you time and money by reducing your inventory.
3. Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. The U-Cup seal rides easily along the stroker and keeps water, oils, dust and other corrosive particles in the air away from the contact blocks. This U-cup seal also acts like a squeegee and forms a permanent watertight seal that meets Type 4/4X with or without a rubber boot.

### SOME OF OUR POPULAR CONFIGURATIONS:

#### MOMENTARY NON-ILLUMINATED PUSH BUTTON OPERATORS WITH POLYESTER CLAMP RING (TYPE 4X)

|             | FLUSH CAP |                |         | EXTENDED CAP   |         |                | MUSHROOM CAP |  |  |
|-------------|-----------|----------------|---------|----------------|---------|----------------|--------------|--|--|
|             | CAP COLOR | CATALOG NUMBER | LIST    | CATALOG NUMBER | LIST    | CATALOG NUMBER | LIST         |  |  |
| 1NO         | Black     | 22PBNO-XFBK    | \$28.80 | 22PBNO-XXBK    | \$28.80 | 22PBNO-XMBK    | \$39.00      |  |  |
|             | Green     | 22PBNO-XFGN    | \$28.80 | 22PBNO-XXGN    | \$28.80 | 22PBNO-XMGN    | \$39.00      |  |  |
|             | Red       | 22PBNO-XFRD    | \$28.80 | 22PBNO-XXRD    | \$28.80 | 22PBNO-XMRD    | \$39.00      |  |  |
| 1NC         | Black     | 22PBNC-XFBK    | \$28.80 | 22PBNC-XXBK    | \$28.80 | 22PBNC-XMBK    | \$39.00      |  |  |
|             | Green     | 22PBNC-XFGN    | \$28.80 | 22PBNC-XXGN    | \$28.80 | 22PBNC-XMGN    | \$39.00      |  |  |
|             | Red       | 22PBNC-XFRD    | \$28.80 | 22PBNC-XXRD    | \$28.80 | 22PBNC-XMRD    | \$39.00      |  |  |
| 1 NO & 1 NC | Green     | 22PBNONC-XFGN  | \$39.80 | 22PBNONC-XXGN  | \$39.80 | 22PBNONC-XMGN  | \$50.00      |  |  |
|             | Red       | 22PBNONC-XFRD  | \$39.80 | 22PBNONC-XXRD  | \$39.80 | 22PBNONC-XMRD  | \$50.00      |  |  |



**IT'S EASY TO BUILD YOUR OWN PUSH BUTTON**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Maintained Push Buttons (Non-Illuminated)  
2-Position Push-Pull**

**22PP**  -  **PM**   
I II III IV V

Example: To build one of our most popular Push Buttons, the part number would be **22PP + II + III + PM + V** or **22PPNC-XPMRD**



| I. OPERATOR TYPE |                      |         |
|------------------|----------------------|---------|
| CODE             | DESCRIPTION          | LIST    |
| 22PP             | Push-Pull Maintained | \$48.00 |

| II. CONTACT BLOCK CONFIGURATION |   |         |
|---------------------------------|---|---------|
| CODE                            | DESCRIPTION   | LIST    |
| NO                              | 1 Normally Open Contact Block                         | —       |
| NC                              | 1 Normally Closed Contact Block                       | —       |
| NONC                            | Contact Block w/1 Normally Open and 1 Normally Closed | \$11.00 |
| 2NO                             | Contact Block w/2 Normally Open                       | \$11.00 |
| 2NC                             | Contact Block w/2 Normally Closed                     | \$11.00 |

| III. CLAMP RING |                     |         |
|-----------------|---------------------|---------|
| CODE            | DESCRIPTION         | LIST    |
| X               | Polyester (Type 4X) | —       |
| M               | Aluminum (Type 4)   | \$ 3.90 |

| IV. CAP TYPE |                               |         |
|--------------|-------------------------------|---------|
| CODE         | DESCRIPTION                   | LIST    |
| PM           | Push-Pull Maintained Mushroom | \$16.00 |

| V. CAP COLOR |        |
|--------------|--------|
| CODE         | COLOR  |
| BK           | Black  |
| BE           | Blue   |
| GN           | Green  |
| GY           | Grey   |
| RD           | Red    |
| WE           | White  |
| YW           | Yellow |

Our 22mm Maintained operators come with integral contacts ready for field wiring and are maintained in both the push and pull positions. The primary application is “push” to “stop” and “pull” to “start”. Our push-pull operators are often used as maintained emergency stop buttons.



**LEGEND PLATES** in almost any size & color are available for same day shipping. See pages 372-373 for complete selection.



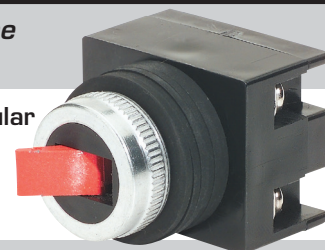
**IT'S EASY TO BUILD YOUR OWN TOGGLE SWITCH**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Maintained Toggle Switches**

**22T**    -   
I II III IV V

Example: To build one of our most popular Toggle Switches, the part number would be **22T + II + III + IV + V** or **22THRDNC-MT**



| I. OPERATOR TYPE |               |         |
|------------------|---------------|---------|
| CODE             | DESCRIPTION   | LIST    |
| 22T              | Toggle Switch | \$40.00 |

| II. TOGGLE DIRECTION |             |
|----------------------|-------------|
| CODE                 | DESCRIPTION |
| H                    | Horizontal  |
| V                    | Vertical    |

| III. TOGGLE COLOR |        |
|-------------------|--------|
| CODE              | COLOR  |
| BK                | Black  |
| BE                | Blue   |
| GN                | Green  |
| GY                | Grey   |
| RD                | Red    |
| WE                | White  |
| YW                | Yellow |

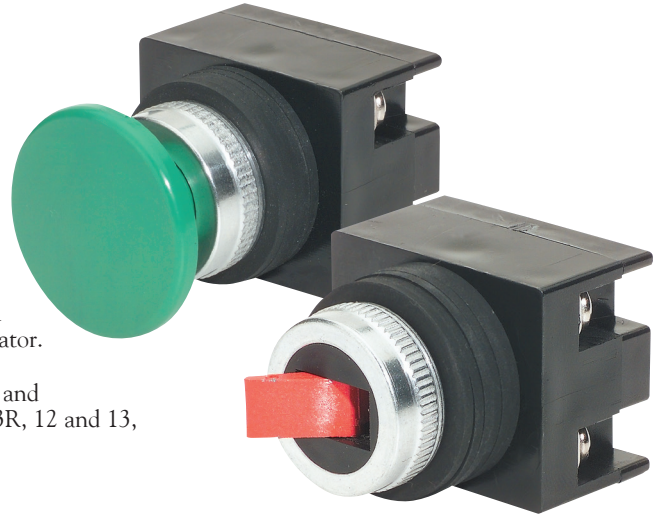
| IV. CONTACT BLOCK CONFIGURATION |   |         |
|---------------------------------|---|---------|
| CODE                            | DESCRIPTION   | LIST    |
| NO                              | 1 Normally Open Contact Block                         | —       |
| NC                              | 1 Normally Closed Contact Block                       | —       |
| NONC                            | Contact Block w/1 Normally Open and 1 Normally Closed | \$11.00 |
| 2NO                             | Contact Block w/2 Normally Open                       | \$11.00 |
| 2NC                             | Contact Block w/2 Normally Closed                     | \$11.00 |

| V. CLAMP RING |                     |         |
|---------------|---------------------|---------|
| CODE          | DESCRIPTION         | LIST    |
| (Blank)       | Polyester (Type 4X) | —       |
| MT            | Aluminum (Type 4)   | \$ 3.90 |

Toggle Switch Operators come with integral contacts ready for field wiring. They provide maintained operation and may be used in place of 2-Position Selector Switches to provide “On-Off” functions.

## 22MM NEMA MAINTAINED NON-ILLUMINATED PUSH BUTTONS & TOGGLE SWITCHES

Our 22mm NEMA line of Maintained Non-Illuminated Push Buttons and Toggle Switches feature a compact, thin design for tight fitting spaces and come with integral circuits for field wiring. Contact blocks are available to add to basic operators to increase the number and type of contacts. Up to three blocks deep with two circuits each may be added giving a total of eight contacts per operator. Blocks simply screw on the back of the operator. Refer to page 370 for add-on contact blocks. All c3controls 22mm NEMA operators are UL Listed and are rated Type 4/4X as standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.



### UNIQUE PRODUCT FEATURES



#### We Put The Metal On The Inside — Where It Counts!

1. c3controls Maintained Push Buttons contain a solid brass detent mechanism and are the best-engineered, most reliable heavy-duty Emergency Stop in the world. This rugged design, which is available with either polyester or aluminum clamp rings, ensures reliable operation in emergency applications, providing safe interruption of circuits, and much longer life when compared to any competitor's product.

2. Our Maintained Push Buttons and Toggle Switches feature a revolutionary U-Cup seal that is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. The U-Cup seal rides easily along the stroker and keeps water, oils, dust and other corrosive particles in the air away from the contact blocks. This U-cup seal also acts like a squeegee and forms a permanent watertight seal that meets Type 4/4X.

### SOME OF OUR POPULAR CONFIGURATIONS:

#### 2-POSITION PUSH-PULL MAINTAINED NON-ILLUMINATED OPERATORS WITH POLYESTER CLAMP RING (TYPE 4X)

| CATALOG NUMBER | DESCRIPTION  | LIST    |
|----------------|--|---------|
| 22PPNC-XPMRD   | Push-Pull Maintained Red Mushroom Cap w/1 Normally Closed Contact Block      | \$64.00 |
| 22PP2NC-XPMRD  | Push-Pull Maintained Red Mushroom Cap with a 2 Normally Closed Contact Block | \$75.00 |

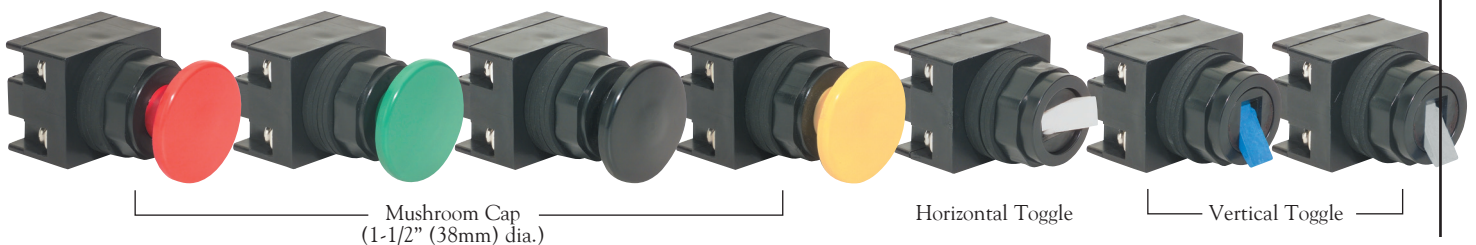
#### MAINTAINED TOGGLE SWITCH OPERATORS WITH POLYESTER CLAMP RING (TYPE 4X)

| CATALOG NUMBER | DESCRIPTION                                   | LIST    |
|----------------|---|---------|
| 22TVBKNO       | Black Vertical Toggle w/1 NO Contact Block    | \$40.00 |
| 22TVRD2NC      | Red Vertical Toggle with a 2 NC Contact Block | \$51.00 |

**MECHANICAL INTERLOCKS**  
provide lockout operation to a second push button, selector switch or toggle operator. See page 370 for details.



### AVAILABLE COLORS FOR MAINTAINED NON-ILLUMINATED PUSH BUTTONS AND TOGGLE SWITCHES



**IT'S EASY TO BUILD YOUR OWN PUSH BUTTON**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Momentary Push Buttons (Illuminated)**

**22IPB** I II III IV - V VI VII - VIII

Example: To build one of our most popular Push Buttons, the part number would be **22IPB + II + III + IV + V + VI + VII + VIII** or **22IPBR120I-XIFCRD-NC**



**I. OPERATOR TYPE**

| CODE  | DESCRIPTION             | LIST     |
|-------|-------------------------|----------|
| 22IPB | Illuminated Push Button | \$ 23.00 |

**II. OPERATOR LIGHT UNIT BASE**

| CODE | DESCRIPTION  | LIST     |
|------|--------------|----------|
| F    | Full Voltage | \$ 49.00 |
| R    | Resistor     | \$ 49.00 |

**III. VOLTAGE BASED ON LIGHT UNIT BASE**

| CODE                | DESCRIPTION |
|---------------------|-------------|
| <b>FULL VOLTAGE</b> |             |
| 6                   | 6V AC/DC    |
| 12                  | 12V AC/DC   |
| 24                  | 24V AC/DC   |
| 120                 | 120V AC/DC  |
| <b>RESISTOR</b>     |             |
| 120                 | 120V AC/DC  |
| 240                 | 240V AC/DC  |
| 480                 | 480V AC/DC  |

**IV. LAMP TYPE/COLOR**

| CODE                | DESCRIPTION          | LIST     |
|---------------------|----------------------|----------|
| <b>LED</b>          |                      |          |
| LA                  | Amber                | \$ 18.00 |
| LB                  | Blue                 | \$ 18.00 |
| LG                  | Green                | \$ 18.00 |
| LR                  | Red                  | \$ 18.00 |
| LW                  | White                | \$ 18.00 |
| <b>INCANDESCENT</b> |                      |          |
| I                   | Clear                | —        |
| F                   | Clear Flashing Bulb* | \$ 7.10  |

\*NOTE: Incandescent flashing bulbs available for any 6V full voltage application.

**NEON†**

|    |       |   |
|----|-------|---|
| NG | Green | — |
| NR | Red   | — |

†NOTE: Only available in 22IPBR120, 22IPBR240 and 22IPBR480.

|    |         |           |
|----|---------|-----------|
| NL | No Lamp | - \$ 1.80 |
|----|---------|-----------|

**V. CLAMP RING**

| CODE | DESCRIPTION         | LIST    |
|------|---------------------|---------|
| X    | Polyester (Type 4X) | —       |
| M    | Aluminum (Type 4)   | \$ 3.90 |

**VI. LENS TYPE**

| CODE | DESCRIPTION   | LIST     |
|------|---------------|----------|
| IFC  | Flush/Guarded | \$ 10.00 |
| IXC  | Extended      | \$ 10.00 |
| IMC  | Mushroom      | \$ 23.00 |

**VII. LENS COLOR**

| CODE | COLOR |
|------|-------|
| AR   | Amber |
| BE   | Blue  |
| CR   | Clear |
| GN   | Green |
| RD   | Red   |
| WE   | White |

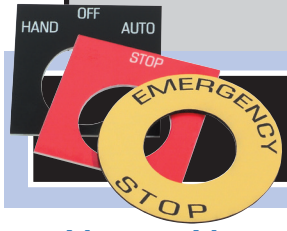
**VIII. CONTACT BLOCK CONFIGURATION**

| CODE  | DESCRIPTION  | LIST     |
|-------|--|----------|
| NO    | 1 Normally Open Contact Block                        | \$ 13.00 |
| NC    | 1 Normally Closed Contact Block                      | \$ 13.00 |
| EM    | 1 Early Make Contact Block                           | \$ 17.00 |
| DB    | 1 Delayed Break Contact Block                        | \$ 17.00 |
| NO-NO | 2 Normally Open Contact Blocks                       | \$ 26.00 |
| NC-NC | 2 Normally Closed Contact Blocks                     | \$ 26.00 |
| NO-NC | 1 Normally Open and 1 Normally Closed Contact Blocks | \$ 26.00 |

SEE PAGE 374 FOR LAMP TECHNICAL DATA CHART.

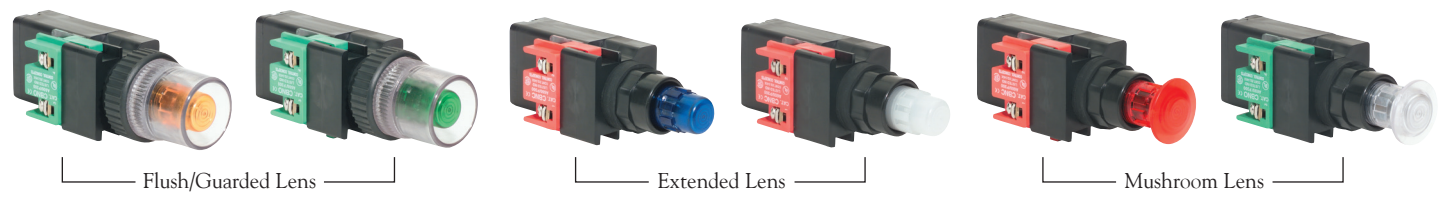
22mm Illuminated Push Buttons accept standard 30mm contact blocks. These standard contact blocks feature convenient snap-on assembly and are stackable up to four deep. They are also color coded for easy circuit identification to minimize wiring errors and speed the wiring process. Please refer to pages 199-200.

DISCOUNT SCHEDULE **E**



**LEGEND PLATES** in almost any size & color are available for same day shipping. See pages 372-373 for complete selection.

**MIX AND MATCH ANY COLOR AND MOMENTARY ILLUMINATED PUSH BUTTON LENS**



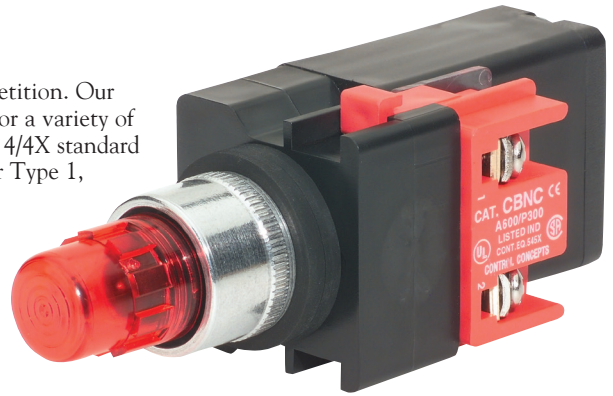


## 22MM NEMA MOMENTARY ILLUMINATED PUSH BUTTONS

c3controls goes the extra step to make sure that our products outlast the competition. Our 22mm NEMA Momentary Illuminated Push Buttons are durable and flexible for a variety of uses. All c3controls 22mm NEMA operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.

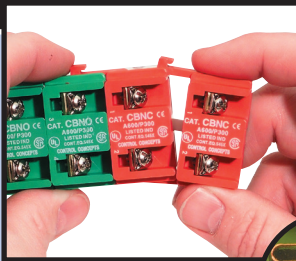
Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Polyester or polished aluminum clamp rings.
- Full voltage lights incorporate a unique insulated socket design to minimize accidental contact during lamp change.
- All lights use miniature bayonet base lamps to provide reliable lamp secureness.
- Available with Incandescent, Neon, or our LED lamps with leakage protection.
- #6 terminal screws with self-lifting captive wire clamps accommodate #22 through two #12 AWG wires (0.5 - 4mm<sup>2</sup>) per terminal.
- Operators conveniently mount in a round 7/8" (22.5mm) hole that is directly interchangeable with competitors units.

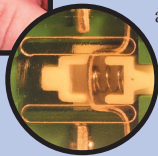


22MM NEMA PILOT DEVICES

### UNIQUE PRODUCT FEATURES



**NOTE:** Gold plated contacts are available on standard 30mm blocks for dry circuit applications. See pages 199-200 for details.

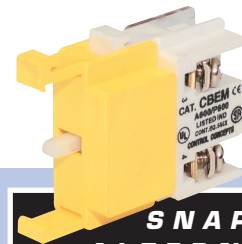


1. Vibration resistant snap-on assembly 30mm contact blocks simplify installation. See pages 199-200 for information on 30mm contact blocks.
2. Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. The U-Cup seal rides easily along the stroker and keeps water, oils, dust and other corrosive particles in the air away from the contact blocks. This U-cup seal also acts like a squeegee and forms a permanent watertight seal that meets Type 4/4X standards.

### SOME OF OUR POPULAR CONFIGURATIONS:

#### MOMENTARY ILLUMINATED PUSH BUTTON OPERATORS WITH POLYESTER CLAMP RING (TYPE 4X)

|              | FLUSH/GUARDED LENS |                          |          | EXTENDED LENS            |          |
|--------------|--------------------|--------------------------|----------|--------------------------|----------|
|              | CAP COLOR          | CATALOG NUMBER           | LIST     | CATALOG NUMBER           | LIST     |
| Full Voltage | Amber              | 22IPBF120LA-XIFCAR-NO-NC | \$126.00 | 22IPBF120LA-XIXCAR-NO-NC | \$126.00 |
|              | Green              | 22IPBF120LG-XIFCGN-NO    | \$113.00 | 22IPBF120LG-XIXCGN-NO    | \$113.00 |
|              | Red                | 22IPBF120LR-XIFCRD-NC    | \$113.00 | 22IPBF120LR-XIXCRD-NC    | \$113.00 |
| Resistor     | Amber              | 22IPBR120I-XIFCAR-NO-NC  | \$108.00 | 22IPBR120I-XIXCAR-NO-NC  | \$108.00 |
|              | Green              | 22IPBR120I-XIFCGN-NO     | \$ 95.00 | 22IPBR120I-XIXCGN-NO     | \$ 95.00 |
|              | Red                | 22IPBR120I-XIFCRD-NC     | \$ 95.00 | 22IPBR120I-XIXCRD-NC     | \$ 95.00 |



**SNAP-ON ALTERNATE ACTION BLOCKS**  
provide "push-on/push-off" operation on our push buttons. See page 212.

IT'S EASY TO BUILD YOUR OWN PILOT LIGHT

Simply pick the code number from each of the sections below and combine them to build your part number.

**Pilot Lights**



Example: To build one of our most popular Pilot Lights, the part number would be I + II + III + IV + PL + VI or 22FVL120I-XPLGN



**I. PILOT LIGHT OPERATOR**

| CODE  | DESCRIPTION            | LIST    |
|-------|------------------------|---------|
| 22FVL | Full Voltage           | \$50.00 |
| 22RL  | Resistor               | \$50.00 |
| 22RTL | Dual Input Remote Test | \$78.00 |

**II. VOLTAGE BASED ON OPERATOR TYPE**

| CODE                          | DESCRIPTION           |
|-------------------------------|-----------------------|
| <b>FULL VOLTAGE</b>           |                       |
| 6                             | 6V AC/DC              |
| 12                            | 12V AC/DC             |
| 24                            | 24V AC/DC             |
| 120                           | 120V AC/DC            |
| <b>RESISTOR</b>               |                       |
| 120                           | 120V AC/DC            |
| 240                           | 240V AC/DC            |
| 480                           | 480V AC/DC            |
| <b>DUAL INPUT REMOTE TEST</b> |                       |
| 6                             | 6V AC/DC              |
| 12                            | 12V AC/DC             |
| 24                            | 24V AC/DC             |
| 120                           | 120V AC/DC (LED Only) |

**III. LAMP TYPE/COLOR**

| CODE  | COLOR                | LIST      |
|---|----------------------|-----------|
| <b>LED</b>  |                      |           |
| LA  | Amber                | \$18.00   |
| LB  | Blue                 | \$18.00   |
| LG  | Green                | \$18.00   |
| LR  | Red                  | \$18.00   |
| LW  | White                | \$18.00   |
| <b>INCANDESCENT</b>   |                      |           |
| I   | Clear                | —         |
| F   | Clear Flashing Bulb* | \$ 7.10   |
| *NOTE: Incandescent flashing bulbs available for any 6V full voltage application. |                      |           |
| <b>NEON†</b>  |                      |           |
| NG  | Green                | —         |
| NR  | Red                  | —         |
| †NOTE: Only Available in 22FVL120, 22RL240 and 22RL480.                           |                      |           |
| NL  | No Lamp              | — \$ 1.80 |

**IV. CLAMP RING**

| CODE | DESCRIPTION         | LIST    |
|------|---------------------|---------|
| X    | Polyester (Type 4X) | —       |
| M    | Aluminum (Type 4)   | \$ 3.90 |

**V. LENS TYPE**

| CODE | DESCRIPTION      | LIST    |
|------|------------------|---------|
| PL   | Pilot Light Lens | \$ 7.00 |

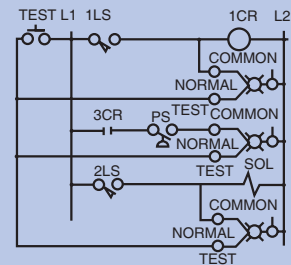
**VI. LENS COLOR**

| CODE | COLOR |
|------|-------|
| AR   | Amber |
| BE   | Blue  |
| CR   | Clear |
| GN   | Green |
| RD   | Red   |
| WE   | White |

SEE PAGE 374 FOR LAMP TECHNICAL DATA CHART.

**DUAL INPUT REMOTE TEST**

Our unique Dual Input Remote light unit can be used as a pilot light while also permitting the testing of a number of lights from a single push button. A diode circuit isolates the test supply from the normal supply. The schematic shown represents a typical dual input application.



DISCOUNT SCHEDULE **E**

SOME OF OUR POPULAR CONFIGURATIONS:

**PILOT LIGHTS WITH POLYESTER CLAMP RING (TYPE 4X)**

| CATALOG NUMBER   | DESCRIPTION                               | LIST    |
|------------------|---|---------|
| 22FVL120I-XPLRD  | Full Voltage 120V Incandescent w/Red Lens | \$57.00 |
| 22FVL120LG-XPLGN | Full Voltage 120V Green LED w/Green Lens  | \$75.00 |
| 22FVL120LA-XPLAR | Full Voltage 120V Amber LED w/Amber Lens  | \$75.00 |

AVAILABLE LENS COLORS FOR PILOT LIGHTS



## 22MM NEMA PILOT LIGHTS

Our 22mm NEMA Pilot Lights and Illuminated Push-To-Test Pilot Lights, when utilized with our LED lamps, provide leakage protection, long-lasting life and high quality with tremendous resistance to shock and vibration. Our reflection technology and state-of-the-art LED lamps improve visibility from all angles. c3controls LED lamps last 100,000 hours — that's 11.4 years! Combine these LEDs with our full voltage or resistor packages for optimum durability. All c3controls 22mm NEMA operators are UL Listed and are rated Type 4/4X as standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.

### IT'S EASY TO BUILD YOUR OWN PILOT LIGHT

Simply pick the code number from each of the sections below and combine them to build your part number.

#### Push-To-Test Pilot Lights



Example: To build one of our most popular Pilot Lights, the part number would be **I + PTT + III + IV + V + VI + VII** or **22RPTT120I-XIFCGN**



#### I. PUSH-TO-TEST OPERATOR LIGHT UNIT BASE

| CODE | DESCRIPTION  | LIST    |
|------|--------------|---------|
| 22F  | Full Voltage | \$49.00 |
| 22R  | Resistor     | \$49.00 |

#### II. OPERATOR TYPE

| CODE | DESCRIPTION  | LIST    |
|------|--------------|---------|
| PTT  | Push-To-Test | \$19.00 |

#### III. VOLTAGE BASED ON OPERATOR LIGHT UNIT BASE

| CODE                | DESCRIPTION |
|---------------------|-------------|
| <b>FULL VOLTAGE</b> |             |
| 6                   | 6V AC/DC    |
| 12                  | 12V AC/DC   |
| 24                  | 24V AC/DC   |
| 120                 | 120V AC/DC  |
| <b>RESISTOR</b>     |             |
| 120                 | 120V AC/DC  |
| 240                 | 240V AC/DC  |
| 480                 | 480V AC/DC  |

#### IV. LAMP TYPE/COLOR

| CODE  | COLOR                | LIST      |
|---|----------------------|-----------|
| <b>LED</b>  |                      |           |
| LA  | Amber                | \$18.00   |
| LB  | Blue                 | \$18.00   |
| LG  | Green                | \$18.00   |
| LR  | Red                  | \$18.00   |
| LW  | White                | \$18.00   |
| <b>INCANDESCENT</b>   |                      |           |
| I   | Clear                | —         |
| F   | Clear Flashing Bulb* | \$ 7.10   |
| *NOTE: Incandescent flashing bulbs available for any 6V full voltage application. |                      |           |
| <b>NEON†</b>  |                      |           |
| NG  | Green                | —         |
| NR  | Red                  | —         |
| †NOTE: Only Available in 22FPTT120, 22RPTT240 and 22RPTT480.                      |                      |           |
| NL  | No Lamp              | — \$ 1.80 |

#### V. CLAMP RING

| CODE | DESCRIPTION         | LIST    |
|------|---------------------|---------|
| X    | Polyester (Type 4X) | —       |
| M    | Aluminum (Type 4)   | \$ 3.90 |

#### VI. LENS TYPE

| CODE | DESCRIPTION        | LIST    |
|------|--------------------|---------|
| IFC  | Flush/Guarded Lens | \$10.00 |
| IXC  | Extended Lens      | \$10.00 |

#### VII. LENS COLOR

| CODE | COLOR |
|------|-------|
| AR   | Amber |
| BE   | Blue  |
| CR   | Clear |
| GN   | Green |
| RD   | Red   |
| WE   | White |

SEE PAGE 374 FOR LAMP TECHNICAL DATA CHART.

Our Push-To-Test Pilot Lights combine an illuminated push button with normally open and normally closed contact blocks factory wired for three-point wiring in standard push-to-test circuits.

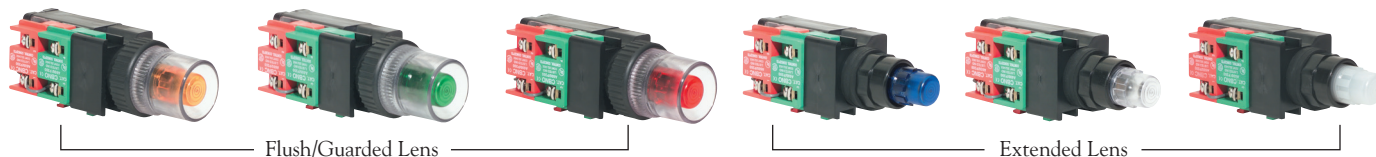


### SOME OF OUR POPULAR CONFIGURATIONS:

#### PUSH-TO-TEST PILOT LIGHTS W/POLYESTER CLAMP RING (TYPE 4X)

| CATALOG NUMBER     | DESCRIPTION   | LIST    |
|--------------------|---|---------|
| 22FPTT120LG-XIFCGN | Full Voltage 120V w/LED Lamp & Green Flush/Guarded Lens | \$96.00 |
| 22RPTT120I-XIFCRD  | Resistor 120V w/Incand. Lamp and Red Flush/Guarded Lens | \$78.00 |

#### MIX AND MATCH ANY COLOR AND PUSH-TO-TEST PILOT LIGHT LENS



Flush/Guarded Lens

Extended Lens

**IT'S EASY TO BUILD YOUR OWN SELECTOR SWITCH**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Selector Switches**



Example: To build one of our most popular Selector Switches, the part number would be **I + II + III + IV + V + VI + VII** or **22SS3AC-XHBK**



\*NOTE: Our 22mm Non-Illuminated Selector Switches come with two integral contacts in the operator base and are ready for field wiring.  
\*\*NOTE: Up to three blocks with two circuits each may be added giving a total of eight contacts per operator.

**I. OPERATOR FUNCTION**

| CODE  | POSITION/FUNCTION           | LIST    |
|-------|-----------------------------|---------|
| 22SS2 | 2/Maintained                | \$19.00 |
| 22SRL | 2/Spring Return, R to L     | \$25.00 |
| 22SS3 | 3/Maintained                | \$19.00 |
| 22SAC | 3/Spring Return, L & R to C | \$25.00 |
| 22SLC | 3/Spring Return, L to C     | \$25.00 |
| 22SRC | 3/Spring Return, R to C     | \$25.00 |

**II. CIRCUIT DESIGNATION BASED ON OPERATOR FUNCTION**

**2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**HANDLE POSITION**

| CODE | LEFT | RIGHT | CONTACT BLOCK TYPE | LIST    |
|------|------|-------|--------------------|---------|
| G    | X 0  | 0     | 22CBNC             | \$13.00 |
| H    | 0 X  | X     | 22CBNO             | \$13.00 |
| GH   | X 0  | 0 X   | 22CBNONC           | \$23.00 |
| GG   | X 0  | 0     | 22CB2NC            | \$23.00 |
| HH   | 0 X  | 0 X   | 22CB2NO            | \$23.00 |

**3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**HANDLE POSITION**

| CODE | LEFT | CENTER | RIGHT | CONTACT BLOCK TYPE | LIST    |
|------|------|--------|-------|--------------------|---------|
| AB   | X 0  | 0      | 0     | 22CBNONC           | \$23.00 |
| AC   | X 0  | 0      | X     | 22CB2NO            | \$23.00 |
| AE   | X 0  | 0      | 0     | 22CBNOEM           | \$25.00 |
| AF   | X 0  | 0      | 0     | 22CBNODB           | \$25.00 |
| BC   | 0 X  | 0      | 0     | 22CBNCNO           | \$23.00 |
| BD   | 0 X  | 0      | X     | 22CBDBNC           | \$25.00 |
| BF   | 0 X  | 0      | 0     | 22CBNCDB           | \$25.00 |
| CD   | 0 0  | X      | X     | 22CBNODB           | \$25.00 |
| CE   | 0 0  | X      | X     | 22CBNOEM           | \$25.00 |
| DE   | 0 X  | X      | X     | 22CBDBEM           | \$25.00 |
| DF   | 0 X  | X      | 0     | 22CB2DB            | \$25.00 |
| EF   | X 0  | X      | 0     | 22CBDBEM           | \$25.00 |

**0 = OPEN X = CLOSED**

**III. CLAMP RING**

| CODE | DESCRIPTION         | LIST    |
|------|---------------------|---------|
| X    | Polyester (Type 4X) | —       |
| M    | Aluminum (Type 4)   | \$ 3.90 |

**IV. HANDLE TYPE**

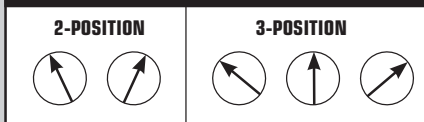
| CODE | DESCRIPTION | LIST    |
|------|-------------|---------|
| H    | Standard    | \$ 9.50 |
| L    | Lever       | \$ 9.50 |
| G    | Guarded*    | \$15.00 |

\*NOTE: Only available with a polyester clamp ring.

**V. HANDLE/INSERT COLOR**

| CODE | HANDLE COLOR | INSERT COLOR |
|------|--------------|--------------|
| BK   | Black        | White        |
| BE   | Blue         | White        |
| GN   | Green        | White        |
| GY   | Grey         | White        |
| RD   | Red          | White        |
| WE   | White        | Black        |
| YW   | Yellow       | Black        |

**HANDLE POSITIONS**



**DISCOUNT SCHEDULE E**

**SOME OF OUR POPULAR CONFIGURATIONS:**

**2-POSITION SELECTOR SWITCH OPERATORS**

| CONTACT SYMBOL | HANDLE POSITION<br>0=OPEN X=CLOSED |       | TYPE OF OPERATOR | MAINTAINED POSITION |         |
|----------------|------------------------------------|-------|------------------|---------------------|---------|
|                | LEFT                               | RIGHT |                  | CATALOG #           | LIST    |
| 1 NO           | 0                                  | X     | STANDARD         | 22SS2H-XHBK         | \$41.50 |
| 1 NC           | X                                  | 0     | STANDARD         | 22SS2G-XHBK         | \$41.50 |

**3-POSITION SELECTOR SWITCH OPERATORS**

| CONTACT SYMBOL | HANDLE POSITION<br>0=OPEN X=CLOSED |        |       | TYPE OF OPERATOR | MAINTAINED POSITION |         |
|----------------|------------------------------------|--------|-------|------------------|---------------------|---------|
|                | LEFT                               | CENTER | RIGHT |                  | CATALOG #           | LIST    |
| NO/NO          | X                                  | 0      | 0     | STANDARD         | 22SS3AC-XHBK        | \$51.50 |



**VI. OPTIONS—ADD-ON CONTACT BLOCKS**

**2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**HANDLE POSITION**

| CODE | LEFT | RIGHT | CONTACT BLOCK TYPE | LIST    |
|------|------|-------|--------------------|---------|
| G    | X    | 0     | 22CBNC             | \$13.00 |
| H    | 0    | X     | 22CBNO             | \$13.00 |
| GH   | X    | 0     | 22CBNONC           | \$23.00 |
|      | 0    | X     |                    |         |
| GG   | X    | 0     | 22CB2NC            | \$23.00 |
|      | X    | 0     |                    |         |
| HH   | 0    | X     | 22CB2NO            | \$23.00 |
|      | 0    | X     |                    |         |

**3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**HANDLE POSITION**

| CODE | LEFT | CENTER | RIGHT | CONTACT BLOCK TYPE | LIST    |
|------|------|--------|-------|--------------------|---------|
| A    | X    | 0      | 0     | 22CBNO             | \$ 8.00 |
| B    | 0    | X      | 0     | 22CBNC             | \$ 9.00 |
| C    | 0    | 0      | X     | 22CBNO             | \$10.00 |
| D    | 0    | X      | X     | 22CBDB             | \$11.00 |
| E    | X    | 0      | X     | 22CBEM             | \$12.00 |
| F    | X    | X      | 0     | 22CBDB             | \$13.00 |
| AB   | X    | 0      | 0     | 22CBNONC           | \$23.00 |
|      | 0    | X      | 0     |                    |         |
| AC   | X    | 0      | 0     | 22CB2NO            | \$23.00 |
|      | 0    | 0      | X     |                    |         |
| AE   | X    | 0      | 0     | 22CBNOEM           | \$25.00 |
|      | X    | 0      | X     |                    |         |
| AF   | X    | 0      | 0     | 22CBNODB           | \$25.00 |
|      | X    | X      | 0     |                    |         |
| BC   | 0    | X      | 0     | 22CBNCNO           | \$23.00 |
|      | 0    | 0      | X     |                    |         |
| BD   | 0    | X      | 0     | 22CBDBNC           | \$25.00 |
|      | 0    | X      | X     |                    |         |
| BF   | 0    | X      | 0     | 22CBNCDB           | \$25.00 |
|      | X    | X      | 0     |                    |         |
| CD   | 0    | 0      | X     | 22CBNODB           | \$25.00 |
|      | 0    | X      | X     |                    |         |
| CE   | 0    | 0      | X     | 22CBNOEM           | \$25.00 |
|      | X    | 0      | X     |                    |         |
| DE   | 0    | X      | X     | 22CBDBEM           | \$25.00 |
|      | X    | 0      | X     |                    |         |
| DF   | 0    | X      | X     | 22CB2DB            | \$25.00 |
|      | X    | X      | 0     |                    |         |
| EF   | X    | 0      | X     | 22CBDBEM           | \$25.00 |
|      | X    | X      | 0     |                    |         |

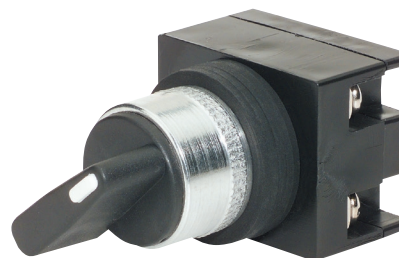
**VII. OPTIONS—ADD-ON CONTACT BLOCKS**

(USE CHART VI FROM ABOVE)

**0 = OPEN X = CLOSED**

## 22MM NEMA NON-ILLUMINATED SELECTOR SWITCHES

With our unique universal cam design, c3controls 22mm NEMA Selector Switches offer multiple functions in a single device eliminating the need to install separate devices to perform individual functions based on contact block configuration. All operators feature polyester housings, are UL Listed, and are rated Type 4/4X as standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.



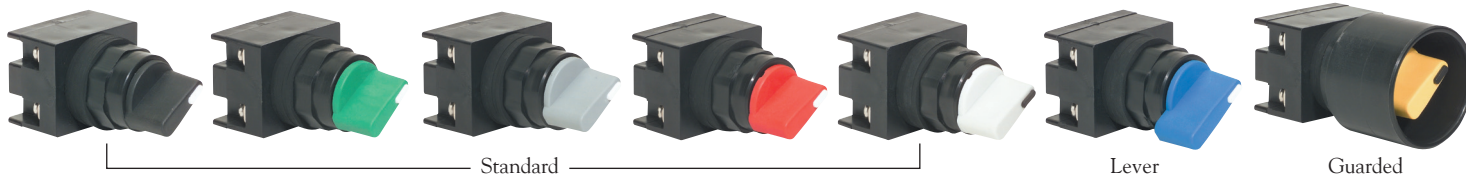
### UNIQUE PRODUCT FEATURES

SAVE TIME & MONEY - WITH C3CONTROLS, ONE CAM DOES IT ALL!

1. One-Cam does it all vs. our competitors who need up to fifteen cams to perform the same function. This One-Cam design eliminates the need for multiple cam configurations and selector switch configuration nightmares, saving time, inventory, money, and ensuring 100% cam selection configuration accuracy.
2. Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight.
3. All frictional parts are molded with an internal self-lubricant to provide outstanding wear and smooth cam operations without troublesome greases used by others that attracts dust and other particles in the area.



MIX AND MATCH ANY COLOR AND SELECTOR SWITCH HANDLE



**IT'S EASY TO BUILD YOUR OWN SELECTOR SWITCH**

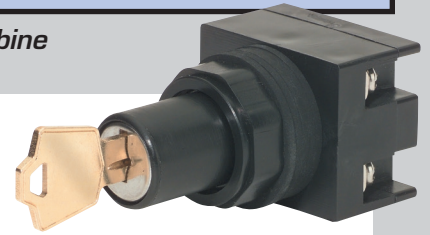
Simply pick the code number from each of the sections below and combine them to build your part number.

**Keyed Selector Switches**



Example: To build one of our most popular Selector Switches, the part number would be **I + II + III + IV + V + VI** or **22K3ACKAX**

\*NOTE: Our 22mm Keyed Selector Switches come with two integral contacts in the operator base and are ready for field wiring.  
\*\*NOTE: Up to three blocks with two circuits each may be added giving a total of eight contacts per operator.



**I. OPERATOR FUNCTION**

| CODE  | POSITION/FUNCTION           | AVAILABLE KEY REMOVAL POSITION(S) | LIST     |
|-------|-----------------------------|-----------------------------------|----------|
| 22K2  | 2/Maintained                | KA, KL, KR                        | \$ 70.00 |
| 22KRL | 2/Spring Return, R to L     | KL                                | \$ 82.00 |
| 22K3  | 3/Maintained                | KA, KL, KR, KC, KLR, KLC, KRC     | \$ 70.00 |
| 22KAC | 3/Spring Return, L & R to C | KC                                | \$ 81.00 |
| 22KLC | 3/Spring Return, L to C     | KR, KC                            | \$ 81.00 |
| 22KRC | 3/Spring Return, R to C     | KL, KC, KLC                       | \$ 81.00 |

**III. KEY REMOVAL POSITION**

| CODE | REMOVAL POSITION    |
|------|---------------------|
| KA   | All                 |
| KL   | Left Only           |
| KR   | Right Only          |
| KC   | Center Only         |
| KLR  | Left & Right Only   |
| KLC  | Left & Center Only  |
| KRC  | Right & Center Only |

**II. CIRCUIT DESIGNATION BASED ON OPERATOR FUNCTION**

**2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

| KEY POSITION |      |       |                    |          |
|--------------|------|-------|--------------------|----------|
| CODE         | LEFT | RIGHT | CONTACT BLOCK TYPE | LIST     |
| G            | X    | 0     | 22CBNC             | \$ 13.00 |
| H            | 0    | X     | 22CBNO             | \$ 13.00 |
| GH           | X    | 0     | 22CBNONC           | \$ 23.00 |
|              | 0    | X     |                    |          |
| GG           | X    | 0     | 22CB2NC            | \$ 23.00 |
|              | X    | 0     |                    |          |
| HH           | 0    | X     | 22CB2NO            | \$ 23.00 |
|              | 0    | X     |                    |          |

**3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

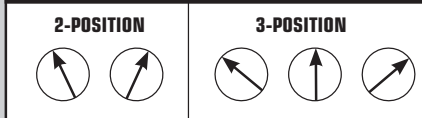
| KEY POSITION |      |        |       |                    |          |
|--------------|------|--------|-------|--------------------|----------|
| CODE         | LEFT | CENTER | RIGHT | CONTACT BLOCK TYPE | LIST     |
| AB           | X    | 0      | 0     | 22CBNONC           | \$ 23.00 |
|              | 0    | X      | 0     |                    |          |
| AC           | X    | 0      | 0     | 22CB2NO            | \$ 23.00 |
|              | 0    | 0      | X     |                    |          |
| AE           | X    | 0      | 0     | 22CBNOEM           | \$ 25.00 |
|              | X    | 0      | X     |                    |          |
| AF           | X    | 0      | 0     | 22CBNODB           | \$ 25.00 |
|              | X    | X      | 0     |                    |          |
| BC           | 0    | X      | 0     | 22CBNCNO           | \$ 23.00 |
|              | 0    | 0      | X     |                    |          |
| BD           | 0    | X      | 0     | 22CBDBNC           | \$ 25.00 |
|              | 0    | X      | X     |                    |          |
| BF           | 0    | X      | 0     | 22CBNCDB           | \$ 25.00 |
|              | X    | X      | 0     |                    |          |
| CD           | 0    | 0      | X     | 22CBNODB           | \$ 25.00 |
|              | 0    | X      | X     |                    |          |
| CE           | 0    | 0      | X     | 22CBNOEM           | \$ 25.00 |
|              | X    | 0      | X     |                    |          |
| DE           | 0    | X      | X     | 22CBDBEM           | \$ 25.00 |
|              | X    | 0      | X     |                    |          |
| DF           | 0    | X      | X     | 22CB2DB            | \$ 25.00 |
|              | X    | X      | 0     |                    |          |
| EF           | X    | 0      | X     | 22CBDBEM           | \$ 25.00 |
|              | X    | X      | 0     |                    |          |

**0 = OPEN    X = CLOSED**

**IV. CLAMP RING**

| CODE | DESCRIPTION         | LIST    |
|------|---------------------|---------|
| X    | Polyester (Type 4X) | —       |
| M    | Aluminum (Type 4)   | \$ 3.90 |

**KEY POSITIONS**



**DISCOUNT SCHEDULE E**

**KEYED SWITCH FEATURES**

**Alternate Key Combinations:** Up to 9 different key combinations (CC series) are available. To order locks keyed differently, consult factory or specify on order and increase the List price \$28.00 per operator.

**Master Keys:** A master key is available that works in all 9 CC series key combinations. To order, specify part number MS MK1250 (\$20.00 per set of two master keys).

**Extra or Replacement Keys:** Available for standard keyed selector switches only. To order, specify part number ES201 (\$4.00 per set of two keys). NOTE: Two keys come standard with each operator.

**V. OPTIONS—ADD-ON CONTACT BLOCKS**

**2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**KEY POSITION**

| CODE | LEFT | RIGHT | CONTACT BLOCK TYPE | LIST     |
|------|------|-------|--------------------|----------|
| G    | X    | 0     | 22CBNC             | \$ 13.00 |
| H    | 0    | X     | 22CBNO             | \$ 13.00 |
| GH   | X    | 0     | 22CBNONC           | \$ 23.00 |
|      | 0    | X     |                    |          |
| GG   | X    | 0     | 22CB2NC            | \$ 23.00 |
|      | X    | 0     |                    |          |
| HH   | 0    | X     | 22CB2NO            | \$ 23.00 |
|      | 0    | X     |                    |          |

**3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION**

**KEY POSITION**

| CODE | LEFT | CENTER | RIGHT | CONTACT BLOCK TYPE | LIST     |
|------|------|--------|-------|--------------------|----------|
| A    | X    | 0      | 0     | 22CBNO             | \$ 8.00  |
| B    | 0    | X      | 0     | 22CBNC             | \$ 9.00  |
| C    | 0    | 0      | X     | 22CBNO             | \$ 10.00 |
| D    | 0    | X      | X     | 22CBDB             | \$ 11.00 |
| E    | X    | 0      | X     | 22CBEM             | \$ 12.00 |
| F    | X    | X      | 0     | 22CBDB             | \$ 13.00 |
| AB   | X    | 0      | 0     | 22CBNONC           | \$ 23.00 |
|      | 0    | X      | 0     |                    |          |
| AC   | X    | 0      | 0     | 22CB2NO            | \$ 23.00 |
|      | 0    | 0      | X     |                    |          |
| AE   | X    | 0      | 0     | 22CBNOEM           | \$ 25.00 |
|      | X    | 0      | X     |                    |          |
| AF   | X    | 0      | 0     | 22CBNODB           | \$ 25.00 |
|      | X    | X      | 0     |                    |          |
| BC   | 0    | X      | 0     | 22CBNCNO           | \$ 23.00 |
|      | 0    | 0      | X     |                    |          |
| BD   | 0    | X      | 0     | 22CBDBNC           | \$ 25.00 |
|      | 0    | X      | X     |                    |          |
| BF   | 0    | X      | 0     | 22CBNCDB           | \$ 25.00 |
|      | X    | X      | 0     |                    |          |
| CD   | 0    | 0      | X     | 22CBNODB           | \$ 25.00 |
|      | 0    | X      | X     |                    |          |
| CE   | 0    | 0      | X     | 22CBNOEM           | \$ 25.00 |
|      | X    | 0      | X     |                    |          |
| DE   | 0    | X      | X     | 22CBDBEM           | \$ 25.00 |
|      | X    | 0      | X     |                    |          |
| DF   | 0    | X      | X     | 22CB2DB            | \$ 25.00 |
|      | X    | X      | 0     |                    |          |
| EF   | X    | 0      | X     | 22CBDBEM           | \$ 25.00 |
|      | X    | X      | 0     |                    |          |

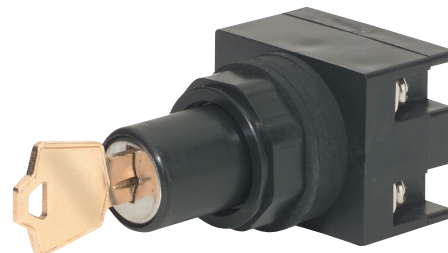
**VI. OPTIONS—ADD-ON CONTACT BLOCKS**

(USE CHART V FROM ABOVE)

**0 = OPEN X = CLOSED**

## 22MM NEMA KEYED SELECTOR SWITCHES

With our unique universal cam design, c3controls 22mm NEMA Selector Switches offer multiple functions in a single device eliminating the need to install separate devices to perform individual functions based on contact block configuration. All operators feature polyester housings, are UL Listed, and are rated Type 4/4X as standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements. Keys are extra heavy brass for long life.



### UNIQUE PRODUCT FEATURES

SAVE TIME & MONEY - WITH C3CONTROLS, ONE CAM DOES IT ALL!

1. One-Cam does it all vs. our competitors who need up to fifteen cams to perform the same function. This One-Cam design eliminates the need for multiple cam configurations and selector switch configuration nightmares, saving time, inventory, money, and ensuring 100% cam selection configuration accuracy.
2. Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight.
3. All frictional parts are molded with an internal self-lubricant to provide outstanding wear and smooth cam operations without troublesome greases used by others that attracts dust and other particles in the area.



SOME OF OUR POPULAR CONFIGURATIONS:

**2-POSITION KEYED SELECTOR SWITCHES W/POLYESTER CLAMP RING (TYPE 4X)**

| CONTACT SYMBOL | HANDLE POSITION |            | KEY REMOVAL POSITION | MAINTAINED POSITION |          | SPRING RETURN FROM RIGHT TO LEFT |          |
|----------------|-----------------|------------|----------------------|---------------------|----------|----------------------------------|----------|
|                | 0=OPEN          | X=CLOSED   |                      | CATALOG #           | LIST     | CATALOG #                        | LIST     |
| 1 NO<br>       | LEFT<br>0       | RIGHT<br>X | Left & Right         | 22K2H-KAX           | \$ 83.00 | 22KRLH-KAX                       | \$ 95.00 |

**3-POSITION KEYED SELECTOR SWITCHES W/POLYESTER CLAMP RING (TYPE 4X)**

| CONTACT SYMBOL | HANDLE POSITION |        |       | KEY REMOVAL POSITION | MAINTAINED POSITION |          | SPRING RETURN FROM ALL TO CENTER |          |
|----------------|-----------------|--------|-------|----------------------|---------------------|----------|----------------------------------|----------|
|                | LEFT            | CENTER | RIGHT |                      | CATALOG #           | LIST     | CATALOG #                        | LIST     |
| NO/NO<br>      | X               | 0      | 0     | Center               | 22K3AC-KCX          | \$ 93.00 | 22KACAC-KCX                      | \$104.00 |
|                | 0               | 0      | X     |                      |                     |          |                                  |          |

**IT'S EASY TO BUILD YOUR OWN POTENTIOMETER**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Potentiometer Operators**

**22POTO**    -    -   

I            II            III            IV

Example: To build one of our most popular Potentiometer Operators, the part number would be **22POTO + II + III + IV** or **22POTO5K-TBW**



Terminal block kit may be ordered separately (part number TBK, List price \$9.60) or installed and wired at the factory to the potentiometer operator.

**DISCOUNT SCHEDULE E**

| I. OPERATOR TYPE |               |         |
|------------------|---------------|---------|
| CODE             | DESCRIPTION   | LIST    |
| 22POTO           | Potentiometer | \$58.00 |

| II. RESISTANCE |                    |         |
|----------------|--------------------|---------|
| CODE           | DESCRIPTION        | LIST    |
| (Blank)        | Operator only      | —       |
| 1k             | 1k Potentiometer   | \$22.00 |
| 2.5k           | 2.5k Potentiometer | \$22.00 |
| 5k             | 5k Potentiometer   | \$22.00 |
| 10k            | 10k Potentiometer  | \$22.00 |

Special order values available—consult factory (not available for guaranteed same day shipping).

| III. CLAMP RING |                     |         |
|-----------------|---------------------|---------|
| CODE            | DESCRIPTION         | LIST    |
| (Blank)         | Polyester (Type 4X) | —       |
| PM              | Aluminum (Type 4)   | \$ 4.30 |

| IV. TERMINAL BLOCK |                                    |         |
|--------------------|------------------------------------|---------|
| CODE               | DESCRIPTION                        | LIST    |
| (Blank)            | Operator only                      | —       |
| TBW                | Terminal Block installed and wired | \$16.00 |

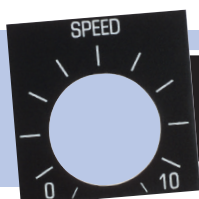
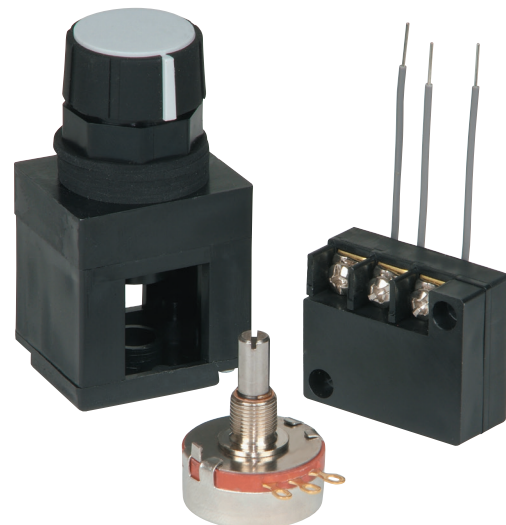
**SEE PAGE 379 FOR WIRING DIAGRAM.**

**UNIQUE PRODUCT FEATURES**

Our single-turn Potentiometer Operators utilize standard 2 watt potentiometers with 1/4" (6.4mm) bushing and 7/8" (22.5mm) long slotted shafts. 5/64" allen wrench is required for installation. All c3controls 22mm NEMA operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Type 1, 2, 3, 3R, 12 and 13, and meet global standards requirements.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Polyester or polished aluminum clamp rings.
- Three point terminal block and hardware.
- Standard 2 watt potentiometer.
- All frictional parts are molded with an internal self-lubricant to provide outstanding wear without troublesome greases used by others that attracts dust and other particles in the area.
- Our revolutionary U-Cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight.
- #6 terminal screws with self-lifting captive wire clamps accommodate #22 through two #12 AWG wires (0.5 - 4mm<sup>2</sup>) per terminal.
- Operators conveniently mount in a round 7/8" (22.5mm) hole that is directly interchangeable with competitors units.



**LEGEND PLATES FOR POTENTIOMETER OPERATORS** are available for same day shipping. See pages 372-373 for complete selection.

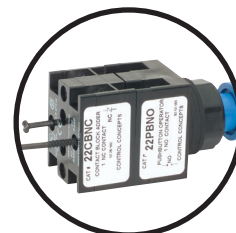


**ADD-ON CONTACT BLOCKS**

| CODE     | DESCRIPTION   | LIST    |
|----------|---|---------|
| 22CBNO   | 1 Normally Open Contact Block                       | \$13.00 |
| 22CBNC   | 1 Normally Closed Contact Block                     | \$13.00 |
| 22CBDB   | 1 Delayed Break Contact Block                       | \$17.00 |
| 22CBEM   | 1 Early Make Contact Block                          | \$17.00 |
| 22CBNONC | Contact Block w/1 Normally Open & 1 Normally Closed | \$23.00 |
| 22CBNCNO | Contact Block w/1 Normally Closed & 1 Normally Open | \$23.00 |
| 22CB2NO  | Contact Block w/2 Normally Open                     | \$23.00 |
| 22CB2NC  | Contact Block w/2 Normally Closed                   | \$23.00 |
| 22CBDBNO | Contact Block w/1 Delayed Break & 1 Normally Open   | \$25.00 |
| 22CBDBNC | Contact Block w/1 Delayed Break & 1 Normally Closed | \$25.00 |
| 22CBEMNO | Contact Block w/1 Early Make & 1 Normally Open      | \$25.00 |
| 22CBEMNC | Contact Block w/1 Early Make & 1 Normally Closed    | \$25.00 |
| 22CBDBEM | Contact Block w/1 Delayed Break & 1 Early Make      | \$28.00 |
| 22CB2DB  | Contact Block w/2 Delayed Break                     | \$28.00 |
| 22CB2EM  | Contact Block w/2 Early Make                        | \$28.00 |



Our "Add-On" Contact Blocks can be added to basic operators to increase the number and type of contacts. Up to three blocks with two circuits each may be added giving a total of eight contacts per operator. Blocks simply screw on the back of the operator. NOTE: The first two contacts must be ordered in operator base.



With our "Add-On" Contact Blocks you can get up to 8 contacts per operator!

**CONTACT BLOCK RATINGS:**

A600 (7,200 VA Make and 720 VA Break), 600V AC Maximum Maximum Continuous Thermal Current, Ith: 10A  
P300 (138 VA Make and 138 VA Break), 250V DC Maximum Maximum Continuous Thermal Current, Ith: 5A

**MECHANICAL INTERLOCK**



Our Mechanical Interlock is available in two styles and is designed for use between two adjacent operators mounted on 2" (50.8mm) centers. Use with Flush and Extended caps (see page 357) or with Push-Pull Maintained Caps or Toggle Switches (see page 359).

Mechanical Interlock Code "22MI" has a built-in mechanical advantage and may be used to interlock momentary push buttons and/or selector switch combinations.

Mechanical Interlock Code "22MIR" provides maximum leverage and is designed for use between maintained operators.



| CODE  | CONTACTS          | FOR USE WITH                                | LIST    |
|-------|-------------------|---|---------|
| 22MI  | No Contact Blocks | Momentary Push Buttons or Selector Switches | \$23.00 |
| 22MIR | No Contact Blocks | Maintained Operators                        | \$23.00 |

**THRUST & TRIM WASHERS**



For mounting contact blocks in the horizontal position. NOTE: Trim washer is not necessary when using a legend plate.

| CODE  | DESCRIPTION              | LIST    |
|-------|--------------------------|---------|
| 22TWH | Thrust Washer Horizontal | \$ 4.00 |

**EXTENDED CLAMP RINGS**



We offer three types of 22mm extended clamp rings that guard against accidental operation. Use our Extended Clamp Ring (22XECR) with flush caps, our Aluminum Extended Clamp Ring (22MECR) with flush or extended caps for easier access to buttons, and our Clear Guarded Clamp Ring (22EECR) with illuminated push buttons.

| CODE   | DESCRIPTION                  | LIST    |
|--------|------------------------------|---------|
| 22XECR | Extended Clamp Ring          | \$ 7.60 |
| 22MECR | Aluminum Extended Clamp Ring | \$16.00 |
| 22EECR | Clear Guarded Clamp Ring     | \$12.00 |

**CLAMP RING WRENCHES**



To simplify tightening and loosening of standard polyester octagonal clamp rings. Won't scratch your lens or panel. Our standard wrench (22CRW) fits all 22mm NEMA operators except mushroom sizes and lever selector switches. Our mushroom wrench (22CRWM) is for use with 22mm NEMA mushroom operators in tight spaces and should be purchased if mushroom caps and/or lever handles are commonly installed for 22X series octagonal polyester only.

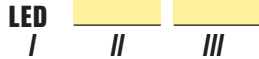
| CODE   | DESCRIPTION                | LIST    |
|--------|----------------------------|---------|
| 22CRW  | Standard Clamp Ring Wrench | \$23.00 |
| 22CRWM | Mushroom Clamp Ring Wrench | \$25.00 |



**LED, INCANDESCENT & NEON REPLACEMENT LAMPS**

c3controls offers a full range of lamp options in a miniature bayonet base for direct interchangeability which provides flexibility in choosing the best lamp for each installation application. Multiple voltage options in Incandescent, LED and Neon lamps are available. Please refer to the chart below to determine the appropriate replacement lamp based on your operator voltage. For lamp technical data, see page 374.

**LED Lamps**



Our LED lamps feature built-in leakage protection.

To order LED Lamps, the part number would be **LED + II + III**

**I. LAMP TYPE**

| CODE | DESCRIPTION | LIST    |
|------|-------------|---------|
| LED  | LED Lamp    | \$28.00 |

**II. VOLTAGE**

| CODE | DESCRIPTION |
|------|-------------|
| 6    | 6V          |
| 12   | 12V         |
| 24   | 24V         |
| 130  | 130V        |

**III. LAMP COLOR**

| CODE | COLOR |
|------|-------|
| AR   | Amber |
| BE   | Blue  |
| GN   | Green |
| RD   | Red   |
| WE   | White |

**PANEL GASKET**



Our panel gaskets are constructed of Neoprene for long life and low compression set and provide a watertight seal. Panel gaskets are supplied to accommodate different panel thickness. In order to meet Type 4/4X requirements, at least one gasket must be used. NOTE: All 22mm NEMA c3controls products come standard with five panel gaskets.

| CODE  | DESCRIPTION          | LIST    |
|-------|----------------------|---------|
| 22PG2 | 1/16" (1.6mm) Gasket | \$ 0.20 |

**LOCK OFF ATTACHMENT**



Our lock off attachment permits padlocking most 22mm NEMA operators.

| CODE    | FITS   | LIST    |
|---------|--|---------|
| 22LOAFC | Most 22mm Push Buttons and Selector Switches | \$50.00 |

**LAMP REMOVAL TOOL**



Used to facilitate the removal of lamps particularly in illuminated push buttons and push-to-test operators.

| CODE | DESCRIPTION       | LIST    |
|------|-------------------|---------|
| LRT  | Lamp Removal Tool | \$ 8.00 |

**Incandescent Lamps**



| CODE   | VOLTAGE      | LIST    |
|--------|--------------|---------|
| FVB6   | 6V           | \$ 4.00 |
| FVB12  | 12V          | \$ 4.00 |
| FVB24  | 24V          | \$ 4.00 |
| FVB55  | 55V          | \$ 8.00 |
| FVB120 | 120V         | \$ 8.00 |
| FVB6F  | 6V Flashing* | \$12.00 |

\*NOTE: There may be a 5-15 second delay before flashing begins.

**Neon Lamps**



| CODE     | VOLTAGE | COLOR | LIST    |
|----------|---------|-------|---------|
| FVB120NG | 120V    | Green | \$ 9.00 |
| FVB120NR | 120V    | Red   | \$ 9.00 |

**HOLE PLUGS**



Use to close and seal unused 7/8" (22.5mm) panel holes. Manufactured with integral "O" ring seal molded on both sides to provide Type 4X rating.

| CODE   | COLOR  | LIST    |
|--------|--------|---------|
| HP22BK | Black  | \$11.00 |
| HP22GY | Grey   | \$11.00 |
| HP22YW | Yellow | \$11.00 |

**22MM NEMA REPLACEMENT LAMP REFERENCE CHART**

(FOR REFERENCE ONLY - USE CHARTS ABOVE TO ORDER)

| OPERATOR CODE | OPERATOR VOLTAGE        | LED (ALL COLORS) | INCANDESCENT  | NEON                 |
|---------------|-------------------------|------------------|---------------|----------------------|
| 22FVL6        | Full Voltage 6V AC/DC   | LED6             | FVB6 or FVB6F | —                    |
| 22FVL12       | Full Voltage 12V AC/DC  | LED12            | FVB12         | —                    |
| 22FVL24       | Full Voltage 24V AC/DC  | LED24            | FVB24         | —                    |
| 22FVL120      | Full Voltage 120V AC/DC | LED130           | FVB120        | FVB120NG or FVB120NR |
| 22RL120L      | Resistor 120V AC/DC*    | LED24            | —             | —                    |
| 22RL120I      | Resistor 120V AC/DC*    | —                | FVB55         | —                    |
| 22RL240L      | Resistor 240V AC/DC*    | LED24            | —             | —                    |
| 22RL240I      | Resistor 240V AC/DC*    | —                | FVB120        | —                    |
| 22RL240N      | Resistor 240V AC/DC*    | —                | —             | FVB120NG or FVB120NR |
| 22RL480N      | Resistor 480V AC/DC*    | —                | —             | FVB120NG or FVB120NR |
| 22RTL6        | Dual Input 6V AC/DC     | LED6             | FVB6          | —                    |
| 22RTL12       | Dual Input 12V AC/DC    | LED12            | FVB12         | —                    |
| 22RTL24       | Dual Input 24V AC/DC    | LED24            | FVB24         | —                    |
| 22RTL120      | Dual Input 120V AC/DC   | LED130           | —             | —                    |

\*NOTE: Lamps are unique to Resistor Light Units. Refer to side of light unit for correct replacement lamp part number.



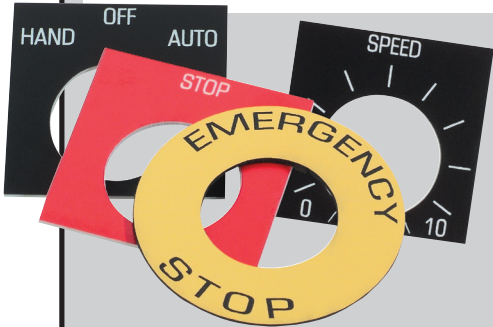
**IT'S EASY TO BUILD YOUR OWN LEGEND PLATE**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Legend Plates**



Legend plates feature 2 lines of text with approximately 16 characters per line. Uppercase is standard unless specified. The Potentiometer legend plate comes standard with a scale and one or two lines of text, see chart D below.



**I. LEGEND PLATE TYPE**

| CODE   | DESCRIPTION                  | LIST     |
|--------|------------------------------|----------|
| 22LP   | Standard 1-3/4" h x 1-3/4" w | \$ 4.00  |
| 22LPN  | Narrow 1-3/4" h x 1-1/2" w   | \$ 4.00  |
| 22LPS  | Short 1-1/2" h x 1-3/4" w*   | \$ 4.00  |
| 22LPT  | Tall 2" h x 1-3/4" w         | \$ 5.00  |
| 22LPJ  | Jumbo 2" h x 2" w            | \$ 5.00  |
| 22LPR  | Standard Round 2-13/32" Dia. | \$ 9.00  |
| 22LPRM | Medium Round 2-3/4" Dia.     | \$ 11.00 |
| 22LPRJ | Jumbo Round 3-3/4" Dia.      | \$ 12.00 |

\*NOTE: The short legend plate (22LPS) features 1 line of text with approximately 16 characters.

**II. FACE AND LETTER COLOR**

| CODE    | FACE COLOR | LETTER COLOR |
|---------|------------|--------------|
| AL      | Aluminum   | Black        |
| (Blank) | Black      | White        |
| BE      | Blue       | White        |
| GN      | Green      | White        |
| RD      | Red        | White        |
| WE      | White      | Black        |
| YW      | Yellow     | Black        |

**III. LEGEND DESIGNATION**

**A. PUSH BUTTONS AND LIGHTS**

| CODE | DESCRIPTION    |
|------|----------------|
| 00   | (Blank)        |
| 01   | AUTO           |
| 02   | CLOSE          |
| 31   | CYCLE START    |
| 100  | CYCLE STOP     |
| 03   | DOWN           |
| 102  | EMERGENCY      |
| 04   | EMERGENCY STOP |
| 06   | FAST           |
| 101  | FAULT          |
| 07   | FORWARD        |
| 08   | HAND           |
| 32   | HIGH           |
| 33   | IN             |
| 09   | INCH           |
| 10   | JOG            |
| 38   | JOG FORWARD    |
| 39   | JOG REVERSE    |
| 34   | LOW            |
| 35   | LOWER          |
| 11   | MANUAL         |
| 26   | MOTOR RUN      |
| 12   | OFF            |
| 13   | ON             |
| 14   | OPEN           |
| 36   | OUT            |
| 27   | OVERLOAD       |
| 15   | POWER OFF      |
| 16   | POWER ON       |
| 30   | PUSH TO RESET  |
| 17   | PUSH TO TEST   |
| 37   | RAISE          |
| 109  | READY          |
| 18   | RESET          |
| 19   | REVERSE        |
| 20   | RUN            |
| 21   | SLOW           |
| 22   | START          |
| 23   | STOP           |
| 24   | TEST           |
| 29   | TRIP           |
| 25   | UP             |

**B. 2-POSITION SELECTOR**

| CODE | LEGEND LEFT  | LEGEND RIGHT  |
|------|--------------|---------------|
| 00   | (Blank)      | (Blank)       |
| 50   | AUTO         | HAND          |
| 68   | AUTO         | MANUAL        |
| 51   | DOWN         | UP            |
| 63   | FAST         | SLOW          |
| 52   | FWD          | REV           |
| 53   | HAND         | AUTO          |
| 73   | HIGH         | LOW           |
| 54   | INCH         | RUN           |
| 75   | LEFT         | RIGHT         |
| 70   | LOCAL        | REMOTE        |
| 55   | MANUAL       | AUTO          |
| 56   | OFF          | ON            |
| 57   | ON           | OFF           |
| 58   | OPEN         | CLOSE         |
| 65   | PULL START   | PUSH STOP     |
| 66   | PUSH OFF     | PULL ON       |
| 64   | PUSH ON      | PUSH OFF      |
| 67   | PUSH TO STOP | PULL TO START |
| 71   | RAISE        | LOWER         |
| 59   | REV          | FWD           |
| 60   | RUN          | JOG           |
| 69   | SLOW         | FAST          |
| 61   | START        | STOP          |
| 62   | STOP         | START         |
| 74   | SUMMER       | WINTER        |
| 72   | UP           | DOWN          |

**C. 3-POSITION SELECTOR**

| CODE | LEGEND LEFT | LEGEND CENTER | LEGEND RIGHT |
|------|-------------|---------------|--------------|
| 00   | (Blank)     | (Blank)       | (Blank)      |
| 108  | A           | 0             | H            |
| 92   | AUTO        | OFF           | HAND         |
| 93   | AUTO        | MAN           | OFF          |
| 80   | DOWN        | OFF           | UP           |
| 81   | FWD         | AUTO          | REV          |
| 82   | FWD         | OFF           | REV          |
| 107  | H           | 0             | A            |
| 83   | HAND        | OFF           | AUTO         |
| 94   | HIGH        | OFF           | LOW          |
| 99   | JOG         | OFF           | AUTO         |
| 90   | LOCAL       | OFF           | REMOTE       |
| 84   | MANUAL      | OFF           | AUTO         |
| 89   | OFF         | RUN           | START        |
| 85   | OFF         | START         | RUN          |
| 86   | OFF         | 1             | 2            |
| 95   | OPEN        | OFF           | CLOSE        |
| 91   | RAISE       | OFF           | LOWER        |
| 96   | SLOW        | OFF           | FAST         |
| 97   | SUMMER      | OFF           | WINTER       |
| 98   | UP          | OFF           | DOWN         |
| 87   | 1           | OFF           | 2            |
| 88   | 1           | 2             | 3            |

**D. POTENTIOMETER**

| CODE | DESCRIPTION          |
|------|----------------------|
| 40   | Blank Legend 0 - 10  |
| 41   | "SPEED" 0 - 10       |
| 43   | Blank Legend 0 - 100 |
| 44   | "SPEED" 0 - 100      |

**IV. ADHESIVE BACK**

| CODE    | DESCRIPTION      |
|---------|------------------|
| (Blank) | No Adhesive Back |
| A       | Adhesive Back    |



**IT'S EASY TO BUILD YOUR OWN LEGEND PLATE**

Simply pick the code number from each of the sections below and combine them to build your part number.

**Special Legend Plates**



All legend plates are a 2-ply laminated plastic, laser engraved for a permanent and quality appearance. Uppercase is standard unless specified.



**I. LEGEND PLATE TYPE**

| CODE   | DESCRIPTION                  | LIST    |
|--------|------------------------------|---------|
| 22LP   | Standard 1-3/4" h x 1-3/4" w | \$ 4.00 |
| 22LPN  | Narrow 1-3/4" h x 1-1/2" w   | \$ 4.00 |
| 22LPS  | Short 1-1/2" h x 1-3/4" w*   | \$ 4.00 |
| 22LPT  | Tall 2" h x 1-3/4" w         | \$ 5.00 |
| 22LPJ  | Jumbo 2" h x 2" w            | \$ 5.00 |
| 22LPR  | Standard Round 2-13/32" Dia. | \$ 9.00 |
| 22LPRM | Medium Round 2-3/4" Dia.     | \$11.00 |
| 22LPRJ | Jumbo Round 3-3/4" Dia.      | \$12.00 |

Legend plates feature 2 lines of text with approximately 16 characters per line.

\*The short legend plate (22LPS) features 1 line of text with 16 characters.

**II. FACE AND LETTER COLOR**

| CODE    | FACE COLOR | LETTER COLOR |
|---------|------------|--------------|
| AL      | Aluminum   | Black        |
| (Blank) | Black      | White        |
| BE      | Blue       | White        |
| GN      | Green      | White        |
| RD      | Red        | White        |
| WE      | White      | Black        |
| YW      | Yellow     | Black        |

**III. LEGEND DESIGNATION**

| CODE | DESCRIPTION    | LIST    |
|------|----------------|---------|
| SP   | Special Legend | \$14.00 |

NOTE: \$6.00 each when ordering 3 or more of the same exact legend plate.

**IV. ADHESIVE BACK**

| CODE    | DESCRIPTION      |
|---------|------------------|
| (Blank) | No Adhesive Back |
| A       | Adhesive Back    |

Upon receipt of your order, legend plates will be set-up as specified and a proof will be sent to you prior to production to ensure accuracy.

To order, submit your drawing to:

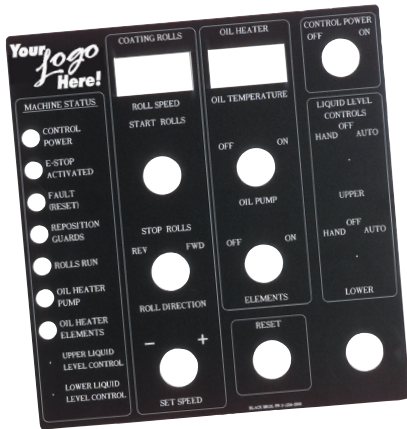
**Mail:** c3controls  
Attn: Customer First  
PO Box 496  
Beaver, PA 15009

**Fax:** 724.775.5283

**Email:** legendplates@c3controls.com

To help simplify your order process, templates are available by calling our factory at 724.775.7926 or reference one of the drawings shown on page 381.

Special legend plates are not available for same day shipping.



(Sample custom plate)

**CUSTOM LEGEND PLATES**

- **Add your Corporate Logo!** Send us your corporate logo electronically to promote your company image in a clean professional legend plate.
- Available in 2-ply 12" x 24" (304.8mm x 609.6mm) sheets of laminated plastic for custom laser engraving.
- To order, specify part number 22LP-CP (no adhesive back) or 22LP-CP-A (adhesive back).
- Initial Set-Up Fee Per Legend Plate: \$50/hour (minimum fee \$50.00).
- \$2.00/Square Inch (minimum \$18.00).
- Design services available. Consult factory for details and hourly rate.
- Custom legend plates are not available for same-day shipping.

To order, submit your drawing to:

**Mail:** c3controls  
Attn: Customer First  
PO Box 496  
Beaver, PA 15009

**Fax:** 724.775.5283

**Email:** legendplates@c3controls.com



**22MM NEMA PILOT DEVICES**

**ELECTRICAL RATINGS**

| Lamp     | Industry Number | Rated Volts | Lumens (MSCD)                          | Design Life (Hrs.) | Current Draw (mA) | Lamp Type    | Shock & Vibration | Leakage Protection |
|----------|-----------------|-------------|--|--------------------|-------------------|--------------|-------------------|--------------------|
| FVB6     | 1866            | 6.3V        | 0.65                                   | 5,000              | 250               | Incandescent | Very Good         | N/A                |
| FVB12    | 756             | 14V         | 0.31                                   | 15,000             | 80                | Incandescent | Good              | N/A                |
| FVB24    | 757             | 28V         | 0.62                                   | 7,500              | 80                | Incandescent | Good              | N/A                |
| FVB55    | 1835            | 55V         | 1.1                                    | 5,000              | 50                | Incandescent | Good              | N/A                |
| FVB120   | **              | 130V        | 0.36                                   | 10,000             | 20                | Incandescent | Good              | N/A                |
| LED6     | **              | 6V          | Varies w/ Color<br>2000 mcd<br>Typical | 100,000            | 50                | LED          | Excellent         | 14 mA              |
| LED12    | **              | 12V         |  | 100,000            | <20               | LED          | Excellent         | 4 mA               |
| LED24    | **              | 24V         |  | 100,000            | <20               | LED          | Excellent         | 4 mA               |
| LED130   | **              | 130V        |  | 100,000            | <10               | LED          | Excellent         | 2 mA               |
| FVB120NG | —               | 95-135V     | Typical (Glow)                         | 25,000             | <5                | Neon/Green   | Very Good         | N/A                |
| FVB120NR | —               | 95-135V     | Typical (Glow)                         | 25,000             | <5                | Neon/Red     | Very Good         | N/A                |

\*\* Designates a lamp design optimized for c3controls Illuminated Devices. See LED replacement lamps on page 371.

**DIELECTRIC STRENGTH (MECHANICAL CONTACTS)**

2200V for 1 Minute

**STANDARD CONTACTS**

|  | Utilization Category |       |      | Make Rating | Break Rating | Ith-Thermal Current |
|--|----------------------|-------|------|-------------|--------------|---------------------|
|  | AC                   | IEC   | UL   |             |              |                     |
|  | AC                   | AC-15 | A600 | 7200VA      | 720VA        | 10A                 |
|  | DC                   | DC-13 | P300 | 138VA       | 138VA        | 5A                  |

NOTE: For AC voltage below 72VAC the maximum allowed switching current is 10A = Ith

For DC voltages below 28VDC the maximum allowed switching current is 5A = Ith

**ENVIRONMENTAL RATINGS**

|                       | UNITS   |  |
|-----------------------|---------|--|
| Operators             |         | Rated and Certified for use in Type 1, 2, 3, 3R, 4/4X, 12, & 13 and IP65 |
| Operating Temperature | °F / °C | -40 to +131 / -40 to +55   |
| Storage Temperature   | °F / °C | -40 to +185 / -40 to +85   |

NOTE: Operating environments below freezing temperatures are assumed to be absent of freezing liquids or pollutants.

**TERMINAL & WIRING CONSIDERATION**

|                    |             |   |
|--------------------|-------------|---|
| AWG Conductor      |             | 22-12 CU (Copper only - Solid & Stranded) [.5 - 4mm <sup>2</sup> ] One or two wires permitted per termination |
| Recommended Torque | Lb-in. [Nm] | 7 (+3.0/-0.0) [.8]  |

**CONSTRUCTION**

**OPERATING FORCES**

| <b>PUSH BUTTONS (1 CONTACT/2 CONTACT)</b> |          |                     |
|---|----------|---------------------|
| Momentary                                 | lbs. [N] | 3.5/4.0 [15.5/17.8] |
| Illuminated                               | lbs. [N] | 4.0/5.0 [17.8/22.0] |
| Maintained (1NC)                          | lbs. [N] | 8.5 [37.8]          |

| <b>SELECTOR SWITCHES (2 CONTACTS)</b> |              |           |
|---------------------------------------|--------------|-----------|
| Maintained                            | in-lbs. [Nm] | 3.5 [.4]  |
| Momentary                             | in-lbs. [Nm] | 4.5 [.51] |
| Key Operated Maintained               | in-lbs. [Nm] | 3.5 [.4]  |
| Key Operated Momentary                | in-lbs. [Nm] | 4.5 [.51] |

| <b>POTENTIOMETER</b> |             |                                 |
|----------------------|-------------|---------------------------------|
| 2 Watt "J" Series    | in-oz. [Nm] | 3-12 [.11 Max.] (300° Rotation) |

| <b>CONTACT ADD-A-BLOCK (SINGLE POLE)</b> |          |               |
|--|----------|---------------|
|  | lbs. [N] | .5/pole [2.2] |

| <b>INDICATING LIGHTS</b> |  |                                    |
|--------------------------|--|------------------------------------|
|                          |  | Refer to the appropriate Lamp Data |

**MECHANICAL ENDURANCE**

| <b>PUSH BUTTONS</b> |      |           |
|---------------------|------|-----------|
| Momentary           | Ops. | 5,000,000 |
| Maintained          | Ops. | 1,000,000 |

| <b>SELECTOR SWITCHES</b> |      |         |
|--------------------------|------|---------|
|                          | Ops. | 500,000 |

| <b>ALL OTHER DEVICES</b> |      |         |
|--------------------------|------|---------|
|                          | Ops. | 250,000 |

| <b>CONTACT BLOCKS</b> |      |           |
|-----------------------|------|-----------|
|                       | Ops. | 5,000,000 |

| <b>INDICATING LIGHTS</b> |      |                                    |
|--------------------------|------|------------------------------------|
|                          | Ops. | Refer to the appropriate Lamp Data |

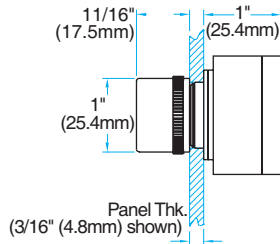
**22MM NEMA PILOT DEVICES**

|   | UNITS |   |
|---|-------|---|
| <b>MATERIALS</b>  |       |   |
| Operator Housings   |       | Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)                                      |
| Operator Caps and Handles - Non-Illuminated (Glass Reinforced Grades) |       | Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)                                      |
| Mounting Rings and Nuts   |       | Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)                                      |
| Thrust Washer   |       | Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)                                      |
| Trim Washer   |       | Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)                                      |
| Pilot Light Lens  |       | High Impact Polycarbonate (UV Stabilized for outdoor use)   |
| Transparent Push Button and Mushroom Caps                             |       | High Impact Polycarbonate (UV Stabilized for outdoor use)   |
| Certain CAM and Bearing Parts   |       | Custom Polymers: Teflon, Silicon and Moly-Disulfide impregnated for improved wearability                          |
| Rubber Boots  |       | Custom Polymers: Thermoplastic Neoprene   |
| Seals   |       | Neoprene Gaskets  |
|   |       | Thermoplastic - Molded Neoprene and Alloy Derivatives   |
|   |       | BUNA N - Rubber - Teflon Coated   |
|   |       | Thermoplastic - Elastomer Molded Seals  |
| Push Pull Bushings  |       | Brass (plated and un-plated)  |
| Detents for Maintained Devices  |       | Brass (plated and un-plated)  |
| Springs   |       | Stainless Steel throughout  |
| Optional Mounting Nut   |       | Aluminum  |
| <b>ROHS COMPLIANCE</b>  |       | For RoHS compliance documentation by product, refer to <a href="http://www.c3controls.com">www.c3controls.com</a> |

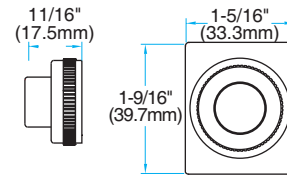
**MOMENTARY NON-ILLUMINATED PUSH BUTTONS**

Fully-assembled operators come standard with five 1/16" (1.5mm) gaskets.  
See page 381 for mounting gasket specifications.

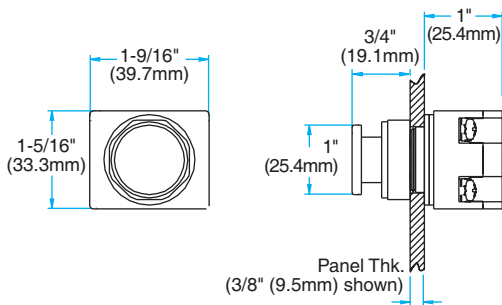
**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH FLUSH CAP)**



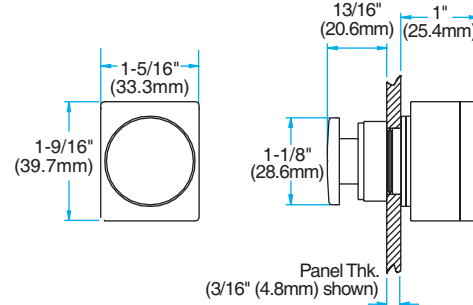
**MOMENTARY EXTENDED CAP**



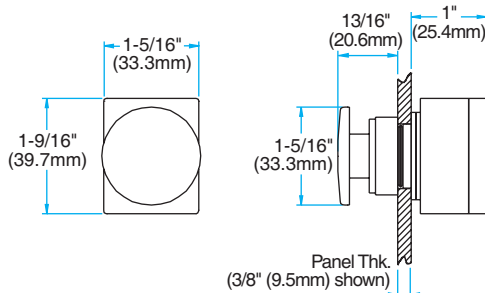
**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH 1" (25.4MM) MUSHROOM CAP)**



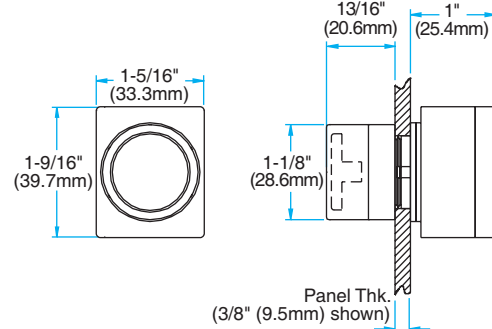
**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH 1-5/32" (27MM) MUSHROOM CAP)**



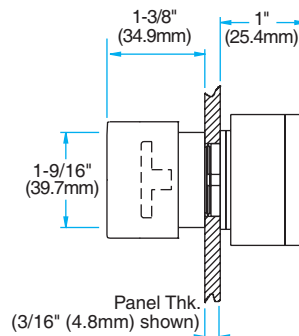
**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH 1-1/3" (33.8MM) JUMBO MUSHROOM CAP)**



**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH 1" (25.4MM) SHROUDED MUSHROOM CAP)**



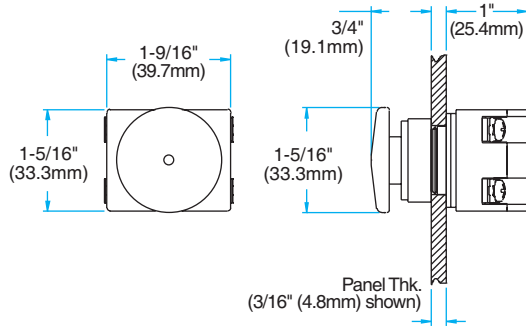
**MOMENTARY NON-ILLUMINATED OPERATOR  
(SHOWN WITH 1-5/32" (27MM) SHROUDED MUSHROOM CAP)**



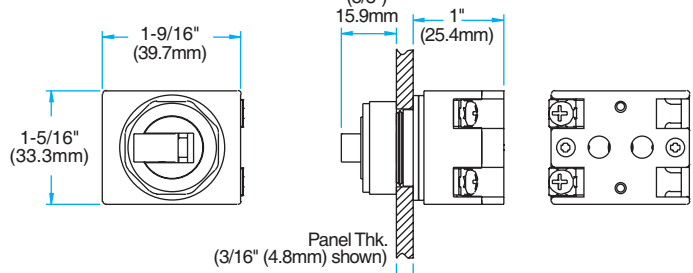
**MAINTAINED NON-ILLUMINATED PUSH BUTTONS**

Fully-assembled operators come standard with five 1/16" (1.5mm) gaskets.  
See page 381 for mounting gasket specifications.

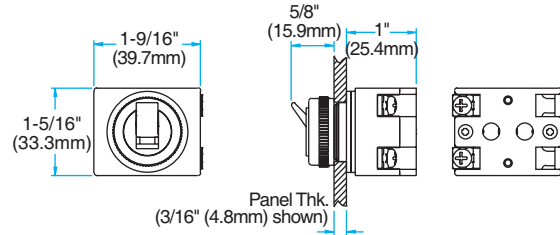
**2-POSITION PUSH-PULL MAINTAINED NON-ILLUMINATED OPERATOR (SHOWN WITH 1-1/2" (38mm) MUSHROOM CAP)**



**MAINTAINED NON-ILLUMINATED OPERATOR (SHOWN WITH HORIZONTAL TOGGLE SWITCH)**



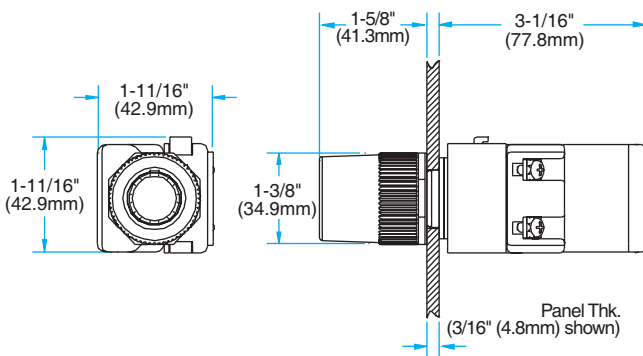
**MAINTAINED NON-ILLUMINATED OPERATOR (SHOWN WITH VERTICAL TOGGLE SWITCH)**



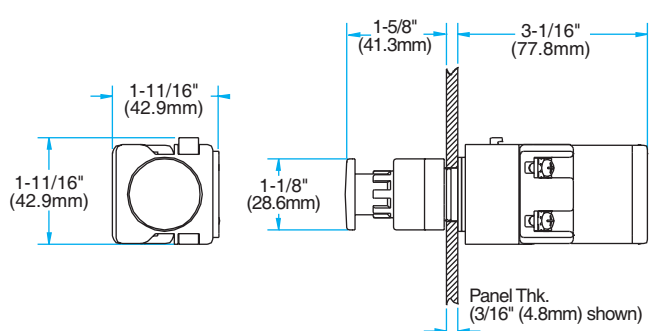
**MOMENTARY ILLUMINATED PUSH BUTTONS**

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.  
See page 381 for mounting gasket specifications.

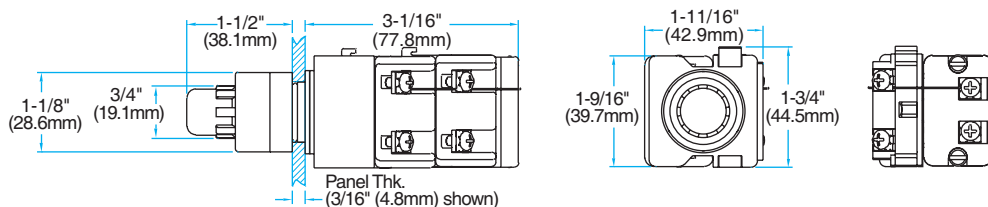
**ILLUMINATED FULL VOLTAGE AND RESISTOR OPERATORS (SHOWN WITH IFC)**



**ILLUMINATED FULL VOLTAGE AND RESISTOR OPERATORS (SHOWN WITH IMC)**



**ILLUMINATED FULL VOLTAGE AND RESISTOR OPERATORS (SHOWN WITH IXC)**

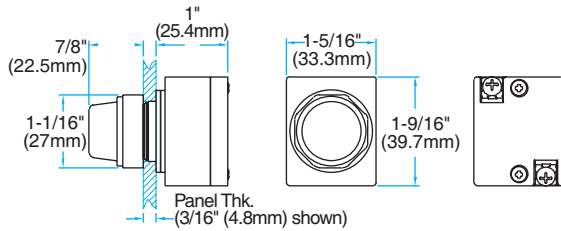




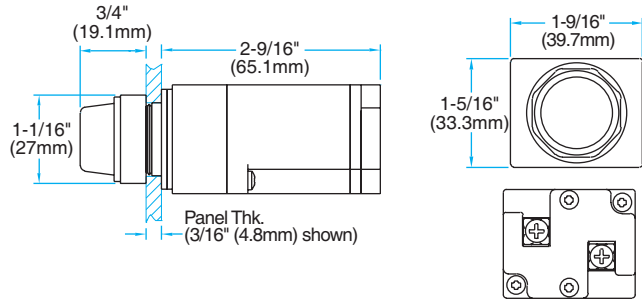
**PILOT LIGHTS**

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.  
See page 381 for mounting gasket specifications.

**FULL VOLTAGE AND DUAL INPUT PILOT LIGHT OPERATORS (SHOWN WITH PL)**



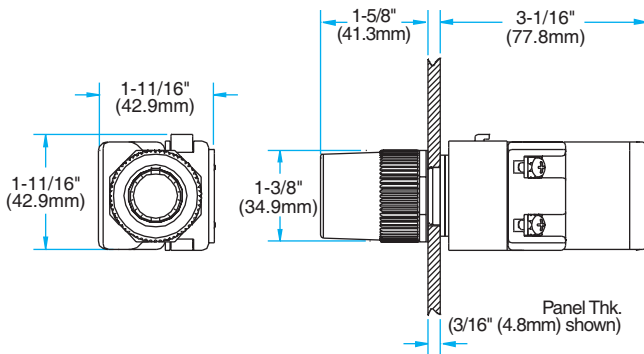
**RESISTOR PILOT LIGHT OPERATORS (SHOWN WITH PL)**



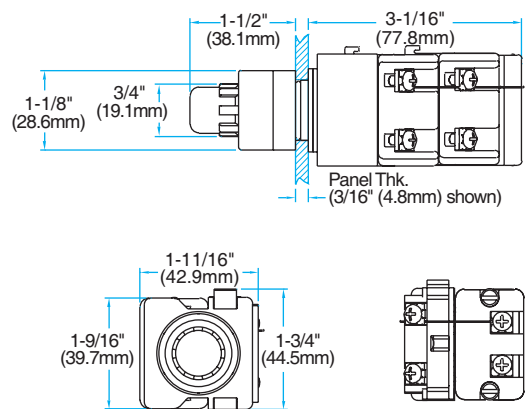
**PUSH-TO-TEST PILOT LIGHTS**

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.  
See page 381 for mounting gasket specifications.

**FULL VOLTAGE AND RESISTOR PUSH-TO-TEST OPERATORS (SHOWN WITH IFC)**



**FULL VOLTAGE AND RESISTOR PUSH-TO-TEST OPERATORS (SHOWN WITH IXC)**

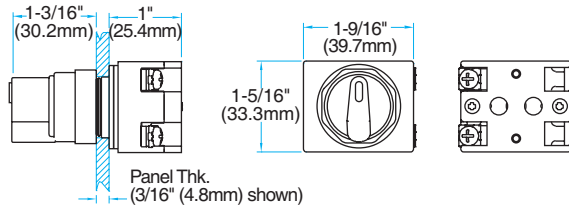


**VISIT [WWW.C3CONTROLS.COM](http://WWW.C3CONTROLS.COM)  
TO DOWNLOAD CAD DRAWINGS**

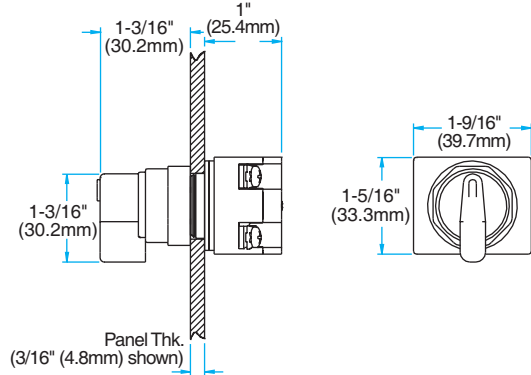
**SELECTOR SWITCHES**

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.  
See page 381 for mounting gasket specifications.

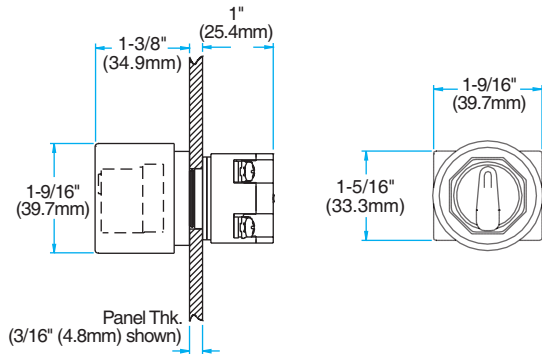
**SELECTOR SWITCH OPERATOR  
(SHOWN WITH STANDARD HANDLE)**



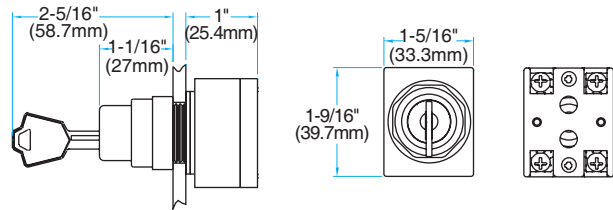
**SELECTOR SWITCH OPERATOR  
(SHOWN WITH LEVER HANDLE)**



**SELECTOR SWITCH OPERATOR  
(SHOWN WITH GUARDED HANDLE)**



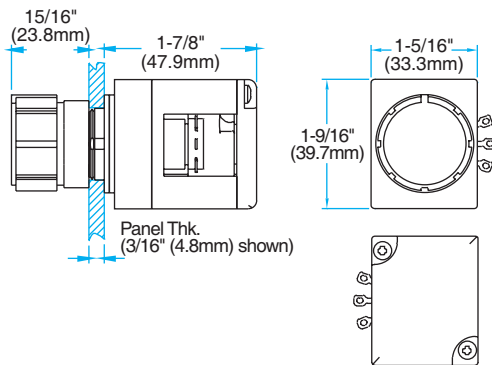
**KEYED SELECTOR SWITCH OPERATOR**



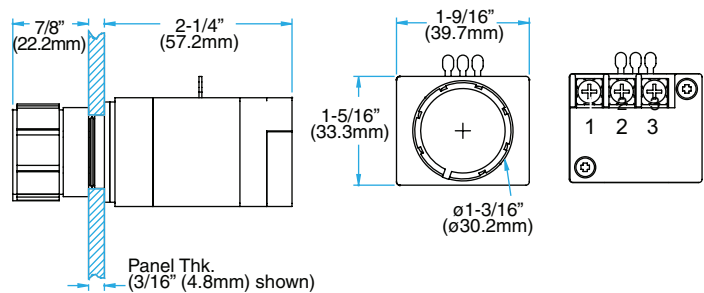
**POTENTIOMETER WITH & WITHOUT TERMINAL BLOCK**

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.  
See page 381 for mounting gasket specifications.

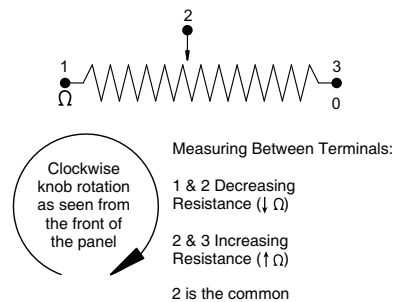
**POTENTIOMETER OPERATOR  
(SHOWN WITHOUT TERMINAL BLOCK)**



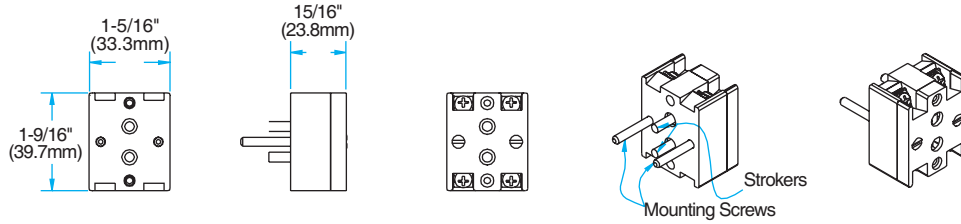
**POTENTIOMETER OPERATOR  
(SHOWN WITH TERMINAL BLOCK)**



**WIRING DIAGRAM**

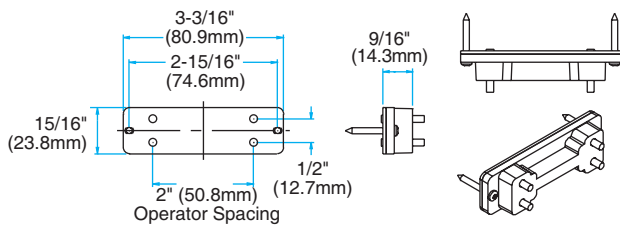


**CONTACT BLOCK**

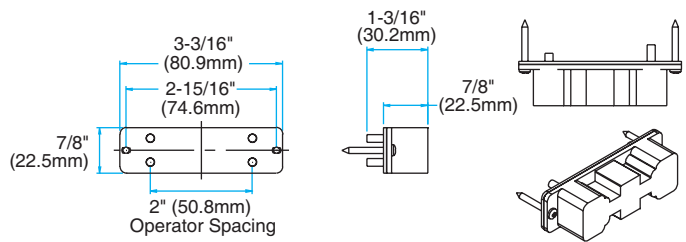


**MECHANICAL INTERLOCK**

22MI

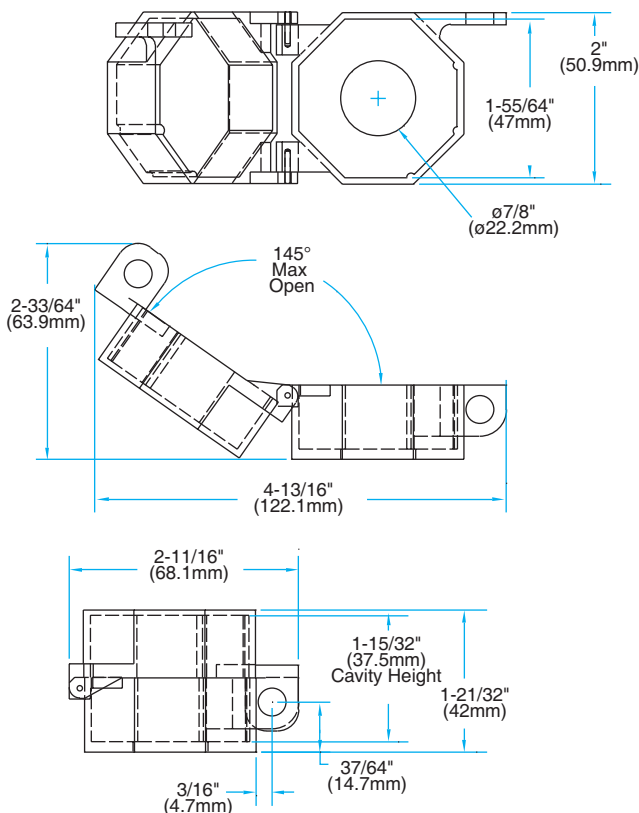


22MIR



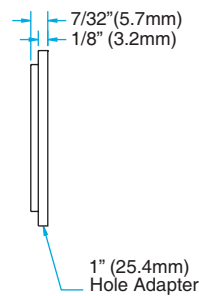
**LOCK-OFF ATTACHMENT**

22LOAFC



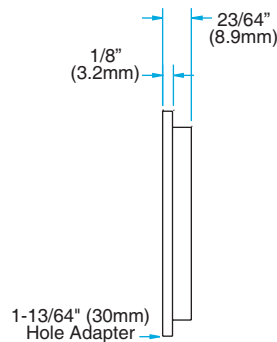
**MOUNTING ADAPTERS**

MAK-1/22



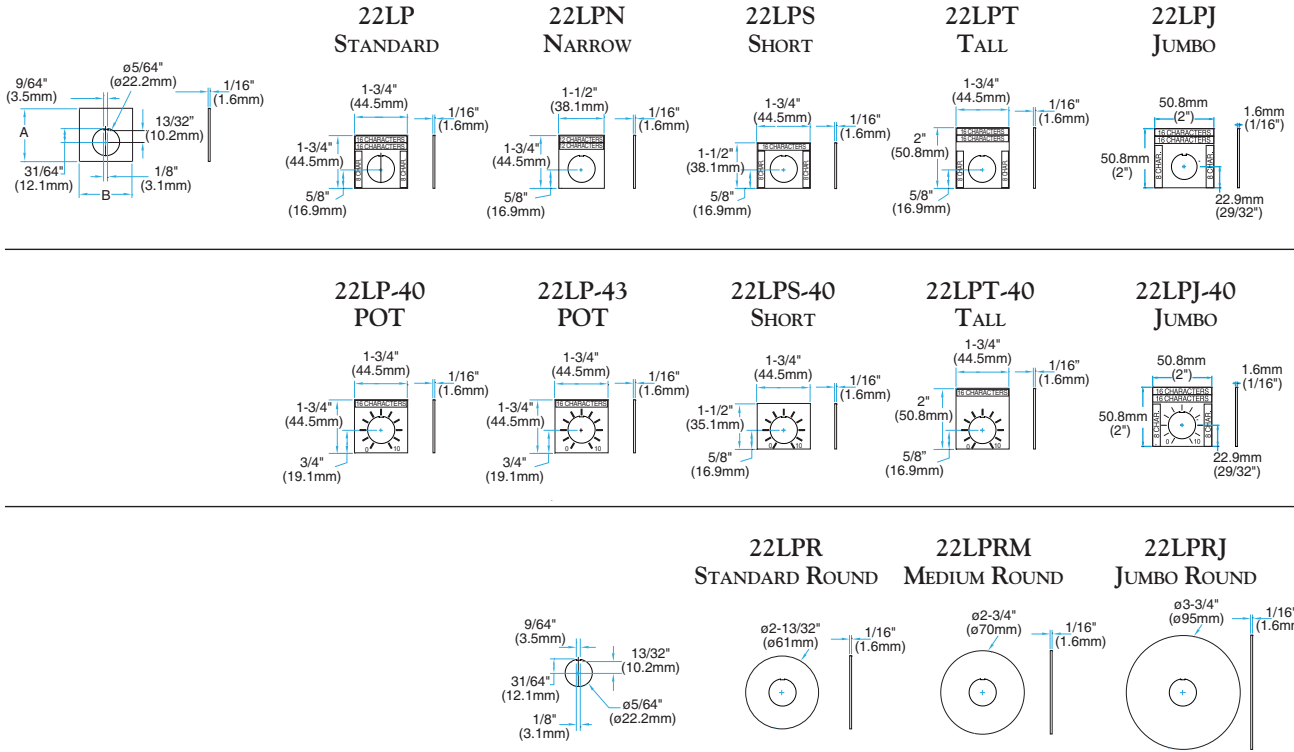
- Mounting Adapter for use with all 22mm operators.
- Maximum enclosure thickness 3/64" (1.3mm).
- No gasket is required.

MAK-30/22



- Mounting Adapter for use with all 22mm operators.
- Maximum enclosure thickness 1/64" (3.8mm).
- Mounting Adapter must be used with one 1/16" (1.6mm) gasket to ensure a watertight seal.

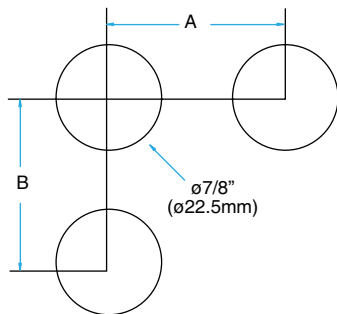
**LEGEND PLATES**



Note: Legend plates feature a tab for optional break-away positioning and can be used in conjunction with the Thrust & Trim Washer accessory.

**MOUNTING HOLE PATTERN**

| MOUNTING HOLE PATTERN |                 |                 |
|-----------------------|-----------------|-----------------|
| SPACING               | A               | B               |
| Minimum               | 1-3/4" (44.5mm) | 1-3/4" (44.5mm) |
| Standard              | 2" (50.8mm)     | 2" (50.8mm)     |



**MOUNTING GASKETS**

| MOUNTING GASKETS            |                                   |
|-----------------------------|-----------------------------------|
| PANEL THICKNESS IN DECIMALS | # OF 1/16" (1.6mm) GASKETS NEEDED |
| .040 – .060                 | 5                                 |
| .061 – .115                 | 4                                 |
| .116 – .170                 | 3                                 |
| .171 – .220                 | 2                                 |

NOTE: Remove one 1/16" (1.6mm) gasket when using a legend plate.