

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!

22MM NEMA PILOT DEVICES



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NOTE: The scope (range, description, price, specifications, dimensions, etc.) of the product featured in this section is subject to change without notice. Refer to www.c3controls.com for product updates.

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 93/68/EEC)



Visit www.c3controls.com to download product certifications.

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. See page 6 for more detailed directions.

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. BASIC OPERATOR TYPE

CODE	DESCRIPTION	PRICE
22PB	Push Button Operator	\$12.00

II. CONTACT BLOCK CONFIGURATION

CODE	DESCRIPTION	PRICE
NO	1 Normally Open Contact Block	—
NC	1 Normally Closed Contact Block	—
NONC	Contact Block w/1 Normally Open and 1 Normally Closed	\$ 5.00
2NO	Contact Block w/2 Normally Open	\$ 5.00
2NC	Contact Block w/2 Normally Closed	\$ 5.00
NOEM	Contact Block w/1 Normally Open and 1 Early Make	\$ 7.00

III. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

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

IV. CAP TYPE

CODE	DESCRIPTION	PRICE
(Blank)	Operator less Cap	—
F	Flush Cap*	\$ 3.00
X	Extended Cap*	\$ 3.00
1	Mushroom Cap (1" Diameter)	\$ 4.00
M	Mushroom Cap (1-5/32" Diameter)	\$ 8.00
J	Jumbo Mushroom Cap (1-21/64" Diameter)	\$ 8.00
S1	Shrouded Mushroom Cap (1" Diameter) NOTE: Only available with a Polyester Clamp Ring.	\$ 5.00
SM	Shrouded Mushroom Cap (1-5/32" Diameter) NOTE: Only available with a Polyester Clamp Ring.	\$10.00

*These caps can also be used with our Mechanical Interlock. See page 262.

V. CAP COLOR

CODE	DESCRIPTION
(Blank)	Operator less Cap
BK	Black
BE	Blue
GN	Green
GY	Grey
RD	Red
WE	White
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 262 FOR DETAILS.

DISCOUNT
SCHEDULE **B**

LEGEND PLATES in almost any size & color are available for same day shipping. See pages 264-265 for complete selection.



RUBBER BOOTS ALSO AVAILABLE



Your Secondary Defense for Added Protection.

Chemicals on gloves, wash down areas and particularly harsh climates will do damage to any push button. Utilizing our state-of-the-art rubber boots protects both the operators and the circuits behind them.

Our Standard Rubber Boots feature a built-in clamp ring that is molded with Neoprene that has been modified to provide added pliability and protection against dust, freezing and thawing environments.

STANDARD RUBBER BOOTS

CODE	COLOR	PRICE
XRBBK	Black	\$ 9.10
XRBGN	Green	\$ 9.10
XRBRD	Red	\$ 9.10
XRBYW	Yellow	\$ 9.10



Example: To build one of our most popular Push Buttons with a Rubber Boot, replace **III, IV & V (Clamp Ring, Cap Type & Color)** with the code from the rubber boot chart above. The part number would be **22PB + II + (code from rubber boot chart above)** or **22PBNC-XRBRD**.

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.

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.
- Optional 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 - 4mm²) 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), 250 V 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				MUSHROOM CAP	
CAP COLOR		CATALOG NUMBER	PRICE	CATALOG NUMBER	PRICE	CATALOG NUMBER	PRICE
1NO	Black	22PBNO-XFBK	\$15.00	22PBNO-XXBK	\$15.00	22PBNO-XMBK	\$20.00
	Green	22PBNO-XFGN	\$15.00	22PBNO-XXGN	\$15.00	22PBNO-XMGN	\$20.00
	Red	22PBNO-XFRD	\$15.00	22PBNO-XXRD	\$15.00	22PBNO-XMRD	\$20.00
1NC	Black	22PBNC-XFBK	\$15.00	22PBNC-XXBK	\$15.00	22PBNC-XMBK	\$20.00
	Green	22PBNC-XFGN	\$15.00	22PBNC-XXGN	\$15.00	22PBNC-XMGN	\$20.00
	Red	22PBNC-XFRD	\$15.00	22PBNC-XXRD	\$15.00	22PBNC-XMRD	\$20.00
1 NO	Green	22PBNONC-XFGN	\$20.00	22PBNONC-XXGN	\$20.00	22PBNONC-XMGN	\$25.00
& 1 NC	Red	22PBNONC-XFRD	\$20.00	22PBNONC-XXRD	\$20.00	22PBNONC-XMRD	\$25.00

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



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. See page 6 for more detailed directions.

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

22PP - PM 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. BASIC OPERATOR TYPE

CODE	DESCRIPTION	PRICE
22PP	Push-Pull Maintained	\$24.00

II. CONTACT BLOCK CONFIGURATION

CODE	DESCRIPTION	PRICE
NO	1 Normally Open Contact Block	—
NC	1 Normally Closed Contact Block	—
NONC	Contact Block w/1 Normally Open and 1 Normally Closed	\$ 5.00
2NO	Contact Block w/2 Normally Open	\$ 5.00
2NC	Contact Block w/2 Normally Closed	\$ 5.00

III. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

IV. CAP TYPE

CODE	DESCRIPTION	PRICE
PM	Push-Pull Maintained Mushroom Cap	\$ 8.00

V. CAP COLOR

CODE	DESCRIPTION
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 264-265 for complete selection.

DISCOUNT
SCHEDULE **B**

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. See page 6 for more detailed directions.

Maintained Toggle Switches

22T - 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	PRICE
22T	Toggle Switch	\$20.00

II. TOGGLE DIRECTION

CODE	DESCRIPTION
H	Horizontal
V	Vertical

III. TOGGLE COLOR

CODE	DESCRIPTION
BK	Black
BE	Blue
GN	Green
GY	Grey
RD	Red
WE	White
YW	Yellow

IV. CONTACT BLOCK CONFIGURATION

CODE	DESCRIPTION	PRICE
NO	1 Normally Open Contact Block	—
NC	1 Normally Closed Contact Block	—
NONC	Contact Block w/1 Normally Open and 1 Normally Closed	\$ 5.00
2NO	Contact Block w/2 Normally Open	\$ 5.00
2NC	Contact Block w/2 Normally Closed	\$ 5.00

V. CLAMP RING

CODE	DESCRIPTION	PRICE
(Blank)	Polyester (Type 4X)	—
MT	Aluminum (Type 4)	\$ 2.00

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 262 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	PRICE
22PPNC-XPMRD	Push-Pull Maintained Red Mushroom Cap w/1 Normally Closed Contact Block	\$32.00
22PP2NC-XPMRD	Push-Pull Maintained Red Mushroom Cap with a 2 Normally Closed Contact Block	\$37.00

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

CATALOG NUMBER	DESCRIPTION	PRICE
22TVBKNO	Black Vertical Toggle w/1 NO Contact Block	\$20.00
22TVRD2NC	Red Vertical Toggle with a 2 NC Contact Block	\$25.00

MECHANICAL INTERLOCKS
provide lockout operation to a second push button, selector switch or toggle operator.
See page 262 for details.



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



Mushroom Cap
(1-1/2" (38mm) dia.)

Mushroom Cap
(1-1/2" (38mm) dia.)

Mushroom Cap
(1-1/2" (38mm) dia.)

Mushroom Cap
(1-1/2" (38mm) dia.)

Horizontal Toggle

Vertical Toggle

IT'S EASY TO BUILD YOUR OWN PUSH BUTTON

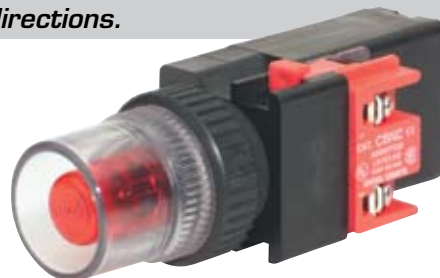
Simply pick the code number from each of the sections below and combine them to build your part number. See page 6 for more detailed directions.

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-XIXCRD-NC**



I. OPERATOR TYPE

CODE	DESCRIPTION	PRICE
22IPB	Illuminated Push Button	\$12.00

II. OPERATOR LIGHT UNIT BASE

CODE	DESCRIPTION	PRICE
F	Full Voltage	\$28.00
T	Transformer (50/60 Hz)	\$38.00
R	Resistor	\$28.00

III. VOLTAGE BASED ON LIGHT UNIT BASE

CODE	DESCRIPTION
FULL VOLTAGE	
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC
TRANSFORMER	
120	120V AC
240	240V AC
277	277V AC
480	480V AC
RESISTOR	
120	120V AC/DC
240	240V AC/DC
480	480V AC/DC

IV. LAMP TYPE/COLOR

CODE	DESCRIPTION	PRICE
LED		
LA	Amber	\$10.00
LB	Blue	\$10.00
LG	Green	\$10.00
LR	Red	\$10.00
LW	White	\$10.00
INCANDESCENT		
I	Clear	—
F	Clear Flashing Bulb*	\$ 4.00
*NOTE: Incandescent flashing bulbs available for any 6V full voltage or transformer application.		
NEON†		
NG	Green	—
NR	Red	—
†NOTE: Only available in 22IPBR120, 22IPBR240 and 22IPBR480.		
NL	No Lamp	— \$ 1.00

V. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

VI. LENS TYPE

CODE	DESCRIPTION	PRICE
IFC	Flush/Guarded Lens	\$ 6.00
IXC	Extended Lens	\$ 6.00
IMC	Mushroom Lens	\$13.50

VII. LENS COLOR

CODE	DESCRIPTION
AR	Amber
BE	Blue
CR	Clear
GN	Green
RD	Red
WE	White

VIII. CONTACT BLOCK CONFIGURATION

CODE	DESCRIPTION	PRICE
NO	1 Normally Open Contact Block	\$ 6.00
NC	1 Normally Closed Contact Block	\$ 6.00
EM	1 Early Make Contact Block	\$ 8.00
DB	1 Delayed Break Contact Block	\$ 8.00
NO-NO	2 Normally Open Contact Blocks	\$12.00
NC-NC	2 Normally Closed Contact Blocks	\$12.00
NO-NC	1 Normally Open and 1 Normally Closed Contact Blocks	\$12.00

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 124-125.

SEE PAGE 266 FOR LAMP
TECHNICAL DATA CHART.



LEGEND PLATES in almost any size & color are available for same day shipping. See pages 264-265 for complete selection.

DISCOUNT
SCHEDULE **B**

MIX AND MATCH ANY COLOR AND MOMENTARY ILLUMINATED PUSH BUTTON LENS



Flush/Guarded Lens



Flush/Guarded Lens



Extended Lens



Extended Lens



Mushroom Lens



Mushroom 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.

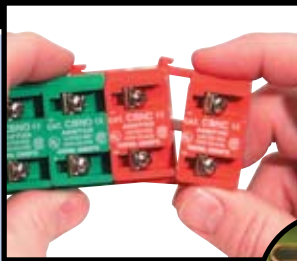
Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Optional 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 - 4mm²) 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



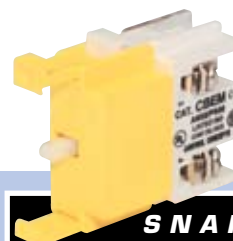
NOTE: Gold plated contacts are available on standard 30mm blocks for dry circuit applications. See pages 124-125 for details.

1. Vibration resistant snap-on assembly 30mm contact blocks simplify installation. See pages 124-125 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	PRICE	CATALOG NUMBER	PRICE
Full Voltage	Amber	22IPBF120LA-XIFCAR-NO-NC	\$68.00	22IPBF120LA-XIXCAR-NO-NC	\$68.00
	Green	22IPBF120LG-XIFCGN-NO	\$62.00	22IPBF120LG-XIXCGN-NO	\$62.00
	Red	22IPBF120LR-XIFCRD-NC	\$62.00	22IPBF120LR-XIXCRD-NC	\$62.00
Resistor	Amber	22IPBR120I-XIFCAR-NO-NC	\$58.00	22IPBR120I-XIXCAR-NO-NC	\$58.00
	Green	22IPBR120I-XIFCGN-NO	\$52.00	22IPBR120I-XIXCGN-NO	\$52.00
	Red	22IPBR120I-XIFCRD-NC	\$52.00	22IPBR120I-XIXCRD-NC	\$52.00



**SNAP-ON
ALTERNATE
ACTION BLOCKS**
provide "push-on/push-off"
operation on our push
buttons. See page 137.

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. See page 6 for more detailed directions.

Pilot Lights

I **II** **III** - **IV** **PL** **VI**

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. BASIC PILOT LIGHT OPERATOR

CODE	DESCRIPTION	PRICE
22FVL	Full Voltage	\$29.00
22TFL	Transformer (50/60 Hz)	\$37.00
22RL	Resistor	\$29.00
22RTL	Dual Input Remote Test	\$45.00

II. VOLTAGE BASED ON OPERATOR TYPE

CODE	DESCRIPTION
	FULL VOLTAGE
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC
	TRANSFORMER
120	120V AC
240	240V AC
277	277V AC
480	480V AC
	RESISTOR
120	120V AC/DC
240	240V AC/DC
480	480V AC/DC
	DUAL INPUT REMOTE TEST
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC (LED Only)

III. LAMP TYPE/COLOR

CODE	DESCRIPTION	PRICE
	LED	
LA	Amber	\$10.00
LB	Blue	\$10.00
LG	Green	\$10.00
LR	Red	\$10.00
LW	White	\$10.00
	INCANDESCENT	
I	Clear	—
F	Clear Flashing Bulb*	\$ 4.00
	*NOTE: Incandescent flashing bulbs available for any 6V full voltage or transformer application.	
	NEON†	
NG	Green	—
NR	Red	—
	†NOTE: Only Available in 22FVL120, 22RL240 and 22RL480.	
NL	No Lamp	— \$ 1.00

IV. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

V. LENS TYPE

CODE	DESCRIPTION	PRICE
PL	Pilot Light Lens	\$ 4.00

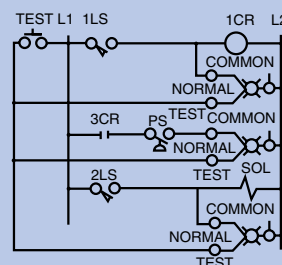
VI. LENS COLOR

CODE	DESCRIPTION
AR	Amber
BE	Blue
CR	Clear
GN	Green
RD	Red
WE	White

SEE PAGE 266 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 **B**

SOME OF OUR POPULAR
CONFIGURATIONS:

PILOT LIGHTS WITH POLYESTER CLAMP RING (TYPE 4X)

CATALOG NUMBER	DESCRIPTION	PRICE
22FVL120I-XPLRD	Full Voltage 120V Incandescent w/Red Lens	\$33.00
22FVL120LG-XPLGN	Full Voltage 120V Green LED w/Green Lens	\$43.00
22FVL120LA-XPLAR	Full Voltage 120V Amber LED w/Amber Lens	\$43.00

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, transformer 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. See page 6 for more detailed directions.

Push-To-Test Pilot Lights

PTT **I** **II** **III** **IV** **V** **VI** **VII**

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. BASIC PUSH-TO-TEST OPERATOR LIGHT UNIT BASE

CODE	DESCRIPTION	PRICE
22F	Full Voltage	\$28.00
22T	Transformer (50/60 Hz)	\$38.00
22R	Resistor	\$28.00

II. OPERATOR TYPE

CODE	DESCRIPTION	PRICE
PTT	Push-To-Test	\$10.00

III. VOLTAGE BASED ON OPERATOR LIGHT UNIT BASE

CODE	DESCRIPTION
FULL VOLTAGE	
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC
TRANSFORMER	
120	120V AC
240	240V AC
480	480V AC
RESISTOR	
120	120V AC/DC
240	240V AC/DC
480	480V AC/DC

IV. LAMP TYPE/COLOR

CODE	DESCRIPTION	PRICE
LED		
LA	Amber	\$10.00
LB	Blue	\$10.00
LG	Green	\$10.00
LR	Red	\$10.00
LW	White	\$10.00
INCANDESCENT		
I	Clear	—
F	Clear Flashing Bulb*	\$ 4.00
*NOTE: Incandescent flashing bulbs available for any 6V full voltage or transformer application.		
NEON†		
NG	Green	—
NR	Red	—
†NOTE: Only Available in 22FPTT120, 22RPTT240 and 22RPTT480.		
NL	No Lamp	— \$ 1.00

V. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

VI. LENS TYPE

CODE	DESCRIPTION	PRICE
IFC	Flush/Guarded Lens	\$ 6.00
IXC	Extended Lens	\$ 6.00

VII. LENS COLOR

CODE	DESCRIPTION
AR	Amber
BE	Blue
CR	Clear
GN	Green
RD	Red
WE	White

SEE PAGE 266 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.

DISCOUNT
SCHEDULE **B**

SOME OF OUR POPULAR CONFIGURATIONS:

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

CATALOG NUMBER	DESCRIPTION	PRICE
22FPTT120LG-XIFCGN	Full Voltage 120V w/LED Lamp & Green Flush/Guarded Lens	\$54.00
22TPTT120I-XIFCRD	Transformer 120V w/Incand. Lamp and Red Flush/Guarded Lens	\$54.00

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



Flush/Guarded Lens



Flush/Guarded Lens



Flush/Guarded Lens



Extended Lens



Extended 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. See page 6 for more detailed directions.

Selector Switches

I II - III IV V

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



I. BASIC SELECTOR SWITCH OPERATOR FUNCTION

CODE	POS./FUNCTION	PRICE
22SS2	2/Maintained	\$10.00
22SRL	2/Spring Return, R to L	\$13.00
22SS3	3/Maintained	\$10.00
22SAC	3/Spring Return, L & R to C	\$13.00
22SLC	3/Spring Return, L to C	\$13.00
22SRC	3/Spring Return, R to C	\$13.00

Our 22mm Selector Switches come with integral contacts ready for field wiring.

HANDLE POSITIONS

2-POSITION



3-POSITION



II. CIRCUIT DESIGNATION BASED ON OPERATOR FUNCTION

2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION

HANDLE POSITION

CODE	LEFT	RIGHT	PRICE
G	X	0	\$ 6.00
H	0	X	\$ 6.00
GH	X	0	\$11.00
	0	X	
GG	X	0	\$11.00
	X	0	
HH	0	X	\$11.00
	0	X	

3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION

HANDLE POSITION

CODE	LEFT	CENTER	RIGHT	PRICE
AB	X	0	0	\$11.00
	0	X	0	
AC	X	0	0	\$11.00
	0	0	X	
AE	X	0	0	\$12.00
	X	0	X	
AF	X	0	0	\$12.00
	X	X	0	
BC	0	X	0	\$11.00
	0	0	X	
BD	0	X	0	\$12.00
	0	X	X	
BF	0	X	0	\$12.00
	X	X	0	
CD	0	0	X	\$12.00
	0	X	X	
CE	0	0	X	\$12.00
	X	0	X	
DE	0	X	X	\$12.00
	X	0	X	
DF	0	X	X	\$12.00
	X	X	0	
EF	X	0	X	\$12.00
	X	X	0	

0 = OPEN X = CLOSED

III. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

IV. HANDLE TYPE

CODE	DESCRIPTION	PRICE
H	Standard	\$ 5.00
L	Lever	\$ 5.00
G	Guarded*	\$ 8.00

*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

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 262 FOR DETAILS.

DISCOUNT
SCHEDULE

B

MIX AND MATCH ANY COLOR AND SELECTOR SWITCH HANDLE



Standard



Standard



Standard



Standard



Standard



Lever



Guarded

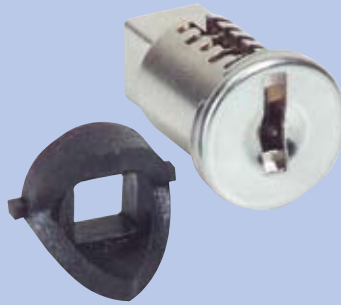
22MM NEMA STANDARD & KEYED SELECTOR SWITCHES

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. Add-on contact blocks are available for up to eight circuits per operator (see page 262).



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.

ADD-ON CONTACT BLOCKS FOR 2 & 3-POSITION SELECTOR SWITCHES*

ADD-ON CONTACT BLOCK SELECTION FOR 3-POSITION SELECTOR SWITCHES

CIRCUIT DESIG.	HANDLE POSITION			CONTACT BLOCK TYPE	PRICE
	LEFT	CENTER	RIGHT		
A	X	O	O	22CBNO	\$ 6.00
B	O	X	O	22CBNC	\$ 6.00
C	O	O	X	22CBNO	\$ 6.00
D	O	X	X	22CBDB	\$ 8.00
E	X	O	X	22CBEM	\$ 8.00
F	X	X	O	22CBDB	\$ 8.00
AB	X	O	O	22CBNONC	\$11.00
	O	X	O		
AC	X	O	O	22CB2NO	\$11.00
	O	O	X		
AE	X	O	O	22CBNOEM	\$12.00
	X	O	X		
AF	X	O	O	22CBNODB	\$12.00
	X	X	O		
BC	O	X	O	22CBNCNO	\$11.00
	O	O	X		
BD	O	X	O	22CBDBNC	\$12.00
	O	X	X		
BF	O	X	O	22CBNCDB	\$12.00
	X	X	O		
CD	O	O	X	22CBNODB	\$12.00
	O	X	X		
CE	O	O	X	22CBNOEM	\$12.00
	X	O	X		
DE	O	X	X	22CBDBEM	\$12.00
	X	O	X		
DF	O	X	X	22CB2DB	\$12.00
	X	X	O		
EF	X	O	X	22CBDBEM	\$12.00
	X	X	O		

ADD-ON CONTACT BLOCK SELECTION FOR 2-POSITION SELECTOR SWITCHES

CIRCUIT DESIG.	HANDLE POSITION		CONTACT BLOCK TYPE	PRICE
	LEFT	RIGHT		
G	X	O	22CBNC	\$ 6.00
H	O	X	22CBNO	\$ 6.00
GH	X	O	22CBNONC	\$11.00
	O	X		
GG	X	O	22CB2NC	\$11.00
	X	O		
HH	O	X	22CB2NO	\$11.00
	O	X		

O = OPEN X = CLOSED

*Specify the Circuit Designation code(s) from the charts above when ordering add-on contact blocks for all types of 22mm NEMA selector switches. To include an add-on contact block in your part builder number, simply add a hyphen (-) after the completed number and then the circuit designation code desired. For multiple add-on contact blocks, place a hyphen between each additional code.

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. See page 6 for more detailed directions.

Keyed Selector Switches



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



I. KEYED SELECTOR SWITCH OPERATOR FUNCTION

CODE	POS./FUNCTION	PRICE
22K2	2/Maintained	\$37.00
22KRL	2/Spring Return, R to L	\$43.00
22K3	3/Maintained	\$37.00
22KAC	3/Spring Return, L & R to C	\$43.00
22KLC	3/Spring Return, L to C	\$43.00
22KRC	3/Spring Return, R to C	\$43.00

KEYED SWITCH FEATURES

Alternate Key Combinations: Up to 9 different key combinations (CC series) are available. To order locks keyed differently, please consult factory or specify on order and increase the 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 MK1250 (\$20.00 per set of two master keys). Discount Schedule A applies.

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

O = OPEN
X = CLOSED

II. CIRCUIT DESIGNATION BASED ON OPERATOR FUNCTION

2-POSITION CONTACT BLOCK CIRCUIT DESIGNATION				
KEY POSITION				
CODE	LEFT	RIGHT		PRICE
G	X	O		\$ 6.00
H	O	X		\$ 6.00
GH	X	O		\$11.00
	O	X		
GG	X	O		\$11.00
	X	O		
HH	O	X		\$11.00
	O	X		
3-POSITION CONTACT BLOCK CIRCUIT DESIGNATION				
KEY POSITION				
CODE	LEFT	CENTER	RIGHT	PRICE
AB	X	O	O	\$11.00
	O	X	O	
AC	X	O	O	\$11.00
	O	O	X	
AE	X	O	O	\$12.00
	X	O	X	
AF	X	O	O	\$12.00
	X	X	O	
BC	O	X	O	\$11.00
	O	O	X	
BD	O	X	O	\$12.00
	O	X	X	
BF	O	X	O	\$12.00
	X	X	O	
CD	O	O	X	\$12.00
	O	X	X	
CE	O	O	X	\$12.00
	X	O	X	
DE	O	X	X	\$12.00
	X	O	X	
DF	O	X	X	\$12.00
	X	X	O	
EF	X	O	X	\$12.00
	X	X	O	

III. KEY REMOVAL POSITION

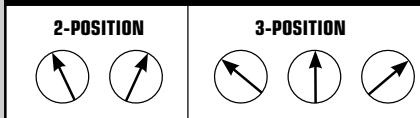
CODE	REMOVAL POSITION
KA	All
KL	Left Only
KR	Right Only
KC	Center Only
KLR	Left & Right Only
KLC	Left & Center Only
KRC	Right & Center Only

IV. CLAMP RING

CODE	DESCRIPTION	PRICE
X	Polyester (Type 4X)	—
M	Aluminum (Type 4)	\$ 2.00

Our 22mm Keyed Selector Switches come with integral contacts ready for field wiring and are supplied with two keys.

KEY POSITIONS



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 262 FOR DETAILS.

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	
	O=OPEN	X=CLOSED		CATALOG #	PRICE	CATALOG #	PRICE
1 NO 	LEFT O	RIGHT X	Left & Right	22K2H-KAX	\$43.00	22KRLH-KAX	\$49.00

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	
	O=OPEN	X=CLOSED			CATALOG #	PRICE	CATALOG #	PRICE
NO/NO 	LEFT X O	CENTER O O	RIGHT O X	Center	22K3AC-KCX	\$48.00	22KACAC-KCX	\$54.00



Discount Schedule B does not apply to MK1250 or ES201.

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. See page 6 for more detailed directions.

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**



I. OPERATOR TYPE		
CODE	DESCRIPTION	PRICE
22POTO	Potentiometer Operator	\$36.00

II. RESISTANCE		
CODE	DESCRIPTION	PRICE
(Blank)	Operator only	—
1k	1k Potentiometer	\$14.00
2.5k	2.5k Potentiometer	\$14.00
5k	5k Potentiometer	\$14.00
10k	10k Potentiometer	\$14.00

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

III. CLAMP RING		
CODE	DESCRIPTION	PRICE
(Blank)	Polyester (Type 4X)	—
PM	Aluminum (Type 4)	\$ 2.00

IV. TERMINAL BLOCK		
CODE	DESCRIPTION	PRICE
(Blank)	Operator only	—
TBW	Terminal Block installed and wired	\$10.00

Terminal block kit may be ordered separately (part number TBK, price \$6.00) or installed and wired at the factory to the potentiometer operator. Discount Schedule A applies.

DISCOUNT SCHEDULE B

Discount Schedule B does not apply to Terminal Block Kit (TBK).

SEE PAGE 270 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.
- Optional 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 - 4mm²) 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 264-265 for complete selection.

ADD-ON CONTACT BLOCKS

CODE	DESCRIPTION	PRICE
22CBNO	1 Normally Open Contact Block	\$ 6.00
22CBNC	1 Normally Closed Contact Block	\$ 6.00
22CBDB	1 Delayed Break Contact Block	\$ 8.00
22CBEM	1 Early Make Contact Block	\$ 8.00
22CBN0NC	Contact Block w/1 Normally Open & 1 Normally Closed	\$11.00
22CBNCNO	Contact Block w/1 Normally Closed & 1 Normally Open	\$11.00
22CB2NO	Contact Block w/2 Normally Open	\$11.00
22CB2NC	Contact Block w/2 Normally Closed	\$11.00
22CBDBNO	Contact Block w/1 Delayed Break & 1 Normally Open	\$12.00
22CBDBNC	Contact Block w/1 Delayed Break & 1 Normally Closed	\$12.00
22CBEMNO	Contact Block w/1 Early Make & 1 Normally Open	\$12.00
22CBEMNC	Contact Block w/1 Early Make & 1 Normally Closed	\$12.00
22CBDBEM	Contact Block w/1 Delayed Break & 1 Early Make	\$13.00
22CB2DB	Contact Block w/2 Delayed Break	\$13.00
22CB2EM	Contact Block w/2 Early Make	\$13.00



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 250) or with Push-Pull Maintained Caps or Toggle Switches (see page 252).

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.



HORIZONTAL THRUST & TRIM WASHERS



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

DISCOUNT
SCHEDULE **C**

CODE	CONTACTS	USE WITH	PRICE
22MI	No Contact Blocks	Momentary Push Buttons or Selector Switches	\$12.00
22MIR	No Contact Blocks	Maintained Operators	\$12.00

DISCOUNT
SCHEDULE **B**

Discount Schedule B does not apply to 22TWH, MAK-30/22 or MAK-1/22.

CODE	DESCRIPTION	PRICE
22TWH	Thrust Washer Horizontal	\$ 1.00

EXTENDED CLAMP RINGS



We offer three types of 22mm extended clamp rings that guard against accidental operation. Use our Extended Clamp Ring (22XECCR) 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 (22ECCR) with illuminated push buttons.

CODE	DESCRIPTION	PRICE
22XECCR	Extended Clamp Ring	\$ 3.80
22MECR	Aluminum Extended Clamp Ring	\$ 7.80
22ECCR	Clear Guarded Clamp Ring	\$ 5.80

CLAMP RING WRENCHES



22CRWM

22CRW

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	PRICE
22CRW	Standard Clamp Ring Wrench	\$11.50
22CRWM	Mushroom Clamp Ring Wrench	\$11.50

MOUNTING ADAPTER KITS



MAK-30/22

MAK-1/22

Our mounting adapter kits offer the ability to conveniently mount 22mm pilot devices in either a round 1-13/64" (30.5mm) hole or a 1" (25.4mm) hole.

DISCOUNT
SCHEDULE **C**

CODE	DESCRIPTION	PRICE
MAK-30/22	Converts 30mm Hole to a 22mm Hole Size. (Kit consists of a molded ring with a 1/16" (1.59mm) gasket.)	\$ 5.00
MAK-1/22	Converts a 1" Hole to a 22mm Hole Size. (No gasket is required.)	\$ 5.00

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 266.

LED Lamps

LED I II III

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



Our LED lamps feature built-in leakage protection.

I. LAMP TYPE

CODE	DESCRIPTION	PRICE
LED	LED Lamp	\$14.00

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 long 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	PRICE
22PG2	1/16" (1.6mm) Gasket	\$ 0.10

LOCK OFF ATTACHMENT



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

CODE	FITS	PRICE
22LOAFC	Most 22mm Push Buttons and Selector Switches	\$25.00

LAMP REMOVAL TOOL



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

CODE	DESCRIPTION	PRICE
LRT	Lamp Removal Tool	\$ 4.00

Incandescent Lamps



CODE	VOLTAGE	PRICE
FVB6	6V	\$ 2.00
FVB12	12V	\$ 2.00
FVB24	24V	\$ 2.00
FVB55	55V	\$ 4.00
FVB120	120V	\$ 4.00
FVB6F	*6V Flashing	\$ 6.00

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

Neon Lamps



CODE	VOLTAGE	COLOR	PRICE
FVB120NG	120V	Green	\$ 2.00
FVB120NR	120V	Red	\$ 2.00

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	DESCRIPTION	PRICE
HP22BK	Black Hole Plug	\$ 3.80
HP22GY	Grey Hole Plug	\$ 3.80
HP22YW	Yellow Hole Plug	\$ 3.80

DISCOUNT SCHEDULE A

Discount Schedule A applies to Replacement Lamps.

DISCOUNT SCHEDULE B

Discount Schedule B applies to Panel Gasket and Lock Off Attachment.

DISCOUNT SCHEDULE C

Discount Schedule C applies to Lamp Removal Tool and Hole Plugs.

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
22TFL120	Transformer 120V AC	LED6	FVB6 or FVB6F	—
22TFL240	Transformer 240V AC	LED6	FVB6 or FVB6F	—
22TFL277	Transformer 277V AC	LED6	FVB6 or FVB6F	—
22TFL480	Transformer 480V AC	LED6	FVB6 or FVB6F	—
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. See page 6 for more detailed directions.

Legend Plates



Legend plates feature 2 lines of text with approximately 16 characters per line. Uppercase is standard unless specified. *The short legend plate (22LPS) features 1 line of text with approximately 16 characters and the Potentiometer legend plate comes standard with a scale and one or two lines of text, see chart D below.

I. STANDARD LEGEND PLATE TYPE

CODE	DESCRIPTION	PRICE
22LP	Standard 1-3/4" h x 1-3/4" w	\$2.00
22LPN	Narrow 1-3/4" h x 1-1/2" w	\$2.00
22LPS	*Short 1-1/2" h x 1-3/4" w	\$2.00
22LPT	Tall 2" h x 1-3/4" w	\$2.50
22LPJ	Jumbo 2" h x 2" w	\$2.50
22LPR	Standard Round 2-13/32" Dia.	\$4.50
22LPRM	Medium Round 2-3/4" Dia.	\$5.25
22LPRJ	Jumbo Round 3-3/4" Dia.	\$6.00

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
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)
92	AUTO	OFF	HAND
93	AUTO	MAN	OFF
80	DOWN	OFF	UP
81	FWD	AUTO	REV
82	FWD	OFF	REV
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

NOT FINDING WHAT YOU NEED IN A STANDARD PLATE?

We offer Special and Custom Engraving up to 12" x 24" (304.8mm x 609.6mm). Please consult factory or see page 265 for details. While our standard legend plates are available for same day shipping, our special and custom legend plates are not.

DISCOUNT
SCHEDULE **C**

POPULAR CONFIGURATIONS:

LEGEND PLATES

CATALOG NO.	DESIGNATION	PRICE
22LPYW-04	EMERGENCY STOP	\$4.50
22LPT-83	HAND OFF AUTO	\$2.50
22LP-41	SPEED 0 - 10	\$2.00

All Legend Plates are a 2-ply laminated plastic, laser engraved for a permanent and quality appearance and 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.

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 2000 mcd 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

Transformer Lights (Burden) 2VA

** Designates a lamp design optimized for c3controls Illuminated Devices. See LED replacement lamps on page 263.

DIELECTRIC STRENGTH (MECHANICAL CONTACTS)

2200V for 1 Minute

STANDARD CONTACTS

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

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

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

ENVIRONMENTAL RATINGS

Type 1, 2, 3, 3R, 4/4X, 12, 13 and IP65

Operating Temperature

-40 to +131° F (-40 to +55° C)

Storage Temperature

-40 to +185° F (-40 to +85° C)

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

TERMINAL & WIRING CONSIDERATION

Wire- AWG 22-12 CU

(Copper Only – Solid & Stranded) [.5 ~ 4 mm²]

One or Two wires permitted per termination

Recommended Tightening Torque

7 lb-in (+3.0/-0.0 lb-in) — [.8 Nm]

OPERATING FORCES

Pushbuttons (1 Contact/2 Contact)

Momentary 3.5/4.0 lbs. [15.5/17.8 N]

Illuminated 4.0/5.0 lbs. [17.8/22.0 N]

Maintained (1 NC) 8.5 Lbs. [37.8 N]

Selector Switches (2 Contacts)

Maintained 3.5 in-lbs [4 Nm]

Momentary 4.5 in-lbs. [51 Nm]

Key Operated Maintained 3.5 in-lbs. [4 Nm]

Key Operated Momentary 4.5 in-lbs [51 Nm]

Potentiometer – 2 Watt -"J" Series

3-12 in-oz. [.11 Nm Max.] (300° Rotation)

Contact Add-A-Block (Single Pole)

.5 Lb per pole [2.2 N]

Indicating Lights – Refer to the appropriate Lamp Data in this catalog

MECHANICAL DESIGN LIFE CYCLES

Pushbuttons

Momentary 5,000,000

Maintained 1,000,000

Selector Switches 500,000

All Other Devices 250,000

Contact Blocks 5,000,000

Indicating Lights – Refer to the appropriate Lamp Data in this catalog.

MATERIALS

Thermoplastic Polyester and Polyester Blends (UV Stabilized for outdoor use)

Operator Housings

Operator Caps and Handles

Non-Illuminated (Glass Reinforced Grades)

Mounting Rings and Nuts

Thrust Washer

Trim Washer

High Impact Polycarbonate (UV Stabilized for outdoor use)

Pilot Light Lens

Transparent PB and Mush Caps

Custom Polymers

Certain CAM and Bearing parts are

Teflon, Silicone, & Moly-Disulfide

Impregnated for improved wearability

Thermoplastic Neoprene Boot

Accessories

Seals

Neoprene Gaskets

Thermoplastic – Molded Neoprene and alloy derivatives

BUNA N – Rubber – Teflon Coated

Thermoplastic – Elastomer Molded

Seals

Metal Brass (Plated and Un-plated)

Push Pull Bushings

Detents for Maintained Devices

Springs (Stainless Steel throughout)

Aluminum

Optional Mounting Nut

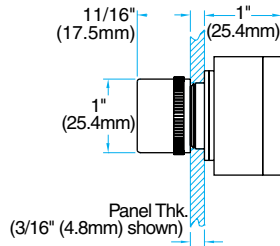
RoHS Compliance

For documentation by product, refer to www.c3controls.com.

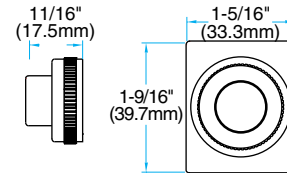
MOMENTARY NON-ILLUMINATED PUSH BUTTONS

Fully-assembled operators come standard with five 1/16" (1.5mm) gaskets.
See page 271 for mounting gasket specifications.

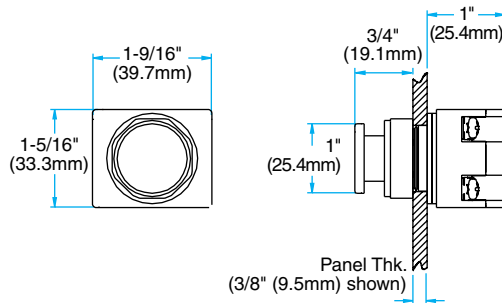
**MOMENTARY NON-ILLUMINATED OPERATOR
(SHOWN WITH FLUSH CAP)**



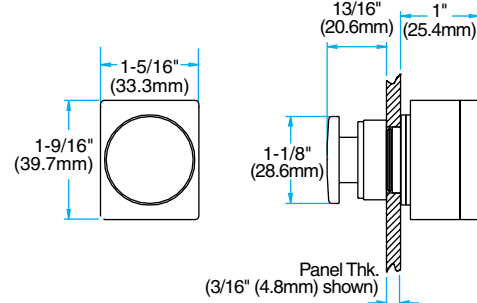
MOMENTARY EXTENDED CAP



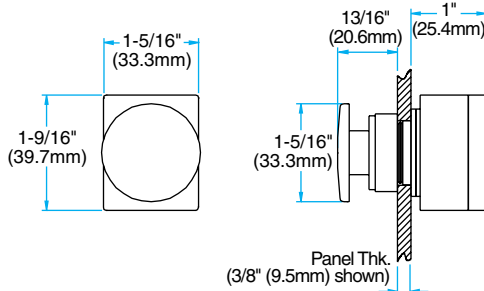
**MOMENTARY NON-ILLUMINATED OPERATOR
(SHOWN WITH 1" (25.4mm) MUSHROOM CAP)**



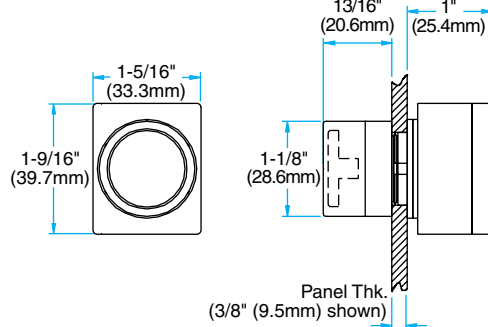
**MOMENTARY NON-ILLUMINATED OPERATOR
(SHOWN WITH 1-5/32" (27mm) MUSHROOM CAP)**



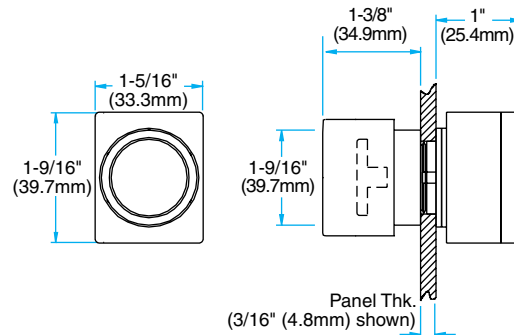
**MOMENTARY NON-ILLUMINATED OPERATOR
(SHOWN WITH 1-1/3" (33.8mm) JUMBO MUSHROOM CAP)**



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



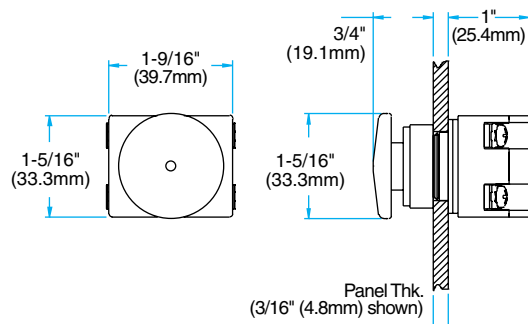
**MOMENTARY NON-ILLUMINATED OPERATOR
(SHOWN WITH 1-5/32" (27mm) SHROUDED MUSHROOM CAP)**



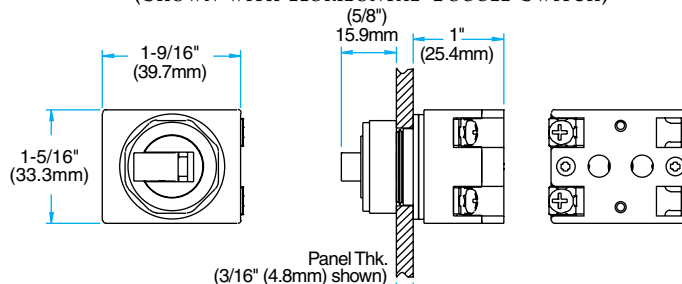
MAINTAINED NON-ILLUMINATED PUSH BUTTONS

Fully-assembled operators come standard with five 1/16" (1.5mm) gaskets.
See page 271 for mounting gasket specifications.

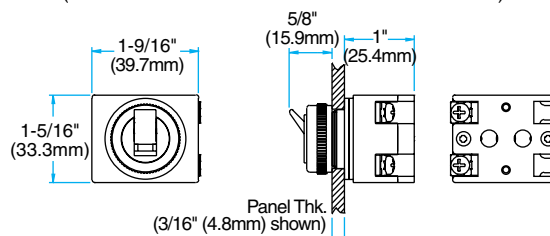
2-POSITION PUSH-PULL MAINTAINED NON-ILLUMINATED OPERATOR (SHOWN WITH 1-1/2" (38mm) MUSHROOM CAP)



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



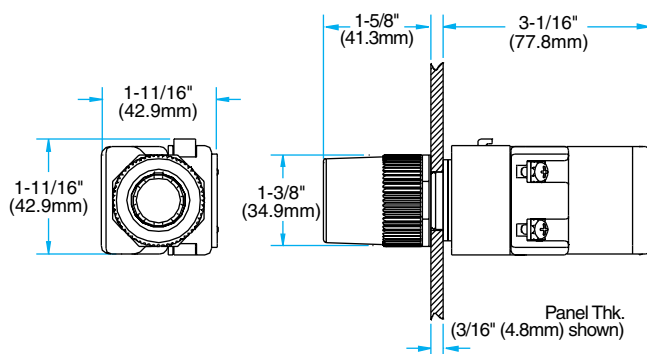
MAINTAINED NON-ILLUMINATED OPERATOR (SHOWN WITH VERTICAL TOGGLE SWITCH)



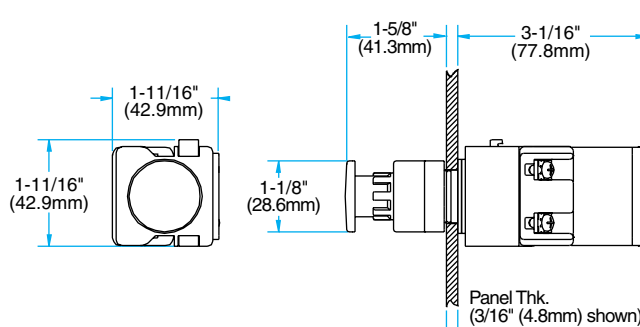
MOMENTARY ILLUMINATED PUSH BUTTONS

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.
See page 271 for mounting gasket specifications.

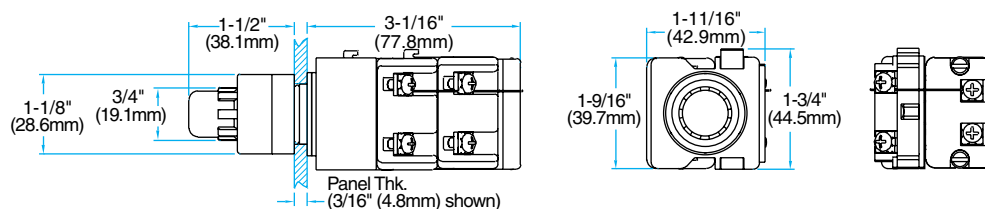
ILLUMINATED FULL VOLTAGE, TRANSFORMER AND RESISTOR OPERATORS (SHOWN WITH IFC)



ILLUMINATED FULL VOLTAGE, TRANSFORMER AND RESISTOR OPERATORS (SHOWN WITH IMC)



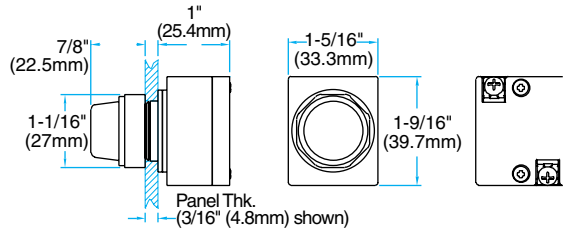
ILLUMINATED FULL VOLTAGE, TRANSFORMER AND RESISTOR OPERATORS (SHOWN WITH IXC)



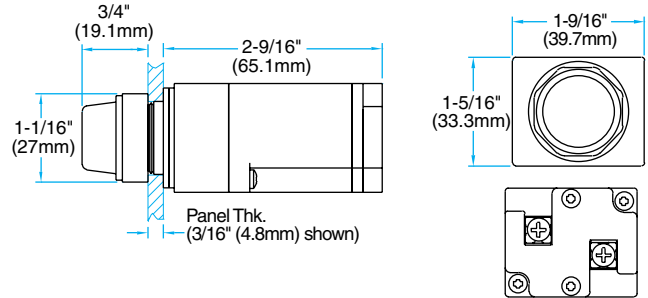
PILOT LIGHTS

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.
See page 271 for mounting gasket specifications.

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



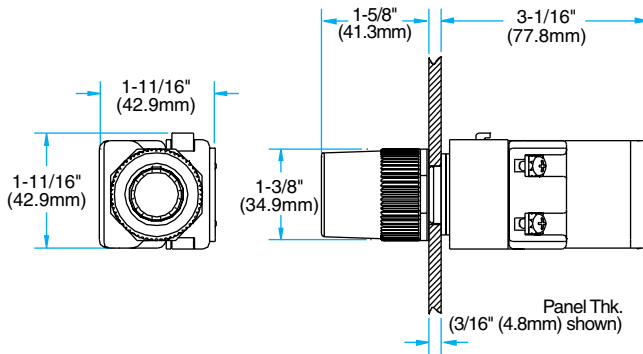
TRANSFORMER AND RESISTOR PILOT LIGHT OPERATORS (SHOWN WITH PL)



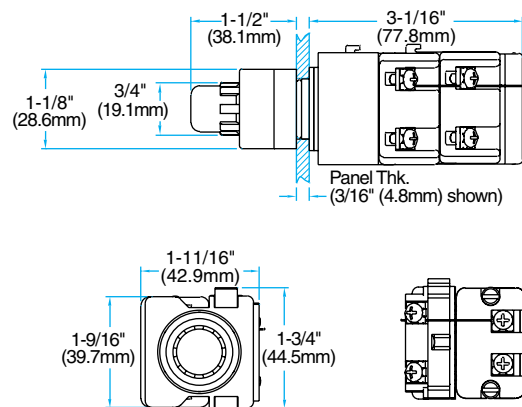
PUSH-TO-TEST PILOT LIGHTS

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.
See page 271 for mounting gasket specifications.

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



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

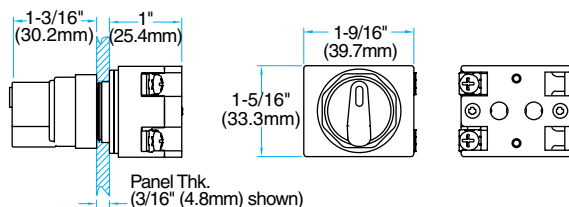


**VISIT WWW.C3CONTROLS.COM
TO DOWNLOAD CAD DRAWINGS**

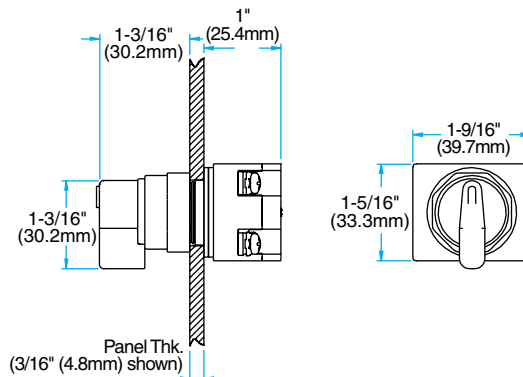
SELECTOR SWITCHES

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.
See page 271 for mounting gasket specifications.

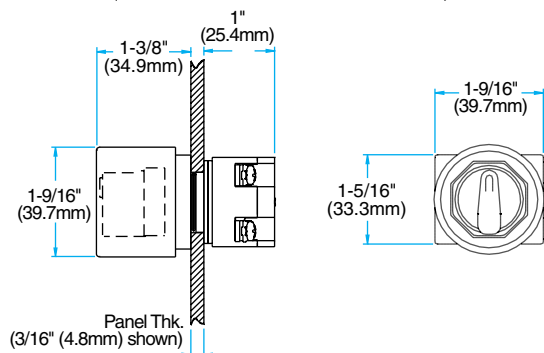
SELECTOR SWITCH OPERATOR
(SHOWN WITH STANDARD HANDLE)



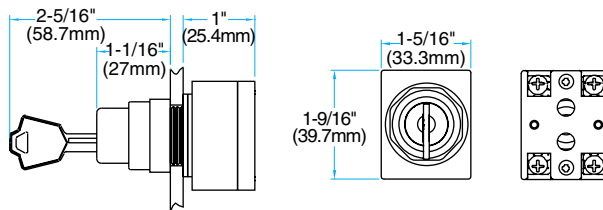
SELECTOR SWITCH OPERATOR
(SHOWN WITH LEVER HANDLE)



SELECTOR SWITCH OPERATOR
(SHOWN WITH GUARDED HANDLE)



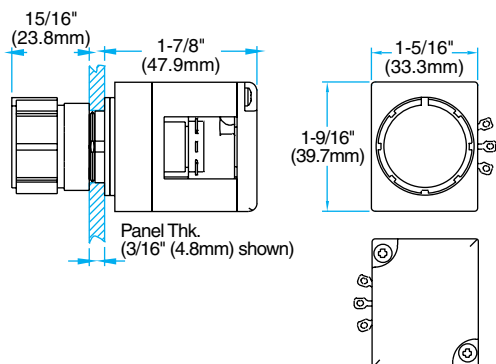
KEYED SELECTOR SWITCH OPERATOR



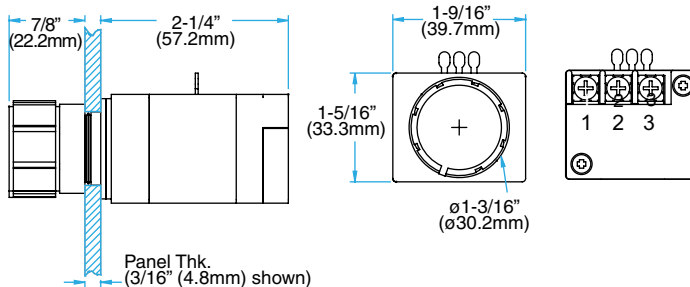
POTENTIOMETER WITH & WITHOUT TERMINAL BLOCK

Fully-assembled operators come standard with five 1/16" (1.6mm) gaskets.
See page 271 for mounting gasket specifications.

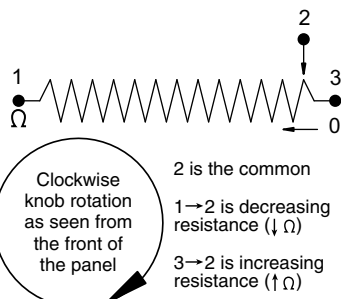
POTENTIOMETER OPERATOR
(SHOWN WITHOUT TERMINAL BLOCK)



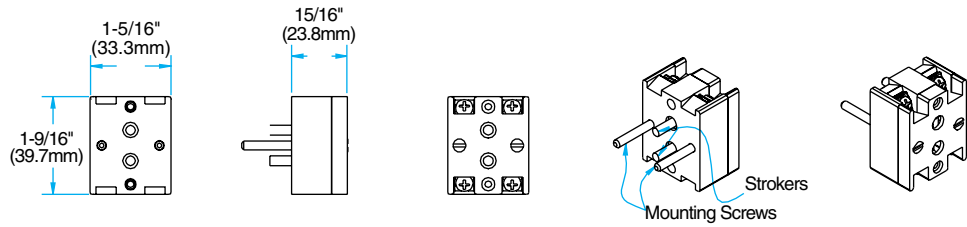
POTENTIOMETER OPERATOR
(SHOWN WITH TERMINAL BLOCK)



WIRING DIAGRAM

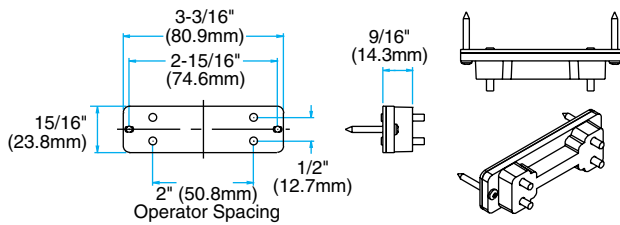


CONTACT BLOCK

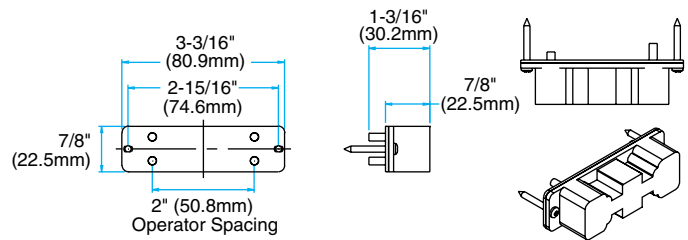


MECHANICAL INTERLOCK

22MI

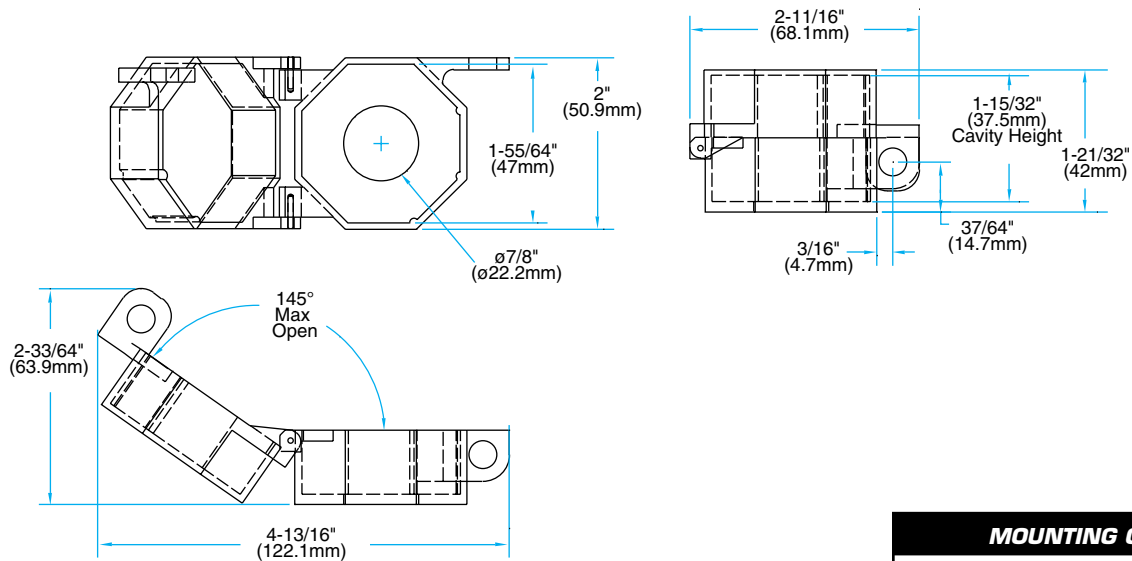


22MIR



LOCK-OFF ATTACHMENT

22LOAFC



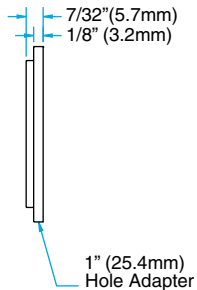
MOUNTING GASKETS

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.

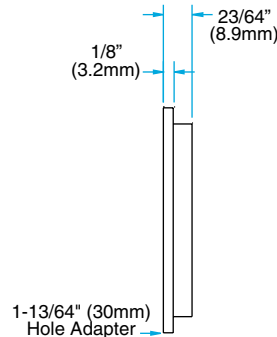
MOUNTING ADAPTERS

MAK-1/22



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

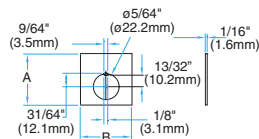
MAK-30/22



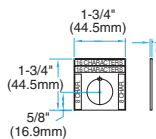
- Mounting Adapter for use with all 22mm operators.
- Maximum enclosure thickness 1/64" (3.8mm).
- Mounting Adapter must be used with one 1/16" (1.6mm) gasket to ensure a watertight seal.

LEGEND PLATES

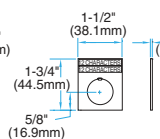
STANDARD LEGEND PLATE
WITH BREAK-AWAY POSITIONING
FOR OPTIONAL THRUST
WASHER ACCESSORY



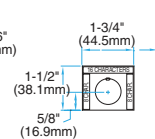
22LP-SP STANDARD



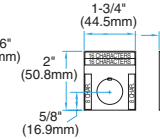
22LPN-SP NARROW



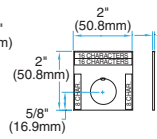
22LPS-SP SHORT



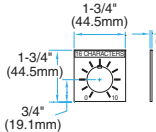
22LPT-SP TALL



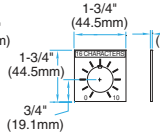
22LPJ-SP JUMBO



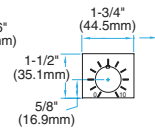
22LP-40-SP POT



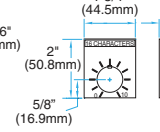
22LP-43-SP POT



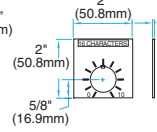
22LPS-40-SP SHORT



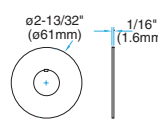
22LPT-40-SP TALL



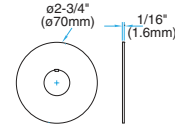
22LPJ-40-SP JUMBO



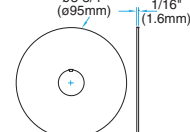
22LPR-SP STANDARD ROUND



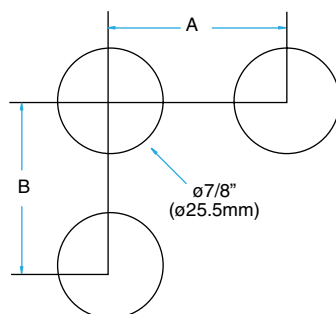
22LPRM-SP MEDIUM ROUND



22LPRJ-SP JUMBO ROUND



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)