



Cutler-Hammer

# E22 Series 22mm Pilot Devices

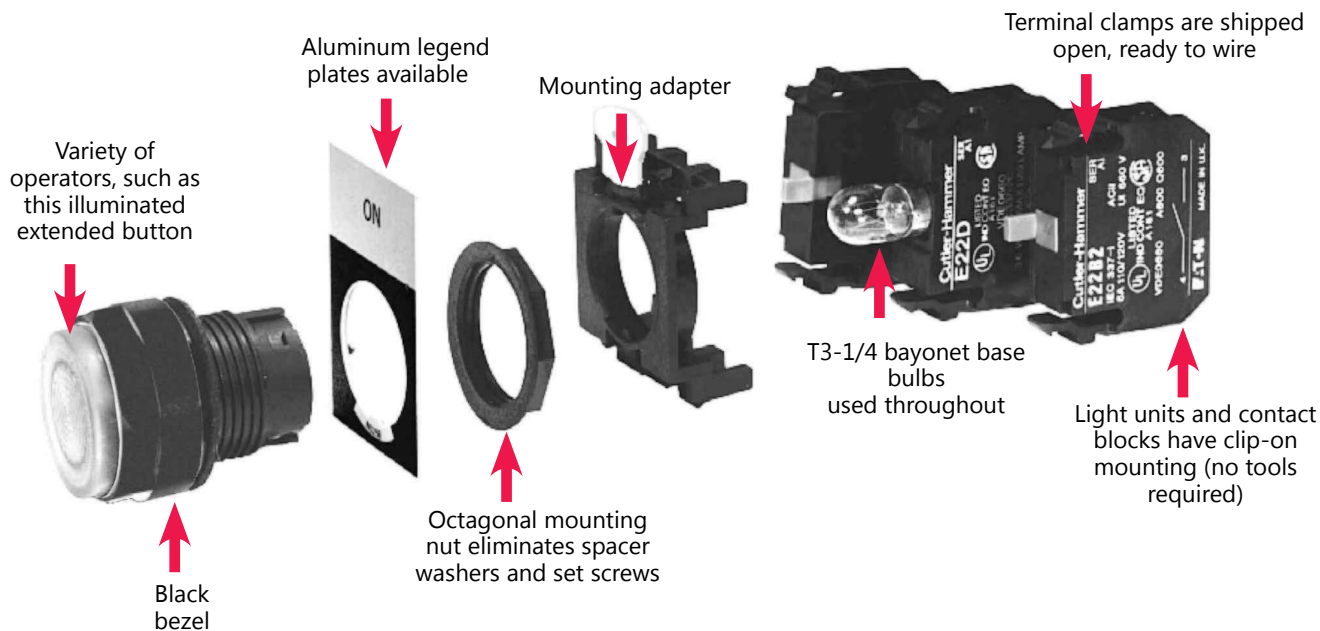
## Overview\*

### 22mm Non-Metal Operator and Pilot Devices

Cutler-Hammer's 22mm industrial pushbutton line offers a wide array of functional, smartly-styled illuminated and non-illuminated pushbuttons, selector switches, and more. We offer transformer, full voltage, resistor, or LED light units. The operators feature a matte black bezel. The space-saving design and modular construction of the E22 line makes on-the-job installation fast and easy.

#### Complete assembled devices

The devices listed are shipped complete with operator, contact blocks and light (if applicable).



\* Cutler-Hammer products are available for sale to North America locations only.



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# E22 Series Selection Guide



## Indicating Lights

Complete assembly includes:

- Illuminated operator, including optically enhanced lens
- Incandescent or LED light units
- (Order legend plate separately)



## Selector Switches

Complete assembly includes:

- Selector operator
- Contact block(s) - one or two normally open or normally closed
- Black bezel
- (Order legend plate separately)



## Pushbuttons

Complete assembly includes:

- Flush or extended momentary operators
- One normally open or normally closed contact
- Push-push models also available
- 120VAC light (if illuminated)
- (Order legend plate separately)



## 40 and 50mm Mushroom Pushbuttons

- Push-Pull trigger action
- Illuminated or non-illuminated
- (Order legend plate separately)



## Double Headed Pushbutton

- On/Off control



## Control Station

- For Start/Stop applications



## Illuminated Pushbuttons

- Red, green or amber
- 120VAC or 24 VAC/DC
- Order legend plate separately



## Push-to-Test Indicating Lights

- Red, green or amber
- Order legend plate separately



## Tools and Accessories

- Legend plates
- Hole plugs
- Bulb tools
- Replacement bulbs



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# E22 Series Technical Specifications

## Ingress Protection (IP) Rating

(IP65, IP66 ratings to IEC 529) UL Listed (NEMA) Types 1, 2, 3, 3R, 4, 4X, 12, and 13 when mounted in an enclosure rated for those same applications.

## Electrical Specifications

**Electrical Rating** UL508; UL File E131568. CSA certified class 3211 03, LR 68551.  
NEMA ICS5-2000: A600, Q600 (refer to page 90). IEC 60947-5-1: AC15, DC13.

## Maximum Frequency of Operation

**22mm Pushbuttons** 6,000 operations/hour IEC 60947-5-1: AC15, DC13.

**Key and Lever Selector Switches** 3,000 operations/hour

**Twist-to-Release Devices** 1,200 operations/hour

**Push-Pull Operators** 3,000 operations/hour

## Mechanical Life

**Pushbutton** 5 million operations

**Selector Switches** 500,000 operations

**Push-Pull and Twist-to-Release** 300,000 operations

**Contact Block** 3 million operations

## Environmental Specifications

**Operating Temperature** Maximum 60°C at 95% RH, -20 to 60°C (-14 to 140°F), altitude 2000 meters

**Storage Temperature** Maximum 60°C at 95% RH, -40 to 80°C (-40 to 176°F)

## Vibration

**Vibration** 5G/0.7 mm peak-to-peak 10 sweeps, 10-500 Hz

**Shock** 18G, 18ms

**Bump** 25G, 6ms for 1,000 cycles

## Construction

Components	Materials
<b>Housing, Bezel, Mounting Rings</b>	Glass-filled nylon
<b>Internal Seal</b>	Nitrate rubber
<b>Panel Gasket</b>	Nitrate rubber
<b>Illuminated Lenses</b>	Polycarbonate
<b>Buttons</b>	Polyester or polycarbonate
<b>Springs</b>	Stainless steel
<b>Contacts</b>	Silver
<b>Terminal Screws/Terminals</b>	Brass

## Panel Thickness - mm (inches)

**Nominal** 6.8 (0.2)<sup>1</sup>

**Aluminum Legend Plates** 1.3 (0.05)

**Large Yellow Round Legend Plates** 1.0 (0.04)

**Minimum** 1.0 (0.04)

<sup>1</sup>) Installation of certain accessories will increase the total (overall) panel thickness by the amount shown. The total panel thickness with all accessories installed cannot exceed the maximum allowable nominal dimensions of 6.8 mm (0.27 in.).

## Wire Specifications

**Minimum/Maximum** 18AWG (0.75 mm<sup>2</sup>) / 12AWG (2.5 mm<sup>2</sup>)

**Tightening Torque** 7 lb·in

## Electrical life

- AC15 durability:  
120V, 6A 1 X 10<sup>6</sup> operations
- DC13 durability:  
24V, 8A 0.15 X 10<sup>6</sup> operations  
660V, .1A 0.5 X 10<sup>6</sup>

## Logic-level operation

5 VDC, 1mA (minimum recommended)

Contacts feature a pointed surface called "Reliability Nib." The projection penetrates through any oxidation providing unmatched low-level operation without using exotic metals or sealed contacts.

## Standards and approvals

- UL listed – UL 508 electrical/environmental;
- UL 486E terminal secureness, File E131568
- CSA Certified – CSA 22.2 #14
- NEMA ICS-1, ICS-2
- IEC 144, 337, 529, 947
- IP65 when mounted in enclosure
- Lloyds No. 4 and 5
- M.T.T.A.
- CE

## IEC utilization categories & ratings

AC15  
(Control of AC electromagnetic loads)

- 24 volts AC at 10 amps
- 130 volts AC at 6.5 amps

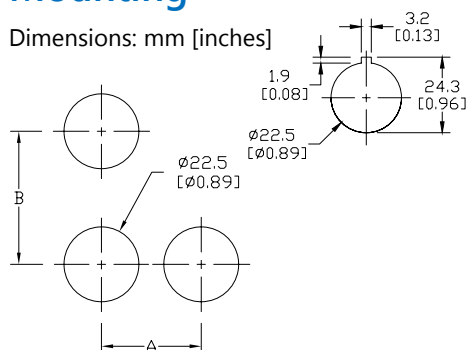
DC13  
(Control of DC electromagnetic loads)

- 24 volts DC at 1.5 amps
- 110 volts DC at .5 amps

# E22 Mounting / NEMA Aux Contact Ratings

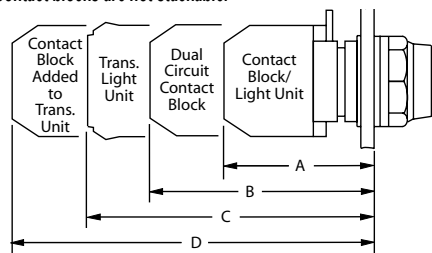
## Mounting

Dimensions: mm [inches]



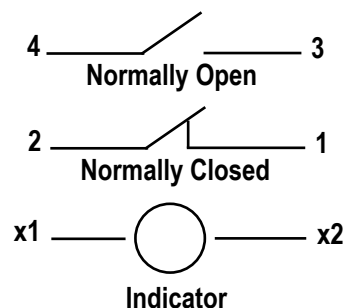
## Back-of-panel extensions

Note: This view is to show dimensions only.  
Contact blocks are not stackable.



## Control Circuit Contact Electrical Ratings and Wiring

### Typical Wiring



Minimum Spacing — mm [inches]		
Size/Type of Operator	Dimensions	
	A	B
All types up to 30 (1.18) dia. including knob and key operated selector switches — except those listed below	30 (1.18)	50 (1.97)
Three-way adapter		
50 (1.97) dia. operators	55 (2.16)	55 (2.16)
Large yellow round legend plate - 70 (2.76) diameter	75 (2.95)	50 (1.97)

Approximate Dimensions — mm [inches]			
A	B	C	D
Single circuit block — full voltage and resistor units	Dual circuit contact block	Transformer light unit	Transformer light unit and single circuit contact block
<b>Pushbuttons (All Types and Push-Pull)</b>			
51 [2.0]	66 (2.6)	74 (2.91)	94 (3.7)
<b>Key and Knob Selector Switches</b>			
57 [2.2]	72 (2.83)	80 (3.15)	99 (3.9)

## NEMA Mechanical Switching Ratings and Test Values for DC Control Circuit Contacts

Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum Make or Break DC Current (A)			Volt amperes
		125 Volts	250 Volts	301 to 600 Volts	
P300	5.0	1.1	0.55	---	138
P600	5.0	1.1	0.55	0.20	138
Q300	2.5	0.55	0.27	---	69
Q600	2.5	0.55	0.27	0.10	69
R300	1.0	0.22	0.11	---	28

This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices. The chart values are from NEMA Standard ICS 5-2000, Table 1-4-2.

## NEMA Mechanical Switching Ratings and Test Values for AC Control Circuit Contacts

Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum AC Current, 50/60Hz (A)								Volt amperes	
		120 Volts		240 Volts		480 Volts		600 Volts			
		Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A300	10	60	6.00	30	3.00	---	---	---	---	7200	720
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B300	5	30	3.00	15	1.50	---	---	---	---	3600	360
B600	5	30	3.00	15	1.50	7.5	0.75	6	0.60	3600	360
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3.00	0.30	1800	180

This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices. The chart values are from NEMA Standard ICS 5-2000, Table 1-4-1.