

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. See pages 30-9 and 30-10 for descriptions.	
Electrical Specifications	
Electrical Rating	UL508; UL File E131568. CSA certified class 3211 03, LR 68551. NEMA ICS5-2000: A600, Q600 (refer to page 25-51). IEC 60947-5-1: AC15, DC13.
Maximum Frequency of Operation	
22 mm 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/0.7mm peak-to-peak 10 sweeps, 10-500 Hz
Shock	18G, 18ms
Bump	25G, 6ms for 1,000 cycles
Construction	
Components	Materials
Housing, Bezel, Mounting Rings	Glass-filled nylon
Internal Seal	Nitrate rubber
Panel Gasket	Nitrate rubber
Illuminated Lenses	Polycarbonate
Buttons	Polyester or polycarbonate
Springs	Stainless steel
Contacts	Silver
Terminal Screws/Terminals	Brass
Panel Thickness - Inches (mm)	
Nominal	0.27 (6.8) ¹
Aluminum Legend Plates	0.05 (1.3)
Large Yellow Round Legend Plates	0.04 (1.0)
Minimum	0.04 (1.0)
¹ 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 0.27 in. (6.8 mm).	
Wire Specifications	
Minimum/Maximum	18AWG (0.75mm ²) / 12AWG (2.5mm ²)
Tightening Torque	7lb./in.

Electrical life

- AC15 durability: 120V, 6A 1 X 10⁶ operations
- DC13 durability: 24V, 8A 0.15 X 10⁶ operations
660V, .1A 0.5 X 10⁶

Logic-level operation

5 VDC, 1 mA (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

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Internal Seal	Nitrate rubber
Panel Gasket	Nitrate rubber
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- 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

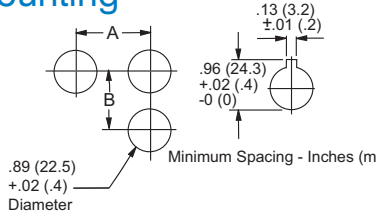
DC13

(Control of DC electromagnetic loads)

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

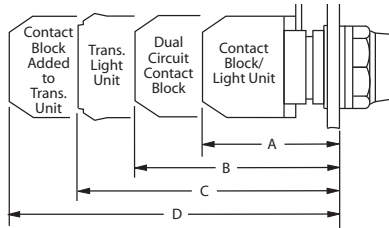
E22 Mounting / NEMA Aux Contact Ratings

Mounting



Back-of-panel extensions

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



Control Circuit Contact Electrical Ratings

Typical Wiring - See page 25-25
Note drawing

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

Approximate Dimensions — Inches (mm)			
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
Pushbuttons (All Types and Push-Pull)			
2.0 (51)	2.6 (66)	2.91 (74)	3.7 (94)
Key and Knob Selector Switches			
2.2 (57)	2.83 (72)	3.15 (80)	3.9 (99)

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.

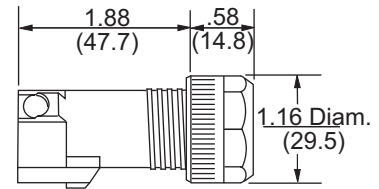
NEMA Mechanical Switching Ratings and Test Values for AC Control Circuit Contacts											
Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum AC Current, 50/60Hz (A)								Volt amperes	
		120 Volts		240 Volts		480 Volts		600 Volts			
		Make	Break	Make	Break	Make	Break	Make	Break	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.

Company Information
Systems Overview
Programmable Controllers
Field I/O
Software
C-more & other HMI
Drives
Soft Starters
Motors & Gearbox
Steppers/Servos
Motor Controls
Proximity Sensors
Photo Sensors
Limit Switches
Encoders
Current Sensors
Pressure Sensors
Temperature Sensors
Pushbuttons/Lights
Process
Relays/Timers
Comm.
Terminal Blocks & Wiring
Power
Circuit Protection
Enclosures
Tools
Pneumatics
Appendix
Product Index
Part # Index

E22 Monoblock Indicating Lights

Monoblock Indicating Lights			
24V AC/DC Full Voltage Incandescent			Price
Red	E22HV2X4	Monoblock indicating light, red optically enhanced lens, 24V full voltage incandescent	<--->
Green	E22HV3X4	Monoblock indicating light, green optically enhanced lens, 24V full voltage incandescent	<--->
Amber	E22HV9X4	Monoblock indicating light, amber optically enhanced lens, 24V full voltage incandescent	<--->
120V AC Full Voltage Incandescent			
Red	E22HV2X8	Monoblock indicating light, red optically enhanced lens, 120V full voltage incandescent	<--->
Green	E22HV3X8	Monoblock indicating light, green optically enhanced lens, 120V full voltage incandescent	<--->
Amber	E22HV9X8	Monoblock indicating light, amber optically enhanced lens, 120V full voltage incandescent	<--->
24V AC/DC Full Voltage LED*			
Red	E22HL2X4	Monoblock indicating light, red optically enhanced lens, 24V full voltage LED	<--->
Green	E22HL3X4	Monoblock indicating light, green optically enhanced lens, 24V full voltage LED	<--->
Amber	E22HL9X4	Monoblock indicating light, amber optically enhanced lens, 24V full voltage LED	<--->
120V AC Full Voltage LED*			
Red	E22HL2X8	Monoblock indicating light, red optically enhanced lens, 120V full voltage LED	<--->
Green	E22HL3X8	Monoblock indicating light, green optically enhanced lens, 120V full voltage LED	<--->
Amber	E22HL9X8	Monoblock indicating light, amber optically enhanced lens, 120V full voltage LED	<--->
120V AC Transformer Incandescent			
Red	E22H2X11	Monoblock Indicating light, red optically enhanced lens, 120V transformer incandescent	<--->
Green	E22H3X11	Monoblock indicating light, green optically enhanced lens, 120V transformer incandescent	<--->
Amber	E22H9X11	Monoblock indicating light, amber optically enhanced lens, 120V transformer incandescent	<--->
See also specifications and mounting data at the beginning of this section.			



Approximate dimensions in mm (in). See dimensions for "back-of-panel extensions" at the beginning of this section.

* Note: Cutler-Hammer 22mm LED indicators feature an LED cluster module. The LED clusters are permanently installed and are non-replaceable. See page 22-32 for replacement lamp information.

E22 Key Switches and Accessories

Two-position key switches

A



Three-position key switches

B



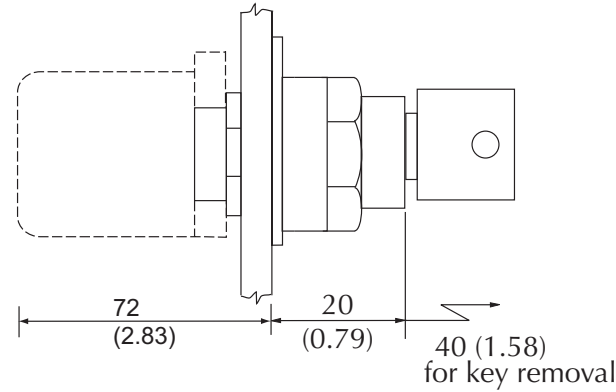
Key Switches			Price
Two-position Key Switch			
(A) Key	E22KB53A	Selector switch, black bezel, 2-position key, "OFF ON" with one N.O. contact block	<--->
(A) Key	E22KB62A	Selector switch, black bezel, 2-position key, spring from right "OFF ON" with one N.O. contact block	<--->
Three-position Key Switch			
(B) Key	E22KBG7RR	Selector switch, black bezel, 3-position key, "ON ON ON" with two contact blocks, each having one N.O. and one N.C. contact. (Contact part number E22B11)	<--->
(B) Key	E22KBG7D	Selector switch, black bezel, 3-position key, "HAND OFF AUTO" with two N.O. contact blocks	<--->

See specifications and mounting data at the beginning of this section.

Notes:

All E22 series key switches are keyed alike. The key is not compatible with the metal 22 mm key switches.

All E22 series key switches will hold only one single row of (2) contacts (non-stackable). Key can be removed in all positions.



Spare keys available: part no. E22KS2

Approximate dimensions in mm (in). See dimensions for "back-of-panel extensions" at the beginning of this section.

Accessories — replacement contact blocks

Replacement Contact Blocks			Price
Contact Blocks	One block contains:		
E22B1*	One N.C. contact (Direct Opening Action)		<--->
E22B2	One N.O. contact		<--->
E22B11*	One N.O., One N.C. contact (N.C. Direct Opening Action)		<--->
E22B20	Two N.O. contacts		<--->
E22CB1M*	Self-monitoring contact block (N.C. Direct Opening Action)		<--->

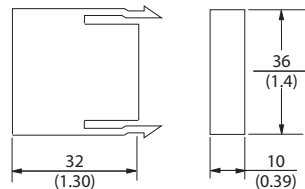
Note: See contact electrical ratings on page 22-26.

***All N.C. contact blocks are EN 418 compliant when used with compliant operators. See Page 22-29.**

E22B1



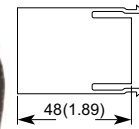
E22B2



E22CB1M

E22B11

E22B20



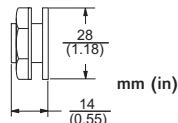
dimensions in mm (in).

Volume 13

Octagonal wrench



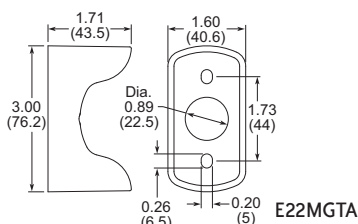
Hole plug



Bulb removal tool



Guard for E22 E-stop



Replacement incandescent bulbs



Replacement LED lamps



Accessories		
Part number	Description	Price
HT8WRENCH	Octagonal wrench for tightening back-of-panel mounting nut on all Cutler-Hammer operators.	<--->
E22BHP	Hole plug for unused 22 mm panel holes.	<--->
E22KS2	Spare key for all Cutler-Hammer 22 mm selector switches (not shown)	<--->
HT8LAMP TOOL	Lamp extraction tool for removing lamps from switches, indicators and stacklights	<--->
E22MGTA	22mm yellow guard for E22LTA2QB and E22LPB2B for emergency stop applications.	<--->

Part Number	Rating	Description	Quantity	Price
ECX1900-5	6V, 1.2 watts	6V replacement bulb for 22 mm switches and indicators. Miniature bayonet base T31/4.	pkg. of 5 bulbs	<--->
ECX1902-5	24V@80mA	24V replacement bulb for 22 mm switches and indicators. Miniature bayonet base T31/4.	pkg. of 5 bulbs	<--->
ECX1904-5	130V@20mA	120V replacement bulb for 22 mm switches and indicators. Miniature bayonet base T31/4.	pkg. of 5 bulbs	<--->

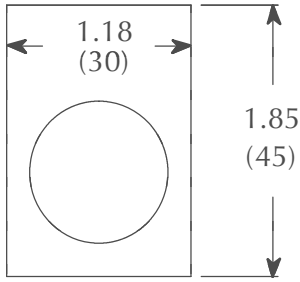
Part Number	Rating	Description	Quantity	Price
W1121	120V@20mA	Replacement lamp for C-H E22 full voltage indicators and switches. Does not replace the LED monoblock indicators.	pkg. of 4 bulbs	<--->
W1226	60V@20mA	Replacement lamp for C-H E22 resistor indicators, switches and pushbuttons. Does not replace the LED monoblock indicators.	pkg. of 4bulbs	<--->
W1819	24V@20mA	Replacement lamp for C-H E22 indicators and pushbut-tions. Does not replace the LED monoblock indicators.	pkg. of 4bulbs	<--->

Part Number	Color	Rating	Description	Quantity	Price
ECX1911-2	Red	24V@26mA	LED replacement lamp for miniature bayonet base lamps.	pkg. of 2 LED bulbs	<--->
ECX1912-2	Green				<--->
ECX1913-2	Yellow				<--->
ECX1914-2	Blue				<--->
ECX1915-2	White				<--->
ECX1921-2	Red	120V@5mA	Works with 22 mm metal and Cutler-Hammer switches and indicators, but illumination will not be as even when used with Our metal indicators.		<--->
ECX1922-2	Green				<--->
ECX1923-2	Yellow				<--->
ECX1924-2	Blue				<--->
ECX1925-2	White				<--->

Note: Bulb removal tool available. Order part number HT8LAMP TOOL.

Legend plates

Aluminum legend plates feature a plastisol backing to help prevent rotation of the operator.



Approximate dimensions in inches (mm).

E22VA8



Accessories			
Color	Part Number	Legend	Price
Black	E22NS11	"CLOSE"	<-->
Black	E22NS12	"DOWN"	<-->
Red	E22NS13	"EMERG. STOP"	<-->
Black	E22NS15	"FORWARD"	<-->
Black	E22NS19	"JOG"	<-->
Black	E22NS25	"ON"	<-->
Black	E22NS26	"OPEN"	<-->
Black	E22NS30	"REVERSE"	<-->
Black	E22NS31	"RUN"	<-->
Black	E22NS33	"START"	<-->
Red	E22NS34	"STOP"	<-->
Black	E22NS35	"UP"	<-->
Black	E22NS36	Blank plate	<-->
Red	E22NS37	Blank plate	<-->
Black	E22NS38	"FOR-REV"	<-->
Black	E22NS39	"HAND-AUTO"	<-->
Black	E22NS41	"JOG-RUN"	<-->
Black	E22NS42	"OFF-ON"	<-->
Black	E22NS43	"OPEN-CLOSE"	<-->
Black	E22NS48	"UP-DOWN"	<-->
Black	E22NS50	"FOR-OFF-REV"	<-->
Black	E22NS51	"HAND-OFF-AUTO"	<-->
Black	E22NS80	"POWER ON"	<-->
Black	E22NS81	"MOTOR RUN"	<-->
Black	E22NS82	"MOTOR STOP"	<-->
Black	E22NL36	Jumbo alum. blank plate (1.57 in wide x 1.85 in tall)	<-->
Red	E22NL37	Jumbo alum. blank plate (1.57 in wide x 1.85 in tall)	<-->
Red /black	E22NSP77	Plastic blank plate; red on one side, black on other side; either side can have letters engraved down into white plastic	<-->
Yellow	E22VA8	"EMERGENCY STOP" oversize yellow legend plate, 2.76" (70mm), printed	<-->

NOTE: Legend plates also work with the 22 mm metal switches. The removal of the locator tab on the legend plate is required for use with the 22 mm metal switches. This is easily accomplished with a round file or small grinder.