

## TECHNICAL DATA

### General Specifications

Conformity to Standards	UL508 (USA) NEMA ICS-2 (USA) VDE 0600 (Germany) BSI (Great Britain) CEI EN60947.5.1 (Italy) CENELEC EN 5000 7 (Europe)	CSA C22.2 No. 14-M91 (Canada) IEC 947.5.1 (International) UTE (France) NFC 63140 (France) JIS (Japan)	
Approvals	UL listed - File Number E170195 Manufacturing Facility is registered to ISO 9000	 	
Finger Protection at Terminals	IP2X according to IEC 529 Terminal identification is registered to ISO 9000		
Enclosure Ratings	Suitable for use in NEMA Types 1, 3, 3R, 3S, 4, 4X, 12 and 13 enclosures. (Multi-function push buttons are suitable for NEMA Type 1 enclosures only unless used with protective rubber cap accessory.) IP66 per IEC529, when mounted in enclosures with equal or superior seal.		
Ambient Temperature	Operating -13° to +158°F -25° to +70°C	Storage -40° to +158°F -40° to +70°C	
Climate Suitability / Humidity	Climate Type Temperature Wet Hot Wet Variable Wet	Temperature 74°F (23°C) 74°F (23°C) 104°F (40°C) 74° to 104°F (23° to 40°C)	Relative Humidity 50% 83% 92% 83% to 92%
Resistance to Vibration	Per IEC 68-2-6, 16g with a frequency from 40-500 Hz and maximum peak-to-peak amplitude of 0.75mm		
Resistance to Shock	According to MIL 202B, method 202A. Test was performed for 1/2 sinusoid for 11md, 38g max for all operators with transformers and 100g for all other operators.		
Operating Force	Standard push button operator: 2.5lbs (11N). Each contact block: 1.3lbs (6N). Selector switch operator: 2.4in/lb (0.27Nm)		

### Wire Terminals

Wire Capacity and Terminal Torque Requirements	Suitable for #22 - #12 AWG stranded or solid copper wires, single or parallel conductors of same size. Terminal torque: 7-12 in/lb. Parallel conductor size combinations (stranded or solid wire):	
	Parallel Conductor Size Combinations (Stranded or Solid Wire)	Terminal Torque
	#12 with #14	12 in/lb
	#14 with #16	12 in/lb
	#16 with #18	12 in/lb
	#16 with #20	12 in/lb
	#16 with #22	12 in/lb
	#18 with #22	10 - 12 in/lb
	#18 with #20	10 - 12 in/lb
	#20 with #22	7 - 12 in/lb
Quick Connect Terminals	Suitable for one female tab connector measuring 0.25 x 0.03 inches (6.35 x 0.8 mm) or two female tab connectors measuring 0.11 x 0.03 inches (2.8 x 0.8 mm).	

### Contact Data

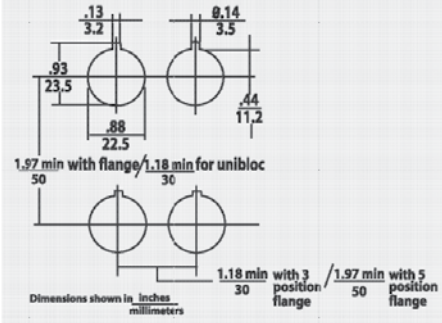
Electrical Reliability Data	Electrical life and reliability in low level current: 80 million operations at 12V, 5mA, resistive load. (32 contacts tested successfully for 2.5 million operations).								
Dust Resistance	In extremely dusty environments, electrical life at low level current is 250,000 operations at 12V, 5mA, resistive load. In a clean environment, electrical life at low level current is 10 million operations at 12V, 5mA, resistive load.								
Thermal Current	I <sub>th</sub> = 10A per IEC 947-5-1								
Insulation Voltage	U <sub>i</sub> = 660 Volts ac/dc (opposite polarity) except 2NO and 2NC blocks 300 Vac/dc								
Protection from Electrical Shock	Class I per IEC 536 for metal operators Class II (double insulation) per IEC 536 for plastic operators								
Insulation Category	Group "C" per VDE 0110								
Dielectric Strength	2500 volts								
Short Circuit Protection	10A type G fuse, per IEC 269.1 & 269.3								
	A600 (maximum make volt-amperes = 7200; maximum break volt-amperes = 720; PF- .25)								
	<b>Volts (AC - V)</b>	12	24	48	60	120	240	480	600
	Continuous (A)	10	10	10	10	10	10	10	10
	Making (A)	100	100	100	60	60	30	15	12
	Breaking (A)	10	10	10	6	6	3	1.5	1.2
Pilot Duty Ratings	Q300 (maximum make or break vold-amperes = 69)								
	<b>Volts (DC - V)</b>	12	24	48	60	125	250	300	
	Continuous (A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	Making (A)	2.5	2.5	1.4	1.1	0.55	0.27	0.23	
	Breaking (A)	2.5	2.5	1.4	1.1	0.55	0.27	0.23	

**Contact Data**

IEC Utilization Categories	AC 5 Control of AC Electromagnetic Loads Rated Operational Voltage and Current									
	Ue (V)	12	24	48	60	110	220	380	500	600
	Ie	10	10	10	10	6	3	2	1.5	1.2
Contact Characteristics	DC1 3 Control of DC Electromagnets Rated Operational Voltage and Current									
	UE (M)	12	24	48	60	110	220	300		
	LE (A)	2.5	2.5	1.4	10	0.55	0.27	0.2		
Contact Resistance Contact Fidelity	NC: slow make, double break (positive opening) NO: slow make, double break Self-cleaning (wiping action) contact Double-bridge contacts with four points of contact									
Logic Reed Contact Data (Special Order)	<25mOhm per IEC 255.7 category 3 @ 24V, 1 amp Minimum current: 5mA Minimum voltage: 12 Vac/dc. maximum resistance - 2 ohms NC: Single break NO: Single break 120 Vac maximum, 0.1 5A maximum, 8VA maximum 30 Vdc maximum, 15A maximum, 4.5W maximum									

**Mounting**

Acceptable Panel Thickness	.040 - .236 inches (1-6 mm)
Operator Locking Ring Torque	26 in/lb (3 N -m)
Force Required to Forcibly Remove Contact Blocks and Flange	Contact block or power supply from flange: 27 lbs (118N) 3- or 5-block flange from metal operator: 88 lbs (392 N) 3- or 5-block flange from plastic operator: 66 lbs (294 N)

Mounting Dimensions	
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	Operators	Number of Operations
Mechanical Life Ratings for Operators	Standard Push Buttons	3,000,000
	Illuminated Push Buttons <sup>1</sup>	1,000,000 - 3,000,000
	Momentary Mushroom-head Push Buttons	3,000,000
	Maintained Mushroom-head Push Buttons	500,000
	Push-to-Latch, Turn-to-Release Mushroom-Head Push Buttons	300,000
	3-Position Mushroom-head Push Buttons	300,000
	Non-Illuminated Selector Switches	1,000,000
	Illuminated Selector Switches	500,000
	Joysticks	500,000
	Toggle Switches	1,000,000
	Wobble Sticks	500,000
	Key-Operated Push Buttons	1,000,000
	Selector Push Buttons	

<sup>1</sup> Number of operations dependent on the operating duration of the lamp. If the lamp is left on for long periods of time, its heat can reduce mechanical life. All illuminated push buttons meet at least 1,000,000 operations.