Carling Technologies®
Innovative Designs. Powerful Solutions.

MILITARY

COTS Switches & Circuit Breakers

CATALOG

FOUNDED IN 1920

Since its founding, Carling Technologies has continually forged a tradition of leadership in quality and product innovation.

There are few products that Carling Technologies hasn't turned "ON" and fewer industries that haven't turned to Carling for solutions. With ISO and TS registered manufacturing facilities and technical sales offices worldwide, Carling ranks among the world's largest manufacturers of circuit breakers, switches, power distribution units, digital switching systems and electronic controls.

SWITCHES & CONTROLS
- Rocker
- Toggle
- Pushbutton
- Rotary

CIRCUIT PROTECTION
- Hydraulic-Magnetic
- Thermal
- GFCI / ELCI

CUSTOM SOLUTIONS
- PDU's
- Keypads
- Control Modules

MULTIPLEXED POWER SYSTEMS
- HMI Devices & I/O Modules
- Programmable Displays
- Data Communication Interfaces
- Electrical Systems Monitoring

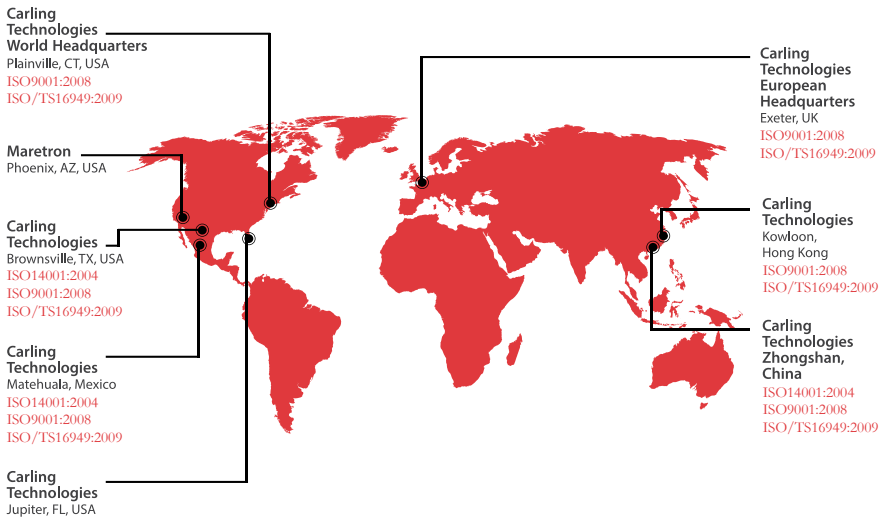
STRATEGIC MARKETS SERVED:

On/Off Highway | Marine | Telecom/Datacom | Military | Renewable Energy

OTHER SERVED INDUSTRIES:

Medical | Industrial Control | Audio / Visual | Commercial Food | HVAC | Floor Care | Generators | Small Appliances | Security Systems | Test & Measurment

GLOBAL LOCATIONS:



WORLDWIDE NUMBERS:

2000+ EMPLOYEES

150+ ENGINEERS

70+ DISTRIBUTORS

50+ REP FIRMS

COMPETITIVE ADVANTAGES+

Vertical Integration | Reliable & On-Time Delivery | Excellent Customer Service | Innovative & Eco-Friendly Products

Military
COTS Switches & Circuit Breakers

Your Military equipment is only as tough as the components used in building it! Carling Technologies products feature a wide range of switches and circuit breakers that were designed and tested to withstand the rigorous military environment. Carling Technologies COTS products provide military OEMs with a reliable and cost effective solution to their design requirements. By drawing upon over 90 years of design excellence, Carling Technologies is also able to provide switch and circuit breaker custom solutions that are sure to be compliant with the most demanding environmental requirements.

Within This Catalog, you will find comprehensive product information for each product series including applications, specifications and ordering schemes.

Available Online are tools such as part configurator, product selectors and stock checks. Please visit **www.carlingtech.com** for the latest information on all our products.

Application Solution Engineers are readily available to assist you in selecting the appropriate product for your application. For further assistance, please email us at **custservice@carlingtech.com**

Custom Design Solutions are available for OEMs that require specific product design and performance.

Other Circuit Protection Products such as thermal protection and ground fault circuit protection are also available. Please refer to **www.carlingtech.com** for a complete list of product offering.

Table of Contents

	CIRCUIT PROTECTION					
	 *MS-Series*	 *A-Series*	 *B-Series*	 *C-Series*	 *E-Series*	 *F-Series*
Number of Poles	1-3	1-6 (handle) 1-3 (rocker & metal toggle)	1-6	1-6 (handle) 1-3 (rocker & metal toggle)	1-6	1-3
Actuator Style	sealed metal, toggle	sealed metal toggle, handle, rocker, paddle	handle, rocker	sealed metal toggle, handle, rocker	handle	handle
Available Delays	**DC:** instantaneous, short & medium	**AC, DC, AC/DC:** instantaneous, ultra-short, short, medium & long **AC, DC:** high inrush-short, medium & long	**AC, DC, AC/DC:** instantaneous, ultra-short, short, medium & long **AC, DC:** high inrush-short, medium & long	**AC, DC, AC/DC:** instant, ultrashort, short, medium & long **AC, DC:** high inrush-short, medium & long	**AC, DC, AC/DC:** instant, short, medium & long **AC, DC, AC/DC:** high inrush-short, medium & long	**AC, DC:** short, medium & long
Max Current & Voltage Ratings	0.2-30A@ 65VDC 240VAC, 120/240VAC	0.02-30A@277VAC, 80VDC 31.0-50A@125 /250VAC, 65VDC	0.02-30A@277VAC, 80VDC 02-30A@125/ 250VAC, 65VDC	**UL Listed:** 0.02-250A@80VDC 0.1-100A@125VDC 0.02-70A@120VAC 0.02-20A@240VAC **UL Recognized:** 0.02-30A@480WYE/277VAC 2 Pole, 1Ø; 3 Pole, 3Ø 0.02-50A@277VAC 0.02-100A@250VAC, 80VDC 0.02-100A@120V/ 240VAC, 65VDC	**UL Listed** 0.02-100A@240VAC, 80VDC, 125VDC **UL Recognized** 0.02-100A@277VAC, 160VDC, 1 pole 0.02-100A@600VAC, 2 Pole 1Ø, 3 pole 3Ø 0.02-120A@125VDC, 1 pole	**UL489 Listed:** 50-250A@125VDC 100-250A@120 /240VAC 100-250A@277VAC 100-250A@208Y /120, 3ØVAC **UL489A Listed** 250-700A@125VDC
Max Interrupting Capacity	3000A, U1@65VDC 2000A, U1@240VAC 2000A, U1@120 /240VAC	7500A@80VDC, UL only 3000A@120/250VAC, UL only 5000A@277VAC, with fuse backup	7500A@80 VDC, UL only 3000A@125/250VAC, UL only 5000A@277VAC, with fuse backup	**UL Listed:** 50000A@80VDC, 1P only 10000A@120VAC 5000A@125VDC/240VAC **UL Recognized:** 7500A@80VDC 3000A@125/250VAC, UL only 5000A@250VAC listed construction 5000A@480WYE/277VAC with fuse backup	**UL Listed** 50000A@80VDC 10000A@125VDC & 240VAC-5KA **UL Recognized** 5000A@125VDC 5000A@600VAC, without fuse backup 10000A@600VAC, with fuse backup	50000A@125VDC 10000A@120/240, 277, 208Y/120VAC
Auxiliary Switch Rating	5A@125VAC 3A@32VDC .1A@125VAC, 32VDC	10.1A@125VAC 0.1A@125VAC (gold contacts) 0.5A@65VDC 0.1A@80VDC	10.1A@125VAC 0.1A@125VAC (gold contacts) 0.5A@65VDC 0.1A@80VDC	10.1A@250VAC 0.1A@125VAC (gold contacts) 0.5A@80VDC	10.1A@250VAC 1.0A@65VDC 0.1A@80VDC	10.1A@250VAC 0.5A@65VDC 0.1A@80VDC
Available Circuits	series and switch only	series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil	series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil, mid-trip with alarm switch	series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil, mid-trip with alarm switch	series, shunt,relay, switch only, series with remote shutdown	series & switch only with or without metering shunt
Terminal Options	.250" QC tabs 8-32 screw & solder type	.250" QC tabs 8-32 & 10-32 screw (& metric), PCB	.250" QC tabs, 8-32 & 10-32 screw (& metric), PCB	10-32 stud, 1/4-20 stud, 10-32 screw with saddle clamp, 7/16 clip & push-In	10-32 stud, 1/4-20 stud, 0-32 screw, 1/4-20 screw, box wire connector	3/8-16 stud, 3/8-16 screw & box wire connector
Mounting Method	front panel	threaded inserts: front panel snap-in	threaded inserts: front panel snap-in	threaded inserts	rear or front panel	rear or front panel
Agency Approvals	UL 1077, cUL	UL, CSA, VDE, TUV (rocker), UL1500, UL489A	UL, CSA, VDE, TUV (rocker), UL1500, UL489, UL489A	UL, CSA, VDE, TUV, UL1500, UL489, UL489A	UL, CSA, VDE, UL1500, UL489	cUL,TUV, UL489, UL489A

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

	SEALED SWITCHES & CONTROLS				
	 *V-Series*	 *V-Series Rotary*	 *V-Charger*	 *W-Series*	 *L-Series*
Poles	1, 2	1, 2	1	1, 2	1, 2
Ratings	up to 20/15A 12/24VDC 15A 125VAC 10A 250VAC	up to 15A 24VDC 20A 12VDC	12V/24V DC	up to 10A 24VDC	up to 15A 125VAC 10A 250VAC 20A 18VDC
Actuator	rocker, paddle, locking rocker	ergonomic knob	sealed spring-loaded access doors	bezel-less rocker, paddle & locking rocker	rocker, paddle, locking rocker
Mounting Hole Specifications	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount
Termination	.250 tabs solder lug wire leads	solder lugs .250 tabs wire leads	.250 tabs	.110 tabs	.187 tab .250 tabs
Sealing	IP66 above panel	IP67 above panel	IP64 above panel	IP68 above and below panel, fully submersible	IP67 above panel
Illumination	incandescent, LED, neon	incandescent, LED	LED	LED	incandescent, LED
Approvals	UL, CSA, VDE	pending	n/a	n/a	n/a

	ELECTRONIC SWITCHING PRODUCTS	
Software	SAE J1939 CAN 2.0b Protocol	 *CKP-Series*
Circuitry	12 individual loads	
Operating Voltage	8-32 V	
Illumination	1, 2, or 3 LED's per load	
Sealing	IP69 Front Panel; IP68 Back Panel when connected	
Termination	Deutsch DT-Series Connector	
Legends	Custom or standard laser etched backlighting	

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

	TOGGLES SWITCHES				
	 *ST-Series*	 *F-Series*	 *G-Series*	 *DK / EK-Series*	 *BD-Series*
Poles	1, 2	1	1, 2	1, 2	1
Ratings	16A 12V 16A 18V 14A 24V 15A 125VAC 10A 250VAC	up to 20A 125VAC 20A 277VAC 2 HP 250VAC	up to 20A 125VAC 20A 277VAC 2 HP 250VAC	up to 20A 125VAC/DC 10A 250VAC/DC	100-250 Amps 12VDC/24VDC
Actuator	toggle (bat)	paddle, toggle (bat)	paddle, toggle (bat)	toggle (bat), toggle (ball)	ergonomic knob
Mounting Hole Specifications	.500” dia [12.7mm] bushing mount	.500” dia [12.7mm] bushing mount	.500” dia [12.7mm] bushing mount	.500” dia [12.7mm] bushing mount	2.75” diameter; 70.1 mm diameter
Termination	.250 tabs screw terminals	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	screw terms	M10 Stud
Sealing	IP68	optional bushing o-ring	optional bushing o-ring	optional bushing o-ring	IP67
Illumination	n/a	n/a	n/a	n/a	n/a
Approvals	UL, cUL pending	UL, CSA	UL, CSA, VDE	UL, CSA	n/a

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

MS-Series
CIRCUIT BREAKER

Designed and tested to operate flawlessly in the harshest of environments, the MS-Series sealed toggle circuit breaker is ideally suited for COTS (commercial off the shelf) military applications. Our space saving envelope meets IP68 requirements and features a durable metal and sealed mounting bushing with MIL-PRF-39019F ingress protection when mounted in a panel.

This class-leading, affordable circuit breaker was designed in accordance with the requirements of MIL-PRF-55629 and MIL STD 202, making it the best choice for those applications where shock, vibration, moisture resistance, salt spray and thermal shock are of the utmost consideration. The MS-Series' compact size and reliability make it ideal for crucial communication equipment and other mission critical components.

1-3 poles; 0.20-30 amps; 65VDC, 240VAC, 120/240VAC; UL, CUL recognized & TUV certified.

Resources:

Download 3D CAD Files

IGS > STP >

Watch Product Video

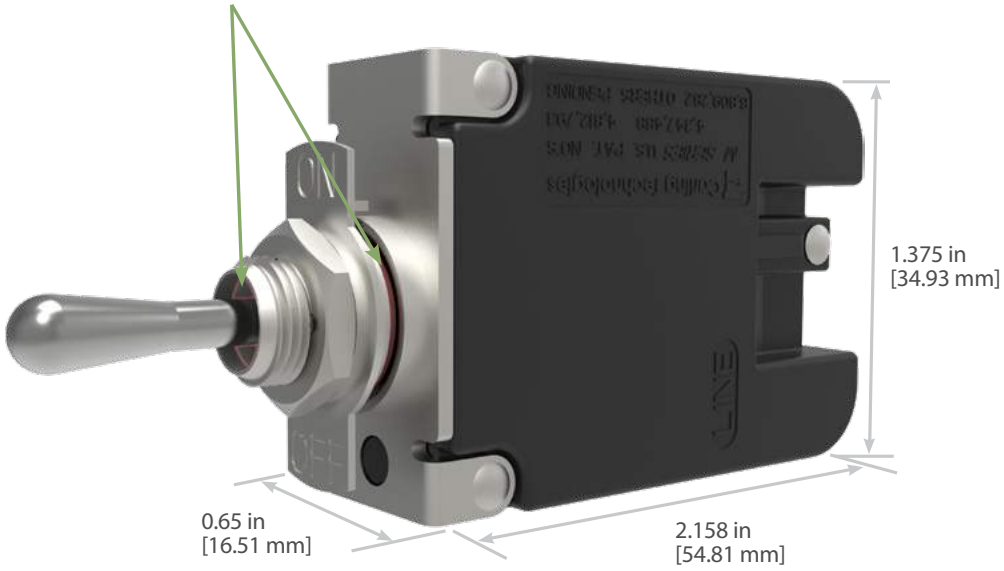
Product Highlights:

- Sealed Toggle Actuator
- MIL-PRF-39019F Ingress Protection
- MIL-PRF-55629 and MIL STD 202 Compliant
- Compact Design

MS-Series
DESIGN FEATURES

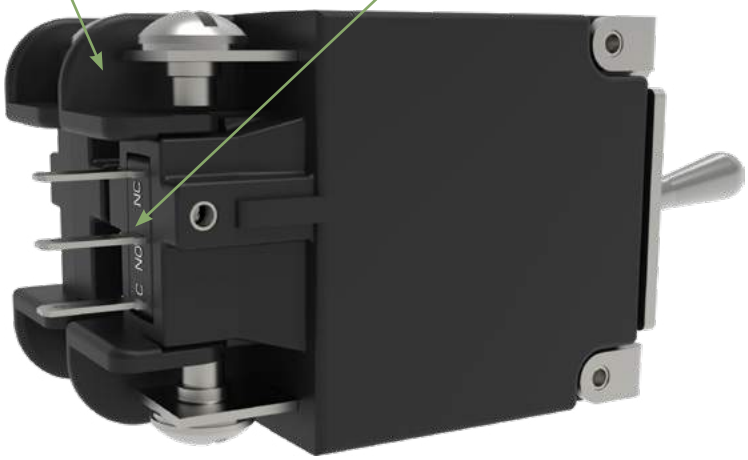
SEALS
IP68 Designed and tested to comply with MIL-PRF-39019F Ingress Protection

COMPACT SIZE
Max performance in compact size: 0.20-30 Amps; 65 VDC, 240 VAC 120/240 VAC



TERMINAL BARRIERS
Meet UL 1077 Spacing Requirements

OPTIONAL AUXILIARY SWITCH
Provides Breaker Status Indication



Electrical Tables

Table A: Lists UL & cUL Configuration & Performance Capabilities

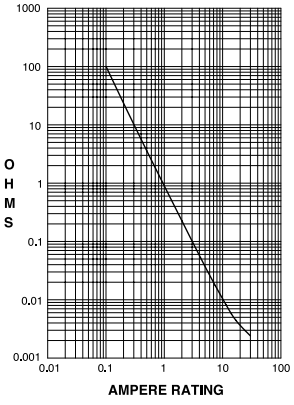
MS-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS									
	Voltage			Current Rating		Short Circuit Capacity (Amps)[1]			
Circuit Configuration	Max Rating	Frequency	Phase	General Purpose Amps	Poles Breaking	UL / cUL		TUV	
						U1	U3	Inc[2]	Icn
Series	65	DC	---	0.02 - 30	1	3000	300	3000	300
	240	50 / 60	1	0.02 - 30	1, 2	2000	300	3000	300
	120 / 240	50 / 60	1	0.02 - 30	2 or 3	2000	300	3000	300

Notes:
1 Short Circuit Current Rating (SC) Codes — The short-circuit current rating, followed by a letter and number designating the test conditions and any calibration following the short-circuit test as defined below:
U - Indicates that the short circuit test was performed without a series fuse
1 - Indicates that a re-calibration was not performed as part of the short circuit testing
3 - Indicates that the protector has proven to be suitable for further use after the short circuit test
Re-calibration, dielectric strength and voltage withstand tests were performed after the short circuit testing
2 - Inc rating obtained with a 50 Amp type gL fuse

Electrical

Current Ratings	.02 - 30 Amps
Voltage Rating	65VDC, 240VAC, 120/240VAC
Short Circuit Rating	See Table A
Auxiliary Switch Rating	5A @ 125VAC, 3A @ 32VDC, .1A @ 125VAC, 32VDC
Dielectric Strength	UL,CSA 1500V, 50/60 Hz for one minute between all electrically isolated terminals.
Insulation Resistance	Minimum of 100 Megohms @ 500VDC
Time Delay	See delay curve
Impedance	

RESISTANCE, IMPEDANCE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)



CURRENT (AMPS)	TOLERANCE (%)
0.20 - 30.0	25

Physical

Number of Poles	1-3 poles
Weight	Approximately 1.8 oz (50 G) per pole
Dimensions	See form & fit drawing

Agency Certifications

UL Standard 1077
CUL Standard C22.2

TUV Certified

Mechanical

Current Ratings	10,000 On-Off operations @ 6 per minute with rated current and voltage.
Trip Free	Trips on short circuit and overload, even when the actuator is forcibly held in the “On” position.
Trip Indication	The operating handle moves positively to the “Off” position when a short circuit or overload causes the circuit breaker to trip.

Environmental

Designed in accordance with requirements of specification MIL PRF-55629 & MIL-STD-202G as follows:

Shock	Withstands 100G’s, 6ms, saw tooth while carrying rated current per Method 213, Condition I. Instantaneous curves tested at 80% of rated current.
Vibration	Withstands 0.060” excursion from 10-55 Hz, and 10G’s 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous curves tested at 80% of rated current.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs)
Moisture Resistance	Method 106G
Thermal Shock	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C
Operating Temperature	-40°C to +85°C
Ingress Protection Level	MIL-PRF-55629C when mounted in panel.
Other	Materials used in this product are non-nutrient to fungus growth.

*Manufacturer reserves the right to change product specification without prior notice.

M	S	1	–	B	–	14	–	615	–	C	–	1	C	B	–	A	–	0A	A
1 Series	2 Actuator	3 Poles		4 Circuit		5 Frequency & Delay		6 Current Rating		7 Terminal		8 Actuator Color	9 Front Panel Hardware	10 Legend Plate		11 Bushing Color		12 Voltage Code	13 Agency Approval

1 SERIES
M

2 ACTUATOR
S Sealed Toggle

3 POLES
1 One **2** Two **3** Three

4 CIRCUIT
A Switch Only (no coil) [1,2]
B Series Trip (current)
M Series Trip (current) Aux switch .110 QC x 0.20 QC (silver contacts)
9 Series Trip (current) Aux switch .110 QC x 0.20 QC (gold contacts)

5 FREQUENCY & DELAY
03	DC, 50/60 Hz, Switch Only [1]	**32**	DC, 50/60 Hz Short
10	DC, Instantaneous	**34**	DC, 50/60 Hz Medium
12	DC, Short	**62**	50/60 Hz Short, Hi-Inrush [4]
14	DC, Medium	**64**	50/60 Hz Medium, Hi-Inrush [4]
20	50/60 Hz Instantaneous	**72**	DC, Short, High-Inrush [4]
22	50/60 Hz Short	**74**	DC, Medium, High-Inrush [4]
24	50/60 Hz Medium	**92**	DC, 50/60 Hz Short, Hi-Inrush [4]
30	DC, 50/60 Hz Instantaneous	**94**	DC, 50/60 Hz Medium, In-rush [4]

6 CURRENT RATING (AMPERES)
CODE	AMPERES						
220	0.200	**295**	0.950	**460**	6.00	**614**	14.00
225	0.250	**410**	1.00	**465**	6.50	**615**	15.00
230	0.300	**512**	1.25	**470**	7.00	**616**	16.00
235	0.350	**415**	1.50	**475**	7.50	**617**	17.00
240	0.400	**517**	1.75	**480**	8.00	**717**	17.50
245	0.450	**420**	2.00	**485**	8.50	**618**	18.00
250	0.500	**522**	2.25	**490**	9.00	**619**	19.00
255	0.550	**425**	2.50	**495**	9.50	**620**	20.00
260	0.600	**527**	2.75	**610**	10.00	**622**	22.00
265	0.650	**430**	3.00	**710**	10.50	**624**	24.00
270	0.700	**435**	3.50	**611**	11.00	**625**	25.00
275	0.750	**440**	4.00	**711**	11.50	**630**	30.00
280	0.800	**445**	4.50	**612**	12.00		
285	0.850	**450**	5.00	**712**	12.50		
290	0.900	**455**	5.50	**613**	13.00		

Notes:
1 Series code “A” only available with delay code “03”
2 Only available when tied to a protected pole
3 Requires a 2 or 3 pole device
4 Only available without agency approvals (Approval Code A)

7 TERMINAL
1 Push-On 0.250 Tab (QC)
2 Screw 8-32 (Upturned Lugs)
3 Screw 8-32 (Bus Type)
C Screw Terminal M4 (Upturned Lugs)
E Screw Terminal M4 (Bus Type)
L Solder Lug

8 ACTUATOR & MARKING COLOR
1 Dull Metallic

9 FRONT PANEL HARDWARE
A No Outer Panel Hardware
B Hex Nut, Nickel Plated
C Hex Nut, Nickel Plated with Locking Ring
F Panel Dress Nut, Nickel Plated
G Panel Dress Nut, Nickel Plated with Locking Ring

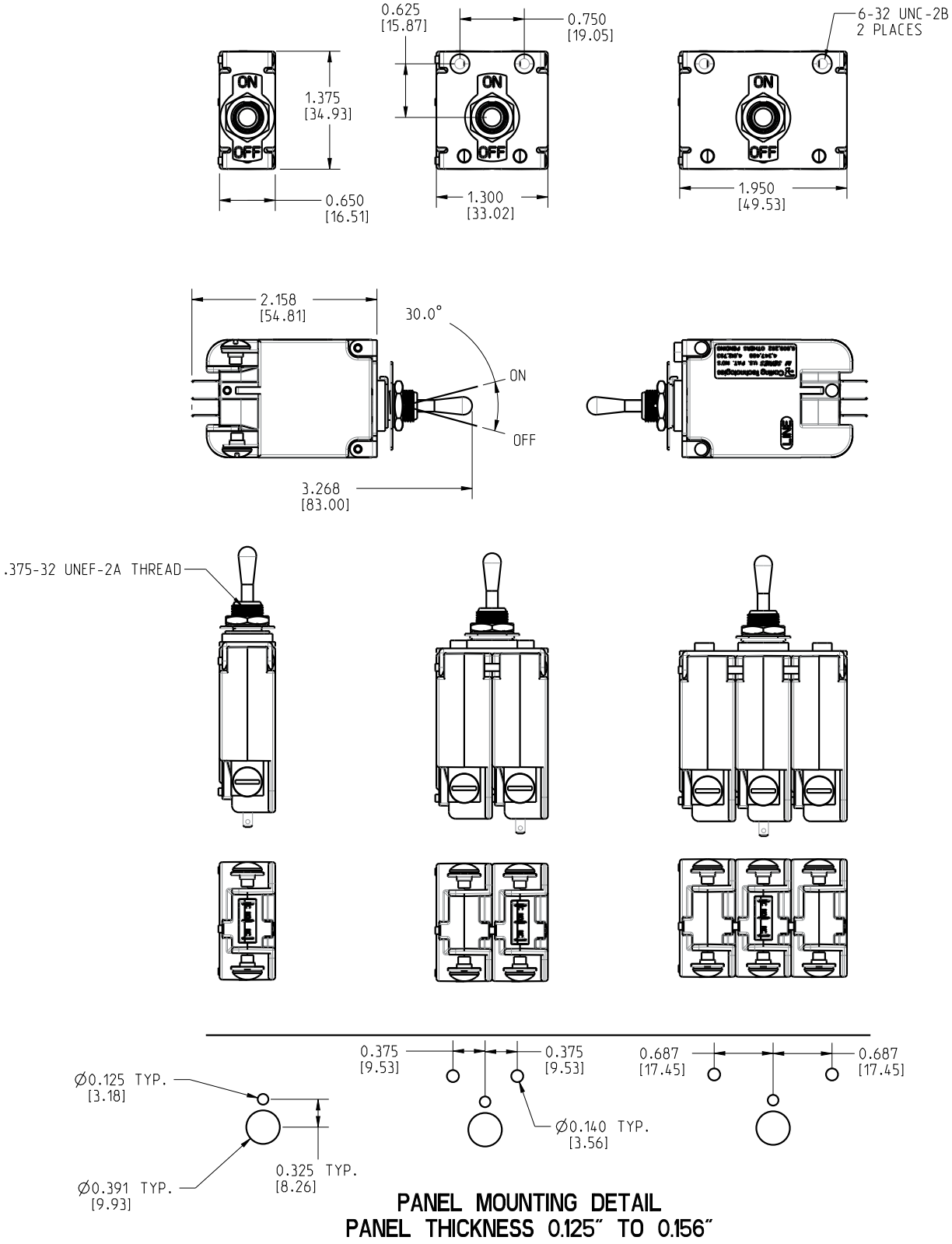
10 LEGEND PLATE
A No Legend Plate
B On-Off Vertical
C On-Off Horizontal
D I-O Vertical
E I-O Horizontal
F Dual Vertical
G Dual Horizontal

11 BUSHING COLOR
A Nickel Plated / Multipole Version

12 VOLTAGE CODE
0A 65 VDC
0D 240 VAC
0C 120/240 VAC [3]
0N 65 VDC / 120/240 VAC [3]
17 65 VDC / 240 VAC

13 AGENCY APPROVAL
A Without approvals
B UL Recognized
C UL & cUL Recognized
E TUV Certified, UL Recognized, CUL Recognized
U TUV Certified

Dimensional Specifications: in. [mm]



PANEL MOUNTING DETAIL
PANEL THICKNESS 0.125″ TO 0.156″

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

A-Series
CIRCUIT BREAKER

Well known for their proven reliability, Carling Technologies' A-Series hydraulic magnetic circuit breakers are compact, temperature stable and designed for precision operation in OEM markets requiring general purpose as well as full load amp applications. When front panel operation and aesthetics demand a clean, contemporary design, the visi-rocker or paddle actuators are ideally suitable. A sealed toggle actuator style is also available and ideal for harsh environment applications requiring additional sealing protection. Optional rocker-guard and push-to-reset bezels, which help prevent inadvertent actuation, are also available.

1-6 poles; ratings from 0.02 to 50 amps, up to 277VAC or 80VDC; UL Recognized, UL Listed, UL1500, UL1077, TUV, VDE & CSA

Product Highlights:

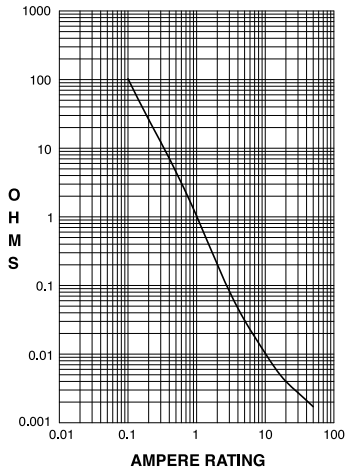
- Up to 50 amps in a compact size
- Various actuator styles
- Sealed metal toggle option tested to MIL-PRF-55629C. Meets IP68 Requirements

Only Military applicable ordering schemes and drawings are shown in this catalog.
For complete product details, please visit *www.carlingtech.com*

Electrical

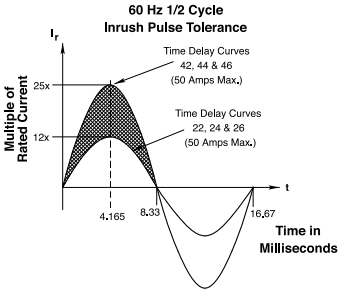
Maximum Voltage	277VAC 50/60 Hz, 80VDC
Current Ratings	Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0, 50.0. Other ratings available - consult ordering scheme.
Standard Voltage Coils	DC-6V, 12V; AC-120V, Other ratings available, consult ordering scheme.
Auxiliary Switch Rating	SPDT; 10.1 A - 250VAC, 1.0 A-65VDC/0.5 A - 80 VDC, 0.1A - 125VAC (with gold contacts).
Insulation Resistance	Minimum: 100 Megohms at 500 VDC
Dielectric Strength	UL, CSA - 1500V 60 Hz for one minute between all electrically isolated terminals. A-Series rocker circuit breakers comply with the 8mm spacing & 3750V dielectric requirements from hazardous voltage to operator accessible surfaces per EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker.

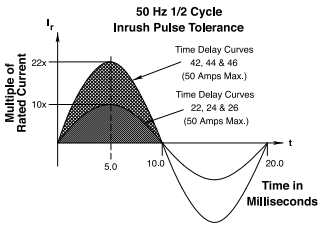
RESISTANCE PER POLE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)



CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	15
5.1 - 20.0	25
20.1 - 50.0	35

Pulse Tolerance Curves





Mechanical

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated Current & Voltage.
Trip Free	All A-Series Circuit Breakers will trip on overload, even when the actuator is forcibly held in the ON position.
Trip Indication	The operating actuator moves positively to the OFF position when an overload causes the circuit breaker to trip. When mid-trip handle is specified, the handle moves to the mid position on electrical trip of the circuit breaker. When mid-trip handle with alarm switch is specified, the handle moves to the mid position & the alarm switch actuates when the circuit breaker is electrically tripped.

Physical

Number of Poles	1 - 6 Poles (handle) and 1-3 poles (rocker) at 30 Amps or less. 1 and 2 poles at 31 Amps thru 50 Amps.
Internal Circuit Config.	Series, (with or without auxiliary switch), Shunt and Relay with
current	or voltage trip coils, Dual Coil, Switch Only with or without auxiliary switch.
Weight	Approximately 65 grams/pole. (Approximately 2.32 ounces/pole)
Standard Colors	Housing - Black; Actuator- See Ordering Scheme.

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
Vibration	Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current.
Moisture Resistance	Method 106D; ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.56 days @ +85°C, 85% RH.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Thermal Shock	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
Operating Temperature	-40° C to +85° C

*Manufacturer reserves the right to change product specification without prior notice.

Electrical Tables

Table A: Lists UL Recognized & CSA Accepted configurations and performance capabilities as a Component Supplementary Protector.

A-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS										
Circuit Configuration	Voltage			Current Rating		Short Circuit Capacity (Amps) UL / CSA		Application Codes		Construction Notes
	Max Rating	Frequency	Phase	Full Load Amps	General Purpose Amps	With Backup Fuse	Without Backup Fuse	UL	CSA	
Series	32	DC	---	0.02 - 15	---	---	5000	TC1, OL1, U2	TC1, OL1, U2	
	65	DC	---	31 - 50	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	80	DC	---	0.02 - 30	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
				---	31 - 50	---	7500	TC1, 2, OL0, U1	TC1, 2, OL0, U1	
	125	50 / 60	1	0.02 - 30	---	---	3000	TC1, OL1, U2	TC1, OL1, U2	Rocker Version
	125	50 / 60	1	1 - 50	---	---	2000	TC1, OL1, U2	TC1, OL1, U2	
	125	50 / 60	1 [4]	1 - 50	---	---	1000	TC1, OL1, U2	TC3, OL1, U3	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1, 2, OL1, U2	TC1, 2, OL1, U2	Rocker Version
	125 / 250	50 / 60	1 [3]	0.02 - 50	---	---	3000	TC1, 2, OL1, U2	TC1, 2, OL1, U2	Handle
	250	50 / 60	1	0.02 - 30	---	---	1500	TC1, 2, OL0, U2	TC1, 2, OL0, U2	Single Pole Break
				0.02 - 30	---	---	3000	TC1, OL1, U2	TC1, OL1, U2	Two Pole Break
				---		---	3000	TC1, 2, OL0, U1	TC1, 2, OL0, U1	
			1 [4]	1 - 50	---	---	1000	TC1, OL1, U2	TC3, OL1, U3	
			3	0.02 - 30	---	5000 [2]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
				31 - 50	---	2000 [1]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
Dual Coil	32	DC	---	0.02 - 50	---	---	5000	TC1, OL1, U2	TC1, OL1, U2	
	65	DC	---	0.02 - 50	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	80	DC	---	0.02 - 30	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
				---	31 - 50	---	7500	TC1, 2, OL0, U1	TC1, 2, OL0, U1	
	125	50 / 60	1	0.02 - 30	---	---	3000	TC1, OL1, U2	TC1, OL1, U2	Rocker Version
				1 - 50	---	---	2000	TC1, OL1, U2	TC1, OL1, U2	
	125	50 / 60	1 [4]	0.02 - 30	---	---	1000	TC1, OL1, U2	TC3, OL1, U3	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Rocker Version
	125 / 250	50 / 60	1 [3]	0.02 - 50	---	---	3000	TC1, 2, OL1, U2	TC1, 2, OL1, U2	
	250	50 / 60	1	0.02 - 30	---	---	1500	TC1, OL0, U2	TC1, OL0, U2	Single Pole Break
			1	0.02 - 30	---	---	3000	TC1, OL1, U2	TC1, OL1, U2	Two Pole Break
			1	---	31 - 50	---	3000	TC1, 2, OL0, U1	TC1, 2, OL0, U1	
			1 [4]	1 - 50	---	---	1000	TC1, OL1, U2	TC3, OL1, U3	
			3	0.02 - 30	---	5000 [2]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
				31 - 50	---	2000 [1]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
Shunt	80	DC	---	0.02 - 30	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	125 / 250	50 / 60	1	0.02 - 30	---	---	3000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	250	50 / 60	1	0.02 - 30	---	---	3000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
			3	0.02 - 30	---	5000 [2]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
Relay	80	DC	---	0.02 - 30	---	---	7500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
	250	50 / 60	1	0.02 - 30	---	---	3000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	
			3	0.02 - 30	---	5000 [2]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	
Switch Only	65	DC	---	0.02 - 50	---	not applicable				
	80	DC	---	0.02 - 30	---					
	250	50 / 60	1	---	31 - 50					
			3	0.02 - 50	---					
	277	50 / 60	1	0.02 - 30	31 - 50					

Notes:
1 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
2 Same as note 1, except that backup fuse is limited to 80 A maximum.
3 2 pole protector required (with one pole per power line) for: 125/250 VAC, 1 pole protector required for : 125 VAC, 1Ø Power System.
4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table B: Lists UL Recognized, CSA Accepted, VDE & TUV Certified configurations & performance capabilities as a Component Supplementary Protector.

A-SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS														
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING		SHORT CIRCUIT CAPACITY (AMPS)						APPLICATION CODES		VDE CONSTRUCTION NOTES
						UL/CSA		VDE		TUV				
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	GENERAL PURPOSE AMPS[1]	WITH BACKUP FUSE	WITHOUT BACKUP FUSE	(Inc) WITH BACKUP FUSE	(Icn) WITHOUT BACKUP	(Inc) WITH BACKUP FUSE	(Icn) WITHOUT BACKUP	UL	CSA	
SERIES	65	DC	—	0.10 - 50	—	—	7500	—	—	5000	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	World Market Breaker TUV Only
	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Handle Version 1 Pole Only
				31 - 50	31 - 50	—	7500	3000	1500	3000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	Handle Version 1 Pole Only
				0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
				31 - 32	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 2 Pole Only
				31 - 50	31 - 50	—	7500	3000	1500	3000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	Rocker Version 1 Pole Only
	250	50 / 60	1	0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
				31 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	Rocker Version 1 - 3 Poles
				31 - 32	—	—	3000	6000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 2 Pole Only
			1	0.10 - 30	—	—	3000	6000	1500	5000	1500	TC1, OL1,U2	TC1, OL1,U2	Rocker Version 2 Pole Only
			1 [4]	1 - 50	—	—	1000	—	—	5000	1500	TC1, OL1,U2	TC3, OL1,U3	Rocker Version 1 - 3 Poles
			3	0.10 - 30	—	5000 [3]	—	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles
				31 - 50	—	2000 [2]	—	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles
DUAL COIL	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
	250	50 / 60	1	0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
				30 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	Rocker Version 1 - 3 Poles
			3	0.10 - 30	—	5000 [3]	—	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles
				31 - 50	—	2000 [2]	—	—	—	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles
SHUNT	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Handle Version 1 Pole Only
				0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
	250	50 / 60	1	0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	Rocker Version 1 - 3 Poles
				30 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	Rocker Version 1 - 3 Poles
			3	0.10 - 30	—	5000 [3]	—	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles
				31 - 50	—	2000 [2]	—	—	—	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	Rocker Version 1 - 3 Poles

Notes:
1 General Purpose Ratings for UL/CSA Only.
2 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
3 Same as note 2, except that backup fuse is limited to 80 A maximum.
4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table C: Lists UL Recognized, CSA Accepted configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

A-SERIES TABLE C: UL1500 (Marine Ignition Protected)							
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	SHORT CIRCUIT CAPACITY (AMPS)	APPLICATION CODES	
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE	UL	CSA
SERIES	14 [1]	DC	---	0.02 - 50	5000	TC1,OL1,U1	TC1,OL1,U1
	32 [1]	DC	---	0.02 - 50	5000	TC1,OL1,U2	TC1,OL1,U2
	65	DC	---	0.02 - 50	3000	TC1,OL1,U1	TC1,OL1,U1
	125	50 / 60	1	0.02 - 50	3000	TC1,OL1,U2	TC1,OL1,U2
	125 / 250	50 / 60	1 [2]	0.02 - 50	3000	TC1,OL1,U2	TC1,OL1,U2
	250	50 / 60	1	0.02 - 30	1500	TC1,OL1,U1	TC1,OL1,U1

Notes:
1 Available with special catalog number only (consult factory).
2 2 pole protector required (with one per power line) for 125 / 250 VAC. 1 pole protector required for 125 VAC 1 phase power system

Table D: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A.

A-SERIES TABLE D: UL489A (COMMUNICATIONS EQUIPMENT)				
CIRCUIT CONFIGURATION	VOLTAGE		CURRENT RATING	INTERRUPTING CAPACITY (AMPS)
	MAX. RATING	FREQUENCY	GENERAL PURPOSE AMPS	WITHOUT BACKUP FUSE
SERIES	80	DC	0.10 - 50	5000
	80	DC	60 - 90 [1]	5000

Notes:
1 Parallel Pole Construction

Agency Certifications

UL Recognized

UL Standard 1077 — Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

UL Standard 508 — Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

UL Standard 1500 — Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

UL Listed

UL Standard 489A — Communications Equipment (Guide CCN/DITT, File E189195)

CSA Accepted

Component Supplementary Protector under Class 3215 30, File 047848 0 000 CSA Standard C22.2 No. 235

TUV Certified

EN60934, under License No. R72103448

VDE Certified

EN60934, VDE 0642 under File No. 10537

A	A	3	–	B	0	–	10	–	450	–	1	B	1	–	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
A	Handle, one per pole
B	Handle, one per multipole unit
S	Mid-Trip Handle, one per pole
T	Mid-Trip Handle, one per pole & Alarm Switch

3 POLES
1	One	**3**	Three	**5**	Five
2	Two	**4**	Four	**6**	Six

4 CIRCUIT
A [2]	Switch Only (No Coil)	**F** [3]	Relay Trip (Current)
B	Series Trip (Current)	**G** [3]	Relay Trip (Voltage)
C	Series Trip (Voltage)	**H** [3,4]	Dual Coil with Shunt Trip Voltage Coil
D [3]	Shunt Trip (Current)		
E [3]	Shunt Trip (Voltage)	**K** [3,4]	Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [5]
0	without Aux Switch	**5**	S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)
1	S.P.D.T., 0.093 Q.C. Term.	**7**	S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
2	S.P.D.T., 0.110 Q.C. Term.	**8**	S.P.S.T., 0.187 Q.C. Term.
4	S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)	**9**	S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03	DC 50/60Hz, Switch Only	**30**	DC, 50/60Hz Instantaneous
10	DC Instantaneous	**31**	DC, 50/60Hz Ultra Short
11	DC Ultra Short	**32**	DC, 50/60Hz Short
12	DC Short	**34**	DC, 50/60Hz Medium
14	DC Medium	**36**	DC, 50/60Hz Long
16	DC Long	**42** [7]	50/60Hz Short, Hi-Inrush
20	50/60Hz Instantaneous	**44** [7]	50/60Hz Medium, Hi-Inrush
21	50/60Hz Ultra Short	**46** [7]	50/60Hz Long, Hi-Inrush
22	50/60Hz Short	**52** [7]	DC, Short,Hi-Inrush
24	50/60Hz Medium	**54** [7]	DC, Medium, Hi-Inrush
26	50/60Hz Long	**56** [7]	DC, Long, Hi-Inrush

Notes:
1. Actuator Code:
   A: Handle tie pin spacer(s) and retainers provided un-assembled with multi-pole units.
   B: Handle location as viewed from front of breaker:
   2 pole - left pole 3 pole - center pole 4 pole - two handles at center poles
   5 pole - three handles at center poles 6 pole - four handles at center poles
   S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, F, G, H and K.
   T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
2. Switch Only circuits, rated up to 50 amps and 6 poles, and only available when tied to a protected pole (Circuit Code B, C, D or H.), For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
3. Available with terminal Codes 1, 2 and 3. Current Rating limited to 50A amps maximum.
4. Consult factory for available Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
5. Auxiliary Switch breakers with Series Trip & Switch Only circuits: ≤ 30A - supplied with standard half shells. 35-50A - supplied with extended boat (B-Style) half shells. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6. Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10 and 20.
7. Available with Circuit Codes B & D only. VDE Certified to 30 amps. UL Recognized, CSA Accepted & TUV Certified to 50 amps.
8. VDE Certification available with single pole breakers with DC Delay only. UL Recognition and CSA Accepted available in one and two pole breakers.
9. Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q..
10. Terminal Code 1: VDE Certification up to 25 amps and UL Recognition and CSA Certification up to 30 amps, but not recommended over 20 amps.
11. Terminal Codes 3, 5, E and H (Bus Type) with VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only VDE Certified when the washers are used.
12. Terminal Code L: VDE Certified available up to 12A. UL Recognized & CSA Accepted available up to 30A.
13. Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL Recognition and CSA Accepted, with Circuit Codes A, B and C. Two pole breakers with Terminal Code P (Printed Circuit Board) are available up to 40 amps with UL Recognition and CSA Accepted with Circuit Codes A, B and C.
14. Terminal Code Q not available with VDE certification.
15. Single pole only.

7 CURRENT RATING (AMPERES)
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**225**	0.250	**420**	2.000	**611**	11.000
025	0.025	**230**	0.300	**522**	2.250	**711**	11.500
030	0.030	**235**	0.350	**527**	2.750	**612**	12.000
035	0.035	**240**	0.400	**430**	3.000	**712**	12.500
040	0.040	**245**	0.450	**435**	3.500	**613**	13.000
045	0.045	**250**	0.500	**440**	4.000	**614**	14.000
050	0.050	**255**	0.550	**445**	4.500	**615**	15.000
055	0.055	**260**	0.600	**450**	5.000	**616**	16.000
060	0.060	**265**	0.650	**455**	5.500	**617**	17.000
065	0.065	**270**	0.700	**460**	6.000	**618**	18.000
070	0.070	**275**	0.750	**465**	6.500	**620**	20.000
075	0.075	**280**	0.800	**470**	7.000	**622**	22.000
080	0.080	**285**	0.850	**475**	7.500	**624**	24.000
085	0.085	**290**	0.900	**480**	8.000	**625**	25.000
090	0.090	**295**	0.950	**485**	8.500	**630**	30.000
095	0.095	**410**	1.000	**490**	9.000	**635** [8]	35.000
210	0.100	**512**	1.250	**495**	9.500	**640** [8]	40.000
215	0.150	**415**	1.500	**610**	10.000	**645** [8]	45.000
220	0.200	**517**	1.750	**710**	10.500	**650** [8]	50.000

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [6]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [9]
1 [10]	Push-On 0.250 Tab (Q.C.)	**E** [11]	Screw M4 (Bus Type)
2	Screw 8-32 with upturned lugs	**F**	Screw M5 with upturned lugs & 30° bend
3 [11]	Screw 8-32 (Bus Type)	**G**	Screw M5 (Bus Type) & 30° bend
4	Screw 10-32 with upturned lugs	**H** [11]	Screw M5 (Bus Type)
5 [11]	Screw 10-32 (Bus Type)	**L** [12]	0.250 Q.C./ Solder Lug
6	Screw 8-32 with upturned lugs & 30° bend	**M** [11]	M6 Threaded Stud
7	Screw 8-32 (Bus Type) & 30° bend	**Q** [14]	Push-In Stud
8	Screw 10-32 with upturned lugs & 30° bend	**R**	Screw M4 with upturned lugs & 30° bend
9	Screw 10-32 (Bus Type) & 30° bend	**T** [11]	Screw M4 (Bus Type) & 30° bend
B	Screw M5 with upturned lugs	**P** [13]	Printed Circuit Board Terminals
C	Screw M4 with upturned lugs	**S** [13]	Push-On 0.110 Tab (Q.C.)

9 ACTUATOR COLOR & LEGEND
Actuator Color	I-O	ON-OFF	Dual	Legend Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White
Red	**F**	**G**	**3**	White
Green	**H**	**J**	**4**	White
Blue	**K**	**L**	**5**	White
Yellow	**M**	**N**	**6**	Black
Gray	**P**	**Q**	**7**	Black
Orange	**R**	**S**	**8**	Black
Black (short handle)[15]	**T**	**U**	**9**	White

10 MOUNTING / BARRIERS
	MOUNTING STYLE	BARRIERS
	Threaded Insert, 2 per pole	
1	6-32 x 0.195 inches	no
A	6-32 x 0.195 inches	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multipole only)	yes
	Front panel Snap-In, 0.75" wide bezel	
5	without Handleguard	no
6	without Handleguard (multipole only)	yes
	Front panel Snap-In, 0.96" wide bezel	
7	without Handleguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides	no
8	without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides	yes

11 AGENCY APPROVAL
C	UL Recognized & CSA Accepted
D	VDE Certified, UL Recognized & CSA Accepted
E	TUV Certified, UL Recognized & CSA Accepted
I	UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

A	A	1	–	B	0	–	14	–	450	–	1	B	1	–	M	T
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
A Handle, one per pole
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES [2]
1 One
2 Two
3 Three
4 Four

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY/ALARM SWITCH [2]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
52 [3] DC, Short,Hi-Inrush
54 [3] DC, Medium, Hi-Inrush
56 [3] DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**285**	0.850	**455**	5.500	**613**	13.000
215	0.150	**290**	0.900	**460**	6.000	**614**	14.000
220	0.200	**295**	0.950	**465**	6.500	**615**	15.000
225	0.250	**410**	1.000	**470**	7.000	**616**	16.000
230	0.300	**512**	1.250	**475**	7.500	**617**	17.000
235	0.350	**415**	1.500	**480**	8.000	**618**	18.000
240	0.400	**517**	1.750	**485**	8.500	**620**	20.000
245	0.450	**420**	2.000	**490**	9.000	**622**	22.000
250	0.500	**522**	2.250	**495**	9.500	**624**	24.000
255	0.550	**527**	2.750	**610**	10.000	**625**	25.000
260	0.600	**430**	3.000	**710**	10.500	**630**	30.000
265	0.650	**435**	3.500	**611**	11.000	**635** [3]	35.000
270	0.700	**440**	4.000	**711**	11.500	**640** [3]	40.000
275	0.750	**445**	4.500	**612**	12.000	**645** [3]	45.000
280	0.800	**450**	5.000	**712**	12.500	**650** [3]	50.000

8 TERMINAL [5]
1 [6] Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 [7] Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 [7] Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
M [7] M6 Threaded Stud
P [8] Printed Circuit Board Terminals
Q [9] Push-In Stud

9 ACTUATOR COLOR & LEGEND

Actuator Color	ON-OFF	Dual	Legend Color
White	**B**	**1**	Black
Black	**D**	**2**	White
Red	**G**	**3**	White
Green	**J**	**4**	White
Blue	**L**	**5**	White
Yellow	**N**	**6**	Black
Gray	**Q**	**7**	Black
Orange	**S**	**8**	Black
Black (short handle) [10]	**U**	**9**	White

10 MOUNTING / BARRIERS

	MOUNTING STYLE	BARRIERS
	Threaded Insert, 2 per pole	
1	6-32 x 0.195 inches	no
A	6-32 x 0.195 inches	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multipole only)	yes
	Front panel Snap-In, 0.75" wide bezel	
5	without Handleguard	no
6	without Handleguard (multipole only)	yes
	Front panel Snap-In, 0.96" wide bezel	
7	without Handleguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides	no
8	without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides	yes

11 MAXIMUM APPLICATION RATING
M 80 DC

12 AGENCY APPROVAL
T UL489A Listed
K UL489A Listed, VDE Certified
J UL489A Listed, TUV Certified

Notes:
1 Actuator Code:
A: Handle tie pin spacer(s) and retainers provided un-assembled with multi-pole units.
S: Handle moves to mid-position only upon electrical trip of the breaker.
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker.
2 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
3 VDE Certified to 30 amps. UL489A Listed to 50 amps.
4 VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
5 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9 G, H, M and Q.
6 Terminal Code 1 (Push-On) available up to 25 amps with VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
7 Terminal Codes 3, 5 and H (Bus Type) with VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only VDE Certified when the washers are used.
8 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
9 Terminal Code Q not available with VDE certification.
10 Single pole only.

A	A	3	–	B	0	–	14	–	450	–	1	A	1	–	P
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
A	Handle, one per pole
B	Handle, one per multipole unit
S	Mid-Trip Handle, one per pole
T	Mid-Trip Handle, one per pole & Alarm Switch

3 POLES
1	One	**3**	Three	**5**	Five
2	Two	**4**	Four	**6**	Six

4 CIRCUIT
A [2]	Switch Only (No Coil)	**D** [3]	Shunt Trip (Current)
B	Series Trip (Current)	**E** [3]	Shunt Trip (Voltage)
C	Series Trip (Voltage)	**H** [3,4]	Dual Coil with Shunt Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [5]
0	without Aux Switch
2	S.P.D.T., 0.110 Q.C. Term.
4	S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)

6 FREQUENCY & DELAY
03	DC 50/60Hz, Switch Only	**30**	DC, 50/60Hz Instantaneous
10	DC Instantaneous	**31**	DC, 50/60Hz Ultra Short
11	DC Ultra Short	**32**	DC, 50/60Hz Short
12	DC Short	**34**	DC, 50/60Hz Medium
14	DC Medium	**36**	DC, 50/60Hz Long
16	DC Long	**42** [7]	50/60Hz Short, Hi-Inrush
20	50/60Hz Instantaneous	**44** [7]	50/60Hz Medium, Hi-Inrush
21	50/60Hz Ultra Short	**46** [7]	50/60Hz Long, Hi-Inrush
22	50/60Hz Short	**52** [7]	DC, Short,Hi-Inrush
24	50/60Hz Medium	**54** [7]	DC, Medium, Hi-Inrush
26	50/60Hz Long	**56** [7]	DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**285**	0.850	**455**	5.500	**613**	13.000
215	0.150	**290**	0.900	**460**	6.000	**614**	14.000
220	0.200	**295**	0.950	**465**	6.500	**615**	15.000
225	0.250	**410**	1.000	**470**	7.000	**616**	16.000
230	0.300	**512**	1.250	**475**	7.500	**617**	17.000
235	0.350	**415**	1.500	**480**	8.000	**618**	18.000
240	0.400	**517**	1.750	**485**	8.500	**620**	20.000
245	0.450	**420**	2.000	**490**	9.000	**622**	22.000
250	0.500	**522**	2.250	**495**	9.500	**624**	24.000
255	0.550	**527**	2.750	**610**	10.000	**625**	25.000
260	0.600	**430**	3.000	**710**	10.500	**630**	30.000
265	0.650	**435**	3.500	**611**	11.000	**635** [8]	35.000
270	0.700	**440**	4.000	**711**	11.500	**640** [8]	40.000
275	0.750	**445**	4.500	**612**	12.000	**645** [8]	45.000
280	0.800	**450**	5.000	**712**	12.500	**650** [8]	50.000

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [6]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [9]
1 [10]	Push-On 0.250 Tab (Q.C.)	**B**	Screw M5 with upturned lugs
2	Screw 8-32 with upturned lugs	**C**	Screw M4 with upturned lugs
3 [11]	Screw 8-32 (Bus Type)	**E** [11]	Screw M4 (Bus Type)
4	Screw 10-32 with upturned lugs	**F**	Screw M5 with upturned lugs & 30° bend
5 [11]	Screw 10-32 (Bus Type)	**G**	Screw M5 (Bus Type) & 30° bend
6	Screw 8-32 with upturned lugs & 30° bend	**H** [11]	Screw M5 (Bus Type)
7	Screw 8-32 (Bus Type) & 30° bend	**R**	Screw M4 with upturned lugs & 30° bend
8	Screw 10-32 with upturned lugs & 30° bend	**T** [11]	Screw M4 (Bus Type) & 30° bend
9	Screw 10-32 (Bus Type) & 30° bend		

9 ACTUATOR COLOR & LEGEND
Actuator Color	I-O	Dual	Legend Color
White	**A**	**1**	Black
Black	**C**	**2**	White
Red	**F**	**3**	White
Green	**H**	**4**	White
Blue	**K**	**5**	White
Yellow	**M**	**6**	Black
Gray	**P**	**7**	Black
Orange	**R**	**8**	Black
Black (short handle)[15]	**T**	**9**	White

10 MOUNTING / BARRIERS
	MOUNTING STYLE	BARRIERS
	Threaded Insert, 2 per pole	
1	6-32 x 0.195 inches	no
A	6-32 x 0.195 inches	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multipole only)	yes
	Front panel Snap-In, 0.75" wide bezel	
5	without Handleguard	no
6	without Handleguard (multipole only)	yes
	Front panel Snap-In, 0.96" wide bezel	
7	without Handleguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides	no
8	without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides	yes

11 AGENCY APPROVAL
P	TUV Certified, UL Recognized & CSA Accepted
Q	UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

Notes:
1. Actuator Code:
   A: Handle tie pin spacer(s) and retainers provided unassembled with multi-pole units.
   S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, and H.
   T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
2. Switch Only circuits, rated up to 50 amps and 6 poles, and only available when tied to a protected pole (Circuit Code B, C, D or H.), For .01 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
3. Available with terminal Codes 1, 2 and 3. Current Rating limited to 30 amps maximum.
4. Consult factory for available Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
5. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6. Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10, 20 & 30.
7. Available with Circuit Codes B & D only. VDE Certified to 30 amps. UL Recognized, CSA Accepted & TUV Certified to 50 amps.
8. Available up to two poles with AC or DC delays.
9. Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G and H.
10. Terminal Code 1: TUV Certification up to 30 amps, but not recommended over 20 amps.
11. Terminal Codes 3, 5 , 7, 9, E, G and H (Bus Type) are supplied with Lock Washers. These breakers are only TUV Certified when the washers are used.
12. Single pole only.

A	F	1	–	B	0	–	14	–	450	–	1	3	1	–	M	T
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
A

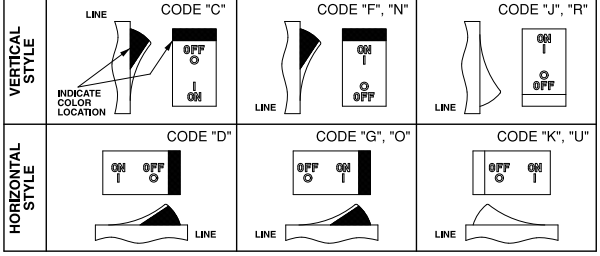
2 ACTUATOR [1]
Two Color Visi-Rocker
- **C** Indicate ON, vertical legend
- **D** Indicate ON, horizontal legend
- **F** Indicate OFF, vertical legend
- **G** Indicate OFF, horizontal legend

Single color
- **J** Vertical legend
- **K** Horizontal legend

Push-To-Reset, Visi-Rocker
- **N** Indicate OFF, vertical legend
- **O** Indicate OFF, horizontal legend

Push-To-Reset , Single color
- **R** Vertical legend
- **U** Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
- **1** One
- **2** Two
- **3** Three

4 CIRCUIT
- **B** Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [2]
- **0** without Aux Switch
- **1** S.P.D.T., 0.093 Q.C. Term.
- **2** S.P.D.T., 0.110 Q.C. Term.
- **7** S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
- **8** S.P.S.T., 0.187 Q.C. Term.
- **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
- **11** DC Ultra Short
- **12** DC Short
- **14** DC Medium
- **16** DC Long
- **52** DC, Short,Hi-Inrush
- **54** DC, Medium, Hi-Inrush
- **56** DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**285**	0.850	**455**	5.500	**613**	13.000
215	0.150	**290**	0.900	**460**	6.000	**614**	14.000
220	0.200	**295**	0.950	**465**	6.500	**615**	15.000
225	0.250	**410**	1.000	**470**	7.000	**616**	16.000
230	0.300	**512**	1.250	**475**	7.500	**617**	17.000
235	0.350	**415**	1.500	**480**	8.000	**618**	18.000
240	0.400	**517**	1.750	**485**	8.500	**620**	20.000
245	0.450	**420**	2.000	**490**	9.000	**622**	22.000
250	0.500	**522**	2.250	**495**	9.500	**624**	24.000
255	0.550	**527**	2.750	**610**	10.000	**625**	25.000
260	0.600	**430**	3.000	**710**	10.500	**630**	30.000
265	0.650	**435**	3.500	**611**	11.000	**635** [4]	35.000
270	0.700	**440**	4.000	**711**	11.500	**640** [4]	40.000
275	0.750	**445**	4.500	**612**	12.000	**645** [4]	45.000
280	0.800	**450**	5.000	**712**	12.500	**650** [4]	50.000

8 TERMINAL [5]
- **1** [6] Push-On 0.250 Tab (Q.C.)
- **2** Screw 8-32 with upturned lugs
- **3** [7] Screw 8-32 (Bus Type)
- **4** Screw 10-32 with upturned lugs
- **5** [7] Screw 10-32 (Bus Type)
- **6** Screw 8-32 with upturned lugs & 30° bend
- **7** Screw 8-32 (Bus Type) & 30° bend
- **8** Screw 10-32 with upturned lugs & 30° bend
- **9** Screw 10-32 (Bus Type) & 30° bend
- **B** Screw M5 with upturned lugs
- **F** Screw M5 with upturned lugs & 30° bend
- **G** Screw M5 (Bus Type) & 30° bend
- **H** Screw M5 (Bus Type)
- **M** [7] M6 Threaded Stud
- **P** [8] Printed Circuit Board Terminals
- **Q** [9] Push-In Stud

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [10]	Marking: ON-OFF	Marking: Dual [10]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [11]

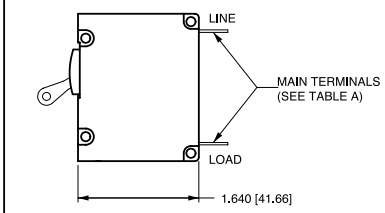
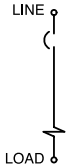
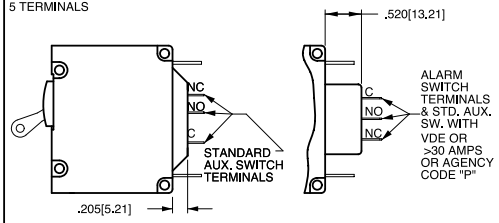
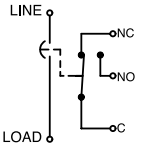
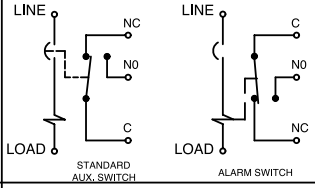
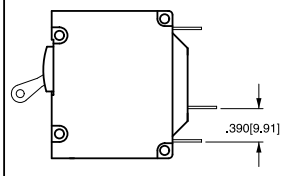
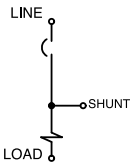
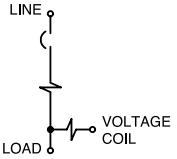
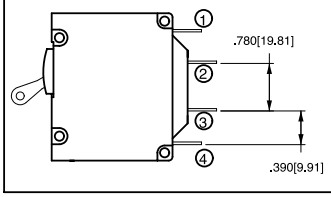
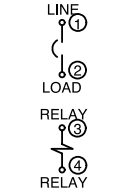
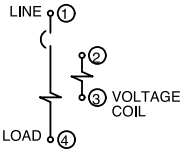
	STANDARD ROCKER BEZEL	BARRIERS
	Threaded Insert, 2 per pole	
1	6-32 x 0.195 inches	no
A	6-32 X 0.195 inches (multi-pole units only)	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multi-pole units only)	yes
	ROCKERGUARD & PUSH-TO-RESET BEZEL	
	Threaded Insert, 2 per pole	
3	6-32 x 0.195 inches	no
C	6-32 x 0.195 inches (multi-pole units only)	yes
4	ISO M3 x 5mm	no
D	ISO M3 x 5mm (multi-pole units only)	yes
	FRONT PANEL SNAP-IN BRACKET, 0.744" [18.90mm] wide bezel	
8	without Rockerguard (single pole units only)	no
H	with Rockerguard (single pole units only)	no
	FRONT PANEL SNAP-IN BRACKET, 0.96" [24.48mm] wide bezel	
9	without Rockerguard (single pole units only)	no
J	with Rockerguard (single pole units only)	no

11 MAXIMUM APPLICATION RATING
- **M** 80 DC

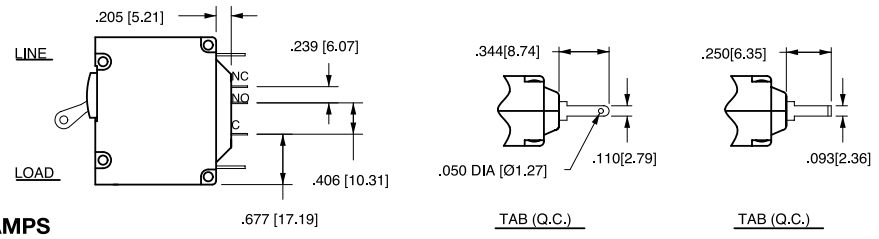
12 AGENCY APPROVAL
- **T** UL489A Listed
- **K** UL489A Listed, VDE Certified
- **J** UL489A Listed, TUV Certified

Notes:
1. Push-To-Reset actuators have OFF portion of rocker shrouded.
2. Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3. Auxiliary Switch breakers with Series Trip circuits: ≤ 30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
4. VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
5. Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
6. Terminal Code 1 (Push-On) available up to 25 amps with TUV or VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
7. Terminal Codes 3, 5 and H (Bus Type) with TUV or VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only TUV or VDE Certified when the washers are used.
8. Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
9. Terminal Code Q not available with VDE certification.
10. Color shown is Visi and Legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
11. Legend on Push-to-reset bezel/shroud is white with single color actuator codes R & U. Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes N & O. Rockerguard available with actuator codes C through K

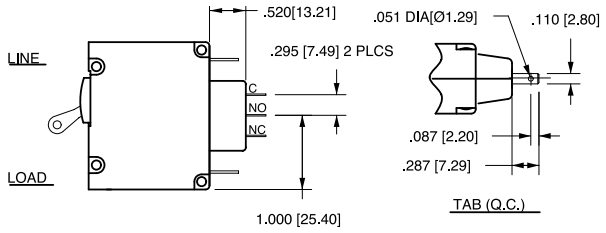
Circuit & Terminal Diagrams: in. [mm]

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC ANSI SWITCH ONLY (NO COIL)	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC ANSI SERIES TRIP	CIRCUIT CODE	AUX SWITCH CODE
2 TERMINALS 		A	0		BC	0
5 TERMINALS 	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 	A	1 2 3 4	SERIES TRIP WITH (3) AUXILIARY/ALARM SWITCH 	BC	1 2 3 4
3 TERMINALS 	SHUNT TRIP 	DE	0	DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL 	H	0
4 TERMINALS 	RELAY TRIP 	FG	0	DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL 	K	0

AUXILIARY/ALARM SWITCH TERMINAL DETAIL



≤ 30 AMPS

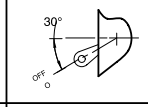
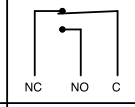
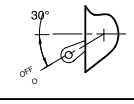
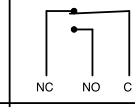
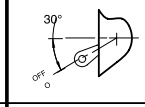
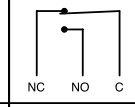
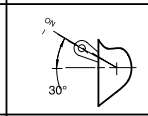
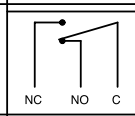
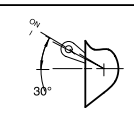
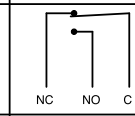
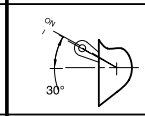
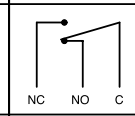
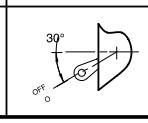
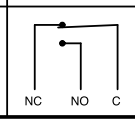
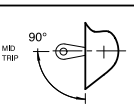
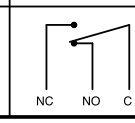
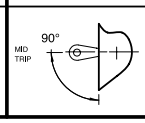
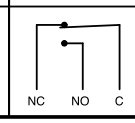


> 30 AMPS

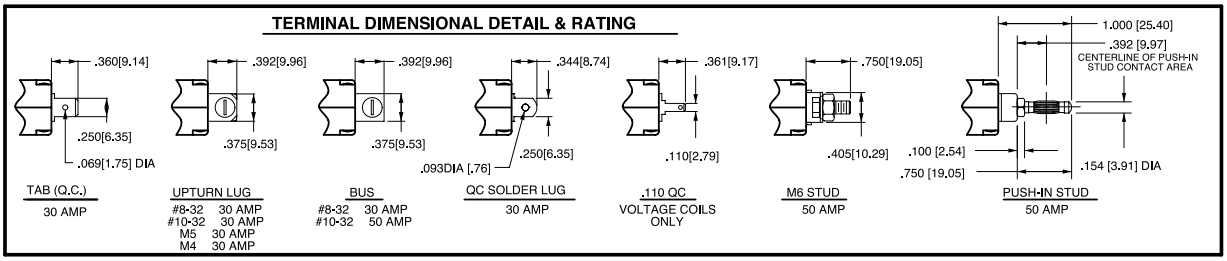
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Alarm Switch available with .110 x .020 Q.C. & Solder Lug Terminals Only.

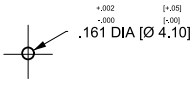
Circuit & Terminal Diagrams: in. [mm]

HANDLE POSITION VS. AUX/ALARM SWITCH MODE

CIRCUIT BREAKER MODE	STANDARD C/B HANDLE POSITION	STANDARD C/B AUX. SWITCH MODE	MID TRIP C/B HANDLE POSITION	MID TRIP C/B ALARM SWITCH MODE	MID TRIP C/B HANDLE POSITION	MID TRIP C/B AUX. SWITCH MODE (w/o ALARM SWITCH)
OFF						
ON						
ELECTRICAL TRIP						

TERMINAL DIMENSIONAL DETAIL & RATING

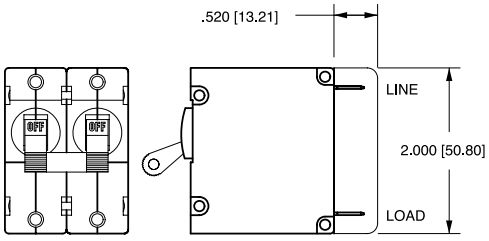




PUSH-IN STUD MATING HOLE

TABLE A TIGHTENING TORQUE SPECIFICATIONS

THREAD SIZE	TORQUE
#6-32 & M3 MOUNTING HARDWARE	7-9 IN-LBS [0.8-1.0 NM]
#8-32 & M4 THREAD TERMINAL SCREW	12-15 IN-LBS [1.4-1.7 NM]
#10-32 & M5 THREAD TERMINAL SCREW	15-20 IN-LBS [1.7-2.3 NM]

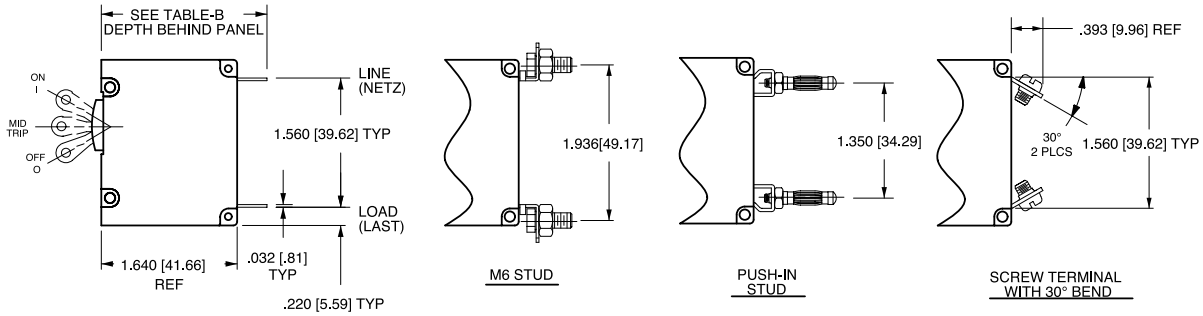


BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS

TABLE B

TERMINAL DESCRIPTION		DEPTH BEHIND PANEL
MAIN	TAB (Q.C.)	2.000 [50.80]
	SCREW TYPE	2.032 [51.60]
SHUNT, RELAY & DUAL COIL	TAB (Q.C.)	2.207 [56.10]
	SCREW #8-32 W/UPTURNED LUGS	2.364 [60.05]
AUX. SWITCH*	.093 TAB (Q.C.)	2.095 [53.20]
	.110 TAB (Q.C.)	2.189 [55.60]
	SOLDER TYPE	1.970 [50.00]

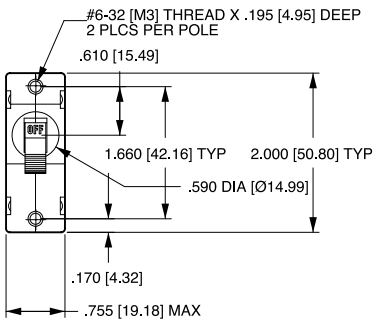
* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS SHOWN IN MULTI-POLE IDENTIFICATION SCHEME.

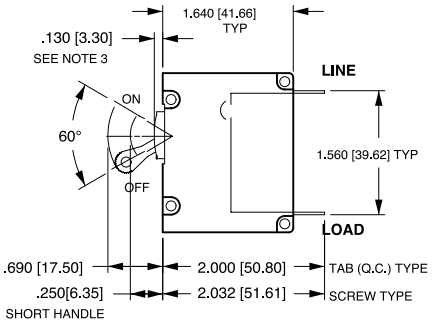


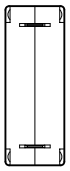
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Alarm Switch available with .110 x .020 QC & solder lug terminals only.

Dimensional Specifications: in. [mm]

1-POLE (AA1)

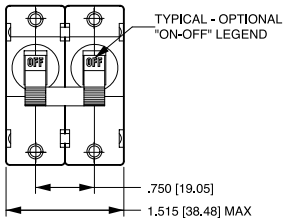




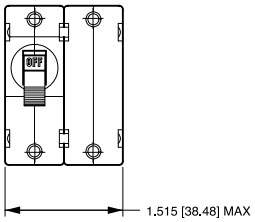


TAB (Q.C.) TYPE TERMINALS IN SERIES TRIP CIRCUIT CONFIGURATION SHOWN. FOR OTHER CONFIGURATIONS, SEE CIRCUIT AND TERMINAL DIAGRAMS.

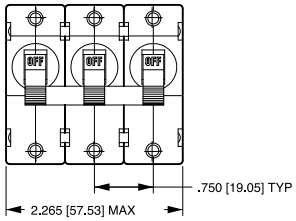
2-POLE (AA2)



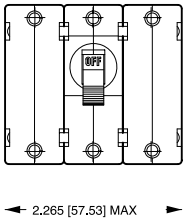
2-POLE (AB2)



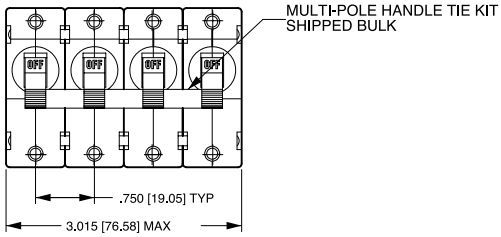
3-POLE (AA3)



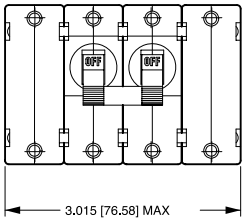
3-POLE (AB3)

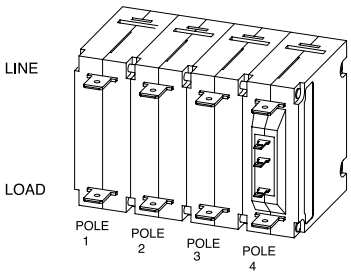


4-POLE (AA4)

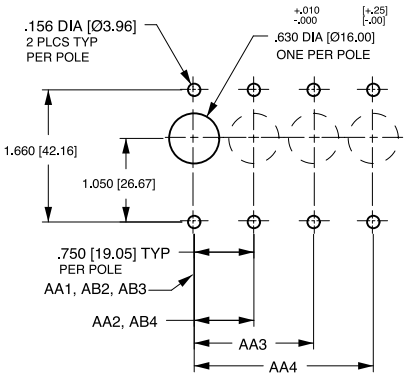


4-POLE (AB4)





MULTI-POLE IDENTIFICATION SCHEME
AS VIEWED FROM TERMINAL END OF BREAKER.

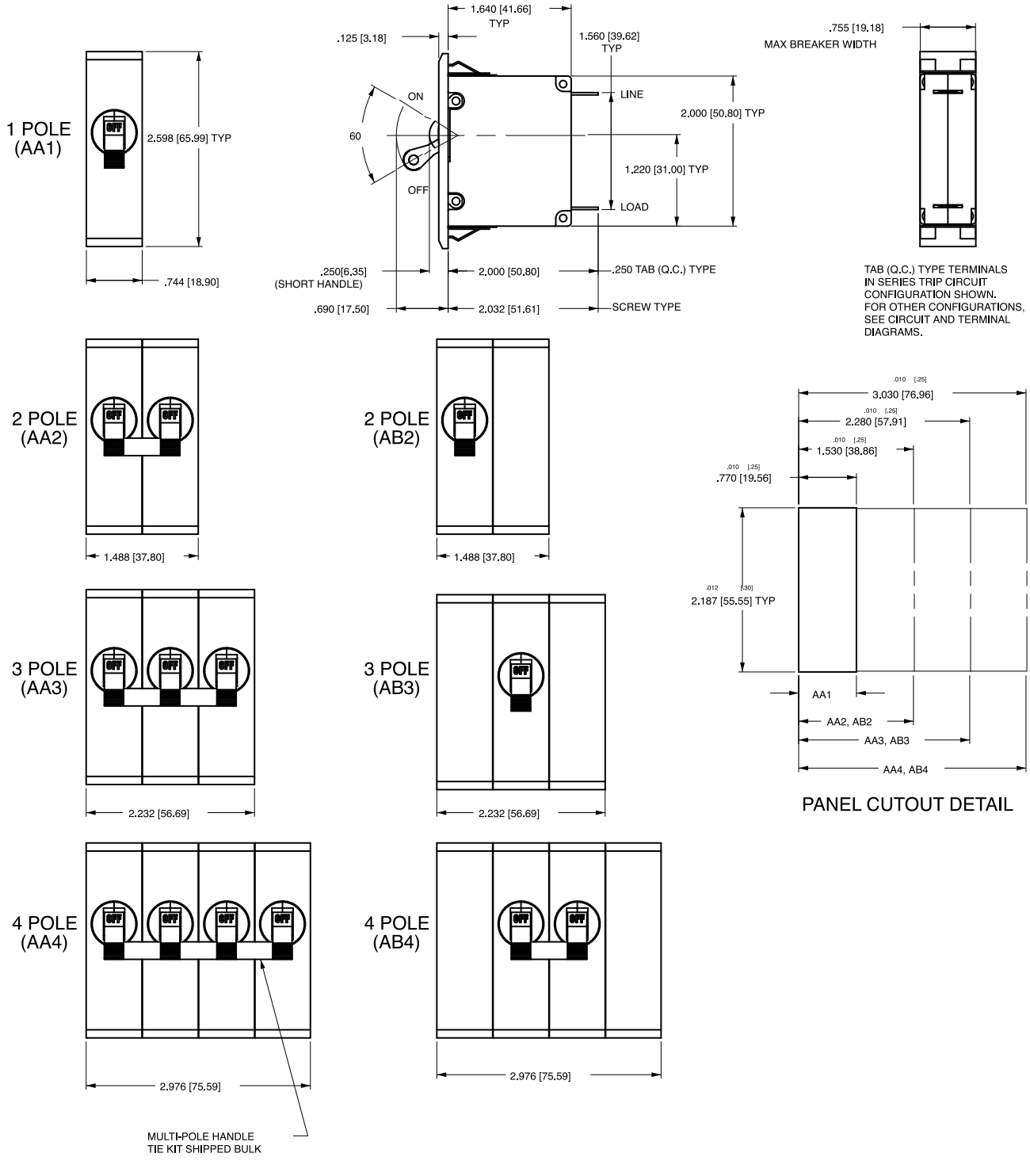


PANEL CUTOUT DETAIL

TOLERANCES ±.005 [±.12]
UNLESS OTHERWISE SPECIFIED

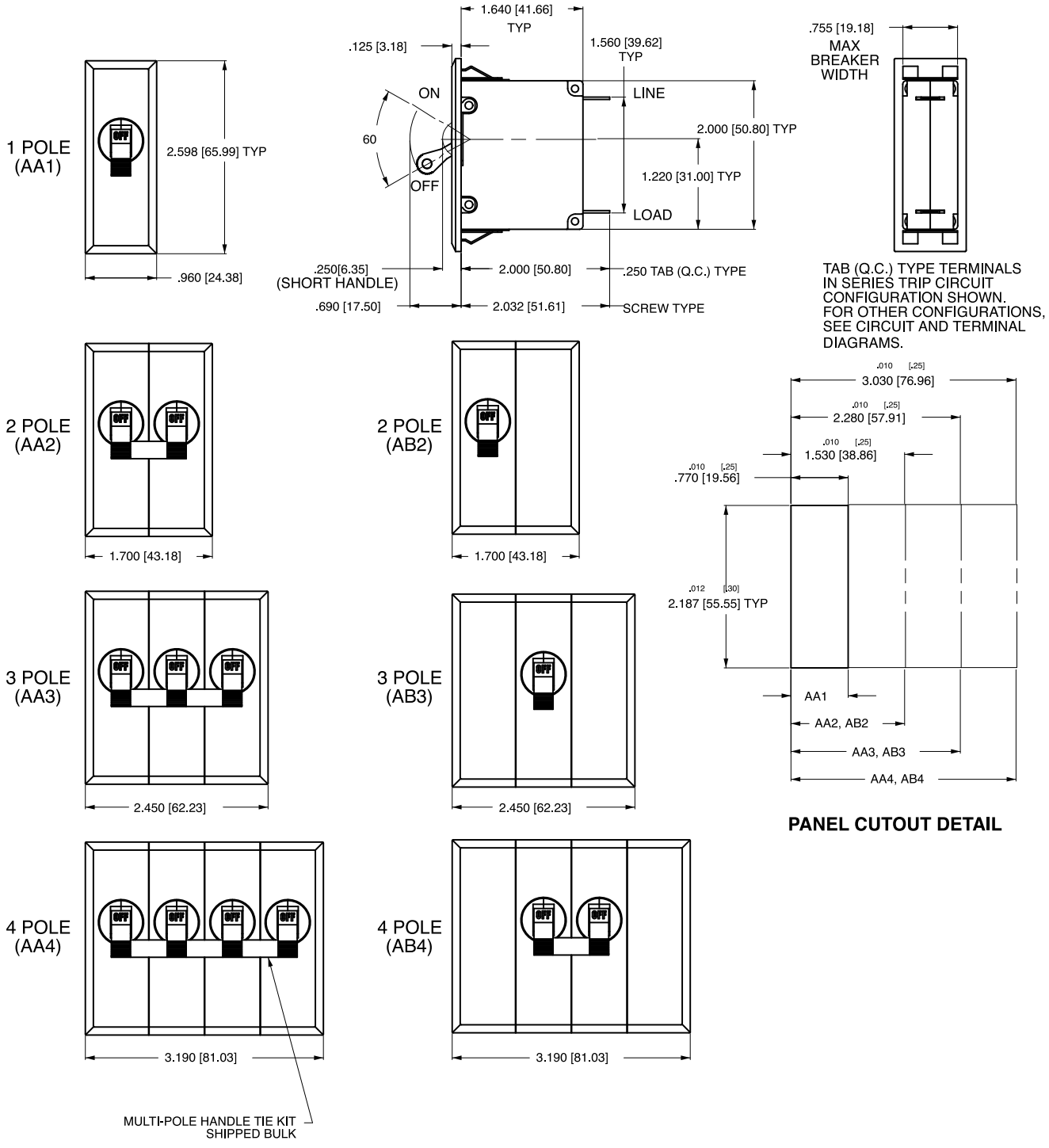
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ± 0.20 [.51] unless otherwise specified.
3 For agency code P = .150 [3.81].

Dimensional Specifications: in. [mm]



Notes:
1 All dimensions are in inches [millimeters].
2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
3 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



Notes:
1 All dimensions are in inches [millimeters].
2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
3 Tolerance ±.020 [.51] unless otherwise specified.

A	M	1	–	B	0	–	10	–	450	–	1	0	1	–	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
M Sealed Toggle, one per unit

3 POLES
1 One
2 Two
3 Three

4 CIRCUIT
A [2] Switch Only (No Coil)
B Series Trip (Current)
C Series Trip (Voltage)
D [3] Shunt Trip (Current)
E [3] Shunt Trip (Voltage)
F [3] Relay Trip (Current)
G [3] Relay Trip (Voltage)
H [3,4] Dual Coil with Shunt Trip Voltage Coil
K [3,4] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [5]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
5 S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 DC 50/60Hz, Switch Only
10 DC Instantaneous
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
20 50/60Hz Instantaneous
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
30 DC, 50/60Hz Instantaneous
31 DC, 50/60Hz Ultra Short
32 DC, 50/60Hz Short
34 DC, 50/60Hz Medium
36 DC, 50/60Hz Long
42 [7] 50/60Hz Short, Hi-Inrush
44 [7] 50/60Hz Medium, Hi-Inrush
46 [7] 50/60Hz Long, Hi-Inrush
52 [7] DC, Short,Hi-Inrush
54 [7] DC, Medium, Hi-Inrush
56 [7] DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**230**	0.300	**425**	2.500	**612**	12.000
025	0.025	**235**	0.350	**527**	2.750	**712**	12.500
030	0.030	**240**	0.400	**430**	3.000	**613**	13.000
035	0.035	**245**	0.450	**435**	3.500	**614**	14.000
040	0.040	**250**	0.500	**440**	4.000	**615**	15.000
045	0.045	**255**	0.550	**445**	4.500	**616**	16.000
050	0.050	**260**	0.600	**450**	5.000	**617**	17.000
055	0.055	**265**	0.650	**455**	5.500	**618**	18.000
060	0.060	**270**	0.700	**460**	6.000	**620**	20.000
065	0.065	**275**	0.750	**465**	6.500	**622**	22.000
070	0.070	**280**	0.800	**470**	7.000	**624**	24.000
075	0.075	**285**	0.850	**475**	7.500	**625**	25.000
080	0.080	**290**	0.900	**480**	8.000	**630**	30.000
085	0.085	**295**	0.950	**485**	8.500	**635** [8]	35.000
090	0.090	**410**	1.000	**490**	9.000	**640** [8]	40.000
095	0.095	**512**	1.250	**495**	9.500	**645** [8]	45.000
210	0.100	**415**	1.500	**610**	10.000	**650** [8]	50.000
215	0.150	**517**	1.750	**710**	10.500		
220	0.200	**420**	2.000	**611**	11.000		
225	0.250	**522**	2.250	**711**	11.500		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [6]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [9]
1 [10] Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
C Screw M4 with upturned lugs
E Screw M4 (Bus Type)
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
L [12] 0.250 Q.C./ Solder Lug
M M6 Threaded Stud
Q Push-In Stud
R Screw M4 with upturned lugs & 30° bend
T Screw M4 (Bus Type) & 30° bend
P [12] Printed Circuit Board Terminals
S Push-On 0.110 Tab (Q.C.)

9 LEGEND PLATE
0 No legend plate

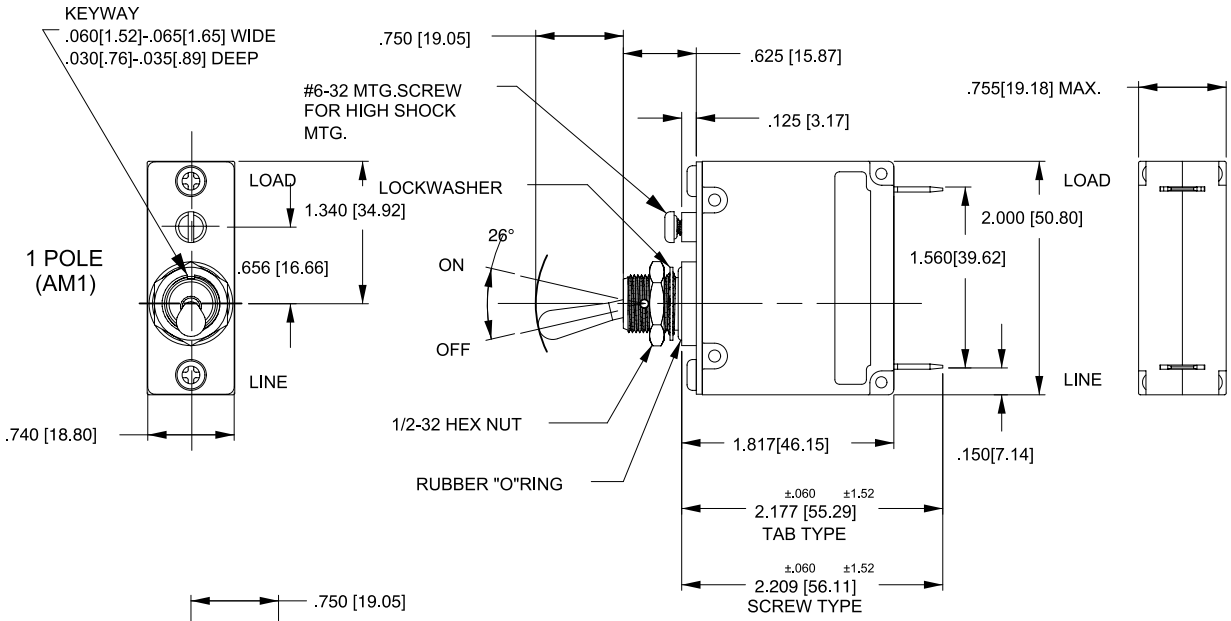
10 MOUNTING / BARRIERS

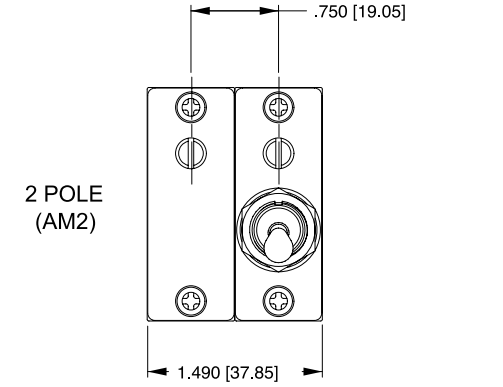
	MOUNTING STYLE	BARRIERS
1	Standard Hex Nut	no
A	Standard Hex Nut (multipole only)	yes

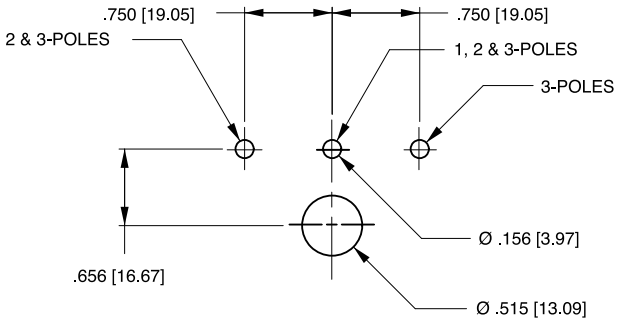
11 AGENCY APPROVAL
C UL Recognized & CSA Accepted
I UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

Notes:
1 Actuator Code M: Handle location as viewed from front of panel:
2 pole - right pole 3 pole - center pole
2 Switch Only circuits, rated up to 50 amps and 3 poles. Only available when tied to a protected pole. For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
3 Available with terminal Codes 1, 2 and 3. Current Rating limited to 30 amps maximum.
4 Consult factory for available Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
5 Auxiliary Switch available on Series Trip & Switch Only circuits, limited to 30 amps. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6 Voltage coils not rated for continuous duty. Available only with delay codes 10 and 20.
7 Available with Circuit Codes B & D only. VDE Certified to 30 amps. UL Recognized, CSA Accepted & TUV Certified to 50 amps.
8 UL Recognition and CSA Certification available on one and two pole breakers.
9 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, B, F, G, H, M and Q.
10 Terminal Code 1: UL Recognition and CSA Certification up to 30 amps, but not recommended over 20 amps.
11 Terminal Code L : available up to 30A.
12 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 50 amps, with Circuit Codes A, B and C. Two pole breakers with Terminal Code P (Printed Circuit Board) are available up to 40 amps with Circuit Codes A, B and C.

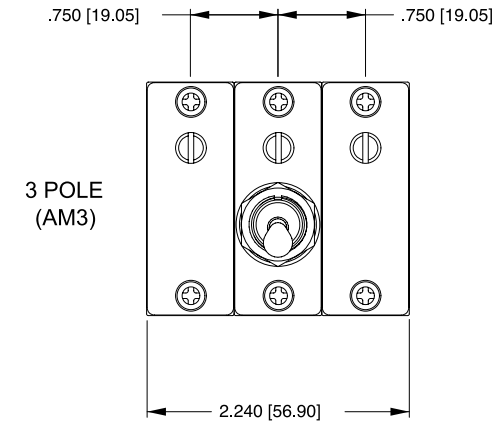
Dimensional Specifications: in. [mm]







PANEL CUTOUT DETAIL
TOLERANCES ±.005[.13]



Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

A	F	1	–	B	0	–	24	–	630	–	2	3	1	–	D
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
A

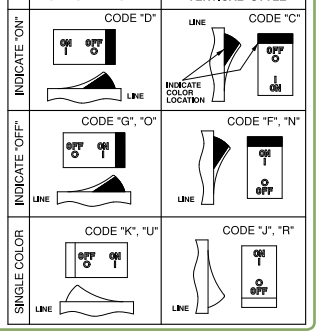
2 ACTUATOR [1]
Two Color Visi-Rocker
- **C** Indicate ON, vertical legend
- **D** Indicate ON, horizontal legend
- **F** Indicate OFF, vertical legend
- **G** Indicate OFF, horizontal legend
- **H** Indicate OFF, no legend

Push-To-Reset, Visi-Rocker
- **N** Indicate OFF, vertical legend
- **O** Indicate OFF, horizontal legend
- **P** Indicate OFF, no legend

Single color
- **J** Vertical legend
- **K** Horizontal legend
- **L** No legend

Push-To-Reset , Single color
- **R** Vertical legend
- **U** Horizontal legend
- **V** No legend

ROCKER STYLE DESCRIPTIONS



3 POLES
1 One **2** Two **3** Three

4 CIRCUIT
- **A** [3] Switch Only (No Coil)
- **B** Series Trip (Current)
- **C** Series Trip (Voltage)
- **D** [4] Shunt Trip (Current)
- **E** [4] Shunt Trip (Voltage)
- **F** [4] Relay Trip (Current)
- **G** [4] Relay Trip (Voltage)
- **H** [4,5] Dual Coil with Shunt Trip Voltage Coil
- **K** [4,5] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [6,7]
- **0** without Aux Switch
- **1** S.P.D.T., 0.093 Q.C. Term.
- **2** S.P.D.T., 0.110 Q.C. Term.
- **4** S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
- **5** S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)
- **7** S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
- **8** S.P.S.T., 0.187 Q.C. Term.
- **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
- **03** DC 50/60Hz, Switch Only
- **10** DC Instantaneous
- **11** DC Ultra Short
- **12** DC Short
- **14** DC Medium
- **16** DC Long
- **20** 50/60Hz Instantaneous
- **21** 50/60Hz Ultra Short
- **22** 50/60Hz Short
- **24** 50/60Hz Medium
- **26** 50/60Hz Long
- **30** DC, 50/60Hz Instantaneous
- **31** DC, 50/60Hz Ultra Short
- **32** DC, 50/60Hz Short
- **34** DC, 50/60Hz Medium
- **36** DC, 50/60Hz Long
- **42** [9] 50/60Hz Short, Hi-Inrush
- **44** [9] 50/60Hz Medium, Hi-Inrush
- **46** [9] 50/60Hz Long, Hi-Inrush
- **52** [9] DC, Short,Hi-Inrush
- **54** [9] DC, Medium, Hi-Inrush
- **56** [9] DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**225**	0.250	**420**	2.000	**611**	11.000
025	0.025	**230**	0.300	**522**	2.250	**711**	11.500
030	0.030	**235**	0.350	**527**	2.750	**612**	12.000
035	0.035	**240**	0.400	**430**	3.000	**712**	12.500
040	0.040	**245**	0.450	**435**	3.500	**613**	13.000
045	0.045	**250**	0.500	**440**	4.000	**614**	14.000
050	0.050	**255**	0.550	**445**	4.500	**615**	15.000
055	0.055	**260**	0.600	**450**	5.000	**616**	16.000
060	0.060	**265**	0.650	**455**	5.500	**617**	17.000
065	0.065	**270**	0.700	**460**	6.000	**618**	18.000
070	0.070	**275**	0.750	**465**	6.500	**620**	20.000
075	0.075	**280**	0.800	**470**	7.000	**622**	22.000
080	0.080	**285**	0.850	**475**	7.500	**624**	24.000
085	0.085	**290**	0.900	**480**	8.000	**625**	25.000
090	0.090	**295**	0.950	**485**	8.500	**630**	30.000
095	0.095	**410**	1.000	**490**	9.000	**635** [8]	35.000
210	0.100	**512**	1.250	**495**	9.500	**640** [8]	40.000
215	0.150	**415**	1.500	**610**	10.000	**645** [8]	45.000
220	0.200	**517**	1.750	**710**	10.500	**650** [8]	50.000

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [8]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [11]
- **1** [12] Push-On 0.250 Tab (Q.C.)
- **2** Screw 8-32 with upturned lugs
- **3** [13] Screw 8-32 (Bus Type)
- **4** Screw 10-32 with upturned lugs
- **5** [13] Screw 10-32 (Bus Type)
- **6** Screw 8-32 with upturned lugs & 30° bend
- **7** Screw 8-32 (Bus Type) & 30° bend
- **8** Screw 10-32 with upturned lugs & 30° bend
- **9** Screw 10-32 (Bus Type) & 30° bend
- **B** Screw M5 with upturned lugs
- **C** Screw M4 with upturned lugs
- **E** [13] Screw M4 (Bus Type)
- **F** Screw M5 with upturned lugs & 30° bend
- **G** Screw M5 (Bus Type) & 30° bend
- **H** [13] Screw M5 (Bus Type)
- **L** [14] 0.250 Q.C./ Solder Lug
- **M** [13] M6 Threaded Stud
- **P** [15] Printed Circuit Board Terminals
- **Q** [16] Push-In Stud
- **R** Screw M4 with upturned lugs & 30° bend
- **S** [17] Push-On 0.110 Tab (Q.C.) & 30° bend
- **T** Screw M4 (Bus Type) & 30° bend

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [12]	Marking: I-O	Marking: ON-OFF	Dual [12]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**A**	**B**	**1**	Black	White
Black	**C**	**D**	**2**	White	n/a
Red	**F**	**G**	**3**	White	Red
Green	**H**	**J**	**4**	White	Green
Blue	**K**	**L**	**5**	White	Blue
Yellow	**M**	**N**	**6**	Black	Yellow
Gray	**P**	**Q**	**7**	Black	Gray
Orange	**R**	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [20]

	STANDARD ROCKER BEZEL Threaded Insert, 2 per pole	BARRIERS
1	6-32 x 0.195 inches	no
A	6-32 X 0.195 inches (multi-pole units only)	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multi-pole units only)	yes
	ROCKERGUARD & PUSH-TO-RESET BEZEL Threaded Insert, 2 per pole	
3	6-32 x 0.195 inches	no
C	6-32 x 0.195 inches (multi-pole units only)	yes
4	ISO M3 x 5mm	no
D	ISO M3 x 5mm (multi-pole units only)	yes
	FRONT PANEL SNAP-IN BRACKET, 0.744" [18.90mm] wide bezel	
8	without Rockerguard (single pole units only)	no
H	with Rockerguard (single pole units only)	no
	FRONT PANEL SNAP-IN BRACKET, 0.96" [24.48mm] wide bezel	
9	without Rockerguard (single pole units only)	no
J	with Rockerguard (single pole units only)	no

11 AGENCY APPROVAL
- **C** UL Recognized & CSA Accepted
- **D** VDE Certified, UL Recognized & CSA Accepted
- **E** TUV Certified, UL Recognized & CSA Accepted
- **I** UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

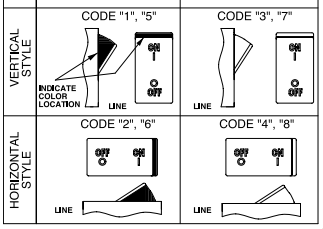
Notes:
1. Push-To-Reset actuators have OFF portion of rocker shrouded.
2. Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3. Switch Only circuits, rated up to 50 amps & 3 poles, are available only when tied to a protected pole (Circuit Code B, C, D or H.), For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
4. Available with terminal Codes 1, 2 and 3. Current Rating limited to 30 amps maximum.
5. Consult factory for Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
6. Auxiliary Switch breakers with Series Trip & Switch Only circuits: ≤ 30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
7. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
8. Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10 & 20.
9. Available with Circuit Codes B & D only. VDE Certified to 30 amps. UL Recognized, CSA Accepted & TUV Certified to 50 amps.
10. Series Trip current ratings: VDE Certification available with single pole breakers with DC Delay only. UL Recognition & CSA Accepted available in one and two pole breakers.
11. Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
12. Terminal Code 1: VDE Certification up to 25 amps and UL Recognition and CSA Accepted up to 30 amps, but not recommended over 20 amps.
13. Terminal Codes 3, 5 E & H (Bus Type) with VDE, are supplied with Lock Washers; Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only VDE Certified when the washers are used.
14. VDE Cert. available up to 12 amps. UL Rec. & CSA Accepted available up to 30 amps.
15. Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL Recognition and CSA Accepted, with Circuit Codes A, B & C. Two pole breakers with Terminal Code P (Printed Circuit Board) are available up to 40 amps with UL Recognition and CSA Certification with Circuit Codes A, B and C.
16. Terminal Code Q not available with VDE.
17. Terminal Code S used on voltage coil circuit constructions only.
18. Color shown is visi and legend with remainder of rocker black.
19. Dual = ON-OFF/I-O legend with actuator. None = no legend on actuator
20. Legend on Push-to-reset bezel/shroud is white with single color actuator codes R, & U. Legend on Push-to-reset bezel/shroud matches Visi-color of rocker with actuator codes N & O. Rockerguard available with actuator codes C through L.

A	1	1	–	B	0	–	24	–	630	–	2	3	1	–	E
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
Two Color Visi-Rocker
1 Indicate OFF, vertical legend
2 Indicate OFF, horizontal legend
Single color
3 Vertical legend
4 Horizontal legend
Push-To-Reset, Visi-Rocker
5 Indicate OFF, vertical legend
6 Indicate OFF, horizontal legend
Push-To-Reset , Single color
7 Vertical legend
8 Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
A [3] Switch Only (No Coil)
B Series Trip (Current)
C Series Trip (Voltage)
D [4] Shunt Trip (Current)
E [4] Shunt Trip (Voltage)
F [4] Relay Trip (Current)
G [4] Relay Trip (Voltage)
H [4,5] Dual Coil with Shunt Trip Voltage Coil
K [4,5] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [6,7]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
5 S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 DC 50/60Hz, Switch Only
10 [6] DC Instantaneous
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
20 [6] 50/60Hz Instantaneous
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
30 DC, 50/60Hz Instantaneous
31 DC, 50/60Hz Ultra Short
32 DC, 50/60Hz Short
34 DC, 50/60Hz Medium
36 DC, 50/60Hz Long
42 [9] 50/60Hz Short, Hi-Inrush
44 [9] 50/60Hz Medium, Hi-Inrush
46 [9] 50/60Hz Long, Hi-Inrush
52 [9] DC, Short,Hi-Inrush
54 [9] DC, Medium, Hi-Inrush
56 DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**225**	0.250	**420**	2.000	**611**	11.000
025	0.025	**230**	0.300	**522**	2.250	**711**	11.500
030	0.030	**235**	0.350	**527**	2.750	**612**	12.000
035	0.035	**240**	0.400	**430**	3.000	**712**	12.500
040	0.040	**245**	0.450	**435**	3.500	**613**	13.000
045	0.045	**250**	0.500	**440**	4.000	**614**	14.000
050	0.050	**255**	0.550	**445**	4.500	**615**	15.000
055	0.055	**260**	0.600	**450**	5.000	**616**	16.000
060	0.060	**265**	0.650	**455**	5.500	**617**	17.000
065	0.065	**270**	0.700	**460**	6.000	**618**	18.000
070	0.070	**275**	0.750	**465**	6.500	**620**	20.000
075	0.075	**280**	0.800	**470**	7.000	**622**	22.000
080	0.080	**285**	0.850	**475**	7.500	**624**	24.000
085	0.085	**290**	0.900	**480**	8.000	**625**	25.000
090	0.090	**295**	0.950	**485**	8.500	**630**	30.000
095	0.095	**410**	1.000	**490**	9.000	**635** [8]	35.000
210	0.100	**512**	1.250	**495**	9.500	**640** [8]	40.000
215	0.150	**415**	1.500	**610**	10.000	**645** [8]	45.000
220	0.200	**517**	1.750	**710**	10.500	**650** [8]	50.000

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [8]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [11]
1 [12] Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 [13] Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 [13] Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
C Screw M4 with upturned lugs
E [13] Screw M4 (Bus Type)
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H [13] Screw M5 (Bus Type)
L [14] 0.250 Q.C./ Solder Lug
M [13] M6 Threaded Stud
P [15] Printed Circuit Board Terminals
Q Push-In Stud
R Screw M4 with upturned lugs & 30° bend
S [16] Push-On 0.110 Tab (Q.C.) & 30° bend
T Screw M4 (Bus Type) & 30° bend

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [17]	Marking: ON-OFF	Marking: Dual [17]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [18]

	STANDARD ROCKER BEZEL Threaded Insert, 2 per pole FLAT ROCKER ACTUATOR	BARRIERS
1	6-32 x 0.195 inches	no
A	6-32 X 0.195 inches (multi-pole units only)	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multi-pole units only)	yes
	RECESSED OFF SIDE ROCKER ACTUATOR [19]	
5	6-32 x 0.195 inches	no
E	6-32 x 0.195 inches (multi-pole units only)	yes
6	ISO M3 x 5mm	no
F	ISO M3 x 5mm (multi-pole units only)	yes
	PUSH-TO-RESET BEZEL,Threaded Insert, 2 per pole	
3	6-32 x 0.195 inches	no
C	6-32 x 0.195 inches (multi-pole units only)	yes
4	ISO M3 x 5mm	no
D	ISO M3 x 5mm (multi-pole units only)	yes

11 AGENCY APPROVAL
C UL Recognized & CSA Accepted
E TUV Certified, UL Recognized & CSA Accepted
I UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

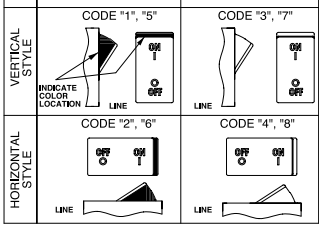
Notes:
1 Push-To-Reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3 Switch Only circuits, rated up to 50 amps & 3 poles. Only available when tied to a protected pole. For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
4 Available with terminal Codes 1, 2 and 3. Current Rating limited to 30 amps maximum.
5 Consult factory for Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
6 Auxiliary Switch breakers with Series Trip & Switch Only circuits: ≤ 30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
7 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
8 Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10 & 20.
9 Available with Circuit Codes B & D only. UL Recognized, CSA Accepted & TUV Certified to 50 amps.
10 UL Recognition, CSA Acceptance & TUV Certification available in one and two pole breakers.
11 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
12 Terminal Code 1: Available up to 30 amps, but not recommended over 20 amps.
13 Terminal Codes 3, 5 E & H (Bus Type) with TUV, are supplied with Lock Washers; Terminal Code M (M6 Threaded Stud) with TUV is supplied with Lock and Flat Washers. These breakers are only TUV Certified when the washers are used.
14 TUV Cert. available up to 12 amps. UL Rec. & CSA Accepted available up to 30 amps.
15 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 50 amps with UL Recognition, CSA Accepted & TUV Certification, with Circuit Codes A, B and C. Two pole breakers with Terminal Code P (Printed Circuit Board) are available up to 40 amps with UL Recognition and CSA Accepted with Circuit Codes A, B and C.
16 Terminal Code S used on voltage coil circuit constructions only.
17 Color shown is visi and legend with remainder of rocker black, Dual = ON-OFF/I-O legend.
18 Legend on Push-to-reset bezel/shroud is white with single color actuator codes 7 & 8. Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes 5 & 6.
19 Recessed “off-side” available with actuator codes 1, 2, 3 & 4. Legends on rocker are available in ink stamping only.

A	1	1	–	B	0	–	14	–	630	–	2	3	1	–	M	T
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
Two Color Visi-Rocker
1 Indicate OFF, vertical legend
2 Indicate OFF, horizontal legend
Single color
3 Vertical legend
4 Horizontal legend
Push-To-Reset, Visi-Rocker
5 Indicate OFF, vertical legend
6 Indicate OFF, horizontal legend
Push-To-Reset , Single color
7 Vertical legend
8 Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [3]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
52 DC, Short,Hi-Inrush
54 DC, Medium, Hi-Inrush
56 DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**225**	0.250	**420**	2.000	**611**	11.000
025	0.025	**230**	0.300	**522**	2.250	**711**	11.500
030	0.030	**235**	0.350	**527**	2.750	**612**	12.000
035	0.035	**240**	0.400	**430**	3.000	**712**	12.500
040	0.040	**245**	0.450	**435**	3.500	**613**	13.000
045	0.045	**250**	0.500	**440**	4.000	**614**	14.000
050	0.050	**255**	0.550	**445**	4.500	**615**	15.000
055	0.055	**260**	0.600	**450**	5.000	**616**	16.000
060	0.060	**265**	0.650	**455**	5.500	**617**	17.000
065	0.065	**270**	0.700	**460**	6.000	**618**	18.000
070	0.070	**275**	0.750	**465**	6.500	**620**	20.000
075	0.075	**280**	0.800	**470**	7.000	**622**	22.000
080	0.080	**285**	0.850	**475**	7.500	**624**	24.000
085	0.085	**290**	0.900	**480**	8.000	**625**	25.000
090	0.090	**295**	0.950	**485**	8.500	**630**	30.000
095	0.095	**410**	1.000	**490**	9.000	**635** [4]	35.000
210	0.100	**512**	1.250	**495**	9.500	**640** [4]	40.000
215	0.150	**415**	1.500	**610**	10.000	**645** [4]	45.000
220	0.200	**517**	1.750	**710**	10.500	**650** [4]	50.000

8 TERMINAL [5]
1 [6] Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 [7] Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 [7] Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
M [7] M6 Threaded Stud
P [8] Printed Circuit Board Terminals
Q [9] Push-In Stud

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [11]	Marking: ON-OFF	Marking: Dual [11]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [12]

	STANDARD ROCKER BEZEL Threaded Insert, 2 per pole FLAT ROCKER ACTUATOR	BARRIERS
1	6-32 x 0.195 inches	no
A	6-32 X 0.195 inches (multi-pole units only)	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multi-pole units only)	yes
	RECESSED OFF SIDE ROCKER ACTUATOR	
5	6-32 x 0.195 inches	no
E	6-32 x 0.195 inches (multi-pole units only)	yes
6	ISO M3 x 5mm	no
F	ISO M3 x 5mm (multi-pole units only)	yes
	PUSH-TO-RESET BEZEL,Threaded Insert, 2 per pole	
3	6-32 x 0.195 inches	no
C	6-32 x 0.195 inches (multi-pole units only)	yes
4	ISO M3 x 5mm	no
D	ISO M3 x 5mm (multi-pole units only)	yes

11 MAXIMUM APPLICATION RATING
M 80 DC

12 AGENCY APPROVAL
T UL489A Listed
J UL489A Listed, TUV Certified

Notes:
1 Push-To-Reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3 Auxiliary Switch breakers with Series Trip circuits: ≤ 30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
4 VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
5 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
6 Terminal Code 1 (Push-On) available up to 25 amps with TUV or VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
7 Terminal Codes 3, 5 and H (Bus Type) with TUV or VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only TUV or VDE Certified when the washers are used.
8 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
9 Terminal Code Q not available with VDE certification.
10 Color shown is Visi and Legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
11 Legend on Push-to-reset bezel/shroud is white with single color actuator codes R & U.
12 Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes N & O. Rockerguard available with actuator codes C through K

A	Y	2	–	B	0	–	24	–	620	–	4	2	1	–	C	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Auxiliary Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
A

2 ACTUATOR [1]
Y Single Color Recessed Paddle Actuator with Vertical Legends

3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
A	Switch-Only (No Coil)	**F**	Relay Trip (Current)
B	Series Trip (Current)	**G**	Relay Trip (Voltage)
C	Series Trip (Voltage)	**H**	Dual Coil with Shunt Trip Voltage Coil
D	Shunt Trip (Current)	**K**	Dual Coil with Shunt Trip Current Coil
E	Shunt Trip (Voltage)		

5 AUXILIARY SWITCH
0 without Aux Switch
1 S.P.D.T. with 0.093 Q.C. Terminals
2 S.P.D.T. with 0.110 Q.C. Terminals
3 S.P.D.T. with 0.139 Solder Lug Terminals
4 S.P.D.T. with 0.110 Q.C. Terminals (Gold Contacts)
5 S.P.D.T. with 0.093 Q.C. Terminals (Gold Contacts)
6 S.P.S.T.-N.O. with 0.139 Solder Lug Terminals
7 S.P.S.T.-N.O. with 0.110 Q.C. Terminals (Gold Contacts)
8 S.P.S.T.-N.O. with 0.187 Q.C. Terminals
9 S.P.D.T. with 0.187 Q.C. Terminals

6 FREQUENCY & DELAY [3]
3	DC, 50/60 Hz Switch Only	**22**	50/60 Hz Short
10	DC Instantaneous	**24**	50/60 Hz Medium
11	DC Ultra Short	**26**	50/60 Hz Long
12	DC Short	**42**	50/60 Hz Short Hi-Inrush
14	DC Medium	**44**	50/60 Hz Medium Hi-Inrush
16	DC Long	**46**	50/60 Hz Long Hi-Inrush
20	50/60 Hz Instantaneous	**52**	DC, Short, Hi-Inrush
21	50/60 Hz Ultra Short	**54**	DC, Medium, Hi-Inrush
		56	DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [4]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
220	0.200	**295**	0.950	**460**	6.000	**614**	14.000
225	0.250	**410**	1.000	**465**	6.500	**615**	15.000
230	0.300	**512**	1.250	**470**	7.000	**616**	16.000
235	0.350	**415**	1.500	**475**	7.500	**617**	17.000
240	0.400	**517**	1.750	**480**	8.000	**618**	18.000
245	0.450	**420**	2.000	**485**	8.500	**620**	20.000
250	0.500	**522**	2.250	**490**	9.000	**622**	22.000
255	0.550	**425**	2.500	**495**	9.500	**624**	24.000
260	0.600	**527**	2.750	**610**	10.000	**625**	25.000
265	0.650	**430**	3.000	**710**	10.500	**630**	30.000
270	0.700	**435**	3.500	**611**	11.000	**635**	35.000
275	0.750	**440**	4.000	**711**	11.500	**640**	40.000
280	0.800	**445**	4.500	**612**	12.000	**645**	45.000
285	0.850	**450**	5.000	**712**	12.500	**650**	50.000
290	0.900	**455**	5.500	**613**	13.000		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL
1	Push-On 0.250 Tab (Q.C.)	**C**	Screw, M4 with upturned lugs
2	Screw 8-32 with upturned lugs	**E**	Screw, M4 (Bus Type)
3	Screw 8-32 (Bus Type)	**F**	Screw M5 with upturned lugs & 30° bend
4	Screw 10-32 with upturned lugs	**G**	Screw M5 (Bus Type) & 30° bend
5	Screw 10-32 (Bus Type)	**H**	Screw M5 (Bus Type)
6	Screw 8-32 with upturned lugs & 30° bend	**L**	0.250 Q.C./Solder Lug
7	Screw 8-32 (Bus Type) & 30° bend	**M**	M6 Threaded Stud
8	Screw 10-32 with upturned lugs & 30° bend	**P**	Printed Circuit Board Terminals
9	Screw 10-32 (Bus Type) & 30° bend	**Q**	Push-In Stud
B	Screw M5 with upturned lugs	**R**	Screw, M4 with upturned lugs & 30° Bend
		S	Screw, M5 with upturned lugs
		T	Screw, M4 with upturned lugs

9 ACTUATOR COLOR & LEGEND [5]
Actuator Color	I-O	ON-OFF	Dual	Legend Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White
Red	**F**	**G**	**3**	White
Green	**H**	**J**	**4**	White
Blue	**K**	**L**	**5**	White
Yellow	**M**	**N**	**6**	Black
Gray	**P**	**Q**	**7**	Black
Orange	**R**	**S**	**8**	Black

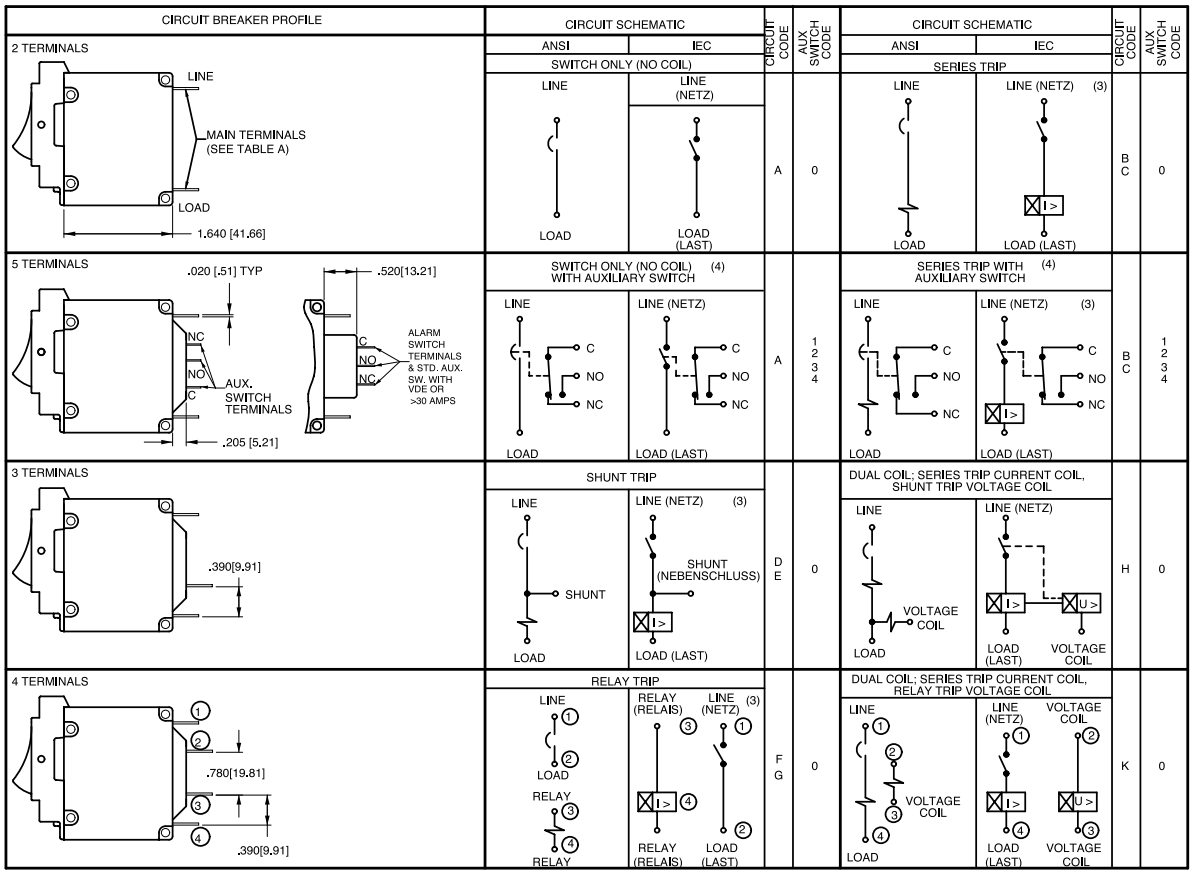
10 MOUNTING / BARRIERS
		BARRIERS
1	6-32 x 0.195 inches	no
A	6-32 X 0.195 inches (multi-pole units only)	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm (multi-pole units only)	yes

11 MAXIMUM APPLICATION RATING [6]
A 65 VDC
C 120/240 VAC (Available only on 2 or 3-Pole units)
K 120 VAC
M 80 DC

12 AGENCY APPROVAL [7]
A Without Approvals
C UL Recognized and CSA Accepted
T UL 489A

Notes:
1 All standard catalog numbers are supplied with Vertical Legends. For Horizontal or other non-standard legends, choose "X" and order as a special catalog number.
2 For rating (T) 2 & 3 Pole not available.
3 Frequency and Time Delay ratings of (03, 20, 21, 22, 24, 26, 42, 44, 46) not available with approval T.
4 Voltage Coil Ratings starting with (J, K, or L) not available with approval T.
5 "OFF and/or "O" Legends are on Bracket and are only visible when the Paddle Actuator is in the off position.
6 Maximum Application Ratings (C & K) not available with approval T.
7 Not all approvals are available in all constructions. Consult factory for details.

Circuit & Terminal Diagrams: in. [mm]

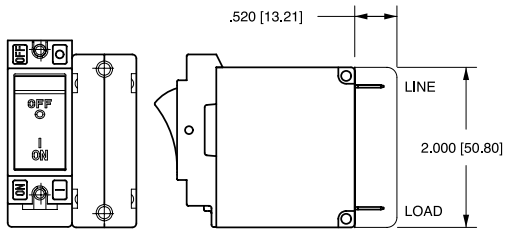


CIRCUIT CODE	AUX SWITCH CODE
A	0
B C	0
A	1 2 3 4
B C	1 2 3 4
D E	0
H	0
F G	0
K	0

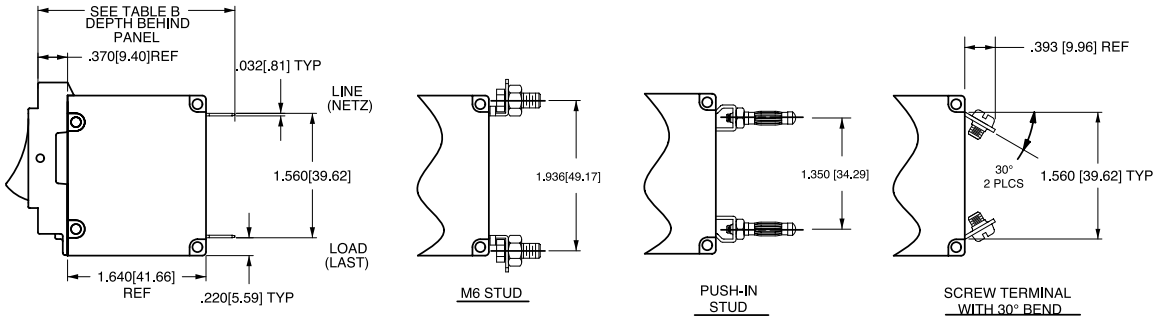
TABLE B

TERMINAL DESCRIPTION		DEPTH BEHIND PANEL
MAIN	TAB (Q.C.)	2.370 [60.20]
	SCREW TYPE	2.402 [61.01]
SHUNT, RELAY & DUAL COIL	TAB (Q.C.)	2.577 [65.46]
	SCREW #8-32 W/UPTURNED LUGS	2.734 [69.44]
AUX. SWITCH*	.093 TAB (Q.C.)	2.465 [62.61]
	.110 TAB (Q.C.)	2.559 [65.00]
	SOLDER TYPE	2.340 [59.44]

* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS VIEWED IN MULTI-POLE IDENTIFICATION SCHEME.

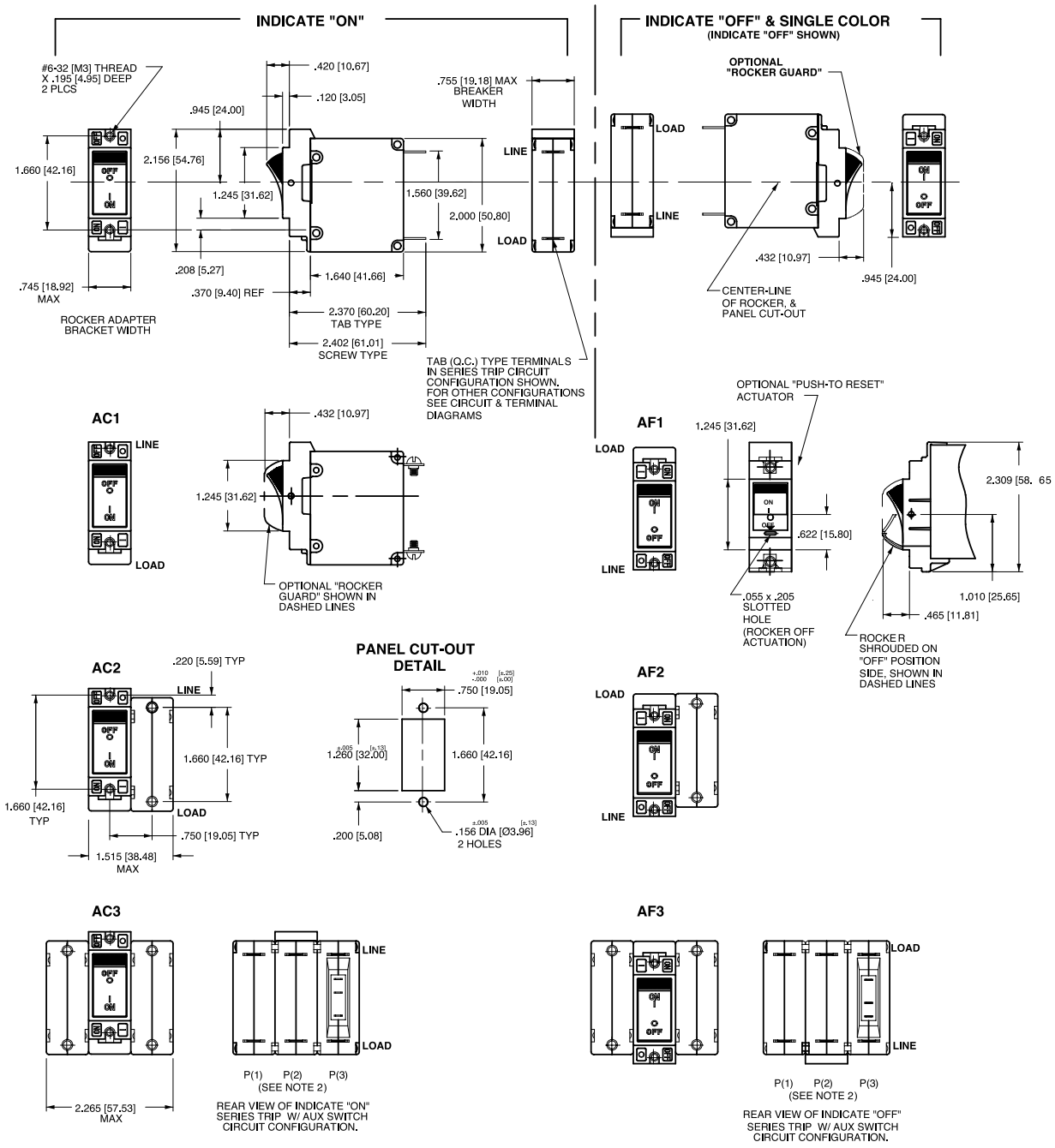


BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS



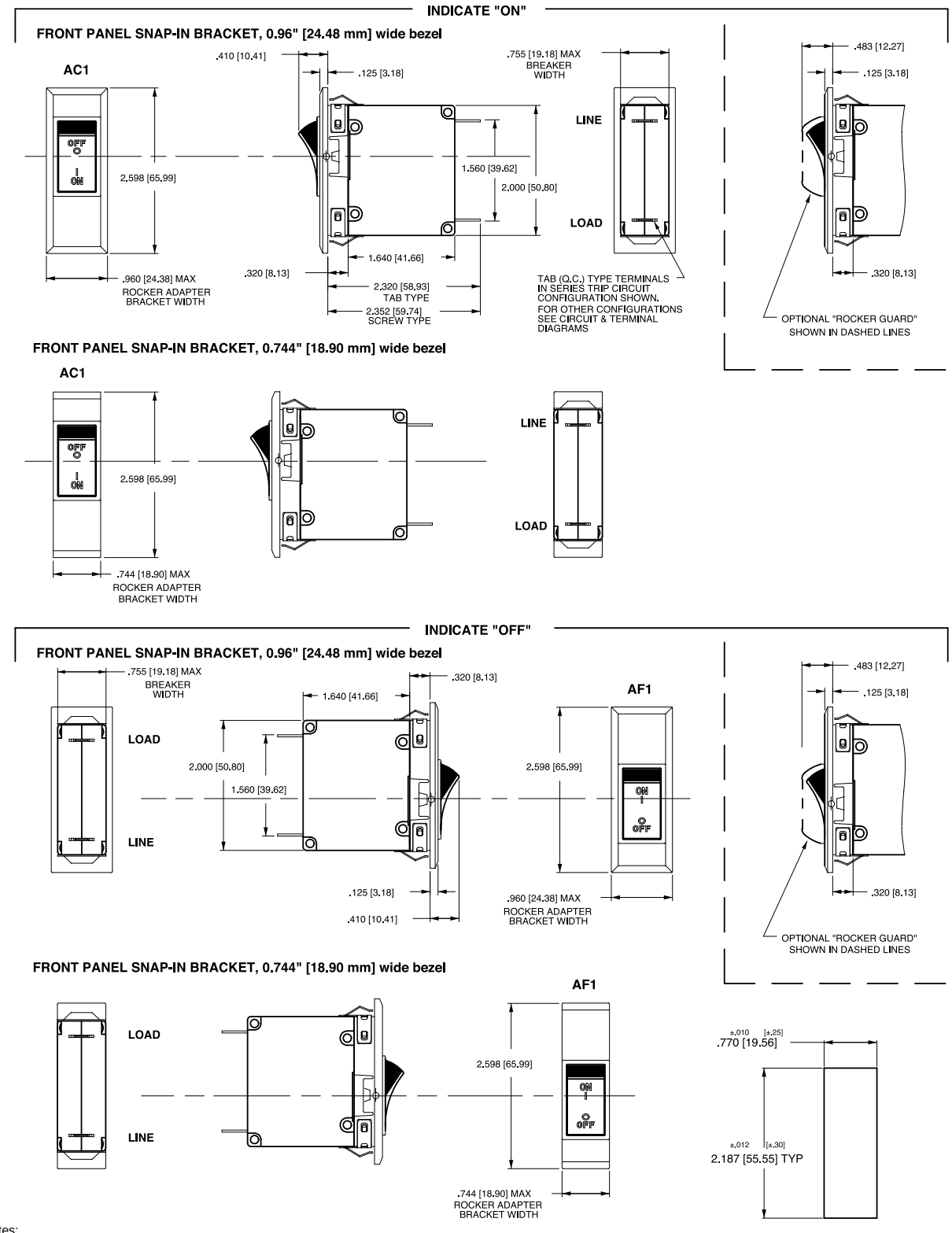
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Schematic shown represents current trip circuit.
4 Circuits shown for >30 amps / VDE.

Dimensional Specifications: in. [mm]



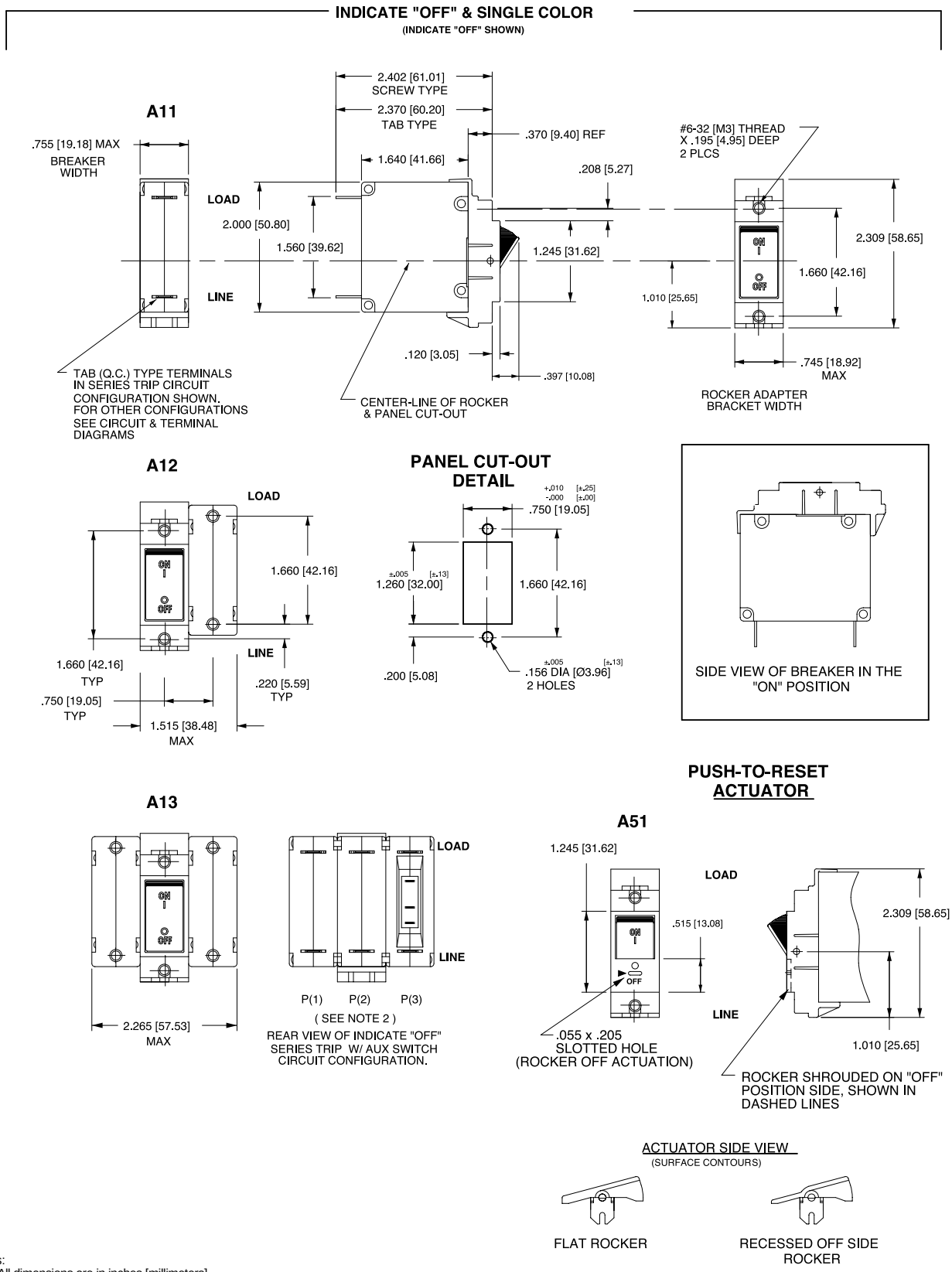
Notes:
1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal orientation on indicate OFF is opposite of indicate ON.
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 All dimensions are in inches [millimeters].
4 Tolerance ± 0.20 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



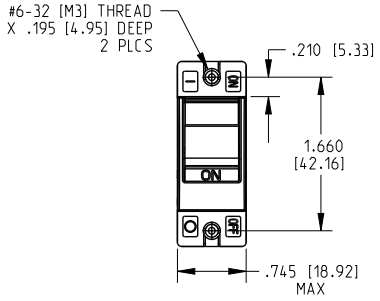
Notes:
1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal
2 For pole orientation with horizontal legend, rotate front view clockwise 90°. Orientation on indicate "OFF" is opposite of indicate "ON"
3 Recommended panel thickness: .04 0 [1.02] to .100 [2.54]
4 All dimensions are in Inches [millimeters].
5 Tolerance ±.020 [.51] unless otherwise specified.

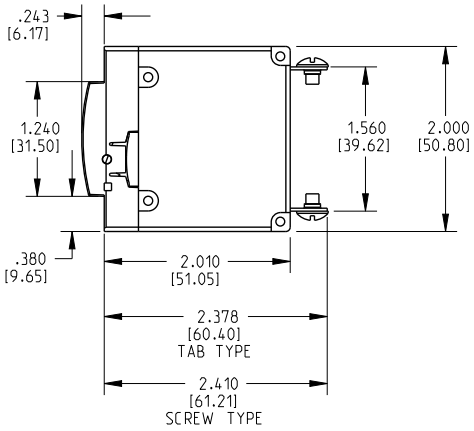
Dimensional Specifications: in. [mm]

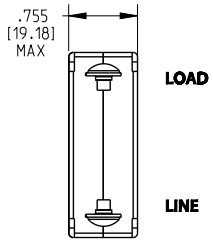


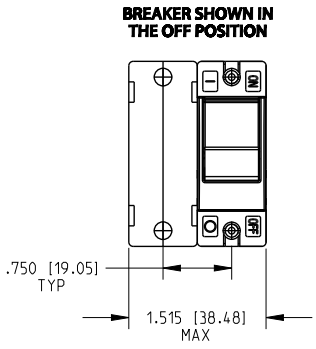
Notes:
1 All dimensions are in inches [millimeters].
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 Tolerance ± 0.20 [.51] unless otherwise specified.

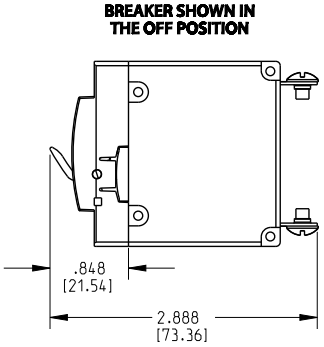
Dimensional Specifications: in. [mm]

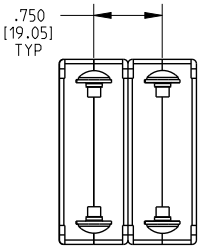


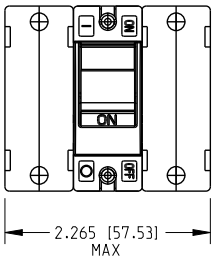


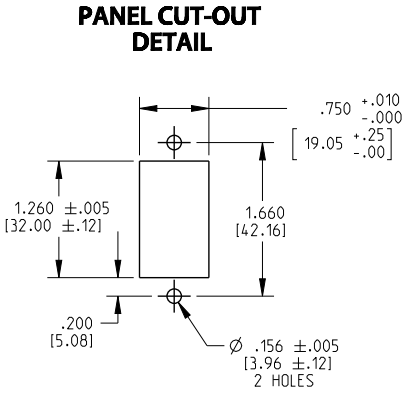








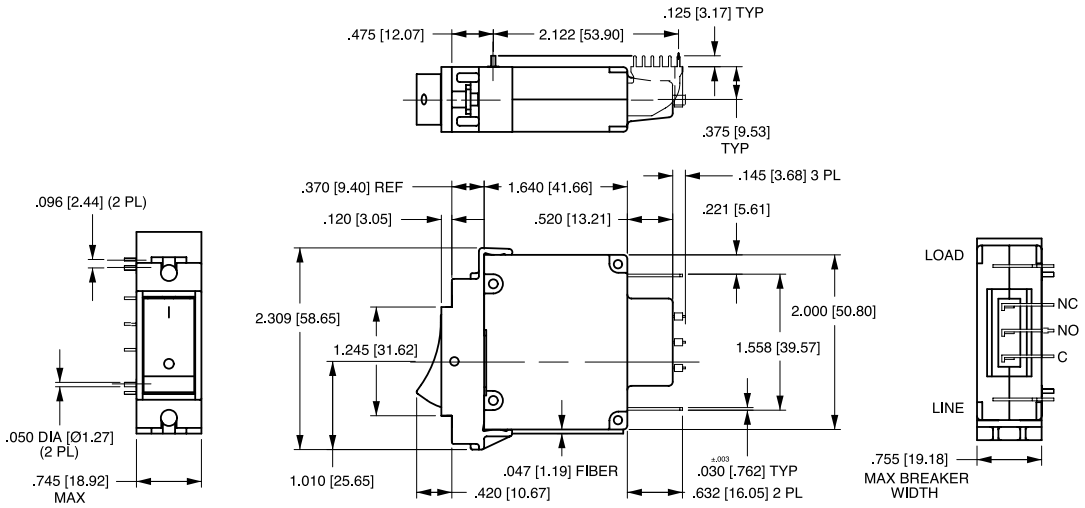




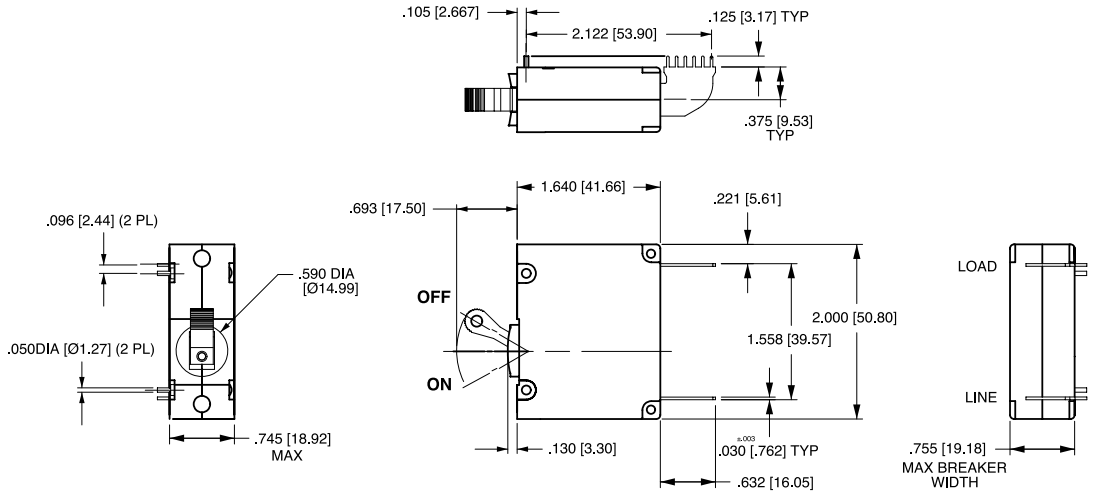
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ± 0.20 [.51] unless otherwise specified

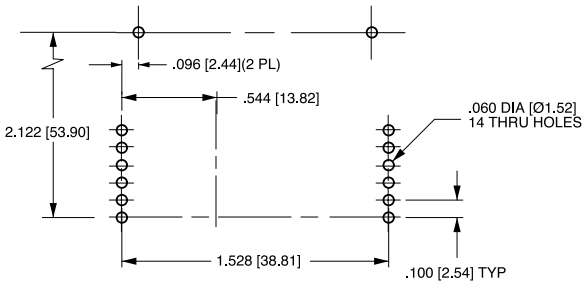
PC Terminal Diagrams: in. [mm]

A-SERIES ROCKER

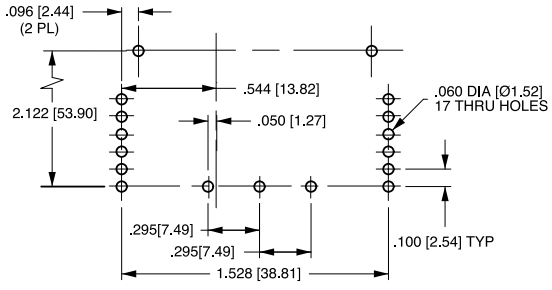


A-SERIES HANDLE





P.C. FOOT PRINT



P.C. FOOT PRINT WITH AUX. SWITCH

Notes:
1 Drawing illustrates A-Series with VDE certification.
2 All dimensions are in inches [millimeters].
3 Tolerance ± 0.20 [.51] unless otherwise specified

B-Series
CIRCUIT BREAKER

Carling Technologies' B-Series hydraulic magnetic circuit breakers are specifically designed for applications requiring extra insulation and tongue and groove half-shell constructions. The B-Series carries global regulatory safety approvals for spacing requirements and are ideal for use as general purpose as well as full load amp applications. Available with various choices of time delays, terminals, actuator styles, with a wide range of standard colors and imprinting.

1-6 poles; ratings from 0.02 to 50 amps, up to 277VAC or 80VDC; UL recognized, CSA, VDE -0642, TUV, UL-1500, UL489A Listed

Product Highlights:

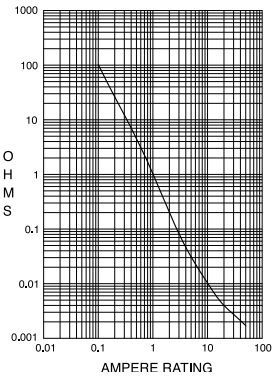
- Meet CSA Standard 22.2 No. 100 for the Generator & Welder markets
- Extra insulation and tongue & groove half-shell constructions
- UL Recognized - UL Standard 508, 1077, 1500
- UL Listed - UL Standard 489, 489A
- CSA Accepted
- TUV Certified
- VDE Certified

Only Military applicable ordering schemes and drawings are shown in this catalog.
For complete product details, please visit *www.carlingtech.com*

Electrical

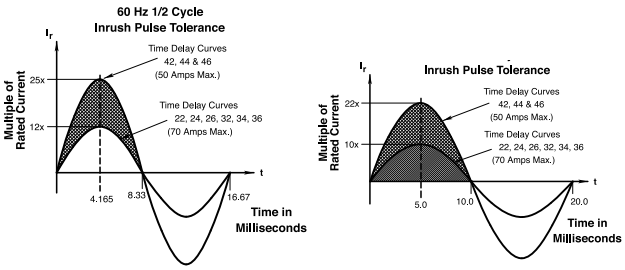
Maximum Voltage	277VAC 50/60 Hz, 80VDC
Current Ratings	Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0 and 50.0 amps. Other ratings available, see ordering scheme.
Standard Voltage Coils	DC - 6V, 12V; AC - 120V, other ratings available, see ordering scheme.
Auxiliary Switch Rating	SPDT; 10.1 AMPS - 250VAC,1.0A 65 VDC or 0.5A 80 VDC, 0.1 Amps - 125VAC (with gold contacts). VDE-1.0 Amp - 125VAC.
Insulation Resistance	Minimum of 100 Megohms at 500 VDC.
Dielectric Strength	UL, CSA-1500 V 50/60 Hz for one minute between all electrically isolated terminals. B-Series circuit breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker.

RESISTANCE PER POLE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)



CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	15
5.1 - 20.0	25
20.1 - 50.0	35

Pulse Tolerance Curves



Mechanical

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated Current and Voltage.
Trip Free	All B-Series Circuit Breakers will trip on overload, even when Handle is forcibly held in the ON position.
Trip Indication	The operating Handle moves positively to the OFF position when an overload causes the breaker to trip.

Physical

Number of Poles	1 - 6 poles at 30 Amps or less. 1 and 2 poles at 31 Amps thru 50 Amps.
Internal Circuit Config.	Series, (with or without auxiliary switch), Shunt and Relay with current or voltage trip coils, Dual Coil, Switch Only (with or without auxiliary switch).
Weight	Approximately 65 grams/pole. (Approximately 2.32 ounces/pole.)
Standard Colors	Housing- Black; Actuator - See Ordering Scheme.

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
Vibration	Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current.
Moisture Resistance	Method 106D, i.e., ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Thermal Shock	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
Operating Temperature	-40° C to +85° C

*Manufacturer reserves the right to change product specification without prior notice.

Electrical Tables

Table A: Lists UL Recognized & CSA Certified configurations and performance capabilities as a Component Supplementary Protector.

B -SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS										
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING		SHORT CIRCUIT CAPACITY (AMPS)		APPLICATION CODES		CONSTRUCTION NOTES
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	GENERAL PURPOSE AMPS	UL/CSA		UL	CSA	
						WITH BACKUP FUSE	WITHOUT BACKUP FUSE			
SERIES	65	DC	---	31 - 50	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	80	DC	---	0.02 - 30	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				---	31 - 50	---	7500	TC1,2, OL0,U1	TC1,2, OL0,U1	
	125	50 / 60	1	1 - 50	---	---	2000	TC1, OL1,U2	TC1, OL1,U2	
	125	50 / 60	1 [4]	1 - 50	---	---	1000	TC1, OL1,U2	TC3, OL1,U3	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.02 - 30	---	---	1500	TC1, OL0,U2	TC1, OL0,U2	Single Pole Break
				0.02 - 30	---	---	3000	TC1, OL1,U2	TC1, OL1,U2	Two Pole Break
				---	31 - 50	---	3000	TC1,2, OL0,U1	TC1,2, OL0,U1	
			1 [4]	1 - 50	---	---	1000	TC1, OL1,U2	TC3, OL1,U3	
			3	0.02 - 30	---	5000 [2]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
				31 - 50	---	2000 [1]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
DUAL COIL	65	DC	---	0.02 - 50	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	80	DC	---	0.02 - 30	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				---	31 - 50	---	7500	TC1,2, OL0,U1	TC1,2, OL0,U1	
	125	50 / 60	1	1 - 50	---	---	2000	TC1, OL1,U2	TC1, OL1,U2	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.02 - 30	---	---	1500	TC1, OL0,U2	TC1, OL0,U2	Single Pole Break
				0.02 - 30	---	---	3000	TC1, OL1,U2	TC1, OL1,U2	Two Pole Break
				---	31 - 50	---	3000	TC1,2, OL0,U1	TC1,2, OL0,U1	
			1 [4]	1 - 50	---	---	1000	TC1, OL1,U2	TC3, OL1,U3	
			3	0.02 - 30	---	5000 [2]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
				31 - 50	---	2000 [1]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1,2, OL1,U1	TC1,2, OL1,U1	
SHUNT	80	DC	---	0.02 - 30	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
			3	0.02 - 30	---	5000 [2]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
RELAY	80	DC	---	0.02 - 30	---	---	7500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	125 / 250	50 / 60	1 [3]	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.02 - 30	---	---	3000	TC1,2, OL1,U1	TC1,2, OL1,U1	
			3	0.02 - 30	---	5000 [2]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
	277	50 / 60	1	0.02 - 30	---	5000 [1]	---	TC1,2, OL1,C1	TC1,2, OL1,C1	
SWITCH ONLY	65	DC	---	0.02 - 50	---	---	---	---	---	
	80	DC	---	0.02 - 30	---	---	---	---	---	
	250	50 / 60	1	---	31 - 50	---	---	---	---	
			3	0.02 - 50	---	---	---	---	---	
	277	50 / 60	1	0.02 - 30	31 - 50	---	---	---	---	

Notes:
1 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
2 Same as note 1, except that backup fuse is limited to 80A maximum.
3 2 pole protector required (with one pole per power line) for: 250/125 VAC, 125/250 VAC and 208Y/120 VAC Power Systems. 1 pole protector required for : 125 VAC, 1Ø Power System.
4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table B: Lists UL Recognized, CSA, VDE & TUV Certified configurations & performance capabilities as a Component Supplementary Protector.

B-SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS														
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING		SHORT CIRCUIT CAPACITY (AMPS)						APPLICATION CODES		CONSTRUCTION NOTES
						UL/CSA		VDE		TUV				
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	GENERAL PURPOSE AMPS [1]	WITH BACKUP FUSE	WITHOUT BACKUP FUSE	(Inc) WITH BACKUP FUSE	(Icn) WITHOUT BACKUP	(Inc) WITH BACKUP FUSE	(Icn) WITHOUT BACKUP	UL	CSA	
SERIES	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				31 - 50	31 - 50	—	7500	3000	1500	3000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	
				0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				31 - 32	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				31 - 50	31 - 50	—	7500	3000	1500	3000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	
	250	50 / 60	1	0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				31 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	
				31 - 32	—	—	3000	6000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				0.10 - 30	—	—	1500	3000	1500	5000	1500	TC1, OL0,U2	TC1, OL0,U2	Single Pole Break
				0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1, OL1,U2	TC1, OL1,U2	Two Pole Break
			3	0.10 - 30	—	5000 [3]	---	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	
	415	50 / 60	3	0.10 - 30	—	—	1000	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	
DUAL COIL	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.10 - 30	—	—	3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				30 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	
			3	0.10 - 30	—	5000 [3]	---	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	
				31 - 50	—	2000 [2]	---	—	—	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	
SHUNT	80	DC	—	0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				0.10 - 30	—	—	7500	3000	1500	3000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
	250	50 / 60	1	0.10 - 30	—		3000	3000	1500	5000	1500	TC1,2, OL1,U1	TC1,2, OL1,U1	
				30 - 50	31 - 50	—	3000	—	—	5000	1500	TC1,2, OL0,U1	TC1,2, OL0,U1	
			3	0.10 - 30	—	5000 [3]	---	3000	1500	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	
				31 - 50	—	2000 [2]	---	—	—	3000	1500	TC1,2, OL1,C1	TC1,2, OL1,C1	

Notes:
1 General Purpose Ratings for UL/CSA Only.
2 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
3 Same as note 1, except that backup fuse is limited to 80 A maximum.

Table C: Lists UL Recognized, CSA Certified configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (CCN/Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (CCN/Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

B-SERIES TABLE C: UL1500 (Marine Ignition Protected)							
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	SHORT CIRCUIT CAPACITY (AMPS)	APPLICATION CODES	
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE	UL	CSA
SERIES	14 [1]	DC	—	0.02 - 50	5000	TC1,2,OL1,U1	TC1,2,OL1,U1
	32 [1]	DC	—	0.02 - 50	5000	TC1,2,OL1,U2	TC1,2,OL1,U2
	65	DC	—	0.02 - 50	3000	TC1,2,OL1,U1	TC1,2,OL1,U1
	125 / 250	50 / 60	1 [2]	0.02 - 50	1500	TC1,2,OL1,U1	TC1,2,OL1,U1
	250	50 / 60	1	0.02 - 30	1000	TC1,2,OL1,U1	TC1,2,OL1,U1

Notes:
1 Available with special catalog number only (consult factory).
2 2 pole protector required (with one pole per power line) for: 250/125 VAC, 125/250 VAC and 208Y/120 VAC Power Systems. 1 pole protector required for : 125 VAC, 1Ø Power System.

Table D: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (CCN/ Guide DITT, File E189195), under UL489A

B-SERIES TABLE D: UL489A (COMMUNICATIONS EQUIPMENT)				
CIRCUIT CONFIGURATION	VOLTAGE		CURRENT RATING	INTERRUPTING CAPACITY (AMPS)
	MAX. RATING	FREQUENCY	GENERAL PURPOSE AMPS	WITHOUT BACKUP FUSE
SERIES	80	DC	0.10 - 50	5000
	80	DC	60 - 90 [1]	5000

Notes:
1 Parallel Pole Construction

Table E: Lists UL Listed (489) configuration and performance capabilities as a Molded Case Circuit Breaker.

B SERIES TABLE E : UL489 LISTED BRANCH CIRCUIT BREAKERS						
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)	CONSTRUCTION NOTES
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE	
SERIES	120	50 / 60	1	0.10 - 30	5,000	1 Pole
	120 / 240	50 / 60	1	0.10 - 30	5,000	2 Poles
	120 / 240	50 / 60	1	0.10 - 30	5,000	2 or 3 Poles (1 Pole of a 3 Pole Unit is for Neutral Break)
SHUNT TRIP DUAL COIL	120	50 / 60	1	0.10 - 30	5,000	1 Pole
	120 / 240	50 / 60	1	0.10 - 30	5,000	2 Poles
	120 / 240	50 / 60	1	0.10 - 30	5,000	2 or 3 Poles (1 Pole of a 3 Pole Unit is for Neutral Break)

Agency Certifications

UL Recognized

UL Standard 1077 — Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

UL Standard 508 — Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

UL Standard 1500 — Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

UL Listed

UL Standard 489 — Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)

UL Standard 489A — Communications Equipment (Guide CCN/DITT, File E189195)

CSA Accepted

Component Supplementary Protector under Class 3215 30, FIle 047848 0 000 CSA Standard C22.2 No. 235

TUV Certified

EN60934, under License No. R72103448

VDE Certified

EN60934, VDE 0642 under File No. 10537

B	A	3	–	B	0	–	10	–	450	–	1	B	1	–	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
B

2 ACTUATOR
A	Handle, one per pole
B	Handle, one per multipole unit
S	Mid-Trip Handle, one per pole
T	Mid-Trip Handle, one per pole & Alarm Switch

3 POLES
1	One	**3**	Three	**5**	Five
2	Two	**4**	Four	**6**	Six

4 CIRCUIT
A [2]	Switch Only (No Coil)	**G** [3]	Relay Trip (Voltage)
B	Series Trip (Current)	**H** [3,4]	Dual Coil with Shunt Trip Voltage Coil
C	Series Trip (Voltage)	**K** [3,4]	Dual Coil with Relay Trip Voltage Coil
D [3]	Shunt Trip (Current)		
E [3]	Shunt Trip (Voltage)		
F [3]	Relay Trip (Current)		

5 AUXILIARY / ALARM SWITCH [5]
0	without Aux Switch	**5**	S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)
1	S.P.D.T., 0.093 Q.C. Term.	**7**	S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
2	S.P.D.T., 0.110 Q.C. Term.	**8**	S.P.S.T., 0.187 Q.C. Term.
4	S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)	**9**	S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 [2]	DC 50/60Hz, Switch Only	**30**	DC, 50/60Hz Instantaneous
10 [6]	DC Instantaneous	**31**	DC, 50/60Hz Ultra Short
11	DC Ultra Short	**32**	DC, 50/60Hz Short
12	DC Short	**34**	DC, 50/60Hz Medium
14	DC Medium	**36**	DC, 50/60Hz Long
16	DC Long	**42** [7]	50/60Hz Short, Hi-Inrush
20 [6]	50/60Hz Instantaneous	**44** [7]	50/60Hz Medium, Hi-Inrush
21	50/60Hz Ultra Short	**46** [7]	50/60Hz Long, Hi-Inrush
22	50/60Hz Short	**52** [7]	DC, Short,Hi-Inrush
24	50/60Hz Medium	**54** [7]	DC, Medium, Hi-Inrush
26	50/60Hz Long	**56** [7]	DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)
CODE	AMPERES						
020	0.020	**225**	0.250	**420**	2.000	**611**	11.000
025	0.025	**230**	0.300	**522**	2.250	**711**	11.500
030	0.030	**235**	0.350	**527**	2.750	**612**	12.000
035	0.035	**240**	0.400	**430**	3.000	**712**	12.500
040	0.040	**245**	0.450	**435**	3.500	**613**	13.000
045	0.045	**250**	0.500	**440**	4.000	**614**	14.000
050	0.050	**255**	0.550	**445**	4.500	**615**	15.000
055	0.055	**260**	0.600	**450**	5.000	**616**	16.000
060	0.060	**265**	0.650	**455**	5.500	**617**	17.000
065	0.065	**270**	0.700	**460**	6.000	**618**	18.000
070	0.070	**275**	0.750	**465**	6.500	**620**	20.000
075	0.075	**280**	0.800	**470**	7.000	**622**	22.000
080	0.080	**285**	0.850	**475**	7.500	**624**	24.000
085	0.085	**290**	0.900	**480**	8.000	**625**	25.000
090	0.090	**295**	0.950	**485**	8.500	**630**	30.000
095	0.095	**410**	1.000	**490**	9.000	**635** [8]	35.000
210	0.100	**512**	1.250	**495**	9.500	**640** [8]	40.000
215	0.150	**415**	1.500	**610**	10.000	**645** [8]	45.000
220	0.200	**517**	1.750	**710**	10.500	**650** [8]	50.000

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [6]
CODE	AMPERES						
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [9]
1 [10]	Push-On 0.250 Tab (Q.C.)	**F**	Screw M5 with upturned lugs & 30° bend
2	Screw 8-32 with upturned lugs	**G**	Screw M5 (Bus Type) & 30° bend
3 [11]	Screw 8-32 (Bus Type)	**H**	Screw M5 (Bus Type)
4	Screw 10-32 with upturned lugs	**J**	Screw M5 Back Connect
5 [11]	Screw 10-32 (Bus Type)	**K**	Screw 10-32 Back Connect
6	Screw 8-32 with upturned lugs & 30° bend	**L** [12]	0.250 Q.C./ Solder Lug
7	Screw 8-32 (Bus Type) & 30° bend	**M** [11]	M6 Threaded Stud
8	Screw 10-32 with upturned lugs & 30° bend	**N**	Screw M4 Back Connect
9	Screw 10-32 (Bus Type) & 30° bend	**P** [13]	Printed Circuit Board Terminals
B	Screw M5 with upturned lugs	**Q** [16]	Push-In Stud
C	Screw M4 with upturned lugs	**R**	Screw M4 with upturned lugs & 30° bend
E [11]	Screw M4 (Bus Type)	**S** [15]	Push-On 0.110 Tab (Q.C.) & 30° bend
		T	Screw M4 (Bus Type) & 30° bend
		Y	Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND
Actuator Color	I-O	ON-OFF	Dual	Legend Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White
Red	**F**	**G**	**3**	White
Green	**H**	**J**	**4**	White
Blue	**K**	**L**	**5**	White
Yellow	**M**	**N**	**6**	Black
Gray	**P**	**Q**	**7**	Black
Orange	**R**	**S**	**8**	Black

10 MOUNTING / BARRIERS
	MOUNTING STYLE	BARRIERS
	Threaded Insert, 2 per pole	
1	6-32 x 0.195 inches	no
A	6-32 x 0.195 inches *(multi-pole units only)*	yes
2	ISO M3 x 5mm	no
B	ISO M3 x 5mm	yes
	Rectangular Adapter Plate with mounting centers of 2.062 inches [52.37mm] and Threaded insert, 2 per pole	
3 [14]	6-32 x 0.225 inches	no
C [14]	6-32 X 0.225 inches *(multi-pole units only)*	yes
4 [14]	ISO M3 x 6.5mm	no
D [14]	ISO M3 x 6.5mm	yes
	Front panel Snap-In, 0.75" [19.05mm] wide bezel	
5	without Handleguard	no
6	without Handleguard (multipole only)	yes
	Front panel Snap-In, 0.96" wide bezel	
7	without Handleguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides	no
8	without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides	yes

11 AGENCY APPROVAL
C	UL Recognized & CSA Accepted
D	VDE Certified, UL Recognized & CSA Accepted
E	TUV Certified, UL Recognized & CSA Accepted
I	UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted

Notes:
1. Actuator Code:
   A: Handle tie pin spacer(s) and retainers provided unassembled with multi-pole units.
   B: Handle location as viewed from front of breaker:
   2 pole - left pole; 3 pole - center pole
   4 pole - two handles at center poles; 5 pole - three handles at center poles
   6 pole - four handles at center poles
   S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, F, G, H and K.
   T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
2. Switch Only circuits, rated up to 50 amps and 6 poles, and only available with VDE Certification when tied to a protected pole (Circuit Code B, C, D or H.), For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650.
3. Available with Terminal Codes 1, 2 and 3. Current Rating limited to 30 amps maximum.
4. Consult factory for available Dual Coil options, as special catalog number is required. With Shunt construction, Dual Coils will trip instantaneously on line voltage. Dual coils require 30VA minimum power to trip and are rated for intermittent duty only.
5. Auxiliary Switch breakers with Series Trip and Switch Only circuits. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6. Separate pole type voltage coils not rated for continuous duty. Available only with delay codes 10 and 20.
7. Available with Circuit Codes B & D only. VDE Certified to 30 amps. UL Recognized and CSA Accepted to 50 amps.
8. VDE Certification available with single pole breakers with DC Delay only. UL Recognition and CSA Accepted available in one and two pole breakers.
9. Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, J, K, M and Q.
10. VDE Certification up to 25 amps and UL Recognition and CSA Acceptance up to 30 amps, but not recommended over 20 amps.
11. Terminal Codes 3, 5 E and H (Bus Type) with VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only VDE Certified when the washers are used.
12. VDE Cert. available up to 12 amps. UL Rec. & CSA Acceptance available up to 30 amps.
13. Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL Recognition and CSA Acceptance, with Circuit Codes A, B and C. Two pole breakers with Terminal Code P (Printed Circuit Board) are available up to 40 amps with UL Recognition and CSA Acceptance with Circuit Codes A, B and C.
14. Available with Actuator Codes A, S and T.
15. Available with voltage coils only.
16. Terminal Code Q not available with VDE approvals.

B	A	1	–	B	0	–	24	–	450	–	1	B	A	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
B

2 ACTUATOR [1]
A Handle, one per pole
B Handle, one per multipole unit
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES [2]
1 One **2** Two **3** [3] Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [4]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.110 Solder Lug
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
21 AC Ultra Short
22 AC Short
24 AC Medium
26 AC Long
42 AC, Short,Hi-Inrush
44 AC, Medium, Hi-Inrush
46 AC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**280**	0.800	**445**	4.500	**711**	11.500
215	0.150	**285**	0.850	**450**	5.000	**612**	12.000
220	0.200	**290**	0.900	**455**	5.500	**712**	12.500
225	0.250	**295**	0.950	**460**	6.000	**613**	13.000
230	0.300	**410**	1.000	**465**	6.500	**614**	14.000
235	0.350	**512**	1.250	**470**	7.000	**615**	15.000
240	0.400	**415**	1.500	**475**	7.500	**616**	16.000
245	0.450	**517**	1.750	**480**	8.000	**617**	17.000
250	0.500	**420**	2.000	**485**	8.500	**618**	18.000
255	0.550	**522**	2.250	**490**	9.000	**620**	20.000
260	0.600	**527**	2.750	**495**	9.500	**622**	22.000
265	0.650	**430**	3.000	**610**	10.000	**624**	24.000
270	0.700	**435**	3.500	**710**	10.500	**625**	25.000
275	0.750	**440**	4.000	**611**	11.000	**630**	30.000

8 TERMINAL [4]
1 Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
A Load Terminal #8 Screw with QC Combination (Special Catalog #)
B Screw M5 with upturned lugs
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
J Screw M5 Back Connect
K Screw 10-32 Back Connect
M M6 Threaded Stud
N Screw M4 Back Connect
Q Push-In Stud
Y Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND [6]

Actuator Color	ON-OFF	Dual	Legend Color
White	**B**	**1**	Black
Black	**D**	**2**	White
Red	**G**	**3**	White
Green	**J**	**4**	White
Blue	**L**	**5**	White
Yellow	**N**	**6**	Black
Gray	**Q**	**7**	Black
Orange	**S**	**8**	Black

10 MOUNTING / BARRIERS

	MOUNTING STYLE	BARRIERS
	Threaded Insert, 2 per pole	
A	6-32 x 0.195 inches *(multi-pole units only)*	yes
B	ISO M3 x 5mm	yes
	Rectangular Adapter Plate with mounting centers of 2.062 inches [52.37mm] and Threaded insert, 2 per pole [7]	
C	6-32 X 0.225 inches *(multi-pole units only)*	yes
D	ISO M3 x 6.5mm	yes
	Front panel Snap-In, 0.75" [19.05mm] wide bezel	
6	without Handleguard (multipole only)	yes
	Front panel Snap-In, 0.96" wide bezel	
8	without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides	yes

11 MAXIMUM APPLICATION RATING
C [8] 120/240VAC
K 120VAC

12 AGENCY APPROVAL
G UL489 Listed
3 UL489 Listed, TUV Certified

Notes:
1 Actuator Code:
A: Handle tie pin spacer(s) and retainers provided un-assembled with multi-pole units.
B: Handle location as viewed from front of breaker:
2 pole - left pole 3 pole - center pole
S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, F, G, H and K.
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
2 All poles must be same polarity.
3 3 pole units available only when 1 of 3 poles is neutral.
4 Auxiliary/Alarm Switch circuit must be same polarity as the main circuit. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
5 Screw Terminals are recommended on ratings greater than 20 amps.
6 Standard actuator colors are black and white.
7 Adapter plate with mounting centers of 2.082 inches. Available with Actuator Codes A, S and T.
8 Voltage Rating available with 2 and 3-pole breakers only.
9 Barriers supplied on multi-pole units only.

Circuit & Terminal Diagrams: in. [mm]

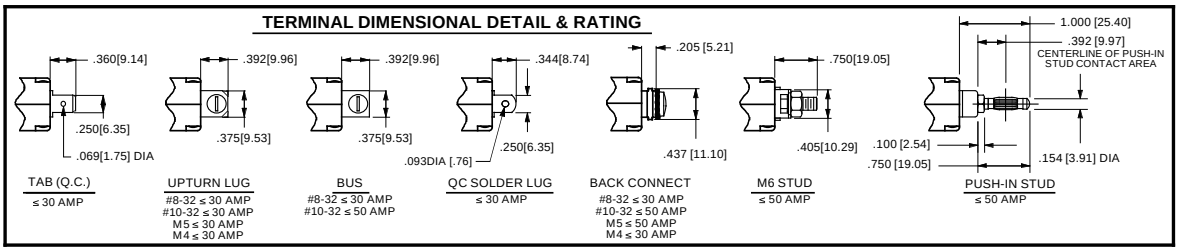
	CIRCUIT SCHEMATIC ANSI	CIRCUIT SCHEMATIC IEC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC ANSI	CIRCUIT SCHEMATIC IEC	CIRCUIT CODE	AUX SWITCH CODE
SERIES TRIP (2 TERM'S.) MAIN TERM'S. (SEE TABLE A) 1.730 [43.94]	SWITCH ONLY (NO COIL)				SERIES TRIP			
	LINE / LOAD	LINE (NETZ) / LOAD (LAST)	A	O	LINE / LOAD	LINE (3) (NETZ) / I > / LOAD (LAST)	B C	O
SERIES TRIP W AUX SWITCH (5 TERM'S.) .520 [13.21] C NO NC AUX. SWITCH TERM'S.	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH				SERIES TRIP WITH AUXILIARY / ALARM SWITCH			
	LINE / C / NO / NC / LOAD	LINE (NETZ) / C / NO / NC / LOAD (LAST)	A	2 3 4	LINE / STD. AUX. SWITCH / C / NO / NC / ALARM SWITCH / LOAD	LINE (NETZ) (3) / STD. AUX. SWITCH / C / NO / NC / I > / ALARM SWITCH / LOAD (LAST)	B C	2 3 4
SHUNT TRIP (3 TERM'S.) .390 [9.91]	SHUNT TRIP				DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL			
	LINE / SHUNT / LOAD	LINE (NETZ) (3) / SHUNT (NEBENSCHLUSS) / I > / LOAD (LAST)	D E	0	LINE / VOLTAGE COIL / LOAD	LINE (NETZ) / I > / U > / LOAD (LAST) / VOLTAGE COIL	H	0
RELAY TRIP (4 TERM'S.) .780 [19.81] .390 [9.91]	RELAY TRIP				DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL			
	LINE ① / ② LOAD / RELAY ③ ④ RELAY	RELAY (RELAIS) ③ ④ RELAY (RELAIS) / LINE (NETZ) (3) ① ② LOAD (LAST)	F G	0	LINE ① ② ③ ④ / VOLTAGE COIL / LOAD	LINE (NETZ) ① ④ LOAD (LAST) / VOLTAGE COIL ② ③ VOLTAGE COIL	K	0

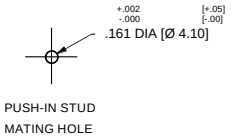
HANDLE POSITION VS. AUX/ALARM SWITCH MODE

	STANDARD C/B		MID TRIP C/B		MID TRIP C/B	
CIRCUIT BREAKER MODE	HANDLE POSITION	AUX. SWITCH MODE	HANDLE POSITION	ALARM SWITCH MODE	HANDLE POSITION	AUX. SWITCH MODE (w/o ALARM SWITCH)
OFF	30° OFF O	NC NO C	30° OFF O	NC NO C	30° OFF O	NC NO C
ON	ON I 30°	NC NO C	ON I 30°	NC NO C	ON I 30°	NC NO C
ELECTRICAL TRIP	30° OFF O	NC NO C	90° MID. TRIP	NC NO C	90° MID. TRIP	NC NO C

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Alarm Switch available with .110 x .020 Q.C. & Solder Lug Terminals Only.

Circuit & Terminal Diagrams: in. [mm]





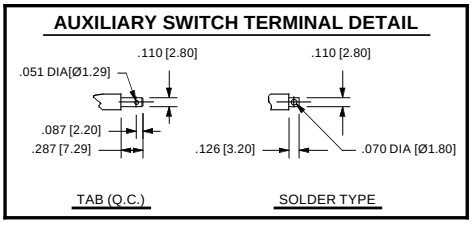


TABLE A
TIGHTENING TORQUE SPECIFICATIONS

THREAD SIZE	TORQUE
#6-32 & M3 MOUNTING HARDWARE	7-9 IN-LBS [0.8-1.0 NM]
#8-32 & M4 THREAD TERMINAL SCREW	12-15 IN-LBS [1.4-1.7 NM]
#10-32 & M5 THREAD TERMINAL SCREW	15-20 IN-LBS [1.7-2.3 NM]

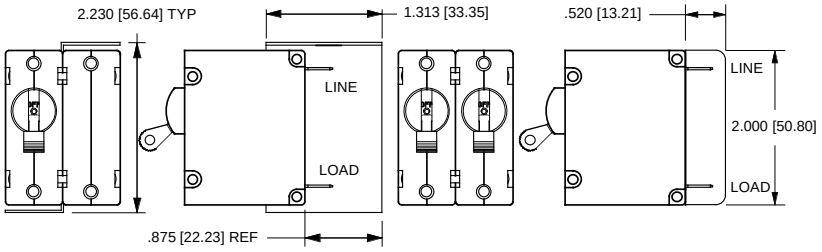
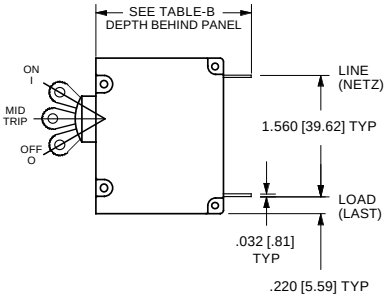
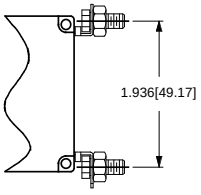


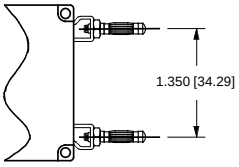
TABLE B

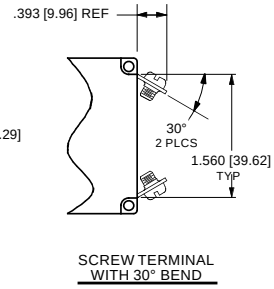
TERMINAL DESCRIPTION		DEPTH BEHIND PANEL
MAIN	TAB (Q.C.)	2.090 [53.09]
	SCREW TYPE	2.122 [53.90]
SHUNT, RELAY & DUAL COIL	TAB (Q.C.)	2.612 [66.35]
	SCREW #8-32 W/UPTURNED LUGS	2.644 [67.16]
AUX. SWITCH*	TAB (Q.C.) .110 x .020	2.537 [64.44]
	SOLDER TYPE	2.348 [59.64]

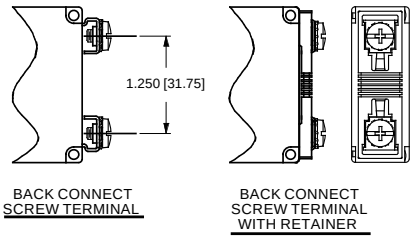
* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS SHOWN IN MULTI-POLE IDENTIFICATION SCHEME.





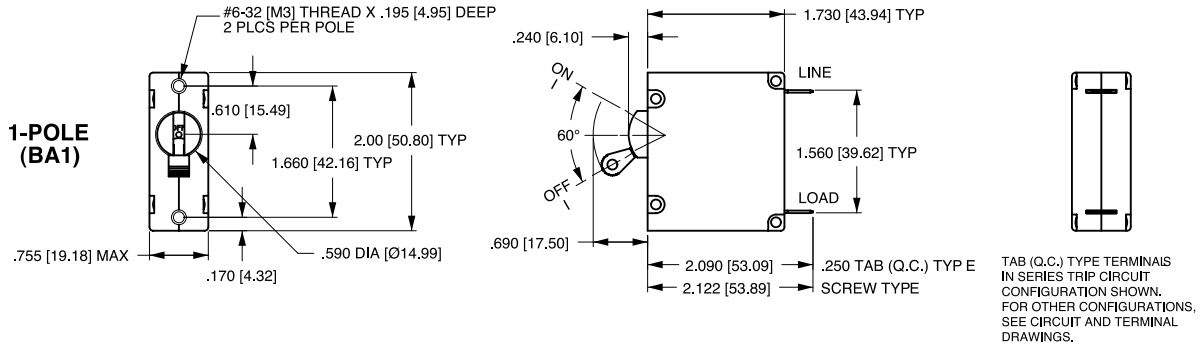


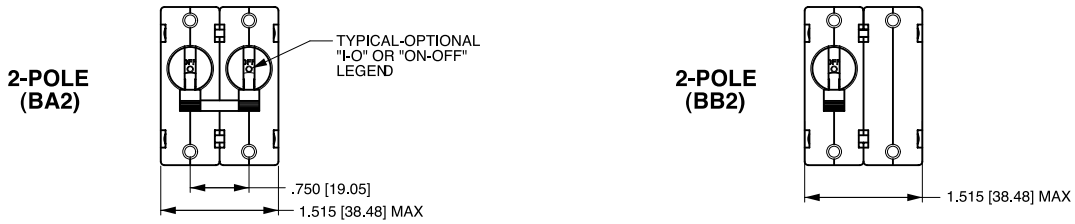


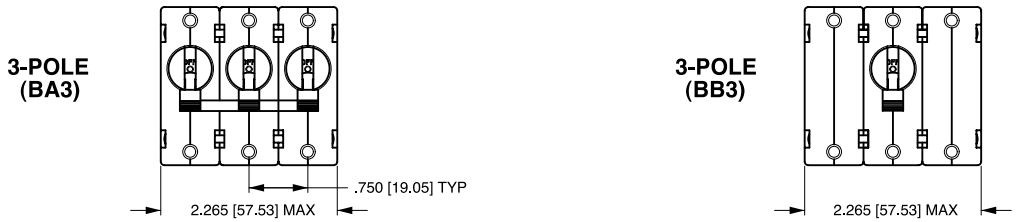


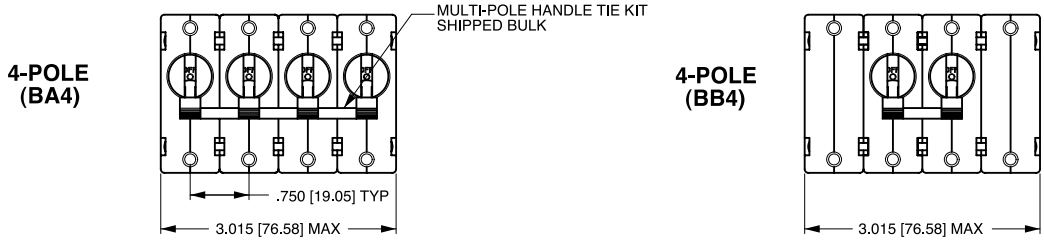
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

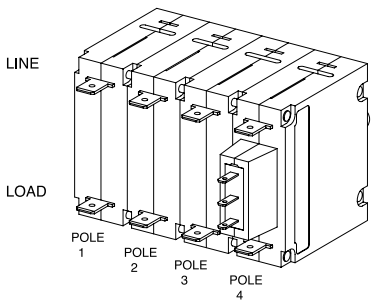
Dimensional Specifications: in. [mm]



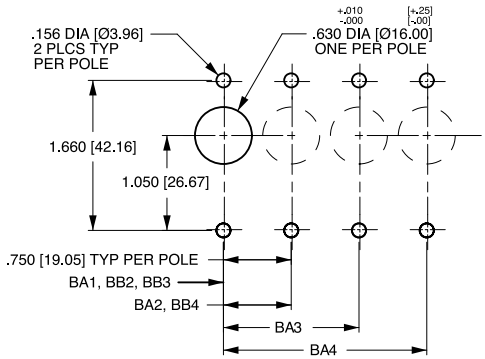








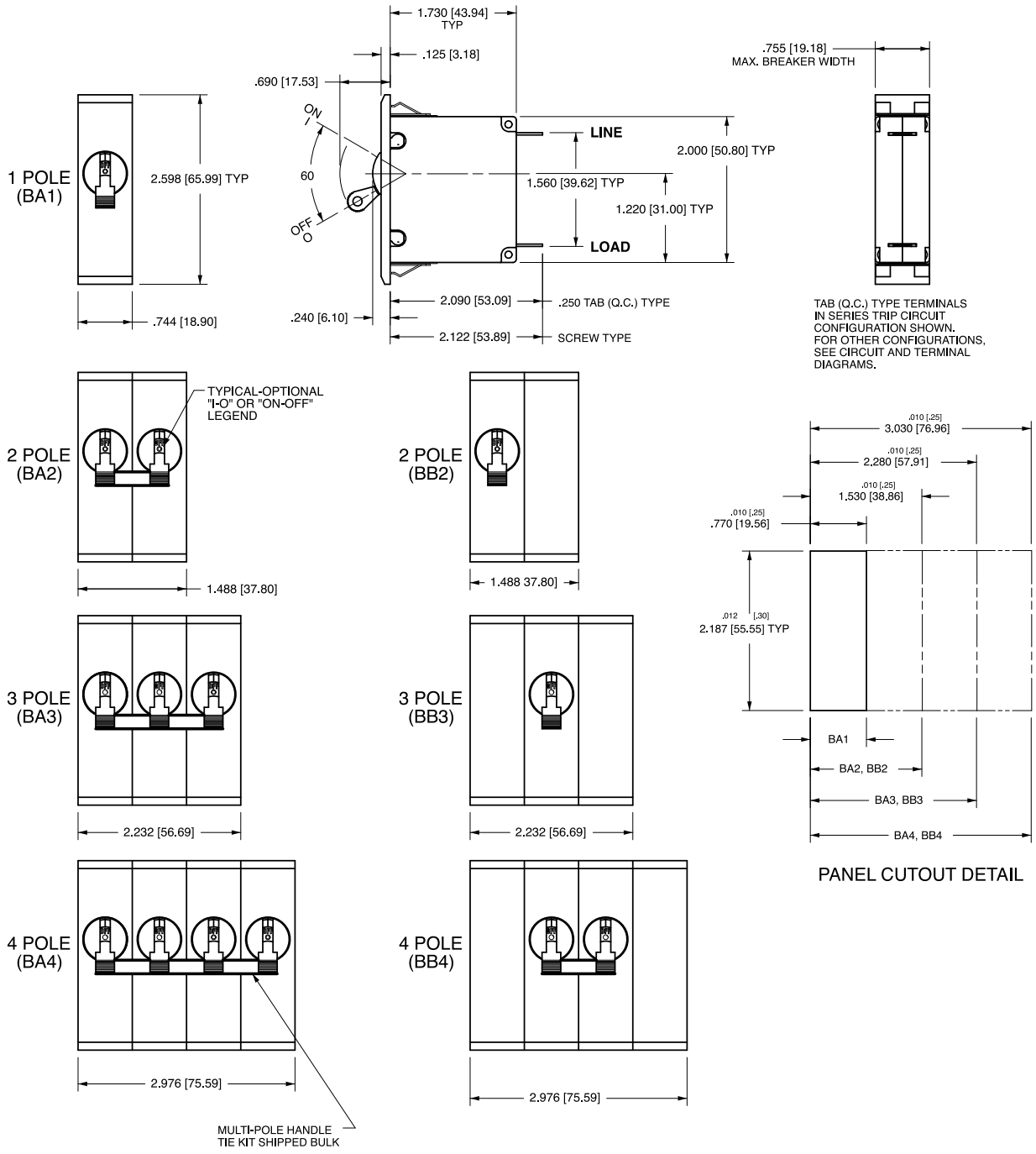
MULTI-POLE IDENTIFICATION SCHEME
AS VIEWED FROM TERMINAL END OF BREAKER.



PANEL CUTOUT DETAIL
TOLERANCES ±.005 [±.12]

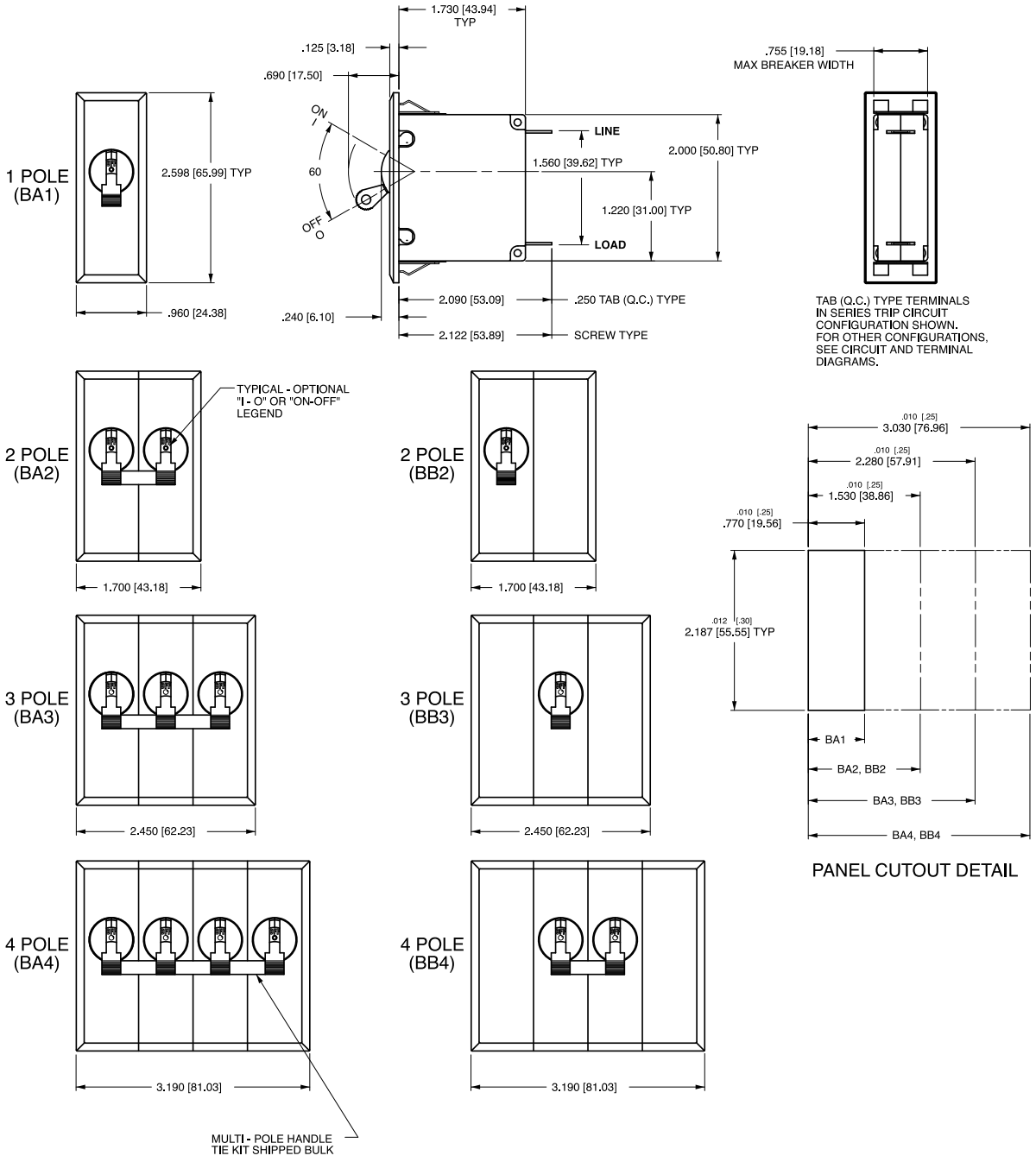
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ± 0.20 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



Notes:
1 All dimensions are in inches [millimeters].
2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
3 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



Notes:
1 All dimensions are in inches [millimeters].
2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
3 Tolerance ±.020 [.51] unless otherwise specified.

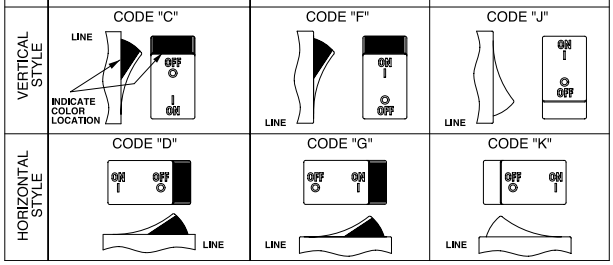
B	F	1	–	B	0	–	24	–	630	–	2	3	A	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
B

2 ACTUATOR
Two Color Visi-Rocker
- **C** Indicate ON, vertical legend
- **D** Indicate ON, horizontal legend
- **F** Indicate OFF, vertical legend
- **G** Indicate OFF, horizontal legend

Single color
- **J** Vertical legend
- **K** Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [1,2]
- **1** One
- **2** Two
- **3** [3] Three

4 CIRCUIT
- **B** Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [4]
- **0** without Aux Switch
- **1** S.P.D.T., 0.093 Q.C. Term.
- **2** S.P.D.T., 0.110 Q.C. Term.
- **3** S.P.D.T., 0.110 Solder Lug
- **7** S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
- **8** S.P.S.T., 0.187 Q.C. Term.
- **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
- **21** AC Ultra Short
- **22** AC Short
- **24** AC Medium
- **26** AC Long
- **42** AC, Short,Hi-Inrush
- **44** AC, Medium, Hi-Inrush
- **46** AC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**220**	0.200	**415**	1.500	**495**	9.500
025	0.025	**225**	0.250	**517**	1.750	**610**	10.000
030	0.030	**230**	0.300	**420**	2.000	**710**	10.500
035	0.035	**235**	0.350	**522**	2.250	**611**	11.000
040	0.040	**240**	0.400	**527**	2.750	**711**	11.500
045	0.045	**245**	0.450	**430**	3.000	**612**	12.000
050	0.050	**250**	0.500	**435**	3.500	**712**	12.500
055	0.055	**255**	0.550	**440**	4.000	**613**	13.000
060	0.060	**260**	0.600	**445**	4.500	**614**	14.000
065	0.065	**265**	0.650	**450**	5.000	**615**	15.000
070	0.070	**270**	0.700	**455**	5.500	**616**	16.000
075	0.075	**275**	0.750	**460**	6.000	**617**	17.000
080	0.080	**280**	0.800	**465**	6.500	**618**	18.000
085	0.085	**285**	0.850	**470**	7.000	**620**	20.000
090	0.090	**290**	0.900	**475**	7.500	**622**	22.000
095	0.095	**295**	0.950	**480**	8.000	**624**	24.000
210	0.100	**410**	1.000	**485**	8.500	**625**	25.000
215	0.150	**512**	1.250	**490**	9.000	**630**	30.000

8 TERMINAL [5]
- **1** [6] Push-On 0.250 Tab (Q.C.)
- **2** Screw 8-32 with upturned lugs
- **3** Screw 8-32 (Bus Type)
- **4** Screw 10-32 with upturned lugs
- **5** Screw 10-32 (Bus Type)
- **6** Screw 8-32 with upturned lugs & 30° bend
- **7** Screw 8-32 (Bus Type) & 30° bend
- **8** Screw 10-32 with upturned lugs & 30° bend
- **9** Screw 10-32 (Bus Type) & 30° bend
- **B** Screw M5 with upturned lugs
- **C** Screw M4 with upturned lugs
- **F** Screw M5 with upturned lugs & 30° bend
- **G** Screw M5 (Bus Type) & 30° bend
- **H** Screw M5 (Bus Type)
- **J** Screw M5 Back Connect
- **K** Screw 10-32 Back Connect
- **N** Screw M4 Back Connect
- **Y** Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [7]	Marking: ON-OFF	Marking: Dual [7]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS

	MOUNTING STYLE	BARRIERS [9]
	Threaded Insert, 2 per pole	
A	6-32 x 0.195 inches *(multi-pole units only)*	yes
B	ISO M3 x 5mm	yes
	ROCKERGUARD BEZEL	
	Threaded Insert, 2 per pole	
C	6-32 X 0.225 inches *(multi-pole units only)*	yes
D	ISO M3 x 6.5mm	yes

11 MAXIMUM APPLICATION RATING
- C [8] 120/240 VAC
- K 120 VAC

12 AGENCY APPROVAL
- **G** UL489 Listed
- **3** UL489 Listed, TUV Certified

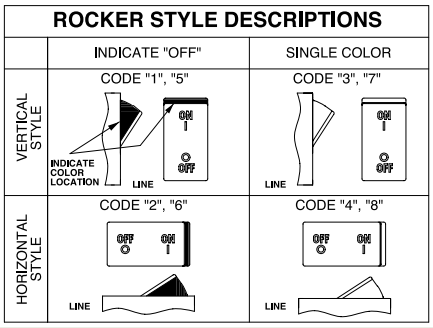
Notes:
1. Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
2. All poles must be same polarity.
3. 3 pole units available only when 1 of 3 poles is neutral.
4. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
5. Screw Terminals are recommended on ratings greater than 20 amps.
6. Terminal Code 1 (Push-On) available up to 30 amps, but are not recommended over 20 amps.
7. Dual legend = ON-OFF/I-O
8. Voltage Rating available with 2 and 3-pole breakers only.
9. Barriers supplied on multi-pole units only.

B	1	1	–	B	0	–	24	–	630	–	2	3	A	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. Appl. Rating	12 Agency Approval

1 SERIES
B

2 ACTUATOR [1]
Two Color Visi-Rocker
1 Indicate OFF, vertical legend
2 Indicate OFF, horizontal legend
Single color
3 Vertical legend
4 Horizontal legend
Push-To-Reset, Visi-Rocker
5 Indicate OFF, vertical legend
6 Indicate OFF, horizontal legend
Push-To-Reset , Single color
7 Vertical legend
8 Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2,3]
1 One **2** Two **3** [4] Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [4]
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.110 Solder Lug
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
21 AC Ultra Short
22 AC Short
24 AC Medium
26 AC Long
42 AC, Short,Hi-Inrush
44 AC, Medium, Hi-Inrush
46 AC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**220**	0.200	**415**	1.500	**495**	9.500
025	0.025	**225**	0.250	**517**	1.750	**610**	10.000
030	0.030	**230**	0.300	**420**	2.000	**710**	10.500
035	0.035	**235**	0.350	**522**	2.250	**611**	11.000
040	0.040	**240**	0.400	**527**	2.750	**711**	11.500
045	0.045	**245**	0.450	**430**	3.000	**612**	12.000
050	0.050	**250**	0.500	**435**	3.500	**712**	12.500
055	0.055	**255**	0.550	**440**	4.000	**613**	13.000
060	0.060	**260**	0.600	**445**	4.500	**614**	14.000
065	0.065	**265**	0.650	**450**	5.000	**615**	15.000
070	0.070	**270**	0.700	**455**	5.500	**616**	16.000
075	0.075	**275**	0.750	**460**	6.000	**617**	17.000
080	0.080	**280**	0.800	**465**	6.500	**618**	18.000
085	0.085	**285**	0.850	**470**	7.000	**620**	20.000
090	0.090	**290**	0.900	**475**	7.500	**622**	22.000
095	0.095	**295**	0.950	**480**	8.000	**624**	24.000
210	0.100	**410**	1.000	**485**	8.500	**625**	25.000
215	0.150	**512**	1.250	**490**	9.000	**630**	30.000

8 TERMINAL [6]
1 [7] Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3 Screw 8-32 (Bus Type)
4 Screw 10-32 with upturned lugs
5 Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
C Screw M4 with upturned lugs
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
J Screw M5 Back Connect
K Screw 10-32 Back Connect
N Screw M4 Back Connect
Y Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND

Actuator or Visi-Color [8]	Marking: ON-OFF	Marking: Dual [8]	Marking Color: Single Color	Marking Color: Visi-Rocker
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [9]

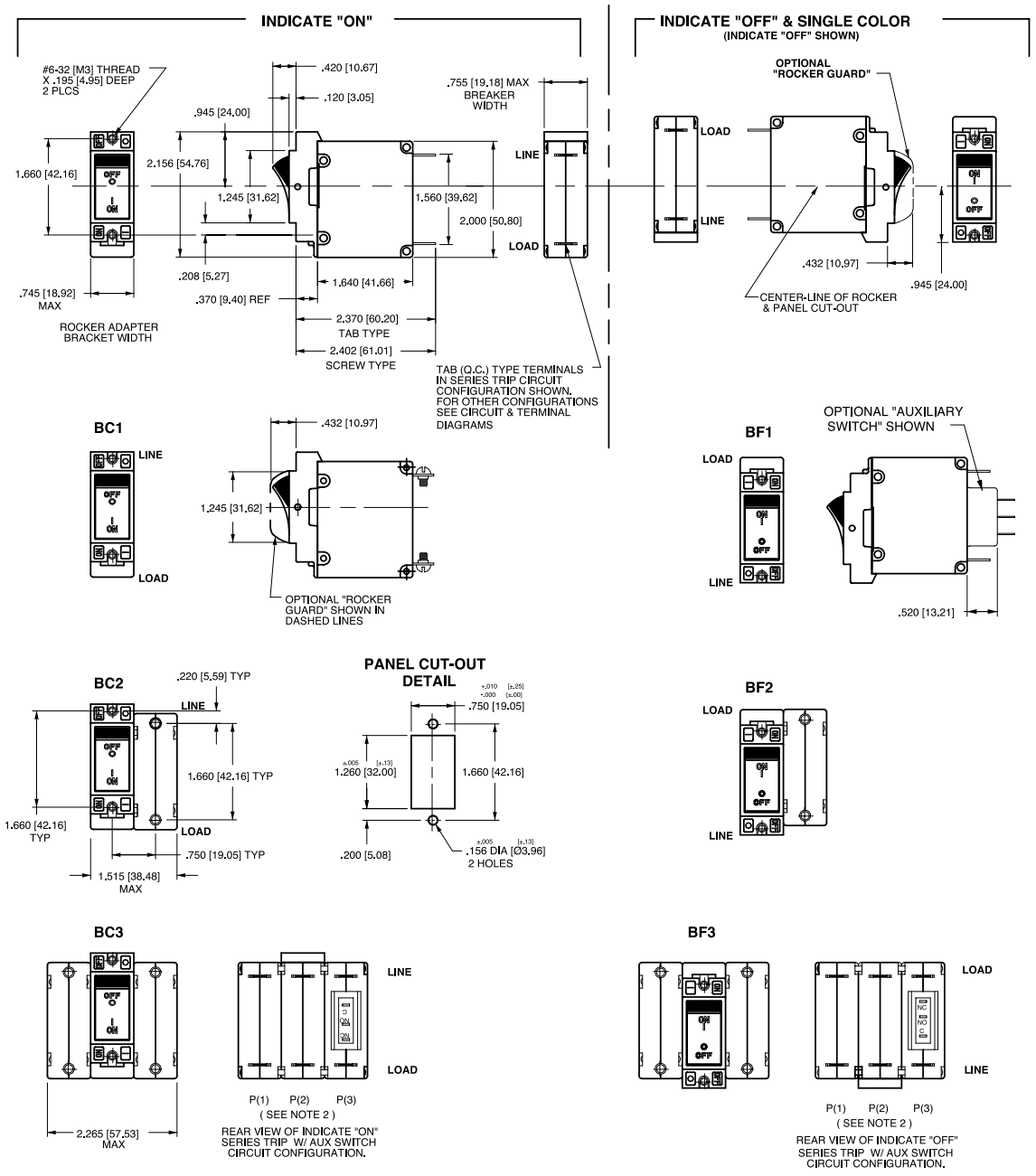
		BARRIERS [12]
	STANDARD ROCKER BEZEL Threaded Insert, 2 per pole FLAT ROCKER ACTUATOR	
A	6-32 x 0.195 inches *(multi-pole units only)*	yes
B	ISO M3 x 5mm	yes
	RECESSED OFF SIDE ROCKER ACTUATOR [10]	
E	6-32 X 0.225 inches *(multi-pole units only)*	yes
F	ISO M3 x 6.5mm	yes
	PUSH-TO-RESET BEZEL,Threaded Insert, 2 per pole	
C	6-32 x 0.195 inches	yes
D	ISO M3 x 5mm	yes

11 MAXIMUM APPLICATION RATING
C [11] 120/240 VAC
K 120 VAC

12 AGENCY APPROVAL
G UL489 Listed
3 UL489 Listed, TUV Certified

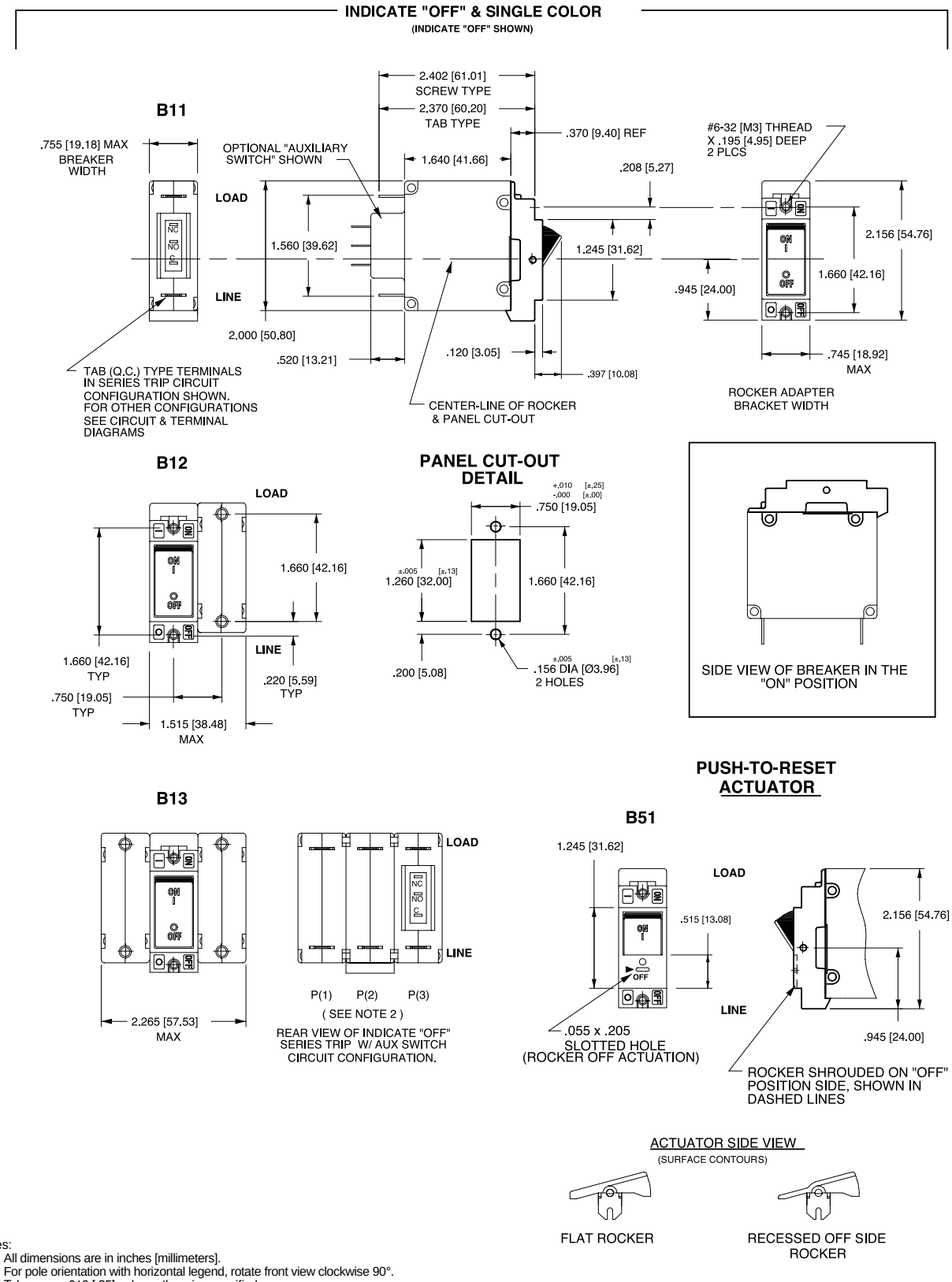
Notes:
1 Push-To-Reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3 All poles must be same polarity.
4 3 pole units available only when1 of 3 poles is neutral.
5 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6 Screw Terminals are recommended on ratings greater than 20 amps.
7 Terminal Code 1 (Push-On) available up to 30 amps, but are not recommended over 20 amps.
8 Color shown is visi and legend with remainder of rocker black, Dual = ON-OFF/I-O legend.
9 Legend on Push-to-reset bezel/shroud is white with single color actuator codes 7 & 8. Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes 5 & 6.
10 Recessed “off-side” available with actuator codes 1, 2, 3 & 4. Legends on rocker are available in ink stamping only.
11 Voltage rating available with 2 & 3-pole breakers only.
12 Barriers supplied on multi-pole units only.

Dimensional Specifications: in. [mm]



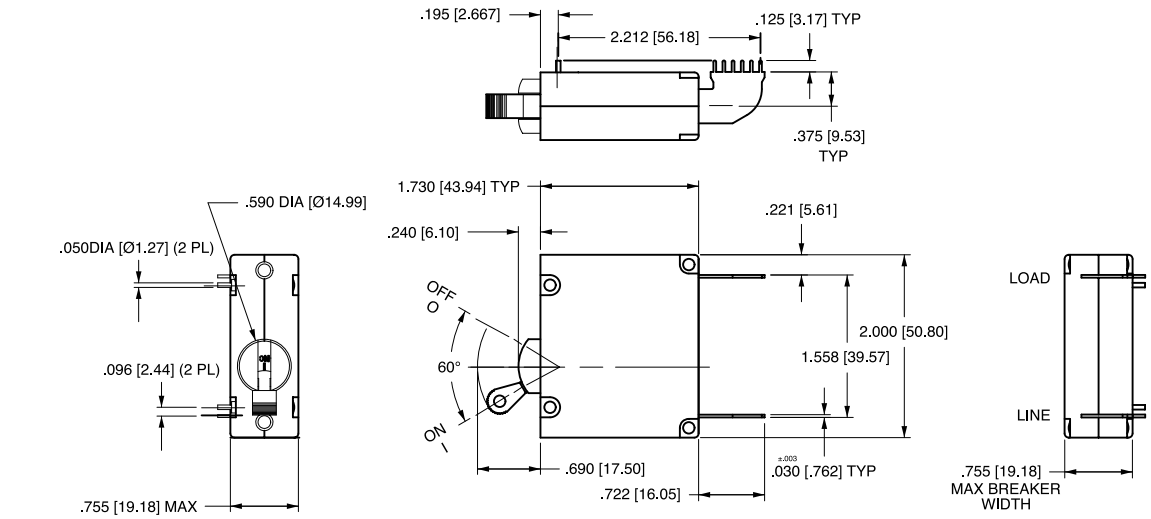
Notes:
1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal orientation on indicate “OFF” is opposite of indicate “ON”.
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 All dimensions are in inches [millimeters].
4 Tolerance ±.020 [.51] unless otherwise specified.

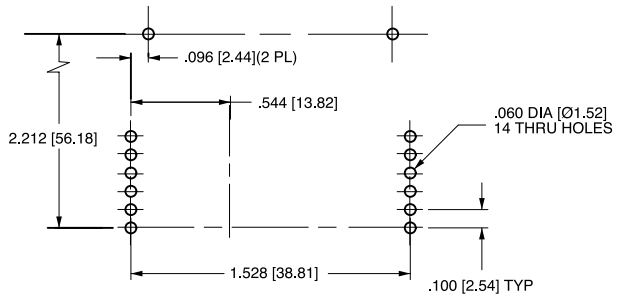
Dimensional Specifications: in. [mm]



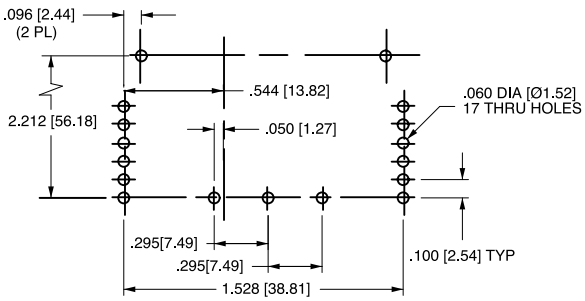
Notes:
1 All dimensions are in inches [millimeters].
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 Tolerance ±.010 [.25] unless otherwise specified.

PC Terminal Diagrams: in. [mm]





P.C. FOOT PRINT



P.C. FOOT PRINT WITH AUX. SWITCH

Notes:
1 All dimensions are in inches [millimeters].
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 Tolerance ±.010 [.25] unless otherwise specified.

C-Series
CIRCUIT BREAKER

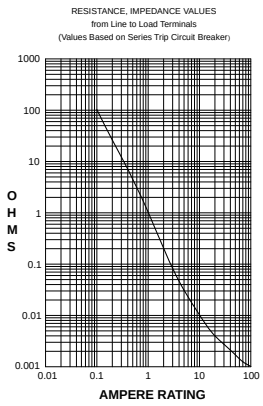
The C-Series hydraulic-magnetic circuit breakers are ideal for applications that require higher amperage and voltage handling capability in a smaller package. They are available in 1-6 poles, 0.02-100amps, UL Recognized up to 480VAC or 150VDC, UL489 Listed up to 240VAC or 125VDC, with choice of time delays, terminal options, actuator styles and colors. The C-Series employs a unique arc chute design which allows for higher interrupting capacities of up to 10,000 amps. Thermoset glass filled polyester half shell construction provides for increased mechanical and electrical strength. The wiping contacts mechanical linkage, with two step actuation, cleans contacts providing high, positive contact pressure and longer contact life. Available with American Standard or Metric Threaded Stud terminals, or Saddle Clamp screw terminals. The optional mid-trip handle style actuator allows a visual indication of electrical overload with or without alarm feature.

Product Highlights:

- Extensive list of Agency Approvals
- Available with Standard or Metric Stud terminals, or Saddle Clamp screw terminals
- Optional mid-trip handle style actuator
- Unique arc chute design which allows for higher interrupting capacities of up to 10,000 amps
- Exclusive Rockerguard and Push-To-Reset bezel
- Available with new solid color and two-color Visi-rocker® actuators
- New thermoset glass filled polyester half shell construction

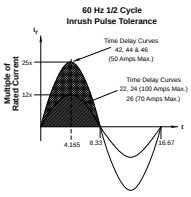
Electrical

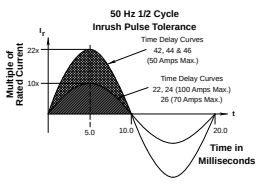
Maximum Voltage	AC, 480 WYE/277 VAC, 50/60 Hz (see Table A.) UL489: AC,240 VAC. (See Table D), 50/60 Hz, 125 VDC
Current Rating	Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 25.0, 30.0, 35.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0 and 100 amps. Other ratings available, see Ordering Scheme.
Standard Voltage Coils	DC - 6V, 12V; AC - 120V; other ratings available, see Ordering Scheme.
Auxiliary Switch Rating	SPDT; 10.1 amps-250VAC, DC Aux. Switch 1.0A, 65 VDC. 0.5A, 80VDC,1/4 HP, 125VAC,VDE & TUV 1.0 125 VAC.
Insulation Resistance	Minimum of 100 Megohms at 500 VDC.
Dielectric Strength	UL, CSA: 1960 V 50/60 Hz for one minute between all electrically isolated terminals. C-Series Circuit Breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker.



CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	15
5.1 - 20.0	25
20.1 - 50.0	35

Pulse Tolerance Curves





Mechanical

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated current & voltage.
Trip Free	All C-Series circuit breakers will trip on overload, even when actuator is forcibly held in the ON position.
Trip Indication	The operating actuator moves positively to the OFF position when an overload causes the breaker to trip. With mid-trip, handle moves to the mid position on electrical trip of the circuit breaker. With mid trip handle with alarm switch, handle moves to the mid position and the alarm switch actuates when the circuit breaker is electrically tripped.

Physical

Number of Poles	1-6 poles ≤ 50A; 1-4 poles @ 51-70A; 1-2 poles 71-100A. UL489 Handle: 1 pole ≤ 100A, 2 pole ≤ 50A; Rocker: 1 pole ≤ 100A.
Internal Circuit Config.	Series (with or without auxiliary switch, mid trip & mid trip with alarm switch) Shunt & Relay with current or voltage trip coils, Dual Coil, Switch Only (with or without aux. switch). UL489: Series (with or without auxiliary switch, mid-trip & midtrip with alarm switch).
Weight	Approx.112 grams/pole (3.95 oz).
Standard Colors	Housing: Black

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

Shock	Withstands 100 Gs, 6ms sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultrashort curves tested @ 90% of rated current.
Vibration	Withstands 0.060" excursion from 10-55 Hz & 10 Gs 55-500 Hz, @ rated current per Method 204C, Test Cond. A. Instantaneous & ultrashort curves tested @ 90% of rated current.
Moisture Resistance	Method 106D, i.e., ten 24-hour cycles @ +25°C to +65°C, 80-98% RH.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Thermal Shock	Method 107D, Condition A (five cycles @ -55°C to +25°C to +85°C to +25°C).
Operating Temperature	-40°C to +85°C

*Manufacturer reserves the right to change product specification without prior notice.

Electrical Tables

Table A: Lists UL Recognized & CSA Accepted configurations and performance capabilities as a component supplementary protector

C-SERIES TABLE A: Component Supplementary Protectors

Circuit Configuration	Voltage			Current Rating		Short Circuit Capacity (Amps) UL / CSA		Application Codes		Construction Notes
	Max. Rating	Frequency	Phase	Full Load Amps	General Purpose Amps	With Backup Fuse	Without Backup Fuse	UL	CSA	
Series	32	DC	---	0.02 - 100	---	---	5,000	TC1, OL1, U2	TC1, OL1, U2	---
	48	DC	---	110 - 150	---	---	5,000			---
	65	DC	---	0.02 - 70	---	---	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
				-	71 - 100			TC1, 2, OL0, U1	TC1, 2, OL0, U1	---
	80	DC	---	0.02 - 70	---	---	7,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
				---	71 - 100			TC1, 2, OL0, U1	TC1, 2, OL0, U1	---
				0.02 - 70	---		10,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L"
				---	71 - 100			TC1, 2, OL0, U1	TC1, 2, OL0, U1	
	125	DC	---	0.02 - 50	---	---	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L"
	125/250	DC	---	0.02 - 50	---	---	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L"
	250	DC	---	0.02 - 50	---	---	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L". 250 volts requires 2 pole
	125	50 / 60	1	0.02 - 100	---	---	3,000	TC1, OL1, U2	TC1, OL1, U2	Per pole rating
					---		5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L"
	150	DC	---	---	80 - 100	---	5,000	TC1, 2, OL0, U3	---	Must have Agency "L"
					101 - 175					Must have Agency "L" parallel pole
	125/250	50 / 60	1	0.02 - 100	---	---	3,500	TC1, OL1, U2	TC1, OL1, U2	---
				0.02 - 50			3,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	2 or 3 poles breaking single phase
				51 - 100			1,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	2 or 3 poles breaking single phase
				0.02 - 100			5,000	TC1, 2, OL1, U2	TC1, 2, OL1, U2	2 or 3 poles breaking single phase. Agency "L"
	250	50 / 60	1	0.02 - 50	---	---	3,500	TC1, 2, OL1, U2	TC1, 2, OL1, U2	Per pole rating
				0.02 - 100			5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	Must have Agency "L"
				51 - 70		5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	---
			3	---	0.02 - 100	---	3,000	TC1, 2, OL0, U2	TC1, 2, OL0, U2	---
				0.02 - 70	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
				---	0.02 - 90	---	5,000	TC1, 2, OL0, U1	TC1, 2, OL0, U1	Must have Agency "L"
	277	50 / 60	1	0.02 - 50	---	5,000	--	TC1, 2, OL1, C1	TC1, 2, OL1, C1	---
	480/277	50 / 60	3	0.02 - 30	---	5,000	--	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
				---				TC1, 2, OL0, C1	TC1, 2, OL0, C1	---
	480	50 / 60	1	0.02 - 30	---	5,000	--	TC1, 2, OL1, C1	TC1, 2, OL1, C1	2 poles breaking 1 phase
				---				TC1, 2, OL0, C1	TC1, 2, OL0, C1	---
Dual Coil	80	DC	---	0.02 - 50	---	---	7,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
	125	50 / 60	1	0.02 - 50	---	---	3,000	TC1, OL1, U2	TC1, OL1, U2	Per pole rating
	125/250	50 / 60	1	0.02 - 50	---	---	3,500	TC1, OL1, U2	TC1, OL1, U2	2 or 3 poles breaking single phase
							3,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	2 or 3 poles breaking single phase
	250	50 / 60	1	0.02 - 50	---	---	3,500	TC1, OL1, U2	TC1, OL1, U2	---
			3			---	3,000	TC1, OL0, U2	TC1, OL0, U2	Per pole rating
						5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	---
	277	50 / 60	1	0.02 - 50	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
Shunt	80	DC	---	0.02 - 50	---	---	7,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
	277	50 / 60	1	0.02 - 50	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	---
	250	50 / 60	3	0.02 - 50	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
	480/277	50 / 60	3	0.02 - 30	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
				---	31 - 50			TC1, 2, OL0, C1	TC1, 2, OL0, C1	---
	480	50 / 60	1	0.02 - 30	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	2 poles breaking 1 phase
				---	31 - 50			TC1, 2, OL0, C1	TC1, 2, OL0, C1	---
Relay	80	DC	---	0.02 - 50	---	---	7,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
	277	50 / 60	1	0.02 - 50	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	---
	250	50 / 60	3	0.02 - 50	---	5,000	---	TC1, 2, OL1, C1	TC1, 2, OL1, C1	3 poles breaking 3 phase
Switch Only	65	DC	---	71 - 100	---	---	---	---	---	---

	80	DC	---	71 - 100	---	---	---	---	---	---

	125	50 / 60	1	0.02 - 100	---	---	---	---	---	---
	125/250	50 / 60	1	0.02 - 100	---	---	---	---	---	2 or 3 poles breaking single phase
	250	50 / 60	1	0.02 - 100	---	---	---	---	---	---
			3	0.02 - 70						---
	277	50 / 60	1	0.02 - 50	---	---	---	---	---	---
	480/277	50 / 60	3	0.02 - 30	---	---	---	---	---	3 poles breaking 3 phase
				---	31 - 50					---

Notes:

1. Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amps not to exceed 125A for 50 Amp or less rating and not to exceed 175 for 51 through 100 Amp rating

Electrical Tables

Table B: Lists UL Recognized and CSA Accepted configurations and performance capabilities as a Manual Motor Controller.

C-SERIES TABLE B: Manual Motor Controllers

Circuit Configuration	Voltage			Current Rating	Horsepower Ratings
	Max. Rating	Frequency	Phase	Full Load Amps	Max. HP
Series, Shunt & Relay Switch Only	120 [1]	50 / 60	1	0.02 - 50	7 ½
	250 [1]	50 / 60	1	0.02 - 20	3
			3	0.02 - 20	5
	277 [1]	50 / 60	1	0.02 - 20	3
	480 [2]	50 / 60	3	0.02 - 20	5

Notes:
1. Requires branch circuit backup with a UL Listed Type K5 or RK5 fuse rated 15A Minimum and no more than 4 times full load amps not to exceed 125A for 50 Amp or less rating and not to exceed 175A for 51 through 100A rating.
2. UL Recognized and CSA Certified at 480V refers to 3 and 4 pole versions used in a 3Ø, WYE connected circuit or a 2 pole version with 2 poles breaking 1Ø and backed up with a series fusing as stated in note 1.

* Shunt and Relay Trip - Voltage Coil Construction not current coils

Table C: Lists UL Recognized, CSA Accepted, VDE and TUV Certified configurations and performance capabilities as a Component Supplementary Protector.

C-SERIES TABLE C: Component Supplementary Protectors

Circuit Configuration	Voltage			Current Rating		Short Circuit Capacity (Amps)						Application Codes	Construction Notes
						UL / CSA		VDE		TUV			
	Max. Rating	Frequency	Phase	Full Load Amps	General Purpose Amps [1]	With Backup Fuse	Without Backup Fuse	(Inc) With Backup Fuse	(Icn) Without Backup Fuse	(Inc) With Backup Fuse	(Icn) Without Backup Fuse	UL / CSA	
Series	80	DC	---	0.10 - 70	---	---	7,500	---	5,000	5,000	1,500	TC1,2,OL1,U1	---
			---	71 - 100	71 - 100	---	10,000	---	5,000	---	5,000	TC1,2,OL0,U1	Agency F, H, J or R
	125	DC	---	1 - 50	---	---	5,000	---	---	---	5,000	TC1,2,OL1,U1	Agency J or R
	250	DC	---	0.10 - 50	---	---	5,000	---	---	---	5,000	TC1,2,OL1,U1	2P, Agency J or R
		50 / 60	1	0.10 - 70				3,000	1,500	3,000	1,500		---
				0.10 - 100				---	---	5,000	5,000		Agency J or R
			3	0.10 - 90				---	---				
	415	50 / 60	3	0.10 - 30	---	5,000 [2]	---	3,000	1,500	3,000	1,500	TC1,2,OL1,C1	Rocker
								5,000	2,500				Handle, Agency F, H, J or R
Dual Coil	80	DC	---	0.10 - 30	---	---	7,500	---	1,500	5,000	1,500	TC1,2,OL1,U1	---
	250	50 / 60	1 & 3				5,000	3,000		3,000			
Shunt	80	DC	---	0.10 - 70	---	---	7,500	---	5,000	5,000	1,500	TC1,2,OL1,U1	---
	250	50 / 60	1 & 3	0.10 - 70	---	---	5,000	3,000	1,500	3,000	1,500	TC1,2,OL1,U1	---
	415	50 / 60	3	0.10 - 30	---	5,000 [2]	---	3,000	1,500	3,000	1,500	TC1,2,OL1,C1	Rocker
								5,000	2,500				Handle, Agency F, H, J or R

Notes:
1. General Purpose ratings for UL/CSA only.
2. Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amps not to exceed 125A for 50 Amp or less rating and not to exceed 175 for 51 through 100 Amp rating.

Table D: Lists UL Listed (489), CSA Certified (C22.2 No. 5.1-M) configuration and performance capabilities as a Molded Case Circuit Breaker.

C-SERIES TABLE D: UL489 Listed Branch Circuit Breakers

Circuit Configuration	Voltage			Current Rating	Interrupting Capacity (Amps)	Construction Notes
	Max. Rating	Frequency	Phase	Full Load Amps	Without Backup Fuse	
Series	80	DC	---	0.10 - 100	50,000 [1]	Limited to 2 Poles Max from 71 - 100 Amps
					10,000	
				101 - 150	10,000	2 Poles - Parallel Poles
				151 - 250	10,000	3 Poles - Parallel Poles
	125	DC	---	0.10 - 100	5,000	1 - 3 Poles
	125 / 250	DC	---	0.10 - 50	5,000	1 or 2 Poles (2 poles required for 250 Volts)
	120	50 / 60	1	0.10 - 50	10,000	1 - 3 Poles
				51 - 70	5,000	
	120 / 240	50 / 60	1	0.10 - 50	5,000	2 or 3 Poles (1 pole of a 3 pole unit is neutral)
					10,000 [1]	
	240	50 / 60	1	0.10 - 30	5,000	1 Pole
				0.10 - 20	10,000	2 Poles
	277	50 / 60	1	0.10 - 20	10,000	1 Pole
Dual Coil	120	50 / 60	1	0.10 - 30	10,000	---

Notes:
1 Special catalog number required. Consult factory.

Electrical Tables

Table E: Lists UL Recognized, CSA Accepted configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

C-SERIES TABLE E: UL1500 *(Marine Ignition Protection)*

Circuit Configuration	Voltage			Current Rating	Interrupting Capacity (Amps)	Application Codes		Construction Notes
	Max. Rating	Frequency	Phase	Full Load Amps	Without Backup Fuse	UL	CSA	
Series	48	DC	---	0.02 - 100	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
				101 - 150				
	65	DC	---	0.02 - 100	1,500	TC1, 2, OL0, U1	TC1, 2, OL0, U1	---
	80	DC	---	0.02 - 70	1,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
	125	50 / 60	1	0.02 - 70	5,000	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
				71 - 100	1,500			
	250	50 / 60	1	0.02 - 70	1,500	TC1, 2, OL1, U1	TC1, 2, OL1, U1	---
				71 - 100				2 Poles Breaking Single Phase

Table F: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A.

C-SERIES TABLE F: PARALLEL POLE CONSTRUCTION
UL489A Listed for Communications Equipment

Circuit Configuration	Voltage		Current Rating	Interrupting Capacity (Amps)
	Max. Rating	Frequency	General Purpose Amps	Without Backup Fuse
Series	80	DC	100 - 250	10,000

Agency Certifications

UL Recognized

UL Standard 1077 — Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

UL Standard 508 — Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

UL Standard 1500 — Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

UL Listed

UL Standard 489 — Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)

UL Standard 489A — Communications Equipment (Guide CCN/DITT, File E189195)

CSA Accepted

Component Supplementary Protector under Class 3215 30, FIle 047848 0 000 CSA Standard C22.2 No. 235

CSA Certified

Circuit Breaker Model Case (Class 1432 01, File 093910), CSA Standard C22.2 No. 5.1 - M

TUV Certified

EN60934, under License No. R72040875

VDE Certified

EN60934, VDE 0642 under File No. 10537

C	A	3	–	B	0	–	10	–	450	–	1	2	1	–	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting Bezel/Barrier		11 Agency Approval

1 SERIES
C

2 ACTUATOR [1]
A	Handle, one per pole
B	Handle, one per multipole unit
S	Mid-Trip Handle, one per pole
T	Mid-Trip Handle, one per pole & Alarm Switch

3 POLES [2]
1	One	**3**	Three	**5**	Five
2	Two	**4**	Four	**6**	Six

4 CIRCUIT [3]
A [3]	Switch Only (No Coil)	**F** [4]	Relay Trip (Current)
B	Series Trip (Current)	**G** [4]	Relay Trip (Voltage)
C	Series Trip (Voltage)	**H** [4,5]	Dual Coil with Shunt Trip Voltage Coil
D [4]	Shunt Trip (Current)	**K** [4,5]	Dual Coil with Relay Trip Voltage Coil
E [4]	Shunt Trip (Voltage)		

5 AUXILIARY / ALARM SWITCH
0	without Aux Switch		
2	S.P.D.T., 0.110 Q.C. Term.	**6**	S.P.S.T., 0.139 Solder Lug
3	S.P.D.T., 0.139 Solder Lug	**8**	S.P.S.T., 0.187 Q.C. Term.
4	S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)	**9**	S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 [3]	DC 50/60Hz, Switch Only	**30**	DC 50/60Hz Instantaneous
10 [7]	DC Instantaneous	**31**	DC 50/60Hz Ultra Short
11	DC Ultra Short	**32**	DC 50/60Hz Short
12	DC Short	**34**	DC 50/60Hz Medium
14	DC Medium	**36**	DC 50/60Hz Long
16	DC Long	**42** [8]	50/60Hz Short, Hi-Inrush
20 [7]	50/60Hz Instantaneous	**44** [8]	50/60Hz Medium, Hi-Inrush
21	50/60Hz Ultra Short	**46** [8]	50/60Hz Long, Hi-Inrush
22	50/60Hz Short	**52** [8]	DC Short, Hi-Inrush
24	50/60Hz Medium	**54** [8]	DC Medium, Hi-Inrush
26	50/60Hz Long	**56**	DC Long, Hi-Inrush

Notes:
1. Actuator Code:
   A: Handle tie pin spacer(s) and retainers provided assembled with multi-pole units.
   B: Handle location as viewed from front of breaker:
   2 pole - left pole 3 pole - center pole 4 pole - two handles at center poles
   5 pole - three handles at center poles 6 pole - four handles at center poles
   S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, F, G, H and K.
   T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
2. Standard multipole units have all poles identical except when specifying auxiliary switch and/or mixed poles. 4 pole max with VDE. 5th pole available as Series Trip with Voltage Coil only.
3. Switch Only circuits, rated up to 50 amps and 6 poles, and only available with VDE Certification when tied to a protected pole (Circuit Code B, C, D or H.). For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650. For 55-70 amps, select Current Code 670. For 75-100 amps, select Current Code 810.
4. Circuit Codes D,E,F,G,H & K available with Terminal Codes 1,2,4 & 5 only. Circuit Codes D, F, H & K available up to 50 amps maximum Current Rating.
5. Consult factory for available Dual Coil options, as special catalog number is required. Dual Coil Voltage Coils with Shunt Trip Construction trip instantaneously on line voltage. Dual Coil Voltage Coils require 30VA minimum power to trip instantaneously and are rated for intermittent duty only.
6. Auxiliary Switch available with Series Trip and Switch Only circuits. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
7. Voltage coils not rated for continuous duty. Available only with delay codes 10 & 20.
8. Available with Circuit Codes B & D only, and up to 50 amps maximum.
9. Current Ratings 60 - 70 are available up to four poles maximum. Ratings 71 - 100 are available up to two poles maximum.
10. Terminal Code 1 available to 60 amps maximum.
11. Terminal Codes 2, 4, 5 and C available to 50 amps maximum.
12. Terminal Codes 3, 6 & 9 available to 100 amps maximum.
13. Terminal Code 7 available to 25 amps maximum.
14. Terminal Code A available to 100 amps maximum.
15. Terminal Codes 7, 9 & C are not VDE approved.
16. No marking available. Consult factory. VDE/TUV Approval requires dual (I-O, ON-OFF) or I-O markings on all handles.
17. Single pole only.
18. VDE/TUV: 30 amps max.; UL/CSA: 50 amps max.; Available in 2 - 4 poles only and limited to AC Delays. “General Purpose amps” not rated for “full load amps” or to be used in applications with a motor.

7 CURRENT RATING (AMPERES)
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660** [9]	60.000
090	0.090	**512**	1.250	**610**	10.000	**670** [9]	70.000
095	0.095	**415**	1.500	**710**	10.500	**680** [9]	80.000
210	0.100	**517**	1.750	**611**	11.000	**685** [9]	85.000
215	0.150	**420**	2.000	**711**	11.500	**690** [9]	90.000
220	0.200	**522**	2.250	**612**	12.000	**695** [9]	95.000
225	0.250	**425**	2.500	**712**	12.500	**810** [9]	100.00
230	0.300	**527**	2.750	**613**	13.000		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [7]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL [15]
1 [10]	Stud 10-32	**6** [12]	Stud M6
2 [11]	Screw 10-32	**7** [13,15]	0.250 Double Click Connect
3 [12]	Stud 1/4-20	**9** [15]	7/16” Clip Terminal
4 [11]	Stud M5 x 0.8	**A** [14]	Plug-In Stud
5 [11]	Screw M5 x 0.8	**C** [11,15]	5/16” Clip Terminal

9 ACTUATOR COLOR & LEGEND [16]
Actuator Color	I-O	ON-OFF	Dual	Legend Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White
Red	**F**	**G**	**3**	White
Green	**H**	**J**	**4**	White
Blue	**K**	**L**	**5**	White
Yellow	**M**	**N**	**6**	Black
Gray	**P**	**Q**	**7**	Black
Orange	**R**	**S**	**8**	Black
Black (short handle)[17]	**T**	**U**	**9**	White

10 MOUNTING / BARRIERS
	MOUNTING STYLE	BARRIERS	VOLTAGE
	Threaded Insert		
1	6-32 x 0.195 inches	no	< 300
A	6-32 X 0.195 inches	yes	< 300
C [18]	6-32 X 0.195 inches	yes	≥ 300
2	ISO M3 x 5mm	no	< 300
B	ISO M3 x 5mm	yes	< 300
D [18]	ISO M3 x 5mm	yes	≥ 300
Front panel Snap-In, 1.00” [25.4mm] wide bezel			
E [17]	with Handleguard	no	< 300

11 AGENCY APPROVAL
C	UL Recognized, CSA Accepted
D	VDE Certified, UL Recognized, CSA Accepted
E	TUV Certified, UL Recognized, CSA Accepted
H	UL489 Construction: VDE Certified, UL Recognized, CSA Accepted
I	UL Recognized STD 1077, UL Recognized 1500 (ignition protected), CSA Accepted
L	UL489 Construction: UL Recognized, CSA Accepted
R	UL489 Construction: TUV Certified, UL Recognized, CSA Accepted

C	A	3	–	B	0	–	14	–	450	–	1	2	1	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. App. Rating	12 Agency Approval

1 SERIES
C

2 ACTUATOR [1]
A Handle, one per pole
B Handle, one per multipole unit
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH [3]
0 without Aux Switch
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.139 Solder Lug
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
6 S.P.S.T., 0.139 Solder Lug
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
42 [4] 50/60Hz Short, Hi-Inrush
44 [4] 50/60Hz Medium, Hi-Inrush
46 [4] 50/60Hz Long, Hi-Inrush
52 [4] DC Short, Hi-Inrush
54 [4] DC Medium, Hi-Inrush
56 [4] DC Long, Hi-Inrush

Notes:
1 Actuator Code:
A: Handle tie pin spacer(s) and retainers provided assembled with multi-pole units.
B: Handle located, as viewed from front of breaker in left pole. 2 pole maximum.
S: Handle moves to mid-position only upon electrical trip of the breaker.
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker.
2 Standard multipole units have all poles identical except when specifying auxiliary switch and/or mixed poles.
2 & 3 pole circuit breakers required for 120/240 VAC (Maximum application rating code C) applications, have all poles identical except when specifying auxiliary / alarm switch which is normally supplied in extreme right pole per figure B. Terminal barriers are required on all multipole breakers.
Third pole is for 120/240 VAC applications requiring neutral disconnect. The 3rd pole has the same construction as poles 1 & 2.
3 On multi-pole breakers, one auxiliary. switch is supplied, mounted in the extreme right pole.
VDE approval on auxiliary switch codes 2, 3 & 4 only.
Auxiliary / Alarm Switch with Independent Circuit ie: separate from breaker circuit, only available with circuit breakers rated 50 amp maximum at 80 VDC, 125 VDC, and 120 VAC. Auxiliary / Alarm Switch with Dependent Circuit ie: same as circuit breaker, is supplied from factory with common terminal of auxiliary / alarm switch connected to line terminal on 120/240 and 240 VAC ratings. Circuit breakers rated 120 VAC 50 amp maximum can be supplied with Auxiliary/Alarm switch common terminal connected to breaker line terminal. Consult factory for special catalog number.
4 Available up to 50 amps maximum.
5 Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
6 Terminal Codes 9 & C are not VDE approved.
7 Terminal Code 1 available to 60 amps maximum.
8 Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
9 Terminal Codes 3, 6 & 9 available to 100 amps maximum.
10 Terminal Code A available to 100 amps maximum.
11 VDE and TUV approvals require Dual (I-O, ON-OFF) markings on all handles.
12 Barriers supplied on multi-pole units only.

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**295**	0.950	**470**	7.000	**618**	18.000
215	0.150	**410**	1.000	**475**	7.500	**620**	20.000
220	0.200	**512**	1.250	**480**	8.000	**622**	22.000
225	0.250	**415**	1.500	**485**	8.500	**624**	24.000
230	0.300	**517**	1.750	**490**	9.000	**625**	25.000
235	0.350	**420**	2.000	**495**	9.500	**630**	30.000
240	0.400	**522**	2.250	**610**	10.000	**635**	35.000
245	0.450	**425**	2.500	**710**	10.500	**640**	40.000
250	0.500	**527**	2.750	**611**	11.000	**660**	60.000
255	0.550	**430**	3.000	**711**	11.500	**670**	70.000
260	0.600	**435**	3.500	**612**	12.000	**680**	80.000
265	0.650	**440**	4.000	**712**	12.500	**685**	85.000
270	0.700	**445**	4.500	**613**	13.000	**690**	90.000
275	0.750	**450**	5.000	**614**	14.000	**695**	95.000
280	0.800	**455**	5.500	**615**	15.000	**810**	100.00
285	0.850	**460**	6.000	**616**	16.000		
290	0.900	**465**	6.500	**617**	17.000		

8 TERMINAL [6]
1 [7] Stud 10-32
2 [8] Screw 10-32
3 [9] Stud 1/4-20
4 [8] Stud M5 x 0.8
5 [8] Screw M5 x 0.8
6 [9] Stud M6
9 [9] 7/16" Clip Terminal
A [10] Plug-In Stud
C [8] 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND [11]

Actuator Color	ON-OFF	Dual	Legend Color
White	**B**	**1**	Black
Black	**D**	**2**	White
Red	**G**	**3**	White
Green	**J**	**4**	White
Blue	**L**	**5**	White
Yellow	**N**	**6**	Black
Gray	**Q**	**7**	Black
Orange	**S**	**8**	Black

10 MOUNTING / BARRIERS

	MOUNTING STYLE ***Threaded Insert***	BARRIERS [12]
1	6-32 x 0.195 inches	yes
2	ISO M3 x 5mm	yes

11 MAXIMUM APPLICATION RATING
B 125 DC
C 120/240 AC [2]
D 240 AC
K 120 AC
F 277 AC
M 80 DC

12 AGENCY APPROVAL [11]
A without approvals
F UL489 Listed, CSA Certified & VDE Certified
G UL489 Listed & CSA Certified
J UL489 Listed, CSA Certified & TUV Certified

C	C	3	–	B	0	–	14	–	450	–	1	2	1	–	D
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
C

2 ACTUATOR [1]

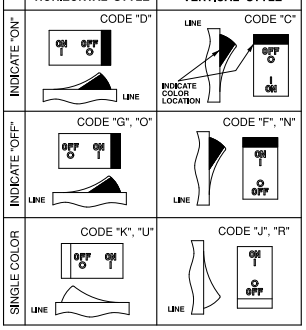
Two Color Visi-Rocker
- **C** Indicate ON, vertical legend
- **D** Indicate ON, horizontal legend
- **E** Indicate ON, no legend
- **F** Indicate OFF, vertical legend
- **G** Indicate OFF, horizontal legend
- **H** Indicate OFF, no legend

Push-To-Reset, Visi-Rocker
- **N** Indicate OFF, vertical legend
- **O** Indicate OFF, horizontal legend
- **P** Indicate OFF, no legend

Single color
- **J** *Vertical legend*
- **K** Horizontal legend
- **L** No legend

Push-To-Reset, Single color
- **R** *Vertical legend*
- **U** Horizontal legend
- **V** No legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
- **1** One
- **2** Two
- **3** Three

4 CIRCUIT
- **A** [3] Switch Only (No Coil)
- **B** Series Trip (Current)
- **C** Series Trip (Voltage)
- **D** [4] Shunt Trip (Current)
- **E** [4] Shunt Trip (Voltage)
- **F** [4] Relay Trip (Current)
- **G** [4] Relay Trip (Voltage)
- **H** [4,5] Dual Coil with Shunt Trip Voltage Coil
- **K** [4,5] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [6]
- **0** without Aux Switch
- **2** S.P.D.T., 0.110 Q.C. Term.
- **3** S.P.D.T., 0.139 Solder Lug
- **4** S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
- **6** S.P.S.T., 0.139 Solder Lug
- **8** S.P.S.T., 0.187 Q.C. Term.
- **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
- **03** DC 50/60Hz, Switch Only
- **10** [7] DC Instantaneous
- **11** DC Ultra Short
- **12** DC Short
- **14** DC Medium
- **16** DC Long
- **20** [7] 50/60Hz Instantaneous
- **21** 50/60Hz Ultra Short
- **22** 50/60Hz Short
- **24** 50/60Hz Medium
- **26** 50/60Hz Long
- **30** DC 50/60Hz Instantaneous
- **31** DC 50/60Hz Ultra Short
- **32** DC 50/60Hz Short
- **34** DC 50/60Hz Medium
- **36** DC 50/60Hz Long
- **42** [8] 50/60Hz Short, Hi-Inrush
- **44** [8] 50/60Hz Medium, Hi-Inrush
- **46** [8] 50/60Hz Long, Hi-Inrush
- **52** [8] DC Short, Hi-Inrush
- **54** [8] DC Medium, Hi-Inrush
- **56** [8] DC Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660** [9]	60.000
090	0.090	**512**	1.250	**610**	10.000	**670** [9]	70.000
095	0.095	**415**	1.500	**710**	10.500	**680** [9]	80.000
210	0.100	**517**	1.750	**611**	11.000	**685** [9]	85.000
215	0.150	**420**	2.000	**711**	11.500	**690** [9]	90.000
220	0.200	**522**	2.250	**612**	12.000	**695** [9]	95.000
225	0.250	**425**	2.500	**712**	12.500	**810** [9]	100.00
230	0.300	**527**	2.750	**613**	13.000		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [7]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL
- **1** [10] Stud 10-32
- **2** [11] Screw 10-32
- **3** [12] Stud 1/4-20
- **4** [11] Stud M5 x 0.8
- **5** [11] Screw M5 x 0.8
- **6** [12] Stud M6
- **7** [13] 0.250 Double Quick Connect
- **9** 7/16" Clip Terminal
- **A** [14] Plug-In Stud
- **C** 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND [16,17,18]

Actuator or Visi-Color	***Marking:***			***Marking Color:***	
Color:	**I-O**	**ON-OFF**	**Dual/None**	**Single Color Rocker/Handle**	**Visi-Rocker**
White	**A**	**B**	**1**	Black	White
Black	**C**	**D**	**2**	White	n/a
Red	**F**	**G**	**3**	White	Red
Green	**H**	**J**	**4**	White	Green
Blue	**K**	**L**	**5**	White	Blue
Yellow	**M**	**N**	**6**	Black	Yellow
Gray	**P**	**Q**	**7**	Black	Gray
Orange	**R**	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [1]

	STANDARD ROCKER BEZEL	BARRIERS	VOLTAGE
1	6-32 x 0.195 inches	no	<300
2	6-32 x 0.195 inches	yes	<300
3 [19]	6-32 x 0.195 inches	yes	≥300
4	ISO M3 x 5mm	no	<300
5	ISO M3 x 5mm	yes	<300
6 [19]	ISO M3 x 5mm	yes	≥300
	ROCKERGUARD BEZEL		
A	6-32 x 0.195 inches	no	<300
C	6-32 x 0.195 inches	yes	<300
E [19]	6-32 x 0.195 inches	yes	≥300
G	ISO M3 x 5mm	no	<300
J	ISO M3 x 5mm	yes	<300
L [19]	ISO M3 x 5mm	yes	≥300
	PUSH-TO-RESET BEZEL		
B	6-32 x 0.195 inches	no	<300
D	6-32 x 0.195 inches	yes	<300
F [19]	6-32 x 0.195 inches	yes	≥300
H	ISO M3 x 5mm	no	<300
J	ISO M3 x 5mm	yes	<300
M [19]	ISO M3 x 5mm	yes	≥300

11 AGENCY APPROVAL
- **C** UL Recognized & CSA Accepted
- **D** VDE Certified, UL Recognized & CSA Accepted
- **E** TUV Certified, UL Recognized & CSA Accepted
- **H** UL489 Construction: VDE Certified, UL Recognized & CSA Accepted
- **I** UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted
- **L** UL489 Construction: UL Recognized & CSA Accepted
- **R** UL489 Construction: TUV Certified, UL Recognized & CSA Accepted

Notes:
1. Push-To-Reset actuators have OFF portion of rocker shrouded.
2. Multi-pole breakers have all poles identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker. Rocker location as viewed from front panel: 2 pole – left pole; 3 pole – center pole.
3. Switch Only circuits, rated up to 50 amps and 3 poles, and only available with VDE Certification when tied to a protected pole (Circuit Code B, C, D or H.), For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650. For 55-70 amps, select Current Code 670. For 75-100 amps, select Current Code 810.
4. Circuit Codes D,E,F,G,H & K available with Terminal Codes 1,2,4 & 5 only. Circuit Codes D,F,H & K available up to 50 amps maximum Current Rating.
5. Consult factory for available Dual Coil options, as special catalog number is required. Dual Coil Voltage Coils with Shunt Trip Construction trip instantaneously on line voltage. Dual Coil Voltage Coils require 30VA minimum power to trip instantaneously and are rated for intermittent duty only.
6. Auxiliary Switch available with Series Trip and Switch Only circuits. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole. Auxiliary switch codes 2, 3 & 4 are VDE approved.
7. Voltage coils not rated for continuous duty. Available only with delay codes 10 & 20.
8. Available with Circuit Codes B & D only, and up to 50 amps maximum.
9. Current Ratings 60-70 are available up to four poles maximum. Ratings 71-100 are available up to two poles maximum.
10. Terminal Code 1 available to 60 amps maximum.
11. Terminal Codes 2,4,5 & C available to 50 amps maximum.
12. Terminal Codes 3,6 & 9 available to 100 amps maximum.
13. Terminal Code 7 available to 25 amps maximum.
14. Terminal Code A available to 100 amps maximum.
15. Terminal Codes 7, 9 & C are not VDE approved.
16. Color shown is visi and legend with remainder of rocker black
17. Legend on Push-to-reset bezel/shroud is white when single color rocker is ordered. Dual = ON-OFF/I-O legend with actuator codes C - G, and J, K, N, O, R, & U. None = no legend with actuator codes H, L, P, V. Rockerguard available with actuator codes C - L. Push-to-reset available with actuator codes N, O, P, R, U, V.
18. VDE/TUV approval requires Dual (I-O, ON-OFF) or I-O markings on rocker.
19. VDE/TUV: 30 amps max.; UL/CSA: 50 amps max.; Available in 2 - 4 poles only and limited to AC Delays. "General Purpose amps" not rated for "full load amps" or to be used in applications with a motor.

C	C	3	–	B	0	–	14	–	450	–	1	2	A	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. App. Rating	12 Agency Approval

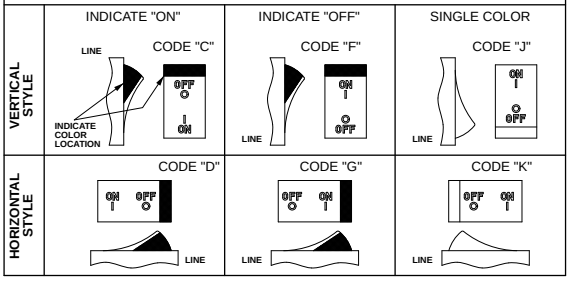
1 SERIES
C

2 ACTUATOR [1]

Two Color Visi-Rocker
- **C** Indicate ON, vertical legend
- **D** Indicate ON, horizontal legend
- **F** Indicate OFF, vertical legend
- **G** Indicate OFF, horizontal legend

Single color
- **J** *Vertical legend*
- **K** Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [1]
1 One **2** Two **3** Three

4 CIRCUIT
B Series Trip (current)

5 AUXILIARY / ALARM SWITCH [2]
- **0** without Aux Switch
- **2** S.P.D.T., 0.110 Q.C. Term.
- **3** S.P.D.T., 0.139 Solder Lug
- **4** S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
- **6** S.P.S.T., 0.139 Solder Lug
- **8** S.P.S.T., 0.187 Q.C. Term.
- **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
- **11** DC Ultra Short
- **12** DC Short
- **14** DC Medium
- **16** DC Long
- **21** 50/60Hz Ultra Short
- **22** 50/60Hz Short
- **24** 50/60Hz Medium
- **26** 50/60Hz Long
- **42** [8] 50/60Hz Short, Hi-Inrush
- **44** [8] 50/60Hz Medium, Hi-Inrush
- **46** [8] 50/60Hz Long, Hi-Inrush
- **52** [8] DC Short, Hi-Inrush
- **54** [8] DC Medium, Hi-Inrush
- **56** DC Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [4]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**295**	0.950	**470**	7.000	**618**	18.000
215	0.150	**410**	1.000	**475**	7.500	**620**	20.000
220	0.200	**512**	1.250	**480**	8.000	**622**	22.000
225	0.250	**415**	1.500	**485**	8.500	**624**	24.000
230	0.300	**517**	1.750	**490**	9.000	**625**	25.000
235	0.350	**420**	2.000	**495**	9.500	**630**	30.000
240	0.400	**522**	2.250	**610**	10.000	**635**	35.000
245	0.450	**425**	2.500	**710**	10.500	**640**	40.000
250	0.500	**527**	2.750	**611**	11.000	**650**	50.000
255	0.550	**430**	3.000	**711**	11.500	**660**	60.000
260	0.600	**435**	3.500	**612**	12.000	**670**	70.000
265	0.650	**440**	4.000	**712**	12.500	**680**	80.000
270	0.700	**445**	4.500	**613**	13.000	**685**	85.000
275	0.750	**450**	5.000	**614**	14.000	**690**	90.000
280	0.800	**455**	5.500	**615**	15.000	**695**	95.000
285	0.850	**460**	6.000	**616**	16.000	**810**	100.00
290	0.900	**465**	6.500	**617**	17.000		

8 TERMINAL
- **1** [5] Stud 10-32
- **2** [6] Screw 10-32 with saddle & washer clamps
- **3** [7] Stud 1/4-20
- **4** [6] Stud M5 x 0.8
- **5** [6] Screw M5 x 0.8 with saddle & washer clamps
- **6** [7] Stud M6
- **9** [7,8] 7/16" Clip Terminal
- **A** [7,8] Plug-In Stud
- **C** [6,8] 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND [11]

Actuator or Visi-Color	***Marking:***		***Marking Color:***	
			Single Color	
Color:	**ON-OFF**	**Dual** [10]	**Rocker/Handle**	**Visi-Rocker**
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [12]

	Standard Rocker Bezel Threaded Insert, 2 per pole	BARRIERS [13]
A	6-32 X 0.195 inches	yes
C	ISO M3 x 5mm	yes
	Rockerguard Bezel Threaded Insert, 2 per pole	
B	6-32 x 0.195 inches	yes
D	ISO M3 x 5mm	yes

11 MAXIMUM APPLICATION RATING
- **B** 125 DC
- **C** 120/240 AC [14]
- **D** 240 AC
- **F** 277 AC
- **K** 120 AC
- **M** 80 DC

12 AGENCY APPROVAL
- **A** without approvals
- **F** UL 489 Listed, CSA Certified, & VDE Certified
- **G** UL 489 Listed & CSA Certified
- **J** UL489 Listed, CSA Certified & TUV Certified

Notes:
1. Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
2. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
3. Available up to 50 amps maximum.
4. Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
5. Terminal Code 1 available to 60 amps maximum.
6. Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
7. Terminal Codes 3, 6, 9 & A available to 100 amps maximum.
8. Terminal Codes 9 & C are not VDE approved.
9. Color shown is visi and legend with remainder of rocker black
10. Dual = ON-OFF/I-O legend on actuator.
11. VDE and TUV approval requires Dual (I-O, ON-OFF) markings on rocker.
12. Rockerguard available with all actuator codes.
13. Barriers supplied on multi-pole units only.
14. 2 & 3 pole circuit breakers required for 120/240 AC rating.

C	M	3	–	B	0	–	10	–	450	–	1	0	1	–	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Legend Plate	10 Mounting Bezel/Barrier		11 Agency Approval

1 SERIES
C

2 ACTUATOR [1]
M Sealed Toggle, one per pole

3 POLES
1 One **2** Two **3** Three

4 CIRCUIT
A [2] Switch Only (no coil)
B Series Trip (current)
C Series Trip (voltage)
D [3] Shunt Trip (current)
E [3] Shunt Trip (voltage)
F [3] Relay Trip (current)
G [3] Relay Trip (voltage)
H [3,4] Dual Coil with Shunt Trip Voltage Coil
K [3,4] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH
0 without Aux Switch
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.139 Solder Lug
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
6 S.P.S.T., 0.139 Solder Lug
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 [2] DC 50/60Hz, Switch Only
10 [6] DC Instantaneous
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
20 [6] 50/60Hz Instantaneous
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
30 DC 50/60Hz Instantaneous
31 DC 50/60Hz Ultra Short
32 DC 50/60Hz Short
34 DC 50/60Hz Medium
36 DC 50/60Hz Long
42 [7] 50/60Hz Short, Hi-Inrush
44 [7] 50/60Hz Medium, Hi-Inrush
46 [7] 50/60Hz Long, Hi-Inrush
52 [7] DC Short, Hi-Inrush
54 [7] DC Medium, Hi-Inrush
56 DC Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [9]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660** [9]	60.000
090	0.090	**512**	1.250	**610**	10.000	**670** [9]	70.000
095	0.095	**415**	1.500	**710**	10.500	**680** [9]	80.000
210	0.100	**517**	1.750	**611**	11.000	**685** [9]	85.000
215	0.150	**420**	2.000	**711**	11.500	**690** [9]	90.000
220	0.200	**522**	2.250	**612**	12.000	**695** [9]	95.000
225	0.250	**425**	2.500	**712**	12.500	**810** [9]	100.00
230	0.300	**527**	2.750	**613**	13.000		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [7]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL
1 [9] Stud 10-32
2 [10] Screw 10-32
3 [11] Stud 1/4-20
4 [10] Stud M5 x 0.8
5 [10] Screw M5 x 0.8
6 [11] Stud M6
7 [12] 0.250 Double Click Connect
9 [11] 7/16" Clip Terminal
A [13] Plug-In Stud
C [10] 5/16" Clip Terminal

9 LEGEND PLATE
0 No Legend

10 MOUNTING / BARRIERS

	MOUNTING STYLE	BARRIERS
1	Standard Hex Nut	no
A	Standard Hex Nut (multi-pole units only)	yes

11 AGENCY APPROVAL
C UL Recognized & CSA Accepted
I UL Recognized & CSA Accepted, UL1500 ignition protection
L UL Recognized & CSA Accepted with listed construction

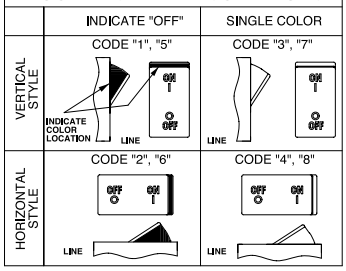
Notes:
1 Actuator Code M: Handle location as viewed from front of breaker:
2 pole - right pole 3 pole - center pole
2 Switch Only circuits, rated up to 50 amps and 3 poles, and only available with VDE. For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650. For 55-70 amps, select Current Code 670. For 75-100 amps, select Current Code 810.
3 Circuit Codes D,E,F,G,H & K available with Terminal Codes 1,2,4 & 5 only.
4 Consult factory for available Dual Coil options, as special catalog number is required. Dual Coil Voltage Coils with Shunt Trip Construction trip instantaneously on line voltage. Dual Coil Voltage Coils require 30VA minimum power to trip instantaneously and are rated for intermittent duty only.
5 Auxiliary Switch available with Series Trip and Switch Only circuits. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
6 Voltage coils not rated for continuous duty. Available only with delay codes 10 & 20.
7 Available with Circuit Codes B & D only, and up to 50 amps maximum.
8 Consult factory for current ratings 71-100, in three pole units, available as special catalog number only.
9 Terminal Code 1 available to 60 amps maximum.
10 Terminal Codes 2, 4, 5 and C available to 50 amps maximum.
11 Terminal Codes 3, 6 & 9 available to 100 amps maximum.
12 Terminal Code 7 available to 25 amps maximum.
13 Terminal Code A available to 100 amps maximum.

C	1	2	–	B	0	–	10	–	450	–	1	2	1	–	E
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Agency Approval

1 SERIES
C

2 ACTUATOR [1]
Two Color Visi-Rocker
1 Indicate OFF, vertical legend
2 Indicate OFF, horizontal legend
Single color
3 Vertical legend
4 Horizontal legend
Push-To-Reset, Visi-Rocker
5 Indicate OFF, vertical legend
6 Indicate OFF, horizontal legend
Push-To-Reset , Single color
7 Vertical legend
8 Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
A [3] Switch Only (No Coil)
B Series Trip (Current)
C Series Trip (Voltage)
D [4] Shunt Trip (Current)
E [4] Shunt Trip (Voltage)
F [4] Relay Trip (Current)
G [4] Relay Trip (Voltage)
H [4,5] Dual Coil with Shunt Trip Voltage Coil
K [4,5] Dual Coil with Relay Trip Voltage Coil

5 AUXILIARY / ALARM SWITCH [6]
0 without Aux Switch
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.139 Solder Lug
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
6 S.P.S.T., 0.139 Solder Lug
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
03 DC 50/60Hz, Switch Only
10 [7] DC Instantaneous
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
20 [7] 50/60Hz Instantaneous
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
30 DC 50/60Hz Instantaneous
31 DC 50/60Hz Ultra Short
32 DC 50/60Hz Short
34 DC 50/60Hz Medium
36 DC 50/60Hz Long
42 [8] 50/60Hz Short, Hi-Inrush
44 [8] 50/60Hz Medium, Hi-Inrush
46 [8] 50/60Hz Long, Hi-Inrush
52 [8] DC Short, Hi-Inrush
54 [8] DC Medium, Hi-Inrush
56 [8] DC Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [9]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660** [9]	60.000
090	0.090	**512**	1.250	**610**	10.000	**670** [9]	70.000
095	0.095	**415**	1.500	**710**	10.500	**680** [9]	80.000
210	0.100	**517**	1.750	**611**	11.000	**685** [9]	85.000
215	0.150	**420**	2.000	**711**	11.500	**690** [9]	90.000
220	0.200	**522**	2.250	**612**	12.000	**695** [9]	95.000
225	0.250	**425**	2.500	**712**	12.500	**810** [9]	100.00
230	0.300	**527**	2.750	**613**	13.000		

OR VOLTAGE COIL (NORMAL RATED VOLTAGE) [7]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC	**A32**	32 DC	**J12**	12 AC	**J65**	65 AC
A12	12 DC	**A48**	48 DC	**J18**	18 AC	**K20**	120 AC
A18	18 DC	**A65**	65 DC	**J24**	24 AC	**L40**	240 AC
A24	24 DC	**J06**	6 AC	**J48**	48 AC		

8 TERMINAL
1 [10] Stud 10-32
2 [11] Screw 10-32
3 [12] Stud 1/4-20
4 [11] Stud M5 x 0.8
5 [11] Screw M5 x 0.8
6 [12] Stud M6
7 [13] 0.250 Double Quick Connect
9 [15] 7/16" Clip Terminal
A [14] Plug-In Stud
C [15] 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND [16,17,18]

Actuator or Visi-Color	*Marking:*			*Marking Color:*	
				Single Color	
Color:	**I-O**	**ON-OFF**	**Dual/None**	**Rocker/Handle**	**Visi-Rocker**
White	**A**	**B**	**1**	Black	White
Black	**C**	**D**	**2**	White	n/a
Red	**F**	**G**	**3**	White	Red
Green	**H**	**J**	**4**	White	Green
Blue	**K**	**L**	**5**	White	Blue
Yellow	**M**	**N**	**6**	Black	Yellow
Gray	**P**	**Q**	**7**	Black	Gray
Orange	**R**	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS [1]

	STANDARD ROCKER BEZEL	BARRIERS	VOLTAGE
1	6-32 x 0.195 inches	no	<300
2	6-32 x 0.195 inches	yes	<300
3 [19]	6-32 x 0.195 inches	yes	≥300
4	ISO M3 x 5mm	no	<300
5	ISO M3 x 5mm	yes	<300
6 [19]	ISO M3 x 5mm	yes	≥300
	RECESSED OFF ROCKER		
7	6-32 x 0.195 inches	no	<300
8	6-32 x 0.195 inches	yes	<300
9	6-32 x 0.195 inches	yes	≥300
A	ISO M3 x 5mm	no	<300
C	ISO M3 x 5mm	yes	<300
E	ISO M3 x 5mm	yes	≥300
	PUSH-TO-RESET BEZEL		
B	6-32 x 0.195 inches	no	<300
D	6-32 x 0.195 inches	yes	<300
F [19]	6-32 x 0.195 inches	yes	≥300
H	ISO M3 x 5mm	no	<300
J	ISO M3 x 5mm	yes	<300
M [19]	ISO M3 x 5mm	yes	≥300

11 AGENCY APPROVAL
C UL Recognized & CSA Accepted
E TUV Certified, UL Recognized & CSA Accepted
I UL Recognized STD 1077, UL Recognized 1500 (ignition protected), & CSA Accepted
L UL489 Construction: UL Recognized & CSA Accepted
R UL489 Construction: TUV Certified, UL Recognized & CSA Accepted

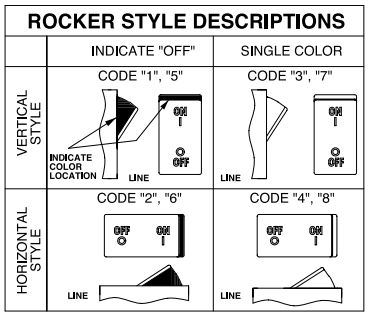
Notes:
1 Push-to-reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all poles identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker. Rocker location as viewed from front panel: 2 pole – left pole; 3 pole – center pole.
3 Switch Only circuits, rated up to 50 amps and 3 poles, and only available with VDE Certification when tied to a protected pole (Circuit Code B, C, D or H.). For .02 to 30 amps, select Current Code 630. For 35 - 50 amps, select Current Code 650. For 55-70 amps, select Current Code 670. For 75-100 amps, select Current Code 810.
4 Circuit Codes D,E,F,G,H & K available with Terminal Codes 1,2,4 & 5 only. Circuit Codes D,F,H & K available up to 50 amps maximum Current Rating.
5 Consult factory for available Dual Coil options, as special catalog number is required. Dual Coil Voltage Coils with Shunt Trip Construction trip instantaneously on line voltage. Dual Coil Voltage Coils require 30VA minimum power to trip instantaneously and are rated for intermittent duty only.
6 Auxiliary Switch available with Series Trip and Switch Only circuits. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole. Auxilary switch codes 2, 3 & 4 are VDE approved.
7 Voltage coils not rated for continuous duty. Available only with delay codes 10 and 20.
8 Available with Circuit Codes B & D only, and up to 50 amps maximum.
9 Current ratings 60-70 are available up to four poles maximum. Current ratings 71 - 100 are available up to two poles maximum.
10 Terminal Code 1 available to 60 amps maximum.
11 Terminal Codes 2,4,5 & C available to 50 amps maximum.
12 Terminal Codes 3,6 & 9 available to 100 amps maximum.
13 Terminal Code 7 available to 25 amps maximum.
14 Terminal Code A available to 100 amps maximum.
15 Terminal Codes 7, 9 & C are not VDE approved.
16 Color shown is visi & legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
17 Legend on Push-to-reset bezel/shroud is white with single color actuator codes 7 & 8. Legend on Push-to-reset bezel/shroud matches visi-color of rocker with actuator codes 5 & 6.
18 VDE/TUV approval requires Dual (I-O, ON-OFF) or I-O markings on rocker.
19 VDE/TUV: 30 amps max.; UL/CSA: 50 amps max.; Available in 2 & 3 poles only and limited to AC Delays. "General Purpose amps" not rated for "full load amps" or to be used in applications with a motor.
20 Recessed "OFF SIDE" available with actuator codes 1,2,3&4. Legends on rocker are available in ink stamping only.

C	1	2	–	B	0	–	14	–	450	–	1	2	A	–	K	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Max. App. Rating	12 Agency Approval

1 SERIES
C

2 ACTUATOR [1]
Two Color Visi-Rocker
1 Indicate OFF, vertical legend
2 Indicate OFF, horizontal legend
Single color
3 Vertical legend
4 Horizontal legend
Push-To-Reset, Visi-Rocker
5 Indicate OFF, vertical legend
6 Indicate OFF, horizontal legend
Push-To-Reset , Single color
7 Vertical legend
8 Horizontal legend

ROCKER STYLE DESCRIPTIONS



3 POLES [2]
1 One **2** Two **3** Three

4 CIRCUIT
B Series Trip (current)

5 AUXILIARY / ALARM SWITCH [3]
0 without Aux Switch
2 S.P.D.T., 0.110 Q.C. Term.
3 S.P.D.T., 0.139 Solder Lug
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
6 S.P.S.T., 0.139 Solder Lug
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
21 50/60Hz Ultra Short
22 50/60Hz Short
24 50/60Hz Medium
26 50/60Hz Long
42 [4] 50/60Hz Short, Hi-Inrush
44 [4] 50/60Hz Medium, Hi-Inrush
46 [4] 50/60Hz Long, Hi-Inrush
52 [4] DC Short, Hi-Inrush
54 [4] DC Medium, Hi-Inrush
56 [4] DC Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [5]

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	**295**	0.950	**470**	7.000	**618**	18.000
215	0.150	**410**	1.000	**475**	7.500	**620**	20.000
220	0.200	**512**	1.250	**480**	8.000	**622**	22.000
225	0.250	**415**	1.500	**485**	8.500	**624**	24.000
230	0.300	**517**	1.750	**490**	9.000	**625**	25.000
235	0.350	**420**	2.000	**495**	9.500	**630**	30.000
240	0.400	**522**	2.250	**610**	10.000	**635**	35.000
245	0.450	**425**	2.500	**710**	10.500	**640**	40.000
250	0.500	**527**	2.750	**611**	11.000	**650**	50.000
255	0.550	**430**	3.000	**711**	11.500	**660**	60.000
260	0.600	**435**	3.500	**612**	12.000	**670**	70.000
265	0.650	**440**	4.000	**712**	12.500	**680**	80.000
270	0.700	**445**	4.500	**613**	13.000	**685**	85.000
275	0.750	**450**	5.000	**614**	14.000	**690**	90.000
280	0.800	**455**	5.500	**615**	15.000	**695**	95.000
285	0.850	**460**	6.000	**616**	16.000	**810**	100.00
290	0.900	**465**	6.500	**617**	17.000		

8 TERMINAL
1 [6] Stud 10-32
2 [7] Screw 10-32
3 [8] Stud 1/4-20
4 [7] Stud M5 x 0.8
5 [7] Screw M5 x 0.8
6 [8] Stud M6
9 [8,9] 7/16" Clip Terminal
A [8] Plug-In Stud
C [7,9] 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND [10]

Actuator or Visi-Color	***Marking:***		***Marking Color:***	
Color:	**ON-OFF**	**Dual** [11,12]	**Single Color Rocker/Handle**	**Visi-Rocker**
White	**B**	**1**	Black	White
Black	**D**	**2**	White	n/a
Red	**G**	**3**	White	Red
Green	**J**	**4**	White	Green
Blue	**L**	**5**	White	Blue
Yellow	**N**	**6**	Black	Yellow
Gray	**Q**	**7**	Black	Gray
Orange	**S**	**8**	Black	Orange

10 MOUNTING / BARRIERS

		BARRIERS [15]
	STANDARD ROCKER BEZEL Threaded Insert, 2 per pole	
A	6-32 X 0.195 inches	yes
C	ISO M3 x 5mm	yes
	RECESSED OFF ROCKER [14] Threaded Insert, 2 per pole	
E	6-32 x 0.195 inches	yes
F	ISO M3 x 5mm	yes
	PUSH-TO-RESET BEZEL [13] Threaded Insert, 2 per pole	
B	6-32 x 0.195 inches	yes
D	ISO M3 x 5mm	yes

11 MAXIMUM APPLICATION RATING
B 125 DC
C 120/240 AC [16]
D 240 AC
F 277 AC
K 120 AC
M 80 DC

12 AGENCY APPROVAL [12]
A without approvals
G UL 489 Listed & CSA Certified
J UL489 Listed, CSA Certified & TUV Certified

Notes:
1 Push-to-reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
4 Available up to 50 amps maximum.
5 Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
6 Terminal Code 1 available to 60 amps maximum.
7 Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
8 Terminal Codes 3, 6, 9 & A available to 100 amps maximum.
9 Terminal Codes 9 & C are not VDE approved.
10 Color shown is visi and legend with remainder of rocker black
11 Dual = ON-OFF/I-O legend on actuator.
12 TUV approval requires Dual (I-O, ON-OFF) markings on rocker.
13 Legend on push-to-reset bezel/shroud is white when single color rocker is ordered. Legend on push-to-reset bezel/shroud matches visi-color of rocker with actuator codes 5 & 6.
14 Recessed "OFF-SIDE" available with actuator codes 1, 2, 3, & 4. Legends on rocker are available in ink stamping only.
15 Barriers supplied on multi-pole units only.
16 2 & 3 pole circuit breakers required for 120/240 AC rating.

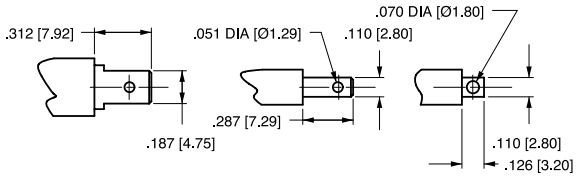
Circuit & Terminal Diagrams: in. [mm]

TERMINAL						
DESCRIPTION	CODE	DIMENSIONAL DETAIL	RATING (AMPS) 25	50	100 80	
#10-32 STUD	1	.723[18.36] .150 [3.81]	■	■		
M5 STUD	4	.688[17.48] .150 [3.81]	■	■		
#1/4-20 STUD	3	.723[18.36] .150 [3.81]	■	■	■	
M6 STUD	6					
#1/4-20 STUD	3	.675 [17.15] .235 [5.97]				■
M6 STUD	6	.669 [16.99] .264 [6.71]				■
#10-32 SCREW	2	±.015 ±.38 .150 [3.81]	■	■		
M-5 SCREW	5					

TERMINAL						
DESCRIPTION	CODE	DIMENSIONAL DETAIL	RATING (AMPS) 25	50	100 80	
.250 DOUBLE Q.C.	7	.400 [10.16] .820 [20.83] .173 [4.39] .320 [8.13] .250 [6.35]				■
7/16" CLIP TERMINALS	9	.437 DIA [Ø11.10] COMPONENT DIA .644[16.36] .901[22.89]		■	■	
PUSH-IN STUD	A	.960 [24.38] +.002 -.000 +.05 -.00 .311 DIA [Ø7.90] .558 [14.17] CENTERLINE OF PUSH-IN STUD CONTACT AREA PUSH-IN STUD MATING HOLE		■	■	■

NOTES: TOLERANCE ON STUD LENGTHS IS ±.031 [±.79] UNLESS OTHERWISE SPECIFIED.

AUXILIARY / ALARM SWITCH TERMINAL DETAIL[3]



TAB (Q.C.) .187 TAB (Q.C.) .110 SOLDER TYPE

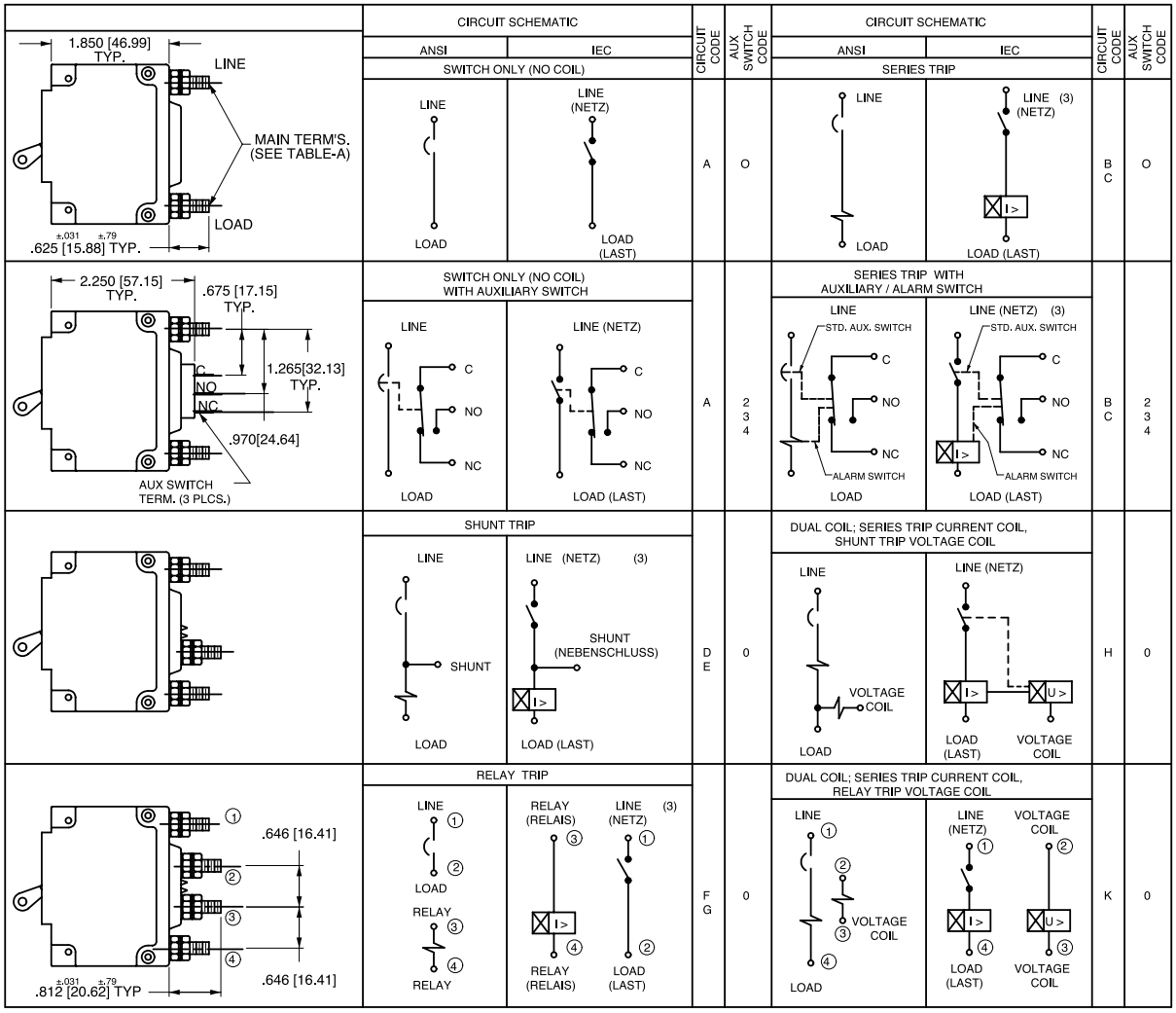
TIGHTENING TORQUE SPECIFICATIONS	
THREAD SIZE	TORQUE
#6-32 [M3] MOUNTING INSERTS	7-9 IN-LBS [0.8-1.0 NM]
#10-32 & M5 THD STUDS	15-20 IN-LBS [1.7-2.3 NM]
#10-32 THD SCREW	15-20 IN-LBS [1.7-2.3 NM]
#1/4-20 & M6 THD STUDS	30-35 IN-LBS [3.4-4.0 NM]

TERMINAL HARDWARE				
TERMINAL DESCRIPTION	CODE	AGENCY APPROVAL	AMPERE RATING	HARDWARE SUPPLIED
#10-32 STUD	1	ALL	.02 - 50	LOCK WASHER - FLAT WASHER - NUT
M5 STUD	4	ALL	.02 - 50	LOCK WASHER - FLAT WASHER - NUT
#1/4-20 STUD	3	ALL	.02 - 80	LOCK WASHER - FLAT WASHER - NUT
			81 - 100	LOCK WASHER - NUT - (2)FLAT WASHER - NUT
M6 STUD	6	ALL	.02 - 80	LOCK WASHER - FLAT WASHER - NUT
			81 - 100	LOCK WASHER - NUT - (2)FLAT WASHER - NUT
#10-32 SCREW	2 & 5	UL RECOGNIZED	.02 - 50	* SADDLE CLAMP - FLAT WASHER - SCREW
		UL-489 LISTED	.02 - 50	LOCK WASHER - FLAT WASHER - SCREW
		TUV & VDE CERTIFIED	.02 - 16	* SADDLE CLAMP - FLAT WASHER - SCREW
		TUV & VDE CERTIFIED	16.1 - 50	LOCK WASHER - FLAT WASHER - SCREW

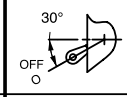
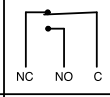
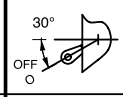
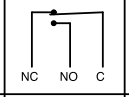
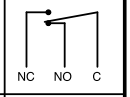
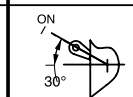
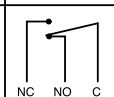
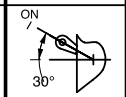
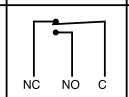
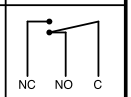
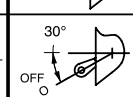
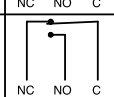
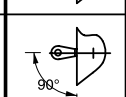
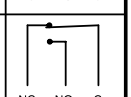
* THE SADDLE CLAMP IS FOR DIRECT WIRE CONNECTION USE. DISCARD SADDLE CLAMP IF WIRE TERMINAL LUG IS USED

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Available on Series Trip and Switch Only Circuits when called for on multi-pole units.
Only one auxiliary switch is normally supplied, as viewed in mulit-pole identification scheme.

Circuit & Terminal Diagrams: in. [mm]

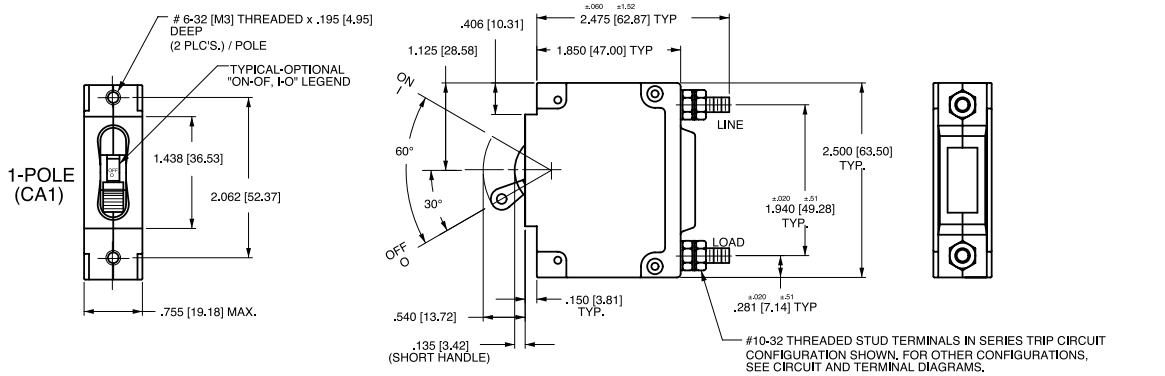


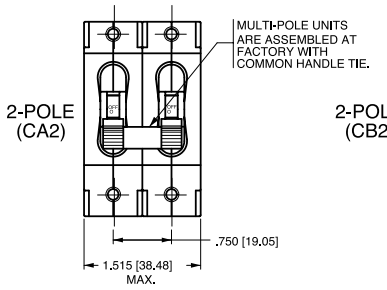
HANDLE POSITION VS. AUX/ALARM SWITCH MODE

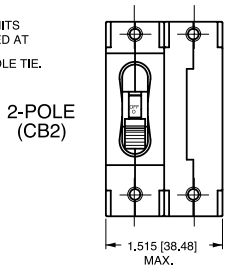
CIRCUIT BREAKER MODE	STANDARD C/B HANDLE POSITION	STANDARD C/B AUX. SWITCH MODE	MID TRIP C/B HANDLE POSITION	MID TRIP C/B STANDARD ALARM SWITCH MODE	MID TRIP C/B REVERSE ALARM SWITCH MODE[4]
OFF					
ON					
ELECTRICAL TRIP					

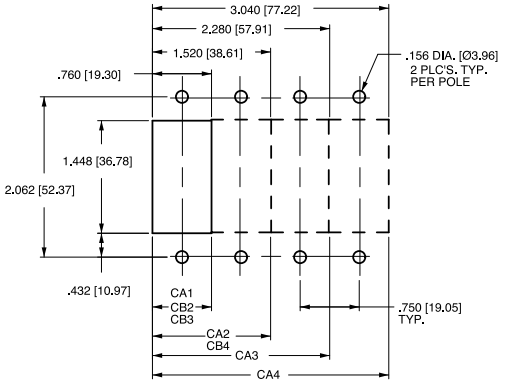
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Schematic shown represents current trip circuits.
4 Available only as special catalog number.

Dimensional Specifications: in. [mm]

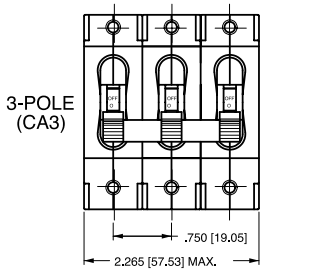


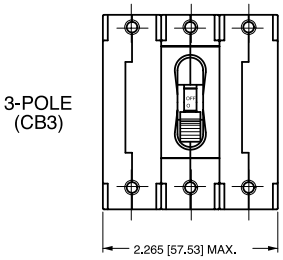


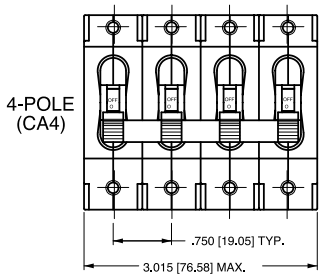


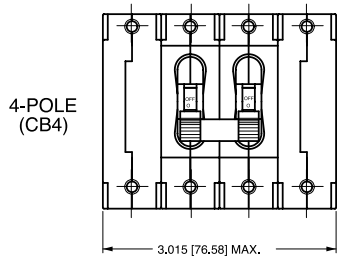


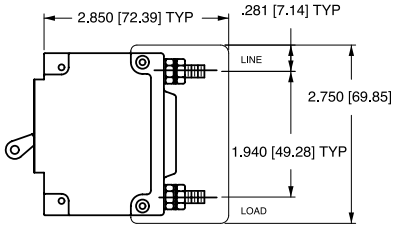
PANEL CUTOUT DETAIL
TOLERANCES ±.005 [.12]



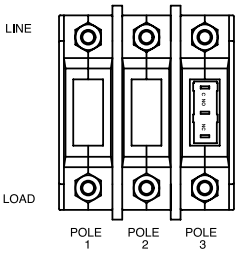




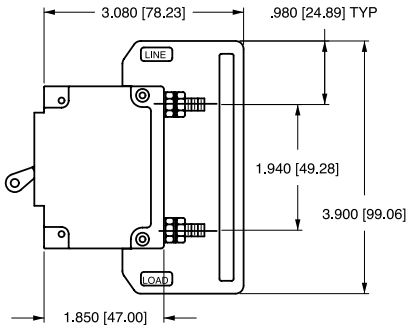




BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS



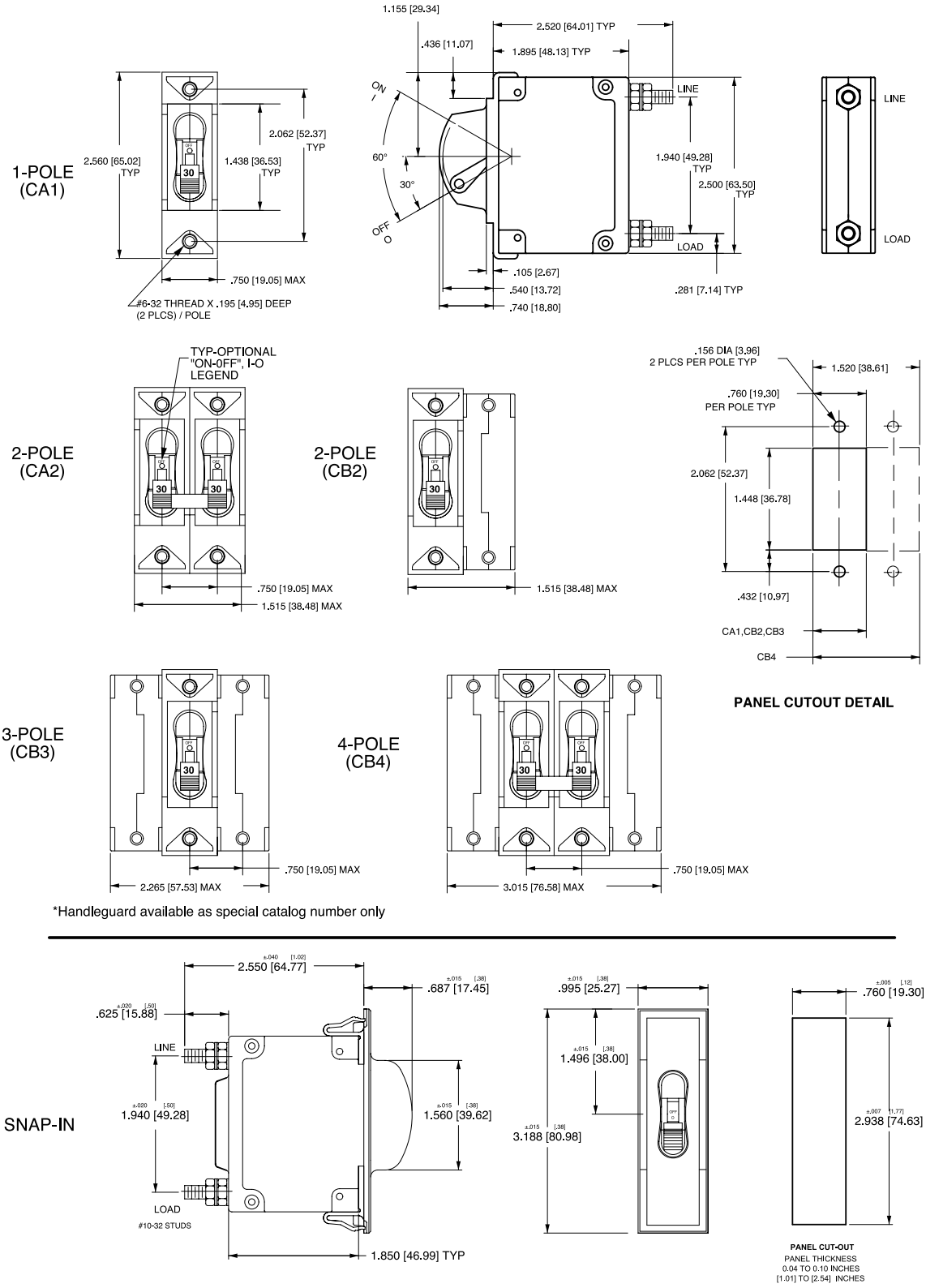
MULTI-POLE IDENTFICATION SCHEME AS VIEWED FROM TERMINAL END OF BREAKER.



BARRIER FOR UL-489 LISTED MULTI-POLE BREAKERS

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

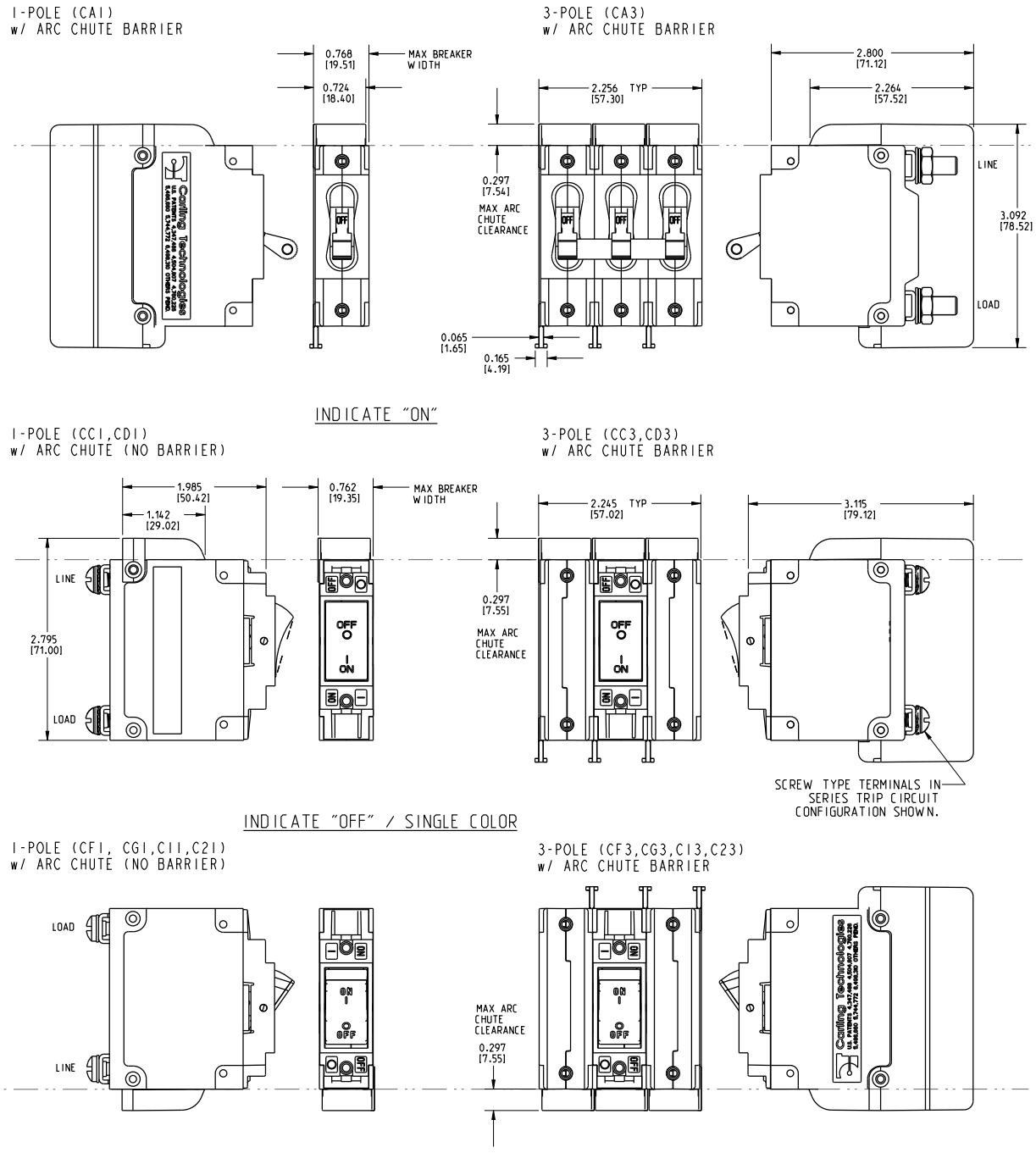
Dimensional Specifications: in. [mm]



*Handleguard available as special catalog number only

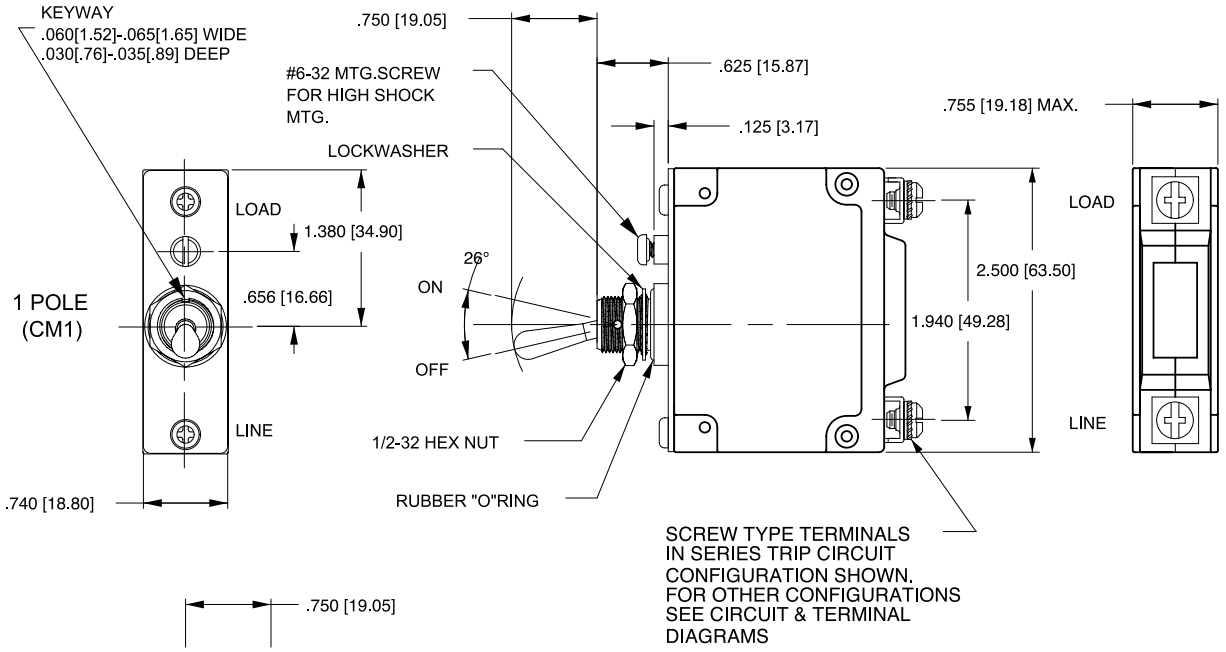
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

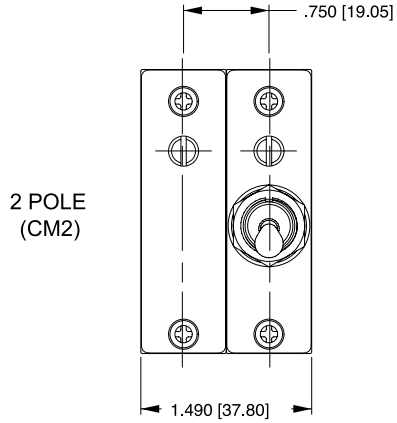
Dimensional Specifications: in. [mm]

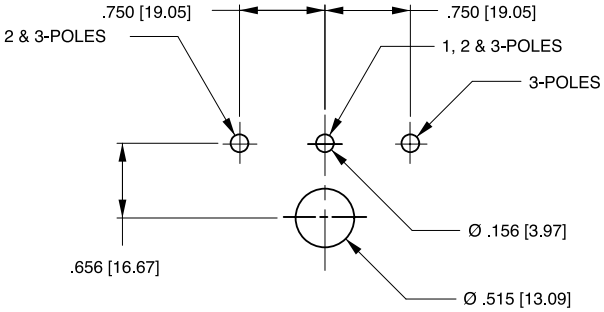


Notes:
1 Only 1-pole and 3-pole configurations shown. Arc chute (without barrier) and arc chute barrier also available for 2-pole construction.
2 Dimensions apply to all variations shown.
3 Notice that line and load terminal orientation for indicate on and indicate off rocker circuit breakers are opposite.
4 Screw type terminals shown for Rocker style (CF1, C11, etc) circuit breakers. For other terminal configurations see circuit and terminal diagrams.
5 All dimensions are in inches [millimeters].
6 Tolerance ± .020 unless otherwise specified.
7 Must be ordered under a special catalog number.

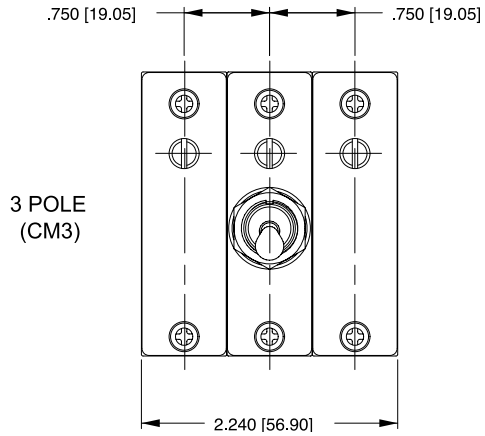
Dimensional Specifications: in. [mm]





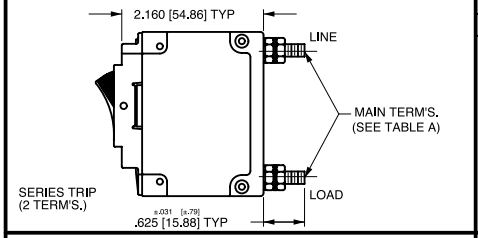
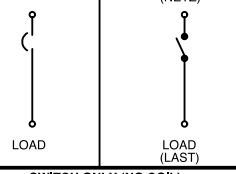
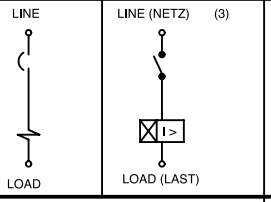
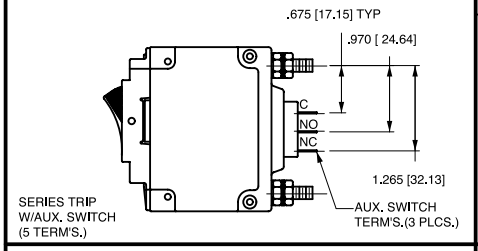
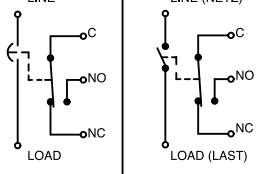
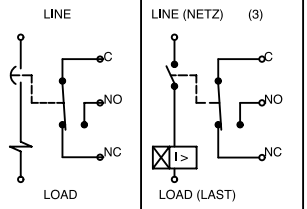
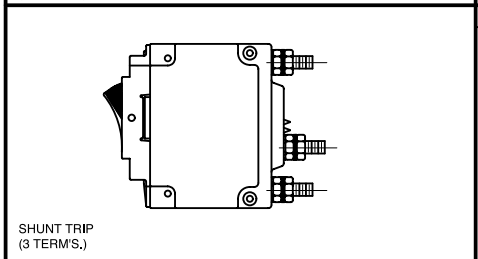
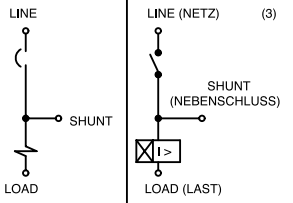
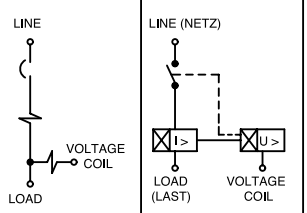
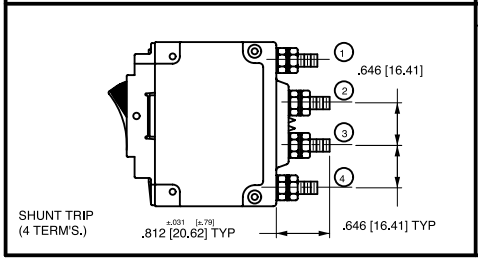
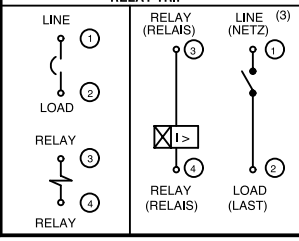
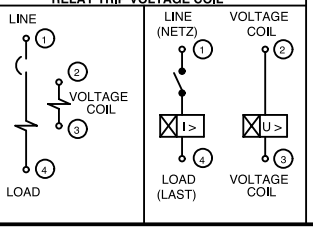


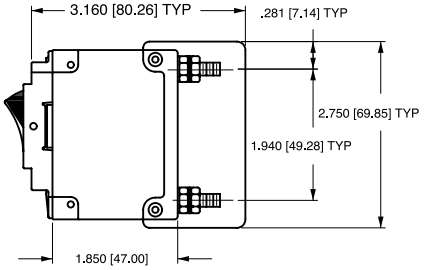
PANEL CUTOUT DETAIL
TOLERANCES ±.005[.13]



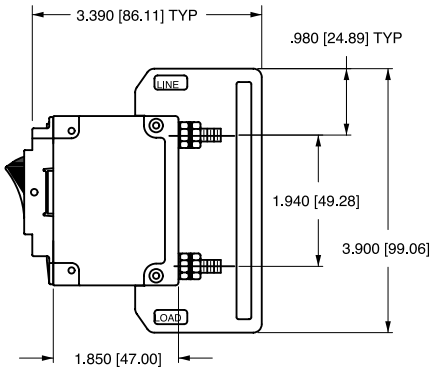
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

Circuit & Terminal Diagrams: in. [mm]

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE
	ANSI / IEC SWITCH ONLY (NO COIL) 	A	0	ANSI / IEC SWITCH TRIP 	BC	0
	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 	A	2 3 4	SERIES TRIP WITH AUXILIARY SWITCH 	BC	2 3 4
	SHUNT TRIP 	DE	0	DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL 	H	0
	RELAY TRIP 	FG	0	DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL 	K	0



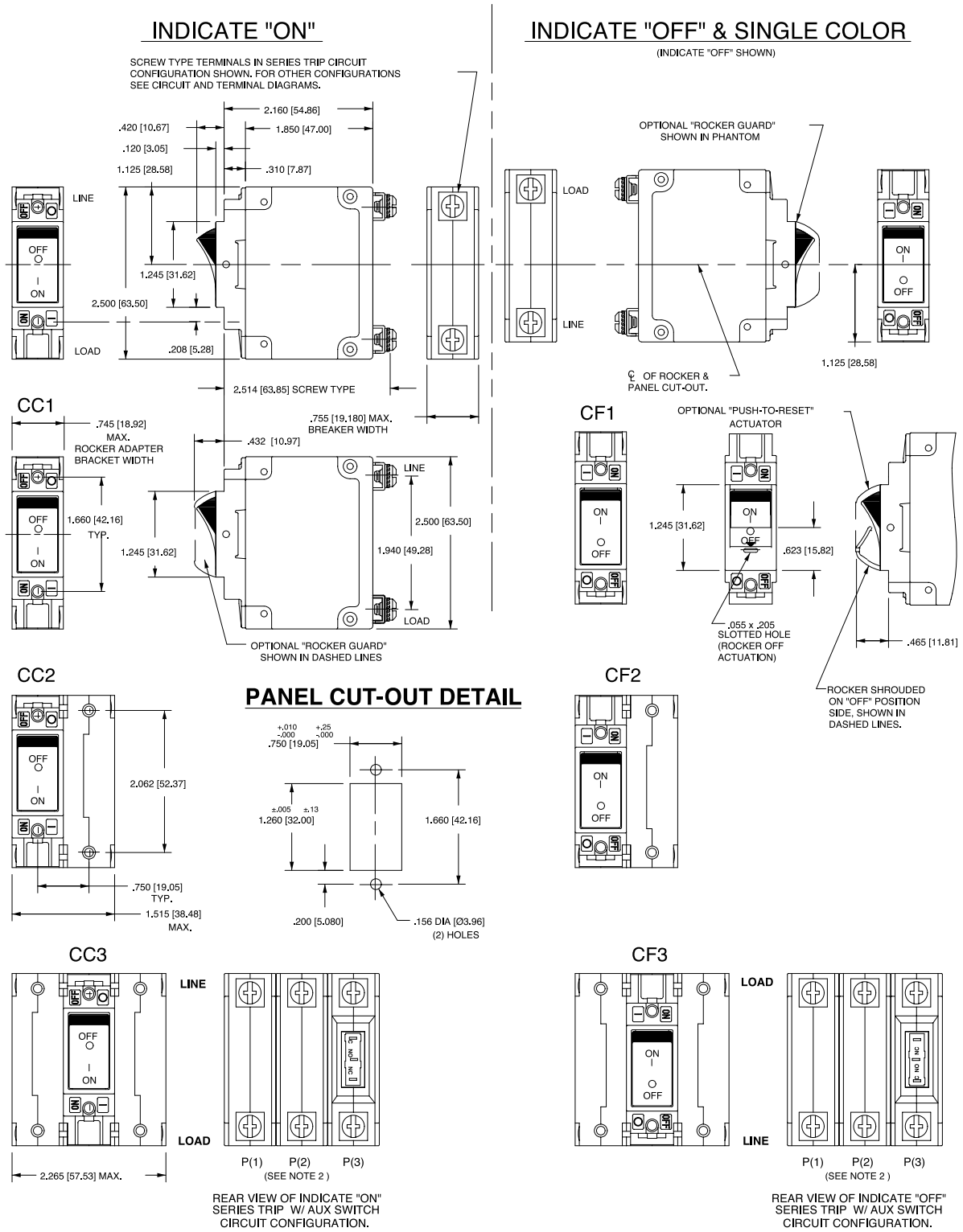
BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS



BARRIER FOR UL-489 LISTED MULTI-POLE BREAKERS

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Schematic shown represents current trip circuit.

Dimensional Specifications: in. [mm]

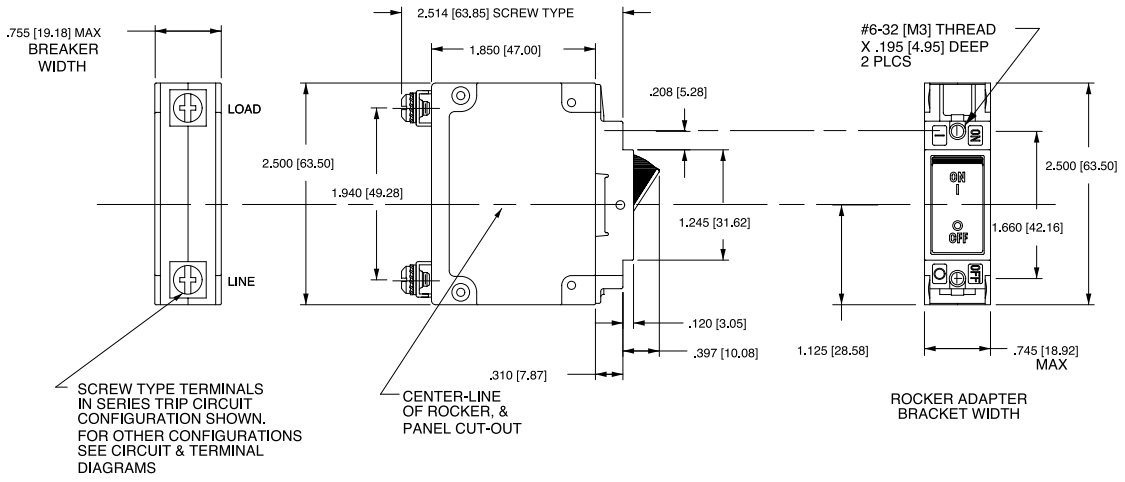


Notes:
1 Dimensions apply to all variations shown. Notice that circuit breaker line and load terminal orientation on indicate OFF is opposite of indicate ON.
2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
3 All dimensions are in inches [millimeters].
4 Tolerance ±.020 [.51] unless otherwise specified.

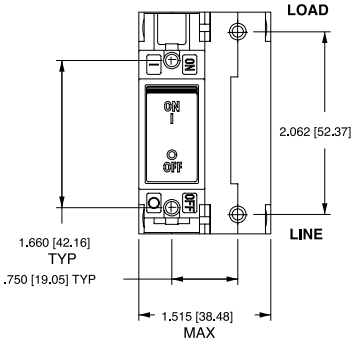
Dimensional Specifications: in. [mm]

INDICATE "OFF" & SINGLE COLOR

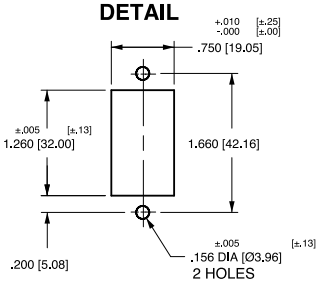
C11

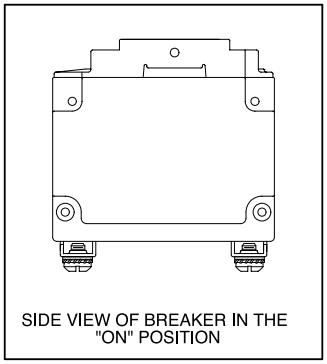


C12



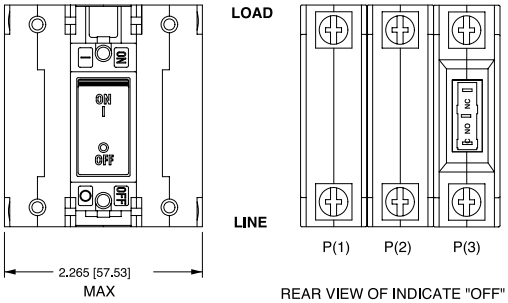
PANEL CUT-OUT DETAIL





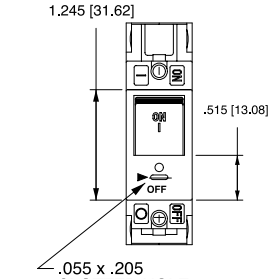
SIDE VIEW OF BREAKER IN THE "ON" POSITION

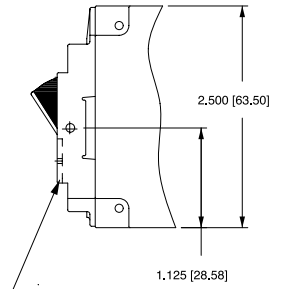
C13



REAR VIEW OF INDICATE "OFF" SERIES TRIP W/ AUX SWITCH CIRCUIT CONFIGURATION.

PUSH-TO-RESET ACTUATOR





ROCKER SHROUDED ON "OFF" POSITION SIDE, SHOWN IN DASHED LINES

ACTUATOR SIDE VIEW
(SURFACE CONTOURS)

FLAT ROCKER

RECESSED OFF SIDE ROCKER

Notes:
1 For pole orientation with horizontal legend, rotate front view clockwise 90°.
2 All dimensions are in inches [millimeters].
3 Tolerance ±.020 [.51] unless otherwise specified.

E-Series
CIRCUIT BREAKER

The E-Series hydraulic-magnetic circuit breaker is ideally suited for higher current and voltage applications. It is UL listed and CSA certified for branch circuit protection, which does not require a fuse back up. It is also UL recognized and CSA certified as a supplementary protector and as a manual motor controller.

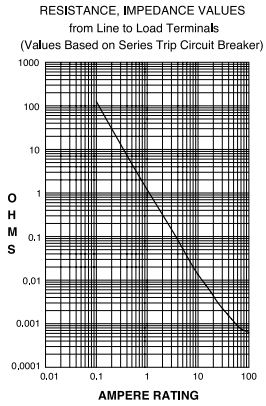
Its physical features include front and back mounting, screw and stud terminals and heavy duty box wire connectors for solid wire or a pressure plate connector for standard wire. The E-series is available with handle actuators and can be configured as .1-125 amps, up to 600VAC or 125VDC, with choice of time delays, actuator colors and 1 to 6 poles configuration. Additionally, a Power Selector device is also available.

Product Highlights:

- UL listed and CSA certified
- Certified for circuit branch protection
- Recognized as a supplementary protector and as a manual motor controller
- Optional power selector device

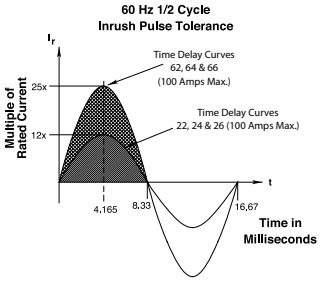
Electrical

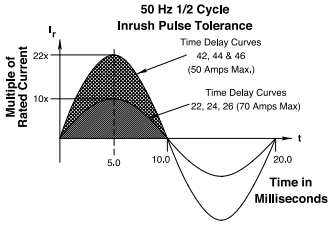
Maximum Voltage	600VAC 50/60 Hz, 125VDC (See Table A)
Current Ratings	Standard current coils: 0.100, 0.250, 0.500, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 50.0, 60.0, 70.0 & 100 Amp.
Auxiliary Switch Rating	SPDT; 10.1A 250VAC, 1.0A 65VDC; 0.5A 80VDC, 0.1A 125VAC (with gold contacts).
Insulation Resistance	Minimum of 100 Megohms at 500 VDC.
Dielectric Strength	UL, CSA: 2200 V 50/60 Hz for one minute between all electrically isolated terminals. E-Series Circuit Breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker.



CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	± 15
5.1 - 20.0	± 25
20.1 - 50.0	± 35

Pulse Tolerance Curves





Mechanical

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated Current and Voltage.
Trip Free	All E-Series Circuit Breakers will trip on overload, even when Handle is forcibly held in the ON position.
Trip Indication	The operating Handle moves positively to the OFF position when an overload causes the breaker to trip.

Physical

Number of Poles	1 - 6
Mounting	A 3" minimum spacing must be provided between the circuit breaker arc venting area on back connected E-Series circuit breakers and grounded obstructions. E-Series circuit breakers must be mounted on a vertical surface.
Connectors, Box Type	Front connected E-Series circuit breakers are supplied with box type pressure connectors that accept copper or aluminum conductors as follows: 1/0-14 Copper, 1/0-12 Aluminum.
Internal Circuit Configuration	Series and Switch Only, (with or without auxiliary switch). Shunt with current coils.
Weight	Approximately 252 grams/pole (Approximately 9 ounces/pole)
Standard Colors	Housing-Black; Actuator - See Ordering Scheme.

Environmental

Designed in accordance with requirements of specification MIL PRF-55629 & MIL-STD-202G as follows:

Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I".
Vibration	Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A.
Moisture Resistance	Method 106D, i.e., ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Thermal Shock	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
Operating Temperature	-40° C to +85° C

*Manufacturer reserves the right to change product specification without prior notice.

Electrical Tables

Table A: Lists UL Listed (489) & CSA Certified (C22.2 No. 5) configurations & performance capabilities as a Molded Case Circuit Breaker.

E SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS						
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)	HIGH INTERRUPTING CAPACITY (AMPS)
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE	
SERIES	80	DC	---	0.10 - 100	5,000	50,000
	125	DC	---	0.10 - 100	5,000	10,000
	125	DC	---	0.10 - 125	10,000	---
	120	50 / 60	1	0.10 - 125	10,000	---
	240	50 / 60	1	0.10 - 30	5,000	10,000
	240	50 / 60	1	31 - 100	5,000	
	120 / 240	50 / 60	1	0.10 - 30	5,000	10,000
	120 / 240	50 / 60	1	31 - 100	5,000	---
	120 / 240	50 / 60	1	101 - 125	10,000	---
	240	50 / 60	3	0.10 - 100	5,000	---

Table B: Lists UL Recognized & CSA Accepted configurations & performance capabilities as a Component Supplementary Protector.

E -SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS									
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING		SHORT CIRCUIT CAPACITY (AMPS)		APPLICATION CODES	
						UL/CSA			
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	GENERAL PURPOSE AMPS	WITH BACKUP FUSE[3]	WITHOUT BACKUP FUSE	UL	CSA
SERIES & SHUNT	125	DC	---	0.02 - 100	---	---	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1
	125	DC	---	---	101 - 120	---	5,000	TC1,2, OL0, U1	TC1,2, OL0, U1
	150	DC	---	---	0.02 - 125	---	5,000	TC1, OL0, U3	TC1, OL0, U3
	160	DC	---	0.02 - 100	---	---	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1
	150 / 300	DC	---	0.02 - 100	---	---	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1
	120 / 240	50 / 60	1	---	0.02 - 100	---	5,000	TC1,2, OL0, U1	TC1,2, OL0, U1
	240	50 / 60	1	0.02 - 100	---	---	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1
	250	50 / 60	1	0.02 - 100	---	10,000	---	TC1,2, OL1, C1	TC1,2, OL1, C1
	277	50 / 60	1	0.02 - 100	---	---	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1
						10,000	---	TC1,2, OL1, C1	TC1,2, OL1, C1
	480	50 / 60	1 & 3	0.02 - 100	---	10,000	---	TC1,2, OL1, C1	TC1,2, OL1, C1
	480[1]	50 / 60	1 & 3	0.02 - 50	---	10,000	---	TC1,2, OL1, C1	TC1,2, OL1, C1
	600	50 / 60	1 & 3	0.02 - 100	---	10,000	---	TC1,2, OL1, C1	TC1,2, OL1, C1
	600[2]	DC	---	---	0.02 - 125	---	5,000	TC1, OL0, U3	TC1, OL0, U3
SWITCH ONLY	125	DC	---	0.02 - 120					
	160	DC	---	0.02 - 100					
	240	50 / 60	1	0.02 - 100					
	277	50 / 60	1	0.02 - 100					
	480	50 / 60	1 & 3	0.02 - 100					
	600	50 / 60	1 & 3	0.02 - 100					

Notes:
1 Per pole opposite polarity rating - Delta Configuration.
2 4 Poles connected in series
3 Requires branch circuit backup with a UL Listed Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amp rating and not to exceed 225A.

Electrical Tables

Table C: Lists UL Recognized, CSA Accepted and VDE Certified configurations and performance capabilities as a Component Supplementary Protector.

E -SERIES TABLE C: COMPONENT SUPPLEMENTARY PROTECTORS WITH VDE										
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	SHORT CIRCUIT CAPACITY (AMPS)			APPLICATION CODES		CONSTRUCTION NOTES
					UL/CSA		VDE (Icn)			
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITH BACKUP FUSE[1]	WITHOUT BACKUP FUSE	WITHOUT BACKUP FUSE	UL	CSA	
SERIES & SHUNT	125	DC	---	0.1 - 100	---	5,000	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1	1 or 2 Poles
	240	50 / 60	1 & 3	0.1 - 100	---	5,000	5,000	TC1,2, OL1, U1	TC1,2, OL1, U1	1 - 5 Poles. Up to 4 Current Poles, 1 Voltage Pole
	415	50 / 60	1 & 3	0.1 - 100	10,000	---	4,000	TC1,2, OL1, C1	TC1,2, OL1, C1	2 - 5 Poles. Up to 4 Current Poles, 1 Voltage Pole
SWITCH ONLY	125	DC	---	0.1 - 125						
	240	50 / 60	1 & 3	0.1 - 100						
	415	50 / 60	1 & 3	0.1 - 100						

Notes:
1 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amp rating and not to exceed 225 amps.

Table D: Lists UL Recognized, CSA Accepted configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

E SERIES TABLE D : UL1500 (Marine Ignition Protection)							
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	SHORT CIRCUIT CAPACITY (AMPS)	APPLICATION CODES	
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE	UL	CSA
SERIES	65	DC	---	0.02 - 100	5,000	TC1,2,OL1,U1	TC1,2,OL1,U1
	125	50 / 60	1	0.02 - 100	1,500	TC1,2,OL1,U1	TC1,2,OL1,U1
	250	50 / 60	1	0.02 - 100	1,500	TC1,2,OL1,U1	TC1,2,OL1,U1

Agency Certifications

UL Recognized

UL Standard 1077

Component Recognition Program as Protectors, Supplementary (Guide QVNU2, File E75596)

Component Recognition Program as Manual Motor Controls (Guide NLRV2, File E135367)

UL Standard 1500

Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

UL Listed

UL Standard 489

Circuit Breakers, Molded Case (Guide DIVQ, File E129899)

CSA Accepted

Component Supplementary Protector (Class 3215 30, File 047848 0 000)
CSA Standard C22.2 No. 235

CSA Certified

Circuit Breaker Molded Case (Class 1432 01, File 093910),
CSA Standard C22.2 No. 5.1 - M

TUV Certified

EN60934 under License No. R72031056

VDE Certified

EN60934, VDE 0642 under File No. 10537

E	A	2	–	B	0	–	24	–	450	–	1	2	A	–	C	B
1 Series	2 Actuator	3 Poles		4 Circuit	5 Auxiliary Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Maximum Application Rating	12 Agency Approval

1 SERIES
E

2 ACTUATOR
A	Handle, one per pole

3 POLES [1]
1	One	3	Three	5	Five
2	Two	4	Four	6	Six

4 CIRCUIT [2]
A [3]	Switch Only (no coil)	**E**	Shunt Trip (voltage)
B	Series Trip (current)	**F**	Relay Trip (current)
C	Series Trip (voltage)	**G**	Relay Trip (voltage)
D	Shunt Trip (current)		

5 AUXILIARY SWITCH [4]
0	without Auxiliary Switch	**6**	S.P.S.T. 0.110 Q.C. Terminals
2	S.P.D.T. 0.110 Q.C. Terminals	**7**	S.P.S.T. 0.110 Q.C. Terminals (Gold Contacts)
3	S.P.D.T. 0.139 Solder Lug	**8**	S.P.S.T. 0.187 Q.C. Terminals
4	S.P.D.T. 0.110 Q.C. Terminals (Gold Contacts)	**9**	S.P.D.T. 0.187 Q.C. Terminals

6 FREQUENCY & DELAY
03 [3]	DC 50/60Hz, Switch Only	**34**	DC, 50/60Hz Medium
10 [5]	DC Instantaneous	**36**	DC, 50/60Hz Long
12	DC Short	**62**	50/60Hz Short, Hi-Inrush
14	DC Medium	**64**	50/60Hz Medium, Hi-Inrush
16	DC Long	**66**	50/60Hz Long, Hi-Inrush
20 [5]	50/60Hz Instantaneous	**72**	DC, Short,Hi-Inrush
22	50/60Hz Short	**74**	DC,Medium, Hi-Inrush
24	50/60Hz Medium	**76**	DC, Long, Hi-Inrush
26	50/60Hz Long	**92** [6]	DC, 50/60Hz Short, Hi-Inrush
30	DC, 50/60Hz Instantaneous	**94** [6]	DC, 50/60Hz Medium, Hi-Inrush
32	DC, 50/60Hz Short	**96** [6]	DC, 50/60Hz Long, Hi-Inrush

7 CURRENT RATING (AMPERES) [7]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660**	60.000
090	0.090	**512**	1.250	**610**	10.000	**670**	70.000
090	0.095	**415**	1.500	**710**	10.500	**680**	80.000
210	0.100	**517**	1.750	**611**	11.000	**690**	90.000
215	0.150	**420**	2.000	**711**	11.500	**810**	100.000
220	0.200	**522**	2.250	**612**	12.000	**811**	110.000
225	0.250	**425**	2.500	**712**	12.500	**812**	120.000
230	0.300	**527**	2.750	**613**	13.000	**912** [8]	125.000

OR VOLTAGE COIL (MIN. TRIP RATING, VOLTS) [5]
A06	6 DC, 5 DC	**A65**	65 DC, 55 DC	**J48**	48 AC, 40 AC
A12	12 DC, 10 DC	**B25**	125 DC, 100 DC	**J65**	65 AC, 55 AC
A18	18 DC, 15 DC	**J06**	6 AC, 5 AC	**K20**	120 AC, 65 AC
A24	24 DC, 20 DC	**J12**	12 AC, 10 AC	**L40**	240 AC, 130 AC
A32	32 DC, 25 DC	**J18**	18 AC, 15 AC		
A48	48 DC, 40 DC	**J24**	24 AC, 20 AC		

8 TERMINAL [12]
BACK CONNECTED (FRONT MOUNTED ONLY)		MAX. RATING
1 [9]	10-32 Stud (All Terminals)	50 A
2 [9]	1/4-20 Stud (All Terminals)	120 A
A [9]	M5 Stud (Line & Load)	50 A
B [9]	M6 Stud (Line & Load)	100 A

FRONT CONNECTED (BACK MOUNTED ONLY)		MAX. RATING
3 [10]	Box Wire Connector (Line & Load)	100 A
C [11]	Box Wire Connector with Pressure Plate (Line & Load)	100 A
4	10-32 Screw (Line & Load)	50 A
D	M5 Screw (Line & Load)	50 A
5	10-32 “Bus-Type” Screw (Line), 10-32 Screw (Load)	50 A
E	M5 “Bus-Type” Screw (Line), 10-32 Screw (Load)	50 A
6 [10]	10-32 “Bus-Type” Screw (Line), Box Wire Connector (Load)	100 A
F [11]	10-32 “Bus-Type” Screw (Line), Box Wire Connector with Pressure Plate (Load)	100 A
7	1/4-20 Screw (Line & Load)	100 A
G	M6 Screw (Line & Load)	100 A
8	1/4-20 “Bus-Type” Screw (Line), 1/4-20 Screw (Load)	100 A
H	M6 “Bus-Type” Screw (Line), M6 Screw (Load)	100 A
9 [10]	1/4-20 “Bus-Type” Screw (Line), Box Wire Connector (Load)	100 A
J [11]	1/4-20 “Bus-Type” Screw (Line), Box Wire Connector with Pressure Plate (Load)	100 A

9 ACTUATOR COLOR & LEGEND [13]
Actuator Color	I-O	ON-OFF	Dual	Legend Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White
Red	**F**	**G**	**3**	White
Green	**H**	**J**	**4**	White
Blue	**K**	**L**	**5**	White
Yellow	**M**	**N**	**6**	Black
Gray	**P**	**Q**	**7**	Black
Orange	**R**	**S**	**8**	Black

10 MOUNTING / BARRIERS
BACK CONNECTED (FRONT MOUNTED ONLY)

	Mounting Inserts
A	6-32
B	ISO M3

FRONT CONNECTED (BACK MOUNTED ONLY) [14]

	Back Mounting Foot Type	Front Mounting Inserts (Optional Use)
C	Short	6-32
D	Short	ISO M3
E	Long	6-32
F	Long	ISO M3

11 MAXIMUM APPLICATION RATING [15]
A	65 VDC, 120 A	**G** [16]	600 VAC, 100 A
B	125 VDC, 120 A	**H** [16]	480 VAC, 100 A
C	120/240 VAC, 100 A	**J** [16]	415 VAC, 100 A
D	240 VAC, 100 A	**L** [16]	160 VDC, 100 A
E [16]	277/480 VAC, 100 A	**T**	125 VDC/240 VAC, 100 A
F	277 VAC, 100 A	**W** [16]	125 VDC/415 VAC, 100 A

12 AGENCY APPROVAL
B	UL 1077 / UL508 Recognized & CSA Accepted
D	UL 1077 Recognized, CSA Accepted, & VDE Certified

Notes:
1. VDE approval on 1-5 poles only. Standard multi-pole units identical poles except when specifying auxiliary switch - (see Note 4). For mixed ratings, consult factory.
2. Switch Only & Series Trip construction available with either front or back connected terminals.
   Shunt construction available with back connected terminals, (Terminal Codes 1 & 2) only. Circuit Codes B,C & D are VDE approved.
3. Switch Only construction: 30 amps or less select Current Rating Code 630; 31-70 amps, select Current Rating code 670; 71-100 amps, select Current Rating Code 810; 101-125 amps Select Current Rating Code 912. Switch Only is VDE approved only if tied to a protected pole.
4. Auxiliary Switch available on Switch Only and Series Trip units. On multi-pole units, only one auxiliary switch is normally supplied mounted in the extreme right pole. Back mounted units require special mounting provisions when auxiliary switch is specified. VDE approval on Auxilary Switch Codes 0,2,3 & 4 only.
5. Voltage Trip Coils are not rated for continuous duty. Available only with Frequency & Delay Codes 10 & 20. Series Trip construction with a voltage coil s VDE approved only if tied to a protected pole.
6. Frequency & Delay Codes 92,94 & 96 are not VDE Certified.
7. Current Coil Ratings 0.100 - 100 ams are VDE Certified.
8. 125 A rating (Code 912) available as a Switch Only (Circuit Code A), rated 125 VDC (Code B).
9. An Anti-Flash Over Barrier is supplied between poles on multi-pole units with 10-32 (Terminal Code 1). 1/4-20 (Code 2), M5 (Code A), and M6 (Code B) terminals per UL requirement.
10. Box Wire Connector will accept #14 through 0 AWG. copper wire or #12 through 0 AWG. aluminum wire.
11. Box Wire Connector with Pressure Plate for stranded wire, consult factory for details.
12. Terminal Codes A,B,D,E,G & H are not VDE Certified.
13. VDE approvals require Dual (I-O, ON-OFF) or I-O markings on all handles.
14. Back Mounted breakers can also be front mounted by utilizing the proper front panel mounting inserts normally supplied. However, terminal connections must be made prior to mounting.
15. Application ratings B,D,J,T & W are available with VDE.
16. 415, 480 & 600 VAC ratings require 3 or 4 pole break 3Ø and 2 pole break 1Ø.

E	A	2	–	B	0	–	24	–	450	–	1	2	A	–	C	C
1 Series	2 Actuator	3 Poles		4 Circuit	5 Auxiliary Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting/ Barriers		11 Maximum Application Rating	12 Agency Approval

1 SERIES
E

2 ACTUATOR
A Handle, one per pole

3 POLES [1]
1	One	3	Three	5	Five
2	Two	4	Four	6	Six

4 CIRCUIT [2]
B Series Trip (current)
C [3] Series Trip (voltage)

5 AUXILIARY SWITCH [4]
0	without Auxiliary Switch	**6**	S.P.S.T. 0.110 Q.C. Terminals
2	S.P.D.T. 0.110 Q.C. Terminals	**7**	S.P.S.T. 0.110 Q.C. Terminals (Gold Contacts)
3	S.P.D.T. 0.139 Solder Lug	**8**	S.P.S.T. 0.187 Q.C. Terminals
4	S.P.D.T. 0.110 Q.C. Terminals (Gold Contacts)	**9**	S.P.D.T. 0.187 Q.C. Terminals

6 FREQUENCY & DELAY
10 [5]	DC Instantaneous	**62**	50/60Hz Short, Hi-Inrush
12	DC Short	**64**	50/60Hz Medium, Hi-Inrush
14	DC Medium	**66**	50/60Hz Long, Hi-Inrush
16	DC Long	**72**	DC, Short,Hi-Inrush
20 [5]	50/60Hz Instantaneous	**74**	DC,Medium, Hi-Inrush
22	50/60Hz Short	**76**	DC, Long, Hi-Inrush
24	50/60Hz Medium		
26	50/60Hz Long		

7 CURRENT RATING (AMPERES) [7]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
020	0.020	**235**	0.350	**430**	3.000	**614**	14.000
025	0.025	**240**	0.400	**435**	3.500	**615**	15.000
030	0.030	**245**	0.450	**440**	4.000	**616**	16.000
035	0.035	**250**	0.500	**445**	4.500	**617**	17.000
040	0.040	**255**	0.550	**450**	5.000	**618**	18.000
045	0.045	**260**	0.600	**455**	5.500	**620**	20.000
050	0.050	**265**	0.650	**460**	6.000	**622**	22.000
055	0.055	**270**	0.700	**465**	6.500	**624**	24.000
060	0.060	**275**	0.750	**470**	7.000	**625**	25.000
065	0.065	**280**	0.800	**475**	7.500	**630**	30.000
070	0.070	**285**	0.850	**480**	8.000	**635**	35.000
075	0.075	**290**	0.900	**485**	8.500	**640**	40.000
080	0.080	**295**	0.950	**490**	9.000	**650**	50.000
085	0.085	**410**	1.000	**495**	9.500	**660**	60.000
090	0.090	**512**	1.250	**610**	10.000	**670**	70.000
090	0.095	**415**	1.500	**710**	10.500	**680**	80.000
210	0.100	**517**	1.750	**611**	11.000	**690**	90.000
215	0.150	**420**	2.000	**711**	11.500	**810**	100.000
220	0.200	**522**	2.250	**612**	12.000	**811**	110.000
225	0.250	**425**	2.500	**712**	12.500	**812**	120.000
230	0.300	**527**	2.750	**613**	13.000	**912** [8]	125.000

OR VOLTAGE COIL (MIN. TRIP RATING, VOLTS) [5]
A06	6 DC, 5 DC	**A65**	65 DC, 55 DC	**J48**	48 AC, 40 AC
A12	12 DC, 10 DC	**B25**	125 DC, 100 DC	**J65**	65 AC, 55 AC
A18	18 DC, 15 DC	**J06**	6 AC, 5 AC	**K20**	120 AC, 65 AC
A24	24 DC, 20 DC	**J12**	12 AC, 10 AC	**L40**	240 AC, 130 AC
A32	32 DC, 25 DC	**J18**	18 AC, 15 AC		
A48	48 DC, 40 DC	**J24**	24 AC, 20 AC		

8 TERMINAL [7]
BACK CONNECTED (FRONT MOUNTED ONLY)		MAX. RATING
1 [8]	10-32 Stud (All Terminals)	50 A
2 [8]	1/4-20 Stud (All Terminals)	125 A

FRONT CONNECTED (BACK MOUNTED ONLY)		MAX. RATING
3 [9]	Box Wire Connector (Line & Load)	100 A
C [10]	Box Wire Connector with Pressure Plate (Line & Load)	100 A
4	10-32 Screw (Line & Load)	50 A
5	10-32 “Bus-Type” Screw (Line), 10-32 Screw (Load)	50 A
6 [9]	10-32 “Bus-Type” Screw (Line), Box Wire Connector (Load)	100 A
F [10]	10-32 “Bus-Type” Screw (Line), Box Wire Connector with Pressure Plate (Load)	100 A
7	1/4-20 Screw (Line & Load)	125 A
8	1/4-20 “Bus-Type” Screw (Line), 1/4-20 Screw (Load)	100 A
9 [9]	1/4-20 “Bus-Type” Screw (Line), Box Wire Connector (Load)	100 A
J [10]	1/4-20 “Bus-Type” Screw (Line), Box Wire Connector with Pressure Plate (Load)	100 A

9 ACTUATOR COLOR & LEGEND [12]
Actuator Color	ON-OFF	Dual	Legend Color
White	**B**	**1**	Black
Black	**D**	**2**	White
Red	**G**	**3**	White
Green	**J**	**4**	White
Blue	**L**	**5**	White
Yellow	**N**	**6**	Black
Gray	**Q**	**7**	Black
Orange	**S**	**8**	Black

10 MOUNTING / BARRIERS
BACK CONNECTED (FRONT MOUNTED ONLY)

	Mounting Inserts
A	6-32
B	ISO M3

FRONT CONNECTED (BACK MOUNTED ONLY) [11]

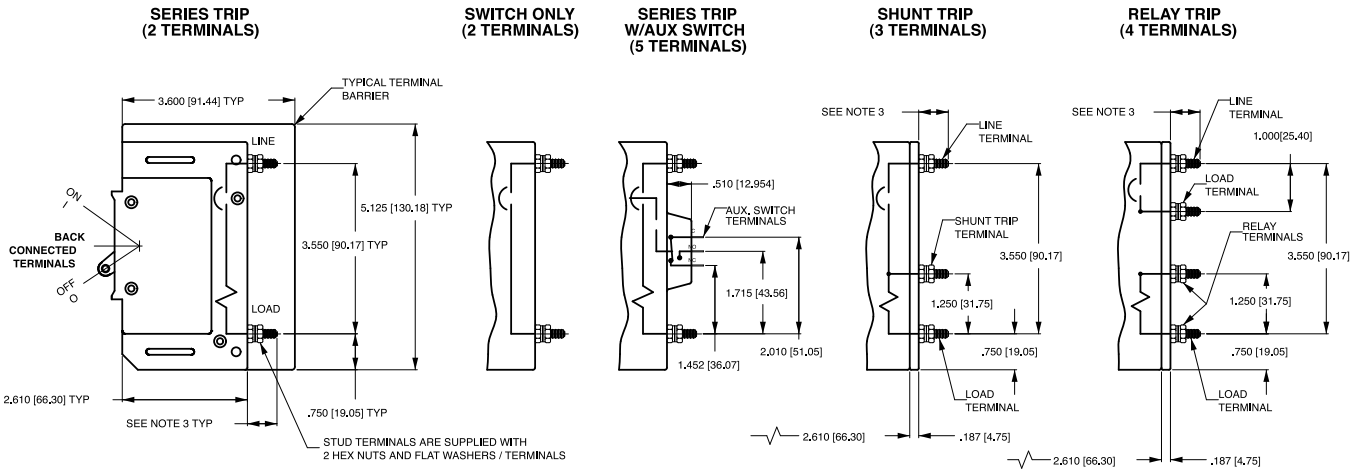
	Back Mounting Foot Type	Front Mounting Inserts (Optional Use)
C	Short	6-32
D	Short	ISO M3
E	Long	6-32
F	Long	ISO M3

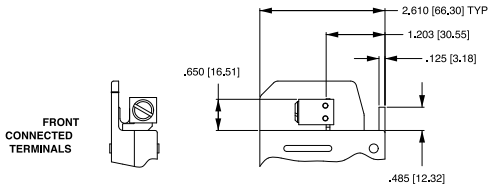
11 MAXIMUM APPLICATION RATING [15]
1 120 VAC
B 125 VDC, 120 A
C [13] 120/240 VAC, 100 A
D 240 VAC, 100 A

12 AGENCY APPROVAL
C UL 489 Listed & CSA Certified
F UL 489 Listed, CSA Certified, & VDE Certified

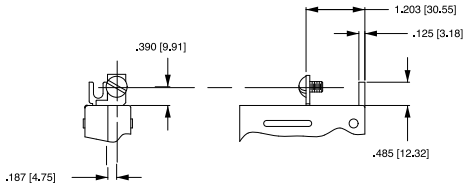
Notes:
1 Standard multi-pole units identical poles except when specifying auxiliary switch - (see Note 4). For mixed ratings, consult factory. VDE Certification on 1-5 poles only.
2 Series Trip construction available with either front or back connected terminals.
3 Series Trip construction with a voltage coil is not available as a single pole unit and must be tied to a protected pole.
4 On multi-pole units, only one auxiliary switch is normally supplied mounted in the extreme right pole per Figure A. Back mounted units require special mounting provisions when auxiliary switch is specified. VDE Certification on auxilary switch codes 0, 2, 3 & 4 only.
5 Voltage Trip Coils are not rated for continuous duty. Available only with Frequency & Delay Codes 10 & 20.
6 Frequency & Delay Codes 92, 94 & 96 are not VDE Certified.
7 Current Ratings under 0.100 amps are not VDE Certified .
8 An Anti-Flash Over Barrier is supplied between poles on multi-pole units with 10-32 Stud (Terminal Code 1) or 1/4-20 Stud (Code 2) terminals per UL requirement.
9 Box Wire Connector will accept #14 through 0 AWG. copper wire or #12 through 0 AWG. aluminum wire.
10 Box Wire Connector with Pressure Plate for stranded wire, consult factory for details.
11 Back Mounted breakers can also be front mounted by utilizing the proper front panel mounting inserts normally supplied. However, terminal connections must be made prior to mounting.
12 VDE Certification requires dual (I-O , ON-OFF) markings on all handles.
13 Not available with VDE Certification.

Circuit & Terminal Diagrams: in. [mm]

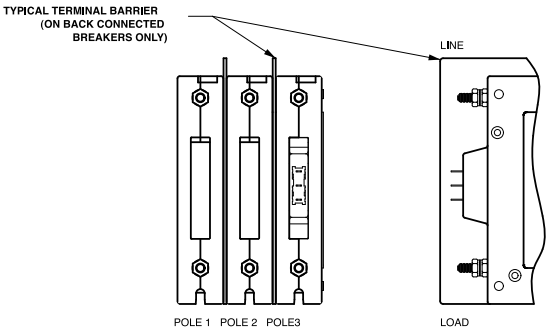




BOX TYPE WIRE CONNECTORS

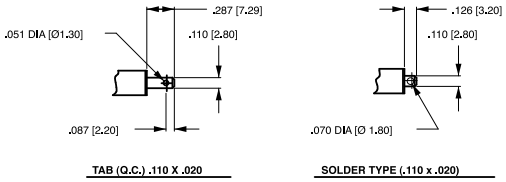


BUS TYPE SCREW TERMINALS



MULTI-POLE IDENTIFICATION SCHEME

AUXILIARY SWITCH TERMINALS



TAB (Q.C.) .110 X .020

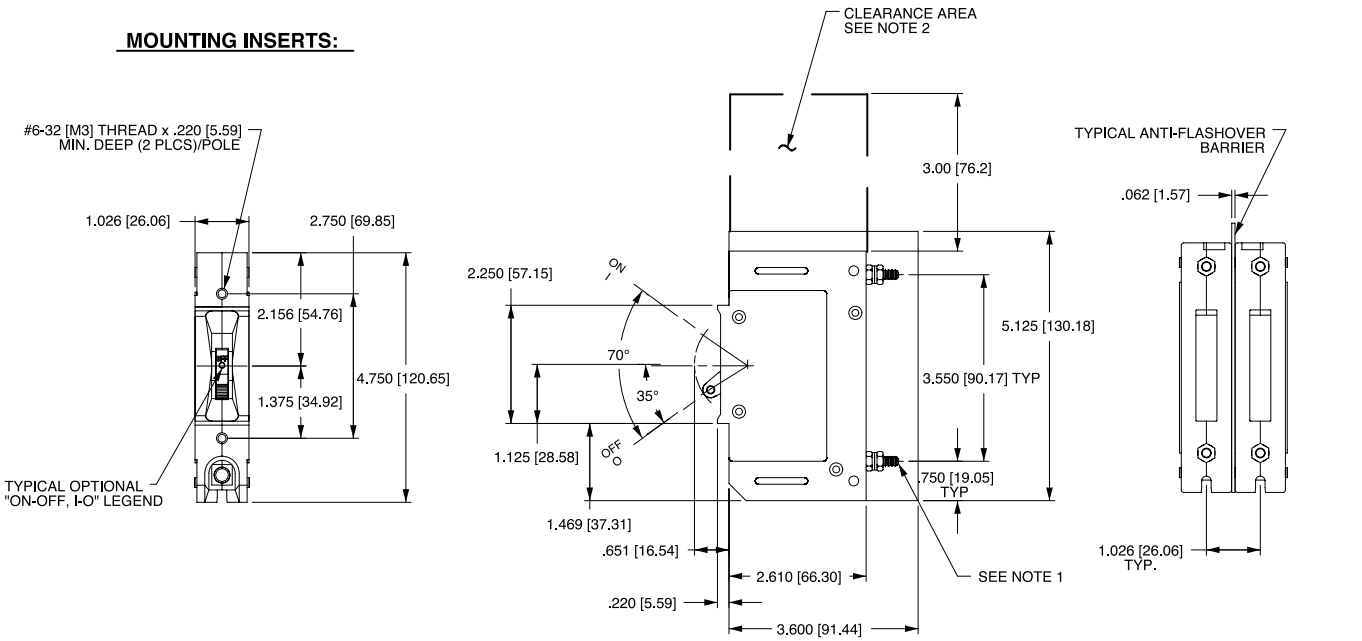
SOLDER TYPE (.110 x .020)

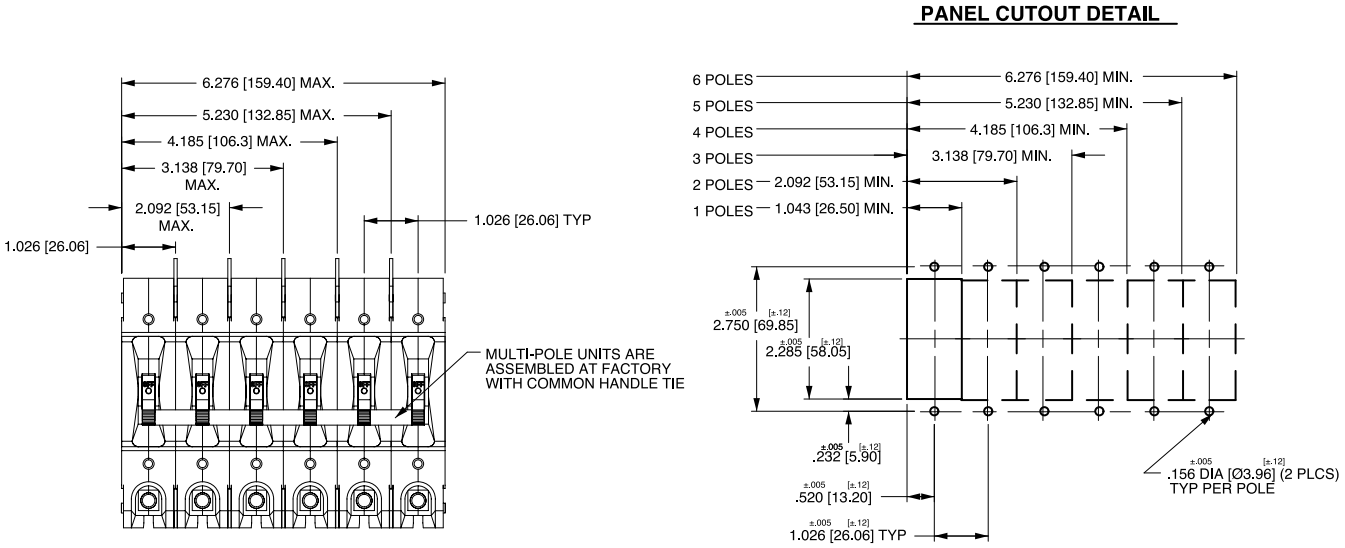
TABLE A
TIGHTENING TORQUE SPECIFICATIONS

THREAD SIZE TERMINAL TYPE	WIRE SIZE	TORQUE
#6-32 [M3] HARDWARE	—	7-9 IN-LBS [0.8-1.0 NM]
#10-32 THD TERMINAL SCREW	ALL	15-20 IN-LBS [1.7-2.3 NM]
1/4-20 THD TERMINAL SCREW	ALL	30-35 IN-LBS [3.4-4.0 NM]
#10-32 STUDS	ALL	15-20 IN-LBS [1.7-2.3 NM]
1/4-20 STUDS	ALL	30-35 IN-LBS [3.4-4.0 NM]
BOX WIRE CONNECTOR	14-10 AWG	35 IN-LBS [4.0 NM]
	8 AWG	40 IN-LBS [4.5 NM]
	6-4 AWG	45 IN-LBS [5.1 NM]
	3-1/0 AWG	50 IN-LBS [5.7 NM]

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 0-50 amps: 10-32 & M5 Studs .625±.062/15.88±1.574 long.
4 51-120 amps: 1/4-20 & M6 Studs .750±.062/19.05±1.574 long.

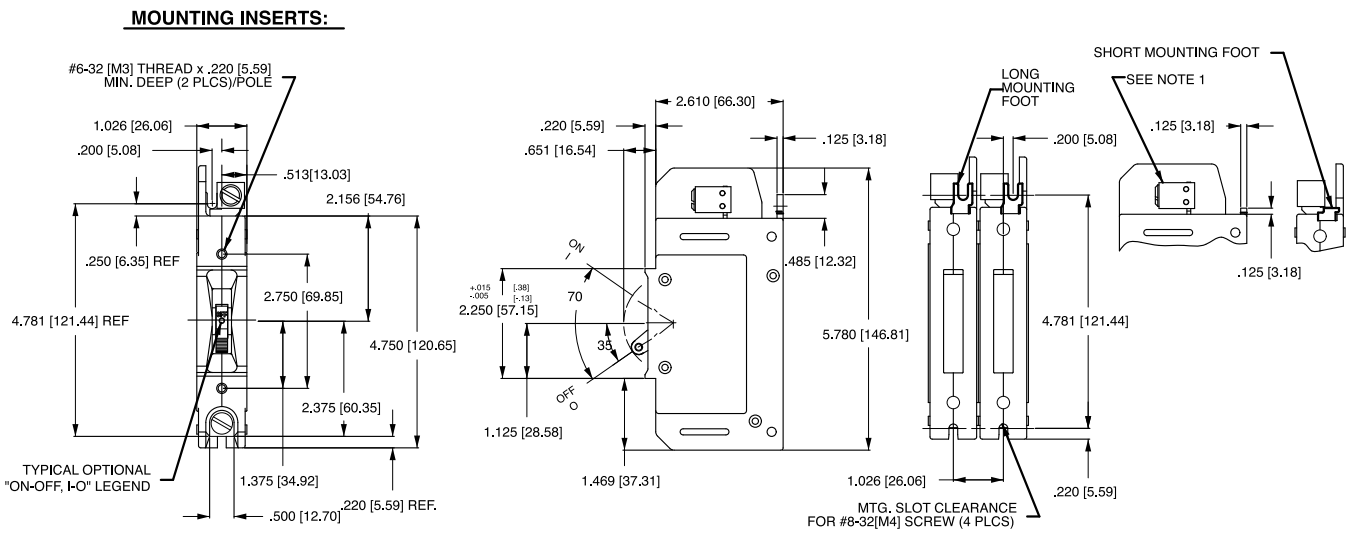
Dimensional Specifications: in. [mm]

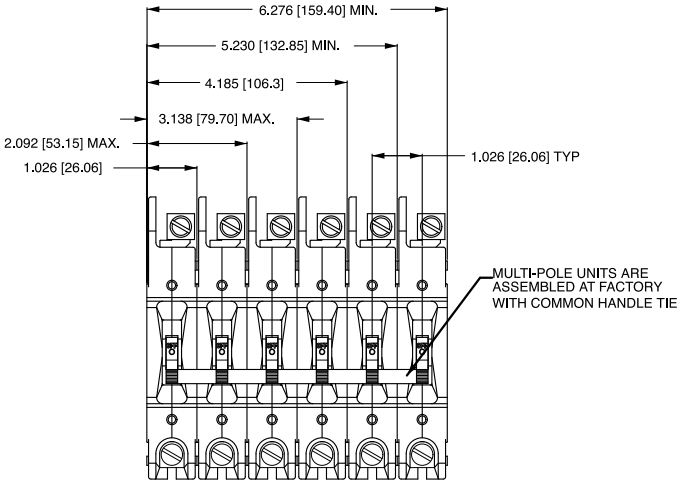


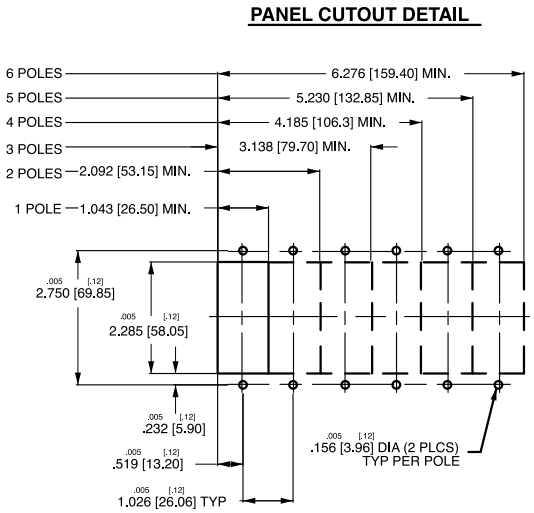


Notes:
1 1/4 -20 stud terminal in Series Trip circuit configuration shown.
2 A 3" min spacing must be provided between the circuit breaker arc venting area of back connected E-Series circuit breaker and grounded obstructions.
3 All dimensions are in inches [millimeters].
4 Tolerance ±.020 [.51] unless otherwise specified.
5 Circuit breakers must be mounted on vertical surface.

Dimensional Specifications: in. [mm]







Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 Box wire connector terminal in Series Trip circuit configuration shown.
4 Circuit breakers must be mounted on vertical surface.

F-Series
CIRCUIT BREAKER

The F-Series hydraulic-magnetic high amperage circuit breakers are designed to handle high current applications in extremely hot and/or cold locations. Due to its time-proven hydraulic-magnetic design, the F-Series load sensing mechanism is insensitive to changes in ambient or enclosure temperature, providing a consistent trip point over temperatures ranging from -40°C to +85°C. Additionally, the F-Series circuit breakers come with a choice of overload time delays, making them ideal for critical applications having inductive loads.

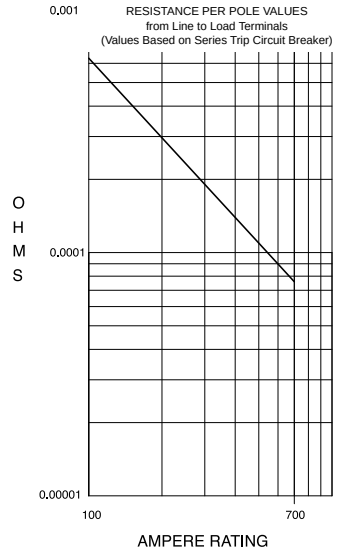
Further, the F-Series breakers are available up to 700A and an optional 25 millivolt metering shunt construction provides a safe method for monitoring current flowing through the breaker by simply connecting a meter with light gauge wire to the appropriate terminals located on the shunt housing at the rear of the breaker. Applications can be customized by measuring and displaying percentage of current, watts or safe/danger zones.

Product Highlights:

- AC ratings to UL 489
- DC voltage ratings up to 700A with metering shunt section
- Consistent trip point over temperatures ranging from -40°C to +85°C
- Optional 25 millivolt metering shunt construction

Electrical

Maximum Voltage	125VDC, 277VAC
Current Ratings	Standard current coils: 100, 125, 150, 175, 225, 250 amps. 300, 350, 400, 500, 600, 700 amps available as parallel pole construction.
Auxiliary Switch Rating	SPDT; 10.1 Amps @ 250VAC, 1.0 Amps @ 65VDC, 0.5 Amps @ 80VDC 0.1 Amps @ 125VAC (with gold contacts).
Insulation Resistance	Minimum: 100 Megohms at 500 VDC
Dielectric Strength	1960 VAC, 50/60 Hz for one minute between all electrically isolated terminals, except 2500 VAC for one minute between alarm/aux. switch and main terminals with contacts in open and closed position. F-Series circuit breakers comply with the 8mm spacing & 3750VAC 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxilary circuits per Publications EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker.



CURRENT (AMPS)	TOLERANCE (%)
100 - 700	50

Mechanical

Endurance	4000 ON-OFF operations with rated Current & Voltage & 4000 operations with no load (8000 operations total) @ 5 per minute. Parallel Pole construction: 1000 operations with rated Current and Voltage @ 5 per minute.
Trip Free	All F-Series Circuit Breakers will trip on overload, even when the actuator is forcibly held in the ON position.
Trip Indication	The operating actuator moves positively to the OFF position when an overload causes the circuit breaker to trip.

Physical

Number of Poles	1 - 3 Poles Note: Ratings over 250 Amps only available with parallel pole.
Internal Circuit Config.	Series (with or without auxiliary switch), Switch Only (with or without auxiliary switch).
Available Accessories	Factory installed: DC Current Metering Shunt (25 mV @Ir)
Weight	Varies depending on construction. Consult factory.
Standard Colors	Housing - Black; Actuator- Black or White with contrasting ON-OFF legend.

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
Vibration	Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current.
Moisture Resistance	Method 106D; ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.56 days @ +85°C, 85% RH.
Salt Spray	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Thermal Shock	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
Operating Temperature	-40° C to +85° C

*Manufacturer reserves the right to change product specification without prior notice.

Electrical Tables

Table A: Lists UL Listed (489)and CSA Certified (C22.2 N0. 5.1-M) configurations and performance capabilities as a Molded Case Circuit Breaker

F SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS						
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)	
	MAX RATING	FREQUENCY	PHASE	FULL LOAD AMPS	UL / CSA 1 - 3 POLES	TUV [2] 1 or 2 POLES
SERIES	125	DC	---	50 - 250	50,000	25,000
	120 / 240 [1]	50 / 60	1	100 - 250	10,000	---
	277	50 / 60	1	100 - 250	10,000	---
	208Y / 120	50 / 60	3	100 - 250	10,000	---

Notes:
1 120/240V rating available in 2 or 3 poles. In a 3 pole construction the center pole is Neutral.
2 TUV constructions are not available with AC ratings and 150-250 amp ratings only.

Table B: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A

F-SERIES TABLE B : UL489 LISTED BRANCH CIRCUIT BREAKERS				
CIRCUIT CONFIGURATION	VOLTAGE		CURRENT RATING	INTERRUPTING CAPACITY (AMPS)
	MAX. RATING	FREQUENCY	FULL LOAD AMPS	WITHOUT BACKUP FUSE
SERIES	125	DC	251 - 700	50,000

Agency Certifications

UL Listed

UL 489

c UL us LISTED

Circuit Breakers , Molded Case (Guide DIVQ, File E129899) Complies with the requirements of the CSA Standard for Molded Case Circuit Breakers, CANCSA- C22.2 No. 5.1 –M

UL 489A

UL LISTED

Circuit Breakers for Use in Communications Equipment (Guide DITT, File E189195)

TUV Certified

IEC 60947-2
Low Voltage Switchgear and Control Gear under TUV License No. R72031058

F	A	2	–	B	0	–	14	–	820	–	1	2	A	–	B	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Aux/Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting		11 Max. App. Rating	12 Agency Approval

1 SERIES
F

2 ACTUATOR
A	Handle, one per pole
S	Mid-Trip Handle, one per pole
T	Mid-Trip Handle, one per pole & Alarm Switch

3 POLES
1	One	**2**	Two	**3**	Three

4 CIRCUIT
A [1]	Switch Only (no coil)	**Parallel Pole Construction:**	
B	Series Trip (current)	**M** [3,4]	Series Trip (Current) with Metering Shunt
C [2]	Series Trip (voltage)	**N** [3,4]	Switch Only with Metering Shunt
		P [3]	Series Trip (Current)
		Q [3]	Switch Only

5 AUXILIARY SWITCH [5]
0	without Auxiliary Switch	**7**	S.P.S.T. 0.110 Q.C. Terminals (Gold Contacts)
2	S.P.D.T. 0.110 Q.C. Terminals	**8**	S.P.S.T. 0.187 Q.C. Terminals
3	S.P.D.T. 0.139 Solder Lug	**9**	S.P.D.T. 0.187 Q.C. Terminals
4	S.P.D.T. 0.110 Q.C. Terminals (Gold Contacts)	**A** [6]	S.P.S.T., 0.093 Round QC Terminals
5	S.P.S.T., 0.093 Q.C. Terminals (Gold Contacts)	**B** [6]	S.P.D.T., 0.093 Round QC Terminals
6	S.P.S.T. 0.110 Q.C. Terminals		

6 FREQUENCY & DELAY
03	DC 50/60Hz, Switch Only	**14**	DC Medium
10 [7]	DC Instantaneous	**16**	DC Long
11	DC Ultra Short	**22**	AC Short
12	DC Short	**24**	AC Medium
		26	AC Long

7 CURRENT RATING (AMPERES)
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
810	100.000	**820**	200.00	**835** [8]	350.00	**860** [8]	600.00
912	125.00	**922**	225.00	**840** [8]	400.00	**870** [8]	700.00
815	150.00	**825**	250.00	**845** [8]	450.00		
917	175.00	**830** [8]	300.00	**850** [8]	500.00		

OR VOLTAGE COIL (MIN. TRIP RATING, VOLTS) [7]
CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
A06	6 DC, 5 DC	**A24**	24 DC, 20 DC	**A65**	65 DC, 55 DC
A12	12 DC, 10 DC	**A32**	32 DC, 25 DC	**B25**	125 DC, 100 DC
A18	18 DC, 15 DC	**A48**	48 DC, 40 DC	**J06**	6 AC, 5 AC

8 TERMINAL
Back Connected (Front Mounted Only)		**Max Rating**
1 [9]	3/8-16 Stud	250A
2 [14]	3/8-16 Screw, Line & Load	700A
5 [14]	3/8-16 Short Stud	250A
Front Connected (Back Mounted Only) [11]		**Max Rating**
3	Box Wire Connector, Line & Load	700A
4 [14]	3/8-16 Screw, Line & Load	700A

9 ACTUATOR COLOR & LEGEND [12,13]
Actuator Color	I-O	ON-OFF	Dual	Marking Color
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White

10 MOUNTING
Front Mounting Inserts		Back Mounting Inserts
A	10-32	10-32 screw clearance holes
B	ISO M5	10-32 screw clearance holes

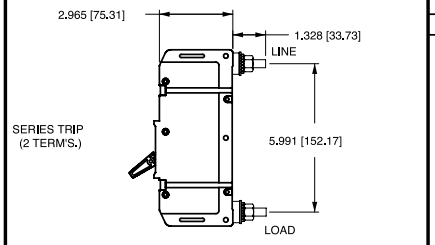
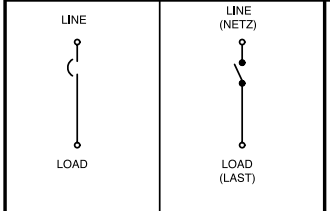
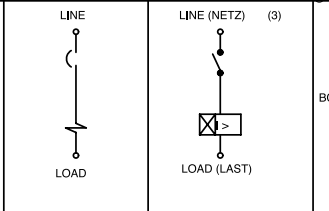
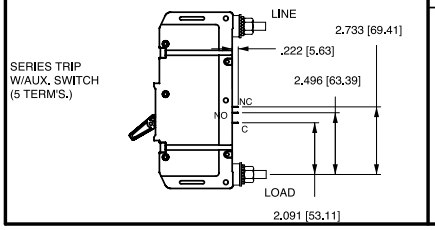
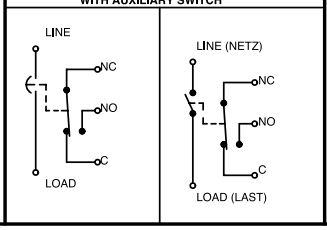
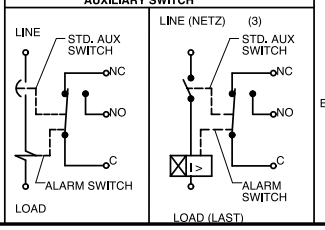
11 MAXIMUM APPLICATION RATING
	VOLTAGE	CURRENT
B	125 VDC	700A
C [15]	120/240	250A
F	277 VAC	250A
7 [16]	120/208 VAC	250A

12 AGENCY APPROVAL
A	No approvals
G	UL489 Listed & CUL Certified
J	UL489 Listed, CUL Certified & TUV Certified
T	UL489A (Telecom) Listed

Notes:
1. For 100 to 250 amps, select Current Code 825. For 300-400 amps, select Current Code 840. For 450-700 amps, select Current Code 870.
2. Available with Frequency and Delay code 10 or 20 only, and are not rated for continuous duty. Delay 10 and 20 are only available with voltage coils.
3. 3 Codes M, N, P & Q (Parallel Poles) are supplied with factory installed Bus Bar on Line and Load.
4. 4 Metering terminals are female pin type, ref. Molex part number 02-09-1101, model 1189-T.
5. Auxiliary Switch breakers are only available with Series Trip and Switch Only circuits. On multi-pole breakers, one Auxiliary Switch is supplied, mounted in the extreme right pole per figure A. Back-Mounted breakers require special mounting provisions when an Auxiliary Switch is specified.
6. Available with parallel pole construction (circuit codes P and Q, and breakers with circuit codes M and N).
7. Frequency and delay code 10 is only available with Voltage Coils. Voltage Coils are not rated for continuous duty.
8. Ratings over 250 amps are only available with Agency Approval code T (UL489A) and are Parallel Pole configuration (circuit codes M, N, P and Q.) 300-450 amp ratings are available on two pole breakers. 500-700 amp ratings are available on three pole breakers.
9. Per UL requirement, an “Anti-Flash Over Barrier” is supplied between poles on multipole breakers with 3/8 - 16 stud terminals (Terminal Code 1) on AC rated breakers only.
10. Front connected breakers can also be front mounted by utilizing the supplied front panel mounting inserts. Terminal connections must be made before mounting.
11. Box Wire connector will accept #6 through 250 MCM copper wire.
12. Agency codes G & T must have ON-OFF or dual legends. Agency code J must have dual legend.
13. Other colors available. Consult factory.
14. Terminals 2,4 & 5 are shipped without terminal hardware.
15. 2 or 3 Pole Circuit Breaker Required for 120/240 VAC Rating.
16. 3 Pole Circuit Breaker Required for 120/208 VAC Rating.

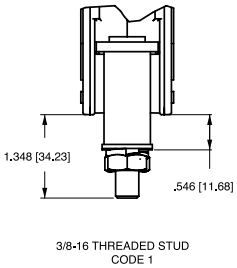
Circuit & Terminal Diagrams: in. [mm]

F SERIES NON-PARALLEL POLE CONSTRUCTION:

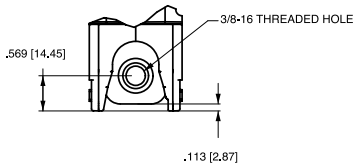
CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE
	ANSI / IEC SWITCH ONLY (NO COIL) 	A	0	ANSI / IEC SWITCH TRIP 	BC	0
	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 	A	2 3 4 5 9	SERIES TRIP WITH AUXILIARY SWITCH 	BC	2 3 4 5 9

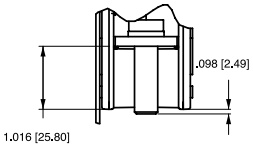
TERMINAL DETAILS

BACK CONNECT

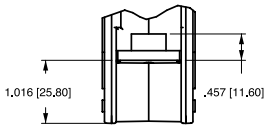


3/8-16 THREADED STUD
CODE 1



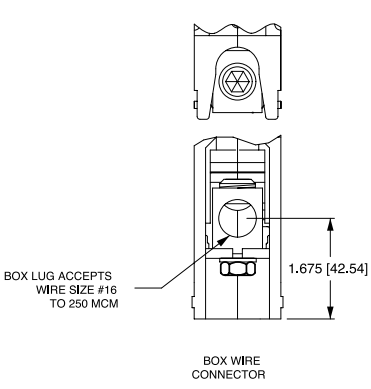


SHORT STUD
CODE 5

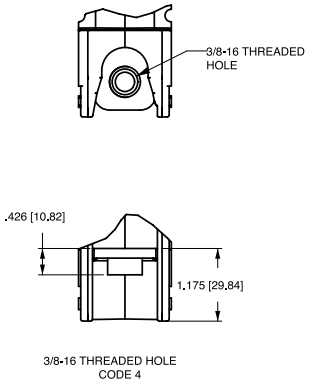


3/8-16 THREADED HOLE
CODE 2

FRONT CONNECT



BOX WIRE
CONNECTOR

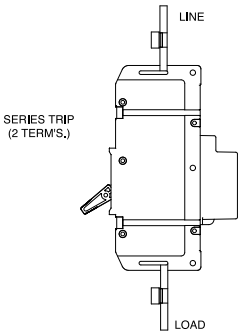
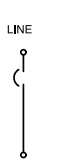
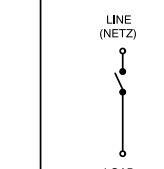
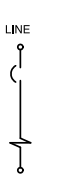
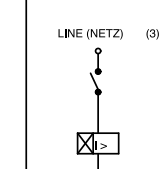
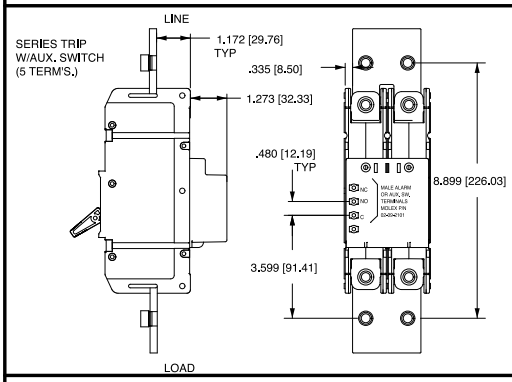
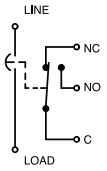
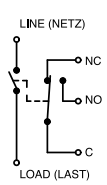
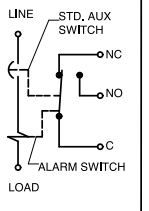
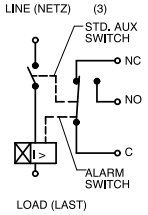
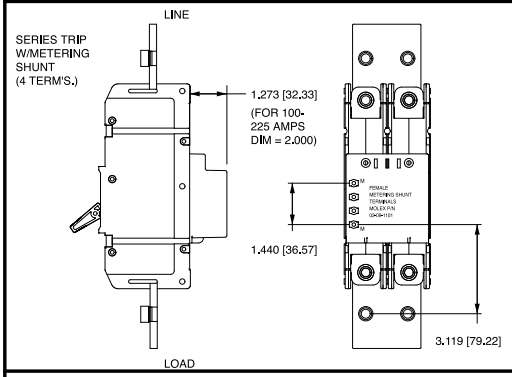
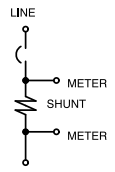
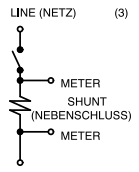
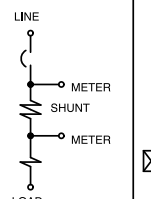
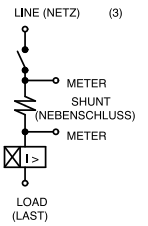
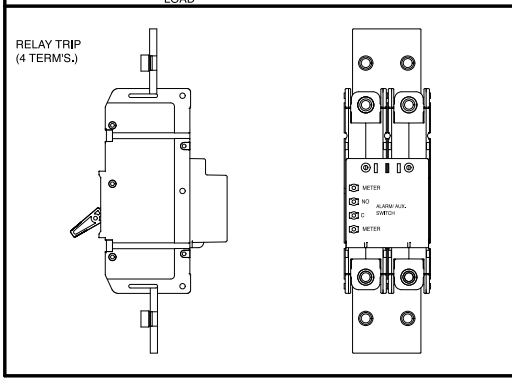
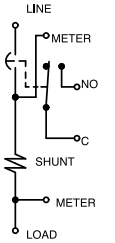
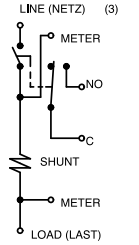
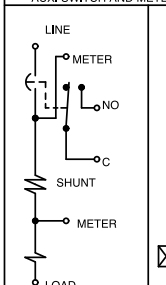
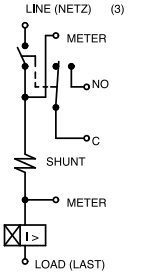


3/8-16 THREADED HOLE
CODE 4

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

Circuit & Terminal Diagrams: in. [mm]

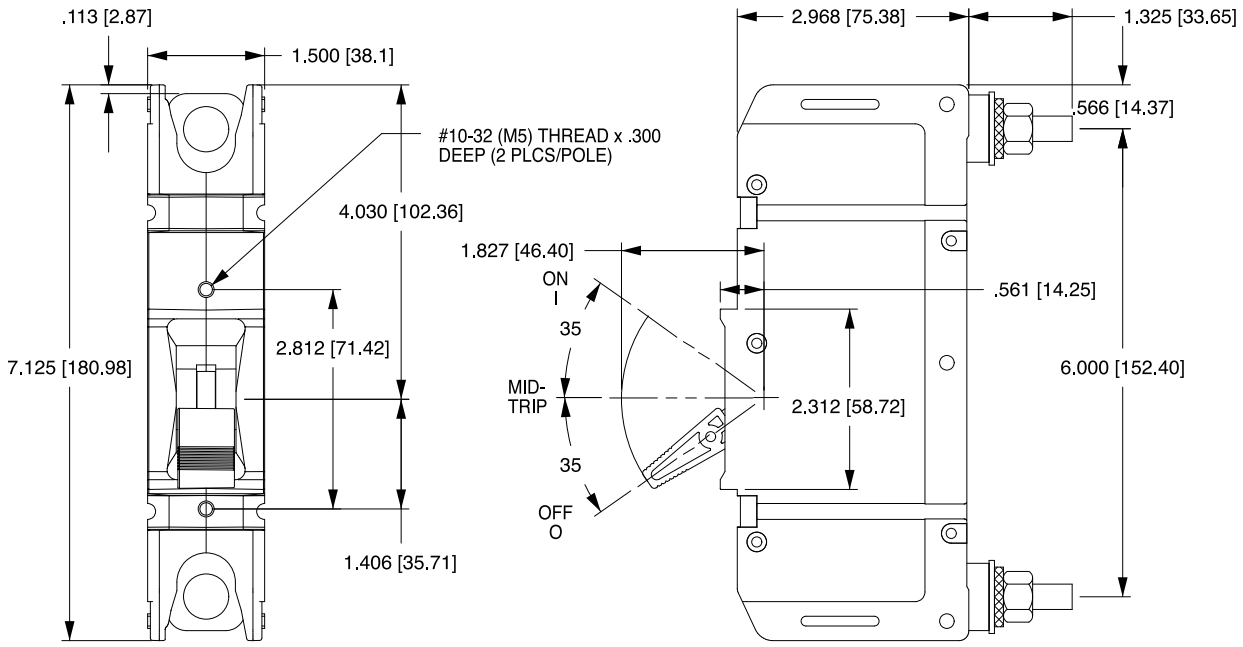
F-SERIES PARALLEL POLE CONSTRUCTION:

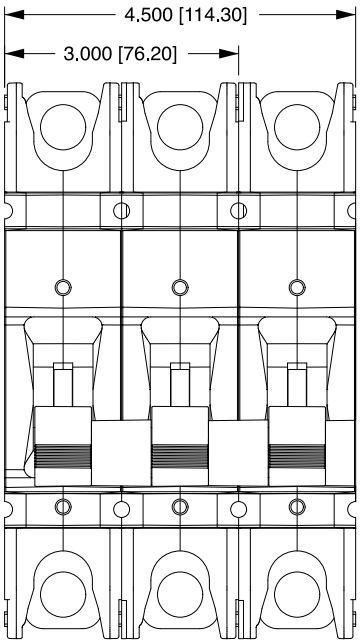
CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC ANSI	CIRCUIT SCHEMATIC IEC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC ANSI	CIRCUIT SCHEMATIC IEC	CIRCUIT CODE	AUX SWITCH CODE
	SWITCH ONLY (NO COIL) 		A	0	SERIES TRIP 		BC	0
	SWITCH ONLY (NO COIL) WITH ALARM OR AUX. SWITCH 		A	B	SERIES TRIP WITH ALARM OR AUX. SWITCH 		BC	B
	SWITCH ONLY (NO COIL) WITH METERING SHUNT 		N	0	SERIES TRIP CURRENT COIL, WITH METERING SHUNT 		M	0
	SWITCH ONLY WITH ALARM OR AUX. SWITCH AND METERING SHUNT 		N	A	SERIES TRIP WITH ALARM OR AUX. SWITCH AND METERING SHUNT 		M	A

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

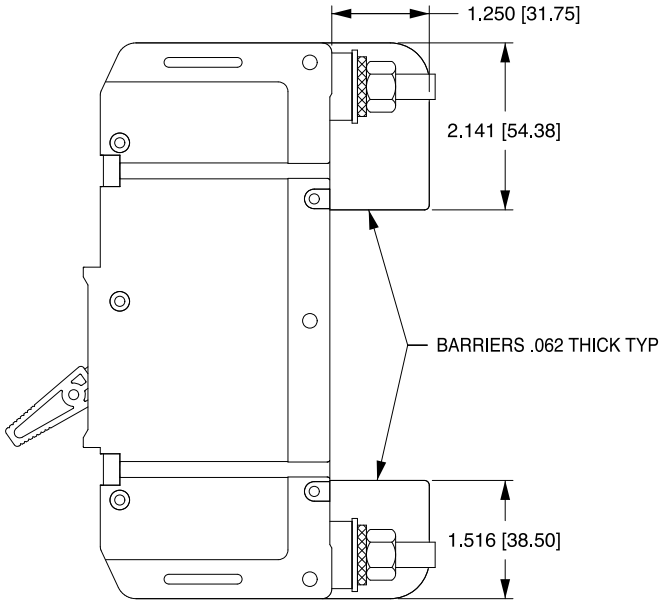
Dimensional Specifications: in. [mm]

SERIES TRIP BACK CONNECT (STUD TERMINALS SHOWN)



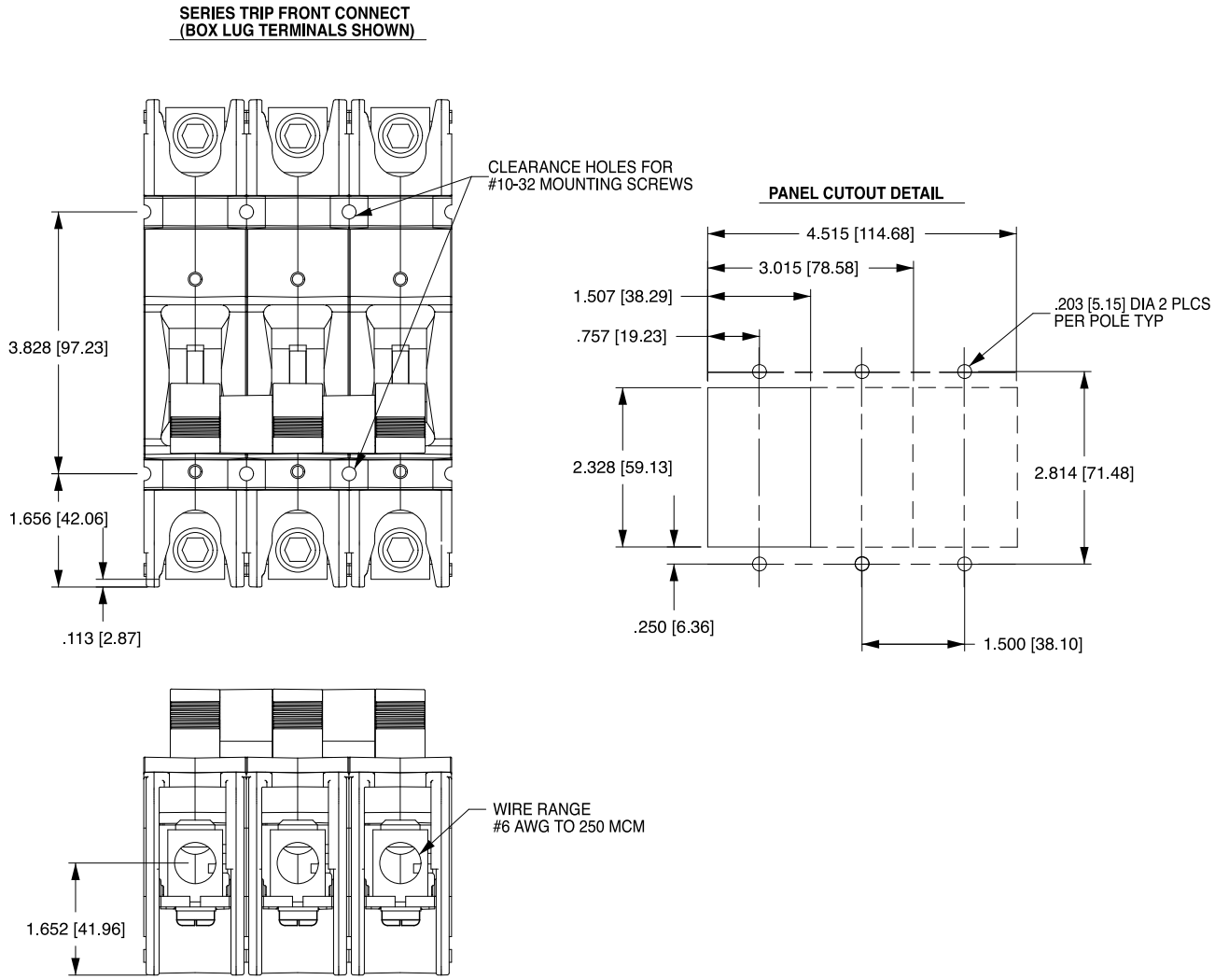


MULTIPOLE SERIES TRIP, SHOWING TERMINAL BARRIER



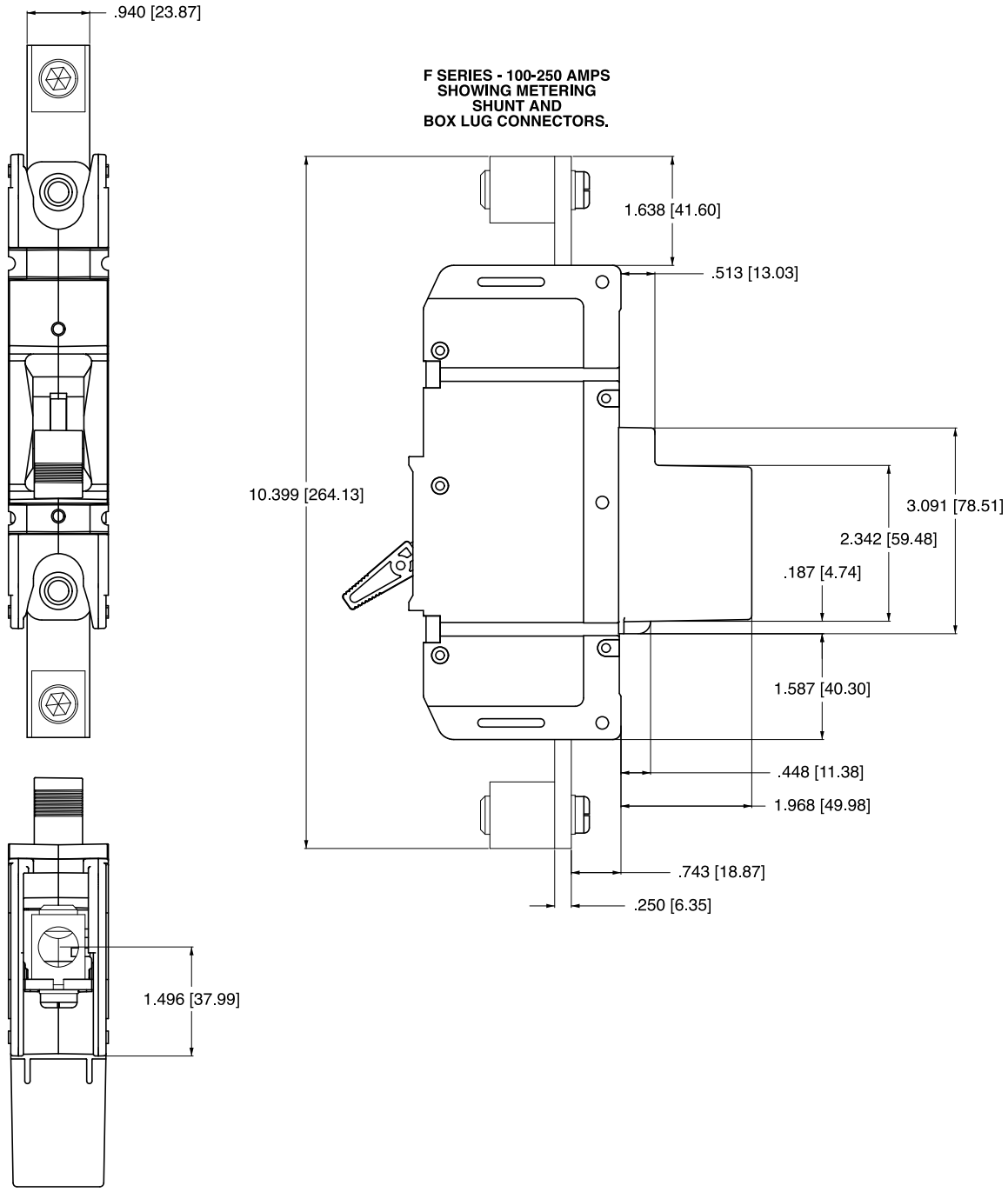
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

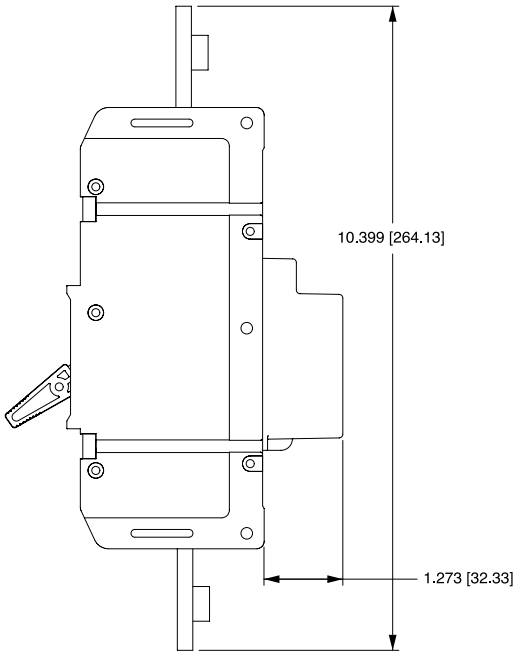
Dimensional Specifications: in. [mm]

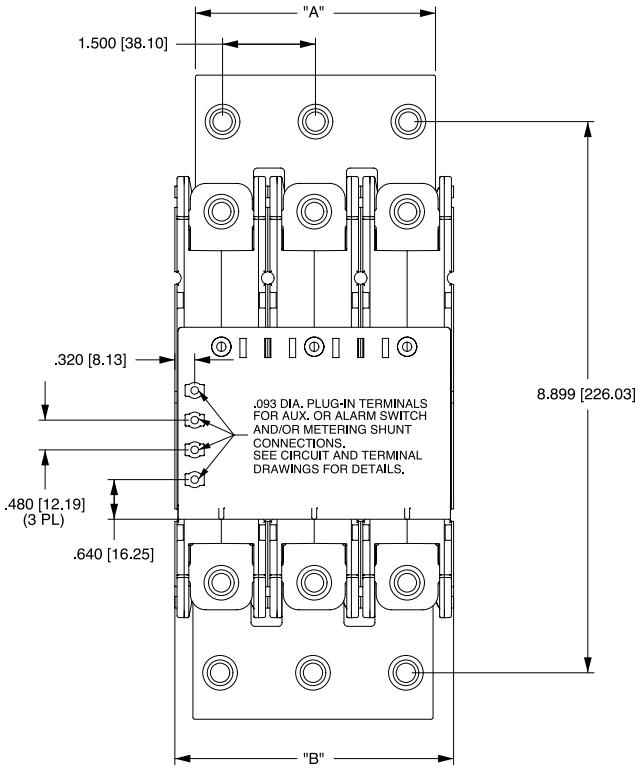


F-Series breakers are available up to 700A, and are also available with a 25 millivolt metering shunt construction. This optional construction provides a safe method for monitoring current flowing through the breaker by simply connecting a meter with light gauge wire to the appropriate terminals located on the shunt housing at the rear of the breaker. You can customize the application by measuring and displaying percentage of current, watts or safe/danger zones.

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]





F-SERIES PARALLEL POLE 250-700 AMPS
SHOWING FRONT CONNECT SCREW TERMINALS

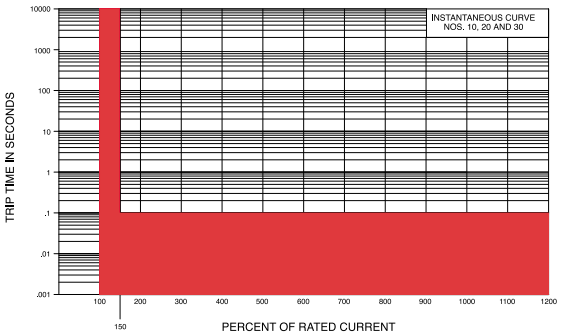
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.

M, MS-SERIES TIME DELAY VALUES										
	PERCENT OF RATED CURRENT									
	Delay	100%	135%	150%	200%	400%	600%	800%	1000%	1200%
TRIP	10, 20, 30	No Trip	May Trip	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max	.100 Max
TIME	12, 22, 32, 62, 72, 92	No Trip	.300 - 7.00	.200 - 5.00	.100 - 2.00	.030 - .500	.008 - .300	.006 - .150	.005 - .100	.005 - .100
SECONDS	14, 24, 34, 64, 74, 94	No Trip	3.00 - 70.0	2.00 - 40.0	1.00 - 15.0	.100 - 4.00	.008 - 2.00	.006 - .800	.005 - .350	.005 - .160

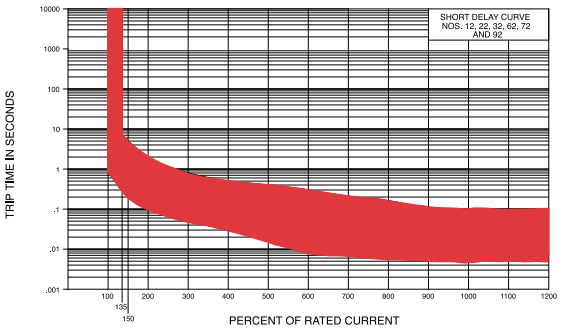
Notes:
1 Delay Curves 12,14, 22, 24, 32, 34, 62, 64, 72, 74, 92, 94: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
2 Delay Curves 10, 20, 30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.
3 All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.
4 The minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 18 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration, such as switching power supplies, highly capacitive loads and transformer loads.

Dual Rated AC/DC

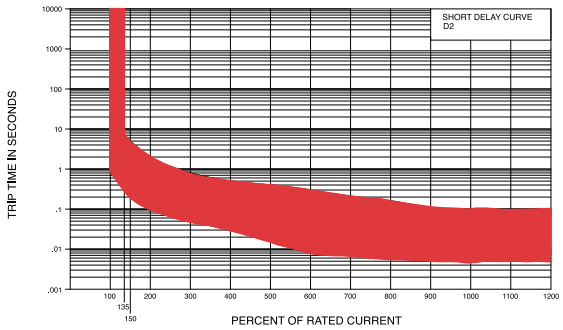
Instantaneous



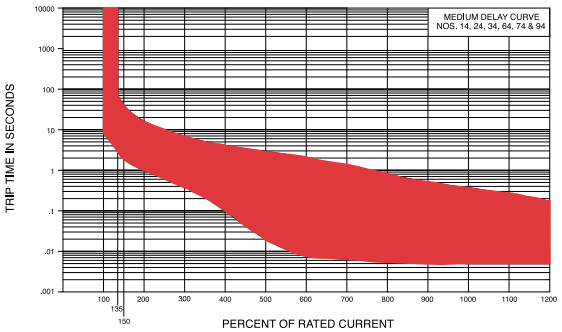
Short



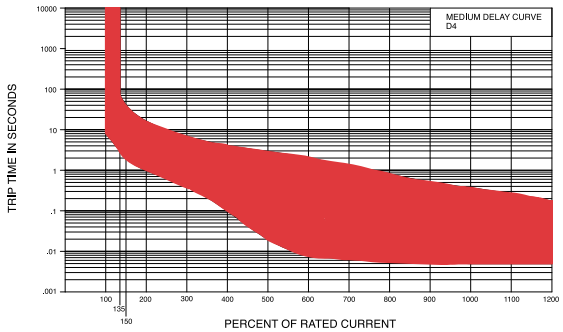
Short D2



Medium



Medium D4



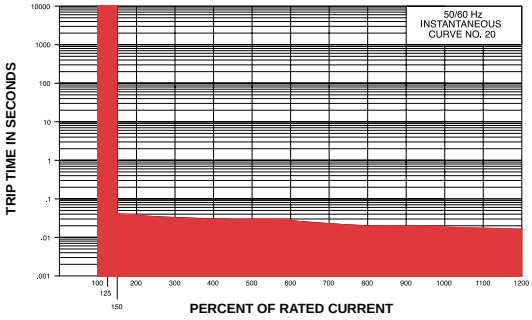
A, B, C, CX, D, G, H, L, N-SERIES TIME VALUES											
	PERCENT OF RATED CURRENT										
	DELAY	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
	10	No Trip	May Trip	---	.032 MAX	.024 MAX	.020 MAX	.018 MAX	.016 MAX	.015 MAX	.013 MAX
	11	No Trip	.013 - .125	---	.010 - .070	.008 - .032	.006 - .020	.005 - .020	.004 - .020	.004 - .020	.004 - .020
	12	No Trip	.500 - 6.50	---	.300 - 3.00	.130 - 1.20	.031 - .220	.011 - .120	.004 - .090	.004 - .060	.004 - .040
	14	No Trip	2.00 - 60.0	---	1.20 - 40.0	.600 - 20.0	.150 - 3.00	.030 - 1.30	.004 - .600	.004 - .100	.004 - .100
	16	No Trip	45.0 - 345	---	20.0 - 150	9.00 - 60.0	1.40 - 11.4	.150 - 5.80	.009 - 3.70	.005 - 1.70	.005 - .500
	20	No Trip	May Trip	---	.040 MAX	.035 MAX	.030 MAX	.025 MAX	.020 MAX	.017 MAX	.015 MAX
	21	No Trip	.014 - .150	---	.011 - .095	.008 - .055	.006 - .035	.005 - .027	.005 - .021	.004 - .018	.004 - .017
TRIP	22	No Trip	.700 - 12.0	---	.350 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .045	.004 - .040
TIME	24	No Trip	10.0 - 160	---	6.00 - 60.0	2.20 - 20.0	.300 - 3.00	.050 - 1.30	.007 - .500	.005 - .060	.005 - .040
(SECONDS)	26	No Trip	50.0 - 700	---	32.0 - 350	10.0 - 90.0	1.50 - 15.0	.500 - 7.00	.020 - 3.00	.006 - 2.00	.005 - 1.00
	32	No Trip	May Trip	.400 - 8.00	.300 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .060	.004 - .040
	34	No Trip	May Trip	1.80 - 100	1.20 - 60.0	.600 - 20.0	.150 - 3.00	.030 - 1.30	.004 - .600	.004 - .110	.004 - .100
	36	No Trip	May Trip	35.0 - 520	20.0 - 350	9.00 - 90.0	1.40 - 15.0	.150 - 7.00	.009 - 3.70	.005 - 2.00	.004 - 1.00
	42	No Trip	.700 - 12.0	---	.400 - 6.00	.180 - 2.30	.050 - .600	.026 - .300	.018 - .200	.014 - .150	.012 - .130
	44	No Trip	7.00 - 100	---	3.00 - 50.0	1.10 - 18.0	.220 - 3.00	.120 - 1.70	.075 - 1.20	.050 - .850	.042 - .720
	46	No Trip	50.0 - 700	---	31.0 - 350	12.0 - 150	1.50 - 20.0	.700 - 10.0	.404 - 7.90	.260 - 6.50	.198 - 5.80
	52	No Trip	.500 - 6.50	---	.340 - 4.50	.180 - 2.30	.051 - .600	.030 - .320	.018 - .220	.014 - .200	.012 - .130
	54	No Trip	1.50 - 50.0	---	.750 - 35.0	.350 - 18.0	.110 - 3.00	.070 - 1.70	.045 - 1.40	.039 - 1.30	.035 - 1.30
	56	No Trip	45.0 - 345	---	19.0 - 170	8.50 - 100	1.24 - 15.0	.410 - 9.00	.256 - 8.00	.210 - 5.50	.198 - 2.90

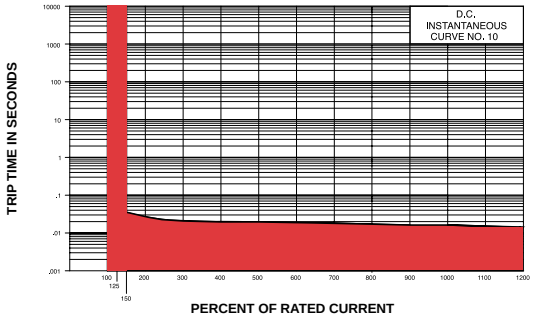
Notes:
UL489 C-Series Breakers available with Delay Curves 11, 12, 14, 16, 21, 22, 24, 26, 42, 44, 46.
Delay Curves 11,12,14,16,21,22,24,26,42,44,46,52,54,56: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.
Delay Curves 32,34,36: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
Delay Curves 10,20: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.
All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.
On 50 amp and less current ratings, the minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 25 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration such as switching power supplies, highly capacitive loads and transformer loads.

AC

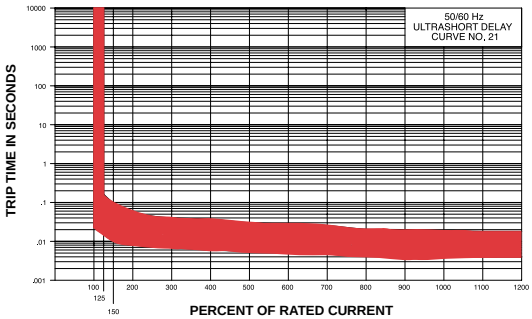
DC

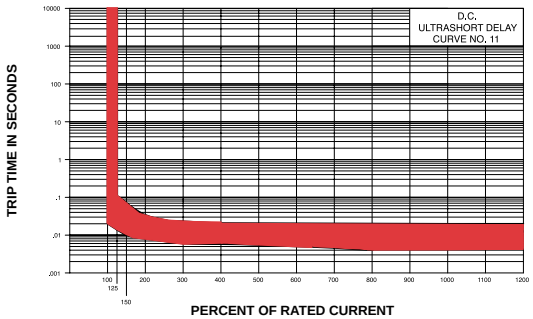
Instantaneous



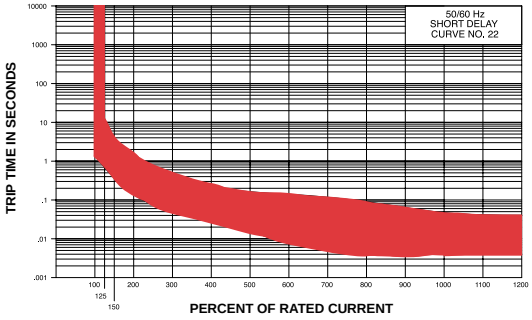


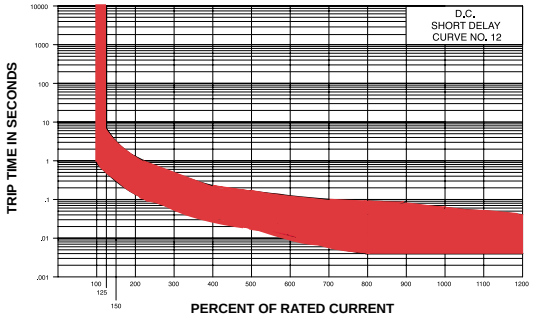
Ultrashort





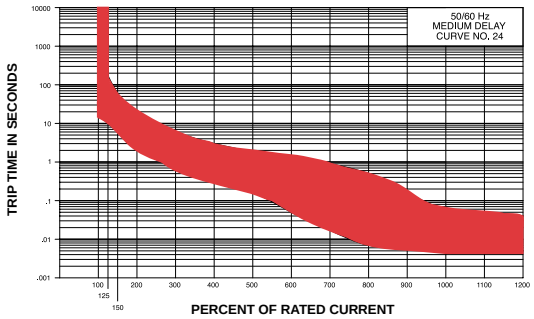
Short



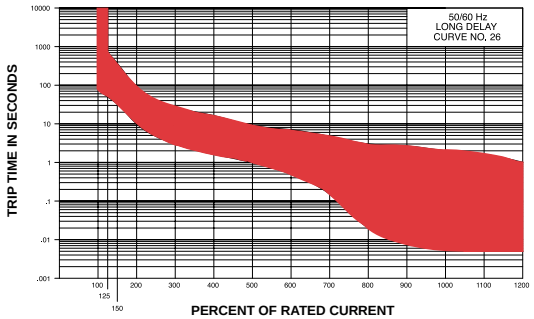


AC

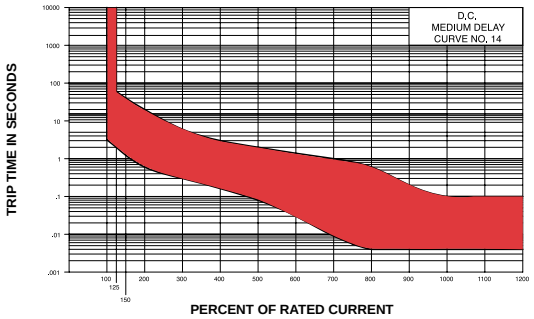
Medium

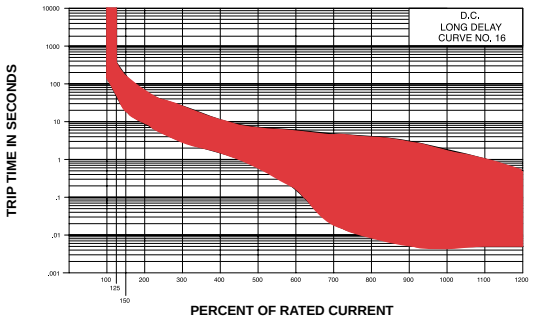


Long



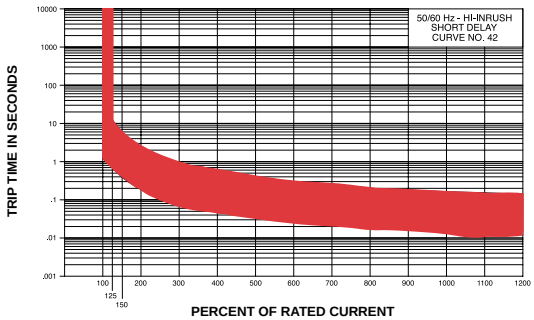
DC



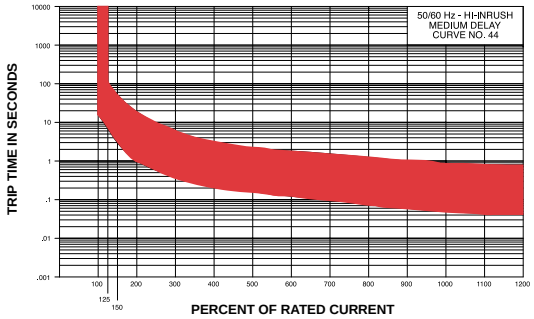


High Inrush AC

Short



Medium



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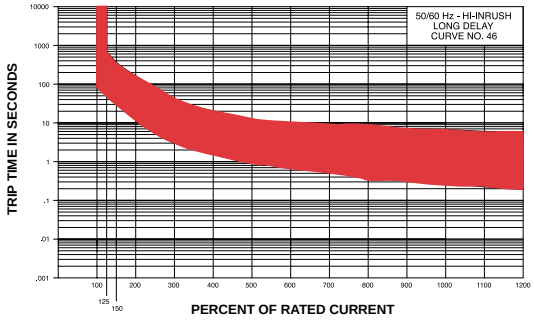
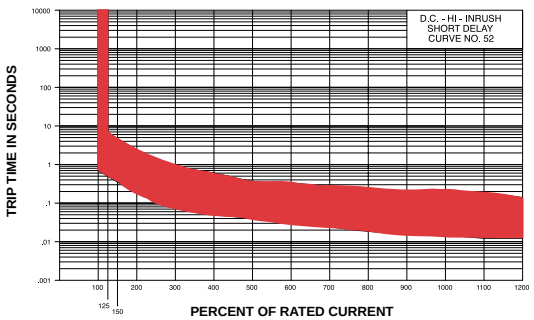
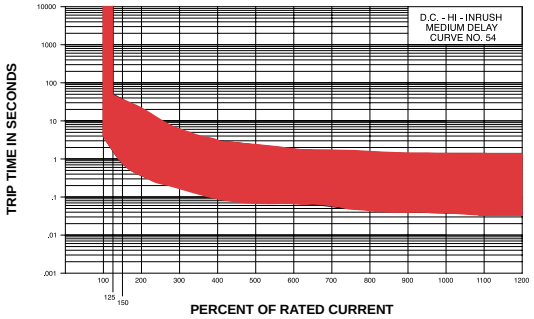
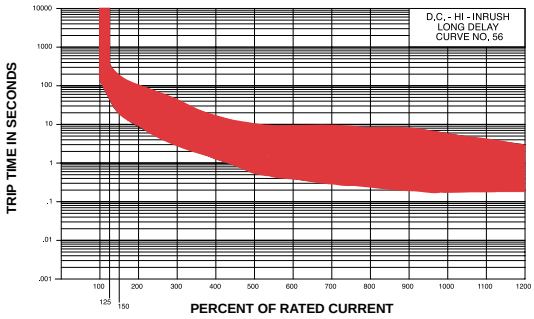


High Inrush DC

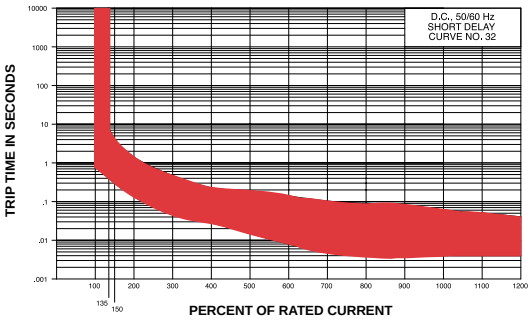






AC/DC

Short



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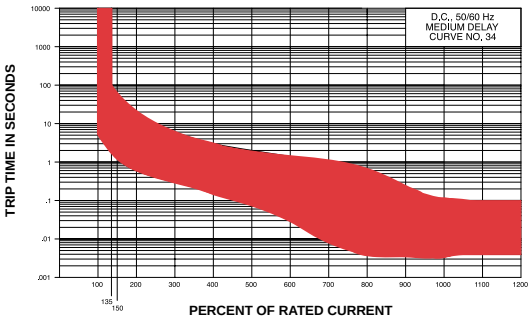

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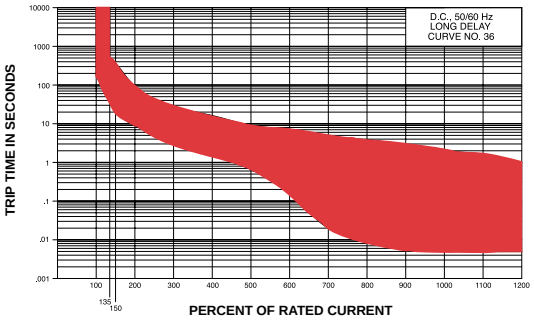
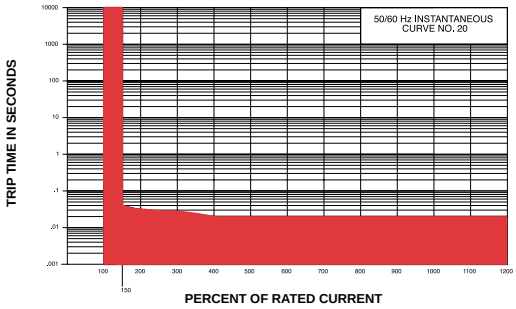


E-SERIES TIME DELAY VALUES											
	PERCENT OF RATED CURRENT										
	Delay	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
TRIP TIME (SECONDS)	10	No Trip	May Trip	---	.001 - .038	.001 - .032	.001 - .021	.001 - .019	.001 - .019	.001 - .019	.001 - .019
	12, 72	No Trip	.600 - 7.00	---	.330 - 2.00	.150 - .800	.033 - .160	.016 - .071	.010 - .048	.008 - .040	.008 - .040
	14, 74	No Trip	11.0 - 110	---	6.00 - 45.0	3.00 - 18.0	.280 - 3.50	.013 - 1.50	.010 - .130	.009 - .090	.009 - .080
	16, 76	No Trip	100 - 800	---	50.0 - 360	20.0 - 120	3.00 - 25.0	.020 - 11.0	.010 - .700	.009 - .230	.009 - .200
	20	No Trip	May Trip	---	.001 - .040	.001 - .031	.001 - .020	.001 - .020	.001 - .020	.001 - .020	.001 - .020
	22, 62	No Trip	.800 - 5.00	---	.400 - 2.30	.150 - .900	.034 - .170	.020 - .080	.012 - .051	.010 - .040	.009 - .040
	24, 64	No Trip	7.20 - 90.0	---	4.40 - 35.0	2.00 - 15.0	.500 - 3.50	.025 - 1.60	.012 - .330	.010 - .070	.009 - .050
	26, 66	No Trip	50.0 - 500	---	32.0 - 250	14.0 - 120	2.50 - 24.0	.320 - 7.00	.0125 - 3.10	.011 - .130	.010 - .055
	30	No Trip	May Trip	---	.001 - .040	.001 - .032	.001 - .020	.001 - .020	.001 - .020	.001 - .020	.001 - .020
	32, 92	No Trip	May Trip	.450 - 5.20	.330 - 2.30	.150 - .900	.033 - .170	.016 - .080	.009 - .051	.008 - .040	.008 - .040
	34, 94	No Trip	May Trip	5.80 - 73.0	4.40 - 45.0	2.00 - 18.0	.280 - 3.60	.013 - 1.60	.010 - .330	.009 - .090	.009 - .080
	36, 96	No Trip	May Trip	42.0 - 600	32.0 - 360	14.0 - 120	2.50 - 25.0	.020 - 11.0	.010 - 4.10	.009 - .330	.009 - .200

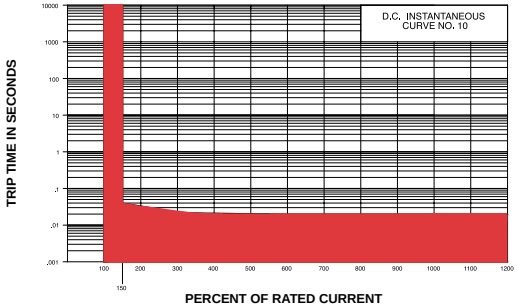
NOTES
Delay Curves 10,20,30: Breakers to hold 100% and must trip at 150% of rated current and greater wthin the time limit shown in these curves.
Delay Curves 12,14,16,22,24,26,62,64,66,72,74,76: Breakers to hold 100% and must trip at 125% of rated current and greater wthin the time limit shown in these curves.
Delay Curves 32,34,36,92,94,96: Breakers to hold 100% and must trip at 135% of rated current and greater wthin the time limit shown in these curves.
All curves: Data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading: Breakers are mounted in standard wall-mount position.
The minimum inrush pulse tolerance handling capacity on the above standard delays is 16 times rated current &20 times rated current for high inrush delays based on a 60Hz 1/2 cycle, 8.33 ms pulse.

Instantaneous

AC



DC



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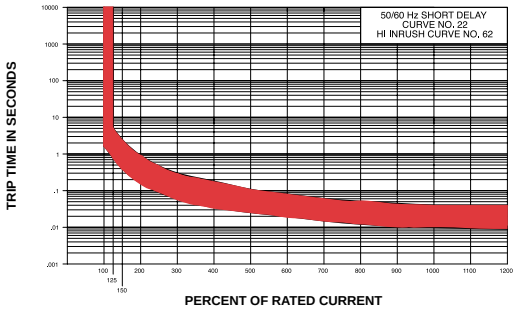

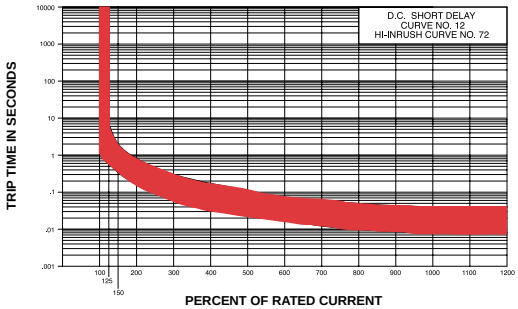

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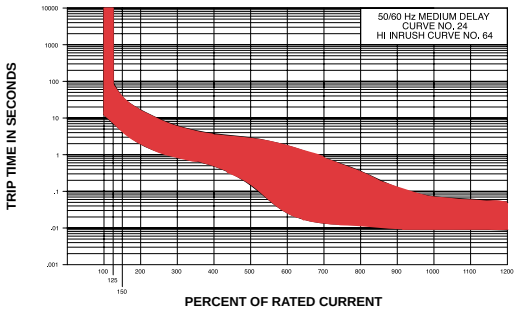

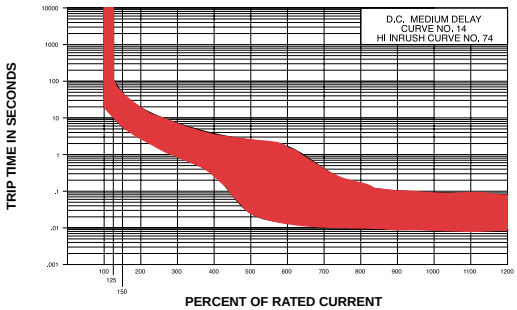

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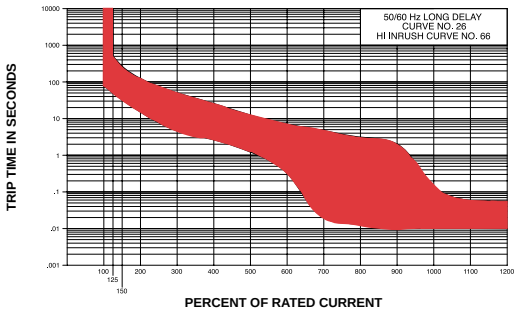
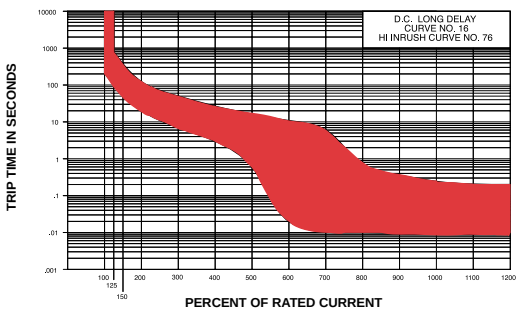
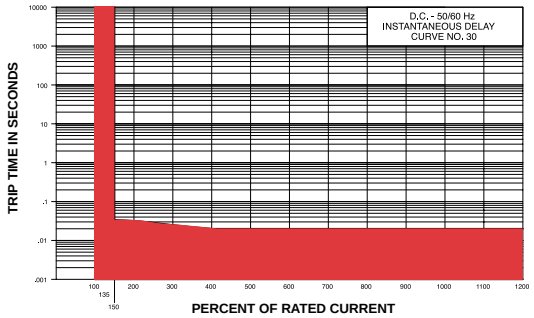




AC/DC

Instantaneous



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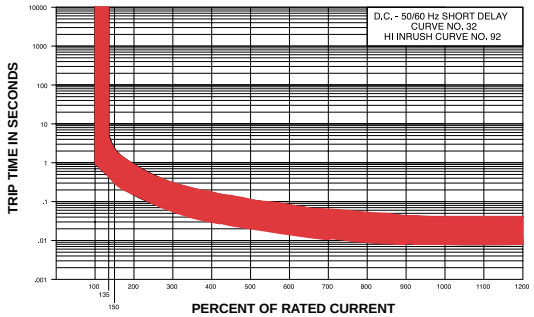

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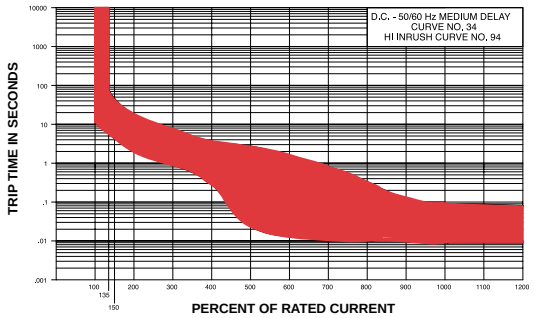

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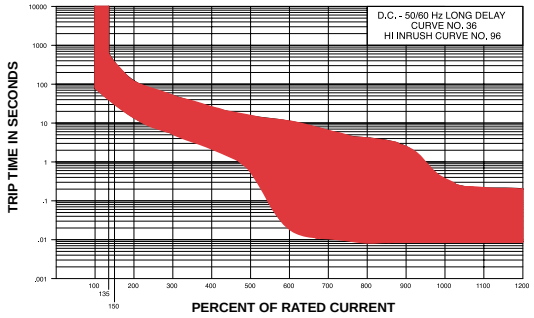
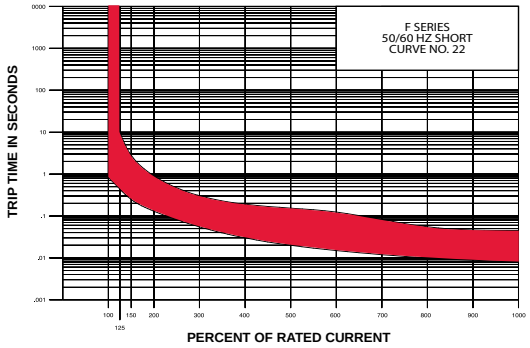


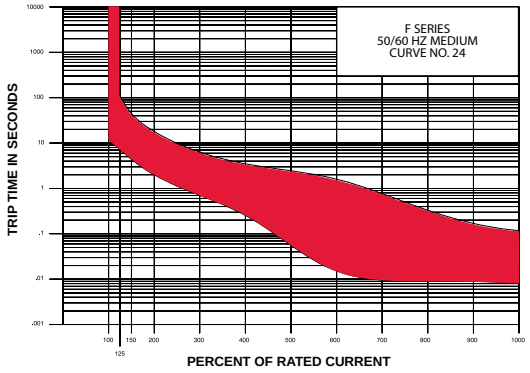
F-SERIES TIME DELAY VALUES									
	PERCENT OF RATED CURRENT								
	Delay	100%	125%	150%	200%	400%	600%	800%	1000%
TRIP TIME SECONDS	11	No Trip	.013 - .125	.010 - .070	.008 - .032	.006 - .020	.005 - .020	.004 - .020	.004 - .020
	12	No Trip	.475 - 10.0	.275 - 2.80	.140 - .850	.030 - .190	.015 - .125	.010 - .050	.008 - .038
	14	No Trip	10.0 - 110	6.00 - 40.0	2.50 - 15.0	.500 - 3.00	.180 - 1.00	.010 - .280	.008 - .080
	16	No Trip	110 - 1000	60.0 - 400	22.0 - 150	4.00 - 25.0	1.00 - 5.50	.010 - 1.80	.008 - .390
	22	No Trip	.700 - 12.0	.350 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .045
	24	No Trip	10.0 - 160	6.00 - 60.0	.220 - 20.0	.300 - 3.00	.050 - 1.30	.007 - .500	.005 - .060
	26	No Trip	50.0 - 700	32.0 - 350	10.0 - 90.0	1.50 - 15.0	.500 - 7.00	.020 - 3.00	.006 - 2.00

AC

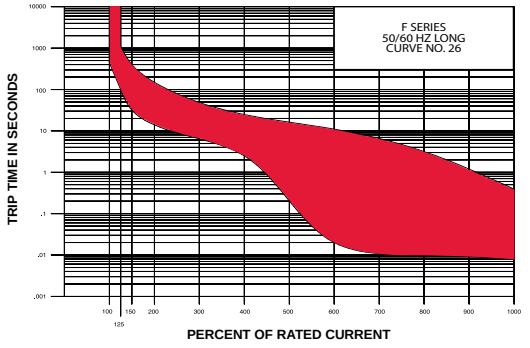
Short - AC 22



Medium - AC 24

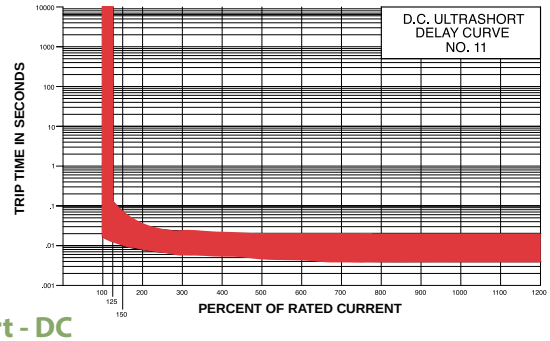


Long - AC 26



DC

Ultrashort - DC



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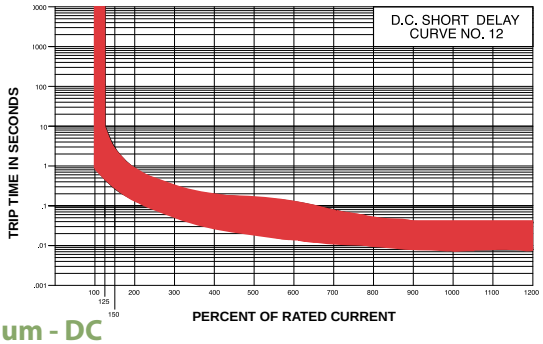

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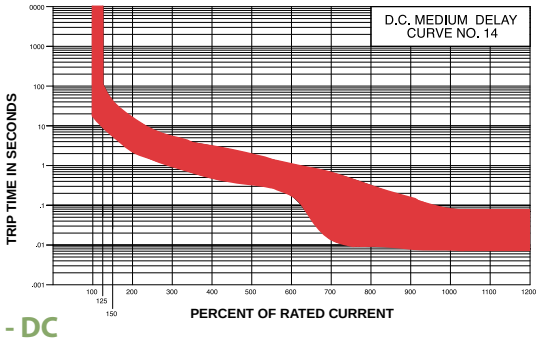

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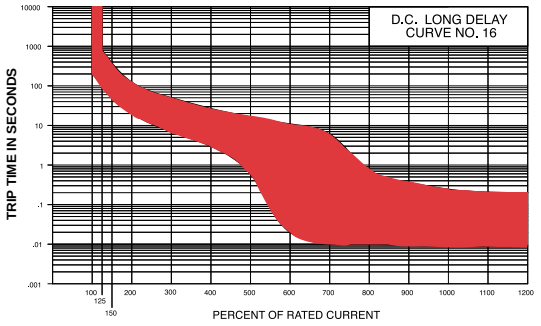


V-Series
CONTURA SWITCHES

Carling Technologies' sealed V-Series Contura switches are well known for their cutting edge design, high quality, maximum performance and unmatched reliability. These switches are a staple in the marine and transportation industries and have passed a range of environmental, corrosion, temperature, vibration, shock and sealing tests including MIL Std 202F, MIL Std 510.1, UL 1500, ISO 8846, IEC 60529 and BS 5490 among others, making them one of the most rugged and reliable switches ever manufactured.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

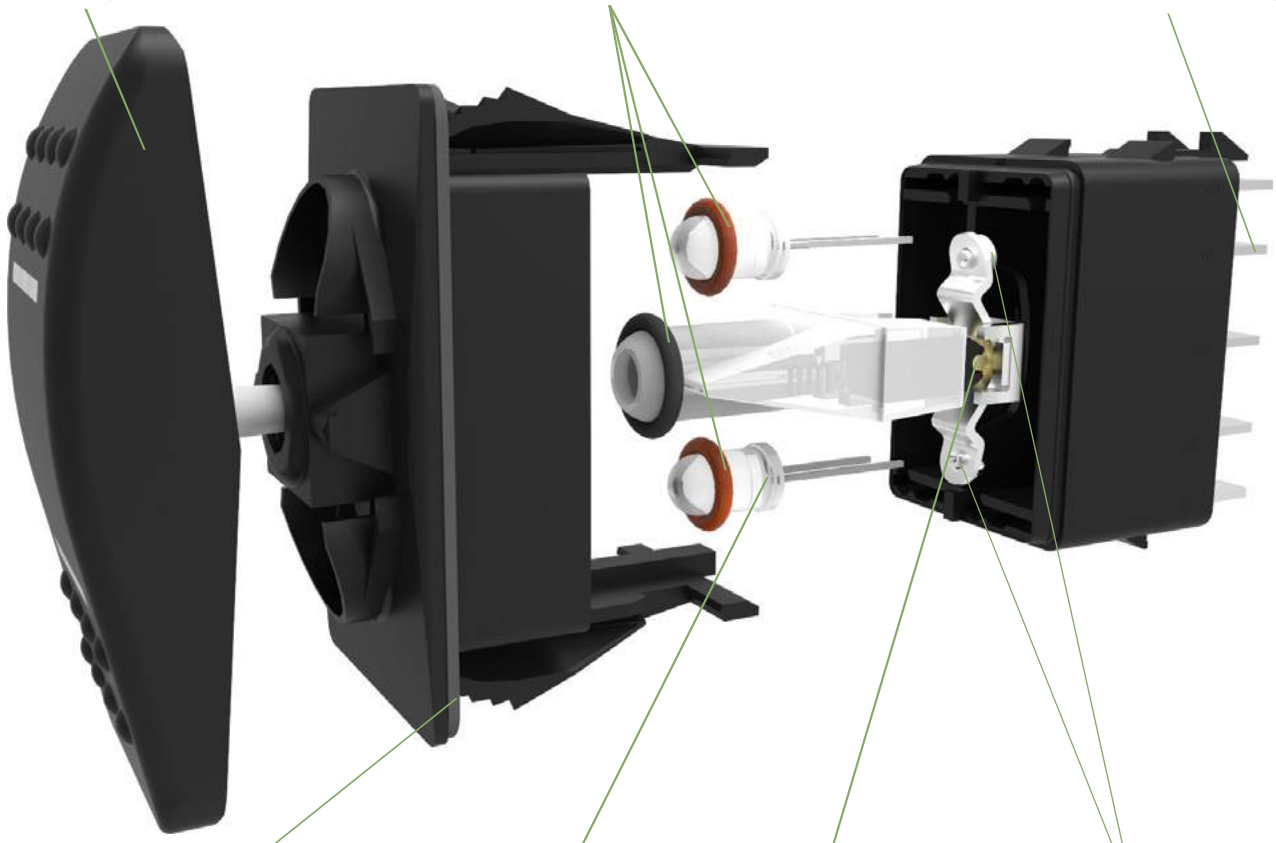
- Certified to IP66/68 with dual seals around lamps and rocker stem.
- Silver plated butt contact mechanism provides reliability up to and beyond 100K electrical cycles
- Greaseless construction withstands temperature extremes down to -40˚C
- The switch accommodates up to 10 terminals and endless illumination and circuit options.
- The switch connector allows the user to preload FQC terminals for ease of assembly.
- Numerous choices of removable rockers allow for style change without having to retest or re-qualify the switch base.

V-Series Switch
DESIGN FEATURES

INTERCHANGEABLE ACTUATORS
Panel redesign is a snap with our wide range of rocker styles. Achieve maximum design variety with minimum inventory. Simply swap rockers to create an entirely new look for your panel.

DUAL SEAL PROTECTION
Seals out water, dust, debris, and enables switch certification to IP66/68 for front panel components.

CLEAN CONNECTIONS
Options for both eight and ten terminal base styles with AMP & Packard compatible connectors affords myriad circuit options while providing ease of assembly.



OPTIONAL PANEL SEAL
Prevents water/dust ingress behind panel.

MULTIPLE LIGHTING OPTIONS
In addition to Incandescent lamps, our LED illumination is offered in a wide array of light intensities, colors, as well as dual level, tri-color, and flashing options.

BRASS ROLLER PIN
Robust mechanism eliminates the need for lubricants. Enables switch to withstand -40°C to +85°C temperatures.

SILVER PLATED BUTT CONTACT MECHANISM
Providing 50k to 100k electrical cycles and a variety of different electrical ratings.

Contura II & III

The Contura II & III actuators are constructed of thermoplastic polycarbonate and are offered with a hard nylon overlay or a "soft-touch" elastomer overlay. These models incorporate aesthetic designs on the top and bottom of the rocker featuring two rows of raised "bumps" on the Contura II and three "indented" lines on the Contura III.

Contura IV

The Contura IV's "Shape to create a Shape" actuator works with the curves, contours & advanced styling of the latest panel designs, flowing with these advanced curves & radii. This actuator style fits on the Contura flush bracket/bezel.

Contura V

The symmetrically curved Contura V actuator provides the perfect complement to the Contura IV's "Shape to create a Shape" design concept. With its flush style mounting bracket, Contura V can be mounted in between two Contura IV's, by itself, or in groups.

Contura VI (WAVE)

The Contura VI WAVE sealed rocker switches, when used in a row, create an uniquely appealing "wave" design on your panel. A variety of colors and finishes are available for both rocker and wave insert. Contura VI features bar and oval lenses.

Contura VII

Contura VII featuring gently curved corners and edges assuring compatibility with most any panel design. Intuitive feel is maximized by the use of 2 embossed circular pads located at opposite ends of the rocker. Any combination of Bar or Oval style lenses can be located in the pads providing a truly unique look, exclusive to Contura VII.

Contura X

The raised bracket/bezel on the Contura X helps prevent inadvertent actuation of the rocker, as well as preventing debris from being trapped under the actuator. This curved rocker style is available with a variety of lenses and legends.

Contura XI

The raised bracket/bezel on the Contura XI helps prevent inadvertent actuation of the rocker, as well as preventing debris from being trapped under the actuator. This convex style rocker is available with a wide variety of lenses and legends.

Contura XII

The Contura XII version features a paddle style actuator with the raised bracket/bezel of Contura X and XI. The contoured handle design provides intuitive recognition and ease of operation and is available with all Contura X and XI lens and legend offerings.

Contura XIV

The Contura XIV represents a sleek new crossover rocker design which should appeal to Trucks, Buses and Heavy Vehicles as well as the Marine Industry. Intuitive feel is provided by recessed ridges along with a Center Groove which effectively defines the boundary between top and bottom switch functions.

Illuminated Indicators & Accessories

Alert operator of systems functions or malfunctions, are offered with removable/replaceable lamps in Contura II, II, V or X styles. Accessories include connectors, mounting panels, hole plugs, panel seals, and actuator removal tools. Refer to accessories page for full details

Electrical

Contact Rating	.4VA @ 24VDC (MAX) resistive 15 amps, 125VAC 10 amps, 250VAC 1/2 HP 125-250VAC 20 amps, 4-14VDC 15 amps, 15-28VDC 10A, 14VT 6A, 125VAC L
Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 milliohms max. @ 4VDC
Life	50,000 - 100,000 cycles circuit dependent
Contacts	Silver alloy, silver tin-oxide, fine silver
Terminals	Brass or copper/silver plate 1/4" (6.3mm) Quick Connect terminations standard. Solder lug, Wire Lead

Mechanical

Endurance	150,000 cycles minimum circuit dependent

Physical

Lighted	Incandescent - rated 10,000 hours Neon - rated 25,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24VDC)
Seals	Internal Optional external gasket panel seal
Base	Polyester blend rated to 125°C with a UL flammability rating of 94V0.
Contura II,III,IV,V, VI, VII Actuator	Hard Surface: Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay. Soft Surface: Basic actuator structure molded of thermoplastic polycarbonate with an elastomer overlay.
Contura X,XI,XII Actuator,VP	Nylon 66 Reinforced rated to 105°C
Lens	Polycarbonate rated at 100°C
Contura XIV	Polycarbonate lens/sub-rocker with ABS shell

Actuator Travel (Angular Displacement)

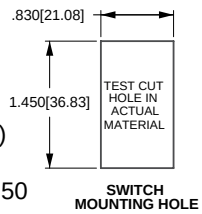
2 position	18°
3 positions	9° from center

Mounting Specifications

Panel Thickness Range

Gaskets	Acceptable Panel Thickness
0	.030 to .250 (.76 to 6.35mm)
1	.030 to .109 & .147 to .157 (.76 to 2.77mm & 3.73 to 3.98mm)

Recommended: No gasket with panel thickness of .032, .062, .093, .125,.187 or .250



SWITCH MOUNTING HOLE

Agency Certifications

Environmental

Sealing	Sealed version: IP66/68, this rating applies to front panel components of the actual switch only, and signifies complete protection against dust as well as powerful jets of water.
Corrosion	Mixed Flowing Gas (MFG) Class III 3 year accelerated exposure per ASTM B-827, B-845 Silver and gold contacts
Operating Temp.	-40°C to +85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with VCH connector. Test criteria - No loss of circuit during test, pre and post test contact resistance.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 Hz ±10 G's peak Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025 No loss of circuit during test; <10µ seconds chatter.
Shock	Per Mil-Std 202F, Method 213B, Test Condition K @ 30G's. Tested with VCH connector. Test criteria - No loss of circuit during test, pre and post test contact resistance.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 96 Hrs. Sealed version only.
Dust	Mil STD 810, Method 510.2 Air Velocity 300 Ft/Min Duration 16Hr
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Cond. A, -55°C to +85°C. Test criteria - pre and post test contact resistance
Moisture Resistance	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance
Ignition Protection	All Contura switches with sealed construction meet the requirements of UL1500/ISO8846 for ignition protection, in addition to conformance with EC directive 94/25/EC for marine products.

V	1	D	A	B	T	0	B	–	A	R	B	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

8 terminal	***10 terminal***
8 - - 7	8 - - 7
1 - - 4	1 - - 4
2 - - 5	2 - - 5
3 - - 6	3 - - 6
	10 - - 9

Position:		**1**	**2**	**3**
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

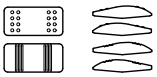
No lamp	**0**			
Neon	**1** 125VAC	**2** 250VAC		
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V **8** 24V
LED*	Red	Amber	superbright Green	superbright Red
2VDC	**A**	**L**	**F**	**R**
6VDC	**B**	**M**	**G**	**S**
12VDC	**C**	**N**	**H**	**T**
24VDC	**D**	**P**	**J**	**V**

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
A, B Contura II
C, D Contura III



Actuator orientation above terminals: 3,6 1,4

10 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**6**	**8**	**G**	**M**	**T**	
2	**7**	**C**	**H**	**N**	**U**	
3	**8**	**D**	**J**	**P**	**V**	
4	**9**	**E**	**K**	**R**	**W**	
5	**A**	**F**	**L**	**S**	**Y**	

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1] AND TEXTURE
0 - No Actuator

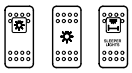
	Black	Gray	Red	White
Soft Surface	**B**	**G**	**R**	**W**
Hard Surface	**C**	**H**	**S**	**Y**

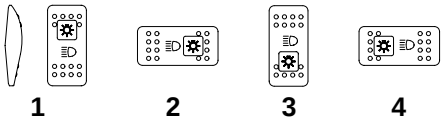
12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I

15 O O F N F **16** O O N F F **17** O I **18** I O

For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





1 **2** **3** **4**

14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Body legends not available on Soft surface actuators; White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.
4 Contura II available with two square lenses. Consult factory for details.

V	1	D	A	S	W	0	B	–	A	Z	E	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch
W lock

7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*			superbright	superbright	
	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

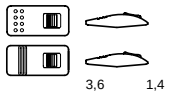
8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 HARD SURFACE ACTUATOR [1]

	Black	Gray	Red	White
Contura II	**A**	**B**	**G**	**H**
Contura III	**C**	**D**	**E**	**F**

Actuator orientation above terminals:



10 LENS
Z - No Lens

Clear	White	Amber	Green	Red	Blue
3	**8**	**D**	**J**	**P**	**V**

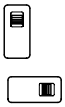
Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK FUNCTION AND COLOR [1]

Lock Color	Up	Down	Up & Down	Center [3]
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Safety Orange	**E**	**M**	**W**	**5**

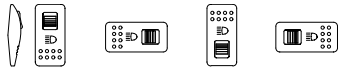
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

21 OFF	**22** ON	**23** O	**24** I
25 O F F	**26** O N	**27** O	**28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 21-28 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Only available with 3 position circuits. Center OFF and special circuits only available with center position lock function.
4 Additional ratings available. See V-Series Switch Accessories page.

V	1	D	A	B	T	0	B	–	E	P	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**JV**		

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
E Contura IV, left orientation
T Contura IV, left orientation, laser etched
F Contura IV, right orientation
R Contura IV, right orientation, laser etched
Actuator orientation above terminals:

10 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue
1	**6**	**8**	**G**	**M**	**T**
2	**7**	**C**	**H**	**N**	**U**
3	**8**	**D**	**J**	**P**	**V**
4	**9**	**E**	**K**	**R**	**W**
5	**A**	**F**	**L**	**S**	**Y**

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1,5,6]

No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F **17** O I **18** I O

For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Gloss brow is on left side of E actuator and right side of F actuator.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Laser etched rocker only available with lens code Z & actuator colors black, nickel or pewter.
6 Pewter and nickel colors only available with laser etched actuator.

V	1	D	A	B	T	0	B	–	G	P	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	superbright Green	superbright Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
G Contura V
P Contura V, laser etched

10 Lens
0 - No Actuator **Z** - No Lens style & location: #1 / #2

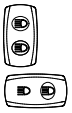
Clear	White	Amber	Green	Red	Blue	
1	**6**	**8**	**G**	**M**	**T**	bar
2	**7**	**C**	**H**	**N**	**U**	bar/bar
3	**8**	**D**	**J**	**P**	**V**	oval
4	**9**	**E**	**K**	**R**	**W**	oval/bar
5	**A**	**F**	**L**	**S**	**Y**	oval/oval

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1,3,5]

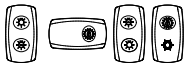
No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

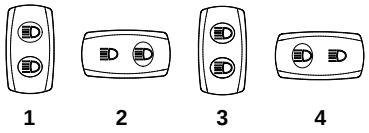
12 ACTUATOR LENS OR BODY LEGENDS [2,6]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





1 **2** **3** **4**

14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Laser Etched rocker only available with lens code Z & actuator colors black, nickel or pewter.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Nickel and Pewter colors only available with laser etched actuator.
6 Consult factory for laser etched lens callout.

V	1	D	A	S	W	0	B	–	J	Z	E	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT [3]
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 8 - - 7
1 - - 4 1 - - 4
2 - - 5 2 - - 5
3 - - 6 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch.
W low profile lock **Y** [6] high profile lock

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Only available with 3 position circuits. Center OFF and special circuits only available with center position lock function.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Located at T3-6 end of switch.
6 Contura V style only.

7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber			
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 HARD SURFACE ACTUATOR
CONTURA IV:

Orientation	Black	Gray	Red	White
Left	J	K	L	M
Right	N	P	R	S

Actuator orientation above terminals: 3,6 1,4

CONTURA V:

Orientation	Black	Gray	Red	White
	U	V	W	Y

Actuator orientation above terminals: 3,6 1,4

10 LENS [5]
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
A	**B**	**C**	**D**	**E**	**F**	bar lens
G	**H**	**J**	**K**	**L**	**M**	oval lens

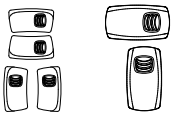
Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK FUNCTION AND COLOR [1]

Lock Color	Up	Down	Up & Down	Center [3]
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Safety Orange	**E**	**M**	**W**	**5**
Gray	**F**	**G**	**N**	**6**

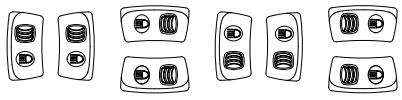
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

21	**22**	**23**	**24**
OFF	ON	O	I
25 O F F	**26** O N	**27** O	**28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



1 **2** **3** **4**

V	1	D	B	G	N	T	B	–	H	A	7	C	B	–	AC	1	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Color	13 Insert Color		14 Actuator Lens	15 Legend Orientation	16 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	superbright Green	superbright Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator **H** High Insert  **L** Low Insert 

10,11 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
–	**7**	**C**	**H**	**N**	**U**	Bar Lens Translucent
3	**–**	**D**	**J**	**P**	**V**	Bar Lens Transparent
4	**–**	**E**	**K**	**R**	**W**	Oval Lens Transparent
–	**A**	**F**	**L**	**S**	**Y**	Oval Lens Translucent

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

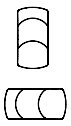
12 ACTUATOR COLOR
C Black **H** Gray **S** Red **Y** White

13 INSERT COLOR
B Black
C Bright Chrome Plated
D Satin Chrome Painted
N Bright Nickel Plated
S Satin Chrome Plated
T Satin Nickel Plated
W White

14 ACTUATOR LENS OR BODY LEGENDS [2]
00 - No Legend this location/No actuator

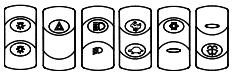
11 ON OFF **12** OFF ON **13** I O **14** O I

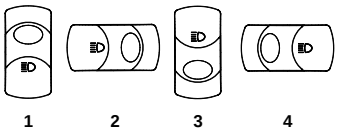
15 O O F N F **16** O O N F F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

15 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





16 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators. Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.

V	1	D	A	B	T	0	B	–	Z	R	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
	0	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

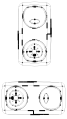
9 ACTUATOR
0 No Actuator
Z Contura VII
Actuator orientation above terminals: 3,6 1,4

10 LENS
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.
0 - No Actuator **Z** - No Lens

White	Amber	Green	Red	Blue	Lens style & location
6	**B**	**G**	**M**	**T**	
7	**C**	**H**	**N**	**U**	
8	**D**	**J**	**P**	**V**	
9	**E**	**K**	**R**	**W**	
A	**F**	**L**	**S**	**Y**	
1	**2**	**3**	**4**	**5**	

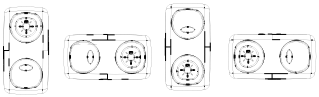
11 ACTUATOR COLOR / THUMB PRINT COLOR [1]
O N/A - No Actuator
H Grey/Black
Y White/Black
C Black/Black
S Red/Black

12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators. Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.
4 Legends available for lighted oval lens version only

V	1	D	A	B	6	0	1	–	6	P	Z	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 / 8 - - 7
1 - - 4 / 1 - - 4
2 - - 5 / 2 - - 5
3 - - 6 / 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*			superbright	superbright	
	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

*Consult factory for "daylight bright" LED. Typical current draw for LED is 20ma

8 BRACKET COLOR [1], PANEL SEAL (EXTERNAL FOAM GASKET)

X & XI with Flush Bracket			X, XI, XII with Raised Bracket		
# of gaskets	**0**	**1**	**2**	**0**	**1**
Black	**B**	**C**	**D**	**1**	**4**
White	**W**	**Y**	**Z**	**2**	**5**
Gray	**G**	**H**	**J**	**3**	**6**

9 ACTUATOR

No Actuator	**0**				
	Black	Gray	White	Red	
Contura X	**1**	**2**	**3**	**4**	
Contura XI	**6**	**7**	**8**	**9**	
Contura XII	**J**	**K**	**N**	**M**	

Actuator orientation above terminals: 3,6 1,4

10 LENS - ABOVE LAMP #1 TERMINALS [1,4]
11 LENS - ABOVE LAMP #2 TERMINALS [3,6]
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
3	**8**	**D**	**J**	**P**	**V**	**Bar**
4	**9**	**E**	**K**	**R**	**W**	**One piece Square**
5	**A**	**F**	**L**	**S**	**Y**	**Two piece Square*** **(With clear top protective lens)**
2	**7**	**C**	**H**	**N**	**U**	**Two piece Square*** **(With smoke top protective lens)**
1	**6**	**B**	**G**	**M**	**T**	**Two piece Square*** **(With white top protective lens)**

* All bottom lenses are molded of opaque material. Consult factory for other lens colors. Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

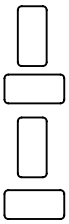
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location / No actuator

11 ON / OFF **12** OFF / ON **13** I / O **14** O / I

15 O F F N **16** O N F F **17** O I **18** I O

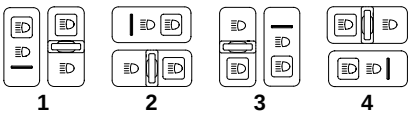
21 OFF **22** ON **23** O **24** I

25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION [3]
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators. Custom colors are available, consult factory.
3 With 2 square lenses, use selection 12 for lens above lamp 1, & selection 14 for lens above lamp 2.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Not available with Contura XI rockers.

V	1	D	A	S	W	0	1	–	1	P	B	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - 7 / 1 - 4 / 2 - 5 / 3 - 6
8 - 7 / 1 - 4 / 2 - 5 / 3 - 6 / 10 - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
9	**N**	OFF	NONE	ON
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch.
W Lock

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators; Custom colors are available, consult factory.
3 Located over T1-4 end of switch.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Located over T3-6 end of switch.

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	superbright Green	superbright Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Gasket	**1**	**2**	**3**
One Gasket	**4**	**5**	**6**

9 HARD SURFACE ACTUATOR

Contura X	Black	Gray	Red	White
	1	**2**	**3**	**4**

Actuator orientation above terminals:

10 LENS - ABOVE LAMP #2 TERMINALS [5]
Z - No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
3	**8**	**D**	**J**	**P**	**V**	**Bar**
4	**9**	**E**	**K**	**R**	**W**	**One piece Square**
5	**A**	**F**	**L**	**S**	**Y**	**Two piece Square*** **(with clear top protective lens)**
2	**7**	**C**	**H**	**N**	**U**	**Two piece Square*** **(with smoke top protective lens)**
1	**6**	**B**	**G**	**M**	**T**	**Two piece Square*** **(with white top protective lens)**

* All bottom lenses are molded of opaque material. Consult factory for other lens colors.
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

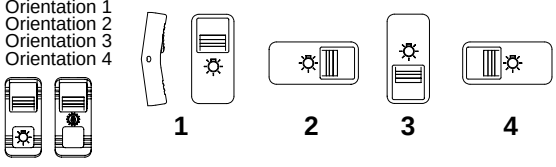
11 ACTUATOR LOCK FUNCTION AND COLOR [3]

Lock Color	Up	Down	Up & Down
Match Actuator	**A**	**H**	**R**
Black	**B**	**J**	**S**
White	**C**	**K**	**T**
Red	**D**	**L**	**V**
Gray	**E**	**M**	**W**
Safety Orange	**F**	**N**	**Y**

12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend
21 OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I

For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION [3]
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



V	1	D	B	B	C	0	B	–	FA	P	C	AB	–	1	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Actuator Color	12 Legend		13 Legend Orientation	14 Actuator, Lens Legends

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:

8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6

10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary

SP - single pole - uses terminals 1, 2 & 3.

DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.

Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1
S*		2 & 3, 5 & 6	2 & 3	1 & 2

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)

4 TERMINATION / BASE STYLE

8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**4**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	–	–
A	1	INDEPENDENT	8 (+) 7 (–)
B	1	DOWN	3 (+) 7 (–)
C	2	UP	3 (+) 7 (–)
D	1	DOWN	3 (+) 7 (–)
	2	DOWN	1 (+) 7 (–)
E	1	UP	1 (+) 7 (–)
	2	UP	3 (+) 7 (–)
F	1	INDEPENDENT	8 (+) 7 (–)
	2	UP	3 (+) 6 (–)
G	1	INDEPENDENT	8 (+) 7 (–)
	2	UP	3 (+) 7 (–)
H	2	INDEPENDENT	8 (+) 7 (–)
SINGLE POLE SWITCHES ONLY			
J	1	DOWN	3 (+) 8 (–)
	2	INDEPENDENT	6 (+) 7 (–)
K	1	INDEPENDENT	8 (+) 7 (–)
	2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY			
L	1	DOWN	3 (+) 6 (–)
M	1	UP	3 (+) 6 (–)
N	1	DOWN	3 (+) 6 (–)
	2	DOWN	1 (+) 4 (–)
P	1	UP	1 (+) 4 (–)
	2	UP	3 (+) 6 (–)
U	1	INDEPENDENT	8 (+) 7 (–)
	2	INDEPENDENT	10 (+) 9 (–)

6 & 7 LAMP

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*			superbright	superbright	
	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR & PANEL SEAL

Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

9 ACTUATOR STYLE
0 No Actuator - Furnished separately
FA Contura XIV
FB Contura XIV - Laser Etched

10 LENS COLOR / STYLE
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**6**	**B**	**G**	**M**	**T**	
2	**7**	**C**	**H**	**N**	**U**	
3	**8**	**D**	**J**	**P**	**V**	
4	**9**	**E**	**K**	**R**	**W**	
5	**A**	**F**	**L**	**S**	**Y**	
5	**A**	**N/A**	**N/A**	**N/A**	**N/A**	Laser-Etched Actuator Only

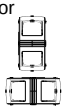
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1]
O N/A - No Actuator
C Black
S Red
Y White

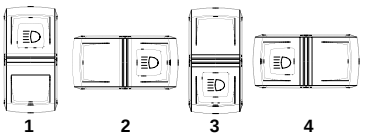
12 ACTUATOR LENS or BODY LEGEND [2]
00 - No Legend this location / No actuator

11 ON / OFF **12** OFF / ON **13** I / O **14** O / I

15 O O / F N / F **16** O O / N F / F **17** O I **18** I O



13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR / LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators.
3 Additional ratings available. See V-Series Switch Accessories page.

V	1	D	A	B	W	0	B	–	FC	Z	B	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Actuator Color	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:

8 terminal — 8 - - 7; 1 - - 4; 2 - - 5; 3 - - 6

10 terminal — 8 - - 7; 1 - - 4; 2 - - 5; 3 - - 6; 10 - - 9

( ) - momentary

SP - single pole - uses terminals 1, 2 & 3.

DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
-	**B**	(ON)	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON

SPECIAL CIRCUITS

H*	2 & 3	2 & 3, 5 & 4	5 & 4
G*	2 & 3, 5 & 6	2 & 3	OFF
M*	(2 & 3, 5 & 6)	2 & 3	OFF
R*	(2 & 3, 5 & 6)	2 & 3	2 & 1
E*	5 & 6	5 & 3	5 & 1
S*	2 & 3, 5 & 6	2 & 3	1 & 2

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1	.4VA @ 28VDC Resistive
B	15A 24V
C	20A 18V
D	20A 12V
E	20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F	10A 14V, 6A 14VT (circuit G only)

4 TERMINATION / BASE STYLE
8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	–	–
C	2	UP	3 (+) 7 (–)
H	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY			
M	1	UP	3 (+) 6 (–)

6 LOCK OPTION
W Low Profile Lock

7 LAMP
No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR & PANEL SEAL
Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

9 ACTUATOR COLOR / STYLE
FC	Black - Standard Rocker
FD	Black - Laser Etched
FS	Red - Standard Rocker
FT	Red - Laser Etched

10 LENS COLOR / STYLE
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**6**	**B**	**G**	**M**	**T**	
3	**8**	**D**	**J**	**P**	**V**	
5	**A**	**N/A**	**N/A**	**N/A**	**N/A**	Laser-Etched Actuator Only

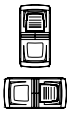
Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK COLOR / FUNCTION [1]
		LOCK IN POSITION		
Lock Color	*UP*	*DOWN*	*UP & DOWN*	*CENTER*
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Orange	**E**	**M**	**W**	**5**
Gray	**F**	**G**	**N**	**6**

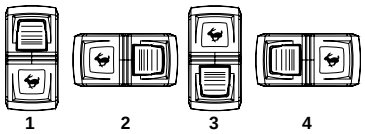
12 ACTUATOR LENS or BODY LEGEND [2]
00 - No Legend

21 OFF **22** ON **23** O **24** I

25 O F F **26** O N **27** O **28** I



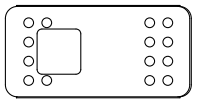
13 LEGEND ORIENTATION
0	No legend
1	Orientation 1
2	Orientation 2
3	Orientation 3
4	Orientation 4

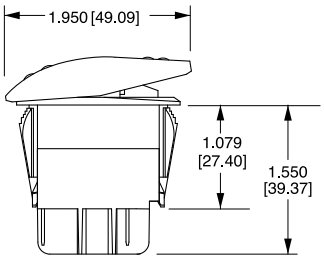


Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators.
3 Additional ratings available. See V-Series Switch Accessories page.

Dimensional Specifications: in. [mm]

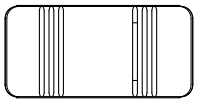
CONTURA II
SHOWN WITH
SQUARE LENS

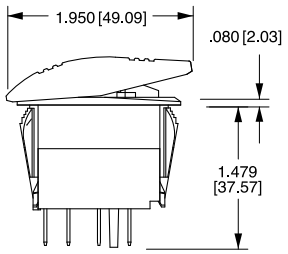




8 TERMINAL BASE W/BARRIERS

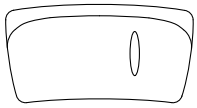
CONTURA III

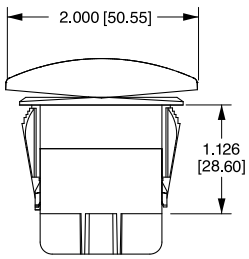




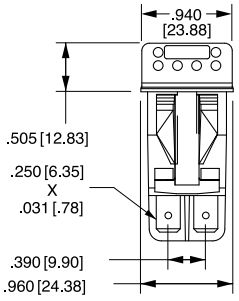
8 TERMINAL BASE W/O BARRIERS

CONTURA IV
SHOWN WITH
BAR LENS

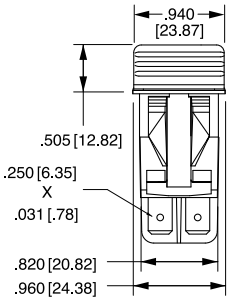




10 TERMINAL BASE W/BARRIERS



8 TERMINAL BASE W/BARRIERS



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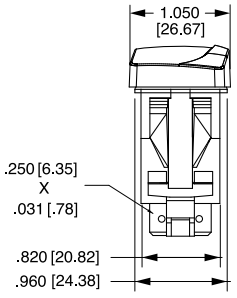
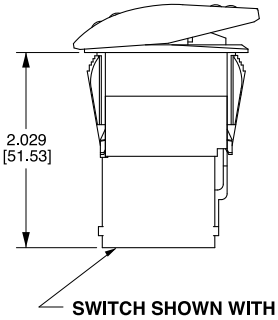
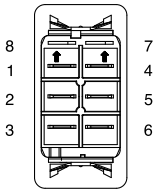


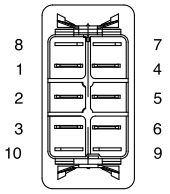
10 TERMINAL BASE W/O BARRIERS



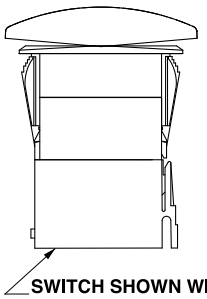
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

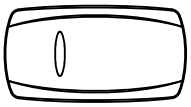


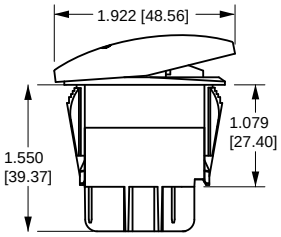
SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

Dimensional Specifications: in. [mm]

CONTURA V

SHOWN WITH BAR LENS

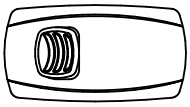


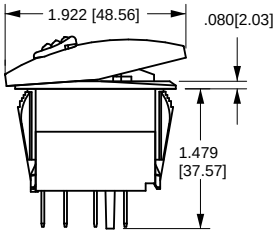


8 TERMINAL BASE W/BARRIERS

CONTURA V

SHOWN WITH LOW PROFILE LOCK

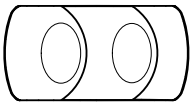


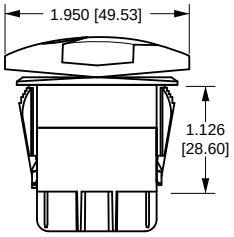


8 TERMINAL BASE W/O BARRIERS

CONTURA VI

SHOWN WITH OVAL LENS

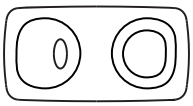


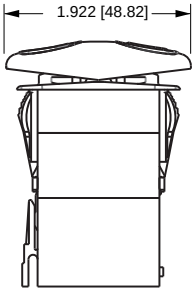


10 TERMINAL BASE W/BARRIER AND LAMP TERMINAL

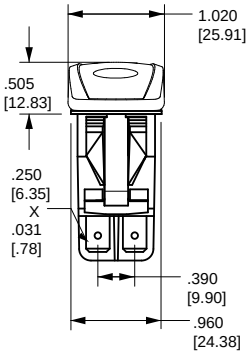
CONTURA VII

SHOWN WITH LARGE LENS AND BAR LENS

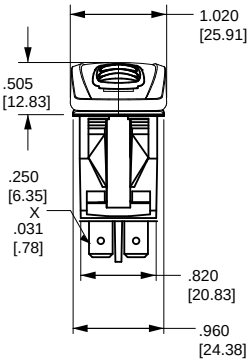




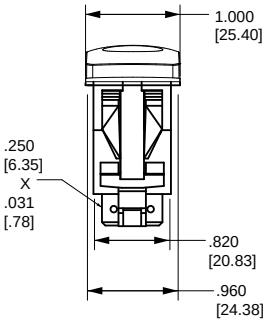
10 TERMINAL BASE W/O BARRIERS



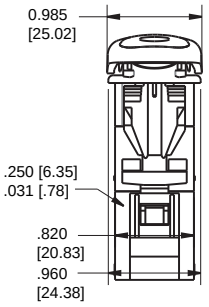
8 TERMINAL BASE W/BARRIERS



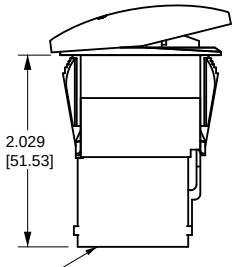
8 TERMINAL BASE W/O BARRIERS



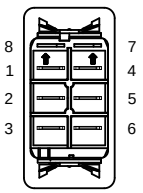
10 TERMINAL BASE W/O BARRIERS



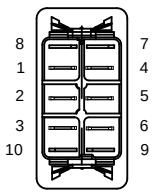
10 TERMINAL BASE W/O BARRIERS



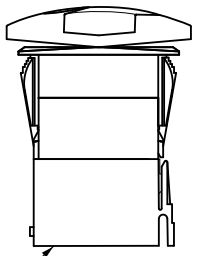
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



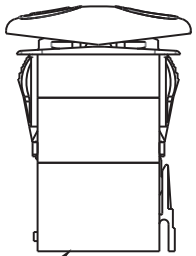
BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE



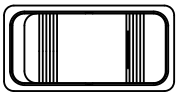
SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

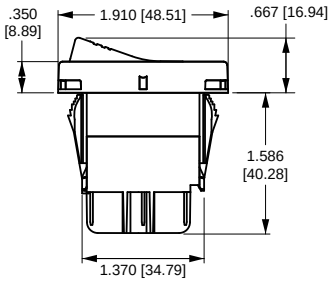


SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

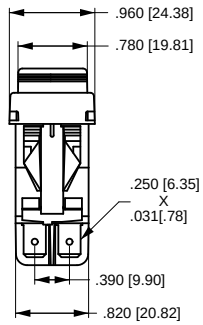
Dimensional Specifications: in. [mm]

CONTURA X
SHOWN WITH RAISED BRACKET

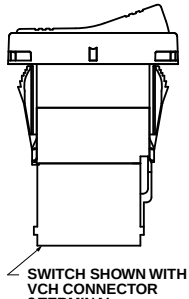




8 TERMINAL BASE W/BARRIERS

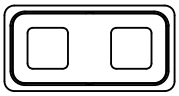


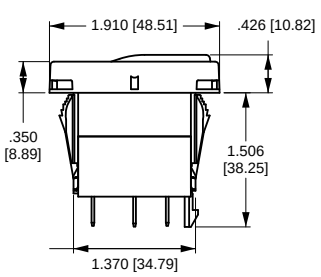
8 TERMINAL BASE W/BARRIERS



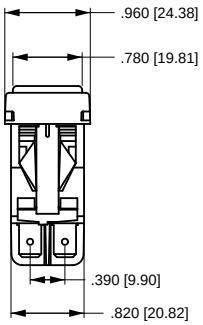
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL

CONTURA XI
SHOWN WITH RAISED BRACKET AND TWO SQUARE LENSES

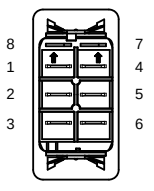




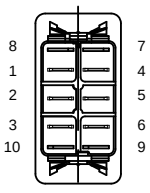
10 TERMINAL BASE W/O BARRIERS



10 TERMINAL BASE W/BARRIERS

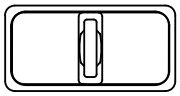


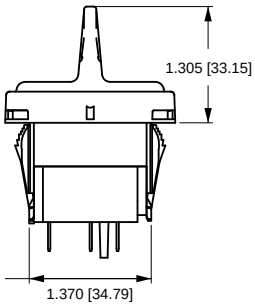
BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



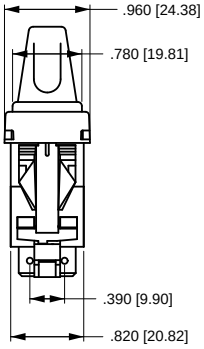
BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

CONTURA XII
SHOWN WITH PADDLE ACTUATOR

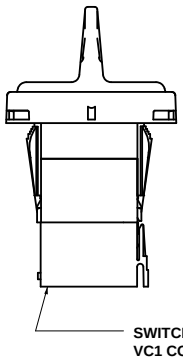




8 TERMINAL BASE W/O BARRIERS

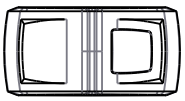


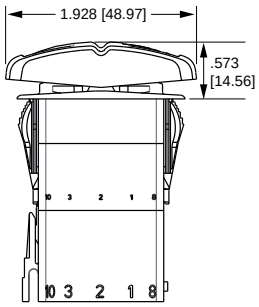
10 TERMINAL BASE W/O BARRIERS



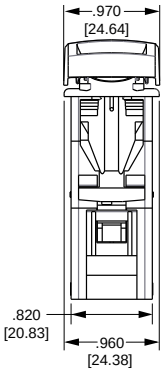
SWITCHES SHOWN WITH VC1 CONNECTOR 10 TERMINAL

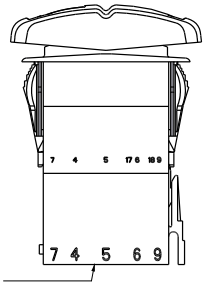
CONTURA XIV
SHOWN WITH LARGE LENS



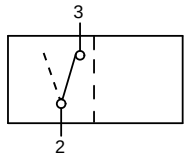
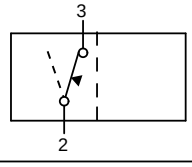
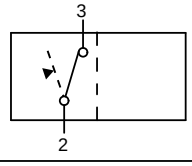
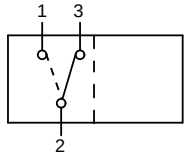
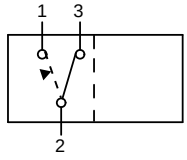
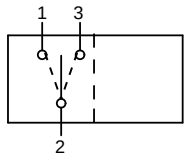
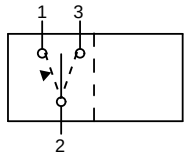
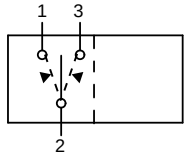


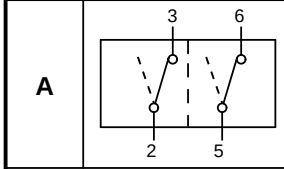
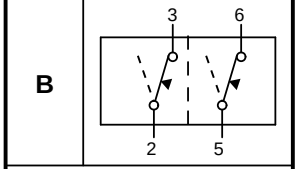
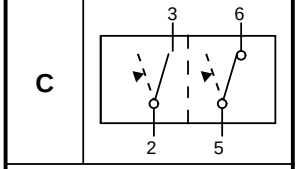
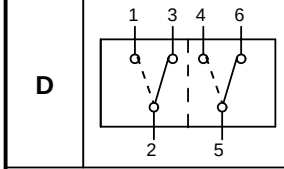
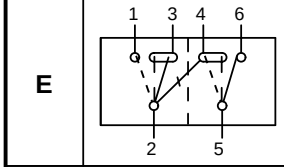
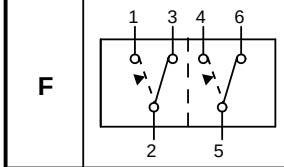
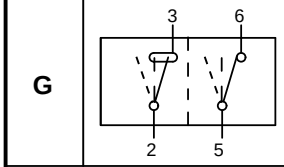
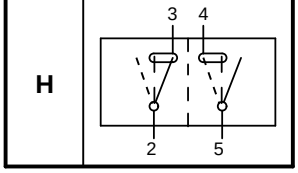
10 TERMINAL BASE W/O BARRIERS

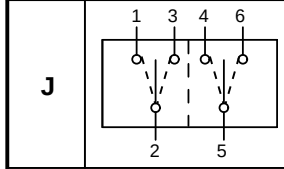
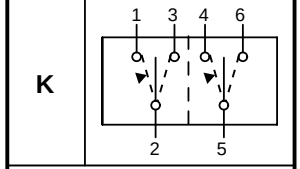
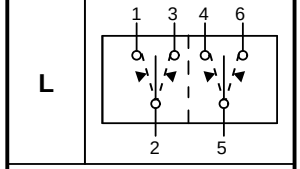
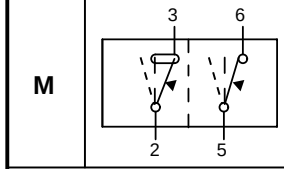
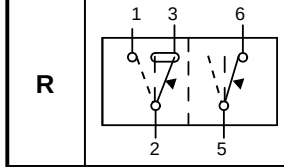
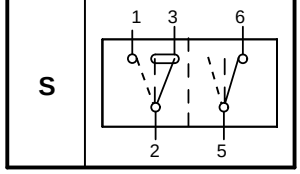




Circuit Diagrams:

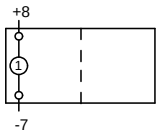
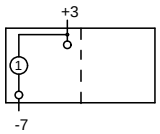
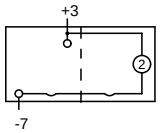
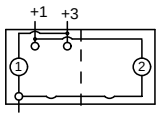
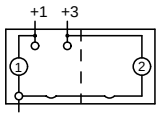
CIRCUIT CODE	CIRCUIT DIAGRAM
1	
2	
3	
4	
5	
6	
7	
8	

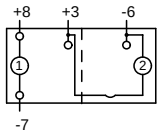
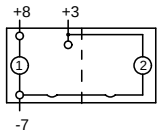
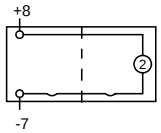
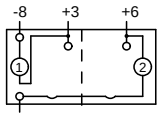
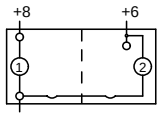
CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

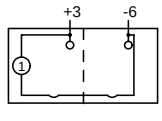
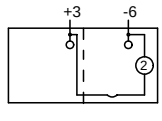
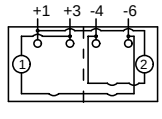
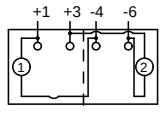
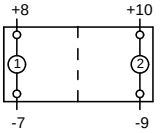
CIRCUIT CODE	CIRCUIT DIAGRAM
J	
K	
L	
M	
R	
S	

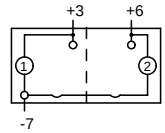
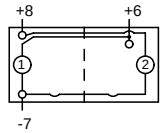
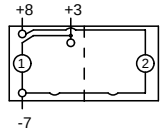
SYMBOL LEGEND	
SYM.	DEFINITION
	DESIGNATES TERMINALS AND CONTACTS
	DESIGNATES MAINTAINED CIRCUITS
	DESIGNATES OTHER POSITION
	DESIGNATES MOMENTARY CIRCUITS
	DESIGNATES TWO POSITION CONNECTION
	DESIGNATES EXTERNAL JUMPER PROVIDED BY CUSTOMER

Lamp Circuit Diagrams:

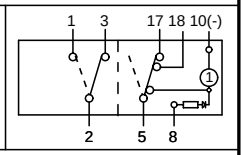
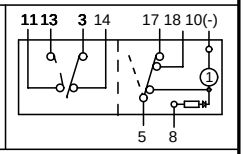
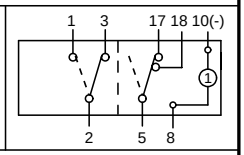
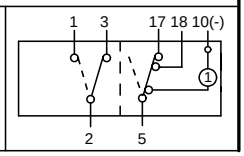
LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A / 1	
B / 2	
C / 3	
D / 4	
E / 5	

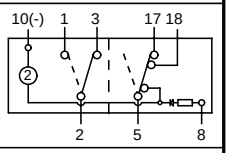
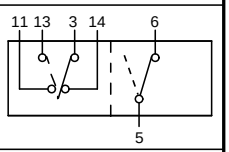
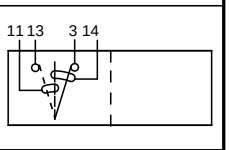
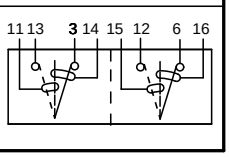
LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
F / 6	
G / 7	
H / Z	
J / 8	
K / W	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
L / 9	
M / R	
N / T	
P / V	
U / Y	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
SPECIAL #1	
SPECIAL #3	
SPECIAL #4	

J-Series Hazard Warning Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM
J1	
J2	
J3	
J4	

CIRCUIT CODE	CIRCUIT DIAGRAM
J5	
JA	
JJ	
JK	

NOTE:
J circuits are available for all non-locking V-Series styles.
Consult factory for partnumber details.

SYMBOL LEGEND	
SYM.	DEFINITION
o	DESIGNATES TERMINALS AND CONTACTS
◯	DESIGNATES LAMP LOCATION

Rotary

V-Series
CONTURA ROTARY SWITCHES

The V-Series Contura Rotary Switch was designed for maximum performance and reliability leveraging the features of the widely popular V-series Contura Rocker Switches. Available in maintained and momentary circuit options, the V-Series Rotary features a sturdy knob construction, up to three separate LEDs, and fits in an industry standard panel opening.

Internally, the V-Series Contura Rotary uses a patented mechanism that translates rotary to linear motion. This allows for common switch functionality and terminal connections with the V-Series rocker version and requires no harness change. A secondary CAM, which helps drive the mechanism, provides definitive detent positions and prevents the switch from stopping between positions, while improving tactile feel.

The V-Series Rotary also features an innovative PC board that supports the LED and surface mount resistors; and IP67 sealing protection above panel by utilizing LED and actuator stem seals. Together, these features make the V-Series Contura Rotary switch the best choice available in the market today.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

- Accommodates up to three separate LEDs
- Patented mechanism translates rotary into linear motion
- Secondary CAM for definitive detent positions
- PC Board supports LED and surface mount resistors
- IP67 sealing protection above panel
- Common terminal & circuit functionality with V-Series Rocker switches, with no harness change required

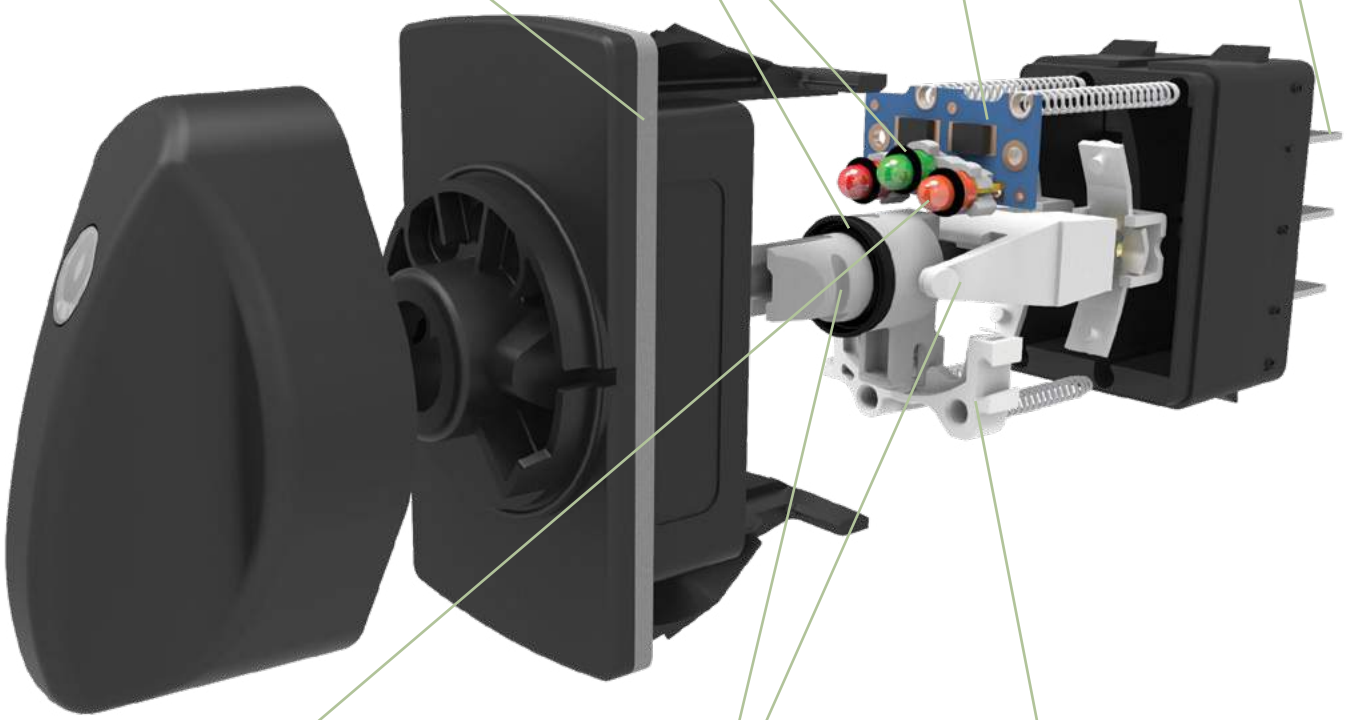
V-Series Rotary Switch
DESIGN FEATURES

OPTIONAL PANEL SEAL
Prevents water/dust ingress behind panel

SEALS
LED and stem seals provide IP67 protection above panel

PC BOARD
Supports LEDs and surface mount resistors

TERMINALS
Same pinout as V-Series Rocker Switches, requiring no harness change



LEDS
Up to three separate LEDs

ROTARY & LINEAR ACTUATOR
Patented mechanism that translates rotary to linear motion

SECONDARY CAM
Provides definitive detent positions with ball & spring located in rotary actuator

Electrical

Rating

Circuit	Voltage	Max Current Resistive
2 Position Maintain	12	20
2 Position Momentary	12	20
3 Position All	12	20
2 Position Maintain	24	15
2 Position Momentary	24	15
3 Position All	24	15

Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 Milli Ohm max @ 4VDC
Life	50,000 Cycles Two Position 25,000 Cycles Two Position Momentary and All Three position
Terminals	0.250" (6.3mm) Quick Connect

Physical

Function Circuits	Double Pole Single Throw, DPST Double Pole Double Throw, DPDT
Operation	Two and Three Position Maintained and Momentary
Knob Rotation	Two Position 60 Degrees Three Position 30 Degrees from Center
Illumination	LED; Red, Green, Amber, Yellow, White, Blue
Seals	LED O-ring(s) – Silicone, Bezel gasket – Neoprene, Knob seal - NBR
Flammability	Exceeds FVMSS 302 Requirements, Exterior Components, UL 94 V-2 or Better Interior Components, UL 94 HB or Better
Base	Polyester, PBT
Bracket	Nylon 66, PA
Knob	Polybutylene Terephthalate, PBT 6.5%GF
Lens	Polycarbonate, PC
Connector	Nylon 66, PA
Mounting	Front Panel Snap In, 1.450" (36.83mm) X 0.830" (21.08mm) Panel Thickness, 0.030" – 0.187" (0.76 – 4.75mm)

Mechanical

Mechanical Life	100,000 Cycles Maintained Circuits 50,000 Cycles Momentary Circuits
Knob Impact	50 Gram weight dropped from a height of 18 inches on Top & Sides

Environmental

Sealing	IP67, in accordance with IEC 60529, BS 5490, DIN 40050 & NFC 20 010. This rating applies to front panel components of the actual switch only, and signifies protection against dust and the prolonged effects of immersion under pressure.
Dust	Mil STD 810, Method 510.2 Air Velocity 300 Ft/Min Duration 16Hr
Corrosion	IEC 68-2-60 Mixed Flowing Gas (MFG) 14 Days
Chemical Splash	Gasoline, Diesel, Motor Oil, Brake Fluid, Ammonia, Armour All
Salt Spray	Mil STD 202G, Method 101, Test Condition A 96 Hr
Vibration Random	Mil STD 202G, Method 214 test Condition C 10G's RMS
Vibration Sinusoidal	Mil STD 202G, Method 204D, Test Condition A 0.06DA or 10G's 10-500Hz
Shock	MIL-STD 202G, Method 213B Test Condition K, 30G's
Handling Shock	1 Meter Drop onto Hard Surface
Thermal Shock	MIL-STD 202G, Method 107G Test Condition A -55 C to 85 C
Moisture Resistance	MIL-STD 202G, Method 106F 10, 25 C to 65 C Cycles 95% RH
Thermal Cycling	25 Cycles -40 C to 85 C
Ignition Protection	ISO 8846 with EC Directive 94/25/EC for Marine Products
UV Protection	300 hr Xenon Arc, 1.4W/m2 wavelength 420 nm
ESD	Human Static Discharge, +/- 15KV applied during normal operation Shipping/Handling, frequency range 200-2000 MHz applied voltage is +8KV to +15KV and -8KV to -15KV 3 discharge cycles

*Manufacturer reserves the right to change product specification without prior notice.

RV	21	D	2	B	6	0	0	B	–	K	R	C
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp 1	7 Lamp 2	8 Lamp 3	9 Bracket		10 Actuator	11 Lens	12 Knob Color

1 SERIES
RV Rotary Contura

2 CIRCUIT [1]
Terminal Connections as viewed from bottom of switch:
8 - - 7
1 - - 4
2 - - 5
3 - - 6
10 - - 9

( ) - momentary

DP - double pole uses 1, 2, 3 and 4, 5, 6.

Position:	1	2	3
DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
21	ON	NONE	OFF
22	(ON)	NONE	OFF
23	ON	NONE	(OFF)
24	ON	NONE	ON
26	ON	OFF	ON
28	(ON)	OFF	(ON)
SPECIAL CIRCUITS			
55	(ON)	OFF	ON
61	2 & 3, 5 & 6	2 & 3, 4 & 5	1 & 2, 4 & 5
62	2 & 3, 5 & 6	2 & 3	OFF
64	(2 & 3, 5 & 6)	2 & 3	OFF

3 RATING
1 .4VA 28VDC Resistive
B 15A 24V
D 20A 12V

4 TERMINATION / BASE STYLE

8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) - no barriers	No
A	**B**	.250 TAB (QC) - with barriers	No
J [4, 5]	**K** [4, 5]	.250 TAB (QC) - no barriers	Yes (T2 to T5)

Notes:
1 Switch circuit uses terminals 1,2,3,4,5 & 6. Terminals 7,8,9 & 10 are for lamp circuit only.
2 Jumper between terminals 2 & 5 for Circuits 61, 62, & 64 to be specified in the Termination & Jumper selection.
3 Circuit 61 may be used for SP, OFF-ON-ON circuit.
4 Base will not have terminal insulating barriers when connector and/or jumpers are used.
5 Code J,K are optional for circuits 62 and 64. Customer may provide externally wired jumper to connect terminals 2 and 5.
6 Lamp #1 located at top end of switch, above terminal 4.
Lamp #2 located at top end of switch between terminals 1 & 4.
Lamp #3 located at top end of switch, above terminal
Positive (+) and negative (-) symbols apply to L.E.D. lamps only.
7 Mounting hole size is 1.450" (36.83mm) by 0.830" (21.08mm). To mount multiple switches in single panel cut-out order optional interlocking mounting panels.
8 Lens color for L.E.D.s must be clear, white, or match color of L.E.D.

5 ILLUMINATION [6, 8]

Sealed	Lamps	when illuminated	Terminals
S	NONE		
A	# 1	Independent	8+ 7-
B	# 1	Dependent	3+ 7-
C	# 1	Independent	8+ 7-
	& # 3	Independent	10+ 7-
D	# 1	Dependent	3+ 7-
	& # 3	Dependent	1+ 7-
E	# 1	Independent	8+ 7-
	# 2	Independent	9+ 7-
	# 3	Independent	10+ 7-
F	# 1	Dependent	3+ 7-
	# 2	Independent	9+ 7-
	# 3	Dependent	1+ 7-
G	# 1	Dependent	3+ 7-
	# 3	Independent	8+ 7-
H	# 2	Independent	8+ 7-
J	# 1	Independent	8+ 7-
	# 2	Independent	10+ 7-
K	# 1	Dependent	3+ 7-
	# 2	Dependent	1+ 7-
L	# 1	Dependent	3+ 7-
	# 2	Independent	8+ 7-
M	# 2	Independent	8+ 7-
	# 3	Independent	10+ 7-
N	# 2	Dependent	3+ 7-
	# 3	Dependent	1+ 7-
P	# 2	Independent	10+ 7-
	# 3	Dependent	1+ 7-
R	# 3	Independent	8+ 7-
T	# 3	Dependent	1+ 7-

6, 7, 8 LAMP #1, 2 AND OR LAMP #3 [6, 8]
Selection 6: above terminal 7; Selection 8: above terminal 8
No lamp **0**

LED	Red	Amber	Green	Blue	White
12VDC	**C**	**N**	**H**	**E**	**6**
24VDC	**D**	**P**	**J**	**K**	**8**

9 BRACKET COLOR & PANEL SEAL [7]

Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

10 ACTUATOR STYLE
K Rotary Knob (Standard)

ACTUATOR ORIENTATION ABOVE TERMINALS

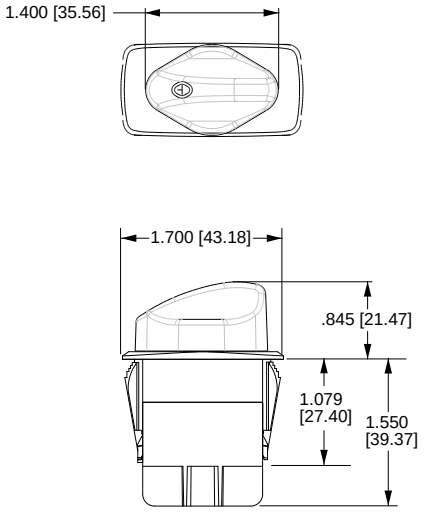
11 LENS COLOR [8]
No Lens **Z**

Clear	White	Amber	Green	Red	Blue
4	**9**	**E**	**K**	**R**	**W**

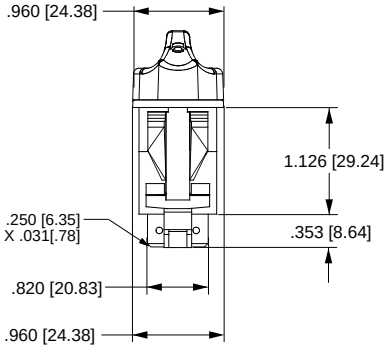
12 KNOB COLOR

Black	Gray	Red	White
C	**H**	**S**	**Y**

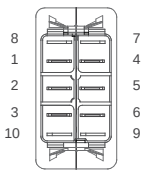
Dimensional Specifications: in. [mm]



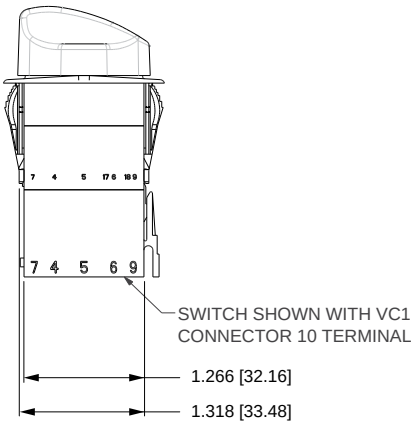
10 TERMINAL BASE
W/ BARRIERS



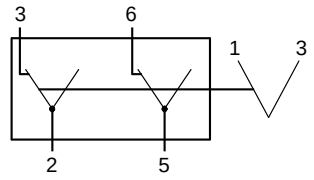
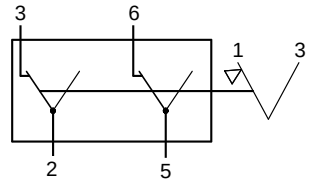
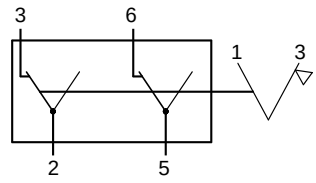
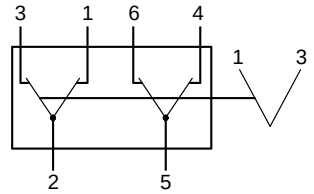
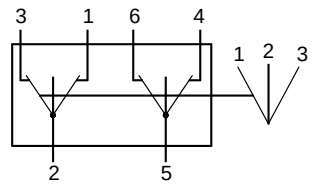
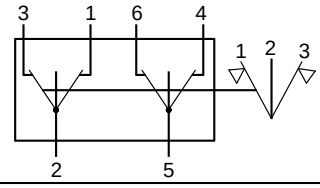
10 TERMINAL BASE
W/O BARRIERS

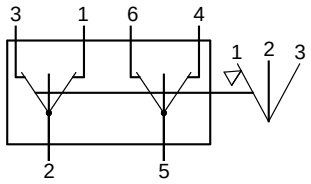
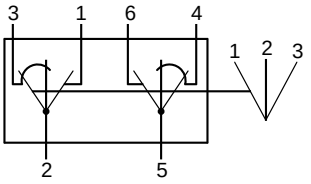
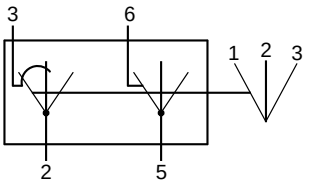
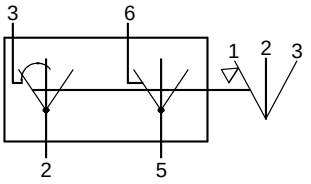


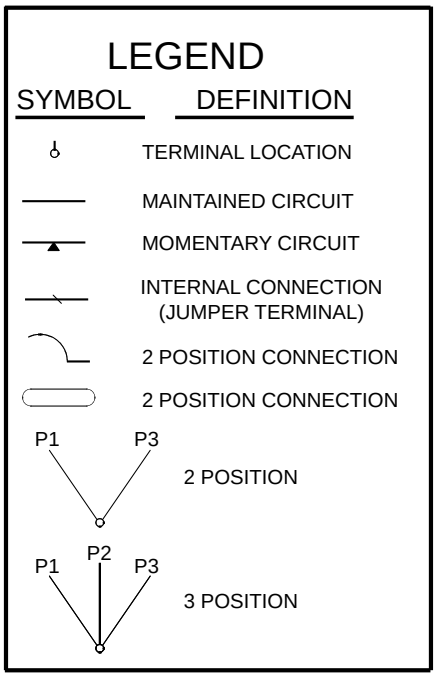
BOTTOM VIEW
TERMINAL ARRANGEMENT
10 TERMINAL BASE



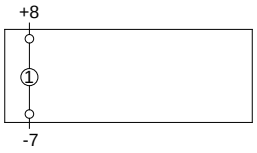
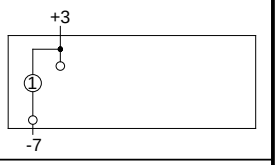
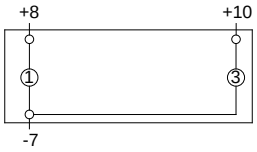
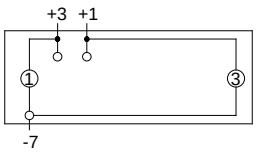
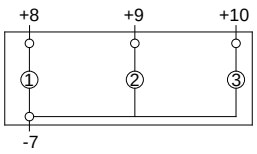
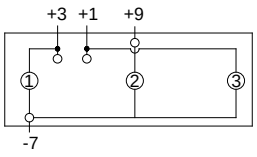
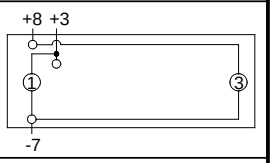
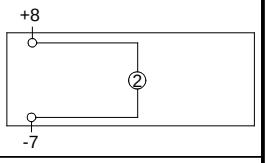
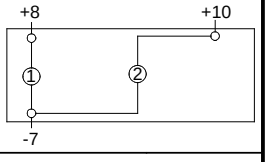
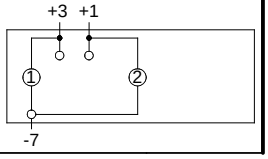
Circuits Diagrams:

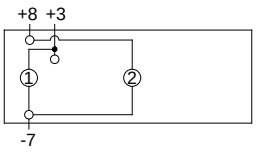
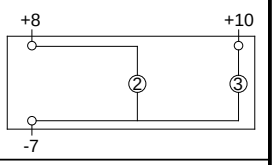
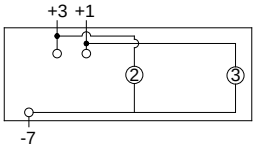
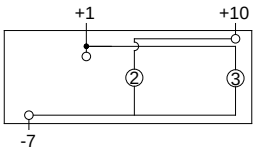
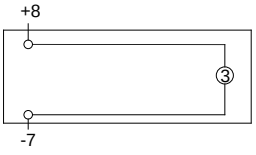
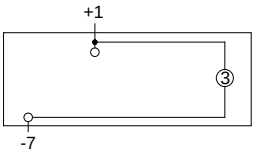
CIRCUIT CODE	CIRCUIT DIAGRAM	KNOB POSITION
21		
22		
23		
24		
26		
28		

CIRCUIT CODE	CIRCUIT DIAGRAM	KNOB POSITION
55		
61		
62		
64		



Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	
J	
K	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
L	
M	
N	
P	
R	
T	

V-Charger

V-SERIES DUAL PORT USB 2.0 CHARGERS

Carling Technologies USB V-Charger is designed to charge tablets, e-readers, mobile and gaming devices, digital cameras, as well as other compatible electronic devices.

Providing a total current of 3.15 amps, the V-Charger delivers fast charging times even in extreme temperatures from -40˚C to +80˚C. This innovative product safeguards its electronics with integrated over-current and thermal overload protection, as well as optional load dump circuitry, assuring prolonged safe and reliable operation. The center LED indicates charging is in progress. Snap-in mounting for an industry standard 1.450" x .830" panel cutout makes installation easy.

*Additionally, the V-Charger's double torsion spring-loaded access doors automatically close and provide effortless IP64 sealing protection with precision-fit silicone rubber seals.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

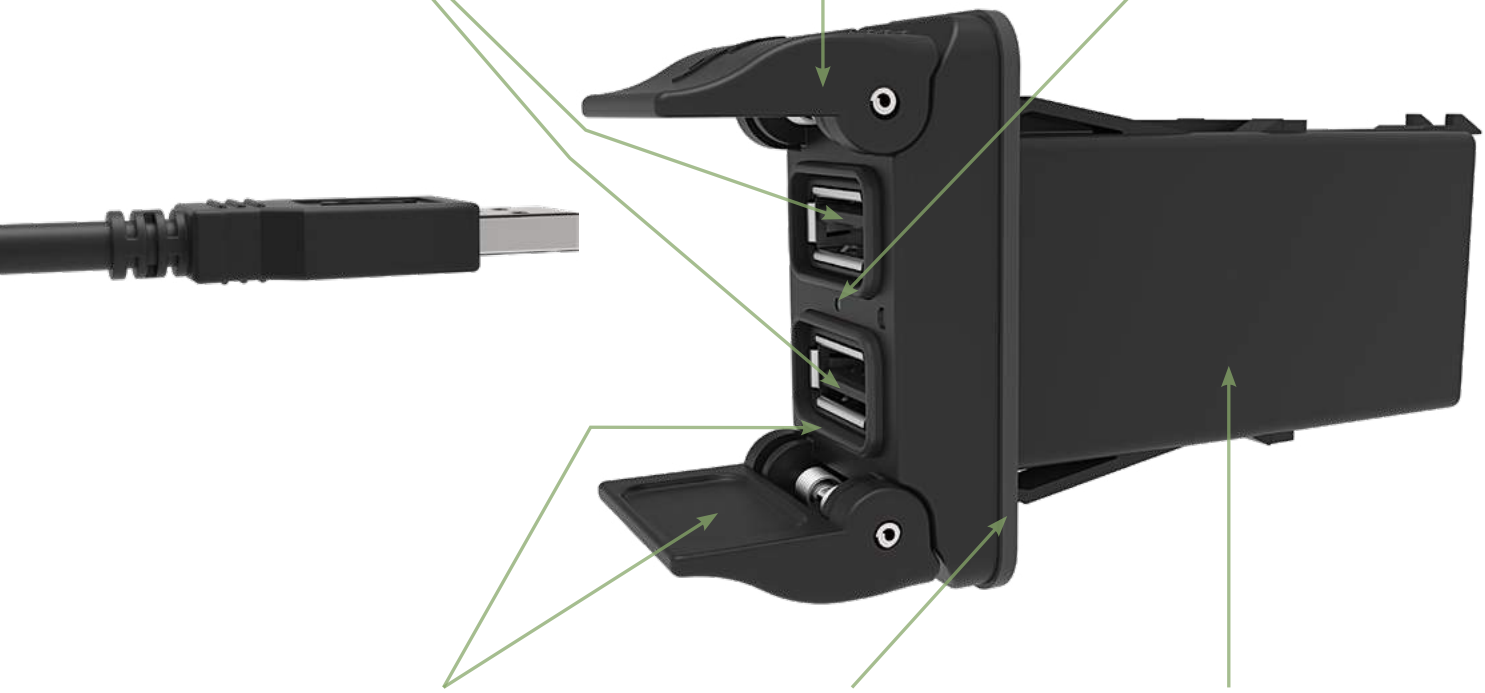
- Dual USB Charging Ports
- 3.15 Amps for Faster Charging
- 10,000 Operating Cycles per Port
- IP64 Sealing Protection
- 12-24 V Operating Voltage
- Protection for Internal Components

V-Charger
DESIGN FEATURES

DUAL USB 2.0 PORTS
Total current of 3.15 amps, facilitating faster charges

SPRING LOADED DOORS
Stylish, wing-shaped double doors automatically close to cover and seal each port when not in use

LED
Green LED brightens to indicate charging is in progress



SEALING PROTECTION
Silicone rubber seal perfectly mates with door indent to provide IP64 level of sealing protection

PANEL SEAL
Prevents water ingress beneath panel to protect critical connections

MOUNTING
Fits industry standard panel opening size of 1.450" x .830"

Electrical

USB Type	2.0
Number of USB Ports	2
Operating Voltage	12V/24V DC power systems (9 to 29 VDC)
Output Voltage	5 VDC ± 5%
Max Output Current	3.15A DC Total
Current Draw (No Load)	12V: 0.8 mA, 24V: 1.9 mA
LED Indicator	Green LED brightens when charging is in progress.
Compatibility	Charges mobile devices including iPad, iPhone, iPod, HTC, Galaxy, Blackberry, MP3 Players, Digital Cameras and PDA's
Life	10,000 operating cycles per port minimum
Terminals	Copper/silver plating 1/4" (6.3 mm) Quick Connect terminations
Reverse Polarity	Operational with correct polarity after reverse polarity exposure
ESD	15kV air, 8 kV touch
Overcurrent Protection	Short Circuit
Thermal Overload Protection	Operation will cease if internal temperature reaches 125°C. Charging will resume after sufficient heat loss

Physical

Panel Opening	1.450" x .830"
Panel Thickness	.030 - .156 inches
Panel Mounting Method	Front Panel Insertion
Seals	Silicone and Poron
Depth Behind Panel	See Figures 1 and 2
Connection	VC1, VC2
Weight	55g (0.12 lbs)
Styling	Curved USB port doors
Port Protection	Twin, self-closing doors

Environmental

Sealing	IP64 for front panel components when USB Ports are covered
Operating Temperature	-40° to +60°C at 3.15A -40° to +70°C at 2.4A -40° to +80°C at 2.1A
Vibration 1 Test	Mil-Std 202G, Method 204D, Condition A. 0.06DA or 10G, 10-500 Hz
Shock Test	Mil-Std 202G, Method 213B, Condition K @ 30-G. No loss of circuit during test.
Chemical Splash	Brush method with USB doors closed: diesel, gasoline, brake fluid, Windex, Armor All
Thermal Shock	MIL-Std 202F, Method 107D, Test Condition A, -55° to +85°C. Test Criteria: Remains functional without damage
Moisture Resistance	Mil-Std 202G, Method 106G. Test Criteria: Remains functional without damage
Thermal Cycling	25 Cycles -40° to +85°C, 2 hours for each temperature every cycle
Salt Spray	Mil-Std 202G, Method 101E, Test Condition A
Dust	Mil-Std 841C Method 510.2 Air Velocity 300 ± 200 Ft/min, test duration: 16 Hr

Mechanical

Endurance	10,000 door cycles minimum

*Manufacturer reserves the right to change product specification without prior notice.

Ordering Scheme

V	–	USB	–	24	–	G	1	1	–	1	B	B	1
1 Series		*2 Product Type*		*3 Source Voltage*		*4 LED Indicator*	*5 Circuit Protection*	*6 Termination*		*7 Door Style*	*8 Door Color*	*9 Base Color*	*10 Panel Seal*

1 SERIES
V

2 PRODUCT TYPE
USB Charger

3 SOURCE VOLTAGE
24 24 / 12 Volts DC

4 LED INDICATOR (VOLTAGE MATCHES SOURCE)
G Green

5 CIRCUIT PROTECTION
1 Reverse Polarity, Thermal Overload & Overcurrent

6 TERMINATION
1 .250 Tab

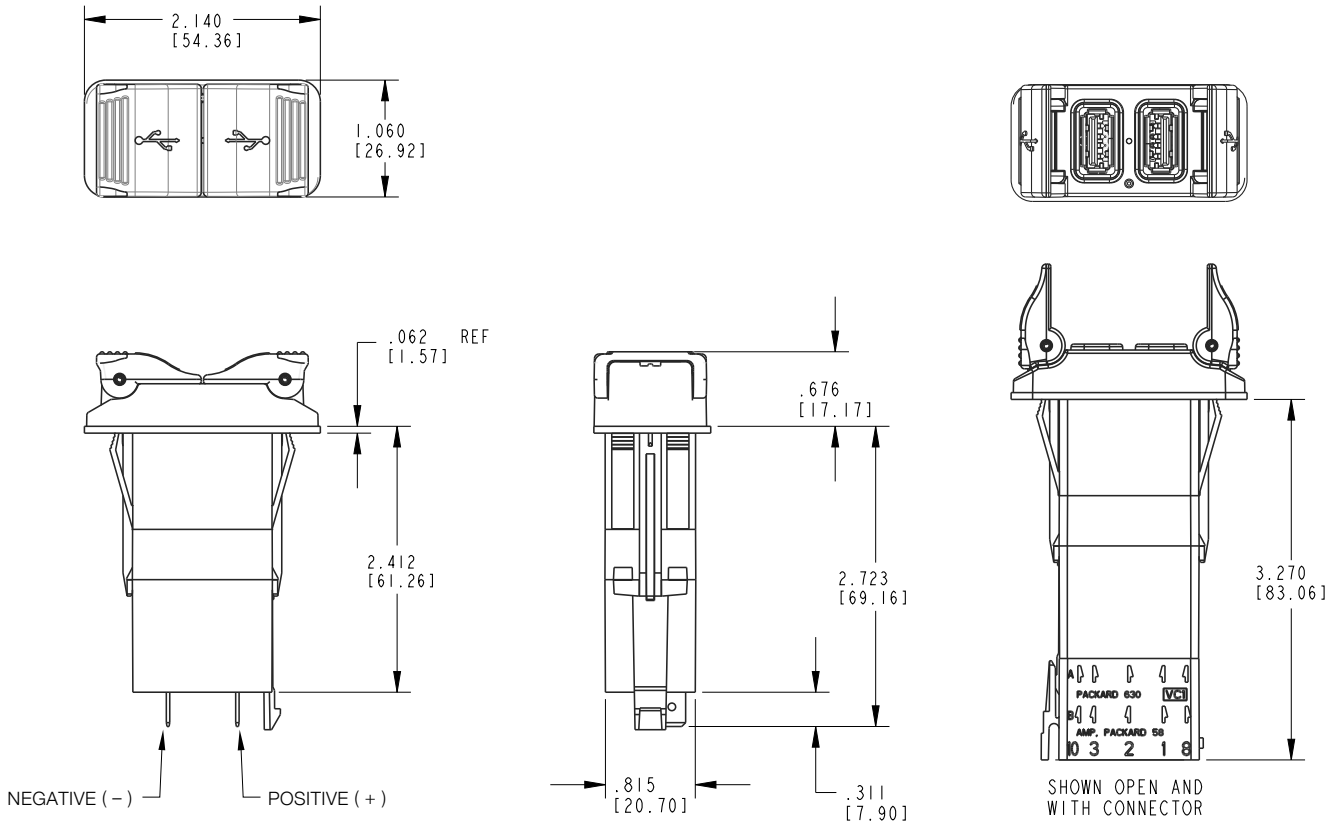
7 DOOR STYLE
1 Curved

8 DOOR COLOR
B Black

9 FRAME COLOR
B Black

10 PANEL SEAL
1 Yes

Dimensional Specifications: in. [mm]



Notes:
1 Charger to install into 1.450” X 0.830” panel opening

Reduce inventory levels and cost by stocking actuators and base switches separately.

Contura II, III, IV, V, VI, VII, X, XI, XII, XIV Base switches separately: specify **V** with code selections 2-8 in the ordering schemes.
Contura II, III, IV, V Actuator only: **VV** with code **A** or **C** for selection 9, & with selections 10-14 in the ordering schemes.
Contura VI Actuator with lenses and inserts only: **VV** with code selections 9-16
Contura II, III, IV, V, VII Actuator only: **VV** with code **A**, **C**, **E**, **G, P** or **Z** for selection 9 & with selections 10-14 in the ordering schemes.
Contura X, XI, XII, XIV actuators with lenses separately: **VV** with code selections 9-14 in the ordering schemes.
Panel Seal: VPS

Contura X & XI actuators without lenses separately:

VVR	6	1	00	1
1 Actuator Separately	*2 Actuator Style/Color*	*3 Lens Opening*	*4 Actuator Legend*	*5 Legend Orientation*

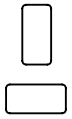
1 CONTURA X & XI ACTUATOR SEPARATELY
VVR

2 ACTUATOR STYLE & COLOR

	Black	Gray	White	Red
Contura X	**1**	**2**	**3**	**4**
Contura XI	**6**	**7**	**8**	**9**

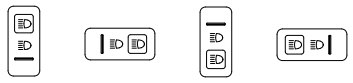
3 LENS OPENING FOR [1]
1 One bar lens
2 One bar lenses
3 One square lens
4 two square lens
5 square lens on top/ bar lens on bottom (Contura X only)

4 ACTUATOR LENS OR BODY LEGEND
00 - No Legend this location
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

5 LEGEND ORIENTATION [1]
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



Contura X, XI & XII top piece of 2-piece lens separately:

VVT	1
1 Lens Separately	*2 Color*

1 TOP OF LENS SEPARATELY
VVT

2 COLOR
1 Clear **2** Smoke **3** White

Contura X, XI & XII actuator lens assembly:

1 piece lens/bar lens are positioned the same as bottom lens for assembly, minus the top lens. Lenses snap in from bottom.

Notes:
1 If actuator lens opening for 2 bar or 2 square lenses, legend orientation 0,1, or 2 must be chosen.
2 Center of actuator marking not available for Contura XII.
3 Legend is not available for bar style lens.
4 Not recommended with neon lamps.
5 Must also order top piece of 2 piece square lens separately.

Contura XII actuators without lenses separately:

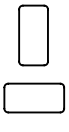
VVP	J	1	Z	21	1	00
1 Actuator	*2 Style & Color*	*3 Lens Opening*	*4 Lens Opening*	*5 Legend*	*6 Legend Orientation*	*7 Legend*

1 CONTURA XII ACTUATOR SEPARATELY
VVP

2 ACTUATOR STYLE & COLOR
J Black **K** Gray **N** White **M** Red

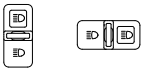
3,4 LENS OPENING FOR
Z No lens **1** Bar lens **2** Square lens

5, 7 LENS OR BODY LEGEND [2]
00 - No Legend **21** OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

6 LEGEND ORIENTATION [3]
0 No legend
1 Orientation 1
2 Orientation 2



Contura X, XI & XII actuator lens assembly separately:

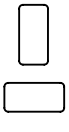
VVL	2	1	00	0
1 Lens Separately	*2 Lens Style*	*3 Lens Color*	*4 Legend*	*5 Legend Orientation*

1 CONTURA X, XI & XII LENS SEPARATELY
VVL

2 LENS STYLE [3]
1 Bar lens
2 One Piece Square lens
3 Bottom of Two-Piece Square lens [5]

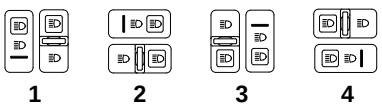
3 TRANSLUCENT LENS COLOR
1 Clear **2** White **3** Amber **4** Green [4] **5** Red **6** Blue [4]

4 LENS OR BODY LEGEND [2]
00 - No Legend **21** OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

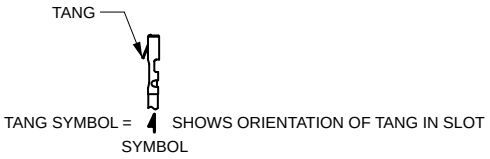
5 LEGEND ORIENTATION [3]
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



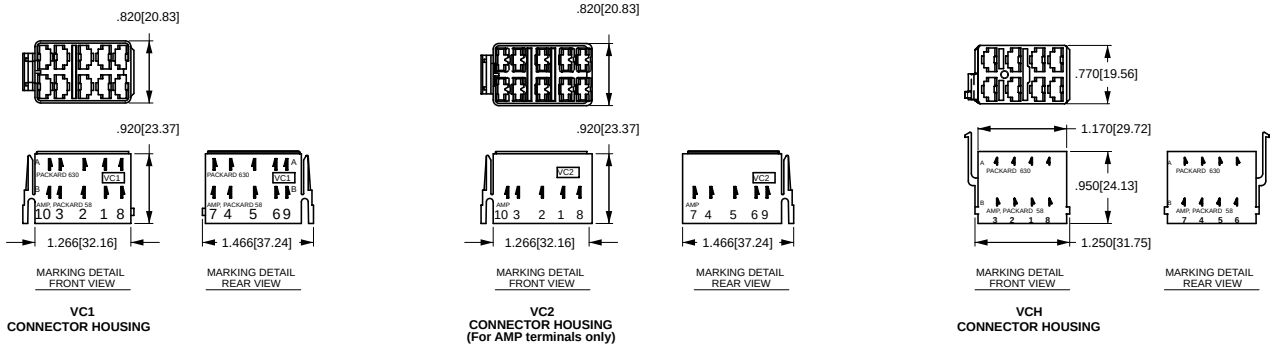
Easily integrate Contura products into your system, with Contura Accessories

Contura Connectors

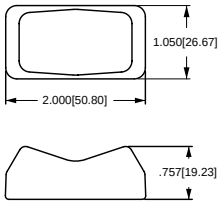
Q.C. SELECTION GUIDE					
COMPANY SERIES	PART NO		WIRE RANGE		ORIEN-TATION
	PLAIN BRASS	TIN PLATED BRASS	AWG	MM 2 (REF)	
PACKARD 58 SERIES	02965580		12	3.0	B
	02965471	12010601	(2)16-14	(2)1.0-2.0	
	02965470		16-14	1.0-2.0	
	02965469	06288318	20-18	.5-.8	
PACKARD METRI-PACK 630 SERIES		12084590	10	5.0	A
		12052224	12	3.0	
		12015870	16-14	1.0-2.0	
		12020035	(2)22-18	(2).5-.8	
	12015832	12015869	20-18	.5-.8	
		12052222	20-22	.35-.5	
AMP 250 SERIES FASTIN-FASTON	60253-1	60253-2	16-12	1.3-3	B
			(2) 16	(2) 1.3	
	42100-1	42100-2	18-14	.8-2	
	60295-1	60295-2	22-18	.3-.9	



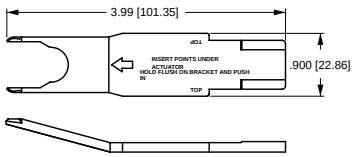
NOTE: Consult Delphi Packard and/or Amp on actual part numbers and availability.
AMP is a registered trademark of AMP Inc. Harrisburg, PA
Delphi Packard is a registered trademark of Delphi-Packard Electrical Systems Warren, Ohio



Contura X Boot (P/N VB1-01)



Contura II, III, IV, V, VI & VII Actuator Removal Tool (P/N VRT)

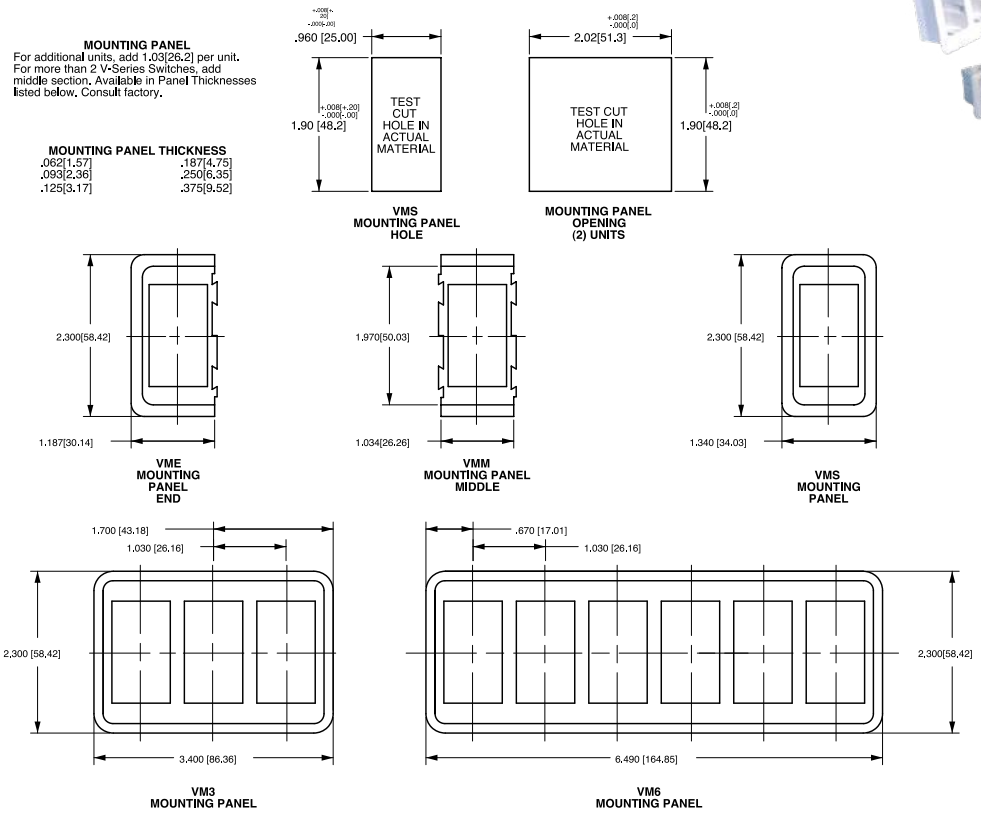


Additional V-Series Ratings

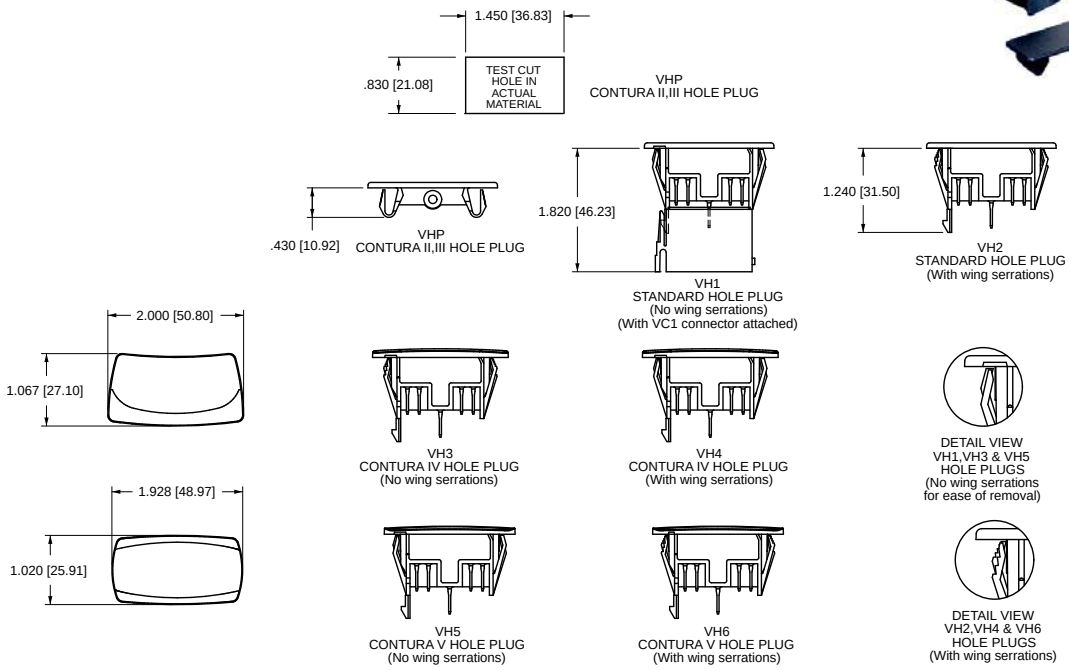
1	.4VA @ 28VDC Resistive
4	10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, No Agency Listings
5 [1]	10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, UL Recognized, CSA Certified
B	15A 24V
C	20A 18V
D	20A 12V
E	20A 14V, 10A 14VT (circuits 1, 4, A, & D only)
F	10A 14V, 6A, 14VT (circuit G only)
G	20A 6V
H	20A 3V
L [2]	15A 125 VAC, 10A 250VAC, 1/2 HP 125-250 VAC; 6A 125 VAC L
M	.4VA/20A 12V (combi-contact) (combination gold/silver contacts for borderline dry circuit applications)
N	.4VA/15A 24V (combi-contact) (combination gold/silver contacts for borderline dry circuit applications)

NOTES
Consult factory to determine availability for individual circuits and their HP rating.
1. Not available with Contura 7 or 14 rocker styles.
2. Rating L available with circuits 1, 4, A & D only.

Contura Mounting Panels
Dimensional Specifications: in. [mm]



Contura Hole Plug
Dimensional Specifications: in. [mm]



W-Series
SEALED ROCKER SWITCHES

Carling Technologies set the standard for performance and aesthetics with the widely successful, often imitated, but never duplicated, V-Series rocker switches. Building further upon that platform, Carling has once again raised the bar with the fully sealed W-Series. The W-Series' traditional appearance features complete IP68 protection, including below the panel, where the critical connection is made from the wiring harness. When used in conjunction with the integrated connector, the totally submersible W-Series provides a seal for up to ten individual wires, assuring compatibility with even the most complex circuitry.

The W-Series also offers a wide variety of accoutrements, including endless illumination options featuring dual level and multicolor LEDs, progressive and hazard warning circuits, ratings up to 10A 24V, choice of paddle, rocker, locking or laser etched actuators, hundreds of standard legend choices and the electrical performance and reliability that is the hallmark of Carling Technologies products.

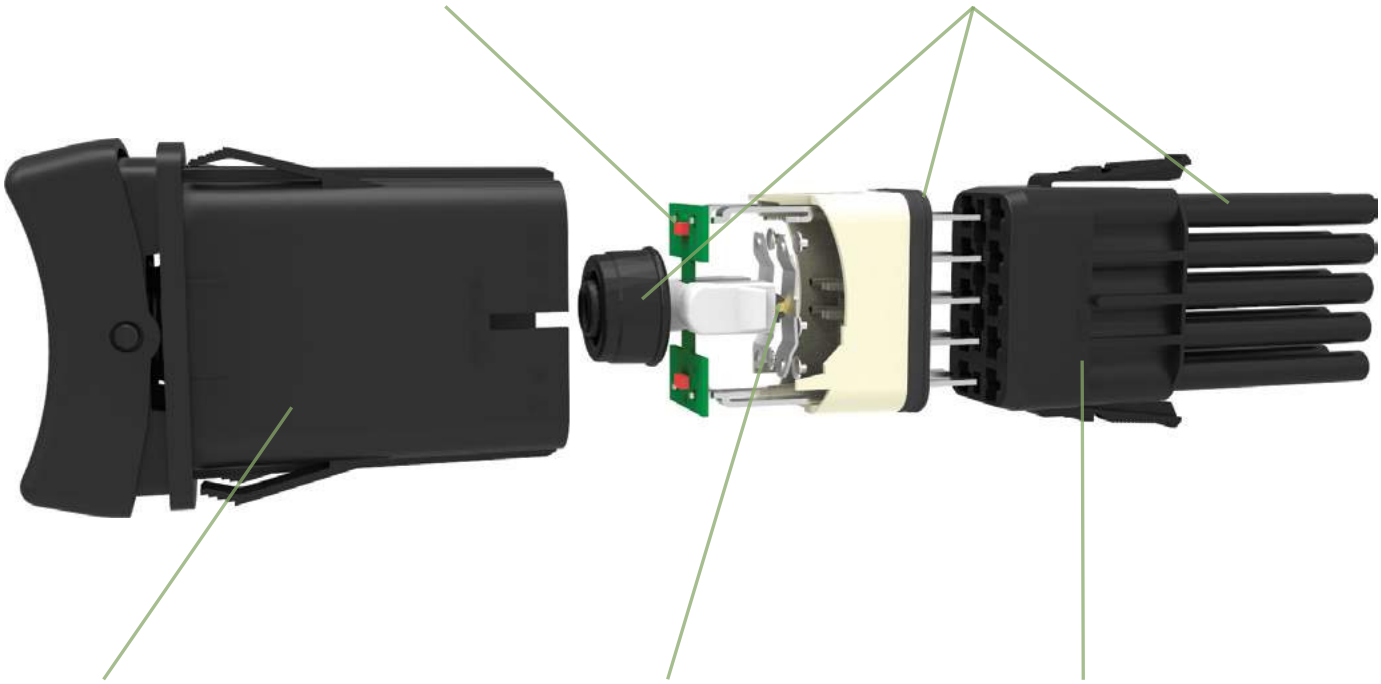
Product Highlights:

- Fully sealed and submersible
- IP68 protection, including below the panel
- Tri-seal design
- Connector with twin locking tabs

W-Series Switch
DESIGN FEATURES

ILLUMINATION
Choice of highly reliable SMT LED or incandescent lighting with 21 dependent or independent circuit options.

TRI-SEAL DESIGN
Sealing at actuator, an insert molded neoprene base seal, along with wire lead seals, assures water tight, fully submersible protection.



BODY
One piece polyester 94V0 seamless body acts as an umbrella to protect critical internal components.

ROLLER PIN
Proven reliable mechanism is lubricant free and allows for 100k electrical and 250k mechanical cycles, and withstands extreme temperatures from -40˚C to +85˚C.

INTEGRATED CONNECTOR
Accommodates Tyco/Amp .110 junior power timer contacts with twin locking tabs to provide a safe, secure, sealed connection.

Electrical

Contact Rating	.4VA @ 24VDC 10 amps, 3-24VDC
Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megaohms
Initial Contact Resistance	10 milliohms max. @ 4 VDC
Life	100,000 cycles
Contacts	Silver tin-oxide, 88/12
Terminals	Copper with silver or gold plating
Quick	Connect terminations.
Voltage	3-24 VDC
Overcurrent	15A for 50 cycles

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24 VDC)
Seals	Neoprene
Base	Polyester blend rated to 125C with a UL flammability rating of 94V0.
Actuator	Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay.
Lens	Polycarbonate rated at 100°C
Function	2 & 3 Position Rocker Style
Operation	Maintained & Momentary
Base	PA 6/6 30GF (glass filled)
Actuator	PA 6/6 13GF
Bracket	PBT 10GF
Connector	PBT 10GF, polarized

Actuator Travel (Angular Displacement)

24° full throw

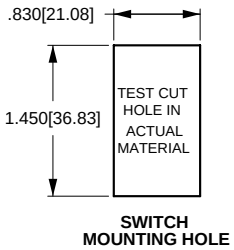
Environmental

Environmental	IP68, Fully sealed
Corrosion/ Chemical Splash	Flowing Mixed Gas (FMG) Class III 3 year accelerated exposure per ASTM B-827, B-845
Operating Temperature	-40°C to +85°C, 22 cycles, 300 hours
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025
Handling/Drop	One meter onto concrete floor
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.
Dust	IP6X
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C Test criteria - pre and post test contact resistance
Moisture Resistance/ Humidity	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance

Mounting Specifications

Panel Thickness Range .032 to .125

For optimum panel fit, the following panel thicknesses are suggested: .032, .062, .093, .125



SWITCH MOUNTING HOLE

W	11	D	2	B	C	0	1	-	A	7	Z	00	-	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
W

2 CIRCUIT ( ) - momentary
For terminal arrangement, see dimensional specifications

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
11	**21**	ON	NONE	OFF
12	**22**	(ON)	NONE	OFF
13	**23**	ON	NONE	(OFF)
14	**24**	ON	NONE	ON
15	**25**	ON	NONE	(ON)
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
-	**42**	2 & 3, 5 & 6	NONE	1 & 8
-	**43**	2 & 3	2 & 3, 4 & 5	4 & 5
-	**44**	2 & 3, 5 & 6	2 & 3	OFF
-	**45**	(2 & 3), (5 & 6)	2 & 3	OFF
-	**46**	(2 & 3), (5 & 6)	2 & 3	2 & 1
-	**47**	2 & 3 & 4, 5 & 6	2 & 3, 4 & 5	2 & 1, 4 & 5
-	**48**	2 & 3, 5 & 6	2 & 3	2 & 1
-	**49**	2 & 3, 5 & 6	2 & 3, 4 & 5	2 & 1, 4 & 5
51	**-**	3 & 10	2 & 3	OFF
52	**-**	3 & 10	2 & 3	2 & 1
53	**-**	(3 & 10)	2 & 3	OFF
54	**-**	3 & 10	2 & 3	(OFF)
55	**-**	(3 & 10)	2 & 3	2 & 1
56	**-**	(3 & 10)	2 & 3	(OFF)
57	**-**	(3 & 10)	2 & 3	(2 & 1)
58	**-**	OFF	2 & 3	2 & 1
-	**61**	3 & 10, 6 & 9	2 & 3, 5 & 6	OFF, OFF
-	**62**	3 & 10, 6 & 9	2 & 3, 4 & 5	2 & 1, 5 & 4
-	**63**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	OFF, OFF
-	**64**	3 & 10, 6 & 9	2 & 3, 4 & 5	(OFF, OFF)
-	**65**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	2 & 1, 5 & 4
-	**66**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	(OFF, OFF)
-	**67**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	(2 & 1, 5 & 4)
-	**68**	OFF, OFF	2 & 3, 4 & 5	2 & 1, 5 & 4

3 RATING

B	10A 24V	**D**	10A 12V	**G**	10A 6V	**H**	10A 3V

4 TERMINATION / BASE STYLE
2 .110 TAB (QC)

5 ILLUMINATION
Lamp #1:above terminals 1&4 end of switch.; Lamp #2 above terminals 3&6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Actuator Lens Position Illumination Type	Lamp Wired to Terminals	
O	NONE			
A	# 1	Independent	8+	7-
B	# 1	Down	3+	7-
C	# 2	Up	3+	7-
D	# 1	Down	3+	7-
	& # 2	Down	1+	7-
E	# 1	Up	1+	7-
	& # 2	Up	3+	7-
F	# 1	Independent	8+	7-
	& # 2	Up	3+	6-
G	# 1	Independent	8+	7-
	& # 2	Up	3+	7-
H	# 2	Independent	8+	7-
Selections for Single Pole Switches Only:				
J	# 1	Down	3+	8-
	& # 2	Independent	6+	7-
K	# 1	Independent	8+	7-
	& # 2	Independent	6+	7-
Selections for Double Pole Switches Only:				
L	# 1	Down	3+	6-
M	# 2	Up	3+	6-
N	# 1	Down	3+	6-
	& # 2	Down	1+	4-
P	# 1	Up	1+	4-
	& # 2	Up	3+	6-
R	# 1	Down	3+	7-
	& # 2	Up	6+	7-
S	# 1	Down	6+	7-
	& # 2	Independent	8+	7-
U	# 1	Independent	8+	7-
	& # 2	Independent	10+	9-
V	# 2	Independent	10+	9-
W	# 1	Independent	8+	7-
	& # 2	Independent	10+	7-
Y	# 1 & # 2	Independent in Series	8+	7-
Z	# 1 & # 2	Independent in Parallel	8+	7-

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	0			
LED*	Red	Amber	Green	White
2VDC	**A**	**L**	**F**	**4**
6VDC	**B**	**M**	**G**	**5**
12VDC	**C**	**N**	**H**	**6**
24VDC	**D**	**P**	**J**	**8**

* Consult factory for “daylight bright”, blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
1 Black

9 ACTUATOR [1]
3 Black with Laser Etched
A Black

10 LENS COLOR / STYLE - ABOVE LAMP #1 TERMINALS 1 AND 4
11 LENS COLOR / STYLE - ABOVE LAMP #2 TERMINALS 3 AND 6
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	**-**	**-**	**-**	**-**	Laser-Etched

Lens color for LEDs must be clear, white, or match color of LED.

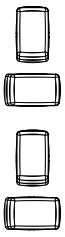
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location/No actuator

11 ON / OFF **12** OFF / ON **13** I / O **14** O / I

15 O O F F **16** O O N F **17** O I **18** I O

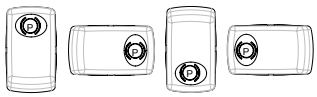
21 OFF **22** ON **23** O **24** I

25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND [2]
00 No legend this location/no actuator (used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens & one body legend, lens legend must be specified in selection 12; body legend specified in selection 14. For legend options & codes, visit us at carlingtech.com

Notes:
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.

W	11	D	2	0	W	0	J	–	P	7	B	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lock Function	12 Legend		13 Legend Orientation

1 SERIES
W

2 CIRCUIT ( ) - momentary
For terminal arrangement, see dimensional specifications

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
11	**21**	ON	NONE	OFF
14	**24**	ON	NONE	ON

3 RATING
1 0.4VA 28V DC Resistive
B 10A 24V
D 10A 12V

4 TERMINATION / BASE STYLE
2 .110 TAB (QC)

5 ILLUMINATION
Lamp #1:above terminals 1&4 end of switch.; Lamp #2 above terminals 3&6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Actuator Lens Position Illumination Type	Lamp Wired to Terminals	
O	NONE			
C	# 2	Up	3+	7-
H	# 2	Independent	8+	7-

6 LOCK
W Lock Option

7 LAMP #2

No lamp	0			
LED*	Red	Amber	Green	White
2VDC	**A**	**L**	**F**	**4**
6VDC	**B**	**M**	**G**	**5**
12VDC	**C**	**N**	**H**	**6**
24VDC	**D**	**P**	**J**	**8**

* Consult factory for “daylight bright”, blue/green and white LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
J Black

9 ACTUATOR [1]
P Black
R Red

10 LENS
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent

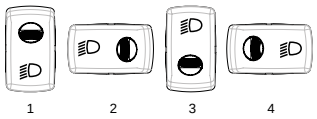
Lens color for LEDs must be clear, white, or match color of LED.

11 LOCK FUNCTION

Up	Down	Lock Color
B	**J**	Black
C	**K**	White
D	**L**	Red
E	**M**	Safety Orange

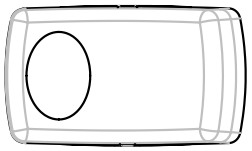
12 LASER ETCHED, LENS OR BODY LEGEND [1]
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

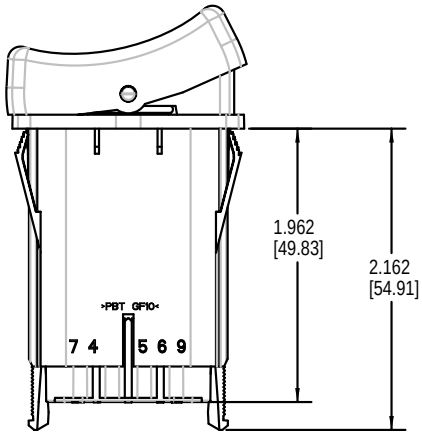
13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



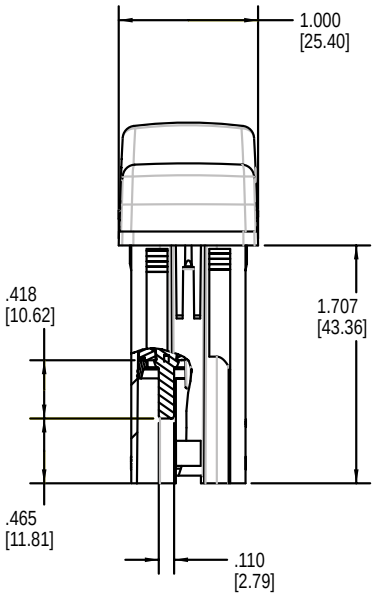
Notes:
1 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.

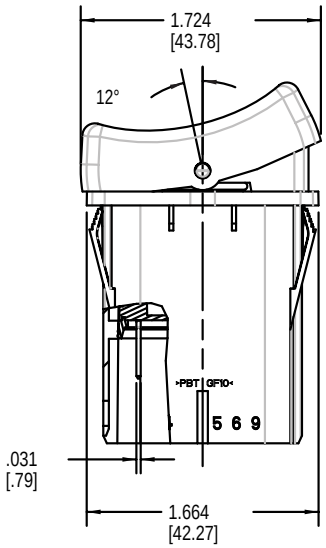
Dimensional Specifications: in. [mm]



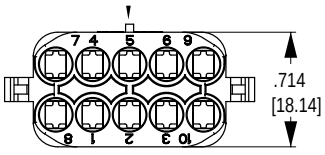


SWITCH SHOWN WITH
CONNECTOR INSTALLED

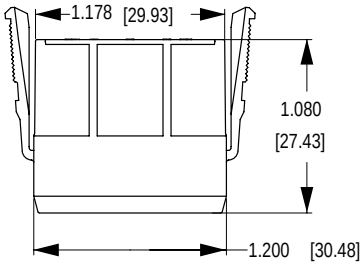




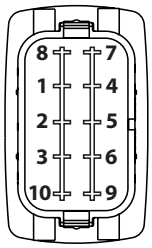
KEYING FEATURE



WCH CONNECTOR
(190-31214-001)



TERMINAL ARRANGMENT



Notes:
WCH connector is intended for use with Tyco/Amp .110 Junior Power Timer, female contacts, and wire seals.
For 14-16 awg wire, specify Tyco/Amp P/N 927766-3
For 16-20 awg wire, specify Tyco/Amp P/N 927770-3
Tyco/Amp cable seal P/N 828904-1 (20-18 awg wire) or P/N 828905-1 (16-14 awg wire) is required for each individual wire lead, and Tyco/Amp cable plug, P/N 828922-1, is required to seal each unused connector opening. Consult Tyco/Amp for the cable seal recommended for your specific wire gauge and thickness.

L-Series
SEALED ROCKER SWITCHES

The L-Series rocker switch is an innovative product offering total design flexibility, while at the same time setting new standards for performance and reliability. Its versatile design features include a neatly proportioned size that fits into an industry standard mounting hole of 1.734 x .867 (44.0mm x 22.0mm), countless unique choices for ratings, circuits, colors, illuminations and laser etched legends. These single or double pole switches also feature a broad choice of actuator styles, colors, and lenses with up to twelve terminals offering an extensive range of switch and lamp circuit options, including LED or incandescent illumination. Additionally, an optional plug-in terminal connector enables pre-wiring of wire harness.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

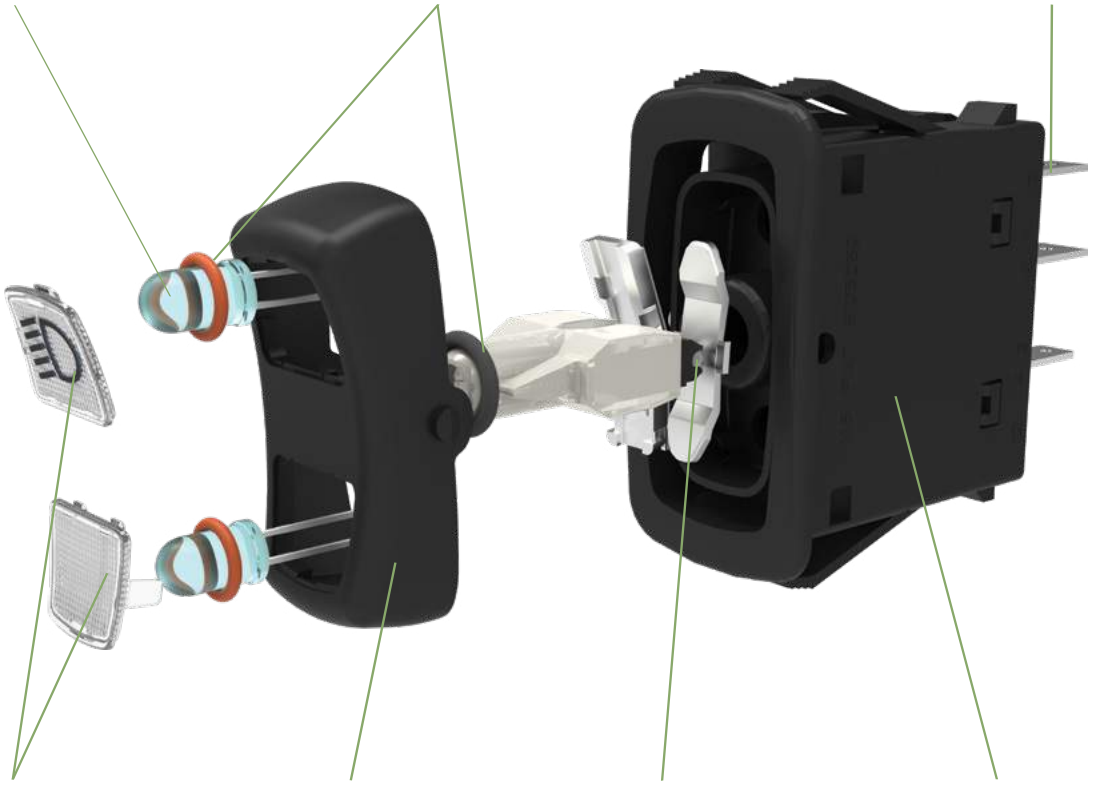
- IP67 certified sealed front panel components
- Withstands temperatures from -40°C to +85°C
- Vibration, shock, thermoshock, moisture and salt spray resistant

L-Series Switch
DESIGN FEATURES

LED LIGHTING
Utilize less current and are not affected by vibration, providing long lasting illumination. Available in 3 standard colors.

SEAL PROTECTION
Locks out elements such as water, dust & debris. Certified to IP67 for front panel components.

TERMINALS
Available with 2 industry standard termination options: .250 or .187 tabs with up to 12 terminal options.



LENS & LEGENDS
Lens available in 2 sizes and 6 standard colors in either translucent or transparent materials. Numerous symbols and text available for imprinting or laser etching.

ACTUATOR
Available in rocker or paddle styles. Several standard color options also available.

ROLLER PIN
Eliminates need for lubricants, increasing the temperature range of the switch from -40˚ C to +85˚C [-40˚ F to 185˚ F].

BASE
Fits into industry standard mounting hole of 1.734 x .867 in [44.0mm x 22.0mm].

*Manufacturer reserves the right to change product specification without prior notice.

Electrical

Contact Rating	.4VA @ 24VDC (MAX) resistive 15 amps, 125VAC 10 amps, 250VAC 20 amps, 4-14VDC 15 amps, 15-28VDC
Dielectric Strength	1250 Volts RMS between pole to pole 3750 Volts RMS between live parts and accessible surfaces
Insulation Resistance	50 Megaohms
Initial Contact Resistance	10 milliohms max. @ 4 VDC
Life	100,000 cycles maintained, 50,000 cycles momentary at rated voltage and current
Contacts	90/10 silver-nickel, silver tin-oxide, gold
Terminals	Brass or copper/silver plate 3/16" (4.76mm) & 1/4" (6.3mm) Quick Connect terminations standard.

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	Incandescent - rated 10,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24 VDC)
Seals	Rocker, base & bracket are sealed.
Base	Nylon 66 GF rated to 85°C with a flammability rating of 94V0.
Actuator	Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay.
Lock	Acetal
Lens	Polycarbonate rated at 100°C
Function	2 & 3 Position Rocker Style
Bracket	Nylon Zytel
Connector	Nylon 66 rated at 85°C. Polarized.

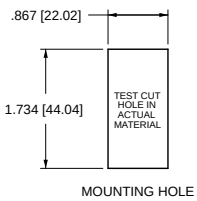
Actuator Travel (Angular Displacement)

2 position	26°
3 positions	13° from center

Environmental

Environmental	IP67 for above panel components of the actual switch, representing an index of protection as applied to electrical equipment in accordance with IEC 529, BS 5490, DIN 400 50 & NFC 20 010.
Corrosion	Mixed Flowing Gas MFG Class III per ASTM B-827 & B-845, Method H, with 3 years exposure.
Operating Temperature	-40°C to + 85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with VCH connector. Test criteria - No loss of circuit during test and pre and post test contact resistance.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025 No loss of circuit during test; <10µ chatter.
Shock	Per Mil-Std 202F, Method 213B, Test Condition K @ 30G's. Tested with VCH connector. Test criteria - No loss of circuit during test, pre, and post test contact resistance.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C. Test criteria - pre and post test contact resistance.
Moisture Resistance	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance.

Mounting Specifications



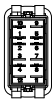
MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

L	11	E	3	C	H	N	1	-	3	A	A	45	-	1	48
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens Style & Color	11 Lens Style & Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
L

2 CIRCUIT [2]
Terminal Orientation



( ) - momentary
SP - single pole - uses terminals 1, 2 & 4.
DP - double pole uses terminals 5, 6 & 8.
Terminals 9, 10 & 11 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 4, 6 & 8	Connected Terminals	1 & 2, 5 & 6
11	**21**	ON	NONE	OFF
12	**22**	(ON)	NONE	OFF
13	**23**	ON	NONE	(OFF)
14	**24**	ON	NONE	ON
15	**25**	ON	NONE	(ON)
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
CIRCUITS WITH JUMPER TERMINALS				
30*		(2,4&5), (1,6&8)	OFF, OFF	(1,2&8), (4,5&6)
31		1, 2 & 5	2, 3 & 7	2, 4 & 8
PROGRESSIVE CIRCUITS				
51		3 & 4	2, 3	1 & 2
52		3 & 4	2, 3	OFF
53		(3 & 4)	2, 3	1 & 2
54		(3 & 4)	2, 3	(OFF)
55		(3 & 4)	2, 3	(1 & 2)
56		(3 & 4)	2, 3	(OFF)
57		3 & 4	2, 3	(OFF)
58*		2 & 4	2, 3	1 & 2
61		3 & 4, 7 & 8	2 & 3, 6 & 7	1 & 2, 5 & 6
62		3 & 4, 7 & 8	2 & 3, 6 & 7	OFF, OFF
63		(3 & 4), (7 & 8)	2 & 3, 6 & 7	1 & 2, 5 & 6
64		(3 & 4), (7 & 8)	2 & 3, 6 & 7	OFF, OFF
65		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(1 & 2), (5 & 6)
66		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(OFF, OFF)
67		3 & 4, 7 & 8	2 & 3, 6 & 7	(OFF, OFF)
68		2 & 4, 7 & 8	2 & 4, OFF	OFF, OFF
69*		2 & 4, 1, 7 & 8	2 & 4, OFF	OFF, OFF
70		(2 & 4), (7 & 8)	2 & 4, 5 & 7	(1 & 2), (5 & 7)
71		(2&4), (7 & 8)	2 & 4, 5 & 7	1 & 2, 5 & 7
72		2 & 4, 7 & 8	2 & 4, 5 & 7	1 & 2, 5 & 7
73		(2 & 4), (7 & 8)	2 & 4, OFF	OFF, OFF
80		2 & 4, 6 & 8	2 & 4, OFF	OFF, 5 & 6
HAZARD WARNING CIRCUITS				
A2		6,7 & 8, 3 & 4	NONE	OFF, 1 & 2
A3		6,7 & 8, 2 & 4	NONE	OFF, 1 & 2

* Available with ratings 1, 4, & E only.

3 RATING [2]
1 .4VA @ 28VDC Resistive
4 10A 250VAC 1/2 HP, 15A 125VAC 1/2 HP, No Listings
B 15A 24V
C 20A 18V
D 20A 12V
E 15A 12V
G 20A 6V
H 20A 3V

4 TERMINATION [2,3]
1 .250 (6.4mm) TAB (QC)
3 .187 (4.7mm) TAB (QC)

Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Circuits 30, 31, 58, 69 are not available with rating codes 4, C, D, G or H.
3 Termination 3 only available with rating codes 1, B, and E.
4 Not available with circuits 11-18, 51-57 and 69.

5 ILLUMINATION
Lamp #1:above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

	Lamps	Illumination Type	Lamp Wired to Terminals		
S	None				
A	# 1	Independent	10+	9-	
B	# 2	Independent	12+	11-	
C	# 1	Independent	10+	9-	
	& # 2	Independent	12+	9-	
D	# 1	Dependent	4+	9-	
E	# 1	Independent	10+	9-	
	& # 2	Dependent	4+	9-	
F[4]	# 1	Independent	10+	9-	
	& # 2	Dependent	8+	9-	
G	# 1	Dependent	4+	9-	
	& # 2	Independent	10+	9-	
H	# 1	Both Independent	10+	9-	
	& # 2	(in series)			
J	# 1	Dependent	4+	9-	
	& # 2	Dependent	1+	9-	
1	# 2	Hazard	6+	10-	12-
2	# 1	Hazard	6+	10-	12-

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 10 & 9; Selection 7: above terminals 12 & 11

No lamp	**0**				
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	Green		
2VDC	**A**	**L**	**F**		
6VDC	**B**	**M**	**G**		
12VDC	**C**	**N**	**H**		
24VDC	**D**	**P**	**J**		

* Consult factory for "daylight bright", blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]

	Black	White	Gray	Red
Standard Bracket	**1**	**2**	**3**	**4**
Rockerguard at Lamp 1	**A**	**B**	**C**	**D**
Rockerguard at Lamp 2	**E**	**F**	**G**	**H**

9 ACTUATOR STYLE AND COLOR [1]

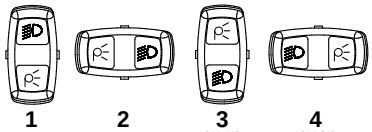
	Black	White	Gray	Red	Laser Etched
Rocker	**A**	**B**	**C**	**D**	**3**
Paddle	**J**	**N**	**K**	**M**	**4**

10 & 11 LENS STYLE AND COLOR
Lens color for LEDs must be clear, white, or match color of LED.
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	**-**	**-**	**-**	**-**	Laser Etched *background color*

12 LASER ETCHED, LENS OR BODY LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1 - vertical, lamp 1 on top
2 Orientation 2 - horizontal, lamp 1 on right
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left

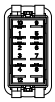


14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

L	11	D	1	S	W	C	J	–	P	M	H	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lock	12 Legend		13 Legend Orientation

1 SERIES
L

2 CIRCUIT [5]
Terminal Orientation



( ) - momentary
SP - single pole - uses terminals 1, 2 & 4.
DP - double pole uses terminals 5, 6 & 8.
Terminals 9, 10 & 11 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 4, 6 & 8	Connected Terminals	1 & 2, 5 & 6
11	**21**	ON	NONE	OFF
14	**24**	ON	NONE	ON
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
CIRCUITS WITH JUMPER TERMINALS				
30 [2]		(2,4&5), (1,6&8)	OFF, OFF	(1,2&8), (4,5&6)
31 [2]		1, 2 & 5	2, 3 & 7	2, 4 & 8
PROGRESSIVE CIRCUITS				
51		3 & 4	2, 3	1 & 2
52		3 & 4	2, 3	OFF
53		(3 & 4)	2, 3	1 & 2
54		(3 & 4)	2, 3	(OFF)
55		(3 & 4)	2, 3	(1 & 2)
56		(3 & 4)	2, 3	(OFF)
57		3 & 4	2, 3	(OFF)
58		2 & 4	2, 3	1 & 2
61		3 & 4, 7 & 8	2 & 3, 6 & 7	1 & 2, 5 & 6
62		3 & 4, 7 & 8	2 & 3, 6 & 7	OFF, OFF
63		(3 & 4), (7 & 8)	2 & 3, 6 & 7	1 & 2, 5 & 6
64		(3 & 4), (7 & 8)	2 & 3, 6 & 7	OFF, OFF
65		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(1 & 2), (5 & 6)
66		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(OFF, OFF)
67		3 & 4, 7 & 8	2 & 3, 6 & 7	(OFF, OFF)
68		2 & 4, 7 & 8	2 & 4, OFF	OFF, OFF
69		2 & 4, 1, 7 & 8	2 & 4, OFF	OFF, OFF
70		(2 & 4), (7 & 8)	2 & 4, 5 & 7	(1 & 2), (5 & 7)
71		(2&4), (7 & 8)	2 & 4, 5 & 7	1 & 2, 5 & 7
72		2 & 4, 7 & 8	2 & 4, 5 & 7	1 & 2, 5 & 7
73		(2 & 4), (7 & 8)	2 & 4, OFF	OFF, OFF
80		2 & 4, 6 & 8	2 & 4, OFF	OFF, 5 & 6

3 RATING [2]
1 .4VA @ 28VDC Resistive
4 10A 250VAC 1/2 HP, 15A 125VAC 1/2 HP, No Listings
B 15A 24V
C 20A 18V
D 20A 12V
E 15A 12V
G 20A 6V
H 20A 3V

4 TERMINATION [4]
1 .250 (6.4mm) TAB (QC)
3 .187 (4.7mm) TAB (QC)

Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

	Lamps	Illumination Type	Lamp Wired to Terminals
S	None		
B	# 2	Independent	12+ 11-

6 LOCK
W Lock above terminals 10 & 9.

7 LAMP
Above terminals 12 & 11

No lamp	**0**				
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	Green		
2VDC	**A**	**L**	**F**		
6VDC	**B**	**M**	**G**		
12VDC	**C**	**N**	**H**		
24VDC	**D**	**P**	**J**		

* Consult factory for “daylight bright”, blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
J Black

9 ACTUATOR STYLE AND COLOR [1]

	Black	Red
Locking Rocker	**P**	**R**

10 & 11 LENS STYLE AND COLOR
Lens color for LEDs must be clear, white, or match color of LED.
0 - No Actuator **Z** - No Lens

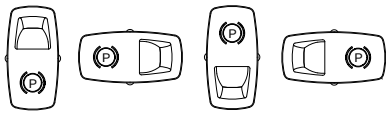
Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent

11 LOCK FUNCTION AND COLOR
Locking Position

Up	Down	Up & Down	Center [3]	Lock Color
A	**H**	**R**	**1**	Match Actuator
B	**J**	**S**	**2**	Black
C	**K**	**T**	**3**	White
D	**L**	**V**	**4**	Red
E	**M**	**W**	**5**	Safety Orange

12 LASER ETCHED, LENS OR BODY LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1 - vertical, lamp 1 on top
2 Orientation 2 - horizontal, lamp 1 on right
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left

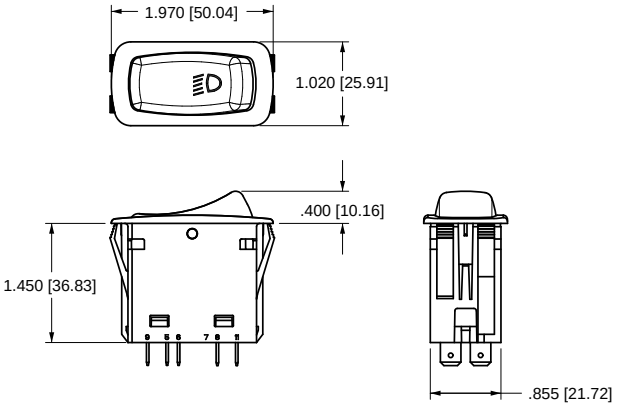


1 PZAY2-1 **2** PZAY2-2 **3** **4**

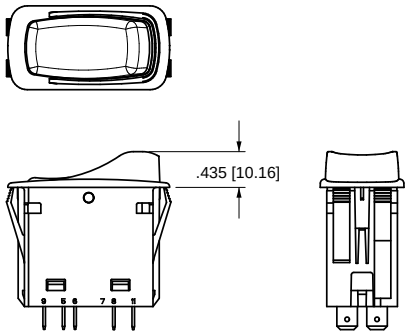
Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Additional lamp circuits available. Consult factory.
3 Available only with 3 position circuits.
4 Termination 3 only available with ratings 1, B and E.
5 Circuits 30, 31, 58 and 69, are not available with rating codes 4, C, D, G or H.

Dimensional Specifications: in. [mm]

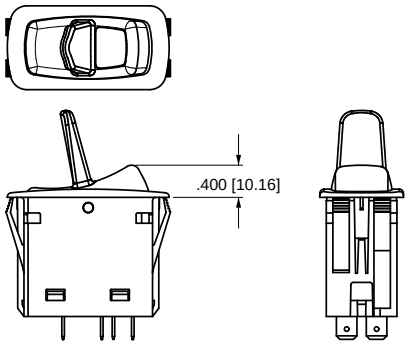
L-SERIES
SHOWN WITH LASER ETCHED ACTUATOR



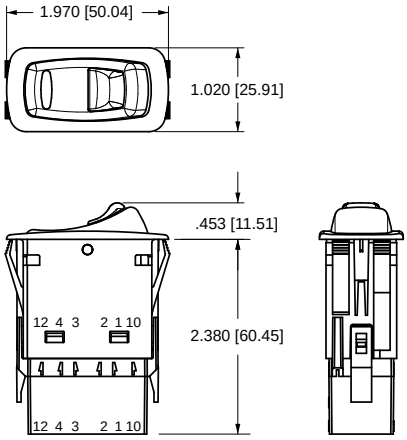
L-SERIES
SHOWN WITH ROCKER GUARD



L-SERIES
SHOWN WITH LARGE LENS AND PADDLE ACTUATOR



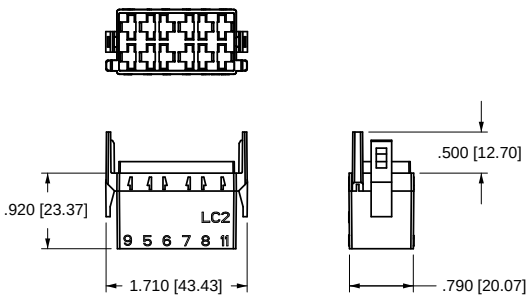
L-SERIES
SHOWN WITH BAR LENS, LOCK AND CONNECTOR



Connector

L-SERIES
CONNECTOR

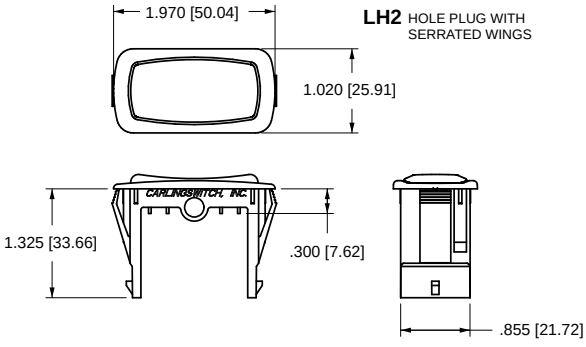
LC1-01 BLACK .250 TAB CONNECTOR (PACKARD 630 SERIES)
LC2-01 BLACK .187 TAB CONNECTOR (PACKARD 480 SERIES)
LC3-01 BLACK .250 TAB CONNECTOR (AMP ONLY)



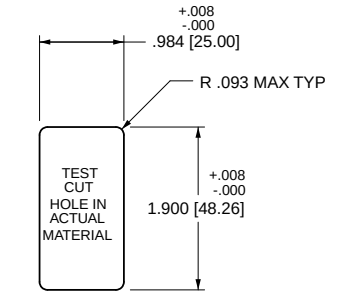
Hole Plug

L-SERIES
HOLE PLUG

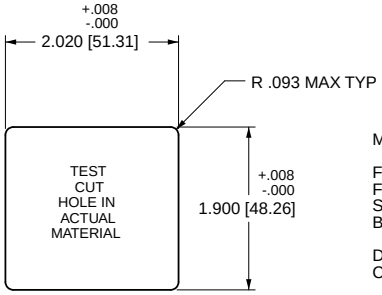
LH1 REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
LH2 HOLE PLUG WITH SERRATED WINGS



Dimensional Specifications: in. [mm]



LMS
MOUNTING PANEL
HOLE



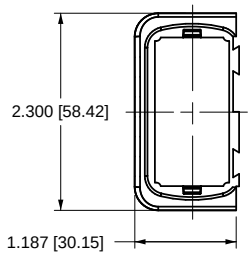
MOUNTING PANEL
OPENING
(2) UNITS

MOUNTING PANEL

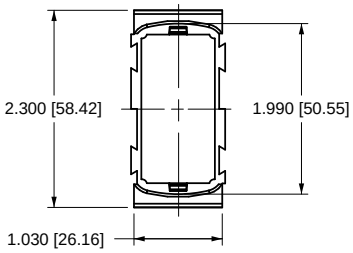
FOR ADDITIONAL UNITS, ADD 1.03 [26.2] PER UNIT.
FOR MORE THAN 2 L-SERIES SWITCHES, ADD MIDDLE SECTION. AVAILABLE IN PANEL THICKNESSES LISTED BELOW. CONSULT FACTORY

DIMENSIONS: LME 2.02 [51.3mm] PLUS NUMBER OF CENTER BEZELS (LMM) X 1.034 [26.26mm]

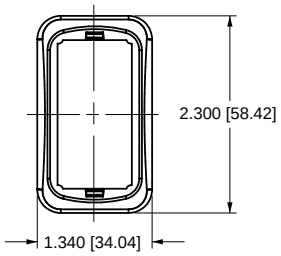
MOUNTING PANEL THICKNESS
.062 [1.57]
.093 [2.36]
.125 [3.17]
.156 [3.96]



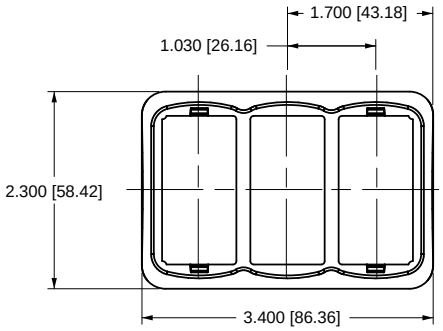
LME MOUNTING PANEL
END



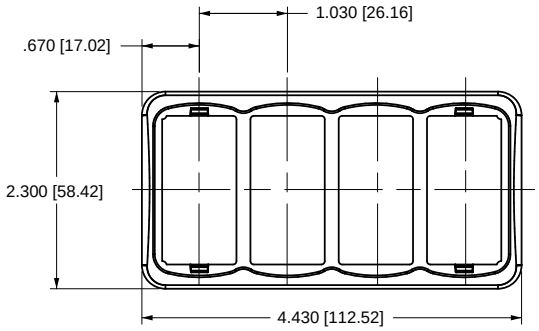
LMM MOUNTING PANEL
MIDDLE



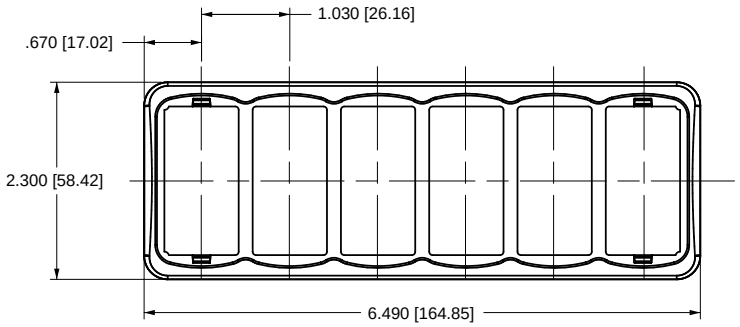
LMS
MOUNTING PANEL



LM3 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 3.06 [48.3mm X 77.7mm]

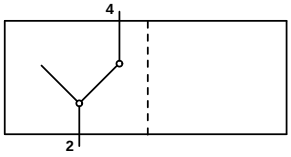
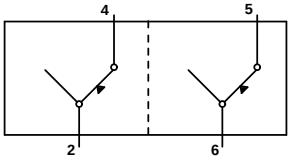
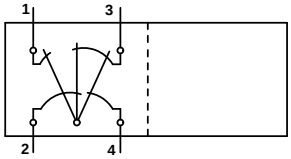
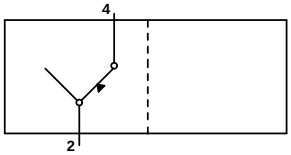
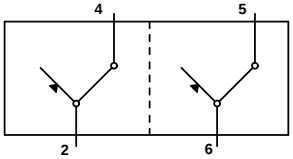
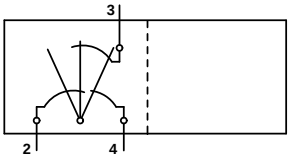
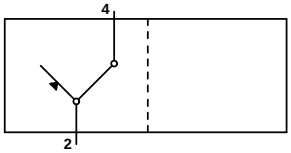
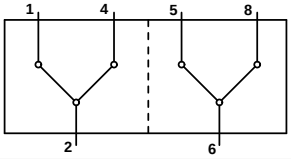
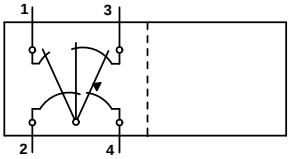
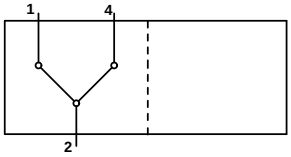
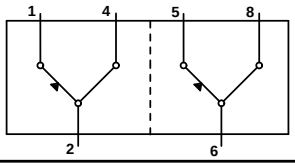
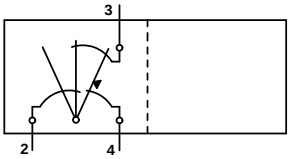
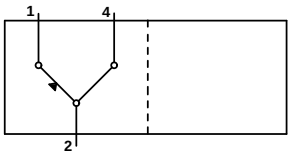
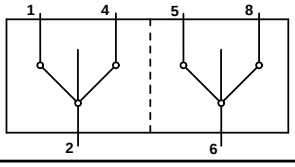
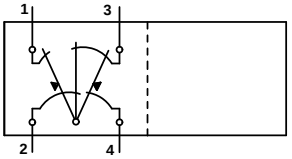
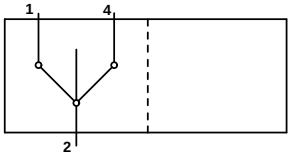
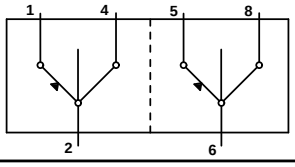
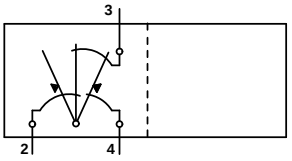
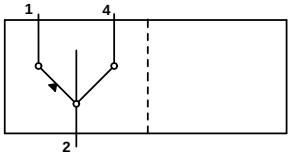
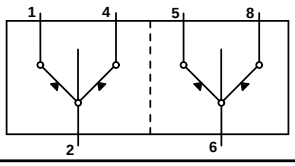
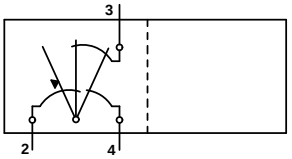
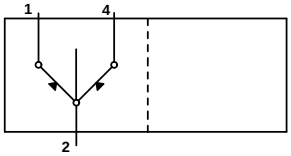
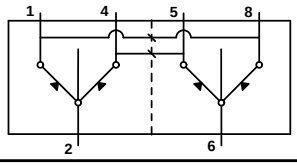
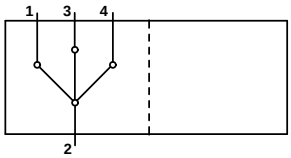
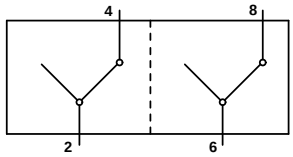
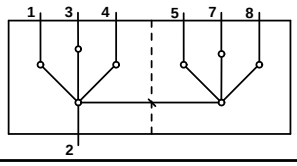
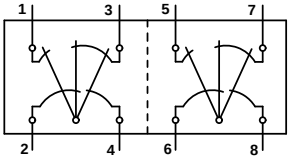


LM4 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 4.09 [48.3mm X 103.9mm]

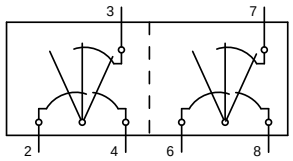
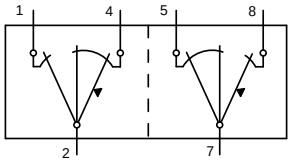
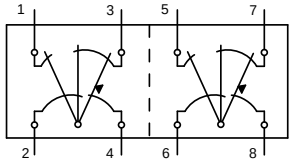
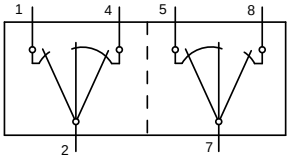
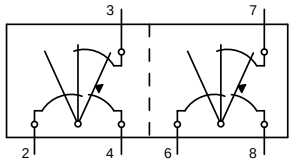
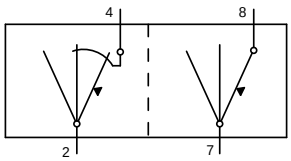
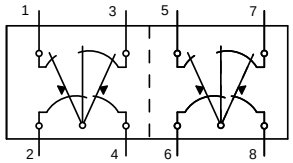
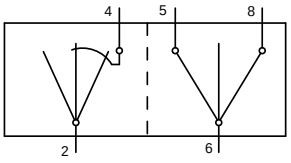
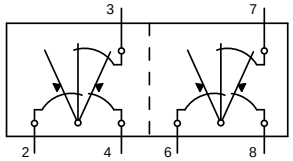
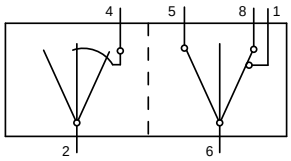
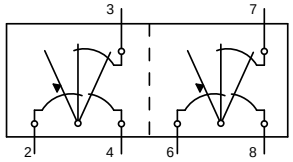
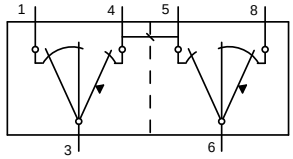
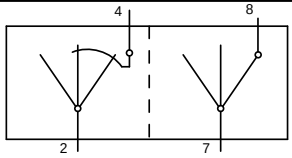
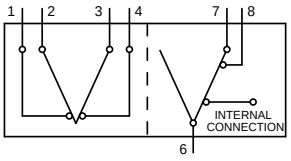
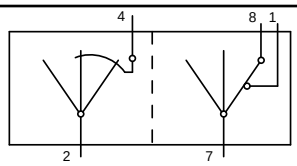
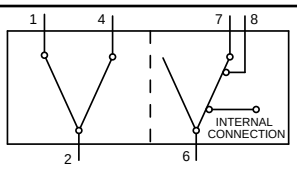
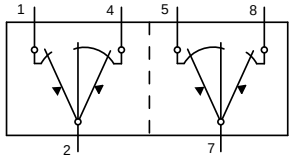


LM6 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 6.15 [48.3mm X 156.2mm]

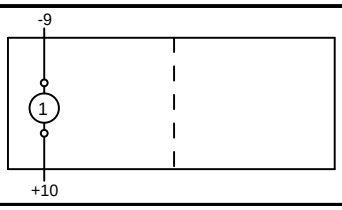
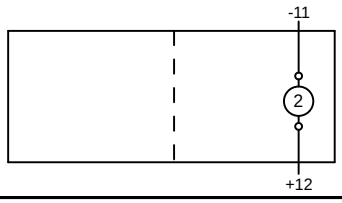
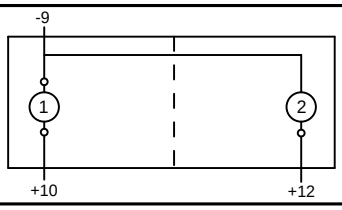
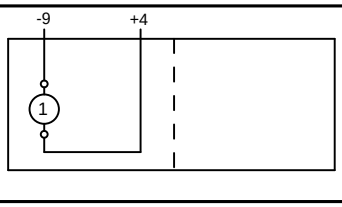
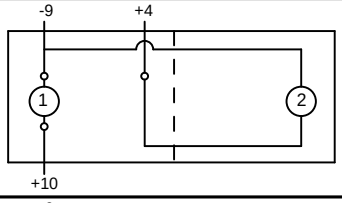
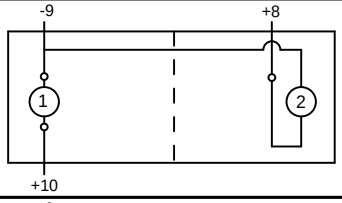
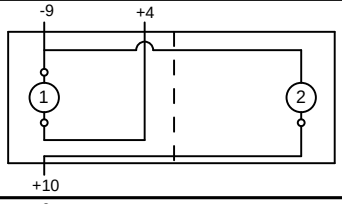
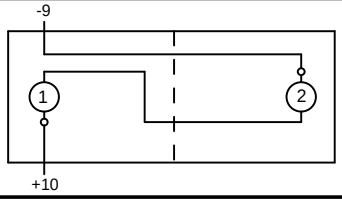
Circuit Diagrams:

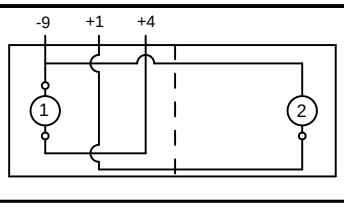
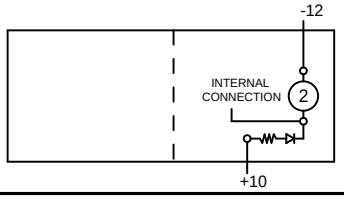
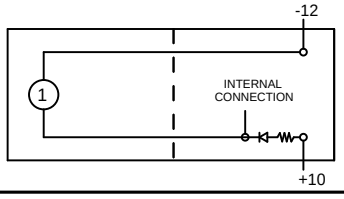
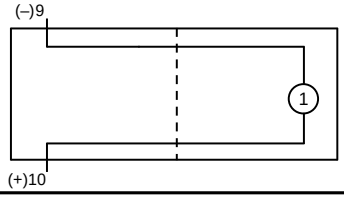
CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM
11		22		51	
12		23		52	
13		24		53	
14		25		54	
15		26		55	
16		27		56	
17		28		57	
18		30		58	
21		31		61	

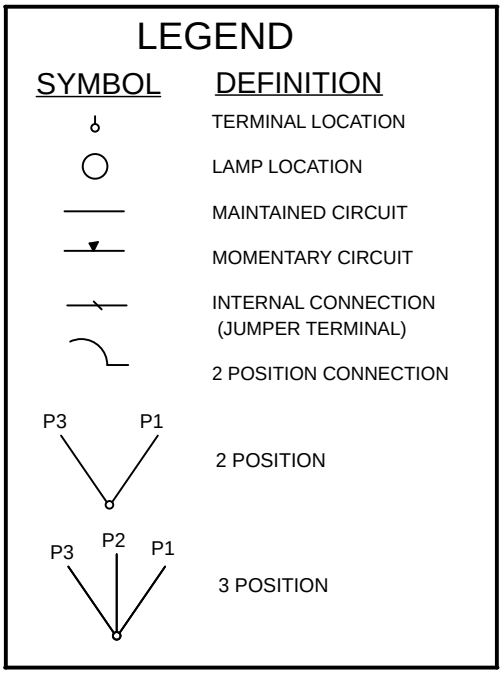
Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM
62		71	
63		72	
64		73	
65		80	
66		81	
67		82	
68		A2	
69		A3	
70			

Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
J	
1	
2	
K	



ST-Series
SEALED TOGGLE SWITCHES

Designed to comply with MIL-DTL-3950G requirements for environmentally sealed toggle switches, Carling Technologies® ST-Series Sealed Toggle Switch features innovative design and performance principles sure to withstand the most demanding applications.

The ST-Series features a toggle seal composed of dynamic silicone material that bonds to the metal toggle, pin and bushing, providing ideal sealing and protection against the environment, vibration and shock, while withstanding extreme temperature variations. It also utilizes up to three terminal seals per pole and an optional o-ring assures additional under panel sealing protection. All silicone seals on the ST-Series comply with A-A-59588 for silicone rubber performance specifications and, together, these features meet the international IEC 60529 standard for sealing performance to an IP68 level.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

- Designed to comply with MIL-DTL-3950G requirements
- IEC 60529 IP68 sealing performance
- Toggle seal bonds to toggle, pin and bushing
- Complies with UL 61058-1 electrical spacing requirements

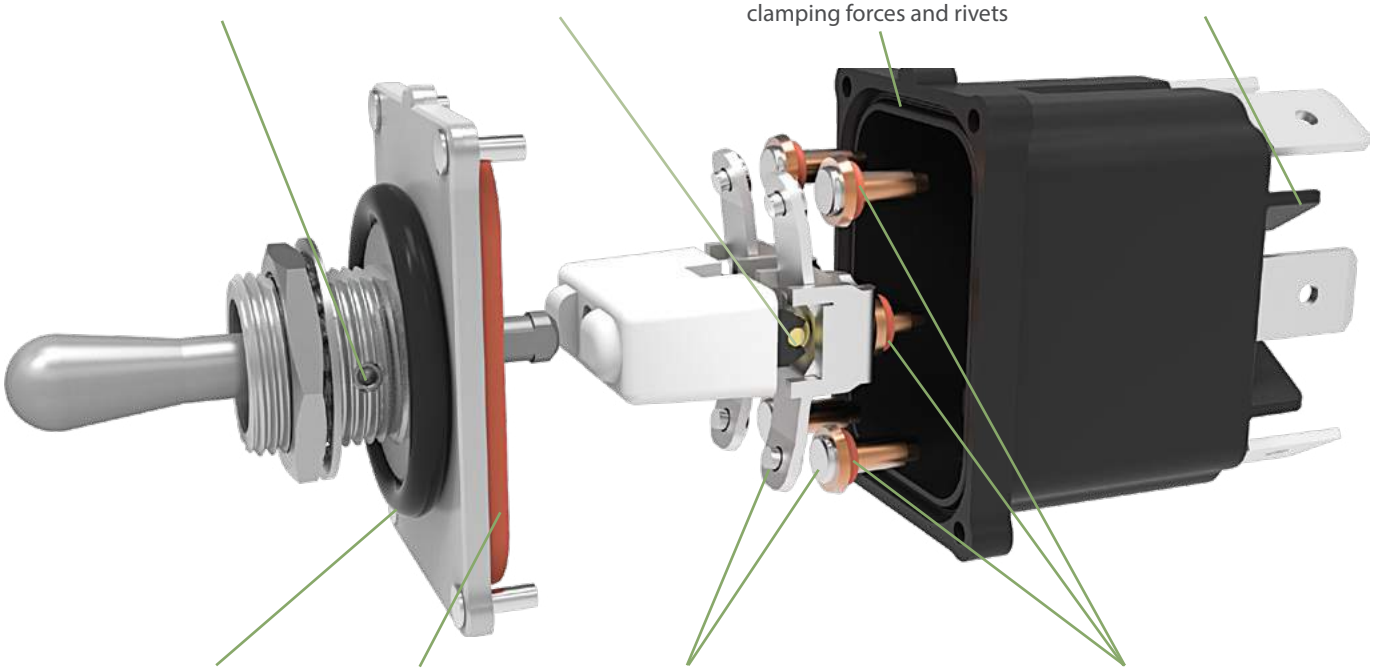
ST-Series Switch
DESIGN FEATURES

PINNED TOGGLE / BUSHING
Keeps metal toggle firmly in place and prevents rotation

BRASS ROLLER PIN
Provides rolling metal on metal actuation for maximum endurance

BASE SEAL CHANNEL
Perfectly fits the toggle assembly seal decreasing the dependence on clamping forces and rivets

TERMINAL BARRIERS
Comply with UL-61058-1 electrical spacing requirements



OPTIONAL O-RING
Assures additional under panel sealing protection

BUSHING/TOGGLE SEAL
Composed of dynamic silicone material that bonds to the metal toggle, pin and bushing

RIVETS
High purity copper composite and silver alloy materials handle various electrical loads and maintain low contact resistance

TERMINAL SEALS
Assure a secure seal at extreme temperatures. Eliminates potential for separated joints associated with insert molded constructions

Electrical

Contact Rating	16A 12V/24V
Dielectric Strength	MIL-STD-202G, Method 301 (1500 Volts RMS)
Insulation Resistance	MIL-STD-202G, Method 302 (50 MegOhms, 500 VDC)
Initial Contact Resistance	MIL-STD-202G, Method 307 (10 milliOhms max.)
Life	Overload: MIL-DTL-3950G, Section 4.8.11.1 Electrical Endurance and Temperature: UL 61058-1 Momentary circuits: 25,000 operations, minimum. Maintained circuits: 50,000 operations, minimum. Testing ongoing to determine maximum values.
Contacts	Silver Alloy
Terminals	Brass or Copper / silver plated. Tab Terminal: ¼" quick-connect Screw Terminal: #6-32 brass screw and cage clamp MIL-STD-202G, Method 211 Test Condition A, and B: 25 lb. pull test, two terminal bends.

Physical

Function	Single/Double Pole with Single/Double Throw functions
Operation	Two/ Three position, Maintained/ Momentary circuits
Toggle	Tin plated brass
Actuator	Polyester PBT, UL94-V0 and fungus resistant per ASTM G- 21
Internal Seals	All internal seals are silicone per A-A-59588-1A.
Mounting	15/32"-32 UNS-2A threaded bushing with a keyway. A single nut and lock washer are supplied unassembled.
Bushing/Top Plate	Zinc/aluminum die cast, with tin plating.
Base	Polyester PBT, UL94-V0 and fungus resistant per ASTM G-21
Actuation Force	Initial Actuation Forces ± 0.3 lb (2-Pole circuits)
Angular Movement	14.5 degrees, each side of center

Mechanical

Life	Mechanical Endurance: 150,000 cycles total (at 25°C)

Environmental

Temperature	Operating: -40°C to +85°C Storage: -65°C to +85°C
Vibration	MIL-STD-202G: Method 204D, Test Condition A (10 G peak, Harmonic, 10Hz to 500Hz sweeps, 9 hours total).
Shock	MIL-STD-202G: Method 213B, Test Condition K (30 G, half sine)
Handling Drop	SAE J1455, Section 4.11.3.1, 1 meter drop in each of three planes
Sealing	MIL-STD-202G, Method 110 (sand and dust) IEC 60529, IP68 (dust-tight and continuous immersion in water)
Salt Atmosphere	MIL-STD-202G, Method 101, Test Condition A (96 hrs)
Thermal Shock	MIL-STD-202G, Method 107, Test Condition A (five cycles in air: -55°C, +25°C, +125°C, +25°C)
Moisture Resistance, Humidity	MIL-STD-202G, Method 106 (ten 24-hour stepped cycles)
Chemical Resistance	No permanent loss of function, obvious loss of sealing, distortion, softening, embrittlement, discoloration or corrosion after being brushed for 10 minutes, wetting all exposed surfaces. Relevant chemical compatibility documentation may be used in place of testing.

Chemical	Concentration
Gasoline	100%
Ethylene Glycol	50% in water
Ethanol/Methanol	10% in water
Diesel Fuel	100%

*Manufacturer reserves the right to change product specification without prior notice.

ST	A	2	E	1	–	53
1 Series	*2 Circuit*	*3 Poles*	*4 Rating*	*5 Termination*		*6 Toggle Style*

1 SERIES [1]

ST Sealed Toggle

2 CIRCUIT

	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
Position:	**1**	**2**	**3**
A	ON	NONE	OFF
B	(ON)	NONE	OFF
C	ON	NONE	(OFF)
D	ON	NONE	ON
F	ON	NONE	(ON)
J	ON	OFF	ON
K	ON	OFF	(ON)
L	(ON)	OFF	(ON)
Special Circuits			
E [2,3]	5 & 6	5 & 3	5 & 1
G [2,4]	2 & 3, 5 & 6	2 & 3	OFF
M [2,4]	(2 & 3, 5 & 6)	2 & 3	OFF

3 POLES

1 Single pole using terminals 1, 2 & 3
2 Double pole using terminals 1, 2, 3, 4, 5 & 6

4 RATING

E 16A, 12/24V

5 TERMINATION

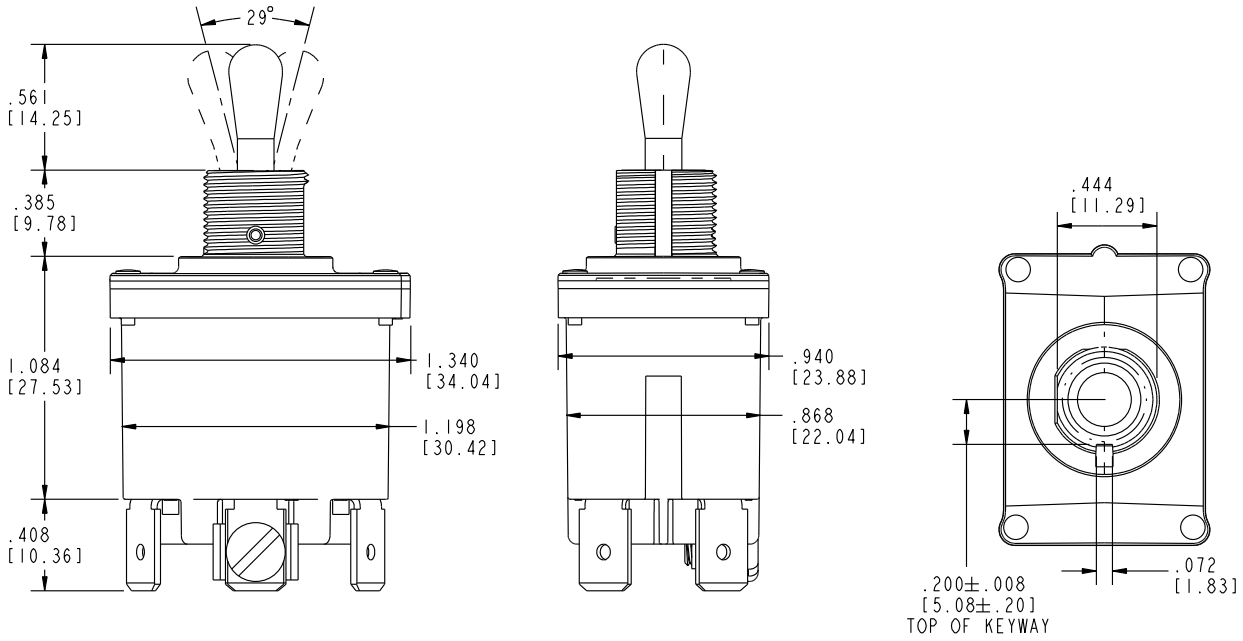
1 .250 (6.4mm) TAB (QC)
4 Screw with Cage Clamps
B [5] .250 (6.4mm) TAB (QC). Jumper T2 to T5. No terminal at T5
E [5] Screw with Cage Clamps. Jumper T2 to T5. No terminal at T5

6 TOGGLE STYLE

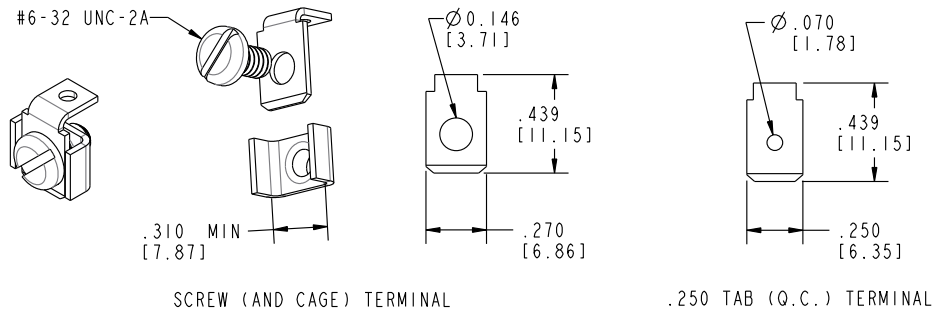
Without Panel Seal	Toggle Length	Bushing Length
53	.561	.385
With Panel Seal (Bulk)		
58	.561	.385

Notes:
1 Standard hardware is (1) inner tooth lock washer and (1) hex nut bulk.
2 Available only with 2 pole option in selection box # 3.
3 External customer supplied jumper required between terminals 2 & 4 to get SP ON-ON-ON circuit.
4 Available with termination B and E only.
5 Available with special circuit G and M only.

Dimensional Specifications: in. [mm]



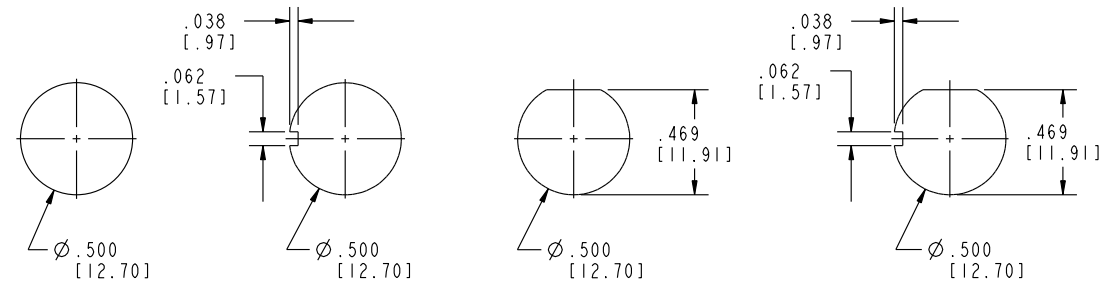
TERMINALS



SCREW (AND CAGE) TERMINAL

.250 TAB (Q.C.) TERMINAL

PANEL CUTOUTS



MOUNTING HOLE

WITH KEYWAY

WITH FLAT

WITH KEYWAY, FLAT

BD-Series

BATTERY DISCONNECT POWER SWITCH

Carling Technologies BD-Series battery disconnect switch is designed to minimize battery drain, ensure maintenance personnel safety, and when used in conjunction with a padlock, provide vehicle theft protection.

Resources:

Download 3D CAD Files

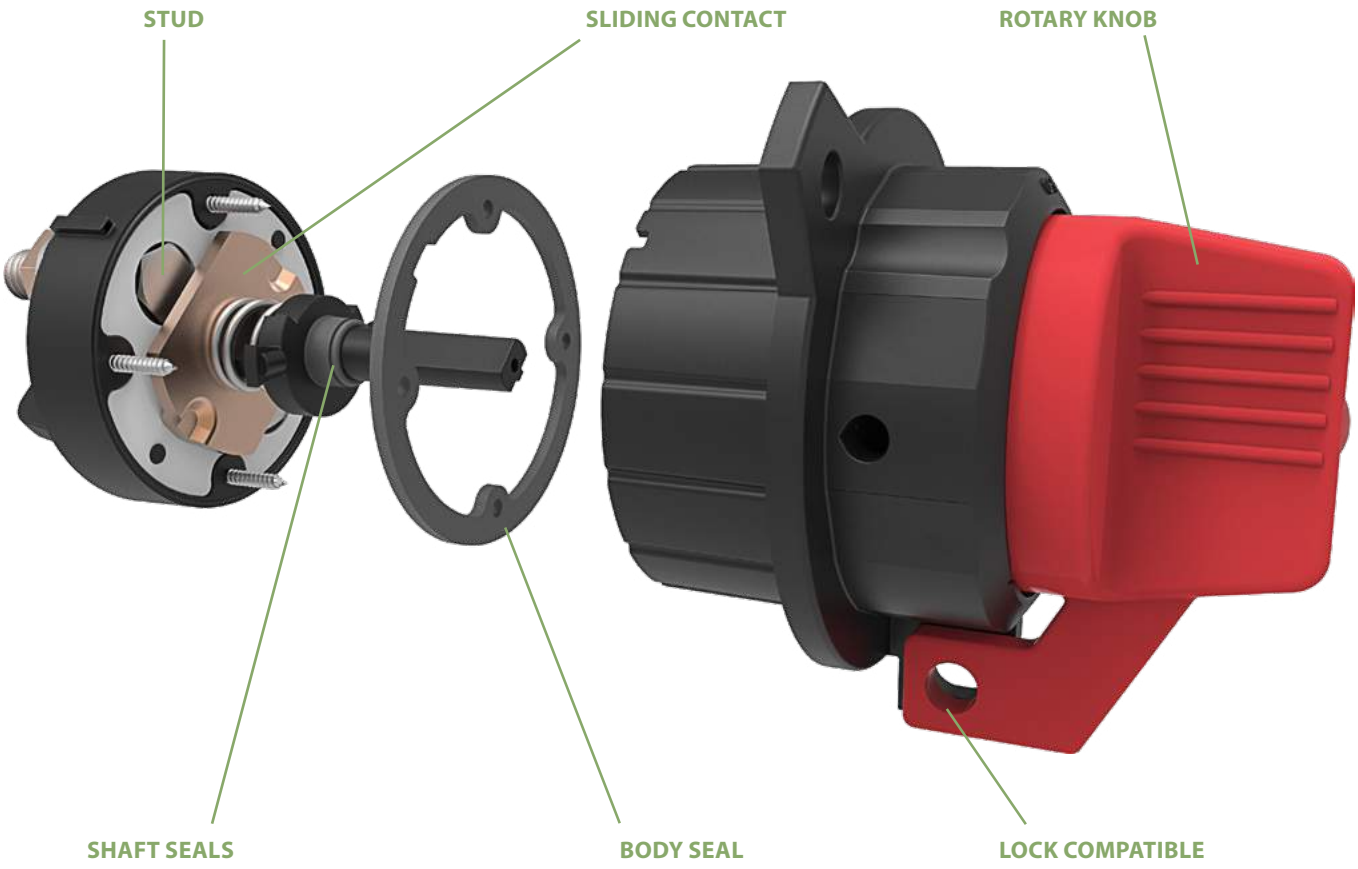
IGS › STP ›

Watch Product Video

Product Highlights:

- 100-250 Amps
- 12VDC/24VDC
- IP67 Sealing Protection
- Lock Compatible

BD-Series
DESIGN FEATURES



Electrical

Application Voltage	DC Rated voltage: 12VDC / 24VDC Range of operating voltage: 12VDC: min 9VDC, max 16VDC; 24VDC: min 18VDC, max 32VDC
Current Ratings	12VDC/24VDC: rated 100A, max 250A
Intermittent Current	24VDC/1500A, 3 seconds on, 60 seconds off, 10 cycles: voltage drop should not exceed 400mV between main terminals. 28V/1500A/30 seconds: voltage drop should not exceed 400mV 28V/2000A/5 seconds followed by 28V/750A/30 seconds followed by 28V/250A/24 hours: voltage drop should not exceed 100mV
Dielectric Strength	50HZ, 550VAC for 1 minute between electrically / isolated terminals in main circuit; between terminals of main circuit, knob and enclosure.
Insulation Resistance	Minimum of 100 Megohms 1 min @ 500VDC
Temperature Rise	Terminal should not exceed 60°C above ambient.
Endurance	2 seconds ON and 2 seconds OFF per operation, load with rated current & voltage. 12V test @14V±0.1V; 24V test @28V±0.2V. 50,000 cycles: 100A current; 20,000 cycles: 200A current; 3,000 cycles: 250A current.

Mechanical

Handling Shock	Fully functional after 3 drops from 1000 mm height. Surface damage may occur.
Endurance	More than 100,000 cycles without load

Environmental

Operating Temp.	-40 ºC to +85 ºC.
Moisture Resistance	IEC 60068-2-38 or G/T 2423.34, Test Z/AD: Composite temperature/humidity cycle test, ten 24-hour cycles @ -10ºC to +65ºC, ≤80-96% RH.
Thermal Cycling	IEC 60068-2-14 or GB/T 2423.22, Test Nb, 25 Cycles -40˚C to +85˚C
Thermal Shock	IEC 60068-2-14 or GB/T 2423.22, Test Na (Five cycles @ -55ºC to +25ºC to +85ºC to +25ºC)
Thermal Resistance	IEC 60068-2-1 or GB/T 2423.1 Cold: Test A, operate 8 hours @ -40°C IEC 60068-2-2 or GB/T 2423.2 Heat: Test B, operate 8 hours @ +85°C
Vibration	IEC 60068-2-34 or GB/T2423.11,10~500Hz, Random vibration test for 8 hours in each of the 3 mutually perpendicular axes. 25Gs @ Z axes, 12.5Gs @ X/Y axes. powered.
Salt Spray	IEC 60068-2-11 or GB/T 2423.17, 48 hrs.
Fire and Smoke	IEC 60695-11-10 or GB/T 2408, HB
Dust / Waterproof	IEC 60529 or GB4208, IP 67
Chemical Splash	Gasoline, Diesel, Motor Oil, Brake Fluid, Ammonia, Armor All
UV Protection	ASTM G155-05a, cycle 11, 300 hr Xenon Arc, 1.4W/(m2·nm), wavelength 420 nm.

Physical

Number of Poles	1 pole
Wiring Terminals	Line/Load terminal: M10 brass nuts Torque value: (6~8 Nm.)
Mounting	M8 Iron nut, torque value: (10-15 Nm.)
Torque Operation	1.0~3.0 Nm.
Body Color	Black
Actuator Color	Red handle, with white color “Arrow” legends.
Weight	340g
Material	Base (PBT glass filled), Bracket & Knob (nylon glass filled), Studs (Copper + Tin plating), Nuts (Brass)

*Manufacturer reserves the right to change product specification without prior notice.

BD	A	10	-	R	A
1 Series	2 Rating	3 Termination		4 Knob Color	5 Legend

1 SERIES
BD Battery Disconnect Power Switch

2 RATING / OPERATION CYCLE
A 100A @ 24VDC: 50,000 Operation
200A @ 24VDC: 20,000 Operation
250A @ 24VDC: 3,000 Operation

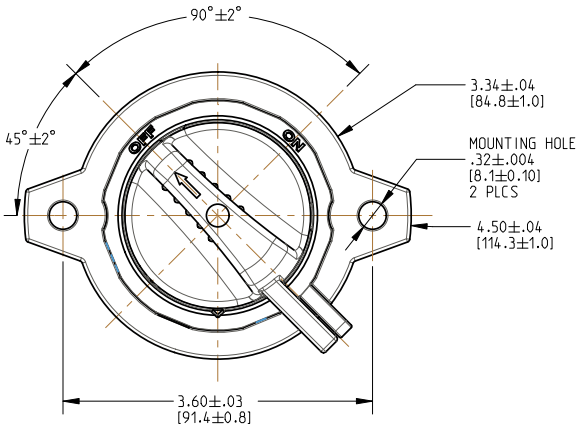
Note: Refer to General Specifications for test parameters.

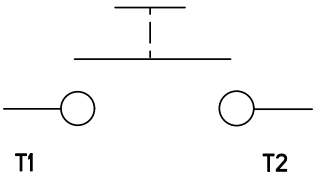
3 TERMINATION
10 M10 Stud

4 KNOB COLOR
R Red

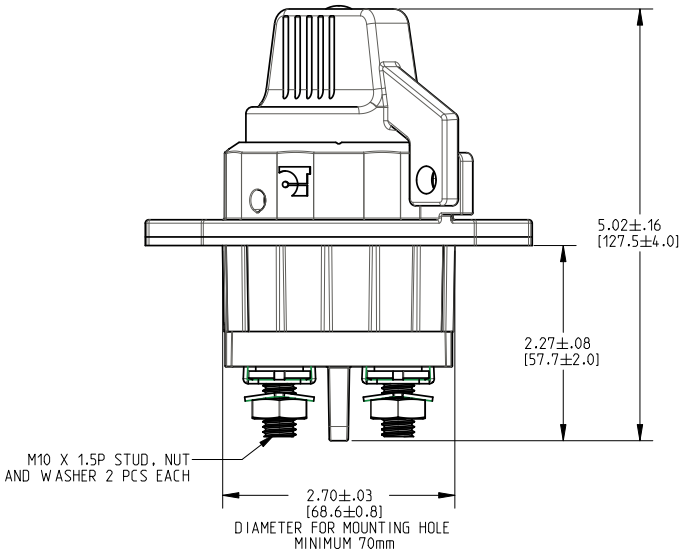
5 LEGEND
A Arrow Legend, White Color

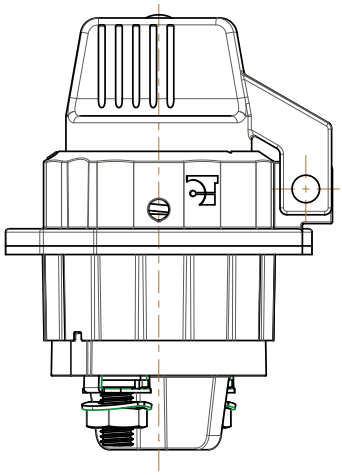
Dimensional Specifications: in. [mm]



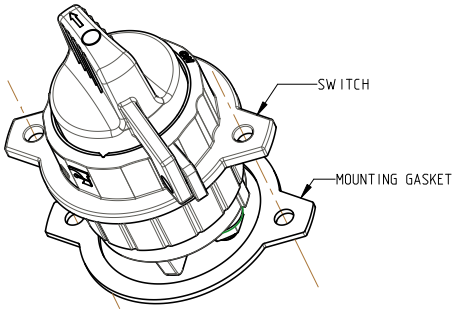


"ON/OFF" SINGLE POLE SINGLE THROW SWITCH
CIRCUIT DIAGRAM

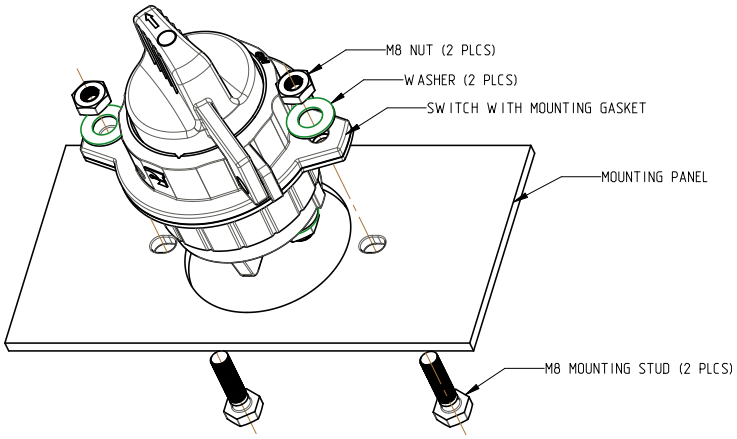




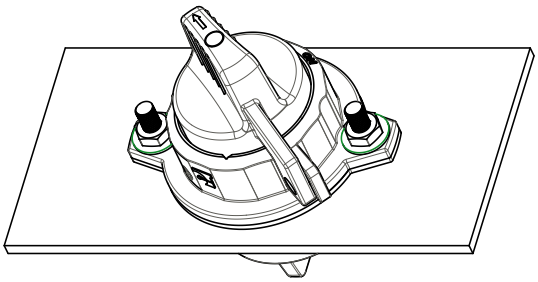
Mounting Method 1: in. [mm]



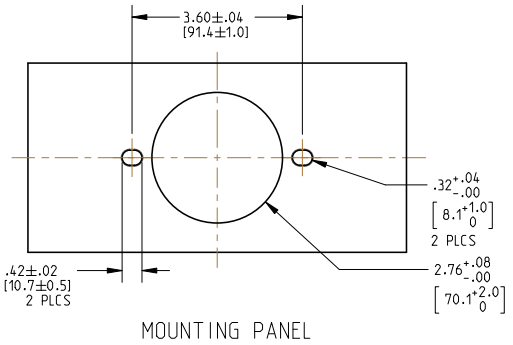
MOUNTING STEP 1: ATTACH MOUNTING GASKET WITH THE SWITCH ORIENTATION AS SHOWN



MOUNTING STEP 2: ORIENT AS SHOWN AND INSTALL THE SWITCH IN MOUNTING PANEL HOLE; THEN INSERT STUDS AND WASHERS



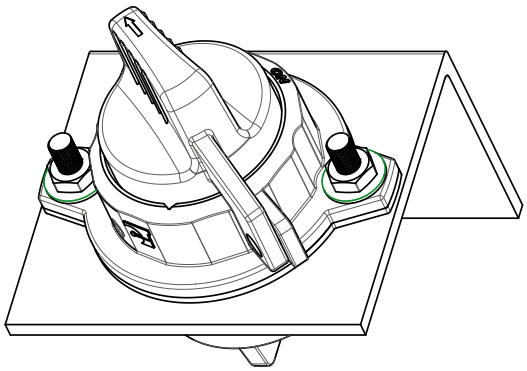
MOUNTING STEP 3: TIGHTEN 2PCS M8 NUTS (REC. TORQUE [10-15Nm])



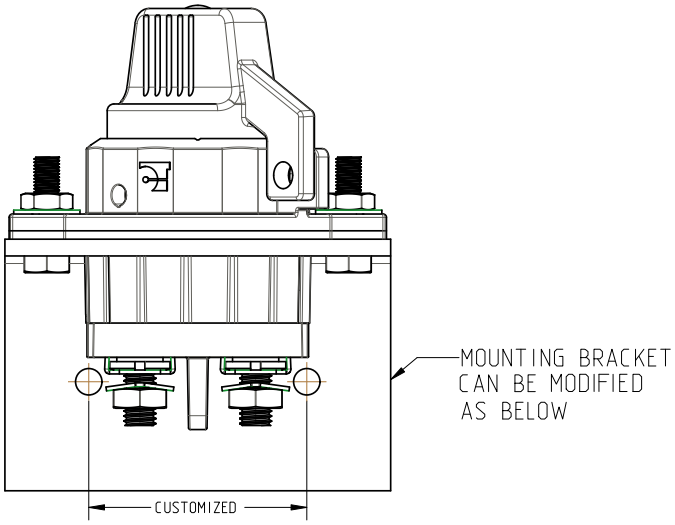
MOUNTING PANEL

Notes:
1 Switch can be mounted horizontally or vertically.

Mounting Method 2: in. [mm]

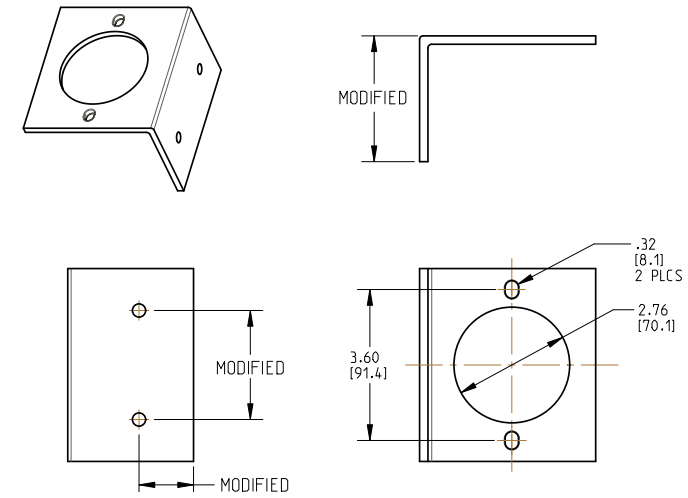


MOUNTING STEP 1: INSTALL SWITCH WITH MOUNTING BRACKET ORIENTATION AS SHOWN

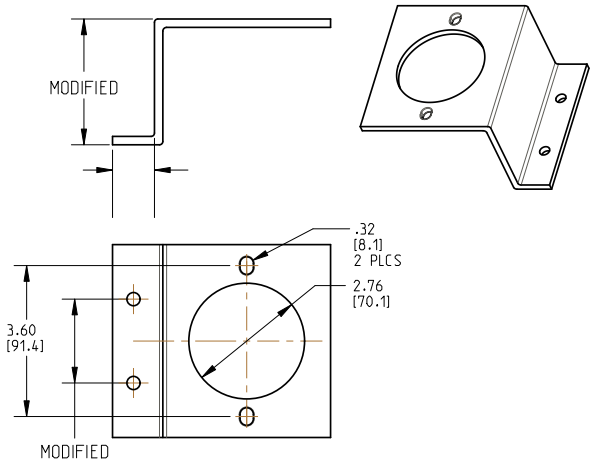


MOUNTING STEP 2: ORIENT AS SHOWN AND INSTALL THE SWITCH IN CUSTOMER PANEL.

"L" SHAPE MOUNTING BRACKET

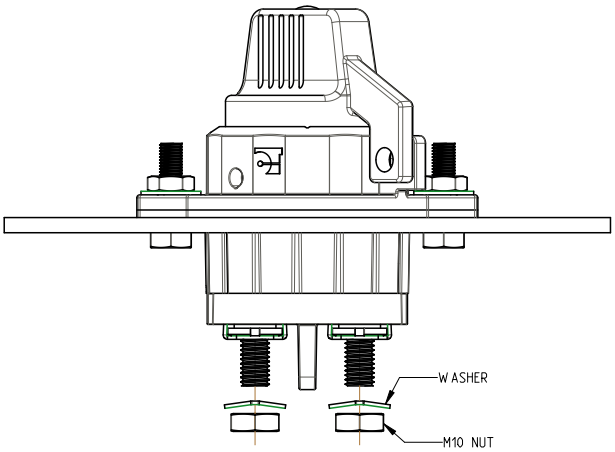


"Z" SHAPE MOUNTING BRACKET

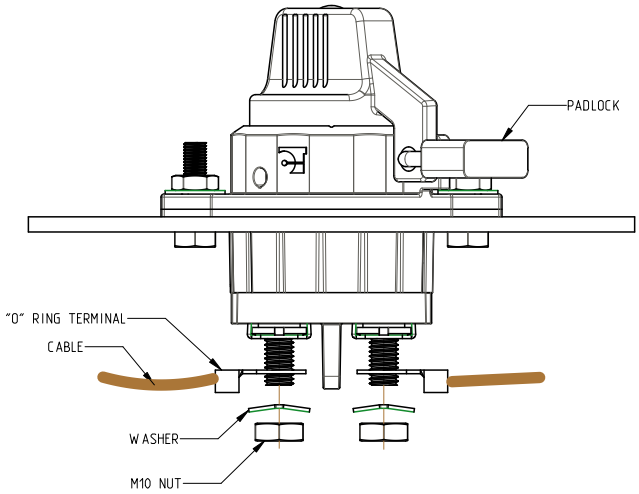


Notes:
1 Switch can be mounted horizontally or vertically.

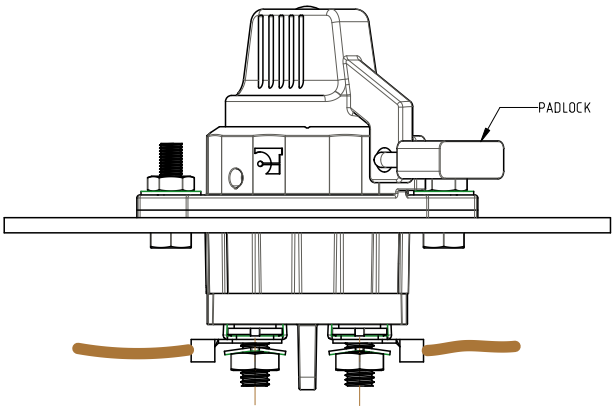
Wiring: in. [mm]



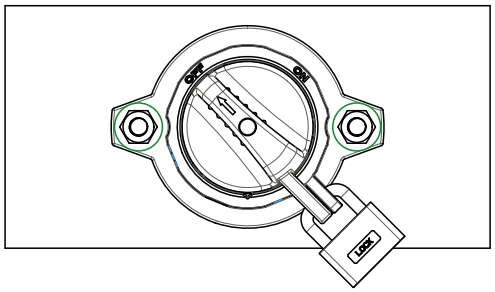
WIRING 1: DISCONNECT WASHERS AND NUTS



WIRING 2: ATTACH 2PCS M10 "O" RING TERMINALS AS SHOWN, THEN RE-FASTEN WASHERS AND NUTS



WIRING 3: TIGHTEN 2PCS BRASS M10 NUTS (REC. TORQUE [6-8Nm])



WHEN USED IN CONJUNCTION WITH A PAD LOCK, SWITCH CAN BE LOCKED IN THE "OFF" POSITION AS A SAFETY MEASURE

CKP-Series

SAE J1939 CAN KEYPAD

Compliant with SAE J1939 CAN standards, the CKP-Series is a customizable keypad featuring laser etched legends and up to three dimmable LED function lights per button, which also offer diagnostic feedback by blinking if there is a fault.

Sealed to an IP69 protection level, the CKP-Series can be installed inside or outside the cab making it ideal for any on/off-highway application. Its low profile design affords a seamless dashboard look and can be mounted either vertically or horizontally.

The CKP-Series offers significant advantages over traditional electromechanical switches such as 1,000,000 actuation cycles, reduced wire harnessing, and easy installation.

Resources:

Download 3D CAD Files

IGS > STP >

Watch Product Video

Product Highlights:

- SAE J1939 CAN 2.0b Protocol
- IP69 Front Panel Sealing Protection
- Up to 3 LED Function Lights Per Button
- Diagnostic Feedback
- Standard or Custom Laser Etched Legends
- 1,000,000+ Button Actuation Cycles
- Low Current Switching
- 8 to 32V Operating Voltage
- Tactile and Audible Feedback

Typical Applications:

- Military
- On/Off-Highway
  - Trucks & Buses
  - Construction
  - Mining
  - Agriculture
  - Among Others

CKP-Series
DESIGN FEATURES

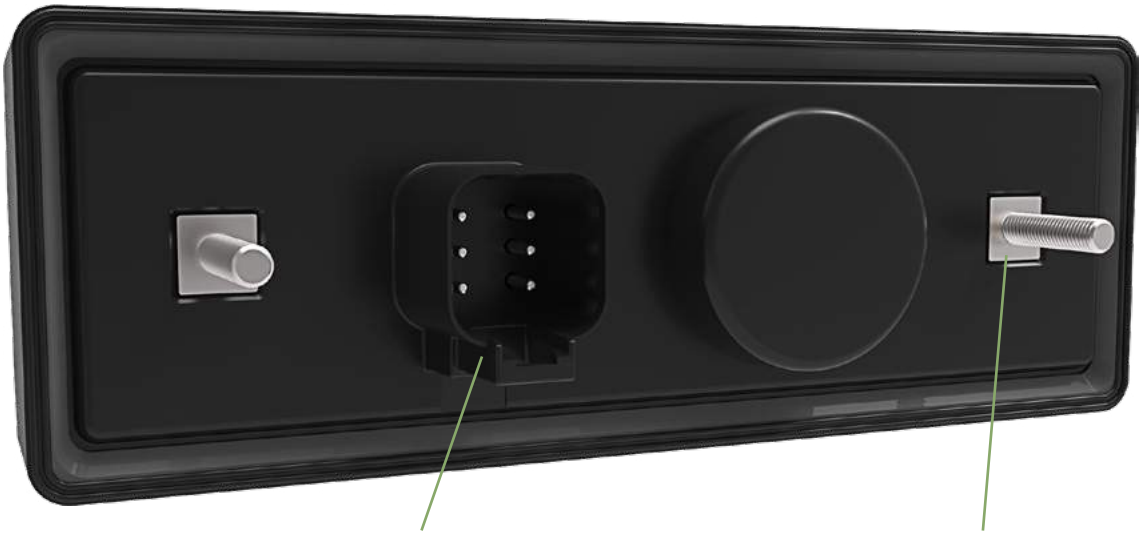
LOW PROFILE DESIGN
0.57 inch [14.48 mm] thickness (see dimensional specifications for more detail)

Front View

SEALING PROTECTION
Fully sealed IP69 front panel

LED FUNCTION LIGHTS
One, two, or three LED Function Lights per button. Colors include Amber, Green, Red or Blue.

CUSTOMIZABLE ICONS
Choose from our standard library of icons or use custom icons.



Back View

SEALING PROTECTION
Fully sealed IP68 back panel when connected

CONNECTOR
Mates to the Deutsch DT-Series Connector

10-32 MOUNTING STUDS (2x)
Max tightening torque 30 inch lbs.

General

Illumination	LED backlit icons and function lights Up to 3 function lights per button Dimmable illumination, controlled by CAN messages
Connection / Wiring	Duetsch DT series connector (See Dimensional Specifications)

Electrical

Operating Voltage	Designed for 12/24 Volt systems Minimum 8 VDC Maximum 32VDC
Sleep Mode	Low current sleep mode draws less than 1.5 mA throughout the supply voltage range wakes on keypress or CAN message
Supply Voltage ratings	The keypad passes SAE J1455 section 4.13.1 for power up, operating voltage, over voltage, reverse polarity, and short circuit
EMC	Transient immunity: ISO 11452-2, 100 V/m, 20 MHz to 2,000 MHz, Class A per ISO 11451-1 Conducted Transient immunity: ISO 7637-2:2004, Annex A Table A2 (for 24V systems), Class A ESD immunity: ISO 10605:2001, Test level IV (8 kV direct dis charge, 15 kV air discharge) Transient Emission: ISO 13766, Broadband: Annex D, Narrow band: Annex E, 30-1000 MHz

Mechanical

Overall Dimensions	See Dimensional Specifications
Panel cutout	See Dimensional Specifications
Endurance	Each button functions for at least 1,000,000 total actuations (100,000 actuations at -40°C, 100,000 actuations at +85°C, and 800,000 actuations at +25°C ± 10°C)

Software

CAN Protocol	CAN 2.0b type interface as defined by SAE J1939

Environmental

Thermal	-40°C to +85°C The following codes were passed: Cold Soak (IEC 60068-2-1) Heat Soak (IEC 60068-2-2) Cycling/Shock (IEC 60068-2-14)
Solar Radiation:	IEC 60068-2-5, procedure B, 10 cycles, Total irradiation per cycle = 22.4 kWh/m2
Low pressure	IEC 60068-2-13
Humidity	Soak: IEC 60068-2-78, 93% RH (±3%), 10 days
Cyclic	IEC 60068-2-30, test Db: Damp Heat Cyclic (12hr + 12hr cycle), variant 1, 6 cycles
Ingress Protection	IP6k9k per ISO 20653 (front side) IP6k8 per ISO 20653 when connected (back side)
Shock and Bump	IEC 60068-2-27, Shock 500 m/s^2 11 milliseconds, Bump 400 m/s^2 6 milliseconds 600 cycles
Drop test	IEC 60068-2-31, Free fall, Procedure 1, 1000 mm height, drop in all 3 axes in both directions
Vibration	IEC 60068-2-6, Swept sine wave section 8.2, 5 - 500 Hz 20 cycles 5g acceleration IEC 60068-2-6, Vibration sinusoidal, section 8.1, 10 - 2000 Hz, 5g acceleration IEC 60068-2-64, Method 1, random excitation, 10 - 350 Hz, 5 hours in each axis
Chemical Resistance	IEC 60068-2-74, Class B, Engine oil, Diesel, Hydraulic oil, Ethylene Glycol, Urea Notrogen, Liquid Lime, NPK Fertiliser, Ammonia, Calcium Chloride, Brake fluid
Corrosion Resistance	IEC 60068-2-52, Test Kb, Severity level 4
Weathering/Cracking Resistance	ASTM D1171-99, method A, 72 hours
Abrasion/Wear Resistance:	40 cycles of ASTM F2357 testing with 0.25” paper at 175 grams of force

Software Interface Integration

Click below for details on integrating the CKP-Series into J1939 CAN network:
www.carlingtech.com/sites/default/files/documents/ckp-series_interface.pdf

*Manufacturer reserves the right to change product specification without prior notice.

Ordering Scheme: Part 1 (Keypad)

CKP	1	-	1	A	1	-	A	B	-	A	-	J	000	/
1 Series	*2 Styling*		*3 Button Layout*	*4 Orientation*	*5 Keypad Color*		*6 Backlight*	*7 Function Light Color*		*8 Un-illuminated Image Code*		*9 Network Type*	*10 Source Address*	

1 SERIES
CKP Carling Keypad

2 KEYPAD STYLING
1 Standard

3 BUTTON LAYOUT
1 Two by Six

4 ORIENTATION
A Landscape
B Portrait
C Reverse Landscape
D Reverse Portrait
See "icon artwork button layout" section for details.

5 KEYPAD COLOR
1 Black

6 BACKLIGHT
A White

7 FUNCTION LIGHT COLOR
B Amber **C** Green **D** Red **E** Blue

8 NON-ILLUMINATED IMAGE CODE
A White

9 NETWORK TYPE
J J1939

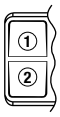
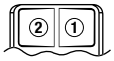
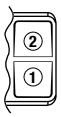
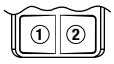
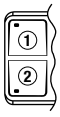
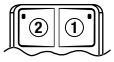
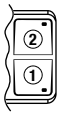
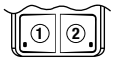
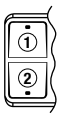
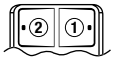
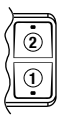
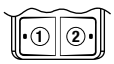
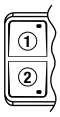
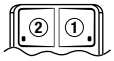
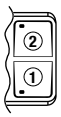
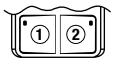
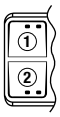
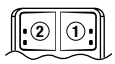
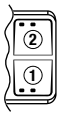
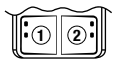
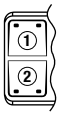
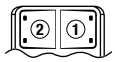
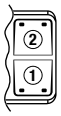
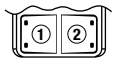
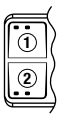
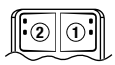
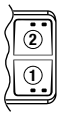
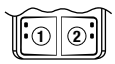
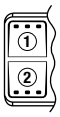
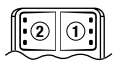
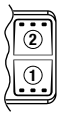
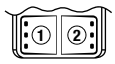
10 SOURCE ADDRESS
The Source Address is a unique number (000-248) assigned to each node on a CAN network, and is determined based on the specific CAN architecture of each customer application.

Ordering Scheme: Part 2 (Icon Artwork)

Button 1		*Button 2*		*Button 3*		*Button 4*		*Button 5*		*Button 6*	
2	RS	2	RA	3	UV	3	UW	6	MT	8	UB
11 Function	*12 Icon Code*	*13 Function*	*14 Icon Code*	*15 Function*	*16 Icon Code*	*17 Function*	*18 Icon Code*	*19 Function*	*20 Icon Code*	*21 Function*	*22 Icon Code*

Button 7		*Button 8*		*Button 9*		*Button 10*		*Button 11*		*Button 12*	
8	NN	8	PU	5	PR	5	PP	4	RH	4	NU
23 Function	*24 Icon Code*	*25 Function*	*26 Icon Code*	*27 Function*	*28 Icon Code*	*29 Function*	*30 Icon Code*	*31 Function*	*32 Icon Code*	*33 Function*	*34 Icon Code*

FUNCTION LIGHT CODE (Select for positions 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33)

	Landscape	*Portrait*	*Reverse Landscape*	*Reverse Portrait*
1 No Function Light				
2 Open-Closed-Closed				
3 Closed-Open-Closed				
4 Closed Closed-Open				
5 Closed-Open-Open				
6 Open-Closed-Open				
7 Open-Open-Closed				
8 Open-Open-Open				

Additional function light colors available, please consult factory.

ICON CODE
00 For standard icons, see next page. For additional icons, please consult factory.

Continue to next page for layout and icons.

Orientation - Icon Artwork Button Number Layout

(see dimensional specifications for more detail)

A: Landscape

B: Reverse Landscape

C: Portrait

D: Reverse Portrait

Standard Icons Codes:

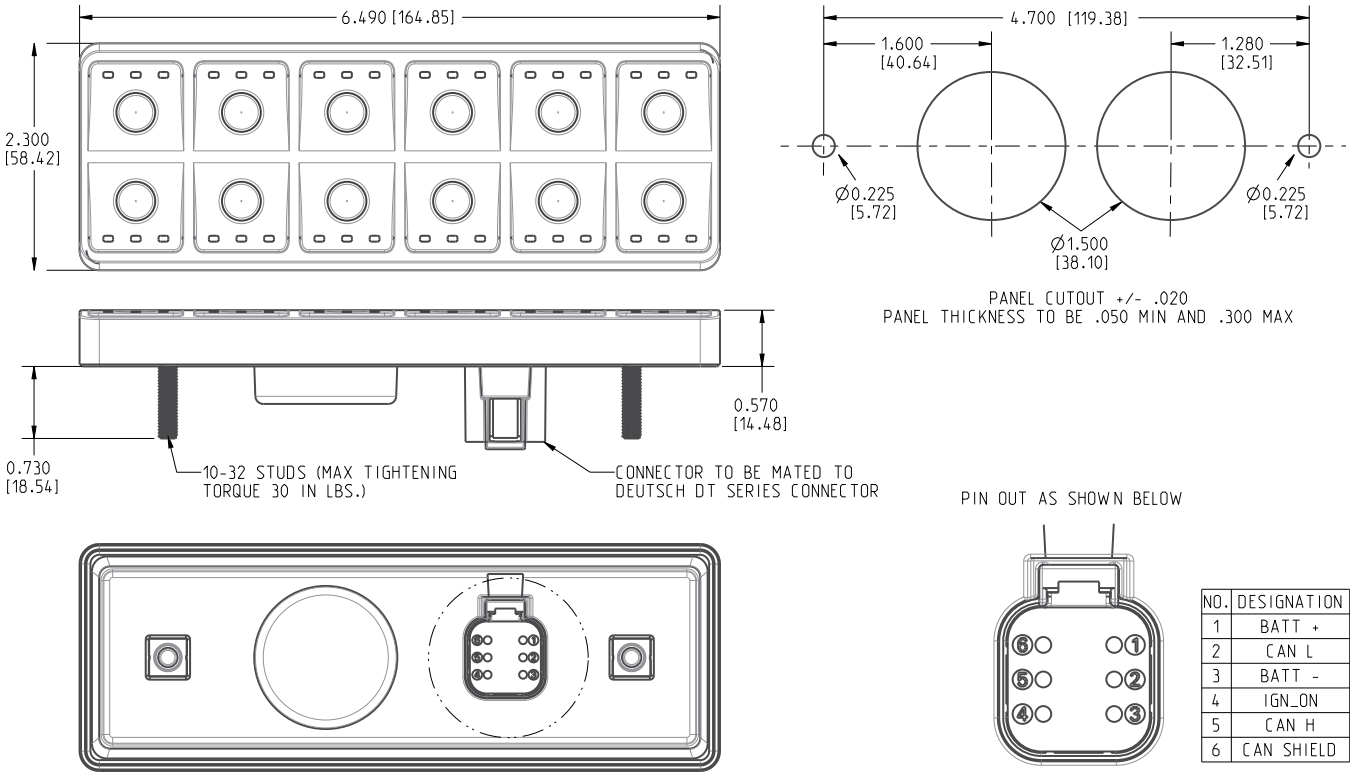
YK	UA	UB	US	UV	UW	UX	UY	MP	MR	PX	MS	MT
VU	MW	NZ	NX	NY	YM	VW	PS	PW	PZ	WG	WM	RN
RP	YG	TX	NAV LIGHTS VD	COURT LIGHTS VE	PANEL LIGHTS VF	ANCH LIGHTS VG	HEAD LIGHTS SH	FOG LIGHTS SM	DASH LIGHTS SN	DOCK LIGHTS SP	BEACON SR	LIGHT SY
DIM WY	BRIGHT WZ	UH	UJ	PD	PE	PF	BILGE PUMP VC	BILGE VJ	UF	UG	MU	TN
NS	PB	WIPER SE	VZ	YE	NN	RW	PU	WA	YN	UE	NM	RJ
NR	YD	TL	VR	ENG FAN SL	BLWR VA	UC	VN	PK	VY	HORN UZ	RH	NU
NV	RB	RC	RK	RL	MZ	RG	UP WS	DOWN WT	UD	UR	WD	TY
PA	UK	WATER PUMP WR	UU	UT	ANCHOR YR	PM	VV	WB	TB	TC	TD	TE
MY	PV	TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK

Standard Icon Codes continued on next page.

Standard Icons Codes:

VS	UL	UM	WK	TS	VT	WL (TCS)	VP	YJ	PJ	RY	UP	NW
NP	RE	RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR
TK (STOP)	RT	SZ (SEAT)	VX	WF	WH	PG	SJ (CRUISE)	YA	YB	RM	TM	RD
RS	UN	TP	TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG
YS	YH	SX (AUX)	RZ (ON OFF)	YP (OFF ON)	WN (I O)	WP (O I)	WW (O F F O N)	WX (ON)	SA (OFF)	SB (I)	SC (O)	SD (II)
ST (RAISE)	SU (LOWER)	WU (HIGH)	WV (LOW)	SV (FWD)	SW (REV)	VB (DEPTH)	VH (TRIM TAB)	VK (ACC)	VL (NAV ANCH)	VM (WIND LASS UP/DN)	WE (LIVE WELL)	SF (REAR)
SG (PARK)	SS (AUTO)	RU	RV	RX								

Dimensional Specifications: in. [mm]

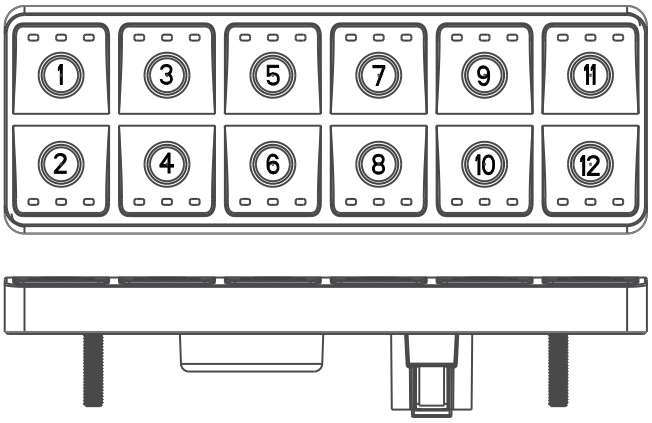


NO.	DESIGNATION
1	BATT +
2	CAN L
3	BATT -
4	IGN_ON
5	CAN H
6	CAN SHIELD

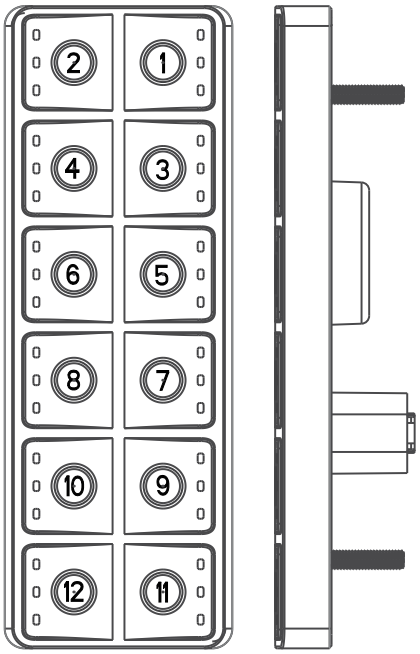
Dimensional Specifications: in. [mm]

ORIENTATION - ICON ARTWORK BUTTON NUMBER LAYOUT

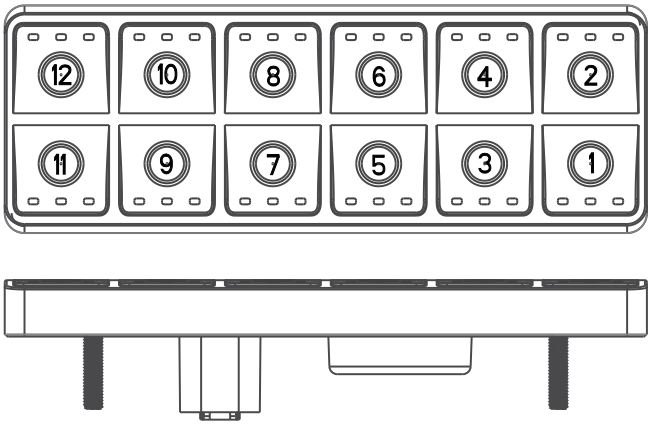
LANDSCAPE



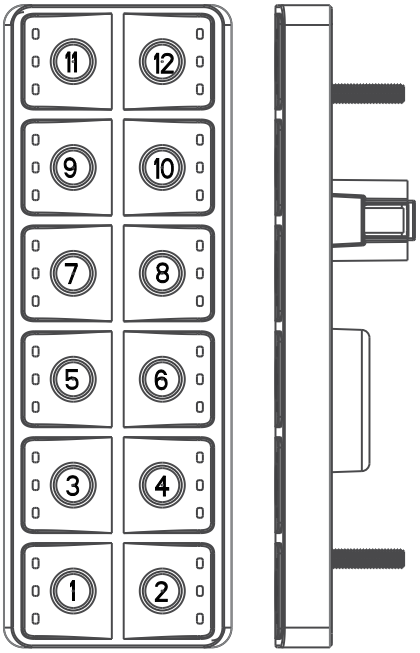
PORTRAIT



REVERSE LANDSCAPE



REVERSE PORTRAIT



F-Series
SINGLE POLE TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, various actuator, bushing, termination, and circuit choices allow this versatile switch to easily integrate into a variety of different applications. The F-Series is appropriate for usage in low voltage DC applications.

Resources:

Download 3D CAD Files

IGS › STP ›

Product Highlights:

- Ratings to 20A
- Suitable for low voltage 12/24V DC
- Variety of termination options
- Consult factory for large choice of bushing/toggle length combinations

Dielectric Strength
1000V - live to dead metal parts

Electrical Life
50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life
100,000 cycles

Operating Temperature
0°F to 150°F (-17.8°C to +65.6°C)

2FA54 - 73 / TABS

1 Base Part Number | 2 Actuator Style | 3 Tab Terminals

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION [1]

10A 250VAC; 15A 125VAC; 3/4 HP 125-250VAC

	Solder Lug	.250 Tab QC	Screw Terminals
On-None-Off	**2FA53**	**2FA53- . . . /TABS**	**2FA54**
(On)-None-Off	**6FA53**	**6FA53- . . . /TABS**	**6FA54**
On-None-(Off)	**6FA57**	**6FA57- . . . /TABS**	**6FA58**
On-None-On	**2FB53**	**2FB53- . . . /TABS**	**2FB54**
On-None-(On)	**6FB53**	**6FB53- . . . /TABS**	**6FB54**
On-Off-On	**2FC53**	**2FC53- . . . /TABS**	**2FC54**
On-Off-(On)	**6FC57**	**6FC57- . . . /TABS**	**6FC58**
(On)-Off-(On)	**6FC53**	**6FC53- . . . /TABS**	**6FC54**

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

2 ACTUATOR STYLE

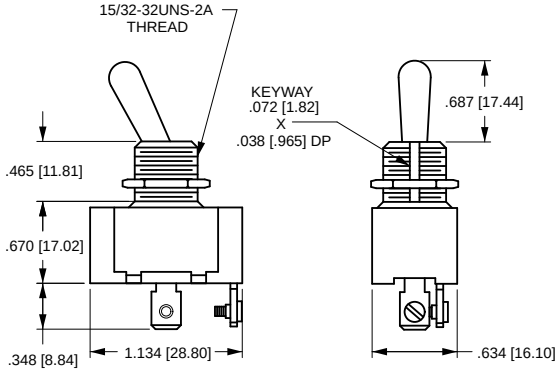
BAT STYLE TOGGLE [2]

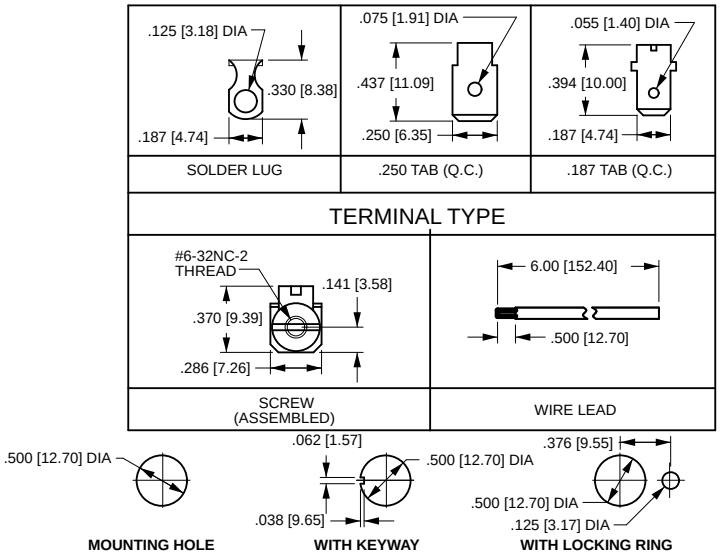
unsealed	sealed	toggle length	bushing length
73	**78**	0.687	0.465
E3	**E8**	2.000	0.465

3 TAB TERMINALS

/TABS	Tab Terminals
(blank)	Leave blank if tab terminals not required.

Notes:
1 Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
2 Additional toggle options are available. Consult factory.
( ) indicates momentary function.





*Manufacturer reserves the right to change product specification without prior notice.

G-Series
TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, international approvals, various actuator, bushing, termination, and circuit choices allow this toggle switch to easily integrate into a variety of different applications. The G-Series is appropriate for usage in low voltage DC applications.

Resources:

Download 3D CAD Files

IGS > STP >

Product Highlights:

- Ratings to 20A 277VAC available
- Metal bat or nylon bat/paddle actuator styles
- UL, CSA and VDE approvals for select circuits
- Suitable for low voltage 12/24V DC

Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

VDE: 4000V - live to dead metal parts; 1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

2GM51 – 73

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION [3]

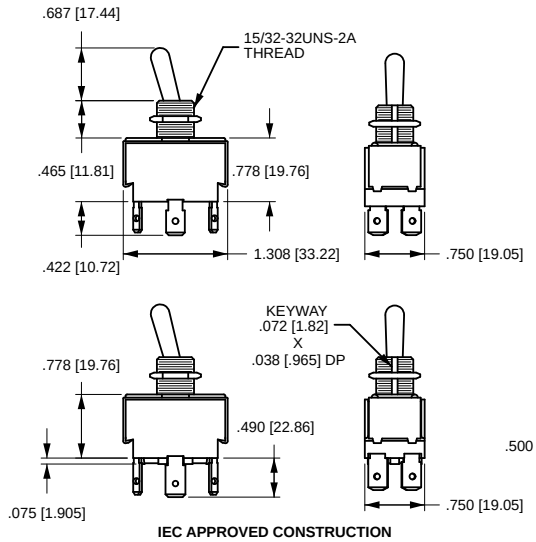
Single Pole in Double Pole base				***Double Pole***		
10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC						
solder lug	.250 tab	screw term.		solder lug	.250 tab	screw term.
2GA50	**2GA51**	**2GA54**	On-None-Off	**2GK50**	**2GK51**	**2GK54**
6GA5A	**6GA5B**	**6GA5E**	(On)-None-Off	**6GK5A**	**6GK5B**	**6GK5E**
6GA5L	**6GA5M**	**6GA5S**	On-None-(Off)	**6GK5L**	**6GK5M**	**6GK5S**
2GB50	**2GB51**	**2GB54**	On-None-On	**2GL50**	**2GL51**	**2GL54**
6GB5A	**6GB5B**	**6GB5E**	On-None-(On)	**6GL5A**	**6GL5B**	**6GL5E**
2GC50	**2GC51**	**2GC54**	On-Off-On	**2GM50**	**2GM51**	**2GM54**
6GC5A	**6GC5B**	**6GC5E**	On-Off-(On)	**6GM5A**	**6GM5B**	**6GM5E**
6GC5L	**6GC5M**	**6GC5S**	(On)-Off-(On)	**6GM5L**	**6GM5M**	**6GM5S**
10A 250VAC, 15A 125VAC, 12 (6)A 250VAC T85/55 ENEC/VDE Approved [1]						
2GA90	**2GA91**	**-**	On-None-Off	**2GK90**	**2GK91**	
2GB90	**2GB91**	**-**	On-None-On	**2GL90**	**2GL91**	
2GC90	**2GC91**	**-**	On-Off-On	**2GM90**	**2GM91**	

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

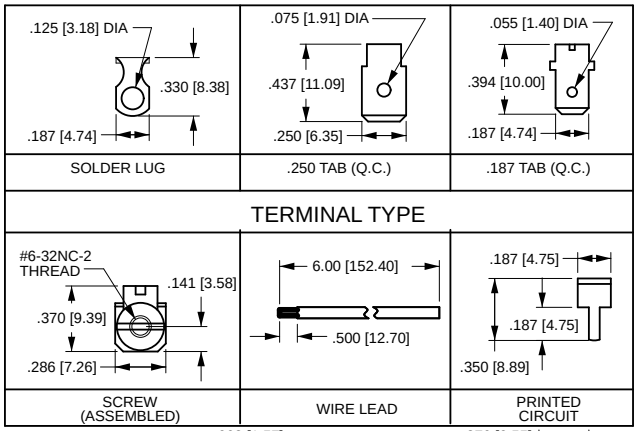
2 ACTUATOR STYLE [4]

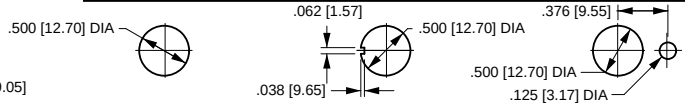
	unsealed	sealed	toggle length	bushing length
BAT	**73**	**78**	0.687	0.465
PADDLE [5]	**NBL3**	**NBL8**	0.687	0.465
BAT [2]	**D-3B-B**	**-**	0.687	0.379
PADDLE [2]	**-**	**D-4B-B**	0.687	0.379

Notes:
1 Not available with 73 or NBL3 style toggles, T55 with 78 and NBL8 style toggles.
2 All nylon bushing and toggle.
3 Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
4 Additional actuator options available. Consult factory.
5 Nylon toggle with black ebanol plated bushing.
( ) Indicates momentary function.



IEC APPROVED CONSTRUCTION





*Manufacturer reserves the right to change product specification without prior notice.

DK/EK-Series
HEAVY DUTY TOGGLE SWITCHES

The switch that can handle your heavy duty requirements. Single or double pole with wire lead or screw terminations, and ratings to 20A 125V 10A 250V, the ac/dc DK/EK-Series is the most heavy duty toggle switch in the Carling line. Its sturdy metal construction and stiff actuation force will withstand the abuses of virtually any stringent application. The quick make/quick break contact mechanism is ideal for high voltage DC applications.

Product Highlights:

- Ratings up to 20A 125V AC or DC
- Screw Term or Wire Lead terminations
- Quick Make / Quick Break contact mechanism
- Bat or Ball style toggle options

Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 150°F (-17.8°C to +65.6°C)

DK284 - 73

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

8A 250V, 16A 125V, 1 HP 125-250V

	Screw Terminals	Wire Leads
Single Pole On-None-Off	**DA284**	**DA285**
Double Pole On-None-Off	**DK284**	**DK285**

10A 250V, 20A 125V, 1 1/2 HP 125-250V

	Screw Terminals	Wire Leads
Single Pole On-None-Off	**EA204**	**EA205**
Double Pole On-None-Off	**EK204**	**EK205**

2 ACTUATOR STYLE [1]

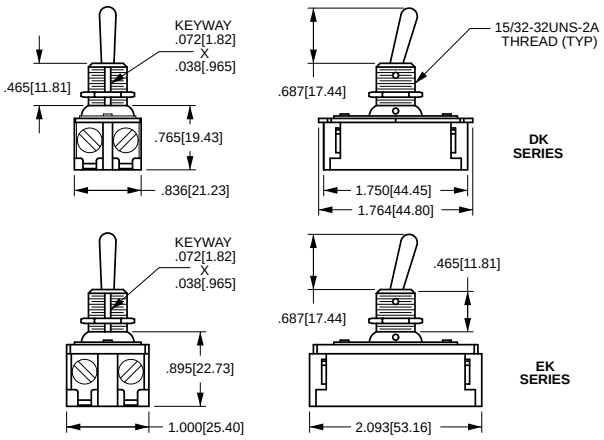
BAT STYLE TOGGLE

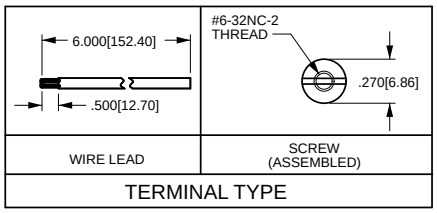
unsealed	toggle length	bushing length
73	0.687	0.465

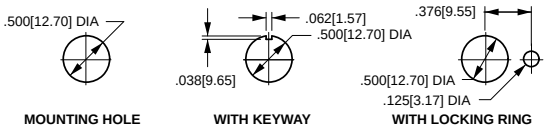
BALL STYLE TOGGLE

unsealed	toggle length	bushing length
32	0.500	0.343

Notes:
1 Additional toggle lengths available. Consult factory for details.







*Manufacturer reserves the right to change product specification without prior notice.

Standard Legend Imprinting Codes:

 YK	 UA	 UB	 US	 UV	 UW	 UX	 UY	 MP	 MR	 PX	 MS	 MT
 VU	 MW	 NZ	 NX	 NY	 YM	 VW	 PS	 PW	 PZ	 WG	 WM	 RN
 RP	 YG	 TX	NAV LIGHTS VD	COURT LIGHTS VE	PANEL LIGHTS VF	ANCH LIGHTS VG	HEAD LIGHTS SH	FOG LIGHTS SM	DASH LIGHTS SN	DOCK LIGHTS SP	BEACON SR	LIGHT SY
DIM WY	BRIGHT WZ	 UH	 UJ	 PD	 PE	 PF	BILGE PUMP VC	BILGE VJ	 UF	 UG	 MU	 TN
 NS	 PB	WIPER SE	VZ	YE	NN	RW	PU	WA	YN	UE	NM	RJ
NR	YD	TL	VR	ENG FAN SL	BLWR VA	UC	VN	PK	VY	HORN UZ	RH	NU
NV	RB	RC	RK	RL	MZ	RG	UP WS	DOWN WT	UD	UR	WD	TY
PA	UK	WATER PUMP WR	UU	UT	ANCHOR YR	PM	VV	WB	TB	TC	TD	TE
MY	PV	TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK
VS	UL	UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW
NP	RE	RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR
STOP TK	RT	SEAT SZ	VX	WF	WH	PG	CRUISE SJ	YA	YB	RM	TM	RD
RS	UN	TP	TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG
YS	YH	AUX SX	ON OFF RZ	OFF ON YP	I O WN	O I WP	OFF ON WW	ON WX	OFF SA	I SB	O SC	II SD
RAISE ST	LOWER SU	HIGH WU	LOW WV	FWD SV	REV SW	DEPTH VB	TRIM TAB VH	ACC VK	NAV ANCH VL	WIND LASS UP/DN VM	LIVE WELL WE	REAR SF
PARK SG	AUTO SS	RU	RV	RX								

Notes:
1 ISO compliant symbols. Consult factory for custom icons.
2 New legend codes recommended for new part set ups. Previous codes still valid for existing customers.

Below is a list of useful product catalogs.
Please scan the QR codes below or visit ***carlingtech.com/onthego*** for complete details.

WEBSITE

Product Selector, Resources, Configurit, Find Rep, Product Materials and Videos.

carlingtech.com */onthego*

SWITCHES AND CONTROLS

Rocker, toggle, pushbutton, rotary, battery disconnects and controls.

catalog

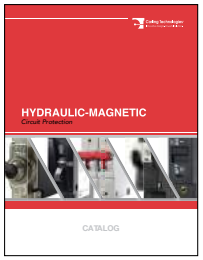
MINI & SUB-MINI SWITCHES

Sealed and non-sealed rocker, toggle, pushbutton and slide options.

catalog

HYDRAULIC-MAGNETIC CIRCUIT PROTECTION

1-6 poles from .02 to 700A with CSA, VDE, TUV, UL489, UL489A, UL1500 approvals.



catalog

THERMAL CIRCUIT PROTECTION

1 pole from 3 to 60A with UL, cUL, CE, UL1500/ISO 8846 approvals.

catalog

GFCI/ELCI CIRCUIT PROTECTION

1-3 poles from 0.10 to 50A with CSA, UL489, UL1077, UL1053, UL1500 approvals.

catalog

Below is a list of useful market specific catalogs and brochures.
Please scan the QR codes below or visit ***carlingtech.com/onthego*** for complete details.

ON-OFF HIGHWAY
Switches, Controls and Custom Solutions


catalog


brochure

MARINE
Circuit Protection and Switches


catalog


brochure

RENEWABLE ENERGY
Circuit Breakers and Disconnect products


catalog


brochure

MILITARY
COTS Switches and Circuits Breakers


catalog


brochure

TELECOM/DATACOM
Hydraulic-Magnetic Circuit Breakers


catalog


brochure

INDUSTRIAL AUTOMATION
Switches and Circuit Breakers


brochure

Authorized Sales Representatives and Distributors

Click on a region of the map below to find your local representatives and distributors or visit ***www.carlingtech.com/findarep***.

About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With four ISO registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit **www.carlingtech.com/company-profile.**

To view all of Carling's environmental, quality, health & safety certifications please visit **www.carlingtech.com/environmental-certifications**

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