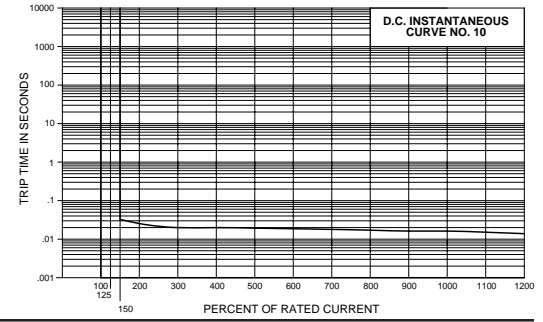
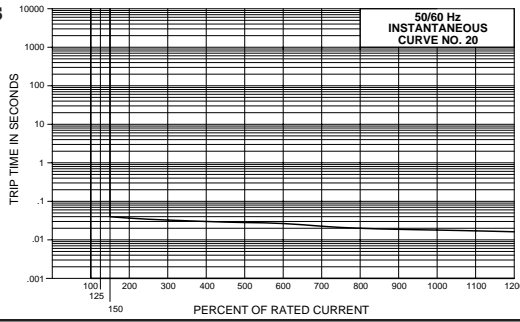


Time Delay Values (A, B, C & D-Series)

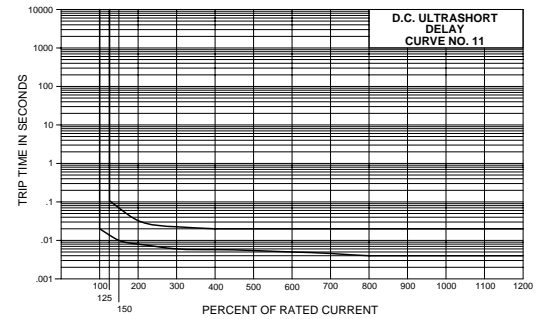
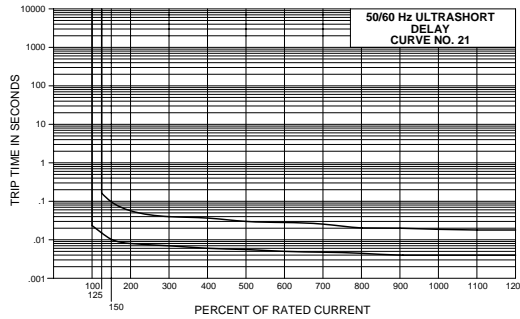
AC

DC

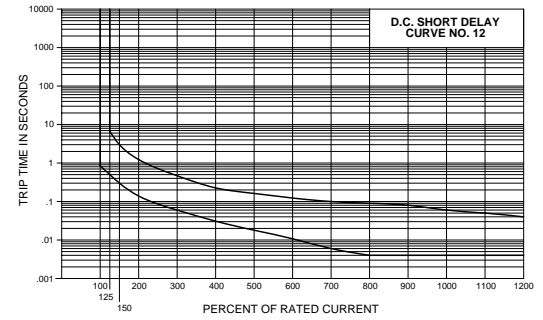
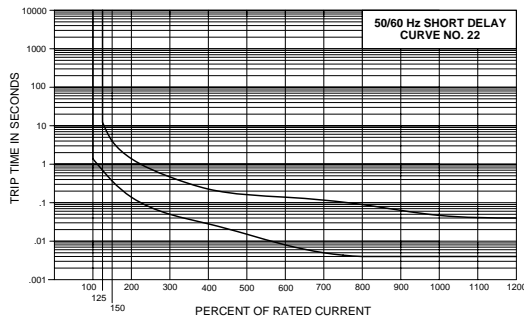
Instantaneous



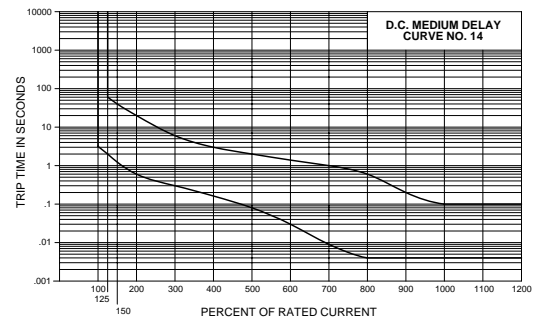
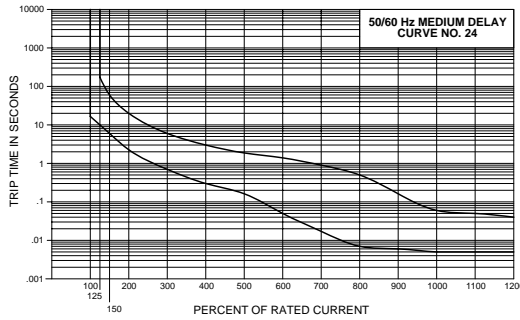
Ultrashort



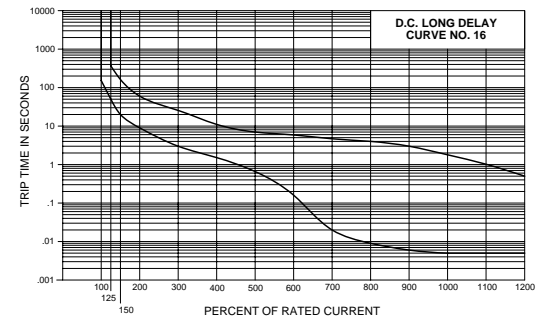
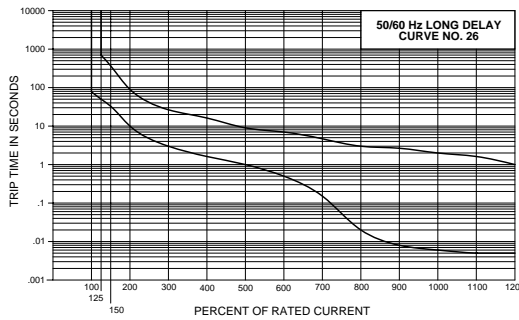
Short



Medium



Long



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: 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.

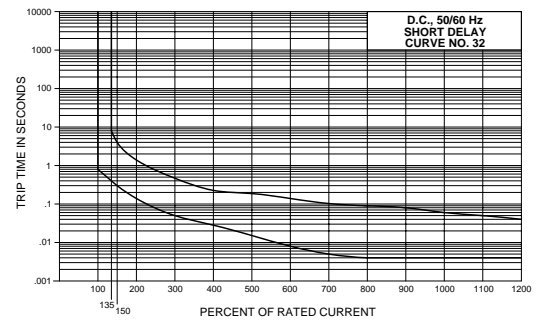
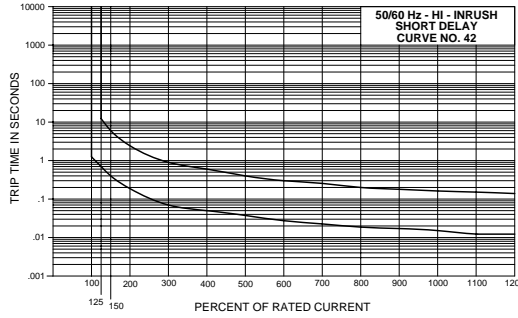
On 50 amp and less current ratings, the minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 25 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration such as switching power supplies, highly capacitive and transformer loads.

Time Delay Values (A, B, C & D-Series)

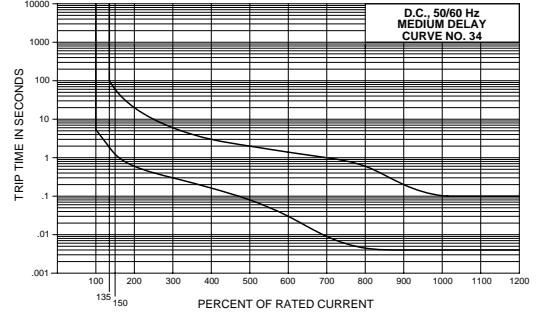
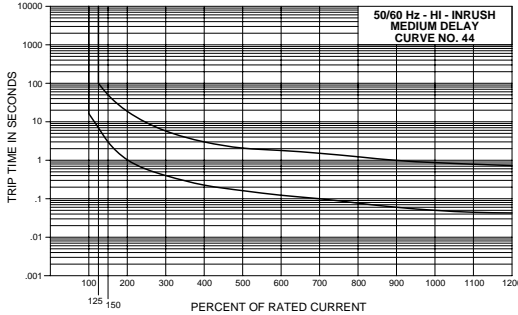
HI-INRUSH AC Delay Curves

Dual Rated AC/DC Delay Curves

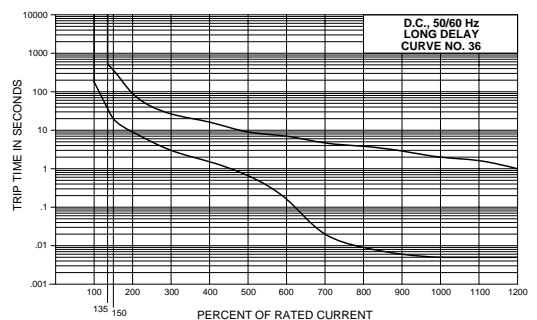
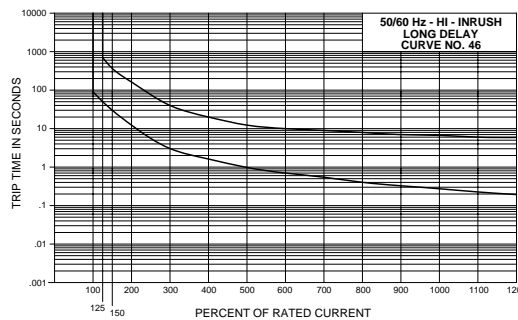
Short



Medium



Long



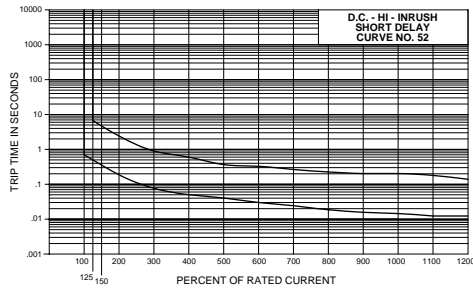
		PERCENT OF RATED CURRENT										
		DELAY	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
TRIP TIME (SECONDS)	10	NO TRIP	MAY TRIP	---	.032 MAX	.024 MAX	.020 MAX	.018 MAX	.016 MAX	.015 MAX	.013 MAX	
	11	NO TRIP	.013 - .125	---	.010 - .070	.008 - .032	.006 - .020	.005 - .020	.004 - .020	.004 - .020	.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 - 5.00	
	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	
	22	NO TRIP	.700 - 12.0	---	.350 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .045	.004 - .040	
	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	
	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

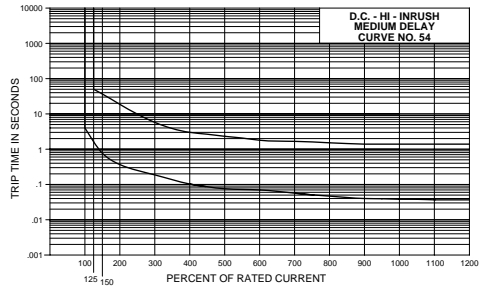
UL489 C-Series Breakers available with Delay Curves 11, 12, 14, 16, 21, 22, 24, 26, 42, 44, 46.
 Delay Curves 11,12,14,16,21,22,24,26,42,44,46: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.
 Delay Curves 32,34,36: Breakers to hold 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 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 and transformer loads.

Time Delay Values (A, B, C & D-Series) HI-INRUSH DC Delay Curves

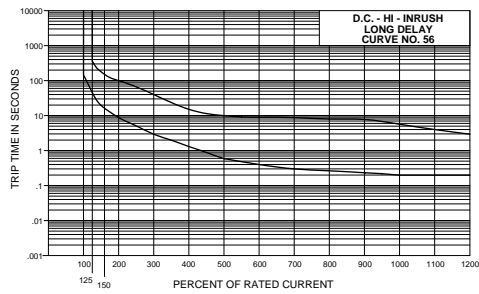
Short



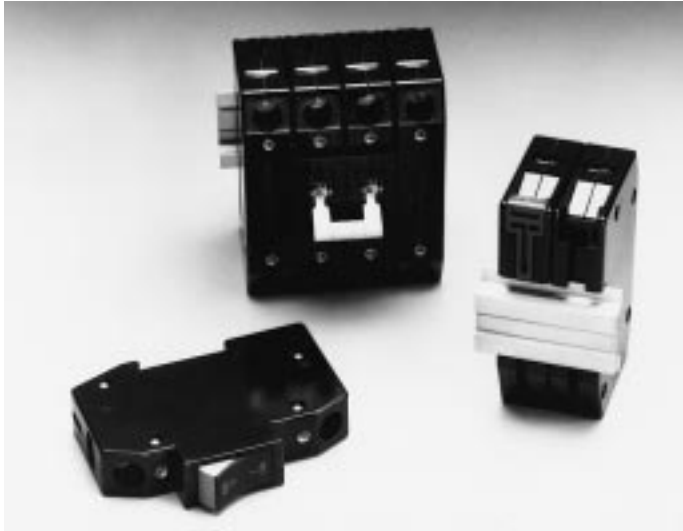
Medium



Long



D-Series – DIN Rail Rocker/Handle Actuator



Similar to the C-Series, but designed for snap-on-back panel rail mounting on either a 35mm x 7.5mm, or a 35mm x 15mm Symmetrical Din Rail. This design allows rapid and simple mounting and removal of the breaker. It features recessed, wire-ready, touch-proof, shock-resistant terminals, suitable for automatic screwdriver assembly, as well as “Dead Front” construction characteristics.

Available with the exclusive Visi-Rocker two-color actuator which can be specified to indicate either the ON or the TRIPPED/OFF mode. Also available with solid color rocker or handle type actuators. All actuator types fit in the same industry standard panel cutouts.

0.02 - 50 amps, up to 480 VAC or 65 VDC, 1 - 4 poles (Handle), 1 - 3 poles (Rocker), with a choice of time delays.

Agency Approvals

UL Recognized under the Component Recognition Program as Protectors, Supplementary (Guide QVNU2, File E75596), UL Standard 1077.

CSA Certified as Supplementary Protectors under Class 3215 01, File LR 47848, CSA Standard C22.2 No. 235.

VDE Certified to DIN VDE 0660, Part 101/09.82 under VDE-Reg.-Nr. 4006.



General Specifications

ELECTRICAL

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

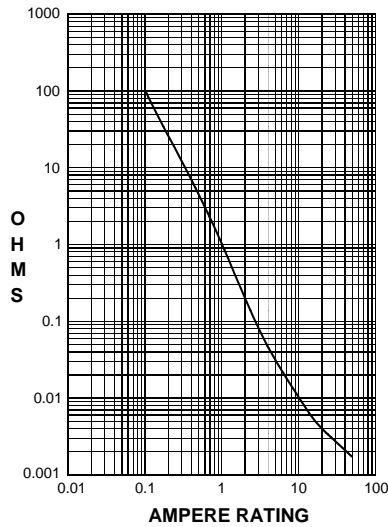
AS A COMPONENT SUPPLEMENTARY PROTECTOR						
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING FULL LOAD AMPS	INTERRUPTING CAPACITY, AMPS	
	MAX. RATING	FREQUENCY	PHASE		W/BACK-UP FUSE	W/O BACK-UP FUSE
					UL / CSA	VDE ¹
SERIES	65	DC	-----	0.02 - 50	5000 (1)	1500 (1)
	125/250	50/60 HZ	1 & 3Ø	0.02 - 50	5000 (1)	-----
	250	50/60 HZ	1 & 3Ø	0.02 - 50	5000 (3)	1500 (1)
	277	50/60 HZ	1Ø	0.02 - 50	5000 (3)	-----
	480Y (4)	50/60 HZ	3Ø	0.02 - 30	5000 (3)	-----
	480Y (4)	50/60 HZ	1Ø	0.02 - 30	5000 (3)	-----
SWITCH ONLY (NO COIL)	65	DC	-----	0.02 - 50		
	250	50/60 HZ	1 & 3Ø	0.02 - 50		
	277	50/60 HZ	1Ø	0.02 - 50		
	480Y (4)	50/60 HZ	3Ø	0.02 - 30		
	480Y (4)	50/60 HZ	1Ø	0.02 - 30		

NOTES FOR TABLE A

- 1 Units do not require back-up (series) fusing.
- 2 DC and 1Ø 277V max. ratings are 1 or 2 pole breaking. 3Ø ratings are 3 pole breaking.
- 3 Requires branch-circuit backup with a UL Listed type K5 fuse rated (15A minimum) and no more than four times full load amps, not to exceed 150A for 250V rating, and 125A for 277V and 480V ratings.
- 4 UL Recognition/CSA Certification at 480 Volts refers to 3 and 4 pole versions, used only in a 3Ø wye connected circuit or 2 pole versions connected with 2 poles breaking 1Ø and backed up with series fusing as stated in Note 3.

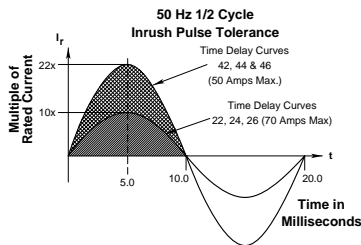
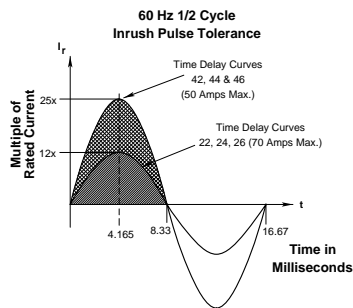
General Specifications (cont.)

Maximum Voltage	AC, 480 wye/277 VAC (See Table A), 50/60 Hz, 65VDC
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 factory.
Standard Voltage Coils	DC - 6V, 12V; AC - 120V, other ratings available, consult factory.
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. D-Series circuit breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces and between adjacent poles per Publications IEC 380, 435, 950, EN 60950 and VDE 0805.
Resistance, Impedance	Values from Line to Load Terminal - based on Series Trip Circuit Breaker



CURRENT (AMPS)	TOLERANCE (%)
0.100 - 5.0	±15
5.1 - 20.0	±25
20.1 - 50.0	±35

Pulse Tolerance Curves



General Specifications (cont.)**MECHANICAL**

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated Current and Voltage.
Trip Free	All D-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.

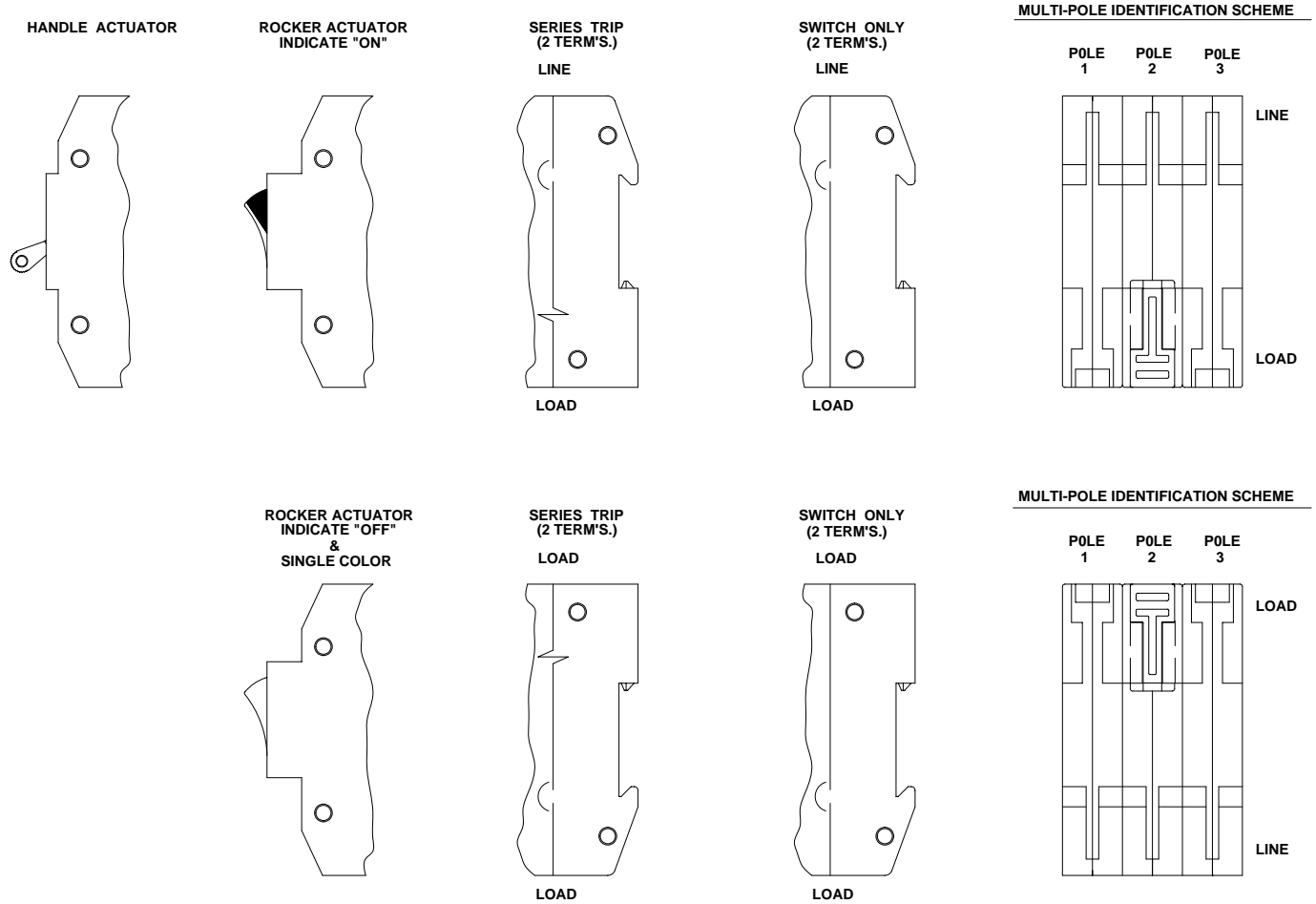
ENVIRONMENTAL

Environmental	Designed and tested in accordance with requirements of specification MIL-C-55629 and MIL-STD-202 as follows:
Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
Condition	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 ultra-short curves tested at 90% of rated current.
Vibration	Method 106D, i.e., ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.
Moisture Resistance	Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
Salt Spray	Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
Thermal Shock	-40° C to +85° C
Operating Temperature	

PHYSICAL

Number of Poles	Rocker Type: 1 - 3; Handle Type: 1 - 4
Internal Circuit Configurations	Switch Only and Series Trip with current or voltage trip coils.
Weigh	Approximately 128 grams/pole (Approximately 4.57 ounces/pole)
Standard Colors	Housing - Black; Actuator - See Ordering Scheme.
Mounting	Mounts on a standard 35mm Symmetrical DIN Rail (35 x 7.5 or 35 x 15mm per DIN EN5002).

Circuit and Terminal Diagrams



(HANDLE ACTUATOR SHOWN)

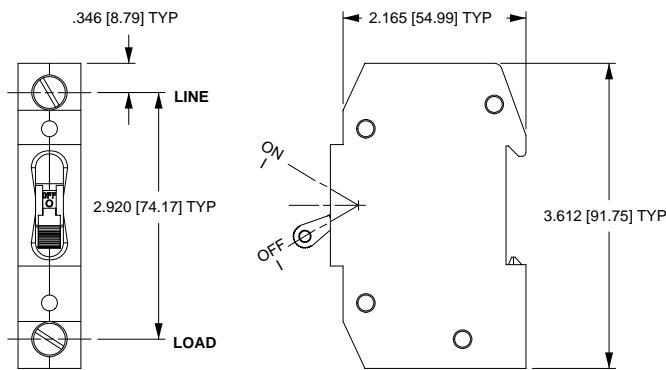
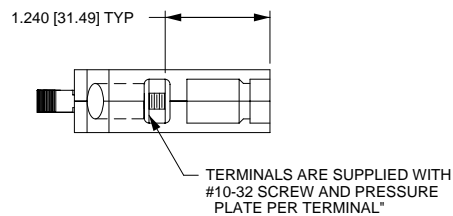


TABLE A TIGHTENING TORQUE SPECIFICATIONS	
THREAD SIZE	TORQUE
#6-32 [M3] HARDWARE	7-9 IN-LBS
#10-32 THD TERMINAL SCREW	15-20 IN-LBS

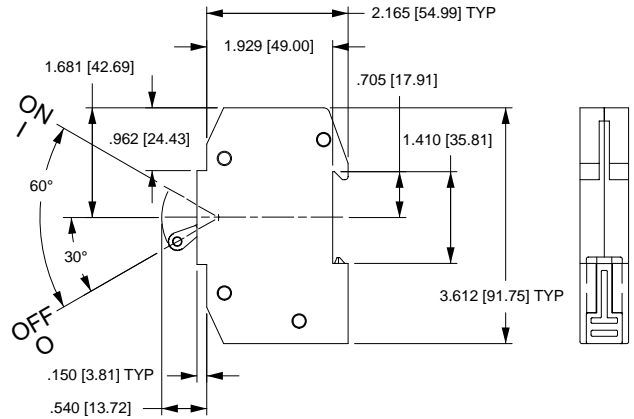
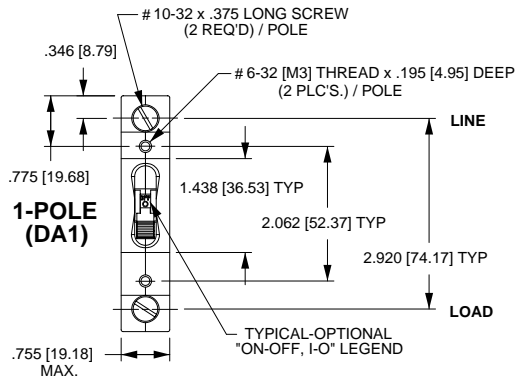


NOTES

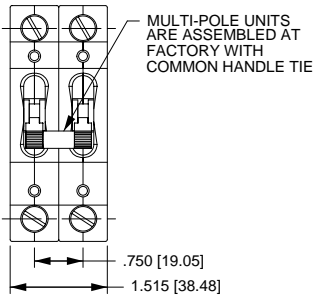
- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.010 [.25] unless otherwise specified.

Form and Fit Drawings

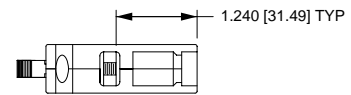
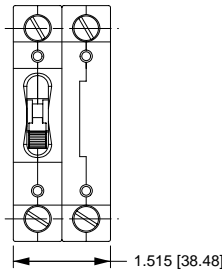
D-Series Handle



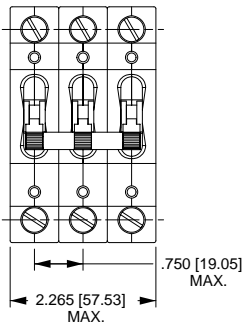
2-POLE (DA2)



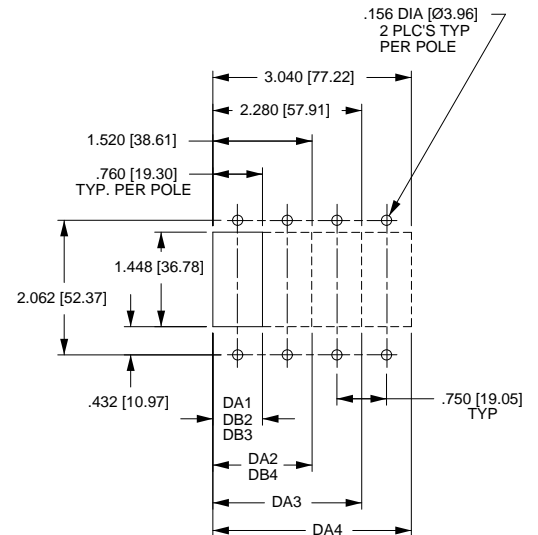
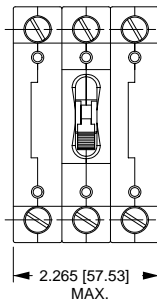
2-POLE (DB2)



3-POLE (DA3)



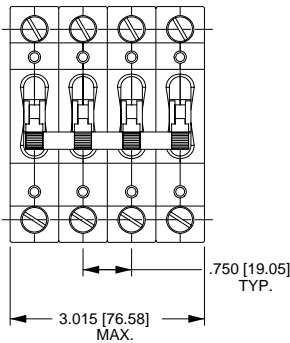
3-POLE (DB3)



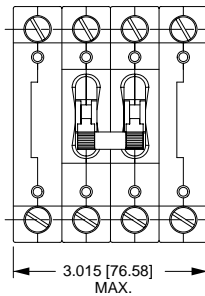
PANEL CUTOUT DETAIL

TOLERANCES ±.005 [0.12]

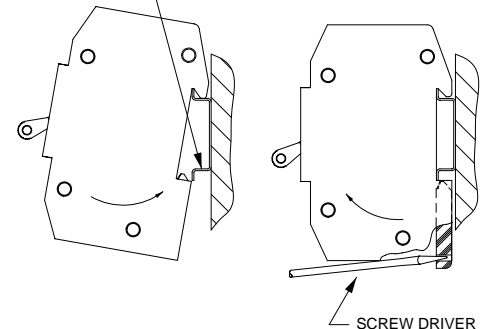
4-POLE (DA4)



4-POLE (DB4)



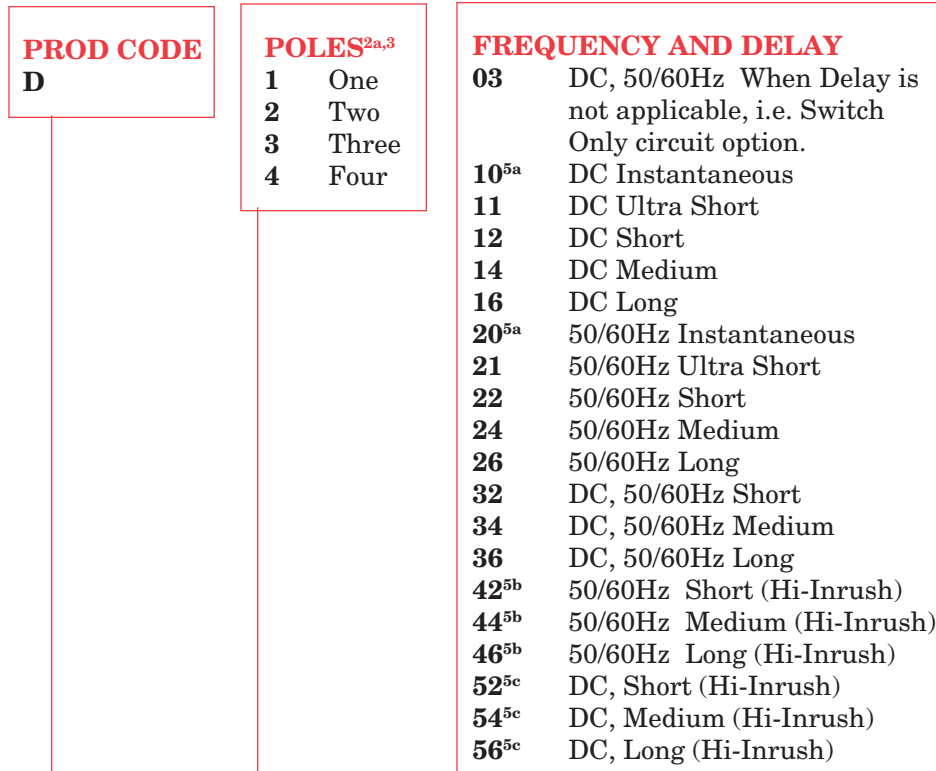
STANDARD 35mm SYMMETRICAL DIN RAIL (35 x 7.5 OR 35 x 15mm PER DIN EN50022).



NOTES

- All dimensions are in inches [millimeters].
- Tolerance ±.010 [.25] unless otherwise specified.

Ordering Scheme



D A 3 - B0 - 24 - 450

ACTUATOR^{1,2a}
HANDLE
A^{2b} Handle, one per pole
B^{2c} Handle, one per multipole unit
VISI-ROCKER^{2d}
C Indicate On, Vertical Legends
D Indicate On, Horizontal Legends
F Indicate Off, Vertical legends
G Indicate Off, Horizontal Legends
SINGLE COLOR ROCKER^{2d}
J Vertical Legends
K Horizontal Legends

CIRCUIT
A0⁴ Switch Only (No Coil)
B0 Series Trip (Current)
C0 Series Trip (Voltage)

COIL RATING⁶

S E L E C T O N E	CURRENT COIL	
	VOLTS	AMPERES
	210	0.100
	225	0.250
	250	0.500
	275	0.750
	410	1.000
	425	2.500
	450	5.000
	475	7.500
	610	10.000
	615	15.000
	620	20.000
	625	25.000
	630	30.000
	635	35.000
	640	40.000
	650	50.000

VOLTAGE COIL

	VOLTS	MIN. TRIP VOLTS
A06^{5a}	6 DC	5 DC
A12^{5a}	12 DC	10 DC
K20^{5a}	120 AC	65 AC
L40^{5a}	240 AC	130 AC

NOTES
 1 For description of rocker styles and legend positions refer to Figure B.
 2a. Handle actuated units available up to 4 poles. Rocker actuated units available up to 3 poles.
 2b. Handle Code A: Multipole units are assembled at factory with common handle tie.
 2c. Handle Code B: Handle locations are viewed from front of panel: 2 pole - left pole; 3 pole - center pole; 4 pole - two handles at center poles.
 2d. Multipole units have one rocker per unit. Rocker location as viewed from front panel: 2 pole - left pole; 3 pole - center pole.
 3. Standard multipole units have all poles identical except when specifying mixed poles (consult factory).
 4. ≤ 30 amps, select Current Rating Code 630; for 31-50 amps, select Current Rating Code 650.
 5a. Voltage coils not rated for continuous duty and are available only with Delay Codes 10 and 20 as one pole of a multipole unit utilizing "Series Trip with Remote Shutdown" circuitry.
 5b. Available to 50 amp maximum and Circuit Code BO only.
 5c. Available with Circuit Code BO only.
 6. For other voltage or current ratings consult factory.
 7. Standard handle colors are white and black.
 8a. Color shown is Visi & Legend color with remainder of rocker black.
 8b. DUAL = ON-OFF/I-O. Separate ON-OFF or I-O legends are also available, consult factory.
 9. ≥ 300V; 3 pole break 3Ø or 2 pole break 1Ø UL/CSA limited to 30 Full Load Amps max.
 10. Consult factory for VDE certified versions.

TERMINAL

- 1** Captured #10 Screw & Pressure Plate for Direct Wire or Fork Terminal Connection

MOUNTING/VOLTAGE

- 1** Threaded insert 6-32 x 0.195 inches deep/ <300 volts
- C⁹** Threaded insert 6-32 x 0.195 inches deep/ ≥300 volts
- 2** Threaded insert ISO M3 x 5mm deep/ <300 volts
- D⁹** Threaded insert ISO M3 x 5mm deep/ ≥300 volts

Figure B

ROCKER STYLE DESCRIPTIONS			
	INDICATE "ON"	INDICATE "OFF"	SINGLE COLOR
VERTICAL STYLE	<p>CODE "C"</p>	<p>CODE "F"</p>	<p>CODE "J"</p>
HORIZONTAL STYLE	<p>CODE "D"</p>	<p>CODE "G"</p>	<p>CODE "K"</p>

SHADED AREAS IDENTIFY INDICATE COLOR LOCATION



ACTUATOR COLOR

VISI-ROCKER¹

VISI-COLOR ^{8a}	LEGEND ^{8b}
A	White I-O (White)
B	White On-Off (White)
1	White Dual (White)
F	Red I-O (Red)
G	Red On-Off (Red)
3	Red Dual (Red)
H	Green I-O (Green)
J	Green On-Off (Green)
4	Green Dual (Green)

HANDLE⁷

COLOR	LEGEND
1	White Dual (Black)
2	Black Dual (White)
3	Red Dual (White)
6	Yellow Dual (Black)

SELECT ONE

SINGLE COLOR ROCKER¹

COLOR	LEGEND ^{8b}
C	Black I-O (White)
D	Black On-Off (White)
2	Black Dual (White)
F	Red I-O (White)
G	Red On-Off (White)
3	Red Dual (White)
H	Green I-O (White)
J	Green On-Off (White)
4	Green Dual (White)
K	Blue I-O (White)
L	Blue On-Off (White)
5	Blue Dual (White)
M	Yellow I-O (Black)
N	Yellow On-Off (Black)
6	Yellow Dual (Black)
P	Gray I-O (Black)
Q	Gray On-Off (Black)
7	Gray Dual (Black)
R	Orange I-O (Black)
S	Orange On-Off (Black)
8	Orange Dual (Black)

AGENCY APPROVAL

- A** W/O Approval
- C** UL Recognized
CSA Certified
- D¹⁰** UL Recognized
CSA Certified
VDE Certified