Product Type
Hydraulic/Magnetic Circuit Breaker

Product Series
E-Series

Description
E-Series PDF eLibrary

The E-Series hydraulic/magnetic circuit breakers are ideally suited for higher current and voltage applications. They offer front and back mounting, screw terminals, stud terminals and heavy duty box wire connectors for solid wire or a pressure plate connector for standard wire. A Power Selector device is also available.

E-Series 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. These circuit breakers are available with handle actuators, 1- 6 poles, .1-100 amps, up to 600VAC or 125VDC, with choice of time delays and actuator colors.

Series PDF eLibrary	• E-Series Cir. Breaker PDF (1.4 MB) • Cir. Breaker Time Delays for E-Series PDF (2.3 MB) • Cir. Breaker Accessories PDF (49.5 KB)
Certifications	UL recognized, UL Listed, CSA, VDE
Number of Poles	1-6 poles
Available Delays	Instant, Short, Medium, Long (motor loads), Hi-Inrush, AC or DC
Maximum Current and Voltage Ratings	UL Listed: .10-100A @ 240VAC, 125VDC UL Recognized: 0.02-100A @ 277VAC, 125VDC, 1 pole 0.02-100A @ 600VAC, 2 pole 1 phase, 3 pole 3 phase
Maximum Interrupting Capacity	5,000A @ 125VDC 5,000A @ 277VAC 10,000A @ 600VAC w/fuse back up
Auxiliary Switch Ratings	10.1A @ 250VAC 0.1A @ 125VAC (gold contacts) 5A @ 30VDC
Available Circuits	Series, Shunt, Relay, Switch Only, Series w/Remote Shutdown
Actuator Style	Handle (1 per pole)
Terminal Options	10-32 Studs 10-32 Screw 1/4-20 Studs 1/4-20 Screw Box Wire Connector Box Wire Connector w/pressure plate Combinations of above for line/load requirements

Mounting Method	Rear Mounted or Front Panel Mounted
Value Added	Custom actuator colors Non-standard current ratings and more

Ideally suited for higher amperage applications. Available with front and back mounting, screw terminals, stud terminals and heavy duty box wire connectors for solid wire or a pressure plate connector for stranded wire. Power selector device available, consult factory.

The E-Series is UL Listed and CSA Certified for Branch Circuit protection which does not require a fuse backup. It is also UL Recognized and CSA Certified as a Supplementary Protector and as a Manual Motor Controller.

1-6 poles, .1 - 100 amps, up to 600 VAC or 125 VDC, with choice of time delays and actuator colors.

Agency Certifications

UL Recognized

UL Standard 1077	Component Recognition Program as Protectors, Supplementary (Guide QVNU2, File E75596)
UL Standard 508	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

Electrical

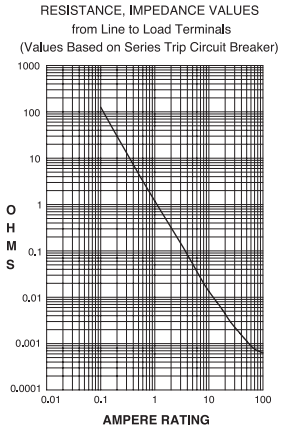
Table A: Lists UL Listed (489) & CSA Certified (C22.2 No. 5) configurations & performance capabilities as a Molded Case Circuit Breaker.

E-SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS

CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)
	MAX. RATING	FREQUENCY	PHASE	FULL LOAD AMPS	WITHOUT BACKUP FUSE
SERIES	80	DC	---	0.10 - 125	50,000
	125	DC	---	0.10 - 125	10,000
	120	50 / 60	1	0.10 - 125	10,000
	120 / 240	50 / 60	1	0.10 - 125	10,000
	240	50 / 60	1 & 3	0.10 - 100	5,000

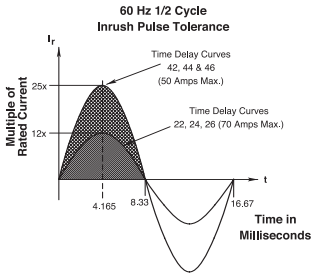
Electrical

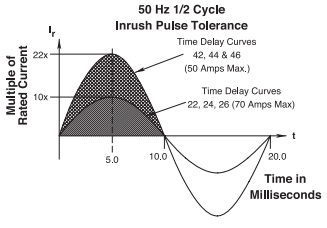
Maximum Voltage	600VAC 50/60 Hz, 125VDC (See Table A)
Current Ratings	Standard current coils: 0.100, 0.250, 0.500, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 50.0, 60.0, 70.0 & 100 Amp.
Auxiliary Switch Rating	SPDT; 10.1A 250VAC, 1.0A 65VDC; 0.5A 80VDC, 0.1A 125VAC (with gold contacts).
Insulation 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 - 125.0	± 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 and tested in accordance with requirements of specification MIL-PRF- 55629 and MIL-STD-202 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

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
Handle

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.D.T. 0.110 Q.C. Terminals
2	S.P.D.T. 0.110 Q.C. Terminals	**7**	S.P.D.T. 0.110 Q.C. Terminals (Gold Contacts)
3	S.P.D.T. 0.139 Solder Lug		
4	S.P.D.T. 0.110 Q.C. Terminals (Gold Contacts)	**8**	S.P.D.T. 0.187 Q.C. Terminals
		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	**92**[6]	DC, 50/60Hz Short, Hi-Inrush
26	50/60Hz Long	**94**[6]	DC, 50/60Hz Medium, Hi-Inrush
32	DC, 50/60Hz Short		
34	DC, 50/60Hz Medium	**96**[6]	DC, 50/60Hz Long, Hi-Inrush
36	DC, 50/60Hz Long		

7 CURRENT RATING (AMPERES)[7]

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	**912**	125.000
225	0.250	**425**	2.500	**712**	12.500		
230	0.300	**527**	2.750	**613**	13.000		

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)	100 A
FRONT CONNECTED (BACK MOUNTED ONLY)		**MAX. RATING**
3[9]	Box Wire Connector (Line & Load)	100 A
C[10]	Box Wire Connector w/ 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 w/ Pressure Plate (Load)	100 A
7	1/4-20 Screw (Line & Load)	100 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 w/ Pressure Plate (Load)	100 A

9 ACTUATOR COLOR & LEGEND[12]

Actuator Color :	***Marking:***		***Marking Color:***
Color:	ON-OFF	Dual	
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

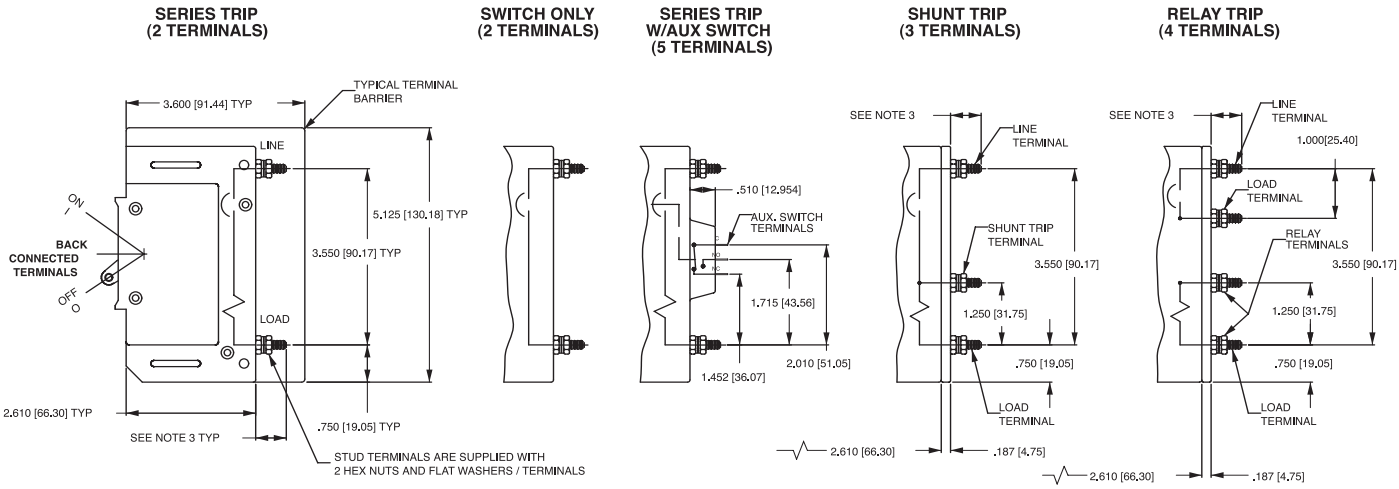
B	125 VDC, 100A
C[13]	120/240 VAC, 100A
D	240 VAC, 100A

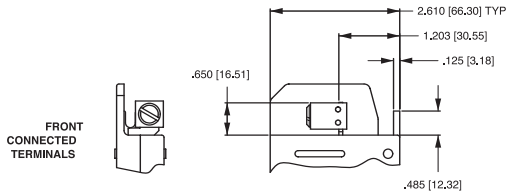
12 AGENCY APPROVAL

C	UL 489 Listed & CSA Certified
F	UL 489 Listed, CSA Certified, & VDE Certified

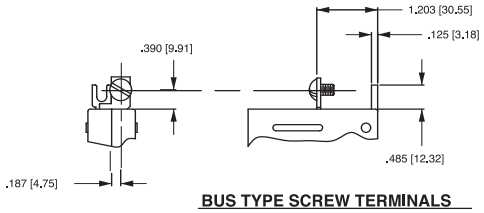
NOTES

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 w/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.

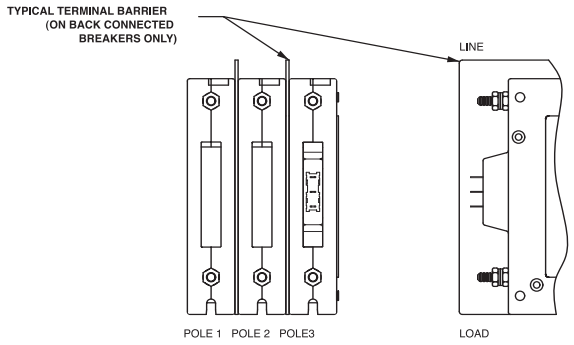




BOX TYPE WIRE CONNECTORS



BUS TYPE SCREW TERMINALS



MULTI-POLE IDENTIFICATION SCHEME

AUXILIARY SWITCH TERMINALS

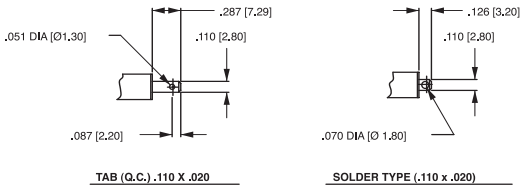
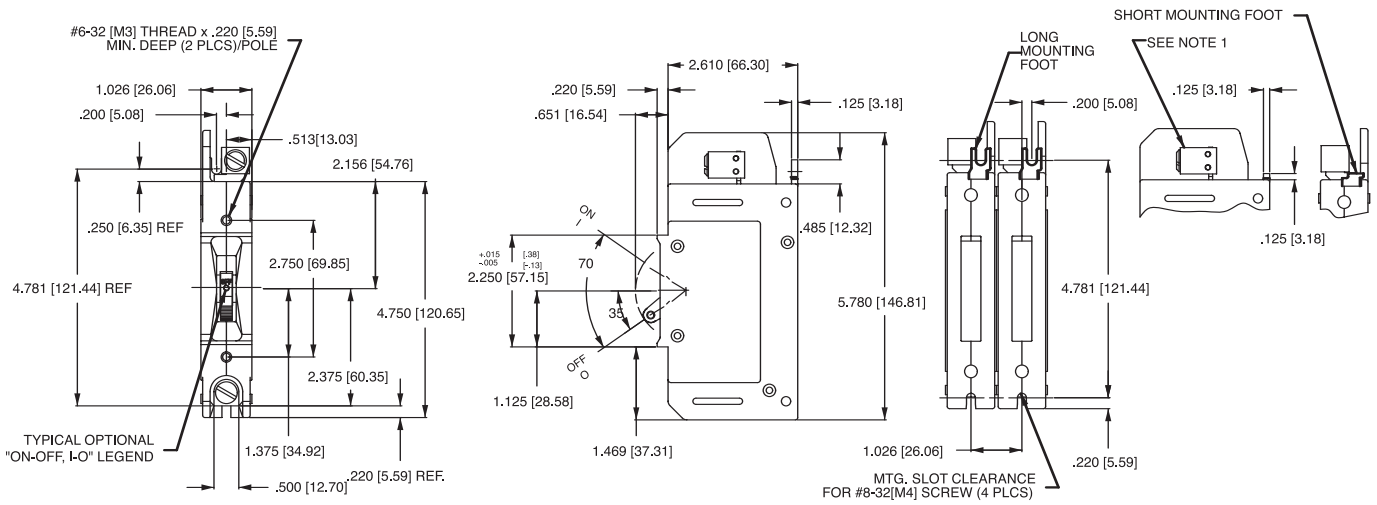


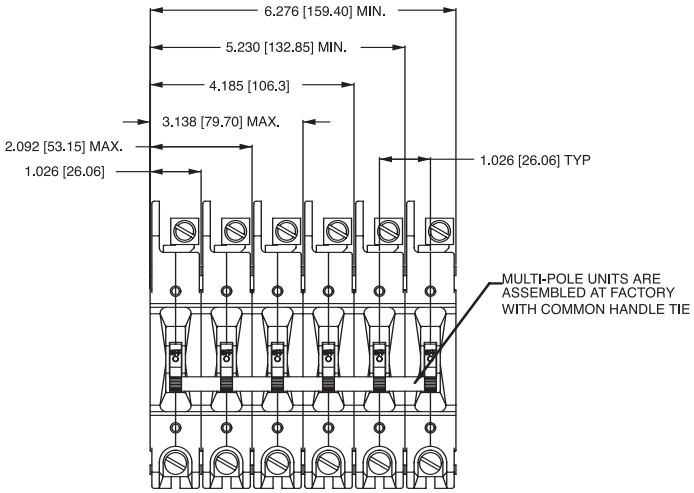
TABLE A
TIGHTENING TORQUE SPECIFICATIONS

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]

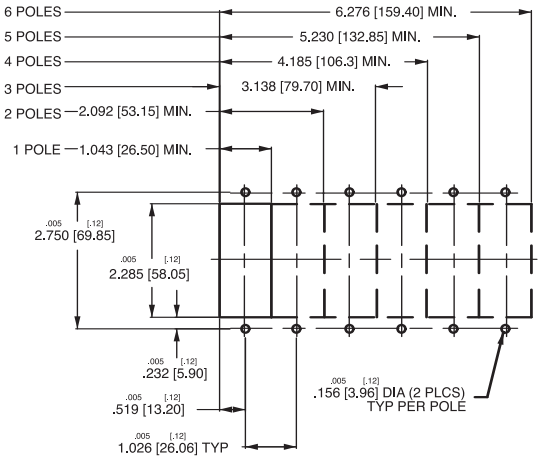
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.020 [.51] unless otherwise specified.
3 0-50 amps: 10-32 & M5 Studs .625$^{\pm.062}$/15.88$^{\pm1.574}$ long.
51-120 amps: 1/4-20 & M6 Studs .750$^{\pm.062}$/19.05$^{\pm1.574}$ long.

MOUNTING INSERTS:





PANEL CUTOUT DETAIL



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.