

RAILWAY HYDRAULIC MAGNETIC CIRCUIT BREAKERS

ER-Series



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

Features:

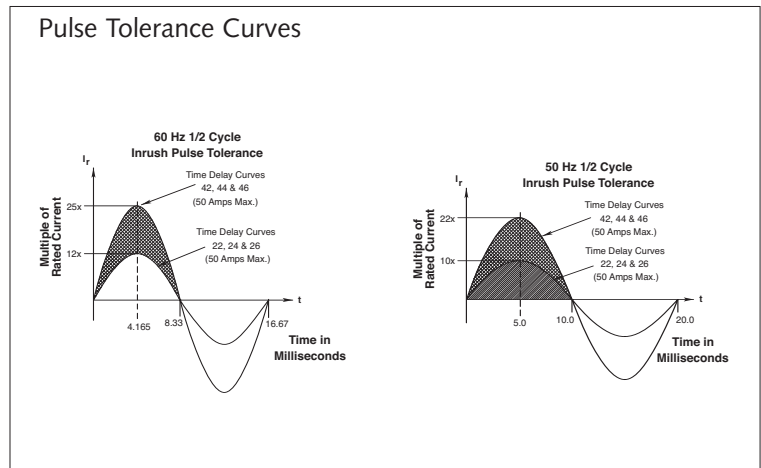
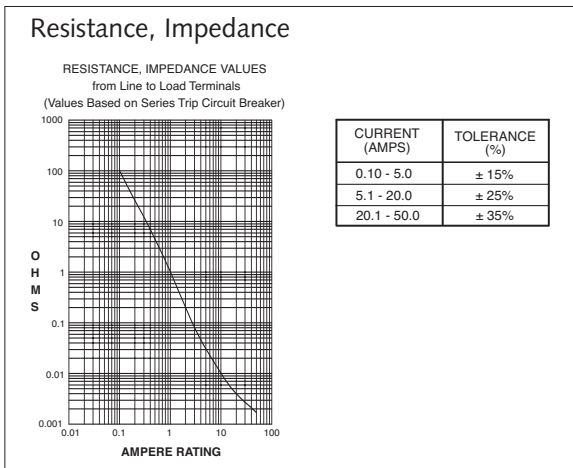
- Blue housing
- 1-6 poles,
- 0.1 - 100 amps,
up to 600 VAC (on request)
or 125 VDC
- Precise, temperature independent,
operation
- Choice of time delays, terminals and
actuator colors.

Our Circuit Breakers are designed according to railway regulations:

- IEC 60077 - 1/2/3
- NF F62-001 - 1/2/3
- EN 45545-2 & NF F16-101/102
(fire and toxic regulations)

Electrical

Maximum Voltage	600VAC 50/60 Hz (on request), 125VDC
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: 100 Megohms at 500 VDC
Dielectric Strength	2200 V 50/60 Hz for one minute between all electrically isolated terminals. ER-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



Mechanical

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

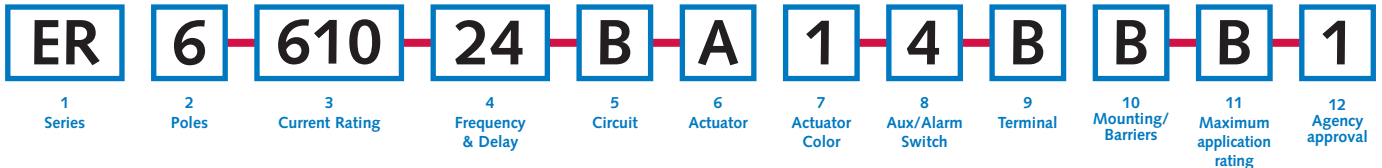
Physical

Number of Poles	1 - 6 Poles
Mounting	A 7,62 mm (3") minimum spacing must be provided between the circuit breaker arc venting area on back connected ER-Series circuit breakers and grounded obstructions. ER-Series circuit breakers must be mounted on a vertical surface.
Connectors, Box Type	Front connected ER-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 - Blue; Actuator - White with dual legends.

Environmental

Shock	Withstands 100 Gs, 6ms, sawtooth while carrying rated current.
Vibration	Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz.
Moisture Resistance	Ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.
Salt Spray	90-95% RH @ 5% NaCl Solution, 96 hrs.
Thermal Shock	Five cycles @ -55°C to +25°C to +85°C to +25°C.
Operating Temperature	-40° C to +85° C

Ordering Scheme - ER-Series



1 SERIES	
ER	

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

3 CURRENT RATING (AMPERES)					
210	0.100	295	0.950	470	7.000
215	0.150	410	1.000	475	7.500
220	0.200	512	1.250	480	8.000
225	0.250	415	1.500	485	8.500
230	0.300	517	1.750	490	9.000
235	0.350	420	2.000	495	9.500
240	0.400	522	2.250	610	10.000
245	0.450	425	2.500	710	10.500
250	0.500	527	2.750	611	11.000
255	0.550	430	3.000	711	11.500
260	0.600	435	3.500	612	12.000
265	0.650	440	4.000	712	12.500
270	0.700	445	4.500	613	13.000
275	0.750	450	5.000	614	14.000
280	0.800	455	5.500	615	15.000
285	0.850	460	6.000	616	16.000
290	0.900	465	6.500	617	17.000

OR VOLTAGE COIL (MIN. TRIP RATING, VOLTS)					
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		

* Other values on request

4 FREQUENCY & DELAY					
03 ³	DC 50/60Hz, Switch Only	32	DC, 50/60Hz Short		
10 ⁵	DC Instantaneous	34	DC, 50/60Hz Medium		
12	DC Short	36	DC, 50/60Hz Long		
14	DC Medium	62	50/60Hz Short, Hi-Inrush		
16	DC Long	64	50/60Hz Medium, Hi-Inrush		
20 ⁹	50/60Hz Instantaneous	66	50/60Hz Long, Hi-Inrush		
22	50/60Hz Short	72	DC, Short, Hi-Inrush		
24	50/60Hz Medium	74	DC, Medium, Hi-Inrush		
26	50/60Hz Long	76	DC, Long, Hi-Inrush		
30	DC, 50/60Hz Instantaneous				

5 CIRCUIT ²			
A ³	Switch Only (No Coil)	C	Series Trip (Voltage)
B	Series Trip (Current)	D	Shunt Trip (Current)

6 ACTUATOR	
A	Handle, one per pole

7 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

8 AUXILIARY/ALARM SWITCH ⁴			
0	w/o Aux Switch	4	S.P.D.T., 0.110 Q.C. Term.
2	S.P.D.T., 0.110 Q.C. Term.		(Gold Contacts)
3	S.P.D.T., 0.139 Solder Lug		

9 TERMINAL	
BACK CONNECTED (FRONT MOUNTED ONLY)	
1 ⁹	10-32 Stud (All Terminals)
2 ⁹	1/4-20 Stud (All Terminals)
A ⁹	M5 Stud (Line & Load)
B ⁹	M6 Stud (Line & Load)
FRONT CONNECTED (BACK MOUNTED ONLY)	
3 ¹⁰	Box Wire Connector (Line & Load)
C ¹¹	Box Wire Connector w/ Pressure Plate (Line & Load)
4	10-32 Screw (Line & Load)
D	M5 Screw (Line & Load)
5	10-32 "Bus-Type" Screw (Line), 10-32 Screw (Load)
E	M5 "Bus-Type" Screw (Line), 10-32 Screw (Load)
6 ¹⁰	10-32 "Bus-Type" Screw (Line), Box Wire Connector (Load)
F ¹¹	10-32 "Bus-Type" Screw (Line), Box Wire Connector w/ Pressure Plate (Load)
7	1/4-20 Screw (Line & Load)
G	M6 Screw (Line & Load)
8	1/4-20 "Bus-Type" Screw (Line), 1/4-20 Screw (Load)
H	M6 "Bus-Type" Screw (Line), M6 Screw (Load)
9 ¹⁰	1/4-20 "Bus-Type" Screw (Line), Box Wire Connector (Load)
J ¹¹	1/4-20 "Bus-Type" Screw (Line), Box Wire Connector w/ Pressure Plate (Load)

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			
B	125 VDC, 120 A	T	125 VDC/240 VAC, 100 A
D	240 VAC, 100 A	W ¹⁶	125 VDC/415 VAC, 100 A
J ¹⁶	415 VAC, 100 A		

12 AGENCY APPROVAL	
1 ¹⁹	UL-Recognized, CSA, TUV to EN60077 and NF F62-001

- NOTES**
- Standard multi-pole units identical poles except when specifying auxiliary switch - (see Note 4). For mixed ratings, consult factory.
 - Switch Only & Series Trip construction available w/either front or back connected terminals. Shunt construction available w/back connected terminals, (Terminal Codes 1 & 2) only.
 - 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 only approved if tied to a protected pole.
 - 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.
 - Voltage Trip Coils are not rated for continuous duty. Available only with Frequency & Delay Codes 10 & 20. Series Trip construction with a voltage coil is only approved if tied to a protected pole.
 - 125 A rating (Code 912) available as a Switch Only (Circuit Code A), rated 125 VDC (Code B).
 - An Anti-Flash Over Barrier is supplied between poles on multi-pole units with 10-32 (Terminal Code 1) or 1/4-20 (Code 2), M5 (Code A), and M6 (Code B) terminals.
 - Box Wire Connector will accept #14 through 0 AWG. copper wire or #12 through 0 AWG. aluminum wire.
 - Box Wire Connector with Pressure Plate for stranded wire, consult factory for details.
 - Terminal Codes A,B,D,E,G & H are not VDE approved.
 - VDE approvals require Dual (I-O, ON-OFF) or I-O markings on all handles.
 - 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.
 - 415 VAC ratings require 3 or 4 pole break 3Ø and 2 pole break 1Ø.
 - Preliminary test results showed that the breakers comply to the EN60077 and NF F62-001. Certificates for UL-Recognized and CSA are available on request. For the EN60077 and NF F62-001 the certificates will be available in short notice.



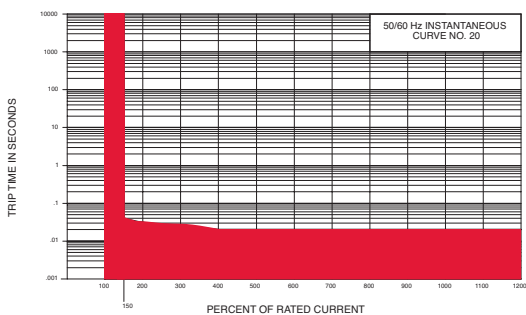
Time Delay Values - ER-Series

TRIP TIME (SECONDS)	PERCENT OF RATED CURRENT										
	Delay	100%	125%	135%	150%	200%	400%	600%	800%	1000%	1200%
10	No Trip	May Trip	---	.001 - .038	.001 - .032	.001 - .021	.001 - .019	.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	No Trip	May Trip	.450 - 5.20	.330 - 2.30	.150 - .900	.033 - .170	.016 - .080	.009 - .051	.008 - .040	.008 - .040	
34	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	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	

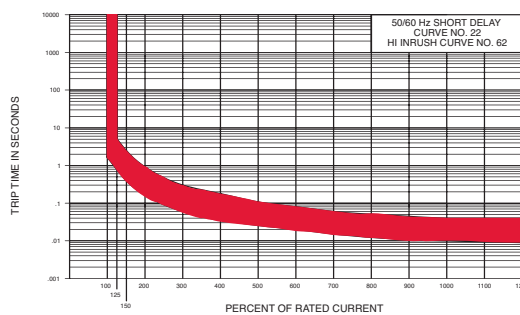
NOTES:
 Delay Curves 12,14, 22, 24, 32, 34, 62, 64, 72, 74: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
 Delay Curves 10, 20, 30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown 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.
 All Curves: Curve data shown represents breaker response at ambient temperature of 25°C (77°F) with no preloading. Breakers are mounted in standard wall-mount position.
 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

AC

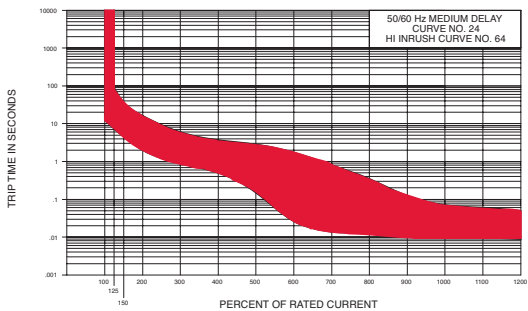
Instantaneous



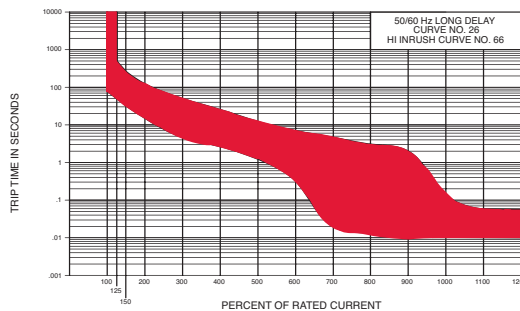
Short



Medium



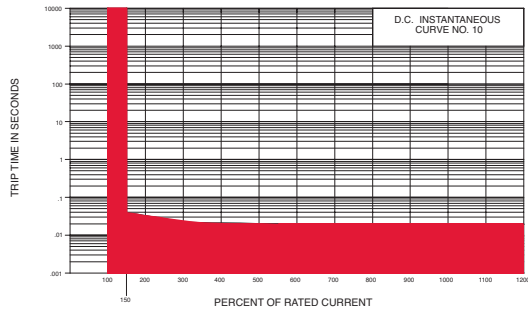
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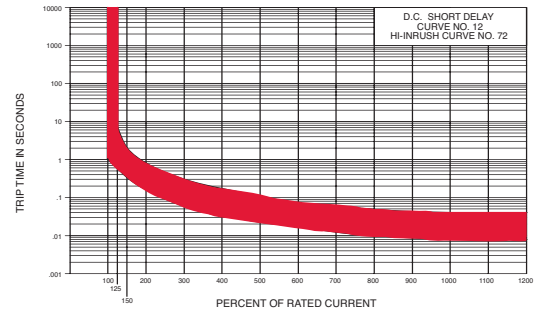
Time Delay Values - ER-Series

DC

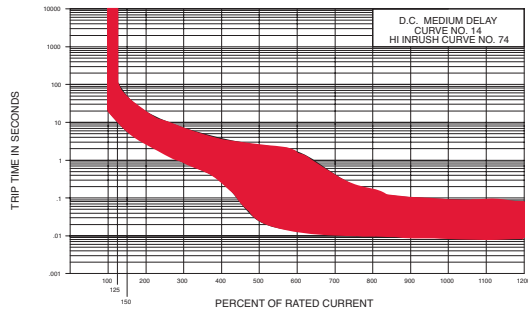
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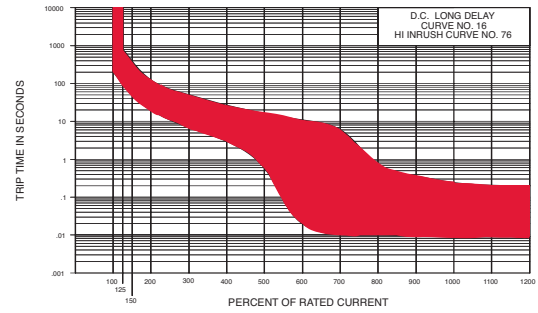
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Medium

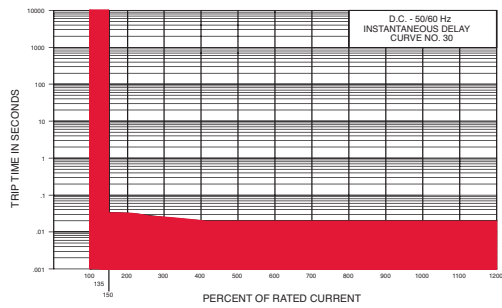


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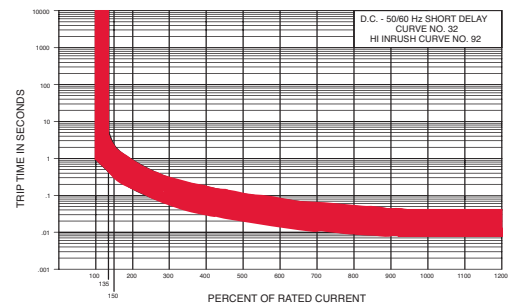


AC/DC

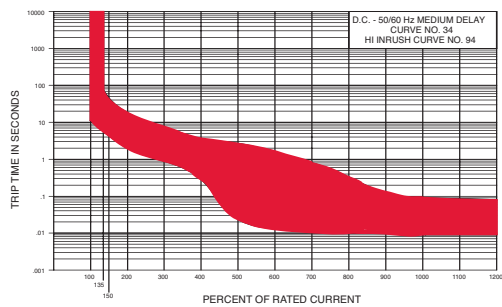
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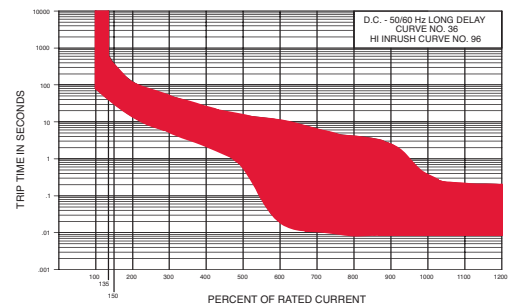
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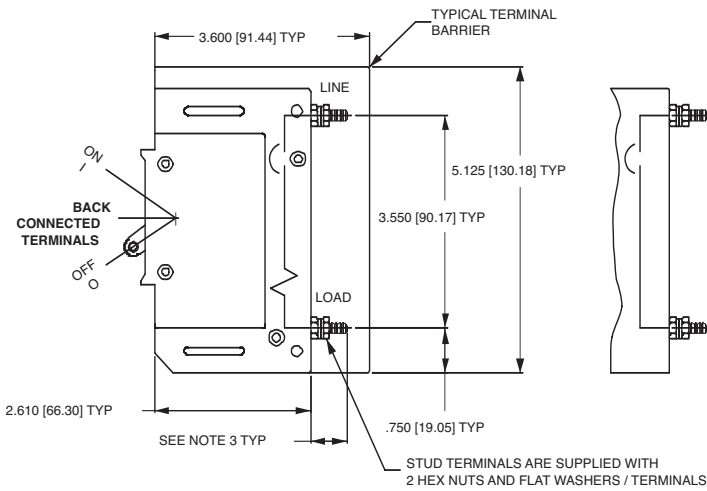
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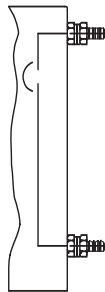
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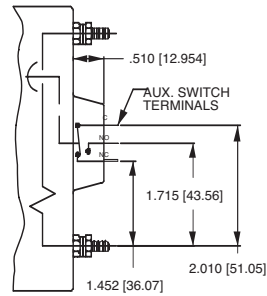
SERIES TRIP (2 TERMINALS)



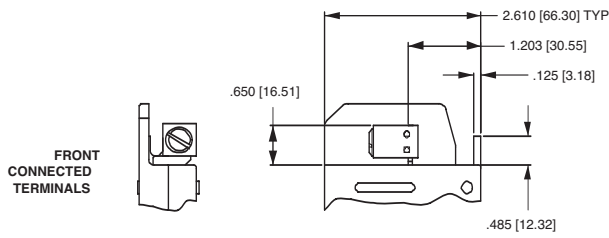
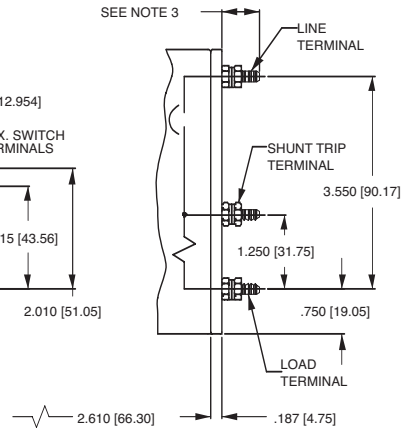
SWITCH ONLY (2 TERMINALS)



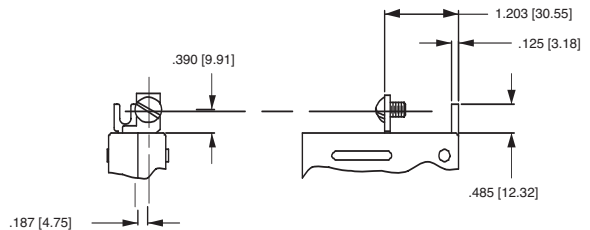
SERIES TRIP W/AUX SWITCH (5 TERMINALS)



SHUNT TRIP (3 TERMINALS)

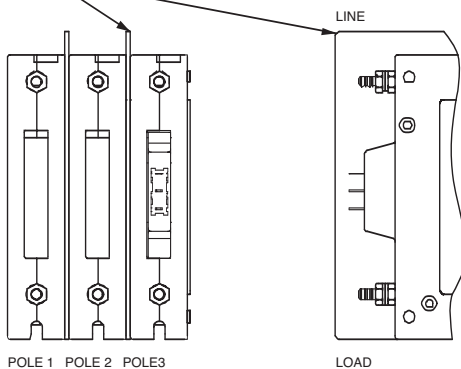


BOX TYPE WIRE CONNECTORS



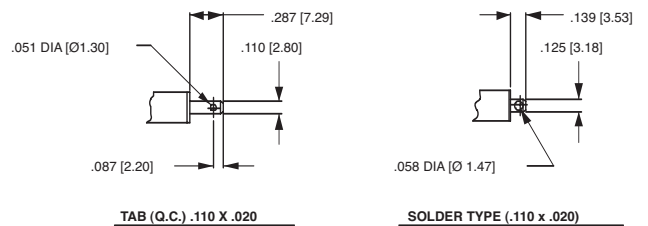
BUS TYPE SCREW TERMINALS

TYPICAL TERMINAL BARRIER
(ON BACK CONNECTED
BREAKERS ONLY)



MULTI-POLE IDENTIFICATION SCHEME

AUXILIARY SWITCH TERMINALS



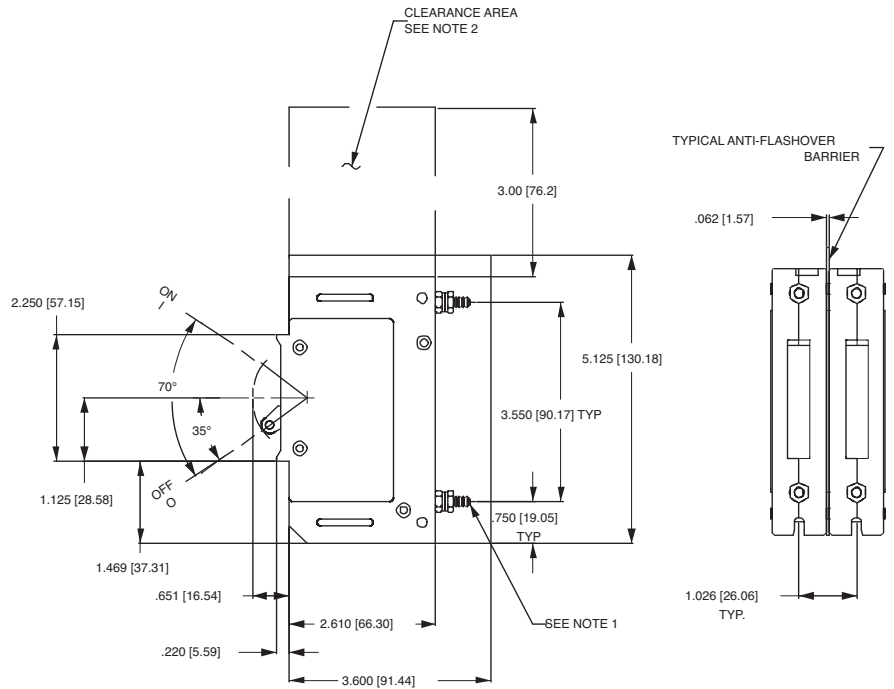
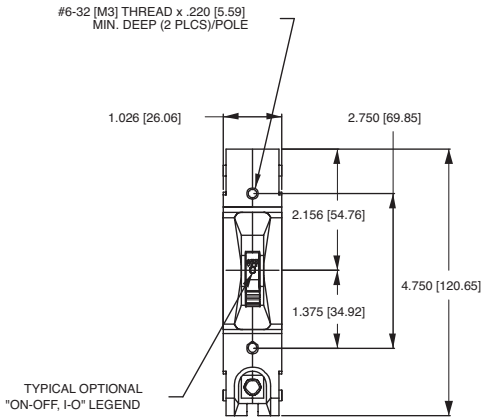
TAB (Q.C.) .110 X .020

SOLDER TYPE (.110 x .020)

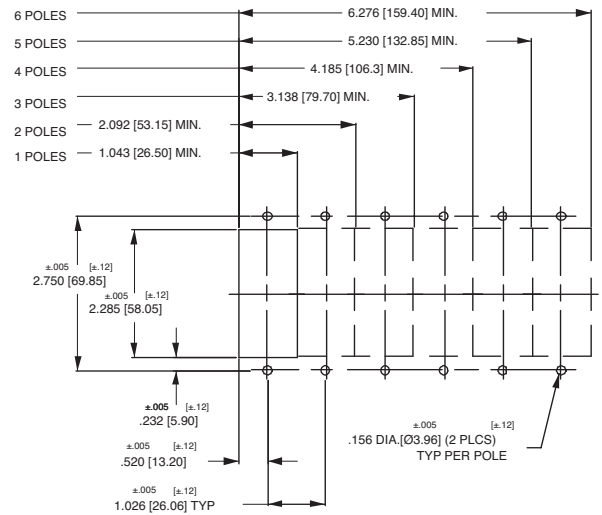
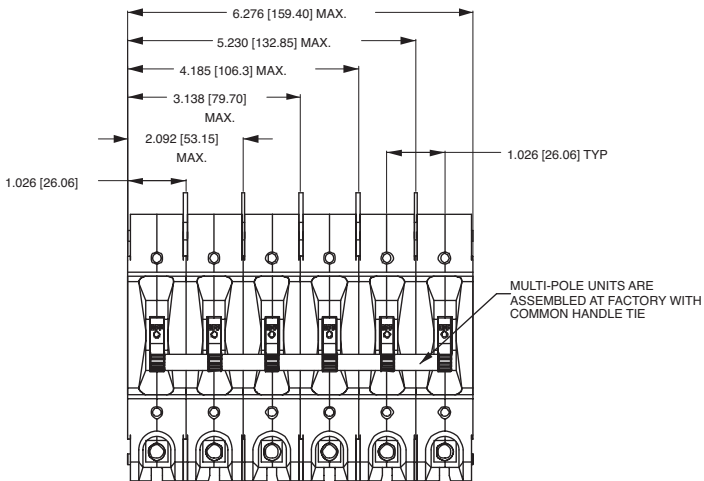
TABLE A TIGHTENING TORQUE SPECIFICATIONS		
THREAD SIZE TERMINAL TYPE	WIRE SIZE	TORQUE
#6-32 (M3) HARDWARE	—	7.9 IN-LBS (0.8-1.0 N·M)
#10-32 THD TERMINAL SCREW	ALL	15-20 IN-LBS (1.7-2.3 N·M)
1/4-20 THD TERMINAL SCREW	ALL	20-25 IN-LBS (2.3-3.0 N·M)
#10-32 STUDS	ALL	15-20 IN-LBS (1.7-2.3 N·M)
1/4-20 STUDS	ALL	20-25 IN-LBS (2.3-3.0 N·M)
BOX WIRE CONNECTOR	14-10 AWG	35 IN-LBS (4.0 N·M)
	8 AWG	42 IN-LBS (4.8 N·M)
	6-4 AWG	45 IN-LBS (5.1 N·M)
	3-1/0 AWG	50 IN-LBS (5.7 N·M)

All dimensions in inches and [mm]

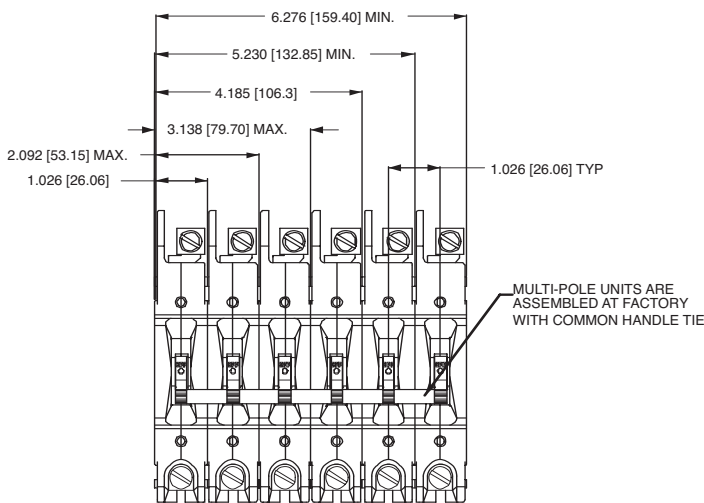
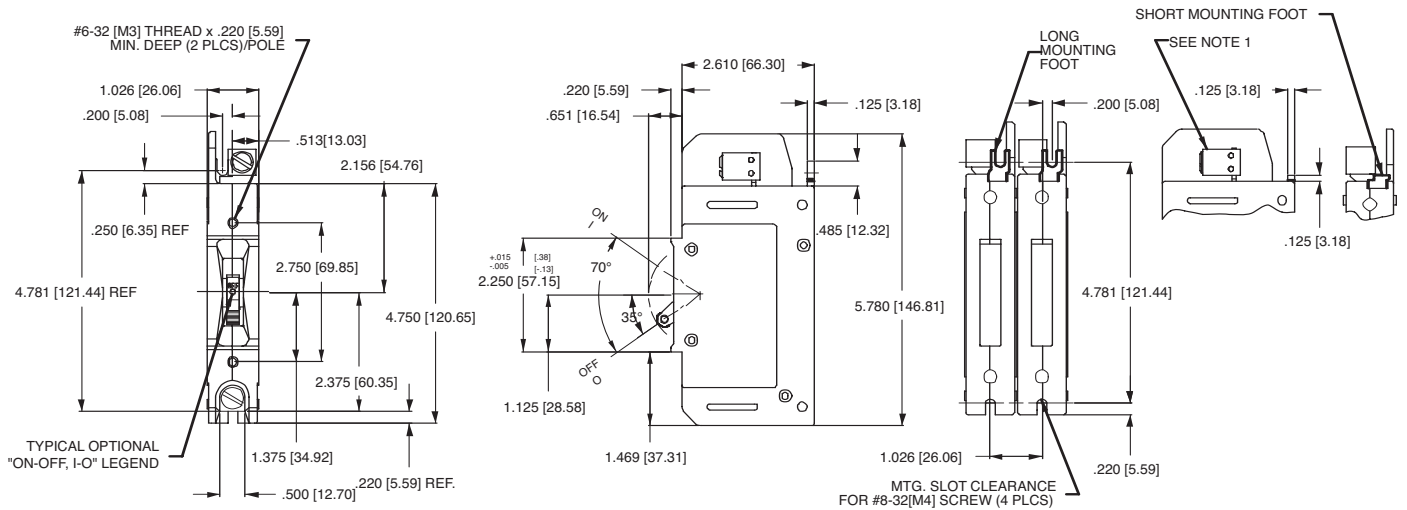
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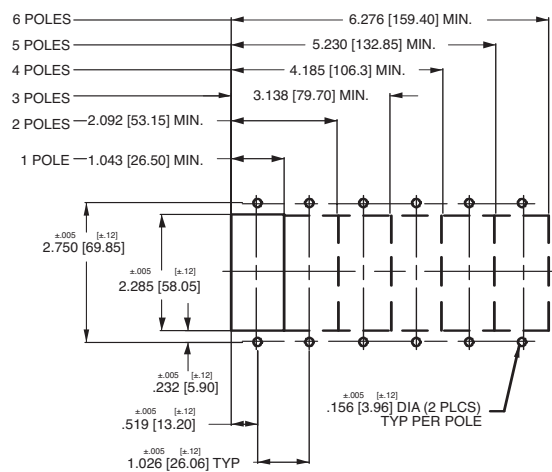
PANEL CUTOUT DETAIL



MOUNTING INSERTS:



PANEL CUTOUT DETAIL



All dimensions in inches and [mm]

MORE INFORMATION?

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Contact person: Function:

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ZIP-code: Place:

Telephone number: Fax number:

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Please send more information for:

- Relays** (instantaneous relays, measuring and monitoring relays and electronic time delay relays)
- Circuit protection** (hydraulic/magnetic circuit breakers, hydraulic/magnetic ground fault breakers and hydraulic/magnetic remote operated breakers)
- High voltage and current protection relays** (overcurrent, undercurrent, differential current, overvoltage, undervoltage, differential voltage and frequency measuring & monitoring relays)
- Electrical control solutions** (Form, fit and function electrical control units for retrofit/refurbishment applications and new built applications)
- Panel indicators** (analogue indicators for speed, voltage, current, power etc.)

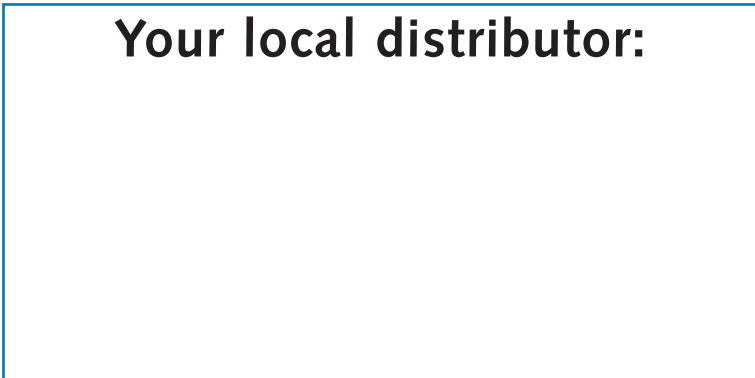
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Proven Reliability

Australian Distributor



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Fax: +61 3 8544 1201
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Web: www.rmspl.com.au