

H-Series HYDRAULIC/MAGNETIC CIRCUIT BREAKER



Carling Technologies is pleased to announce the latest addition to our product portfolio, the H-Series hydraulic/magnetic circuit breaker.

Features

- Provides reliable circuit protection in a low cost compact package
- Meets IEC spacing, making it an ideal choice for your international market applications
- Designed to meet UL489A, UL1077, CSA, C22.2 and EN60934
- Contains a "trip-free" mechanism - the contacts will open when a fault condition occurs, even if the handle is held in the ON position

Product Bulletin #131

June 2009

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Electrical

Maximum Voltage	250VAC 50/60Hz 80 VDC
Current Rating	Standard current coils: 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 32.0
Auxiliary Switch Rating	SPDT: 10.1A-250VAC, 1.0A-65VDC/0.5A-80VDC, 0.1A-125VAC (with gold contacts)

Mechanical

Endurance	10,000 ON-OFF operations @ 6 per minute; with rated current & voltage
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Physical

Number of Poles	1-3
Weight	Approx. 48 grams/pole (1.7 oz)
Internal Circuit Config.	Series and Switch Only (with or without auxiliary switch)

Agency Approvals

UL Listed to UL489A - Communications Equipment (Guide DITT, pending)

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

CCC certified, pending

CSA Accepted Circuit Breaker, CSA standard C22.2 No. 235

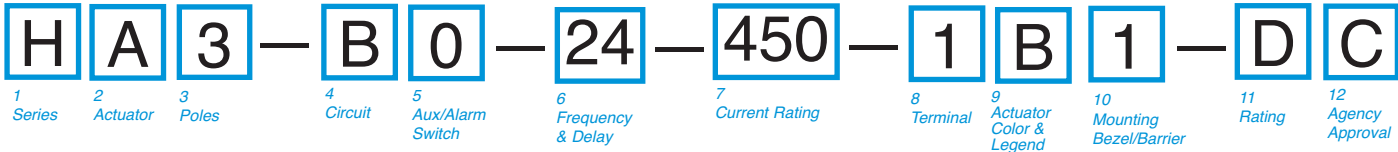
TUV certified to EN60934, pending

Typical Protector Resistance/Impedance Chart

DCR and Impedance values are based on measurements by the voltmeter ammeter method. Rated current is applied for one hour and at a voltage not less than 20 volts. Ambient temperature: 25 °C; Tolerance: Below 10 amps +/- 25%; Above 10 amps +/-35%

Current rating in amperes	Series	
	DC-Ohms	50/60Hz-Ohms
1	0.85	0.87
2.5	0.13	0.15
5	0.035	0.036
7.5	0.018	0.019
10	0.01	0.011
15	0.006	0.0061
20	0.005	0.0051
25	0.003	0.0035
30	0.0025	0.0026

UL Recognized



1 SERIES

H

2 ACTUATOR¹

A Handle, one per pole **B** Handle, one per unit

3 POLES²

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

4 CIRCUIT

A Switch Only (no coil) **B** Series Trip (Current)

5 AUXILIARY SWITCH

0 w/o Aux Switch **2³** 0.110 Solder Lug
1³ 0.110 Q.C. terminal **3³** 0.110 Q.C. term w/ gold contacts

6 FREQUENCY & DELAY

03³ DC 50/60Hz, Switch Only	20 50/60Hz Instantaneous
10 DC Instantaneous	21 50/60Hz Ultra Short
11 DC Ultra Short	22 50/60Hz Short
12 DC Short	24 50/60Hz Medium
14 DC Medium	26 50/60Hz Long
16 DC Long	

7 CURRENT RATING (AMPERES)⁴

410 1.000	440 4.000	490 9.000	615 15.000
512 1.250	445 4.500	495 9.500	616 16.000
415 1.500	450 5.000	610 10.000	617 17.000
517 1.750	455 5.500	710 10.500	618 18.000
420 2.000	460 6.000	611 11.000	620 20.000
522 2.250	465 6.500	711 11.500	622 22.000
425 2.500	470 7.000	612 12.000	624 24.000
527 2.750	475 7.500	712 12.500	625 25.000
430 3.000	480 8.000	613 13.000	630 30.000
435 3.500	485 8.500	614 14.000	632 32.000



8 TERMINAL

1 Push ON 0.250 Tab (Q.C.)	A Screw M4 w/upturned lugs
2 Screw 8-32 w/upturned lugs	B Screw M4 (bus type)
3 Screw 8-32 (bus type)	

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	BEZEL ⁵
	Threaded Insert		
1	6-32 x 0.195 inches	no	domed 
A	6-32 X 0.195 inches	yes	domed
2	ISO M3 x 5mm	no	domed
B	ISO M3 x 5mm	yes	domed
3	6-32 X 0.195 inches	no	flat 
C	6-32 X 0.195 inches	yes	flat
4	ISO M3 x 5mm	no	flat
D	ISO M3 x 5mm	yes	flat

11 MAX. APPLICATION RATING

A 65DC **D** 240AC **M** 80DC⁶

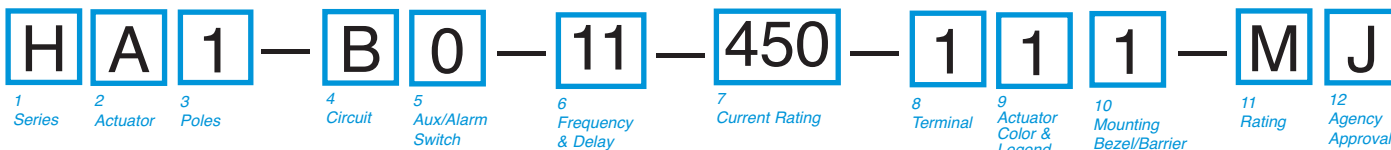
12 AGENCY APPROVAL

A Without approvals
C UL Recognized, CSA Accepted, CCC Certified (CCC pending)
E UL Recognized, CSA Accepted, TUV Certified, CCC Certified (TUV, CCC pending)

Notes:

- Actuator Option A: handle tie pin, spacer & retainers provided unassembled on multi-pole units.
Actuator Option B: Handle location as viewed from front of panel: 2 pole: left pole; 3 pole: center pole
- Standard multipole units have all poles identical, except when specifying auxiliary switch
- Auxiliary switch available on Series Trip and Switch Only circuits to 32A. On multipole units, only one aux. switch is normally supplied, mounted in extreme right pole.
- For other current ratings, consult factory.
- See dimensional specs for breaker bezel style details.
- 26-32A polarity sensitive, only available as 1 pole unit.

UL489A Listed



1 SERIES
H

2 ACTUATOR¹
A Handle, one per pole B Handle, one per unit

3 POLES²
1 One 2 Two 3 Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY SWITCH
0 w/o Aux Switch 2³ 0.110 Solder Lug
1³ 0.110 Q.C. terminal 3³ 0.110 Q.C. term w/ gold contacts

6 FREQUENCY & DELAY
11 DC Ultra Short 14 DC Medium
12 DC Short 16 DC Long

7 CURRENT RATING (AMPERES)⁴

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420	2.000	460	6.000	611	11.000	620	20.000
522	2.250	465	6.500	711	11.500	622	22.000
425	2.500	470	7.000	612	12.000	624	24.000
527	2.750	475	7.500	712	12.500	625	25.000
430	3.000	480	8.000	613	13.000	630	30.000
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8 TERMINAL
1 Push ON 0.250 Tab (Q.C.) A Screw M4 w/upturned lugs
2 Screw 8-32 w/upturned lugs B Screw M4 (bus type)
3 Screw 8-32 (bus type)

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

10 MOUNTING/BARRIERS

	MOUNTING STYLE <i>Threaded Insert</i>	BARRIERS	BEZEL ⁵
1	6-32 x 0.195 inches	no	domed
A	6-32 X 0.195 inches	yes	domed
2	ISO M3 x 5mm	no	domed
B	ISO M3 x 5mm	yes	domed
3	6-32 X 0.195 inches	no	flat
C	6-32 X 0.195 inches	yes	flat
4	ISO M3 x 5mm	no	flat
D	ISO M3 x 5mm	yes	flat

11 MAX. APPLICATION RATING
A 65DC M 80DC⁶

12 AGENCY APPROVAL
T UL489A Listed, CSA Accepted, CCC Certified (CCC pending)
J UL489A Listed, CSA Accepted, TUV Certified, CCC Certified (TUV, CCC pending)

Notes:

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- For other current ratings, consult factory.
- See dimensional specs for breaker bezel style details.
- 26-32A polarity sensitive, only available as 1 pole unit.

H-Series – Time Delay Values

TRIP TIME (SECONDS)	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	
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	

NOTES:

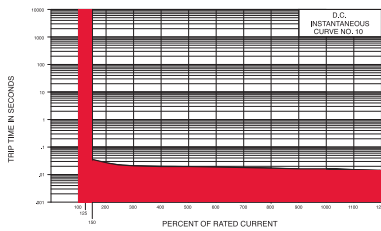
Delay Curves 11,12,14,16,21,22,24,26: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.

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.

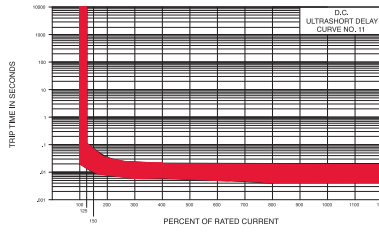
All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.

The minimum inrush pulse tolerance handling capability is 12 times the rated current. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse.

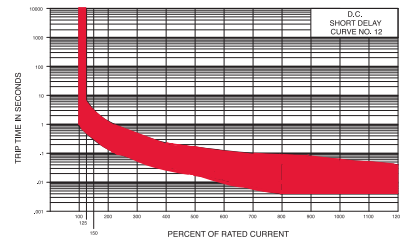
Instantaneous - DC 10



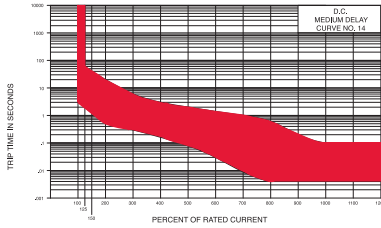
Ultrashort - DC 11



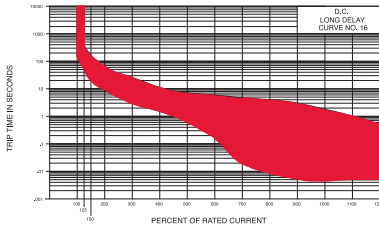
Short - DC 12



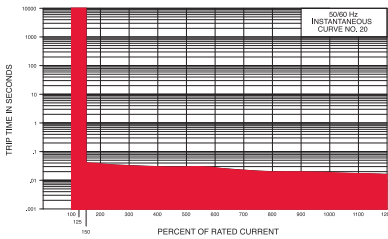
Medium - DC 14



Long - DC 16



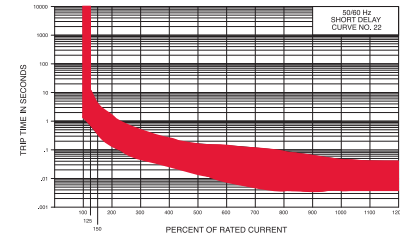
Instantaneous - AC 20



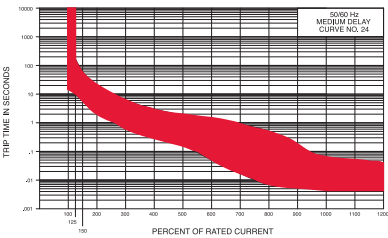
Ultrashort - AC 21



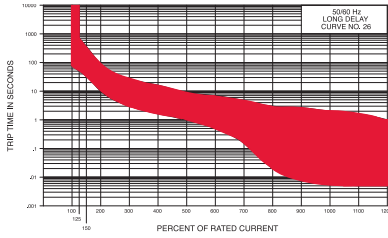
Short - AC 22



Medium - AC 24



Long - AC 26



Electrical Tables

Table A: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment under UL489A.

H - SERIES - UL489A LISTED FOR TELECOMMUNICATIONS EQUIPMENT						
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT	MINIMUM POLES	INTERRUPTING CAPACITY(AMPS) WITHOUT BACKUP FUSE
	MAX RATING	FREQ.	PHASE	GENERAL PURPOSE AMPS		
SERIES	65	DC	--	1 - 32	1	2000
	80	DC	--	1 - 25	1	1000
	80 ¹	DC	--	26 - 32	1	1000

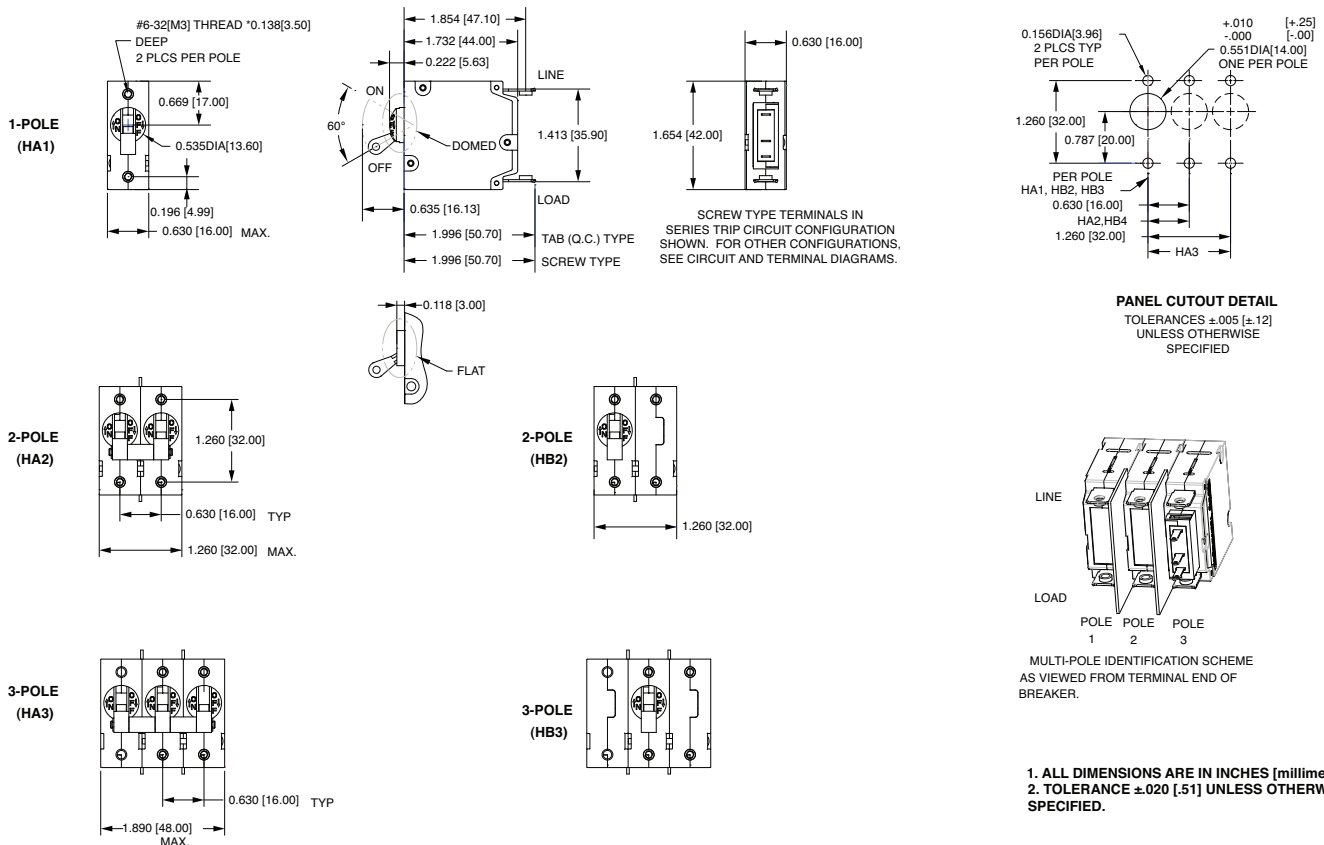
1 - Polarity Sensitive

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

H SERIES - COMPONENT SUPPLEMENTARY PROTECTOR							
CIRCUIT CONFIGURATION	VOLTAGE			CURRENT	MINIMUM POLES	SHORT CIRCUIT CAPACITY (AMPS)	
	MAX RATING	FREQ.	PHASE	FULL LOAD		UL/CSA WITHOUT BACKUP FUSE	TUV WITHOUT BACKUP FUSE
SERIES	65	DC	--	1 - 32	1	3000	1500(PC1)
	80	DC	--	1 - 25	1	1000	1000(PC1)
	80 ¹	DC	--	26 - 32	1	1000	1000(PC1)
	250	50/60	1	1 - 32	1	1500	1000(PC1)
	250	50/60	3	1 - 32	3	1500	1000(PC1)

1 - Polarity Sensitive

Dimensional Specifications: in. [mm]



Circuit & Terminal Specifications: in. [mm]

HANDLE POSITION VS. AUX SWITCH MODE		
STANDARD C/B		
CIRCUIT BREAKER MODE	HANDLE POSITION	AUX. SWITCH MODE
OFF		
ON		
ELECTRICAL TRIP		

TERMINAL DIMENSIONAL DETAIL & RATING		
TAB (Q.C.) ≤ 32 AMP	UPTURN LUG #8-32 ≤ 32 AMP M4 ≤ 32 AMP	BUS #8-32 ≤ 32 AMP M4 ≤ 32 AMP

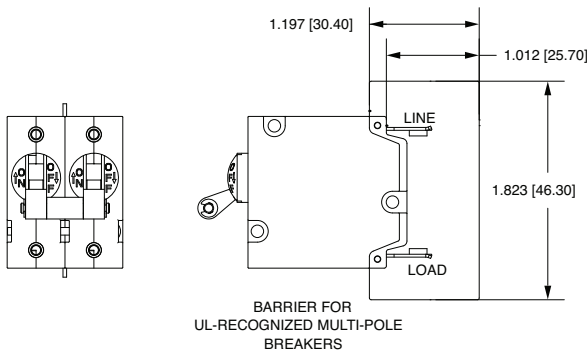
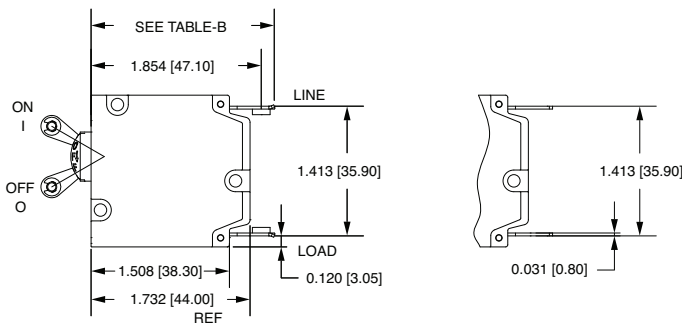


TABLE A TIGHTENING TORQUE SPECIFICATIONS	
THREAD SIZE	TORQUE
#6-32 & M3 MOUNTING HARDWARE	7-9 IN-LBS [0.8-1.0 NM]
#8-32 & M4 THREAD TERMINAL SCREW	12-15 IN-LBS [1.4-1.7 NM]

TABLE B		
TERMINAL DESCRIPTION		DEPTH BEHIND PANEL
MAIN	TAB (Q.C.)	1.996 [50.70]
	SCREW TYPE	1.996 [50.70]
AUX. SWITCH*	.110 TAB (Q.C.)	2.467 [62.67]
	SOLDER TYPE	2.252 [57.19]



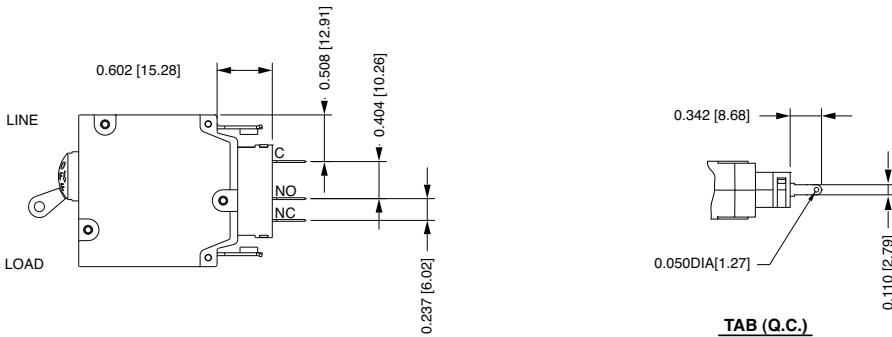
* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS SHOWN IN MULTI-POLE IDENTIFICATION SCHEME.

1. ALL DIMENSIONS ARE IN INCHES [mm]
2. TOLERANCE ±.020 [.51] UNLESS OTHERWISE SPECIFIED.

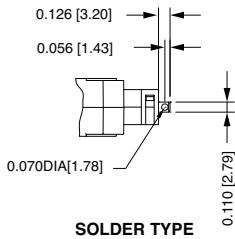
Circuit & Terminal Specifications: in. [mm]

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC		CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE		
	ANSI	ANSI	ANSI	ANSI				
2 TERMINALS 	SWITCH ONLY (NO COIL) 		SWITCH ONLY (NO COIL) 	SWITCH ONLY (NO COIL) 	A	0	B	0
5 TERMINALS 	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 		SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH 	A	1 2 3	B	1 2 3

AUXILIARY SWITCH TERMINAL DETAIL



TAB (Q.C.)



SOLDER TYPE

- 1. ALL DIMENSIONS ARE IN INCHES [mm]
- 2. TOLERANCE ±.020 [.51] UNLESS OTHERWISE SPECIFIED.

