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Agency Certifications

UL Listed

UL Standard 489A



Circuit Breakers, Molded Case, (Guide DIVQ7, File E129899), UL Standard 489; Complies with the requirements of CSA Standard for Molded Case Circuit Breakers, CAN/CSA - C22.2 No. 5.1 - M

TUV Certified



EN60947-2
Low Voltage Switchgear and Control Gear under License No. R72031058

Electrical

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

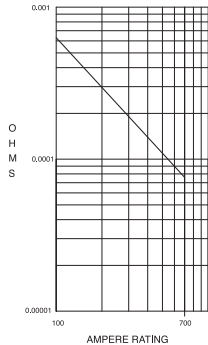
F-SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS					
CIRCUIT CONFIGURATION	VOLTAGE		CURRENT RATING FULL LOAD AMPS	INTERRUPTING CAPACITY (AMPS)	
	MAX. RATING	FREQUENCY		UL / CSA 1 - 3 POLES	TUV 1 or 2 POLES
SERIES	125	DC	50 - 250	50,000	25,000

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 FULL LOAD AMPS	INTERRUPTING CAPACITY (AMPS) WITHOUT BACKUP FUSE
	MAX. RATING	FREQUENCY		
SERIES	125	DC	251 - 700	50,000

Electrical

Maximum Voltage 125VDC
 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 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 (%)
100 - 700	50%

Mechanical

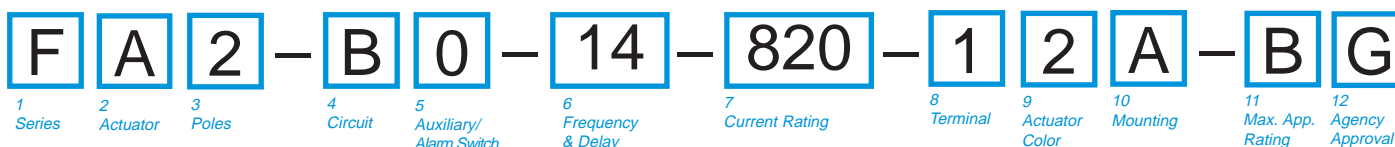
Endurance 4000 ON-OFF operations with rated Current & Voltage & 4000 operations with no load (8000 operations total) @ 5 per minute. Parallel Pole construction: 1000 operations with rated Current and Voltage @ 5 per minute.
 Trip Free All F-Series Circuit Breakers will trip on overload, even when the 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 leg-end.

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



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/ALARM SWITCH⁵

0 w/o Aux Switch	8 S.P.S.T., 0.187 Q.C. Terminals
2 S.P.D.T., 0.110 Q.C. Term.	9 S.P.D.T., 0.187 Q.C. Terminals.
3 S.P.D.T., 0.139 Solder Lug (Gold Contacts)	A ⁶ S.P.S.T., 0.093 Round QC Terminals.
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)	B ⁶ S.P.D.T., 0.093 Round Q.C. Terminals.
5 S.P.S.T., 0.093 Q.C. Term. (Gold Contacts)	
6 S.P.S.T., 0.139 Solder Lug	
7 S.P.S.T., 0.110 Q.C. Term.(Gold Contacts)	

6 FREQUENCY & DELAY

03 DC 50/60Hz, Switch Only	12 DC Short
10 ⁷ DC Instantaneous	14 DC Medium
11 DC Ultra Short	16 DC Long

7 CURRENT RATING (AMPERES)

810 100.00	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 (VOLTS, MIN. TRIP RATING)⁷

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)

1 ⁹ 3/8-16 Stud	Max Rating
2 ¹⁴ 3/8-16 Screw, Line & Load	250A
5 ¹⁴ 3/8-16 Short Stud	700A
	250A

Front Connected (Back Mounted Only)¹¹

3 Box Wire Connector, Line & Load	Max Rating
4 ¹⁴ 3/8-16 Screw, Line & Load	700A
	700A

9 ACTUATOR COLOR & LEGEND^{12,13}

Actuator:	Marking:	Marking Color:
White	I-O ON-OFF Dual	1 Black
Black	A B D 2	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

12 AGENCY APPROVAL

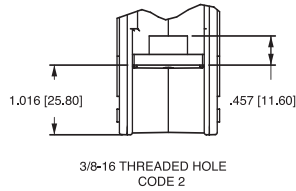
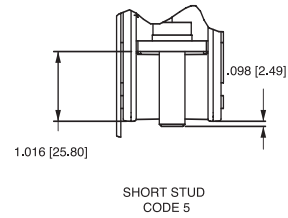
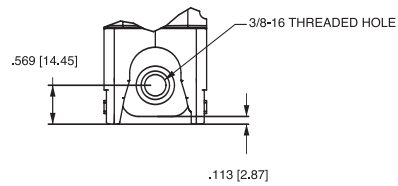
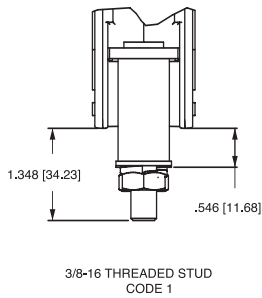
A	No approvals
G	UL 489 Listed & CUL Certified
J	UL 489 Listed, CUL Certified & TUV Certified
T	UL489A (Telecom) Listed

- Notes:
- 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.
 - Available with Frequency and Delay code 10 only, and are not rated for continuous duty. Delay 10 is only available with voltage coils.
 - Codes M, N, P & Q (Parallel Poles) are supplied with factory installed Bus Bar on Line and Load.
 - Metering terminals are female pin type, ref. Molex part number 02-09-1101, model 1189-T.
 - 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.
 - Available with parallel pole construction (circuit codes P and Q, and breakers with circuit codes M and N).
 - Frequency and delay code 10 is only available with Voltage Coils. Voltage Coils are not rated for continuous duty.
 - 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.
 - Per UL requirement, an "Anti-Flash Over Barrier" is supplied between poles on multi-pole breakers with 3/8 - 16 stud terminals (Terminal Code 1)
 - Front connected breakers can also be front mounted by utilizing the supplied front panel mounting inserts. Terminal connections must be made before mounting.
 - Box Wire connector will accept #6 through 250 MCM copper wire.
 - Agency codes G & T must have ON-OFF or dual legends. Agency code J must have dual legend.
 - Other colors available. Consult factory.
 - Terminals 2,4 & 5 are shipped without terminal hardware.

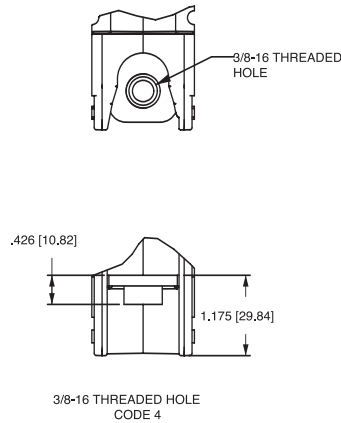
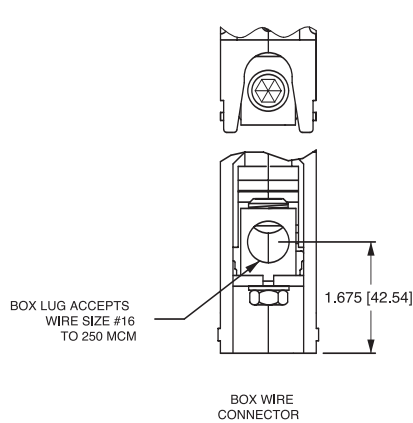
F SERIES NON-PARALLEL POLE CONSTRUCTION:

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE
	ANSI	IEC			ANSI	IEC		
<p>SERIES TRIP (2 TERM.S.)</p>	<p>SWITCH ONLY (NO COIL)</p>		A	0	<p>SWITCH TRIP</p>		BC	0
<p>SERIES TRIP W/AUX. SWITCH (5 TERM.S.)</p>	<p>SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH</p>		A	2 3 4 5 9	<p>SERIES TRIP WITH AUXILIARY SWITCH</p>		BC	2 3 4 5 9

TERMINAL DETAILS
BACK CONNECT



FRONT CONNECT



Notes:

- All dimensions are in inches [millimeters].
- Tolerance ± 0.020 [.51] unless otherwise specified.

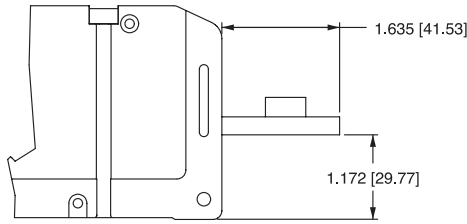
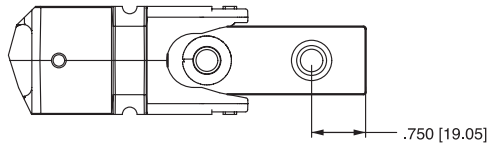
F-SERIES PARALLEL POLE CONSTRUCTION:

CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC		CIRCUIT CODE	AUX SWITCH CODE
	ANSI	IEC			ANSI	IEC		
	SWITCH ONLY (NO COIL)				SERIES TRIP			
<p>SERIES TRIP (2 TERM'S.)</p>			A	0			BC	0
<p>SERIES TRIP W/AUX. SWITCH (5 TERM'S.)</p>	<p>SWITCH ONLY (NO COIL) WITH ALARM OR AUX. SWITCH</p>		A	B	<p>SERIES TRIP WITH ALARM OR AUX. SWITCH</p>		BC	B
<p>SERIES TRIP W/METERING SHUNT (4 TERM'S.)</p>	<p>SWITCH ONLY (NO COIL) WITH METERING SHUNT</p>		N	0	<p>SERIES TRIP CURRENT COIL WITH METERING SHUNT</p>		M	0
<p>RELAY TRIP (4 TERM'S.)</p>	<p>SWITCH ONLY WITH ALARM OR AUX. SWITCH AND METERING SHUNT</p>		N	A	<p>SERIES TRIP WITH ALARM OR AUX. SWITCH AND METERING SHUNT</p>		M	A

Notes:

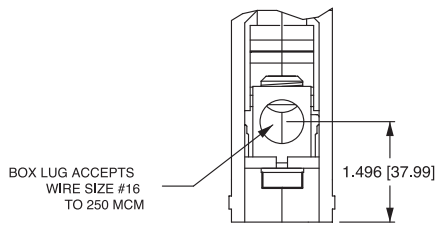
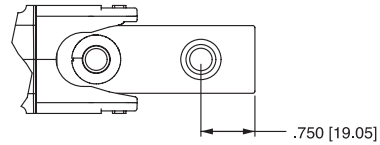
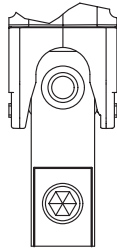
- 1 All dimensions are in inches [millimeters].
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TERMINAL DETAILS
BACK CONNECT

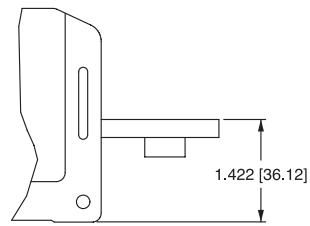


3/8-16 THREADED HOLE
CODE 2

FRONT CONNECT



BOX WIRE
CONNECTOR

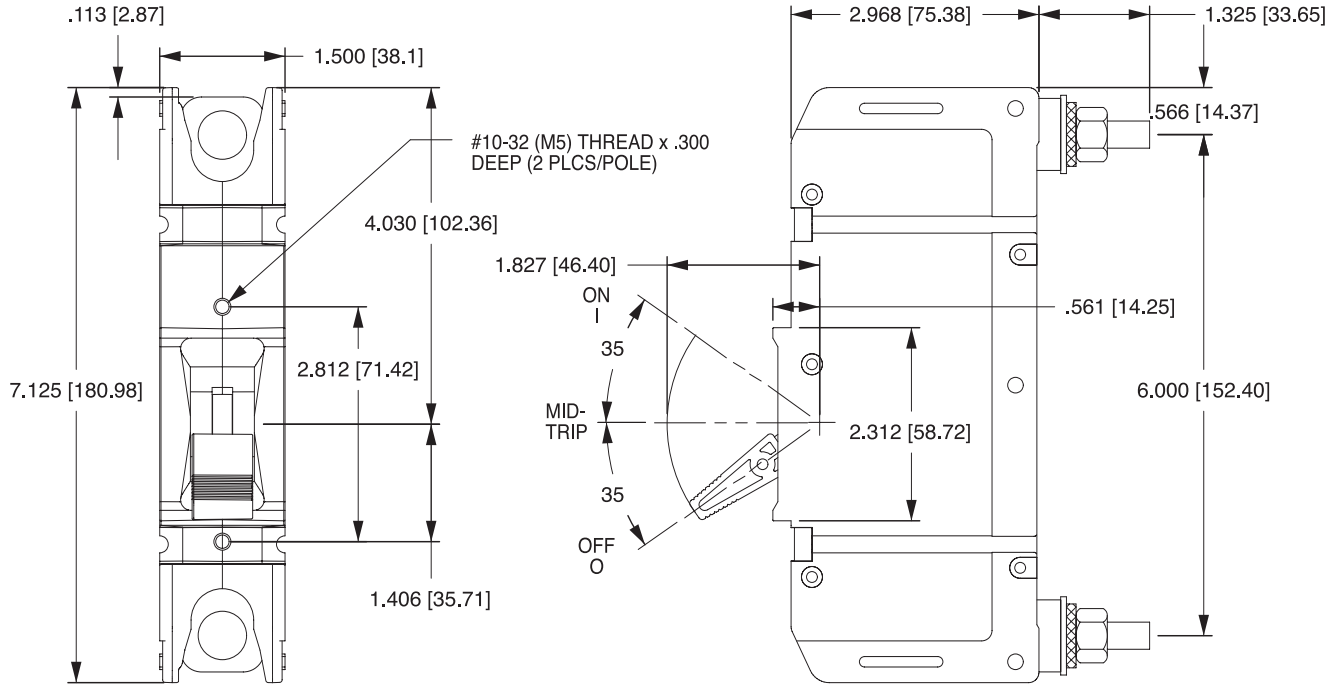


3/8-16 THREADED HOLE
CODE 4

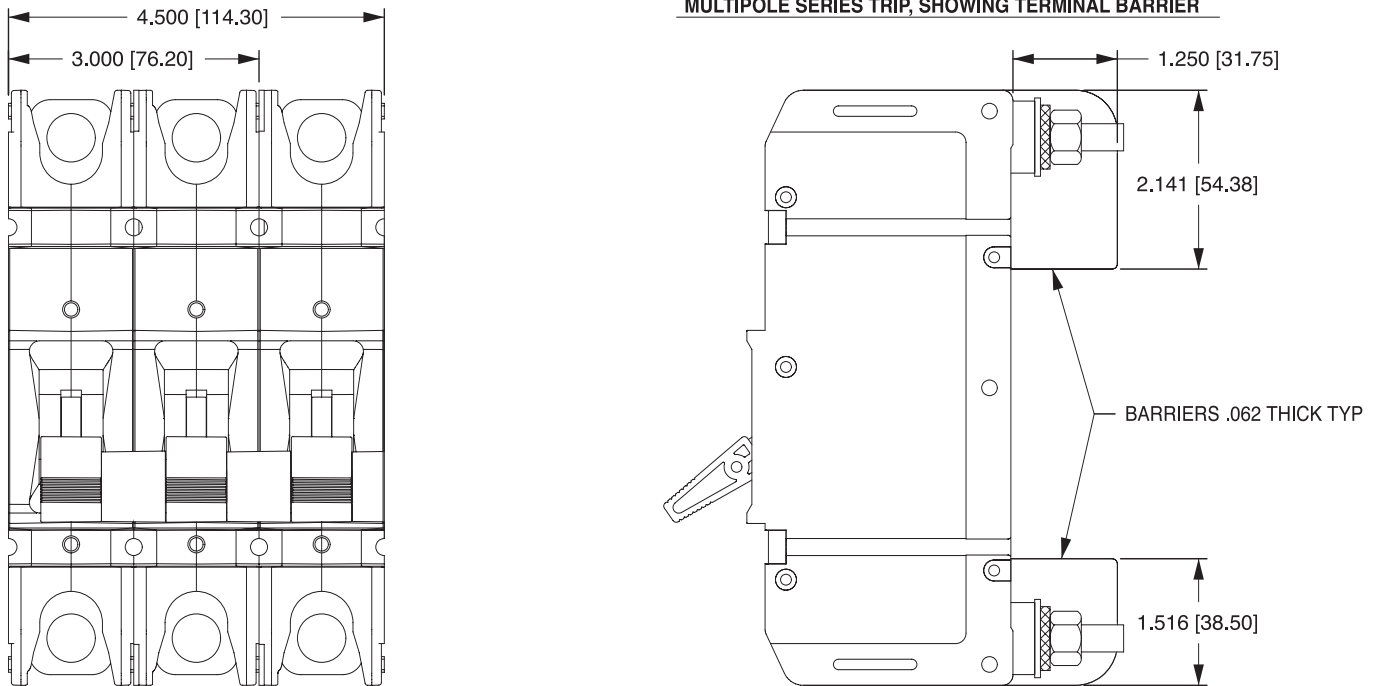
Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance $\pm .020$ [.51] unless otherwise specified.

SERIES TRIP BACK CONNECT (STUD TERMINALS SHOWN)

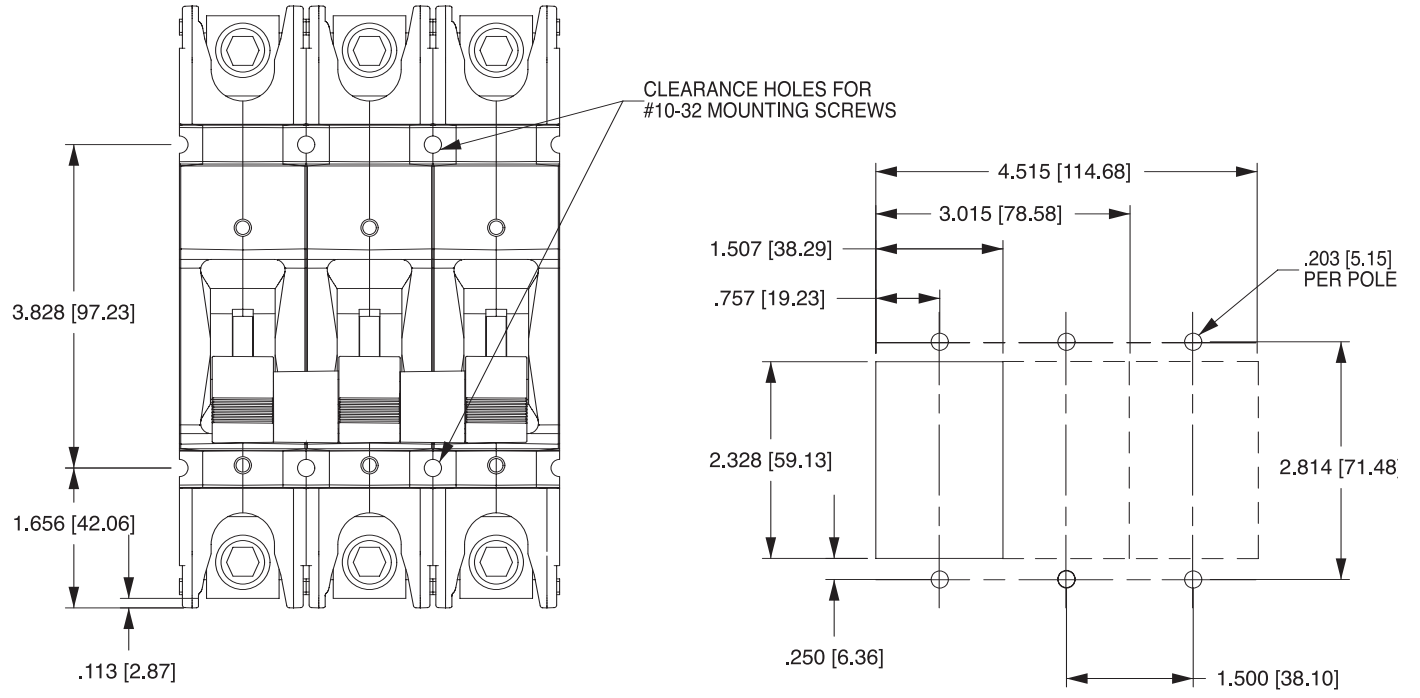


MULTIPOLE SERIES TRIP, SHOWING TERMINAL BARRIER

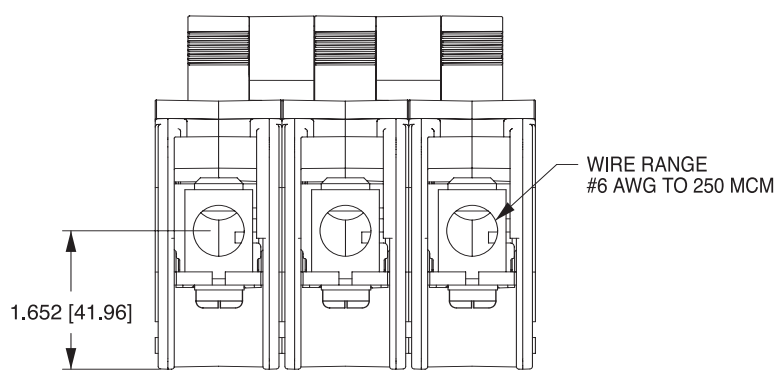


- Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance $\pm .020$ [.51] unless otherwise specified.

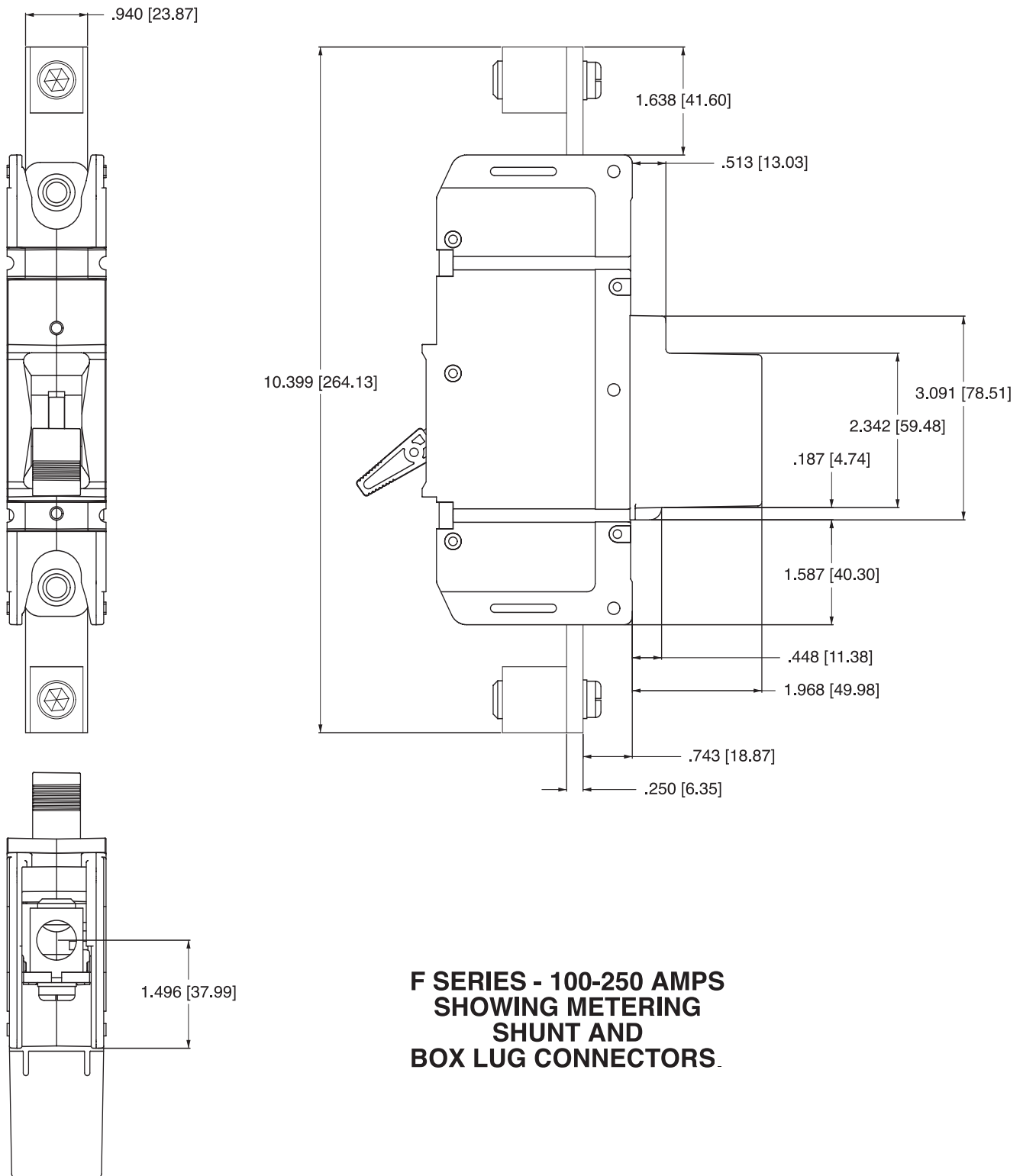
**SERIES TRIP FRONT CONNECT
(BOX LUG TERMINALS SHOWN)**



PANEL CUTOUT DETAIL



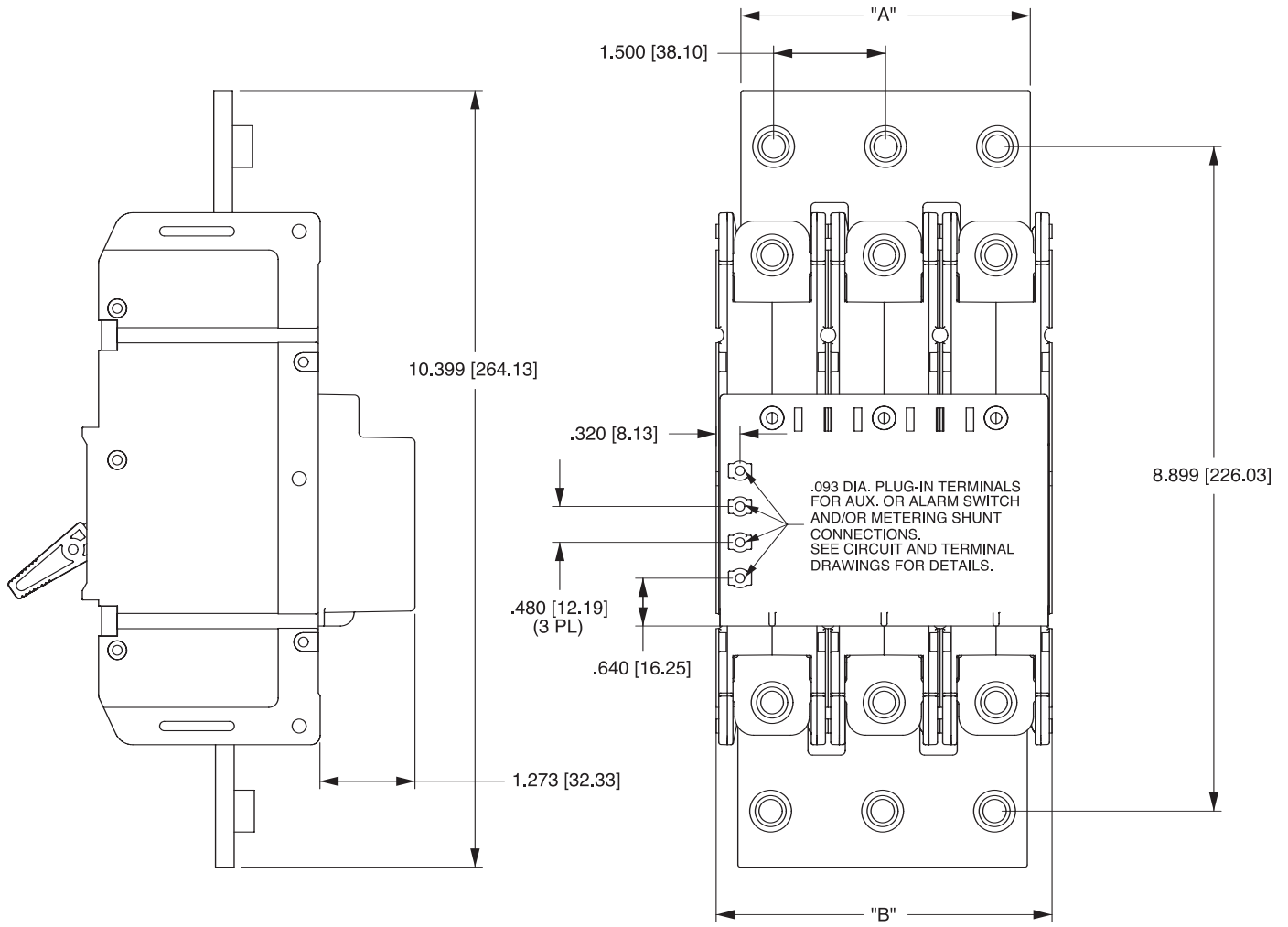
- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Tolerance $\pm .020$ [.51] unless otherwise specified.



**F SERIES - 100-250 AMPS
SHOWING METERING
SHUNT AND
BOX LUG CONNECTORS.**

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:
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 - 2 Tolerance $\pm .020$ [.51] unless otherwise specified.



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

Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.