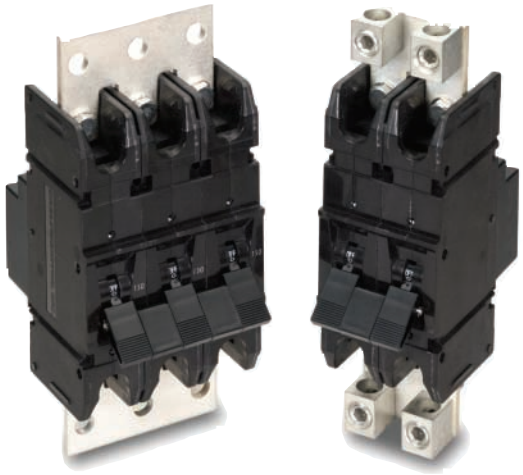


F-Series breakers are available up to 700A, and are also available with a 25 millivolt metering shunt construction. This optional construction provides a safe method for monitoring current flowing through the breaker by simply connecting a meter with light gauge wire to the appropriate terminals located 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.

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.

Electrical

Table A: Lists UL Listed (489),(CAN/CSA - C22.2 No. 5.1-M) TUV Certified configuration and performance capabilities as a Molded Case Circuit Breaker.

F-SERIES TABLE A: UL489 BRANCH CIRCUIT BREAKER

CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)	
	MAX RATING	FREQUENCY	PHASE	FULL LOAD AMPS	UL 1 - 3 POLES	TUV 1 or 2 POLES
SERIES	125	DC	---	50 - 250	50,000	25,000

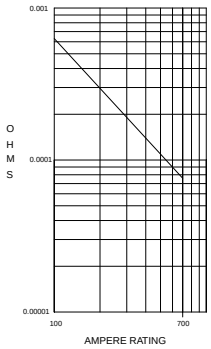
Table B: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A.

F-SERIES TABLE B: PARALLEL POLE CONSTRUCTION UL489A FOR COMMUNICATIONS EQUIPMENT

CIRCUIT CONFIGURATION	VOLTAGE			CURRENT RATING	INTERRUPTING CAPACITY (AMPS)
	MAX RATING	FREQUENCY	PHASE	GENERAL PURPOSE AMPS	
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 auxilary 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

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-

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).

F	A	2	-	B	0	-	14	-	820	-	1	2	A	-	B	G
1 Series	2 Actuator	3 Poles		4 Circuit	5 Auxiliary/ Alarm Switch		6 Frequency & Delay		7 Current Rating		8 Terminal	9 Actuator Color	10 Mounting		11 Max. App. Rating	12 Agency Approval

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)
B	Series Trip (Current)
C[2]	Series Trip (Voltage)

Parallel Pole Construction:

M[3, 4]	Series Trip (Current) with Metering Shunt
N[3, 4]	Switch Only with Metering Shunt
P[3]	Series Trip (Current)
Q[3]	Switch Only

5 AUXILIARY/ALARM SWITCH[5]
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	**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)		***Max Rating***
1[9]	3/8-16 Stud	250A
2	3/8-16 Screw, Line & Load	700A
5	3/8-16 Short Stud	250A
Front Connected (Back Mounted Only)[11]		***Max Rating***
3	Box Wire Connector, Line & Load	700A
4	3/8-16 Screw, Line & Load	700A

9 ACTUATOR COLOR & LEGEND[12,13]
Actuator:	***Marking:***			***Marking Color:***
	I-O	ON-OFF	Dual	
White	**A**	**B**	**1**	Black
Black	**C**	**D**	**2**	White

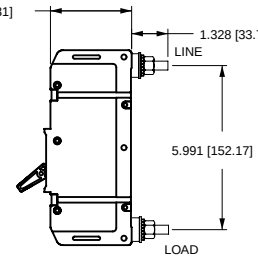
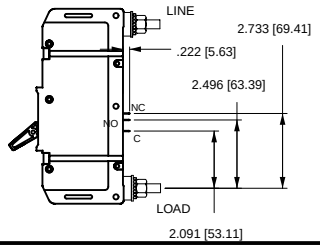
10 MOUNTING
	Front Mounting Inserts	***Back Mounting Inserts***
A	10-32	10-32 screw clearance holes
B	ISO M5	10-32 screw clearance holes

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

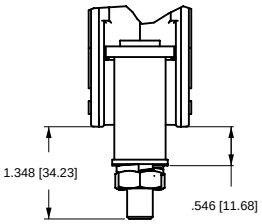
Notes:
1. For 100 to 250 amps, select Current Code 825. For 300-400 amps, select Current Code 840. For 450-700 amps, select Current Code 870.
2. Available with Frequency and Delay code 10 only, and are not rated for continuous duty. Delay 10 is only available with voltage coils.
3. Codes M, N, P & Q (Parallel Poles) are supplied with factory installed Bus Bar on Line and Load.
4. Metering terminals are female pin type, ref. Molex part number 02-09-1101, model 1189-T.
5. 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.
6. Available with parallel pole construction (circuit codes P and Q, and breakers with circuit codes M and N).
7. Frequency and delay code 10 is only available with voltage coils. Voltage Coils are not rated for continuous duty.
8. 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.
9. 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)
10. Front connected breakers can also be front mounted by utilizing the supplied front panel mounting inserts.Terminal connections must be made before mounting.
11. Box Wire connector will accept #6 through 250 MCM copper wire.
12. Agency codes G & T must have ON-OFF or dual legends. Agency code J must have dual legend.
13. Other colors available. Consult factory.

F SERIES NON-PARALLEL POLE CONSTRUCTION:

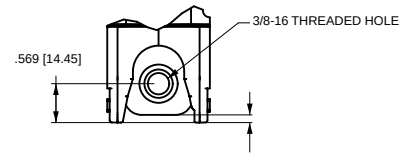
CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE
	ANSI / IEC — SWITCH ONLY (NO COIL)			ANSI / IEC — SWITCH TRIP		
SERIES TRIP (2 TERM'S.) 	ANSI: LINE / LOAD; IEC: LINE (NETZ) / LOAD (LAST)	A	0	ANSI: LINE / LOAD; IEC: LINE (NETZ) (3) / LOAD (LAST)	BC	0
SERIES TRIP W/AUX. SWITCH (5 TERM'S.) 	SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH: LINE / LOAD; LINE (NETZ) / LOAD (LAST)	A	2 3 4 5 9	SERIES TRIP WITH AUXILIARY SWITCH: LINE / STD. AUX SWITCH / ALARM SWITCH / LOAD; LINE (NETZ) (3) / STD. AUX SWITCH / ALARM SWITCH / LOAD (LAST)	BC	2 3 4 5 9

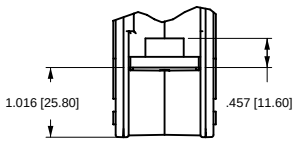
TERMINAL DETAILS

BACK CONNECT

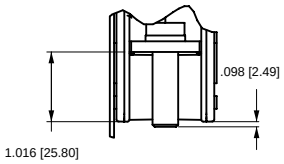


3/8-16 THREADED STUD
CODE 1



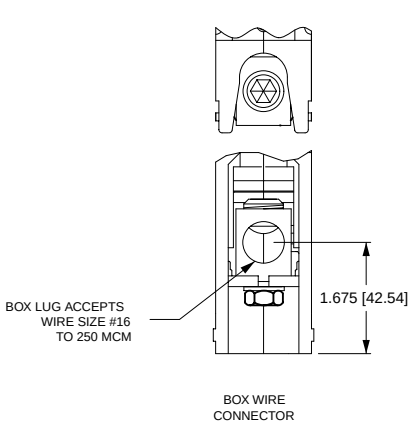


3/8-16 THREADED HOLE
CODE 2

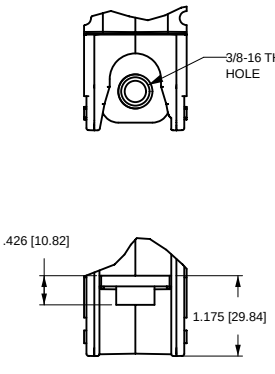


SHORT STUD
CODE 5

FRONT CONNECT



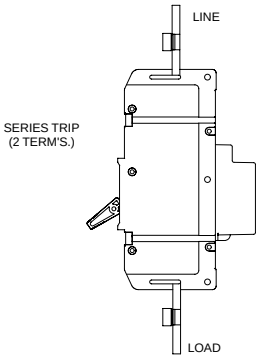
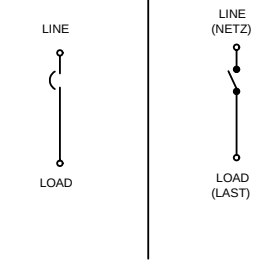
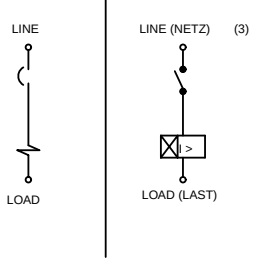
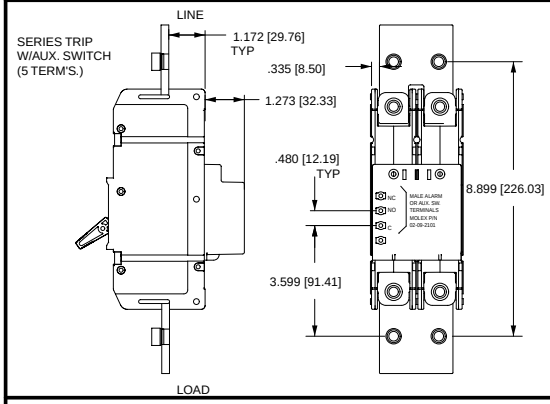
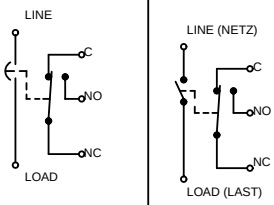
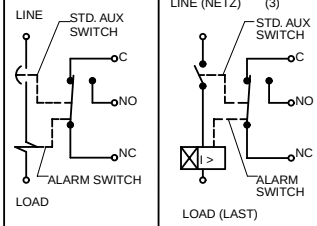
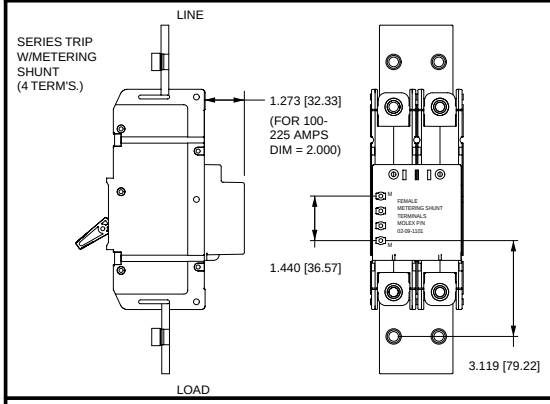
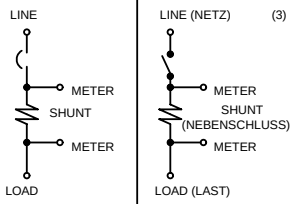
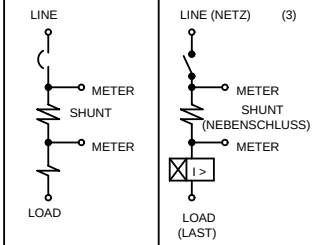
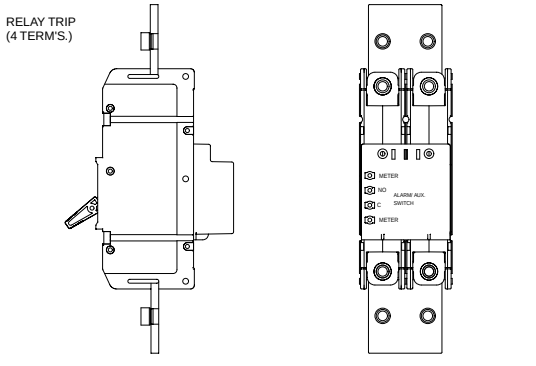
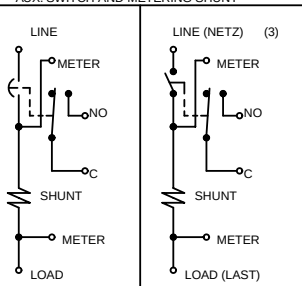
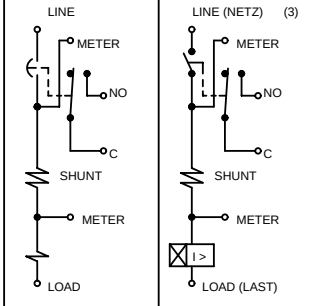
BOX WIRE
CONNECTOR



3/8-16 THREADED HOLE
CODE 4

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.

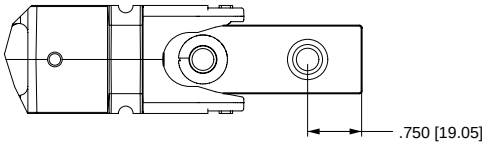
F-SERIES PARALLEL POLE CONSTRUCTION:

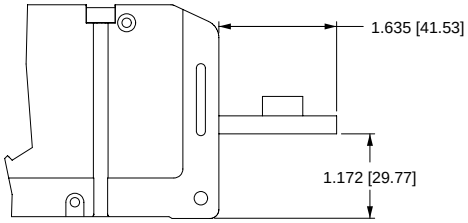
CIRCUIT BREAKER PROFILE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE	CIRCUIT SCHEMATIC	CIRCUIT CODE	AUX SWITCH CODE
	ANSI / IEC — SWITCH ONLY (NO COIL)			SERIES TRIP		
		A	0		BC	0
	SWITCH ONLY (NO COIL) WITH ALARM OR AUX. SWITCH 	A	B	SERIES TRIP WITH ALARM OR AUX. SWITCH 	BC	B
	SWITCH ONLY (NO COIL) WITH METERING SHUNT 	N	0	SERIES TRIP CURRENT COIL, WITH METERING SHUNT 	M	0
	SWITCH ONLY WITH ALARM OR AUX. SWITCH AND METERING SHUNT 	N	A	SERIES TRIP WITH ALARM OR AUX. SWITCH AND METERING SHUNT 	M	A

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.

TERMINAL DETAILS

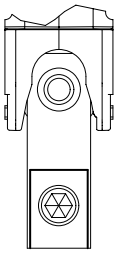
BACK CONNECT

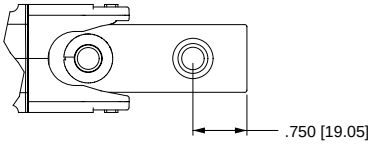


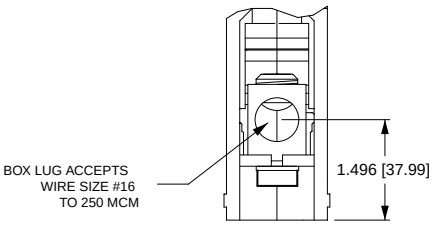


3/8-16 THREADED HOLE
CODE 2

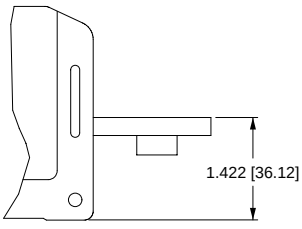
FRONT CONNECT







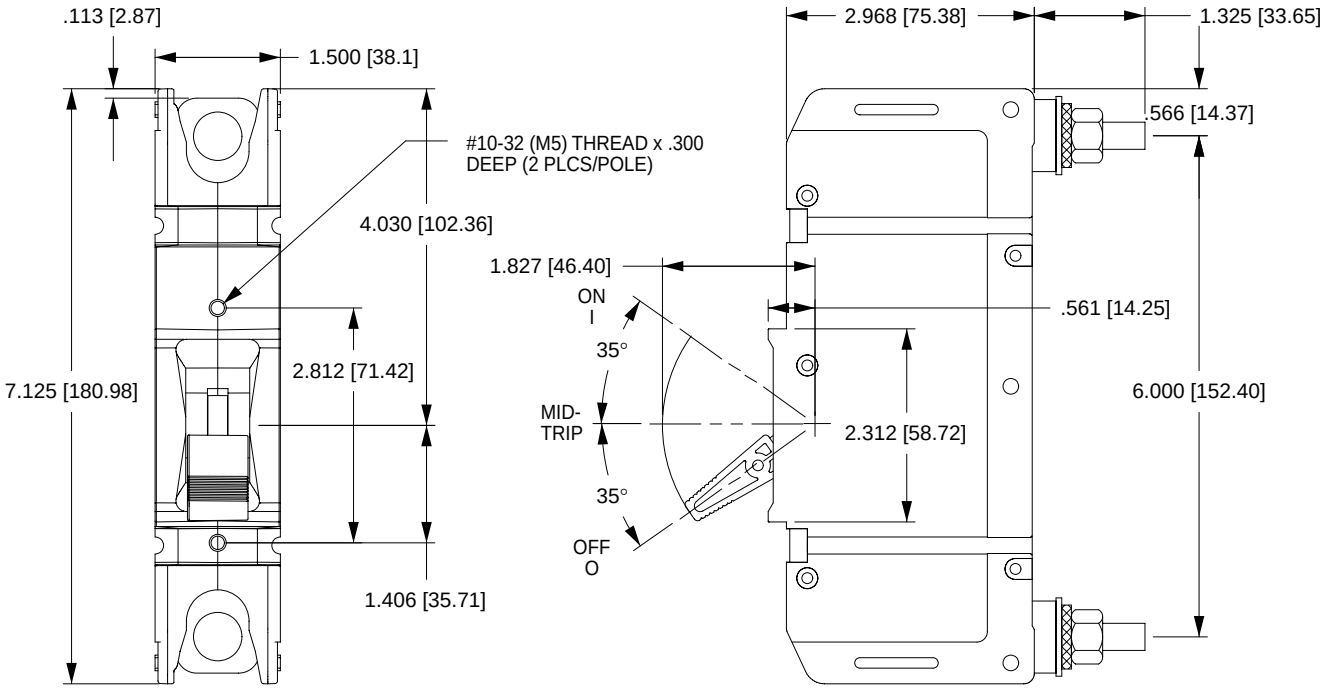
BOX WIRE
CONNECTOR

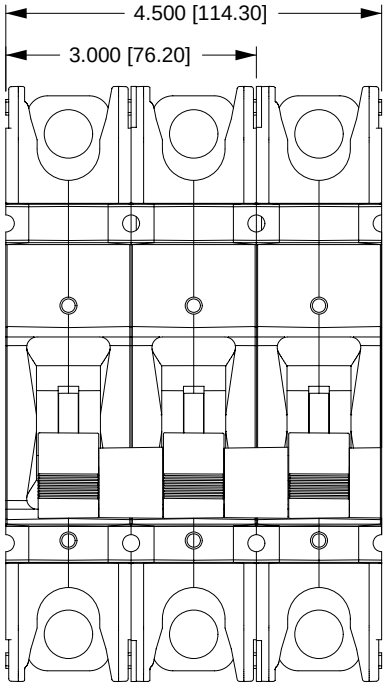


3/8-16 THREADED HOLE
CODE 4

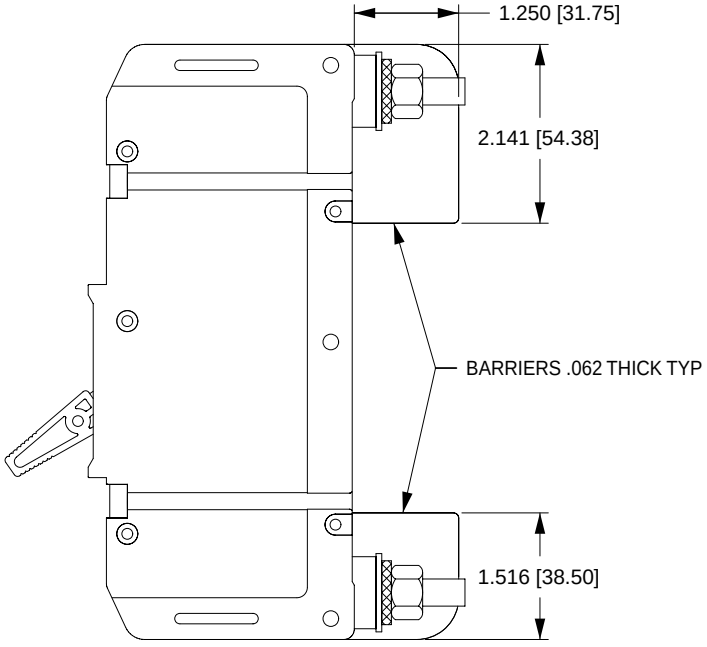
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.

SERIES TRIP BACK CONNECT (STUD TERMINALS SHOWN)



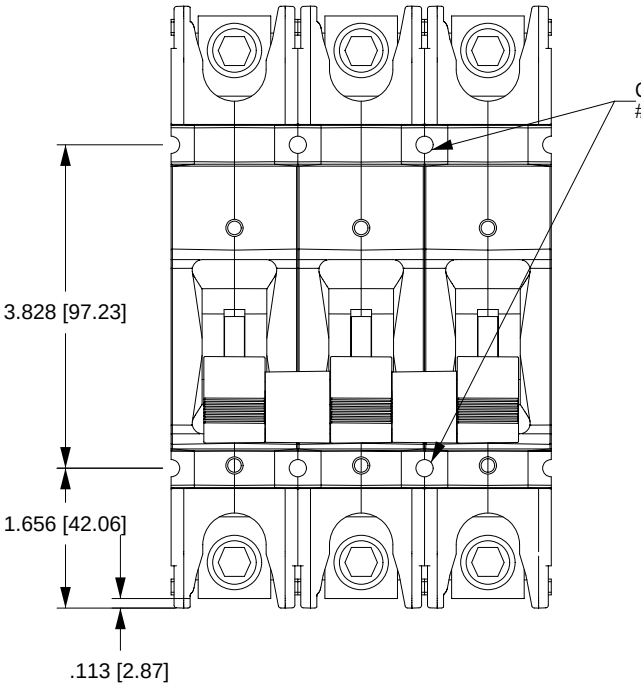


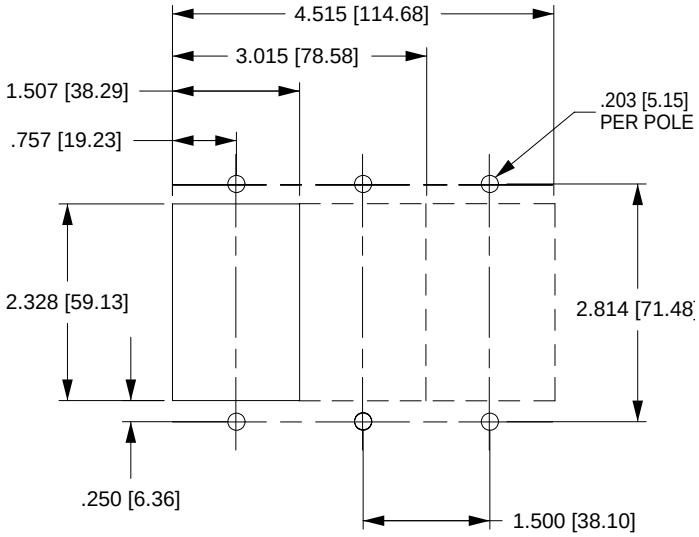
MULTIPOLE SERIES TRIP, SHOWING TERMINAL BARRIER



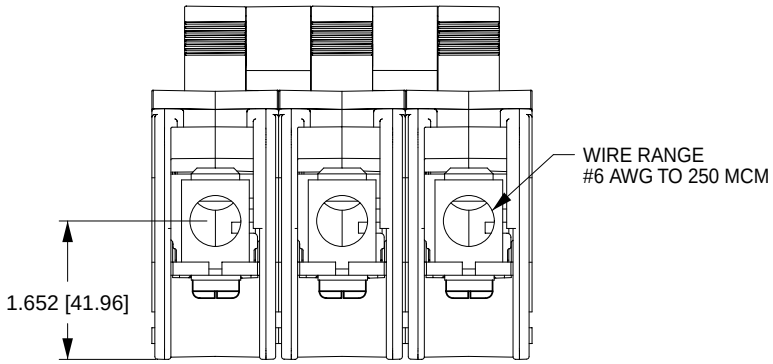
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.

SERIES TRIP FRONT CONNECT
(BOX LUG TERMINALS SHOWN)

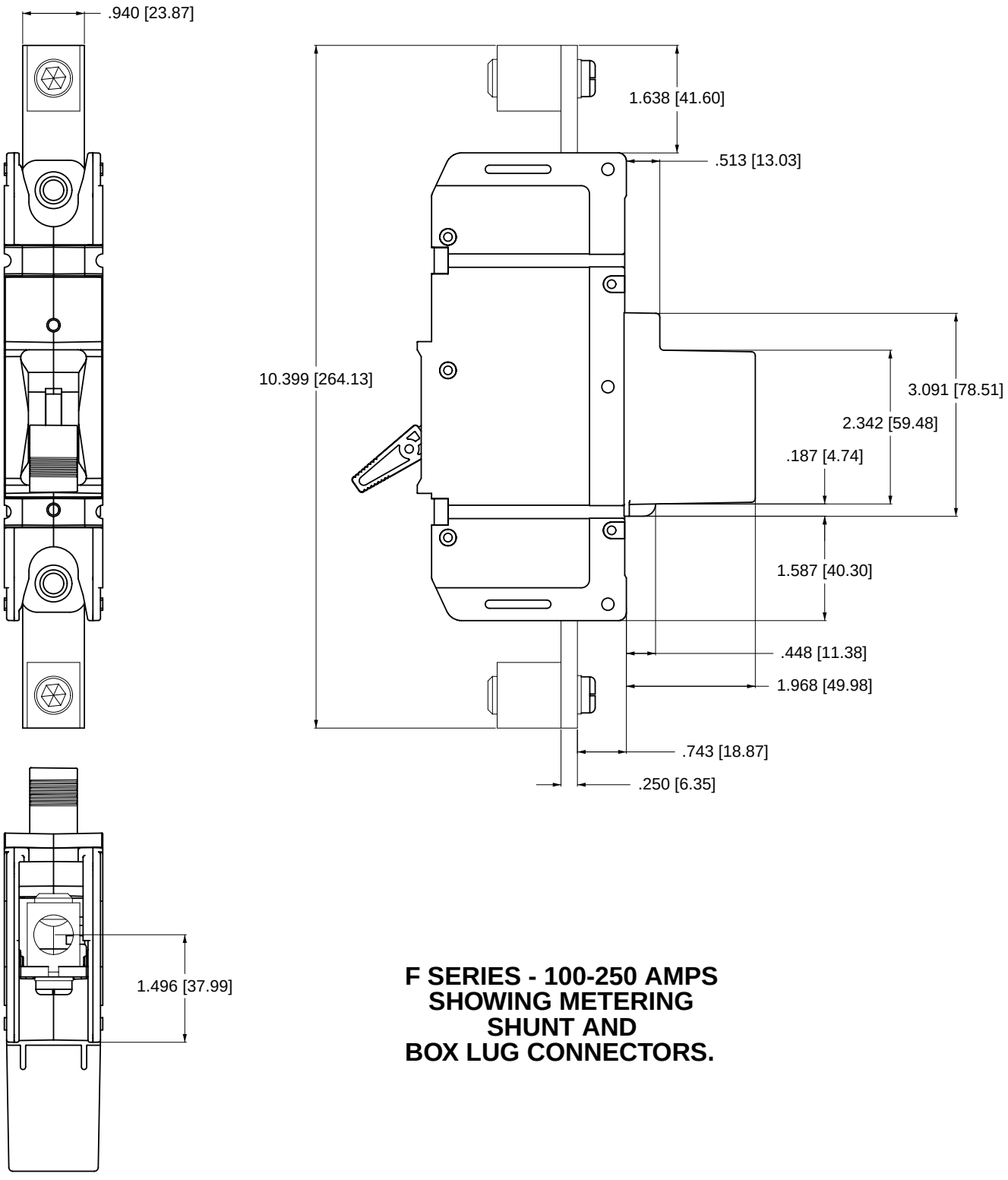




PANEL CUTOUT DETAIL



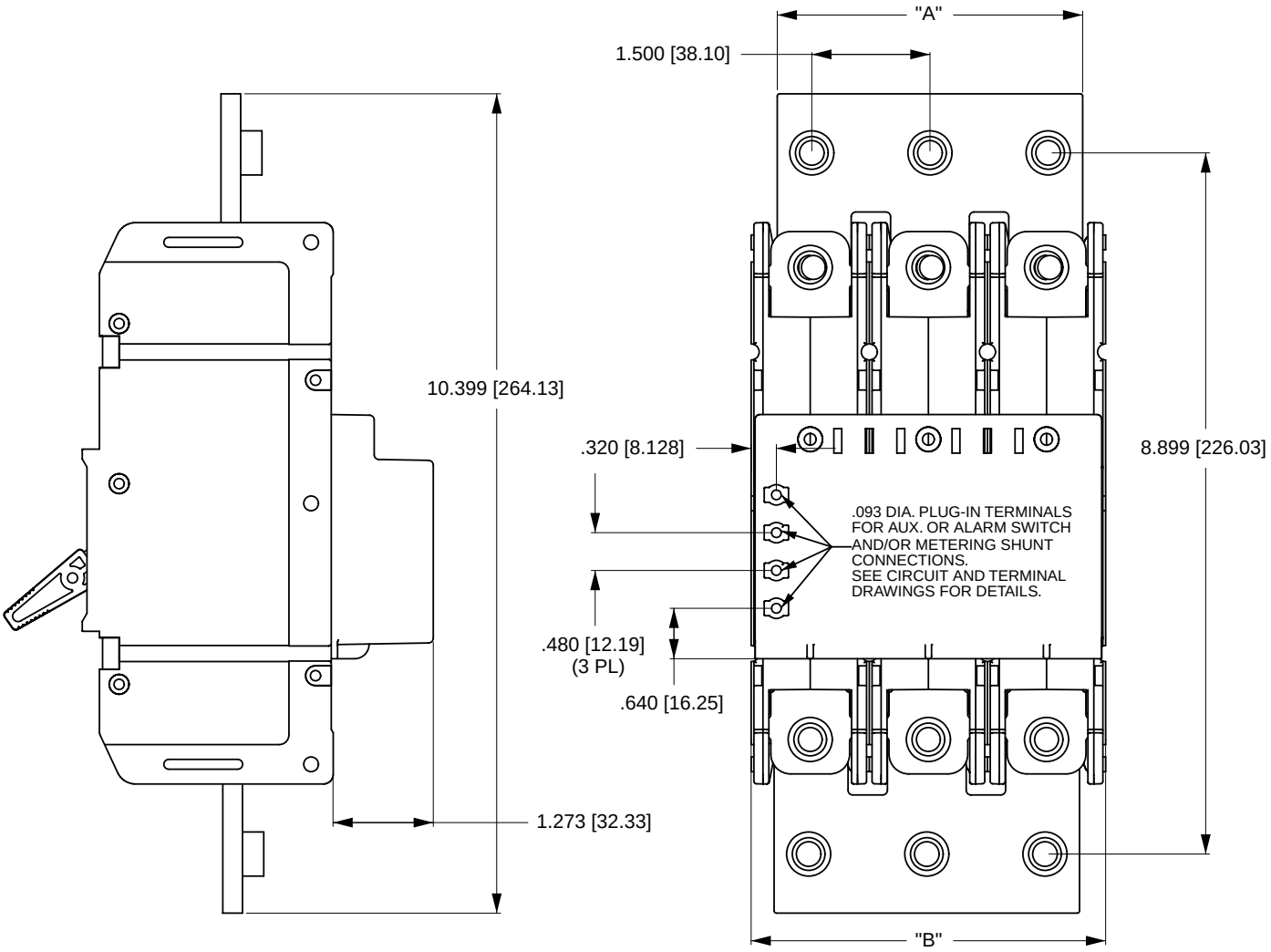
Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.



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:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.



F-SERIES PARALLEL POLE 300-700 AMPS SHOWING FRONT CONNECT SCREW TERMINALS

F-SERIES PARALLEL POLE WIDTH DIMENSIONS

CURRENT RATING	DIM. "A"	DIM. "B"
300-450 AMPS	2.375 [60.32]	3.000 [76.20]
500-700 AMPS	3.875 [98.42]	4.500 [114.30]

TIGHTENING TORQUE SPECIFICATIONS

THREAD SIZE/ TERMINAL TYPE	TORQUE
10-32 MOUNTING HARDWARE	10-12 IN-LBS [1.1-1.4 NM]
M5 MOUNTING HARDWARE	8-10 IN-LBS [0.9-1.1 NM]
3/8-16 SCREW & STUD TERMINALS	220-230 IN-LBS [24.9-26.0 NM]
BOX WIRE CONNECTOR	180 IN-LBS [20.4 NM]

Notes:
1 All dimensions are in inches [millimeters].
2 Tolerance ±.015 [.38] unless otherwise specified.