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Miniature Circuit Breakers, Electronic Protection Modules, and Fuse Holders

Bulletins 188, 1489, 1492, 1694

Allen-Bradley
by ROCKWELL AUTOMATION

Selection Guide

What's Inside

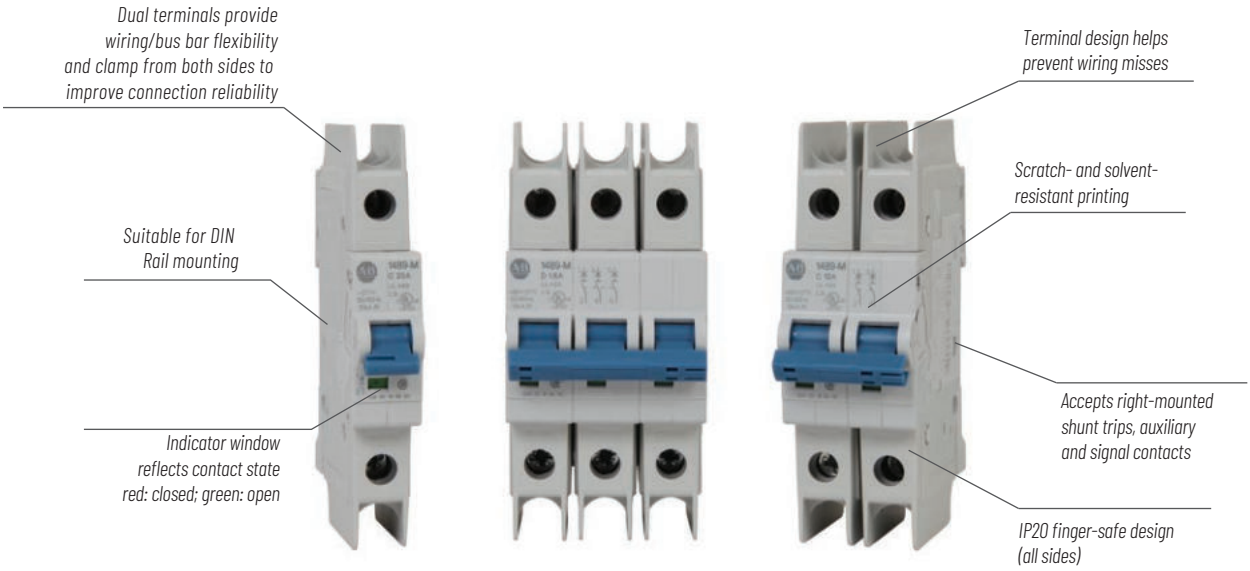
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What's New

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

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Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.



Bulletin 1489-M thermal-magnetic circuit breakers are approved for branch circuit protection in the United States and Canada, and are certified as Miniature Circuit Breakers for IEC applications.

These branch protectors are compatible with many accessories to meet diverse application needs, including UL 508 Listed bus bars for convenience in panel assembly, auxiliary contacts, signal contacts and shunt trips for versatility, and lockout attachments for safety during maintenance.

Features include:

- Current limiting
- Fast breaking time
- High rated voltage
- Dual terminals provide a more secure connection of up to four wires, or two wires and a bus bar
- Superior shock and vibration resistance to help prevent nuisance tripping
- Terminal design helps prevent wiring misses by directing wires into the terminal openings, even while tightening
- Reversible line and load connections
- Single and multi-pole toggle mount lock out attachments available for Lockout/Tagout (LOTO)
- RoHS compliant and fully recyclable device
- Suitable for extreme ambient conditions

1489-M Circuit Breakers	
Rated Voltage	UL/CSA: Max. 480Y/277V AC IEC: U_e 230/400V AC
Interrupting Capacity	UL/CSA: 10 kA IEC: 15 kA
Current Ratings	0.5...63 A
Poles	1, 2, 3
Trip Curves	C, D
Standards Compliance	UL 489 CSA C22.2 No. 5.1 EN 60947-2 GB 14048.2
Certifications	UL Listed, File No. E197878 CSA Certified, File No. 259391 CE Marked VDE Certified CCC Certified RoHS Compliant UKCA Marked KCC Certified

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1489	-	M	1	C	005
		a	b	c	d

a

Voltage Type	
Code	**Description**
M	AC Circuit Breaker

b

Poles	
Code	**Description**
1	1-Pole
2	2-Pole
3	3-Pole

c

Trip Curve	
Code	**Description**
C	Trip Curve C
D	Trip Curve D

d

Rated Current (I_n)	
Code	**Current [A]**
005	0.5
010	1
016	1.6
020	2
030	3
040	4
050	5
060	6
070	7
080	8
100	10
130	13
150	15
160	16
200	20
250	25
300	30
320	32
350	35
400	40
500	50
600	60
630	63

Product Selection

1-Pole Circuit Breakers

Photo/ Wiring Diagram	Max. Voltage		Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	UL/CSA	IEC/EN	[A]	Cat. No.	Cat. No.
	277V AC, 48V DC	230V AC	0.5	1489-M1C005	1489-M1D005
			1	1489-M1C010	1489-M1D010
			1.6	1489-M1C016	1489-M1D016
			2	1489-M1C020	1489-M1D020
			3	1489-M1C030	1489-M1D030
			4	1489-M1C040	1489-M1D040
			5	1489-M1C050	1489-M1D050
			6	1489-M1C060	1489-M1D060
			7	1489-M1C070	1489-M1D070
			8	1489-M1C080	1489-M1D080
			10	1489-M1C100	1489-M1D100
			13	1489-M1C130	1489-M1D130
			15	1489-M1C150	1489-M1D150
			16	1489-M1C160	1489-M1D160
			20	1489-M1C200	1489-M1D200
			25	1489-M1C250	1489-M1D250
			30	1489-M1C300	1489-M1D300
			32	1489-M1C320	1489-M1D320
			35	1489-M1C350	1489-M1D350
 1-pole	C Curve: 277V AC, 48V DC D Curve: 240V AC, 48V DC		40	1489-M1C400	1489-M1D400
	240V AC, 48V DC		50	1489-M1C500	1489-M1D500
			60	1489-M1C600	1489-M1D600
			63	1489-M1C630	1489-M1D630

2-Pole Circuit Breakers

Photo/ Wiring Diagram	Max. Voltage		Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	UL/CSA	IEC/EN	[A]	Cat. No.	Cat. No.
	480Y/277V AC, 96V DC	400V AC	0.5	1489-M2C005	1489-M2D005
			1	1489-M2C010	1489-M2D010
			1.6	1489-M2C016	1489-M2D016
			2	1489-M2C020	1489-M2D020
			3	1489-M2C030	1489-M2D030
			4	1489-M2C040	1489-M2D040
			5	1489-M2C050	1489-M2D050
			6	1489-M2C060	1489-M2D060
			7	1489-M2C070	1489-M2D070
			8	1489-M2C080	1489-M2D080
			10	1489-M2C100	1489-M2D100
			13	1489-M2C130	1489-M2D130
			15	1489-M2C150	1489-M2D150
			16	1489-M2C160	1489-M2D160
			20	1489-M2C200	1489-M2D200
			25	1489-M2C250	1489-M2D250
			30	1489-M2C300	1489-M2D300
			32	1489-M2C320	1489-M2D320
			35	1489-M2C350	1489-M2D350
 2-pole	C Curve: 480Y/277V AC, 96V DC D Curve: 240V AC, 96V DC		40	1489-M2C400	1489-M2D400
	240V AC, 96V DC		50	1489-M2C500	1489-M2D500
			60	1489-M2C600	1489-M2D600
			63	1489-M2C630	1489-M2D630

3-Pole Circuit Breakers

Photo/Wiring Diagram	Max. Voltage		Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	UL/CSA	IEC/EN	[A]	Cat. No.	Cat. No.
  3-pole	480Y/277V AC	400V AC	0.5	1489-M3C005	1489-M3D005
			1	1489-M3C010	1489-M3D010
			1.6	1489-M3C016	1489-M3D016
			2	1489-M3C020	1489-M3D020
			3	1489-M3C030	1489-M3D030
			4	1489-M3C040	1489-M3D040
			5	1489-M3C050	1489-M3D050
			6	1489-M3C060	1489-M3D060
			7	1489-M3C070	1489-M3D070
			8	1489-M3C080	1489-M3D080
			10	1489-M3C100	1489-M3D100
			13	1489-M3C130	1489-M3D130
			15	1489-M3C150	1489-M3D150
			16	1489-M3C160	1489-M3D160
			20	1489-M3C200	1489-M3D200
			25	1489-M3C250	1489-M3D250
			30	1489-M3C300	1489-M3D300
			32	1489-M3C320	1489-M3D320
			35	1489-M3C350	1489-M3D350
	C Curve: 480Y/277V AC D Curve: 240V AC		40	1489-M3C400	1489-M3D400
	240V AC		50	1489-M3C500	1489-M3D500
			60	1489-M3C600	1489-M3D600
			63	1489-M3C630	1489-M3D630

Specifications

Electrical Ratings					
Poles					1, 2, 3
Tripping characteristics					C, D
Rated current (I_n)					0.5...63 A
Rated frequency [f]					50/60 Hz
Rated insulation voltage U_i per IEC/EN 60664-1					250V AC (phase to ground) 440V AC (phase to phase)
Overvoltage category					III
Pollution degree					3
Data per UL/CSA					
Rated voltage	AC	1-pole	C Curve	0.5...40 A	277V AC
				50...63 A	240V AC
			D Curve	0.5...35 A	277V AC
				40...63 A	240V AC
		2-, 3-pole	C Curve	0.5...40 A	480Y/277V AC
				50...63 A	240V AC
			D Curve	0.5...35 A	480Y/277V AC
				40...63 A	240V AC
	DC	1-pole			48V DC
		2-pole			96V DC (2-pole in series)
Rated interrupting capacity per UL 489					10 kA
Reference temperature for tripping characteristics					40 °C (104 °F)
Electrical endurance					6,000 operations (AC and DC); 1 cycle (1s - ON, 9s - OFF)
Data per IEC/EN 60947-2					
Rated operational voltage (U_e)	1-pole				230V AC
	2-, 3-pole				400V AC
Highest supply or utilization voltage (U_{max})	AC	1-pole			253/440V AC
		2-, 3-pole			440V AC
	DC (1)	1-pole			48V DC
		2-pole			96V DC
Min. operating voltage					12V AC, 12V DC
Rated ultimate short-circuit breaking capacity (I_{cu})					15 kA
Rated service short-circuit breaking capacity (I_{cs})					≤ 40 A: 11.25 kA > 40 A: 7.5 kA
Rated impulse withstand voltage $U_{imp.}$ (1.2/50 µs)					4 kV (test voltage 6.2 kV at sea level, 5 kV at 2,000 m)
Dielectric test voltage					2 kV (50/60Hz, 1 min.)
Reference temperature for tripping characteristics					30 °C (86 °F)
Electrical endurance 1 cycle (2s - ON, 13s - OFF, $I_n \leq 32$ A), 1 cycle (2s - ON, 28s - OFF, $I_n > 32$ A)					$I_n < 30$ A: 20,000 ops. (AC) $I_n \geq 30$ A: 10,000 ops. (AC) 1,000 ops. (DC)

(1) Self-declared IEC DC ratings.

Mechanical Data	
Housing	Insulation group II, RAL 7035
Indicator window	red ON/green OFF
Protection degree per EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20,000 operations
Shock resistance per IEC/EN 60068-2-27	25 g – 2 shocks – 13 ms

Mechanical Data		
Vibration resistance per IEC/EN 60068-2-6		5g – 20 cycles at 5...150...5 Hz with load 0.8 x I_n
Environmental		
Environmental conditions (damp heat) per IEC/EN 60068-2-30		28 cycles with 55 °C/90-96% and 25 °C/95-100%
Ambient temperature(1)		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire (2)– solid, stranded (front/back terminal slot)		35/35 mm²
		18...4/18...10 AWG
Cross-section of wire – flexible (front/back terminal slot)		25/10 mm²
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG
		2-4 wires (3), 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm²
Tightening torque	IEC	2.8 N•m
	UL/CSA	AWG 18...16: 13.3 lb•in, AWG 14...10: 17.7 lb•in, AWG 8...4: 39.8 lb•in
Screwdriver		No. 2 Pozidriv
Mounting		DIN Rail (EN 60715, 35 mm) with fast clip
Mounting position		Any
Supply		Optional
Approximate Dimensions and Weight		
Pole dimension (H x D x W)		111 x 69 x 17.5 mm (4.37 x 2.72 x 0.69")
Pole weight		125 g (4.4 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Shunt trip		Yes

(1) See Table 1 and Table 2 for ambient temperature derating values.
(2) 35 mm self-declared, not included in IEC/EN approval.
(3) Wires must be of like size and stranding. Up to two wires per terminal slot.

Power Loss Due to Current

Rated Current [A]	Power Loss Per Pole [W]	Rated Current [A]	Power Loss Per Pole [W]
0.5	1.4	15	2.4
1	1.4	16	2.5
1.6	1.8	20	2.5
2	1.8	25	3.2
3	1.6	30	3.5
4	1.8	32	3.7
5	1.9	35	4.1
6	2.0	40	4.5
7	1.1	50	4.5
8	1.5	60	4.9
10	2.1	63	5.4
13	2.3	–	–

The installation of several devices side by side with rated current on all poles requires a correction factor to the rated current (not required if spacers are used).

Zero-stack Derating

No. of Adjacent Devices	Correction Factor
1	1
2,3	0.9
4,5	0.8
≥ 6	0.75

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 1 - Bulletin 1489-M 1-Pole Devices

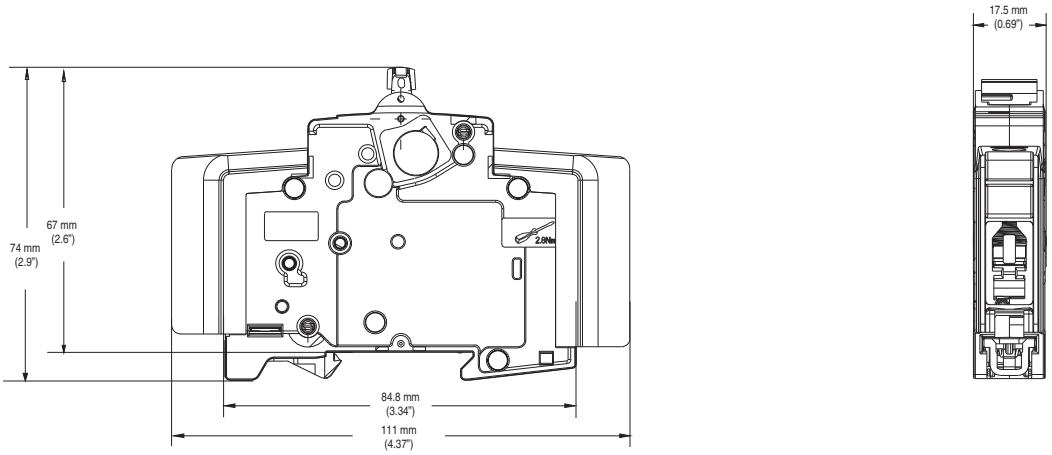
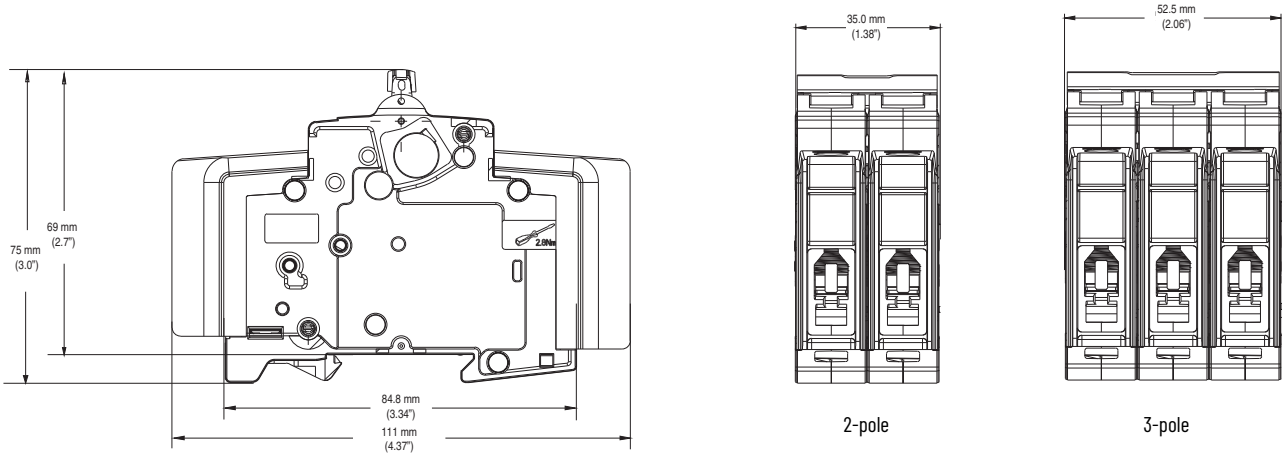


Figure 2 - Bulletin 1489-M 2- and 3-Pole Devices



Application Information

Circuit Voltage

Bulletin 1489-M thermal-magnetic circuit breakers are rated by voltage class. Applications should not exceed the listed voltage and current range.

Circuit Frequency

Bulletin 1489-M thermal-magnetic circuit breakers may be applied to frequencies of 50 Hz and 60 Hz without derating. For applications above 60 Hz, contact Rockwell Automation with specific application information for the derating of the circuit breakers.

Available Short-circuit Current

You should only apply Bulletin 1489-M thermal-magnetic circuit breakers in those applications in which the available short-circuit (or fault) current is less than or equal to 10 kA (US/Canada) and 15 kA (IEC).

Tripping Characteristics

Trip curve characteristics are shown on the following pages. The trip bands shown for each breaker represent current tripping limits for a circuit breaker and are within the limits established by UL.

The standard tripping characteristic for Bulletin 1489-M is Type C. Type C has a magnetic trip activated at 5...10 times the rated current of the circuit breaker. The reference temperature for the thermal tripping characteristics is 30 °C (86 °F). The Type C characteristic suits most applications.

In rare occurrences when the Type C characteristic does not fully meet the application, Type D magnetic trip characteristic is available, allowing for transients approximately twice as high as the standard Type C.

For a specific current at 30 °C (86 °F), a circuit breaker opens (clears the circuit) automatically at some total time that is within the minimum and maximum time shown on the curves. For example, a one-pole, 15 A, Bulletin 1489-M circuit breaker trips in not less than 1 s and not more than 200 s on a 30 A current. Because the UL standard defines this time spread, users should not specify exact tripping time. The lower current portion of the curves (upper left) depicts the time to trip due to thermal action and reflect overload protection of the wire and connect load. The higher current portion of the curves (lower right) depicts the trip due to magnetic action of the circuit breaker and reflects protection due to short circuit level currents.

Application Considerations

The following is a discussion of application considerations related to North American applications. When applying product to IEC regional requirements, follow IEC practices and guidelines.

The selection of a specific ampere rating for a specific application is dependent on the type of load and duty cycle and is governed by the National Electrical Code (Canadian Electrical Code) and UL/CSA. In general, the codes require that overcurrent protection is at the current supply and at points where wire sizes are reduced. In addition, the codes state that conductors be protected according to their current carrying capacity. There are specific situations that require application consideration, such as motor circuit, and guidelines for the selection for transformer protection.

Bulletin 1489-M thermal-magnetic circuit breakers are "non-100% rated" as defined by UL 489, paragraph 7.1.4.2. As such, the circuit breaker should be loaded to no more than 80% of its rating if it is used with continuous loads.

Line and load may be reversed. Bulletin 1489-M thermal-magnetic circuit breaker may be bottom fed.

Branch Circuits

Bulletin 1489-M circuit breakers may be used to protect branch circuits. A branch circuit is the wiring portion of a system extending beyond the final overcurrent device protecting the circuit. Guidelines established in NEC, CEC, UL, and CSA should be used to determine the specific device. For example:

Motor Branch Circuit

Bulletin 1489-M circuit breakers are not horsepower rated because they are able to safely interrupt currents far in excess of the locked rotor value for a selected motor. This ability is recognized in the codes and standards and is also established by the UL and CSA tests described in UL 489 and CSA C22.2 No. 5 standards.

The size of a Bulletin 1489-M circuit breaker should be determined following the guidelines for an Inverse Time Circuit Breaker.

References: NEC 430.51 and UL 489. Also see CEC and appropriate Canadian Standards.

Transformer Protection

Bulletin 1489-M circuit breakers may be used for transformer protection following the guidelines established.

References: NEC 450 and UL 489. Also see CEC and appropriate Canadian Standards.

Heater Load, Lighting, and Other Load Protection Bulletin 1489-M circuit breakers may be used for protection of heater loads, lighting loads, and other loads following the guidelines established.

References: NEC Article 31 and UL 508A. Also see CEC and appropriate Canadian Standards.

SWD Rating

The Bulletin 1489-M breakers (0.5 ... 20 A) are rated as Switch Duty (SWD) and as such may be applied to switch fluorescent lighting loads up to their current and voltage maximum.

Coordinated Overcurrent Protection

Where an orderly shutdown is required to minimize the hazards to personnel and equipment, a system of coordination based upon the faulted or overloaded circuit is isolated by selective operation of only the overcurrent protective device closest to the overcurrent condition. You should select devices that meet this requirement. References: *NEC 240.12. Also see CEC.*

HACR Rating

Bulletin 1489-M Circuit Breakers are rated as Heating, Air Conditioning and Refrigeration circuit breakers as defined by UL 489, paragraph 6.7 and may be used in this type of application.

Current Limiting

Bulletin 1489-M Circuit Breakers are rated as current limiting circuit breakers as defined by UL 489, paragraph 8.6.

The Bulletin 1489-M line features the ability to achieve short circuit interruptions far more effectively than conventional breakers. In conventional circuit breakers, the short circuit interruption time required is approximately one or two half cycles of an AC sine wave. When the contacts open, the resulting arc continues to burn until the current level passes through zero. The arc may re-ignite because of the insufficient width of the contact gap. The current that flows until the arc is extinguished produces a heating effect proportional to the I^2t value (let-through-energy) of the fault current.

The Bulletin 1489-M device is designed to substantially reduce the amount of let-through-current and the resulting let-through-energy that can damage protected components. The Bulletin 1489-M has the ability to interrupt short circuit current within the first half cycle of the fault. Limiting let-through current and energy helps protect against the harmful effects of overcurrent and is focused primarily on avoiding excessive heat and mechanical damage.

Both of these factors are proportional to the square of the current. Thermal energy is proportional to the square of the root mean square (RMS) value and magnetic forces are proportional to the square of the peak value. The most effective way to provide protection is to substantially limit let-through-energy. This provides the following advantages:

- Far less damage at the location of the short circuit.
- Fast electric separation of a faulty unit from the system, especially power supplies connected in parallel that are switched off when the voltage of the power bus drops below a certain level.
- Far less wear on the miniature circuit breaker itself. This means more safe interruptions.
- Better protection of all components in the short circuit path.
- Far wider range of selective action when used with an upstream protective device. (No nuisance shut downs from feeder line interruptions, causing a blackout in all connected branches.)

Ambient Temperature Derating

- Bulletin 1489-M thermal-magnetic circuit breakers are rated in RMS amperes at a 40 °C (104 °F) ambient temperature per UL 489/CSA C22.2 No. 5. This temperature is used as the ambient temperature external to an industrial enclosure.
- If a circuit breaker is applied in a temperature that exceeds the 40 °C (104 °F) ambient rating, then the circuit breaker should be derated using the table below. For IEC 60947-2 standard, the products carry an ambient rating of 30 °C (86 °F).
- Follow standard IEC application considerations for temperature rating in different ambient temperatures.
- Application below 0 °C (32 °F) is for non-condensing atmosphere. Care should be taken for applications at or below 0 °C (32 °F). These devices are not certified to operate correctly in the presence of ice.

Table 1 - Bulletin 1489-M Temperature Derating, UL Applications—Reference Temperature 40 °C (104 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9
1.6	2.0	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.5	1.5
2	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9
3	3.7	3.7	3.6	3.4	3.3	3.0	3.1	3	2.9	2.8
4	5.0	4.9	4.7	4.6	4.4	4.3	4.1	4	3.9	3.8
5	6.2	6.1	5.9	5.7	5.6	5.4	5.2	5	4.8	4.7
6	7.4	7.3	7.1	6.9	6.7	6.4	6.2	6	5.8	5.7
7	8.7	8.6	8.3	8.0	7.8	7.5	7.3	7	6.7	6.6
8	9.9	9.8	9.5	9.2	8.9	8.6	8.3	8	7.7	7.6
10	12.4	12.2	11.9	11.5	11.1	10.7	10.4	10	9.6	9.4
13	16.1	15.9	15.4	14.9	14.4	14.0	13.5	13	12.5	12.3
15	18.6	18.3	17.8	17.2	16.7	16.1	15.6	15	14.4	14.2
16	19.8	19.6	19.0	18.4	17.8	17.2	16.6	16	15.4	15.1
20	24.8	24.4	23.7	23.0	22.2	21.5	20.7	20	19.3	18.9
25	31.0	30.6	29.6	28.7	27.8	26.9	25.9	25	24.1	23.6
30	37.2	36.7	35.6	34.4	33.3	32.2	31.1	30	28.9	28.3
32	39.7	39.1	37.9	36.7	35.6	34.4	33.2	32	30.8	30.2
35	43.4	42.8	41.5	40.2	38.9	37.6	36.3	35	33.7	33.1
40	49.6	48.9	47.4	45.9	44.4	43.0	41.5	40	38.5	37.8
50	62.0	61.1	59.3	57.4	55.6	53.7	51.9	50	48.2	47.2
60	74.4	73.3	71.1	68.9	66.7	64.4	62.2	60	57.8	56.7
63	78.2	77.0	74.7	72.3	70.0	67.7	65.3	63	60.7	59.5

Table 2 - Bulletin 1489-M Temperature Derating, IEC Applications—Reference Temperature 30 °C (86 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9	0.9
1.6	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.5	1.5	1.5
2	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9	1.8
3	3.6	3.6	3.4	3.3	3.2	3.1	3	2.9	2.8	2.7
4	4.8	4.7	4.6	4.4	4.3	4.1	4	3.9	3.7	3.6
5	6.0	5.9	5.7	5.6	5.4	5.2	5	4.8	4.6	4.5
6	7.2	7.1	6.9	6.7	6.4	6.2	6	5.8	5.6	5.4
7	8.4	8.3	8.0	7.8	7.5	7.3	7	6.7	6.5	6.4
8	9.6	9.5	9.2	8.9	8.6	8.3	8	7.7	7.4	7.3
10	12.0	11.9	11.5	11.1	10.7	10.4	10	9.6	9.3	9.1
13	15.6	15.4	14.9	14.4	14.0	13.5	13	12.5	12.0	11.8
15	18.1	17.8	17.2	16.7	16.1	15.6	15	14.4	13.9	13.6
16	19.3	19.0	18.4	17.8	17.2	16.6	16	15.4	14.8	14.5
20	24.1	23.7	23.0	22.2	21.5	20.7	20	19.3	18.5	18.2
25	30.1	29.6	28.7	27.8	26.9	25.9	25	24.1	23.2	22.7
30	36.1	35.6	34.4	33.3	32.2	31.1	30	28.9	27.8	27.2
32	38.5	37.9	36.7	35.6	34.4	33.2	32	30.8	29.6	29.0
35	42.1	41.5	40.2	38.9	37.6	36.3	35	33.7	32.4	31.8
40	48.1	47.4	45.9	44.4	43.0	41.5	40	38.5	37.0	36.3
50	60.2	59.3	57.4	55.6	53.7	51.9	50	48.2	46.3	45.4
60	72.2	71.1	68.9	66.7	64.4	62.2	60	57.8	55.6	54.5
63	75.8	74.7	72.3	70.0	67.7	65.3	63	60.7	58.3	57.2

Tripping Characteristics

- DC trip curves: when using Bulletin 1489-M_ devices on DC applications or DC loads, use the AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip x the continuous current rating (I_n).
  - For C trip curve = 7.5...15 x rated current (I/I_n).
  - For D trip curve = 15...30 x rated current (I/I_n).
- The thermal trip times are the same for both AC and DC applications.
- I_1 is the lower trip range. If the overcurrent condition is 1.04 x Rated Current (I_n) the breaker does not trip. At a level of 1.05 x I_n, the breaker trips according to the trip curve.
- I_2 is the higher trip range. The breaker must trip at that level. The tripping time follows the trip curve.

Figure 3 - C Curve

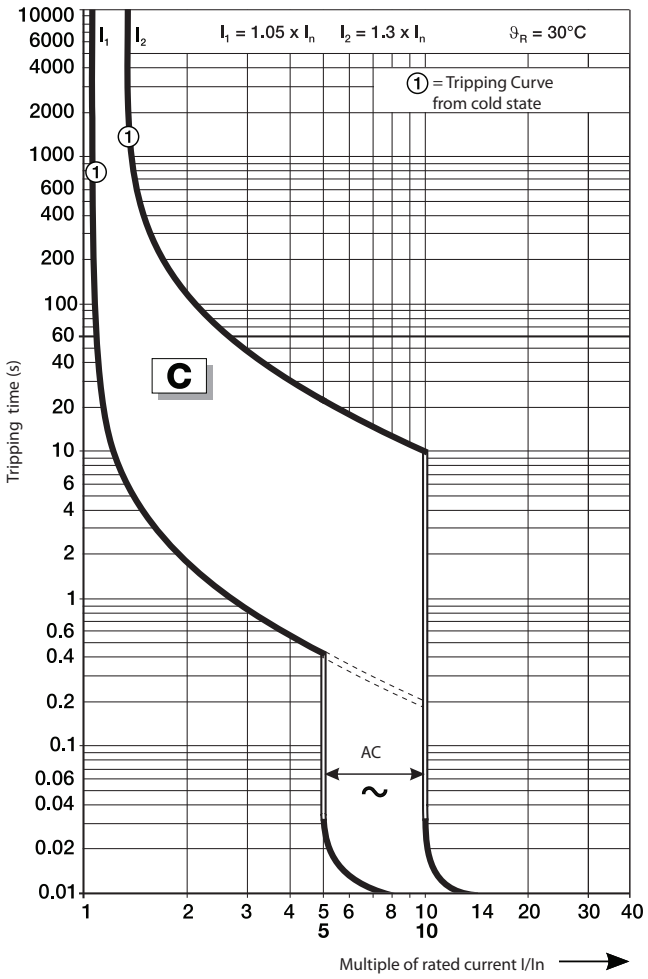
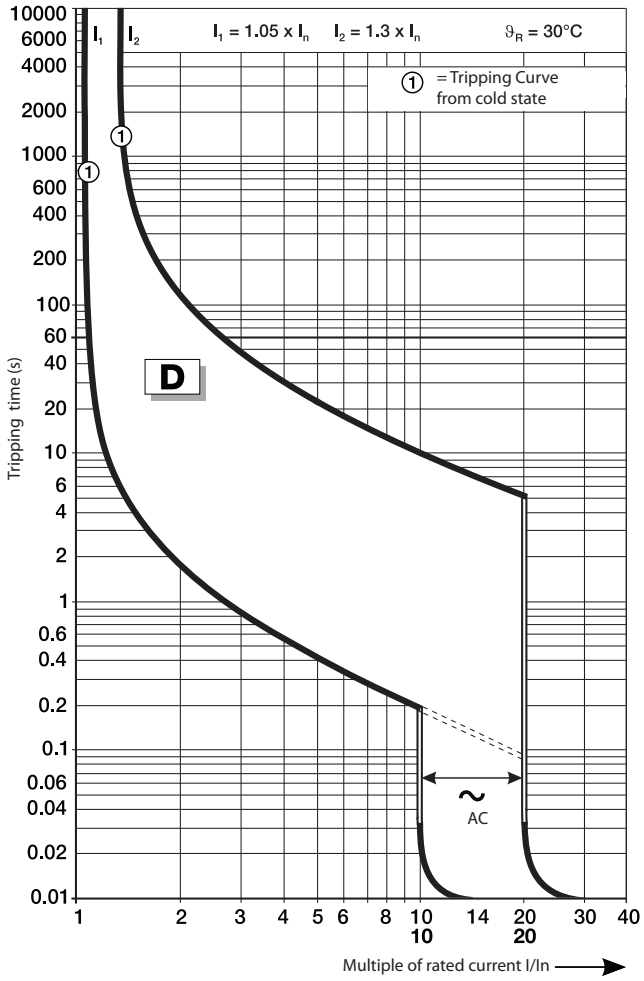


Figure 4 - D Curve



Accessories

Right Mount

Photo	Product Description (1) (2)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip • Min. operational current/voltage: – 10 mA at 12V – 5 mA at 24V • two wires per terminal (one wire per terminal slot)		UL 489 CSA 22.2 No. 5 EN 60947-5-2	UL Listed CSA Certified CE Marked	110...415V AC 110...250V DC	–	1489-AMST1
			UL 489 CSA 22.2 No. 5 EN 60947-5-2	UL Listed CSA Certified CE Marked	12...60V AC/DC	–	1489-AMST2
	Signal Contact • only operates when the protective device trips • Min. operational current/voltage: – 10 mA at 12V – 5 mA at 24V • up to two wires per terminal	1 N.O./N.C. [(1 changeover (C.O.)] 	UL 489 CSA 22.2 No. 5 EN 60947-5-1 GB 14048.5	UL Listed CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	1489-AMRS3
	Auxiliary Contact • up to two wires per terminal • Min. operational current/voltage: – 10 mA at 12V – 5 mA at 24V	1 N.O./N.C. (1 C.O.) 	UL 489 CSA 22.2 No. 5 EN 60947-5-1 GB 14048.5	UL Listed CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	1489-AMRA3

(1) A maximum of two auxiliary contacts ***OR*** one signal contact and one auxiliary contact may installed with or without one shunt trip for each 1489-M. If a shunt trip is not used, two signal contacts may be installed on one device.

(2) A maximum of three accessories may be installed per device. The shunt trip must be mounted closest to the device, then the signal contact, then the auxiliary contact(s). For allowed combinations, see Figure 5 and Table 3.

Toggle Mount

Photo	Product Description		Cat. No.
	Lock-out attachment	for 1-pole MCB	189-ALOA1
		for multi-pole MCB	189-ALOA2

Figure 5 - Bulletin 1489-M Accessory Installation

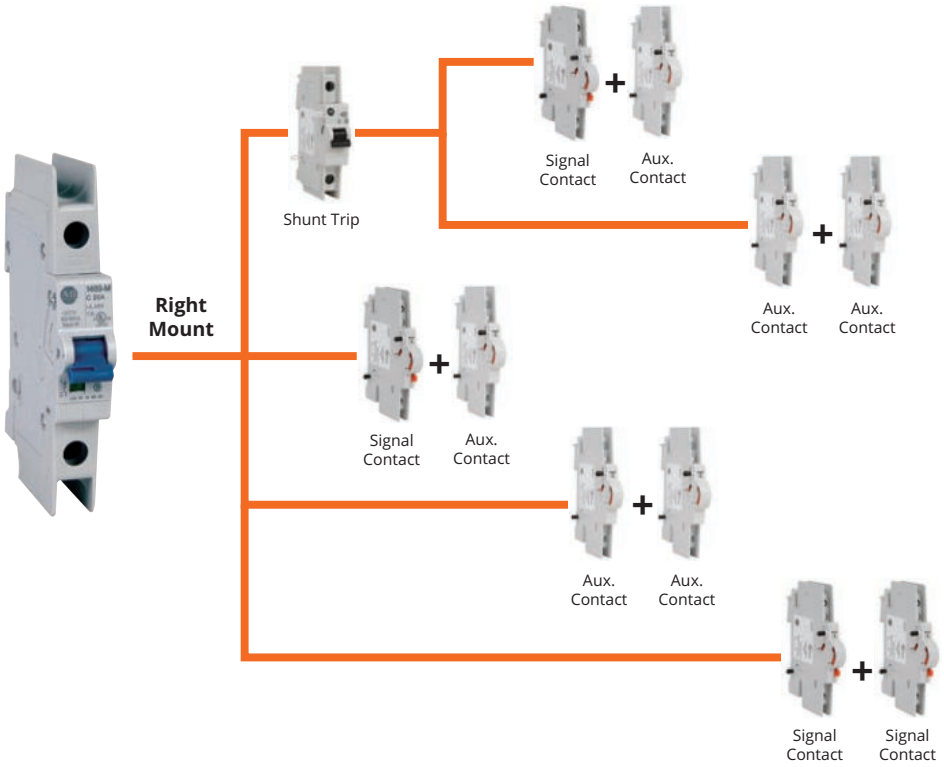


Table 3 - Bulletin 1489-M Accessory Compatibility

Type	Cat. No.	Mounting Location	Contacts
Shunt Trip	1489-AMST1	Right	–
	1489-AMST2	Right	–
Signal Contact	1489-AMRS3	Right	1 C.O.
Auxiliary Contact	1489-AMRA3	Right	1 C.O.

Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 6 - Cat. Nos. 1489-AMST1 and 1489-AMST2

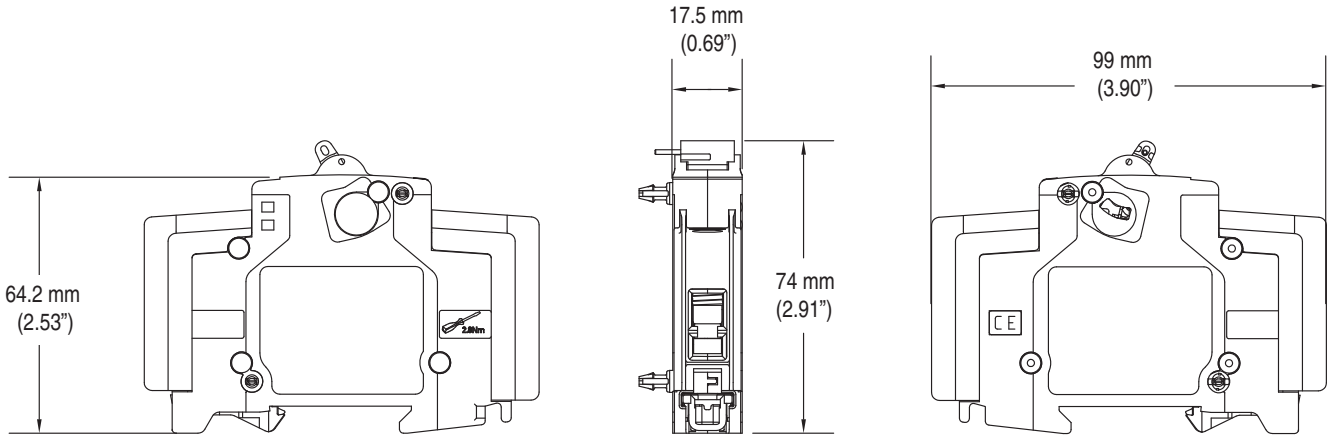


Figure 7 - Cat. No. 1489-AMRS3

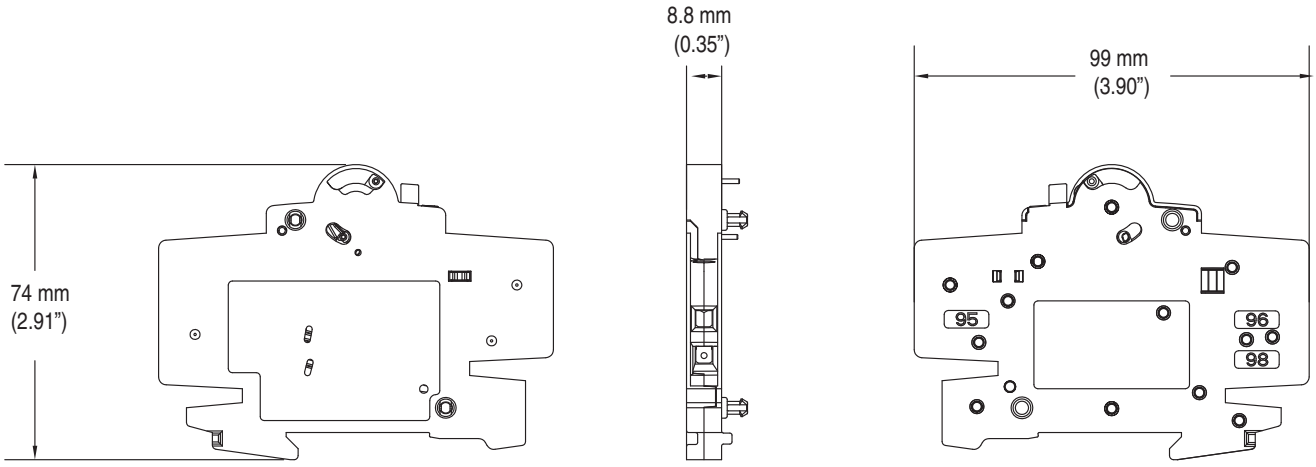
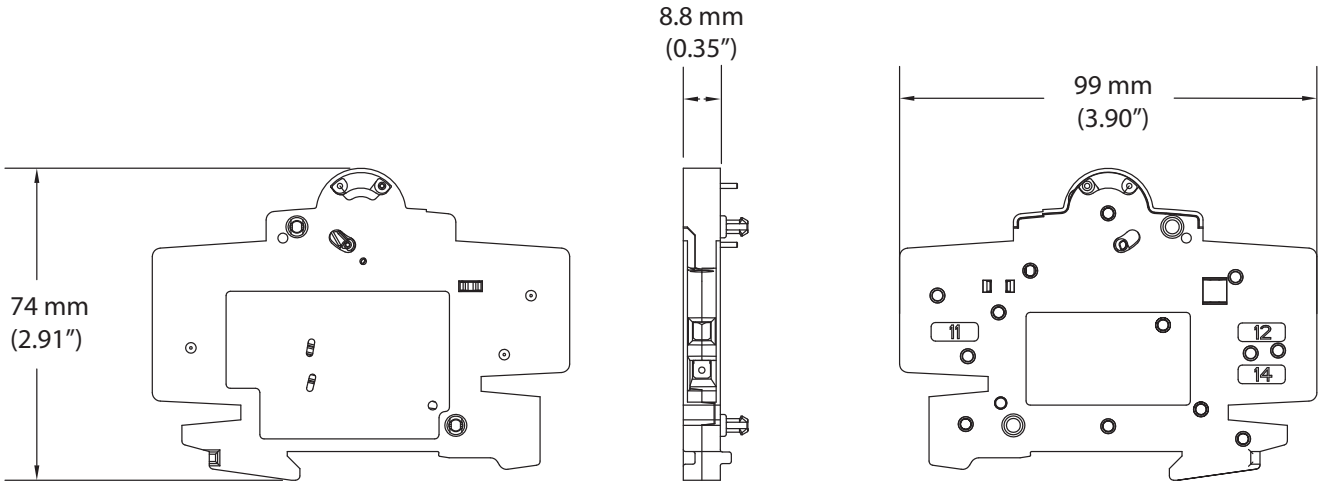


Figure 8 - Cat. No. 1489-AMRA3



Bus Bars

Current Limit: 15 A in an enclosure with dimensions ≥ 762 x 762 x 254 mm (30 x 30 x 10 in). For smaller enclosures, bus bars and power feeds are suitable for 80 A applications.

1489-M Bus Bars

No. of Phases	No. of Pins	No. of Circuit Breakers	Pkg. Qty.	Cat. No. (1) (2)
1-Phase	6	6	10	1489-AMCL106
	12	12	10	1489-AMCL112
	18	18	10	1489-AMCL118
2-Phase	6	3	10	1489-AMCL206
	12	6	10	1489-AMCL212
	18	9	10	1489-AMCL218
3-Phase	6	2	10	1489-AMCL306
	12	4	10	1489-AMCL312
	18	6	10	1489-AMCL318

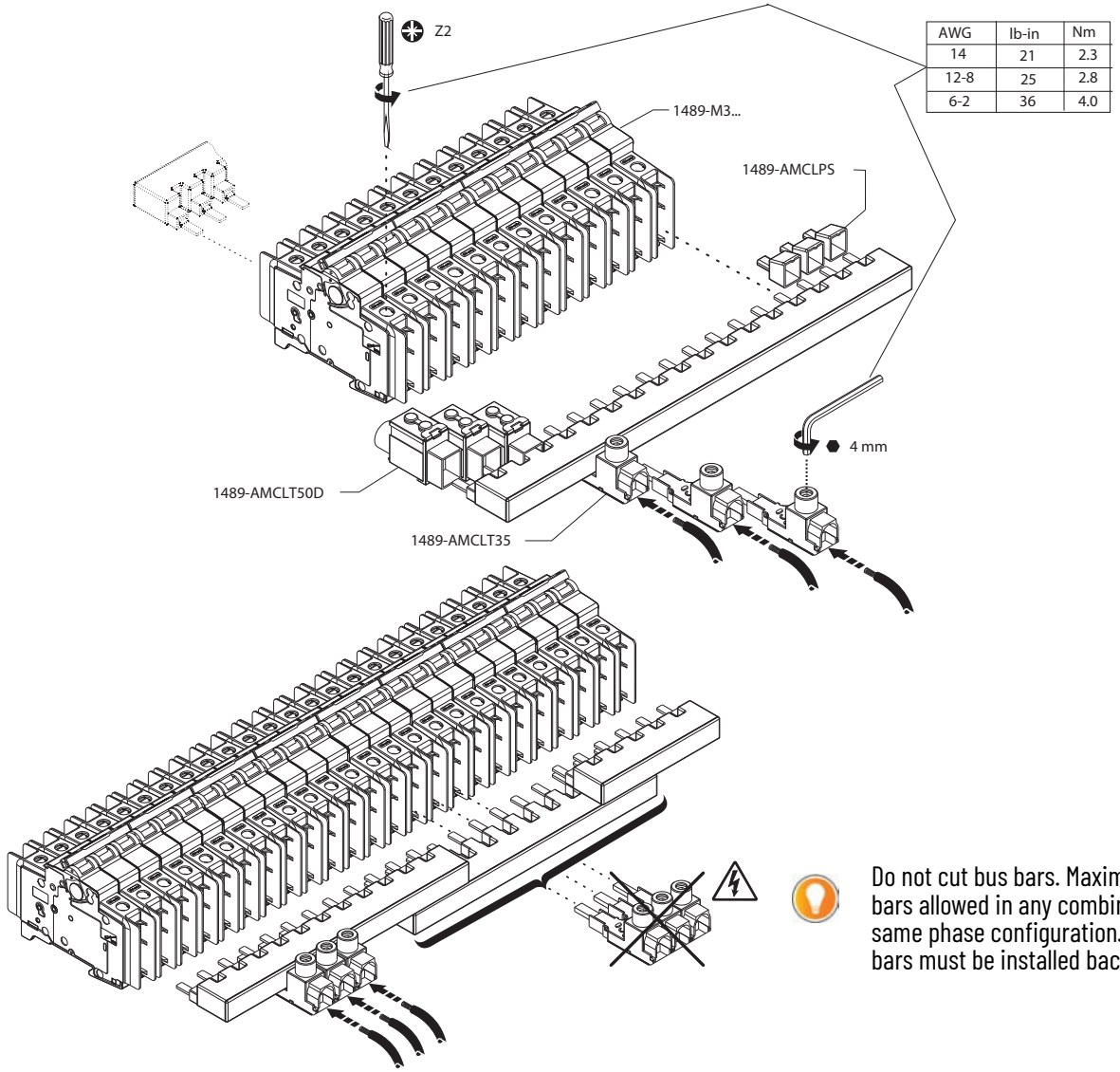
(1) cULus, UL 508, EN 60947-1, CE Marked.
(2) Maximum of three bus bars allowed.

1489-M Bus Bar Accessories

Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed Lugs, 35 mm^2 • occupy one terminal or phase on the breaker	10	1489-AMCLT35
Dedicated Power Feed Lugs, 50 mm^2 • attach and mount to the bus bar pin instead of the 1489-M terminal • add more height to the bus bar installation.	10	1489-AMCLT50D
Protective Shroud (for unused pins)	10	1489-AMCLPS

(1) cULus, UL 508, EN 60947-1, CE Marked.

Figure 9 - Bus Bar Installation



Do not cut bus bars. Maximum of 3 bus bars allowed in any combination of the same phase configuration. Multiple bus bars must be installed back-to-back.

Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 10 - 1-Phase Bus Bars

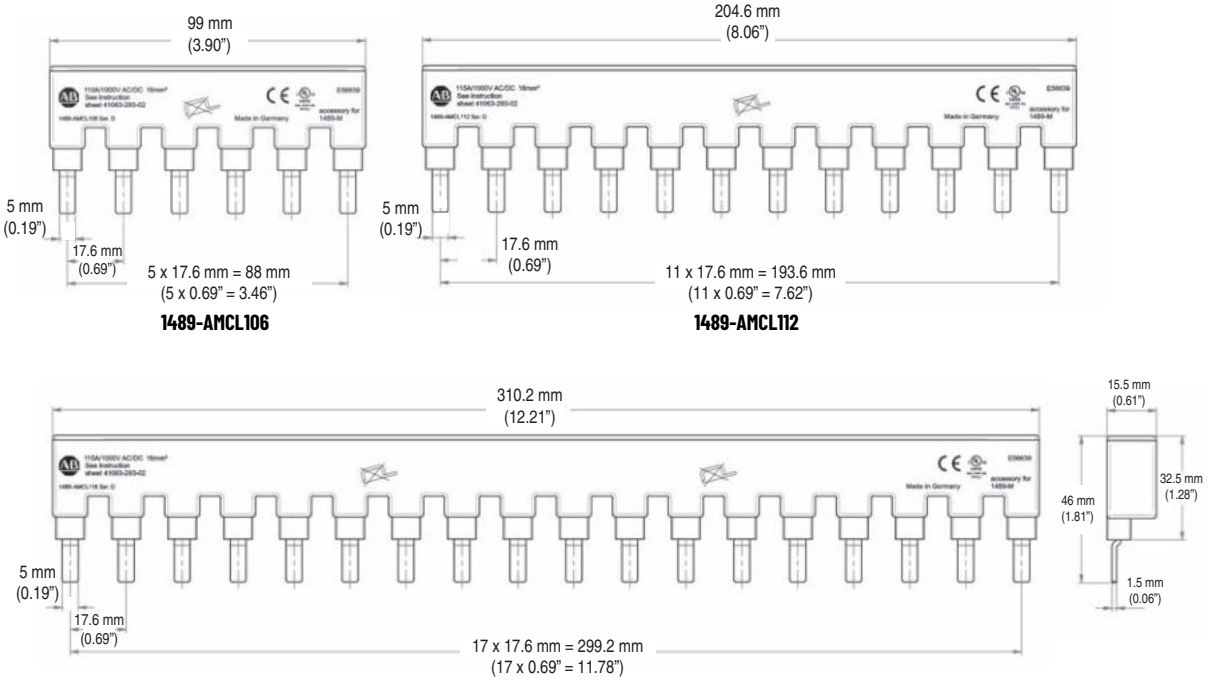


Figure 11 - 2-Phase Bus Bars

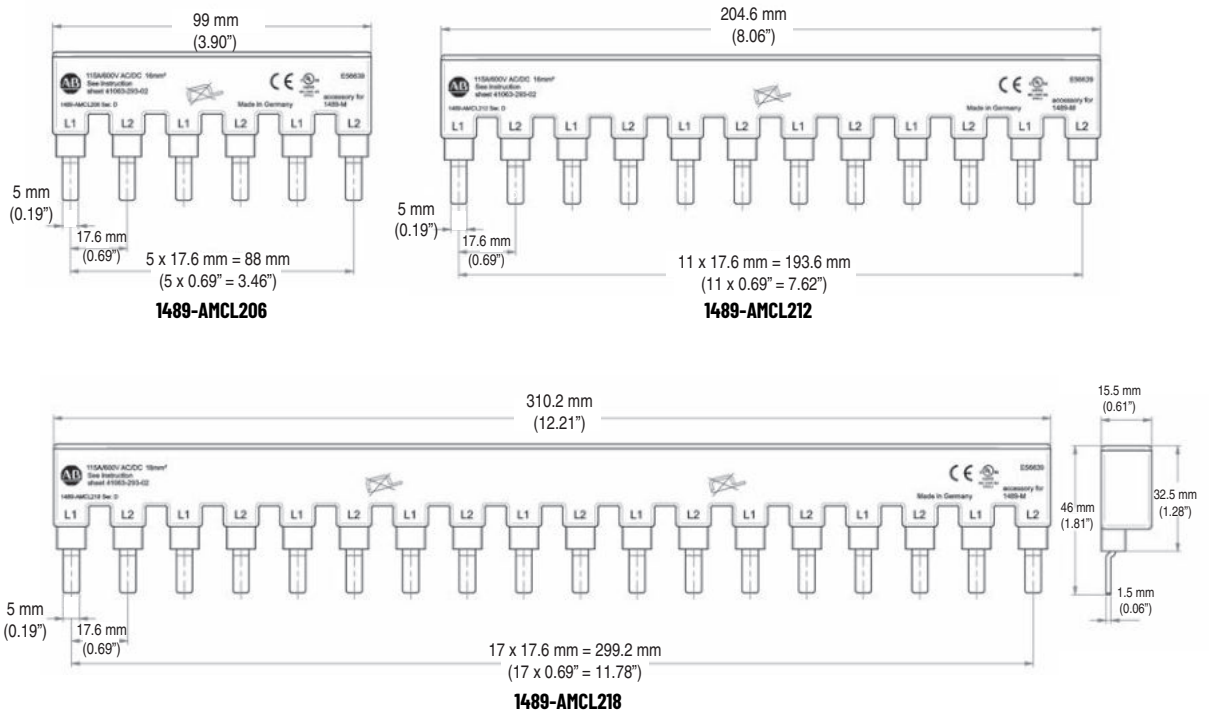
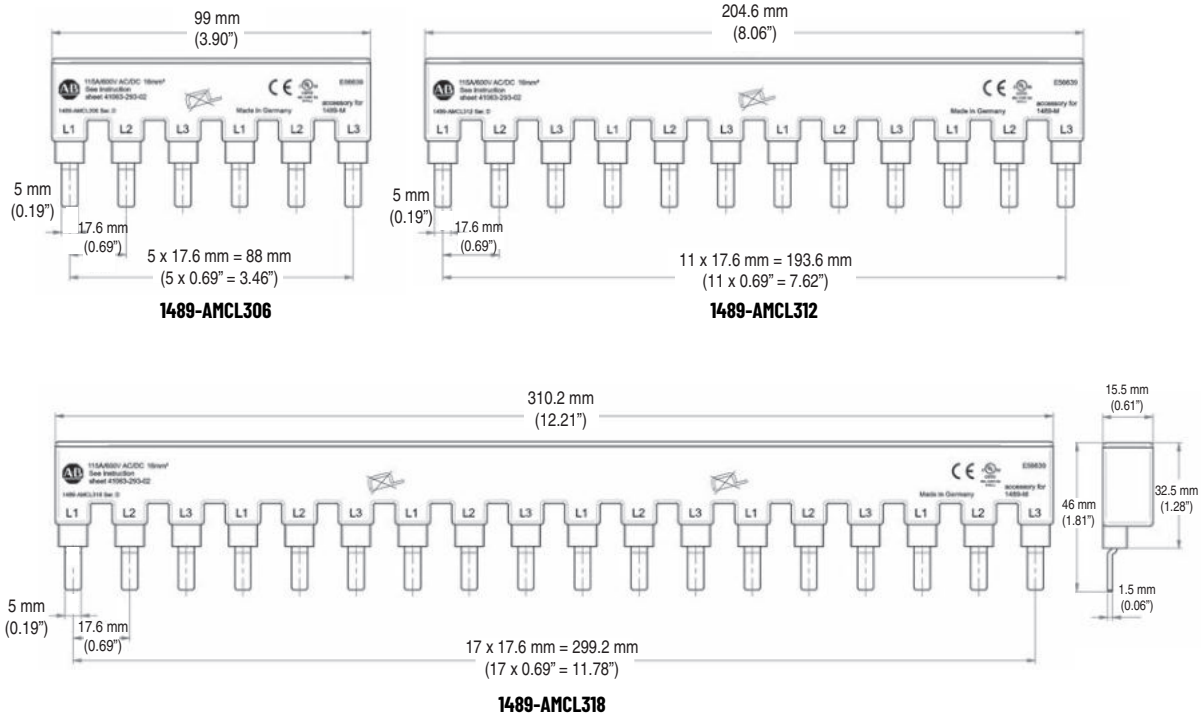


Figure 12 - 3-Phase Bus Bars

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes



Bus Bar Accessory Approximate Dimensions

Figure 13 - Cat. No. 1489-AMCLT35

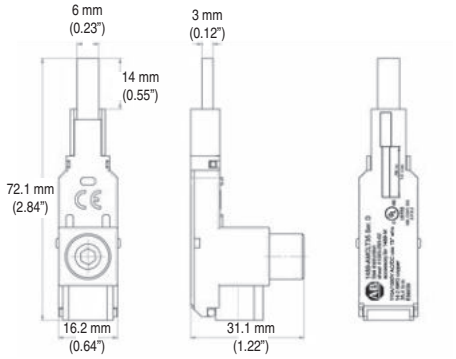


Figure 14 - Cat. No. 1489-AMCLPS

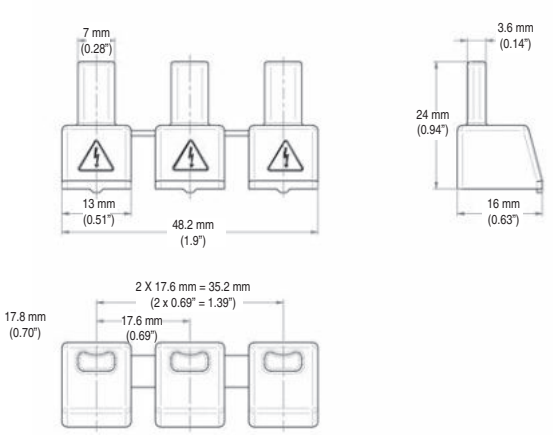
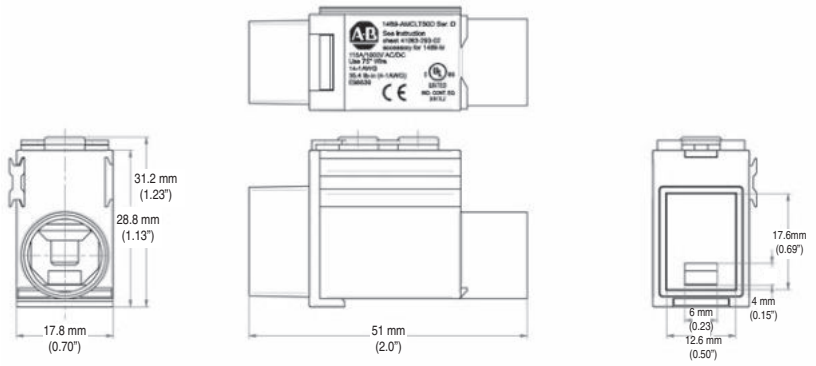
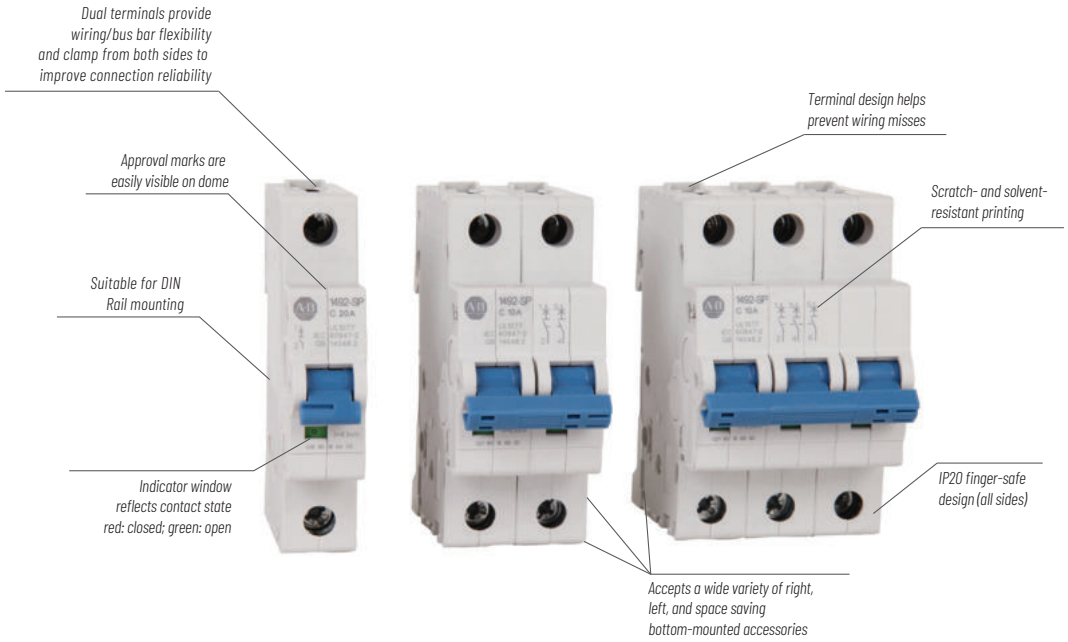


Figure 15 - Cat. No. 1489-AMCLT50D





Bulletin 1492-SP Thermal-magnetic Supplementary Protectors provide overcurrent protection for equipment where branch circuit protection is already provided, or is not required. These devices are also Miniature Circuit Breakers as defined by IEC Standards.

These supplementary protectors are offered as a broad portfolio of pole variants, current ratings, and trip curves to match the appropriate level of protection for your application. They may be used with UL 508 Listed bus bars for convenience in panel assembly, a wide range of left-, right- and space saving bottom-mount accessories, and lock out attachments for safety during maintenance.

Features include:

- Current limiting
- Fast breaking time
- Existing installations can be easily upgraded to include an auxiliary contact by using the bottom mounted auxiliary contact options, which require no DIN Rail space
- 40 °C (104 °F) calibration temperature (UL/CSA) eliminates need to derate for 508A industrial control panel installations
- Installation of up to six accessories on the same circuit breaker
- Dual terminals provide a more secure connection of up to four wires, or two wires and a bus bar
- Superior shock and vibration resistance to prevent nuisance tripping
- Terminal design helps prevent wiring misses by directing wires into the terminal openings, even while tightening
- Reversible line and load connections
- Single and multi-pole toggle mount lock out attachments available for Lockout/Tagout (LOTO)
- RoHS compliant and fully-recyclable device
- Suitable for extreme ambient conditions

1492-SP Supplementary Protectors	
Rated Voltage	UL/CSA: Max. 480Y/277V AC IEC: U_e 230/400V AC
Interrupting Capacity	UL/CSA: 5...10 kA IEC: 15 kA
Current Ratings	0.5...63 A
Poles	1, 2, 3, 1+N, 3+N
Trip Curves	B, C, D
Standards Compliance	UL 1077 CSA C22.2 No. 235 EN 60947-2 GB 14048.2
Certifications	UL Recognized, File No. E65138 (1) CSA Certified, File No. 259391 (1) DNV GL Type Approval CE Marked UKCA Marked KCC Certified(1) CCC Certified VDE Certified RoHS Compliant

(1) 1+N and 3+N devices are not UL Recognized, CSA Certified, or KCC Certified.

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492	–	SPM	1	C	010	N
		a	b	c	d	e

a

Voltage Type	
Code	**Description**
SPM	AC Supplementary Protector

b

Poles	
Code	**Description**
1	1-Pole
2	2-Pole
3	3-Pole

c

Trip Curve	
Code	**Description**
B	Trip Curve B
C	Trip Curve C
D	Trip Curve D

d

Rated Current (I_n)	
Code	**Current [A]**
005	0.5
010	1
020	2
030	3
040	4
050	5
060	6
070	7
080	8
100	10
130	13
150	15
160	16
200	20
250	25
300	30
320	32
400	40
500	50
630	63

e

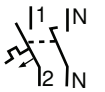
+ Neutral (available for 1+N and 3+N configurations)	
Code	**Description**
	Can be left blank
N	+ Neutral

Product Selection

1-Pole Supplementary Protectors

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.
  1-pole	0.5	1492-SPM1B005	1492-SPM1C005	1492-SPM1D005
	1	1492-SPM1B010	1492-SPM1C010	1492-SPM1D010
	2	1492-SPM1B020	1492-SPM1C020	1492-SPM1D020
	3	1492-SPM1B030	1492-SPM1C030	1492-SPM1D030
	4	1492-SPM1B040	1492-SPM1C040	1492-SPM1D040
	5	1492-SPM1B050	1492-SPM1C050	1492-SPM1D050
	6	1492-SPM1B060	1492-SPM1C060	1492-SPM1D060
	7	1492-SPM1B070	1492-SPM1C070	1492-SPM1D070
	8	1492-SPM1B080	1492-SPM1C080	1492-SPM1D080
	10	1492-SPM1B100	1492-SPM1C100	1492-SPM1D100
	13	1492-SPM1B130	1492-SPM1C130	1492-SPM1D130
	15	1492-SPM1B150	1492-SPM1C150	1492-SPM1D150
	16	1492-SPM1B160	1492-SPM1C160	1492-SPM1D160
	20	1492-SPM1B200	1492-SPM1C200	1492-SPM1D200
	25	1492-SPM1B250	1492-SPM1C250	1492-SPM1D250
	30	1492-SPM1B300	1492-SPM1C300	1492-SPM1D300
	32	1492-SPM1B320	1492-SPM1C320	1492-SPM1D320
	40	1492-SPM1B400	1492-SPM1C400	1492-SPM1D400
	50	1492-SPM1B500	1492-SPM1C500	1492-SPM1D500
	63	1492-SPM1B630	1492-SPM1C630	1492-SPM1D630

1-Pole + Neutral Supplementary Protectors[1]

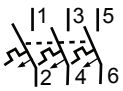
Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.
  1-pole +N	0.5	1492-SPM1B005-N	1492-SPM1C005-N	1492-SPM1D005-N
	1	1492-SPM1B010-N	1492-SPM1C010-N	1492-SPM1D010-N
	2	1492-SPM1B020-N	1492-SPM1C020-N	1492-SPM1D020-N
	3	1492-SPM1B030-N	1492-SPM1C030-N	1492-SPM1D030-N
	4	1492-SPM1B040-N	1492-SPM1C040-N	1492-SPM1D040-N
	5	1492-SPM1B050-N	1492-SPM1C050-N	1492-SPM1D050-N
	6	1492-SPM1B060-N	1492-SPM1C060-N	1492-SPM1D060-N
	7	1492-SPM1B070-N	1492-SPM1C070-N	1492-SPM1D070-N
	8	1492-SPM1B080-N	1492-SPM1C080-N	1492-SPM1D080-N
	10	1492-SPM1B100-N	1492-SPM1C100-N	1492-SPM1D100-N
	13	1492-SPM1B130-N	1492-SPM1C130-N	1492-SPM1D130-N
	15	1492-SPM1B150-N	1492-SPM1C150-N	1492-SPM1D150-N
	16	1492-SPM1B160-N	1492-SPM1C160-N	1492-SPM1D160-N
	20	1492-SPM1B200-N	1492-SPM1C200-N	1492-SPM1D200-N
	25	1492-SPM1B250-N	1492-SPM1C250-N	1492-SPM1D250-N
	30	1492-SPM1B300-N	1492-SPM1C300-N	1492-SPM1D300-N
	32	1492-SPM1B320-N	1492-SPM1C320-N	1492-SPM1D320-N
	40	1492-SPM1B400-N	1492-SPM1C400-N	1492-SPM1D400-N
	50	1492-SPM1B500-N	1492-SPM1C500-N	1492-SPM1D500-N
	63	1492-SPM1B630-N	1492-SPM1C630-N	1492-SPM1D630-N

(1) 1+N configurations are not UL or CSA certified.

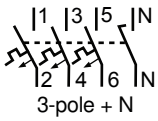
2-Pole Supplementary Protectors

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.
  2-pole	0.5	1492-SPM2B005	1492-SPM2C005	1492-SPM2D005
	1	1492-SPM2B010	1492-SPM2C010	1492-SPM2D010
	2	1492-SPM2B020	1492-SPM2C020	1492-SPM2D020
	3	1492-SPM2B030	1492-SPM2C030	1492-SPM2D030
	4	1492-SPM2B040	1492-SPM2C040	1492-SPM2D040
	5	1492-SPM2B050	1492-SPM2C050	1492-SPM2D050
	6	1492-SPM2B060	1492-SPM2C060	1492-SPM2D060
	7	1492-SPM2B070	1492-SPM2C070	1492-SPM2D070
	8	1492-SPM2B080	1492-SPM2C080	1492-SPM2D080
	10	1492-SPM2B100	1492-SPM2C100	1492-SPM2D100
	13	1492-SPM2B130	1492-SPM2C130	1492-SPM2D130
	15	1492-SPM2B150	1492-SPM2C150	1492-SPM2D150
	16	1492-SPM2B160	1492-SPM2C160	1492-SPM2D160
	20	1492-SPM2B200	1492-SPM2C200	1492-SPM2D200
	25	1492-SPM2B250	1492-SPM2C250	1492-SPM2D250
	30	1492-SPM2B300	1492-SPM2C300	1492-SPM2D300
	32	1492-SPM2B320	1492-SPM2C320	1492-SPM2D320
	40	1492-SPM2B400	1492-SPM2C400	1492-SPM2D400
	50	1492-SPM2B500	1492-SPM2C500	1492-SPM2D500
	63	1492-SPM2B630	1492-SPM2C630	1492-SPM2D630

3-Pole Supplementary Protectors

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.
  3-pole	0.5	1492-SPM3B005	1492-SPM3C005	1492-SPM3D005
	1	1492-SPM3B010	1492-SPM3C010	1492-SPM3D010
	2	1492-SPM3B020	1492-SPM3C020	1492-SPM3D020
	3	1492-SPM3B030	1492-SPM3C030	1492-SPM3D030
	4	1492-SPM3B040	1492-SPM3C040	1492-SPM3D040
	5	1492-SPM3B050	1492-SPM3C050	1492-SPM3D050
	6	1492-SPM3B060	1492-SPM3C060	1492-SPM3D060
	7	1492-SPM3B070	1492-SPM3C070	1492-SPM3D070
	8	1492-SPM3B080	1492-SPM3C080	1492-SPM3D080
	10	1492-SPM3B100	1492-SPM3C100	1492-SPM3D100
	13	1492-SPM3B130	1492-SPM3C130	1492-SPM3D130
	15	1492-SPM3B150	1492-SPM3C150	1492-SPM3D150
	16	1492-SPM3B160	1492-SPM3C160	1492-SPM3D160
	20	1492-SPM3B200	1492-SPM3C200	1492-SPM3D200
	25	1492-SPM3B250	1492-SPM3C250	1492-SPM3D250
	30	1492-SPM3B300	1492-SPM3C300	1492-SPM3D300
	32	1492-SPM3B320	1492-SPM3C320	1492-SPM3D320
	40	1492-SPM3B400	1492-SPM3C400	1492-SPM3D400
	50	1492-SPM3B500	1492-SPM3C500	1492-SPM3D500
	63	1492-SPM3B630	1492-SPM3C630	1492-SPM3D630

3-Pole + Neutral Supplementary Protectors(1)

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.
  3-pole + N	0.5	1492-SPM3B005-N	1492-SPM3C005-N	1492-SPM3D005-N
	1	1492-SPM3B010-N	1492-SPM3C010-N	1492-SPM3D010-N
	2	1492-SPM3B020-N	1492-SPM3C020-N	1492-SPM3D020-N
	3	1492-SPM3B030-N	1492-SPM3C030-N	1492-SPM3D030-N
	4	1492-SPM3B040-N	1492-SPM3C040-N	1492-SPM3D040-N
	5	1492-SPM3B050-N	1492-SPM3C050-N	1492-SPM3D050-N
	6	1492-SPM3B060-N	1492-SPM3C060-N	1492-SPM3D060-N
	7	1492-SPM3B070-N	1492-SPM3C070-N	1492-SPM3D070-N
	8	1492-SPM3B080-N	1492-SPM3C080-N	1492-SPM3D080-N
	10	1492-SPM3B100-N	1492-SPM3C100-N	1492-SPM3D100-N
	13	1492-SPM3B130-N	1492-SPM3C130-N	1492-SPM3D130-N
	15	1492-SPM3B150-N	1492-SPM3C150-N	1492-SPM3D150-N
	16	1492-SPM3B160-N	1492-SPM3C160-N	1492-SPM3D160-N
	20	1492-SPM3B200-N	1492-SPM3C200-N	1492-SPM3D200-N
	25	1492-SPM3B250-N	1492-SPM3C250-N	1492-SPM3D250-N
	30	1492-SPM3B300-N	1492-SPM3C300-N	1492-SPM3D300-N
	32	1492-SPM3B320-N	1492-SPM3C320-N	1492-SPM3D320-N
	40	1492-SPM3B400-N	1492-SPM3C400-N	1492-SPM3D400-N
	50	1492-SPM3B500-N	1492-SPM3C500-N	1492-SPM3D500-N
	63	1492-SPM3B630-N	1492-SPM3C630-N	1492-SPM3D630-N

(1) 3+N configurations are not UL or CSA certified.

Specifications

Electrical Ratings			
Poles			1, 2, 3, 1+N, 3+N
Tripping characteristics			B, C, D
Rated current (I_n)			0.5...63 A
Rated frequency (f)			50/60 Hz
Rated insulation voltage U_i per IEC/EN 60664-1			250V AC (phase to ground), 440V AC (phase to phase)
Overvoltage category			III
Pollution degree			3
Data per UL/CSA			
Rated voltage	1-pole	AC	277V AC
		DC	48V DC
	2-pole	AC	480Y/277V AC
		DC	96V DC
	3-pole	AC	480Y/277V AC
Rated interrupting capacity per UL 1077			≤ 32 A: 10 kA (AC); > 32 A: 5 kA (AC); 0.5...63 A: 10 kA (DC)
Application Supplementary [1] protector for general use; application codes: **TC1:** [1P] OLO 277V AC, [2P, 3P] OLO 480Y/277V AC; **SC:** 10 kA (0.5...32 A), 5 kA (35...63 A), U2 480Y/277V AC; FW3			
Ref. temperature for trip characteristics			40 °C
Electrical endurance			6,000 ops (AC), 6,000 ops. (DC) 1 cycle (1s - ON, 9s - OFF)
Data per IEC/EN 60947-2			
Rated operational voltage (U_e)		1-pole, 1+N	230V AC
		2-pole, 3-pole, 3+N	400V AC
Highest supply or utilization voltage (U_{max})	AC	1-pole, 1+N	253V AC
		2-pole, 3-pole, 3+N	440V AC
	DC [2]	1-pole	48V DC
		2-pole	96V DC
Min. operating voltage			12V AC, 12V DC
Rated ultimate short-circuit breaking capacity (I_{cu})			15 kA
Rated service short-circuit breaking capacity (I_{cs})			≤ 40 A: 11.25 kA > 40 A: 7.5 kA
Rated impulse withstand voltage $U_{imp.}$ (1.2/50µs)			4 kV (test voltage 6.2 kV at sea level, 5 kV at 2,000 m)
Dielectric test voltage			2 kV (50/60Hz, 1 min.)
Reference temperature for tripping characteristics			30 °C (86 °F)
Electrical endurance 1 cycle (2s - ON, 13s - OFF, I_n ≤ 32 A), 1 cycle (2s - ON, 28s - OFF, I_n > 32 A)			I_n < 30 A: 20,000 ops (AC) I_n ≥ 30 A: 10,000 ops. (AC) 1,000 ops. (DC)

(1) 2-pole/3-pole single pole load: TC2.
(2) IEC DC ratings self-declared.

Mechanical Data	
Housing	Insulation group II, RAL 7035
Indicator window	red ON/green OFF
Protection degree per EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20,000 operations

Mechanical Data		
Shock resistance per IEC/EN 60068-2-27		25 G – 2 shocks – 13 ms
Vibration resistance per IEC/EN 60068-2-6		5G – 20 cycles at 5...150...5 Hz with load 0.8 x I_n
Environmental		
Environmental conditions (damp heat) per IEC/EN 60068-2-30		28 cycles with 55 °C (131 °F)/ 90-96% and 25°C (77 °F)/ 95-100%
Ambient temperature [1]		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire [2] – solid, stranded (front/back terminal slot)		35/35 mm²
		18...4/18...10 AWG
Cross-section of wire – flexible (front/back terminal slot)		25/10 mm²
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG
		2-4 wires [3], 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm²
Tightening torque	IEC	2.8 N•m
	UL/CSA	AWG 18...16: 13.3 lb•in AWG 14...10: 17.7 lb•in AWG 8...4: 39.8 lb•in
Screwdriver		No. 2 Pozidriv
Mounting		DIN rail (EN 60715, 35mm) with fast clip
Mounting position		Any
Supply		Optional
Approximate Dimensions and Weight		
Pole dimension (H x D x W)		88 x 69 x 17.5 mm
Pole weight		115 g (4.1 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Shunt trip		Yes

(1) See Table 4 and Table 5 for ambient temperature derating values.
(2) 35 mm² self-declared, not included in IEC/EN approval.
(3) Wires must be of like size and stranding. Up to two wires per terminal slot.

Power Loss Due to Current

Rated Current [A]	Power Loss Per Pole [W]	Rated Current [A]	Power Loss Per Pole [W]
0.5	1.4	13	2.3
1	1.4	15	2.4
2	1.8	16	2.5
3	1.6	20	2.5
4	1.8	25	3.2
5	1.9	30	3.5
6	2.0	32	3.7
7	1.1	40	4.5
8	1.5	50	4.5
10	2.1	63	5.4

The installation of several devices side by side with rated current on all poles requires a correction factor to the rated current (not required if spacers are used).

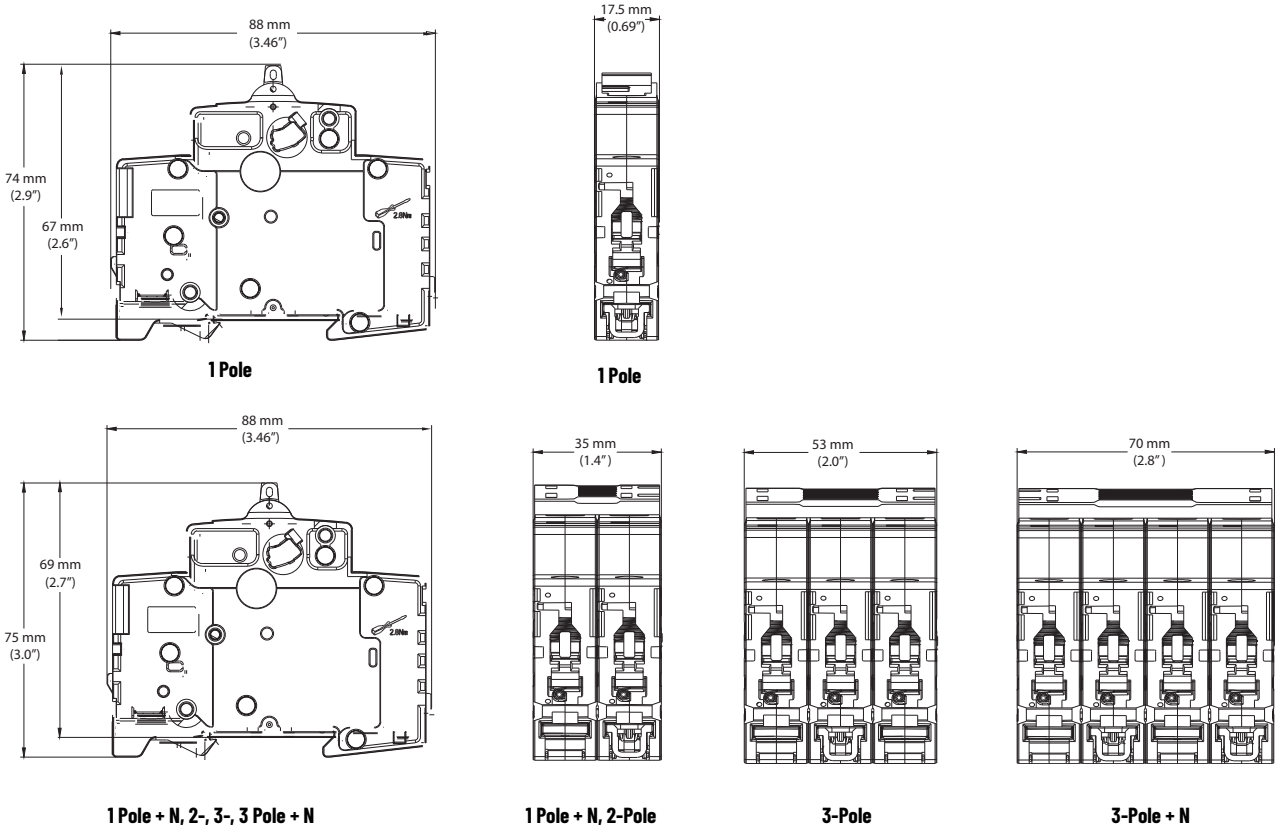
Zero-stack Derating

No. of Adjacent Devices	Correction Factor
1	1
2.3	0.9
4.5	0.8
≥ 6	0.75

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 16 - Bulletin 1492-SP Supplementary Protectors



Ambient Temperature Derating

Application below 0 °C (32 °F) is for non-condensing atmosphere. Care should be taken for applications at or below 0 °C (32 °F) . These devices are not certified to operate correctly in the presence of ice.

Table 4 - Bulletin 1489-SP Temperature Derating, UL Applications—Reference Temperature 40 °C (104 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9
2	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9
3	3.7	3.7	3.6	3.4	3.3	3.0	3.1	3	2.9	2.8
4	5.0	4.9	4.7	4.6	4.4	4.3	4.1	4	3.9	3.8
5	6.2	6.1	5.9	5.7	5.6	5.4	5.2	5	4.8	4.7
6	7.4	7.3	7.1	6.9	6.7	6.4	6.2	6	5.8	5.7
7	8.7	8.6	8.3	8.0	7.8	7.5	7.3	7	6.7	6.6
8	9.9	9.8	9.5	9.2	8.9	8.6	8.3	8	7.7	7.6
10	12.4	12.2	11.9	11.5	11.1	10.7	10.4	10	9.6	9.4
13	16.1	15.9	15.4	14.9	14.4	14.0	13.5	13	12.5	12.3
15	18.6	18.3	17.8	17.2	16.7	16.1	15.6	15	14.4	14.2
16	19.8	19.6	19.0	18.4	17.8	17.2	16.6	16	15.4	15.1
20	24.8	24.4	23.7	23.0	22.2	21.5	20.7	20	19.3	18.9
25	31.0	30.6	29.6	28.7	27.8	26.9	25.9	25	24.1	23.6
30	37.2	36.7	35.6	34.4	33.3	32.2	31.1	30	28.9	28.3
32	39.7	39.1	37.9	36.7	35.6	34.4	33.2	32	30.8	30.2
35	43.4	42.8	41.5	40.2	38.9	37.6	36.3	35	33.7	33.1
40	49.6	48.9	47.4	45.9	44.4	43.0	41.5	40	38.5	37.8
50	62.0	61.1	59.3	57.4	55.6	53.7	51.9	50	48.2	47.2
60	74.4	73.3	71.1	68.9	66.7	64.4	62.2	60	57.8	56.7
63	78.2	77.0	74.7	72.3	70.0	67.7	65.3	63	60.7	59.5

Table 5 - Bulletin 1489-SP Temperature Derating, IEC Applications—Reference Temperature 30 °C (86 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9	0.9
2	2.4	2.4	2.3	2.2	2.1	2.1	2	1.9	1.9	1.8
3	3.6	3.6	3.4	3.3	3.2	3.1	3	2.9	2.8	2.7
4	4.8	4.7	4.6	4.4	4.3	4.1	4	3.9	3.7	3.6
5	6.0	5.9	5.7	5.6	5.4	5.2	5	4.8	4.6	4.5
6	7.2	7.1	6.9	6.7	6.4	6.2	6	5.8	5.6	5.4
7	8.4	8.3	8.0	7.8	7.5	7.3	7	6.7	6.5	6.4
8	9.6	9.5	9.2	8.9	8.6	8.3	8	7.7	7.4	7.3
10	12.0	11.9	11.5	11.1	10.7	10.4	10	9.6	9.3	9.1
13	15.6	15.4	14.9	14.4	14.0	13.5	13	12.5	12.0	11.8
15	18.1	17.8	17.2	16.7	16.1	15.6	15	14.4	13.9	13.6
16	19.3	19.0	18.4	17.8	17.2	16.6	16	15.4	14.8	14.5
20	24.1	23.7	23.0	22.2	21.5	20.7	20	19.3	18.5	18.2
25	30.1	29.6	28.7	27.8	26.9	25.9	25	24.1	23.2	22.7
30	36.1	35.6	34.4	33.3	32.2	31.1	30	28.9	27.8	27.2
32	38.5	37.9	36.7	35.6	34.4	33.2	32	30.8	29.6	29.0
35	42.1	41.5	40.2	38.9	37.6	36.3	35	33.7	32.4	31.8
40	48.1	47.4	45.9	44.4	43.0	41.5	40	38.5	37.0	36.3
50	60.2	59.3	57.4	55.6	53.7	51.9	50	48.2	46.3	45.4
60	72.2	71.1	68.9	66.7	64.4	62.2	60	57.8	55.6	54.5
63	75.8	74.7	72.3	70.0	67.7	65.3	63	60.7	58.3	57.2

Tripping Characteristics

- DC trip curves: when using Bulletin 1492-SPM_ devices on DC applications or DC loads, see the AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating (I_n).
  - For B trip curve = 4.5…7.5 x rated current (I/I_n).
  - For C trip curve = 7.5…15 x rated current (I/I_n).
  - For D trip curve = 15…30 x rated current (I/I_n).
- The thermal trip times remain the same for both AC and DC applications.
- I_1 is the lower trip range. If the overcurrent condition is 1.04 x Rated Current (I_n) the breaker does not trip. At a level of 1.05 x I_n, the breaker trips according to the trip curve.
- I_2 is the higher trip range. The breaker must trip at that level. The tripping time follows the trip curve.

Figure 17 - B Curve

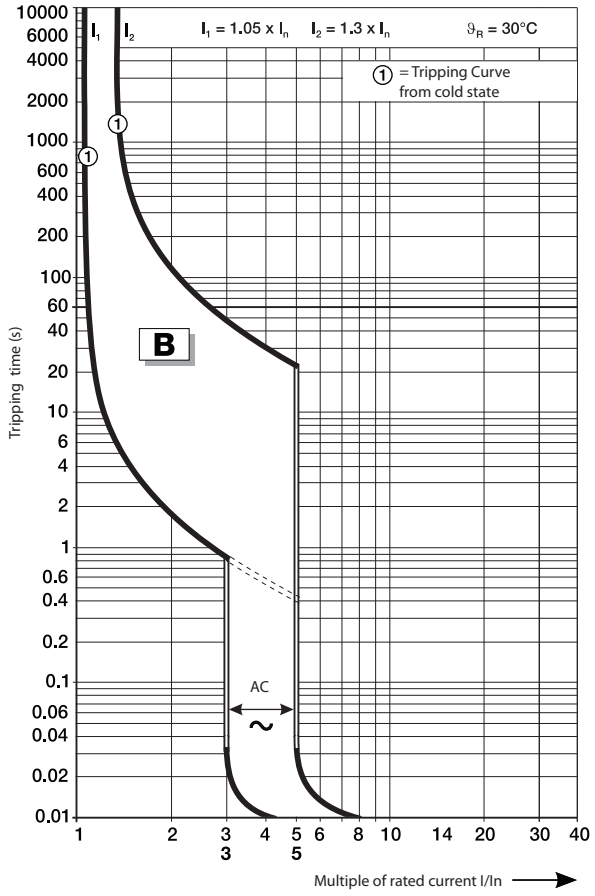


Figure 18 - C Curve

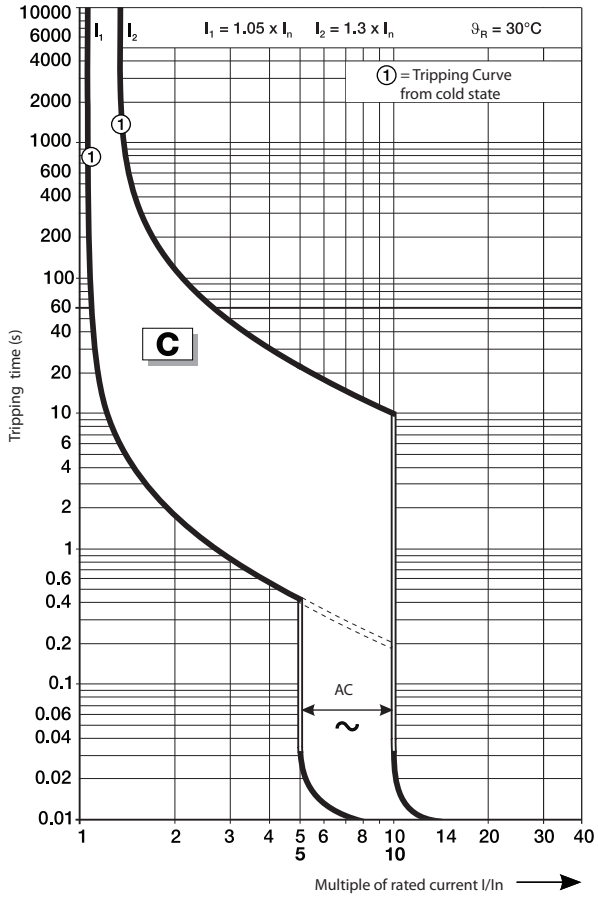
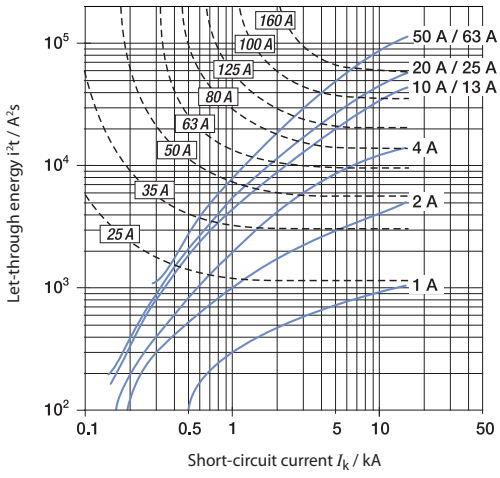


Figure 19 - B and C Curves – 230/400V AC Let-through Energy



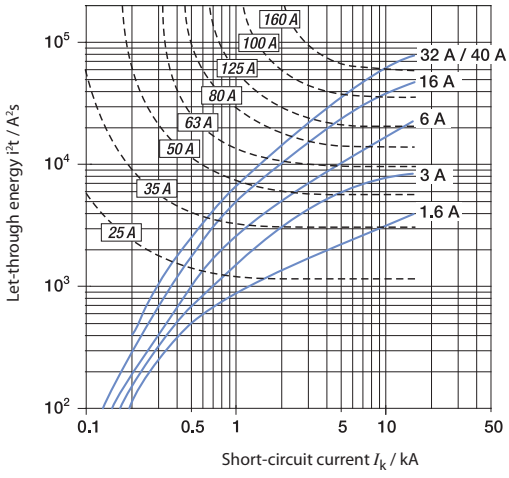


Figure 20 - D Curve

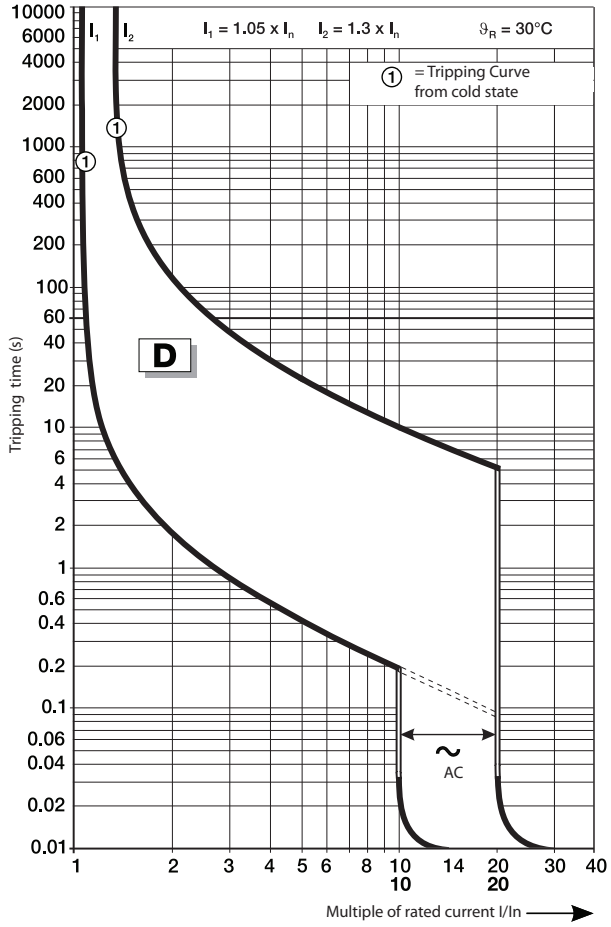
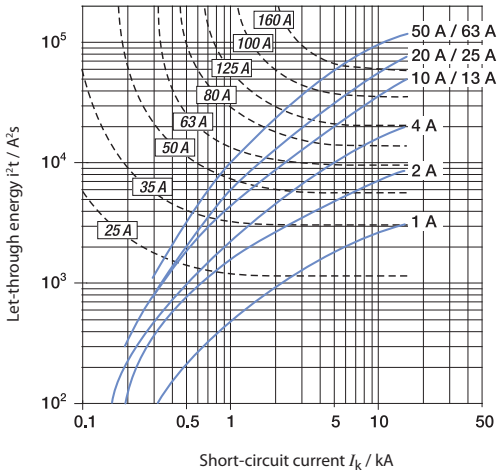
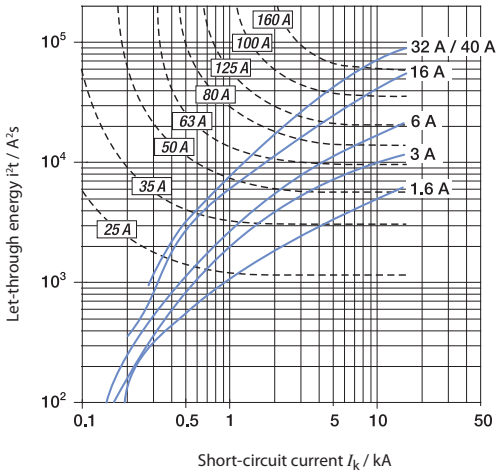


Figure 21 - D Curve – 230/400V AC Let-through Energy





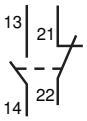
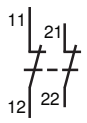
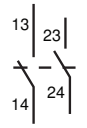
Accessories

Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards Compliance	Certifications	UL/CSA Max Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip		UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	110...415V AC 110...250V DC	110...415V AC 110...250V DC	189-AST1
			UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	12...60V AC/DC	12...60V AC/DC	189-AST2
	Auxiliary/Signal Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-ASCR3
	Auxiliary Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AR3
		1 N.O. + 1 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR11
		2 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR02
		2 N.O. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR20

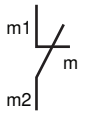
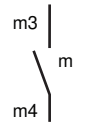
(1) A maximum of one C.O. type signal contact, and two C.O. type auxiliary contacts ***OR*** three C.O. type auxiliary contacts may be installed with or without one shunt trip for each 1492-SP.
(2) A maximum of two 189-AR11, -AR02, or -AR20 auxiliary contacts may be installed for each 1492-SP. They may not be combined with shunt trips or C.O. type contacts.
(3) A maximum of four right mount accessories of any type may be installed for each 1492-SP. The shunt trip must be mounted closest to the 1492-SP, then the signal contact, then the auxiliary contact(s). For allowed combinations, see Figure 22 and Table 6.

Left Mount

Photo	Product Description (1)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/ Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL11
		2 N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-13) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL02
		2 N.O. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL20

(1) Only one left mount auxiliary contact may be installed on each 1492-SP.

Bottom Mount

Photo	Product Description(1)	Contacts	Standards Compliance	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C. 	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB01
		1 N.O. 	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB10

(1) Only one bottom mount auxiliary contact may be installed on each 1492-SP.
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

Toggle Mount

Photo	Product Description		Cat. No.
	Lock-out attachment	for 1-pole MCB	189-ALOA1
		for multi-pole MCB	189-ALOA2

Figure 22 - Bulletin 1492-SP Accessory Installation

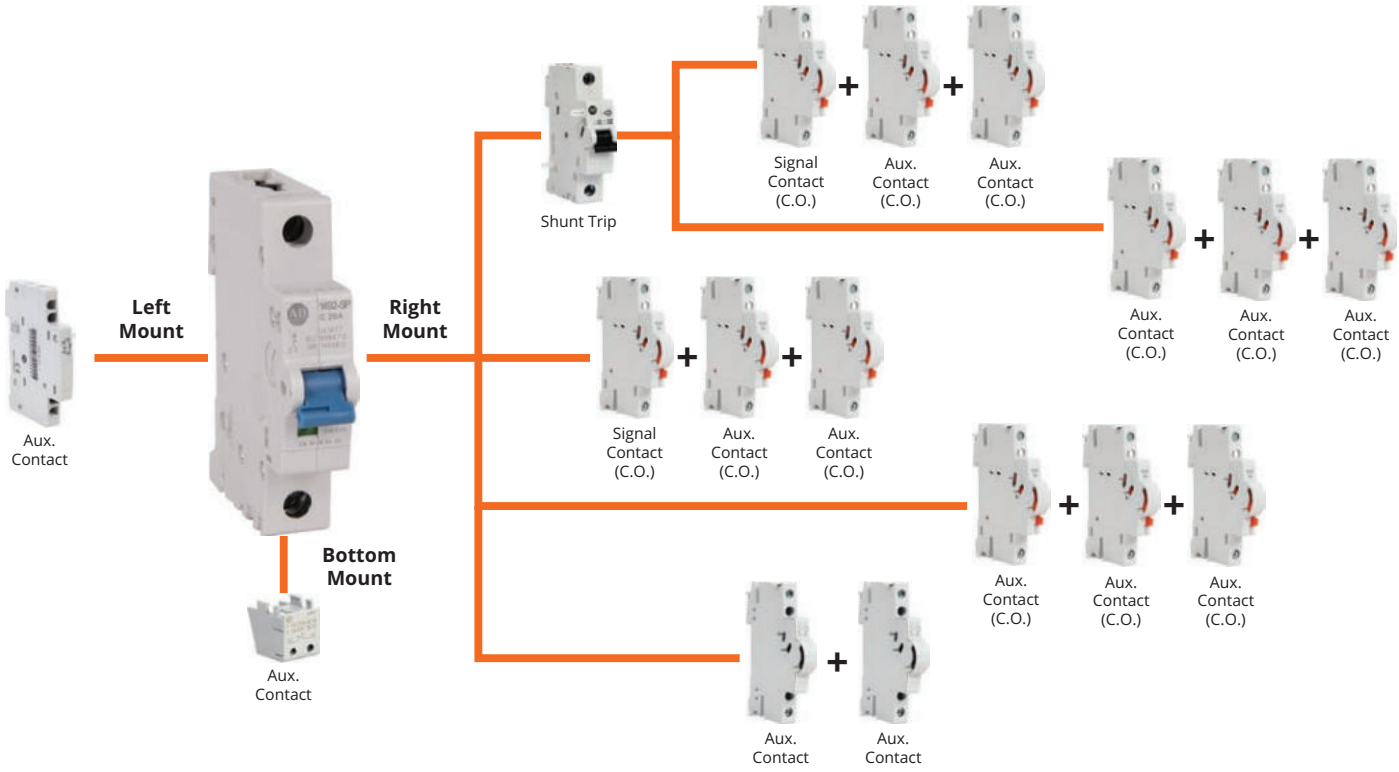


Table 6 - Bulletin 1492-SP Accessory Compatibility

Type	Cat. No.	Mounting Location	Contacts
Shunt Trip	189-AST1	Right	–
	189-AST2	Right	–
Aux/Signal Contact	189-ASCR3	Right	1 C.O.
Auxiliary Contact	189-AR3	Right	1 C.O.
	189-AR11	Right	1 N.O. + 1 N.C.
	189-AR02	Right	2 N.C.
	189-AR20	Right	2 N.O.
	189-AL11	Left	1 N.O. + 1 N.C.
	189-AL02	Left	2 N.C.
	189-AL20	Left	2 N.O.
	189-AB01	Bottom	1 N.C.
	189-AB10	Bottom	1 N.O.

Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 23 - Cat. Nos. 189-AST1 and 189-AST2

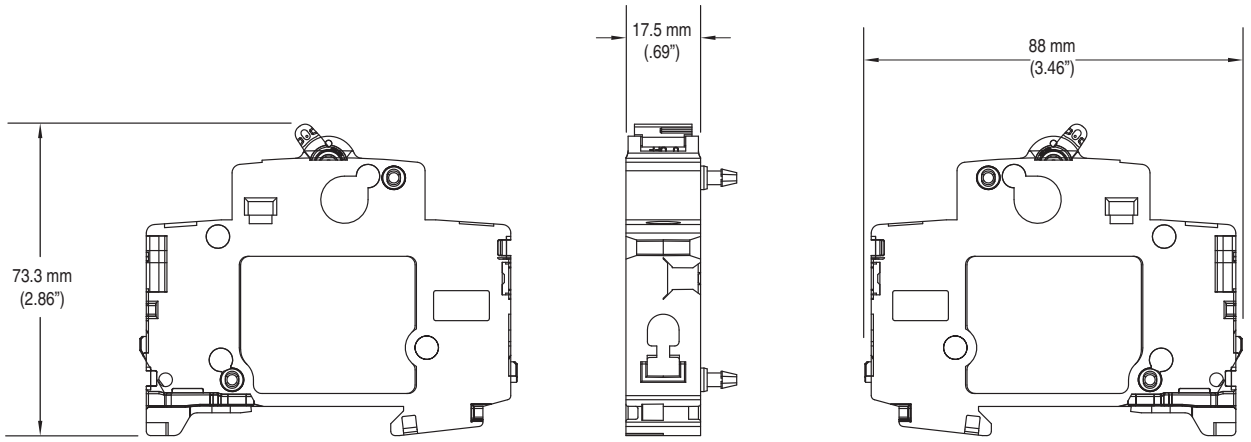


Figure 24 - Cat. No. 189-ASCR3

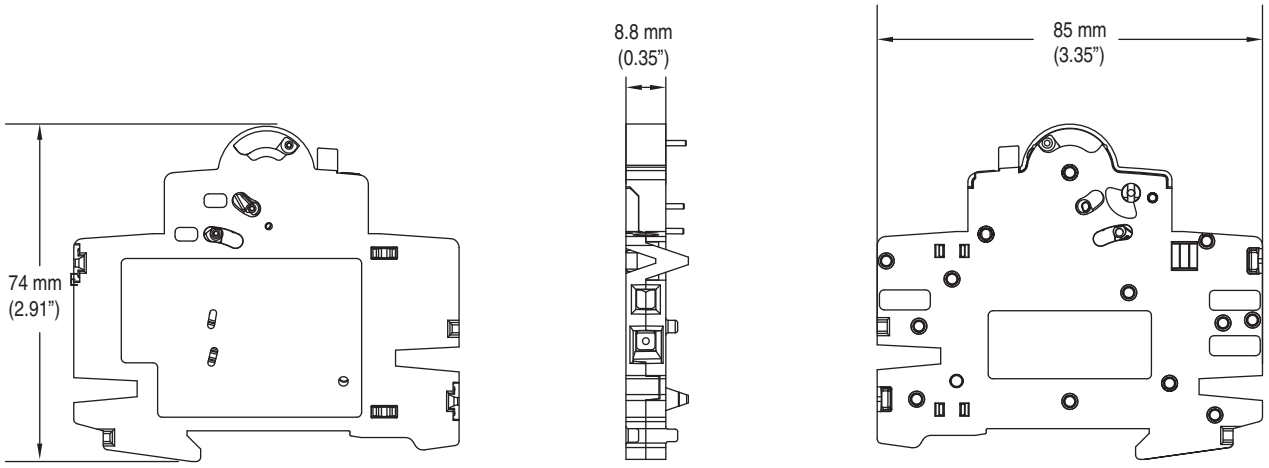


Figure 25 - Cat. No. 189-AR3

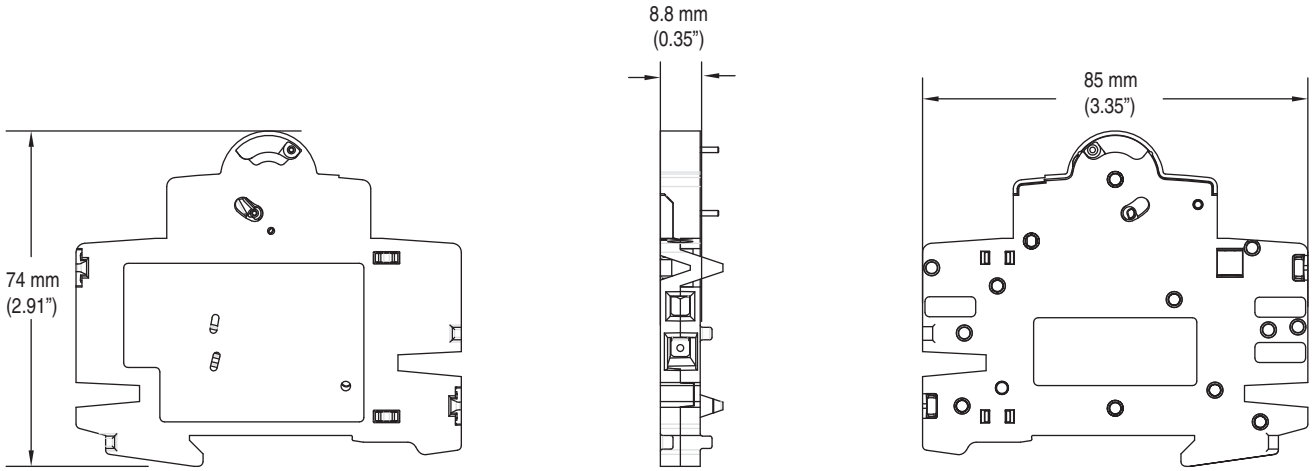


Figure 26 - Cat. Nos. 189-AR11, 189-AR02, and 189-AR20

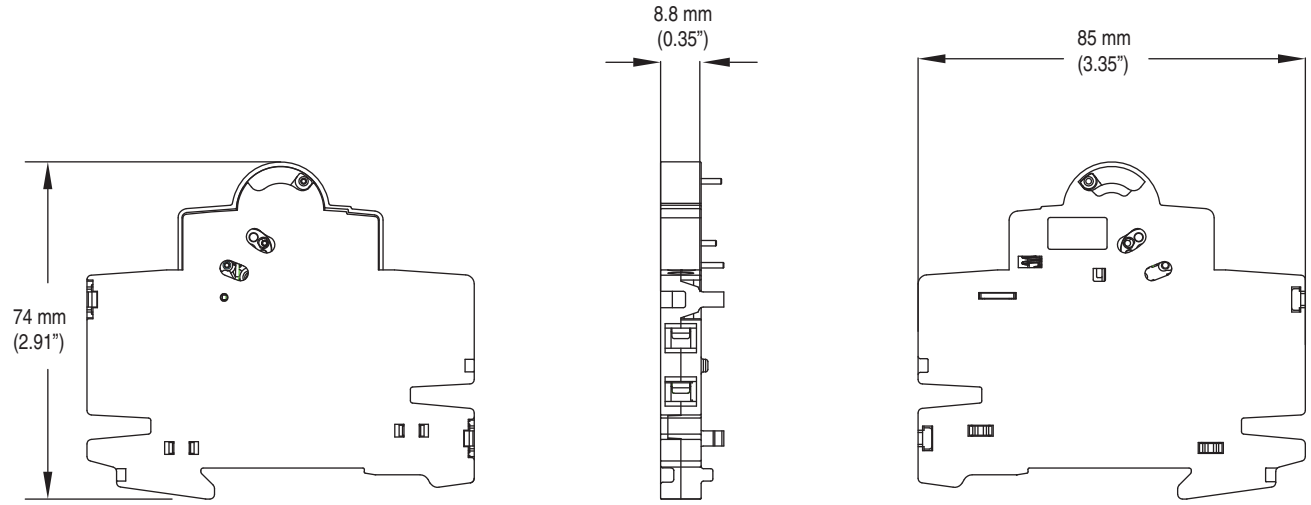


Figure 27 - Cat. Nos. 189-AL11, 189-AL02, and 189-AL20

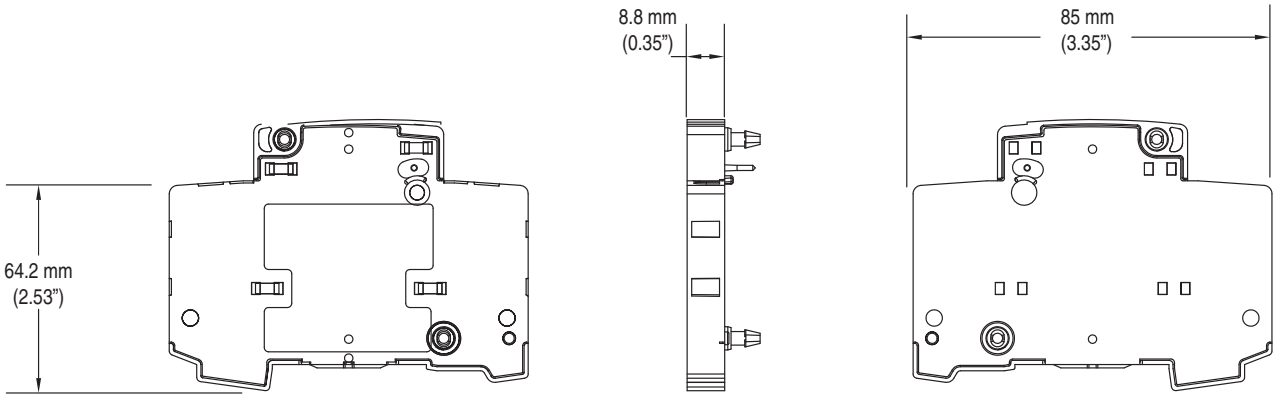
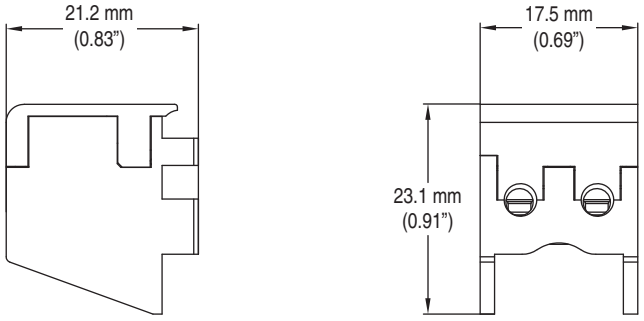


Figure 28 - Cat. Nos. 189-AB01 and 189-AB10



Bus Bars

1492-SP Bus Bars

Description	Pins	Rated Current [A] (1)	Pkg. Qty.	Cat. No.(2)
1-Phase	57	100 A	1	1492-A1B1
	57	80 A	1	1492-A1B8
1-Phase with aux. contact	37	100 A	1	1492-A1B1H
	37	80 A	1	1492-A1B8H
2-Phase	56	100 A	1	1492-A2B1
	56	80 A	1	1492-A2B8
2-Phase with aux. contact	46	100 A	1	1492-A2B1H
	46	80 A	1	1492-A2B8H
3-Phase	57	100 A	1	1492-A3B1
	57	80 A	1	1492-A3B8
3-Phase with aux. contact	48	100	1	1492-A3B1H
	48	80	1	1492-A3B8H

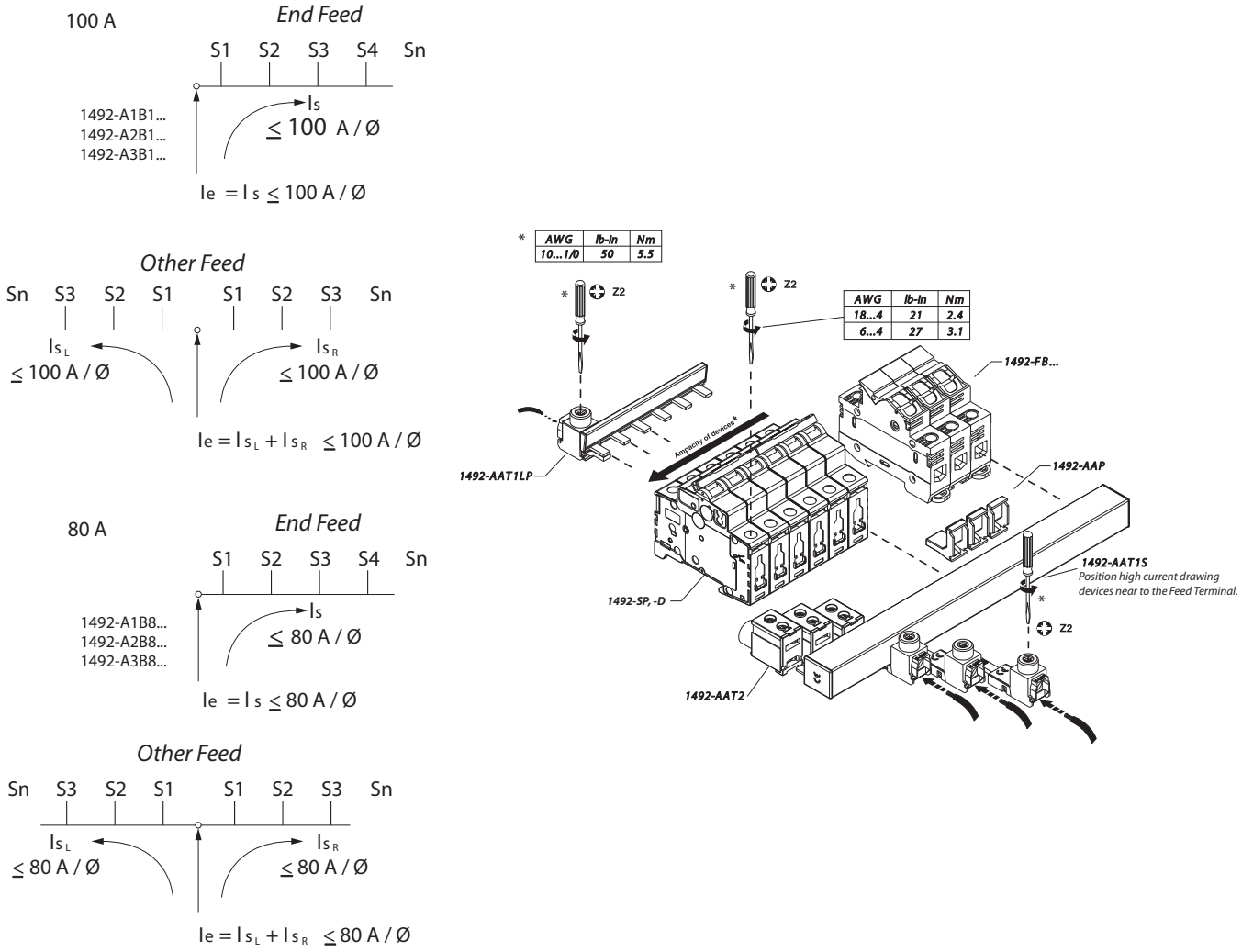
(1) See Figure 29 for Feeder Terminal and Bus Bar Current Distribution
(2) cULus, UL508, EN 60947-1, CE Marked

1492-SP Bus Bar Accessories

Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed Lugs, 35 mm^2 • offset lug, low profile • occupy one terminal or phase on the breaker • for 1-phase bus bar	10	1492-AAT1LP
Terminal Power Feed Lugs, 35 mm^2 • straight lug • occupy one terminal or phase on the breaker • for 2- and 3-phase bus bars	10	1492-AAT1S
Dedicated Power Feed Lugs, 50 mm^2 • attach and mount to the bus bar pin instead of the 1492-SP terminal • add more height to the bus bar installation.	10	1492-AAT2
End Cover for 1-phase bus bar	10	1492-A1E
End Cover for 2- or 3-phase bus bar	10	1492-AME
Protective Shroud for unused pins	10	1492-AAP

(1) cULus, UL 508, EN 60947-1, CE Marked

Figure 29 - Feeder Terminal and Bus Bar Current Distribution



Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

1-Phase Bus Bars

Figure 30 - Cat. No. 1492-A1B1

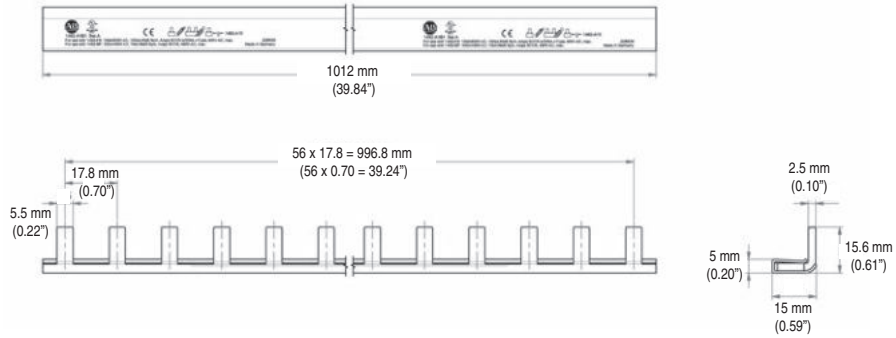
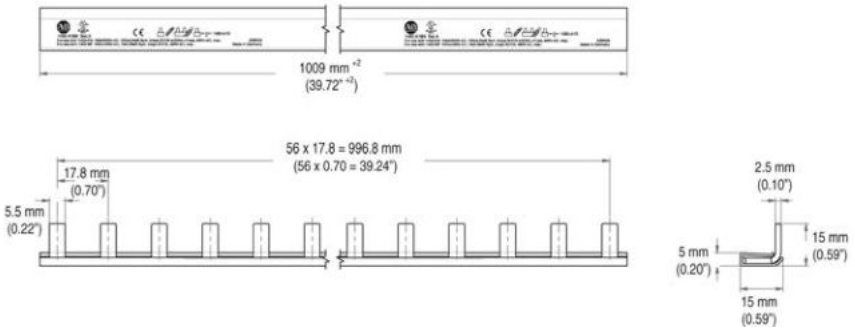


Figure 31 - Cat. No. 1492-A1B8



1-Phase Bus Bars with Auxiliary Contact

Figure 32 - Cat. No. 1492-A1B1H

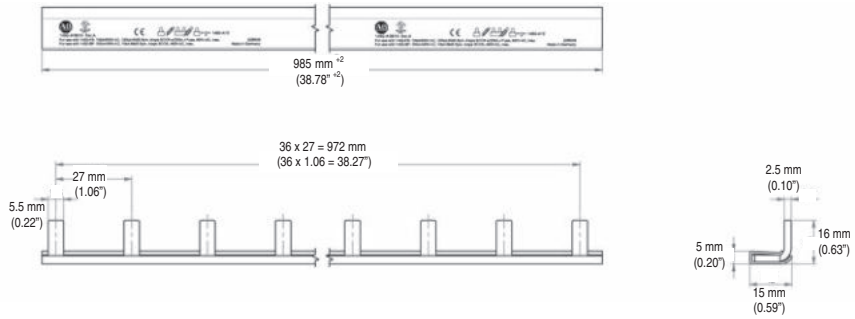
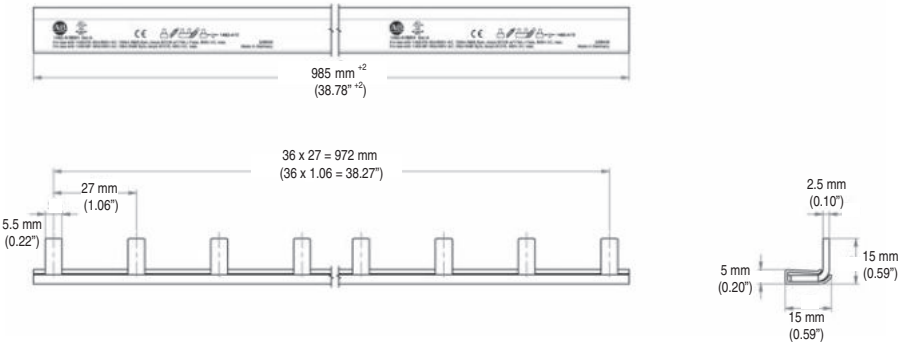


Figure 33 - Cat. No. 1492-A1B8H



2-Phase Bus Bars

Figure 34 - Cat. No. 1492-A2B1

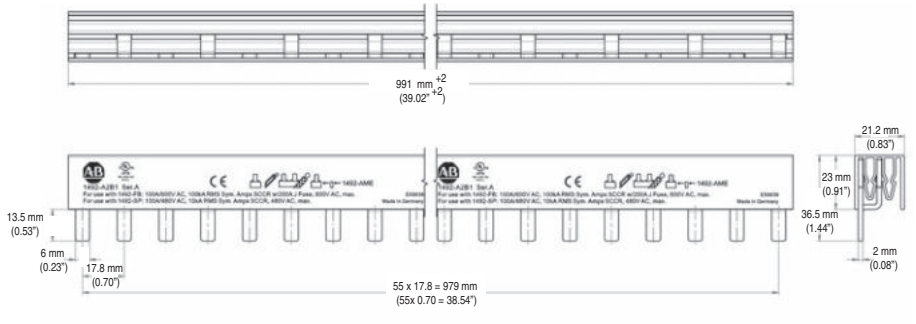
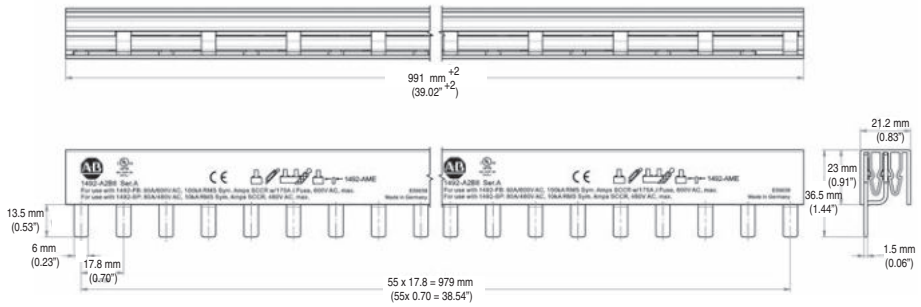


Figure 35 - Cat. No. 1492-A2B8



2-Phase Bus Bars with Auxiliary Contact

Figure 36 - Cat. No. 1492-A2B1H

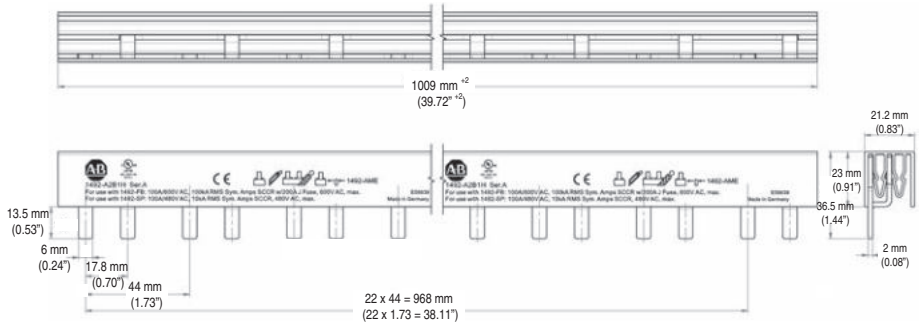
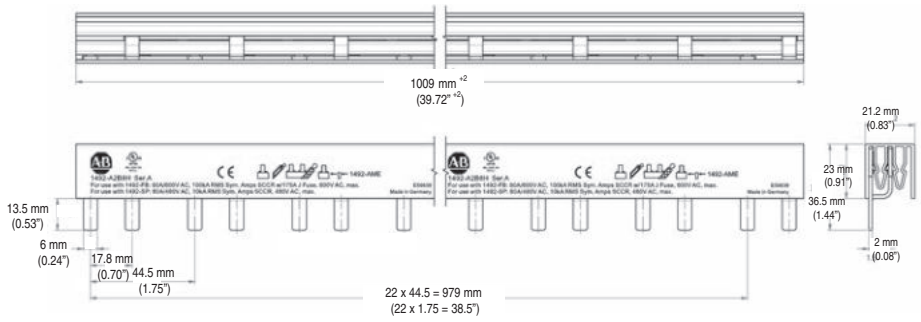


Figure 37 - Cat. No. 1492-A2B8H



3-Phase Bus Bars

Figure 38 - Cat. No. 1492-A3B1

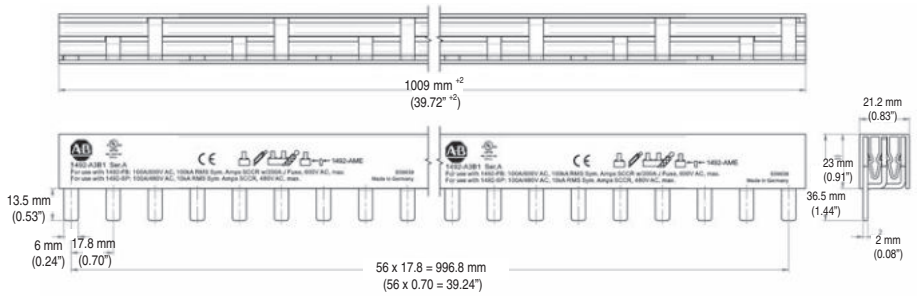
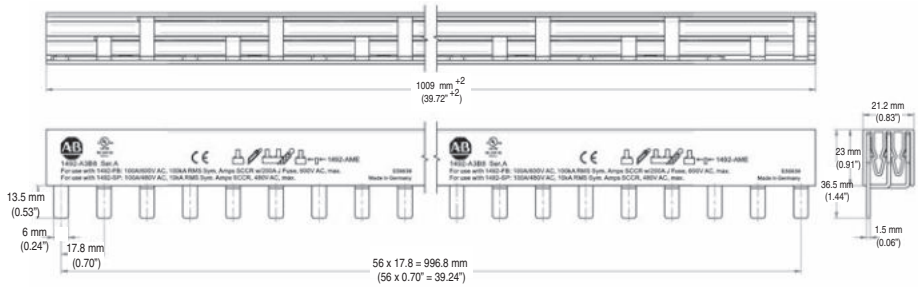


Figure 39 - Cat. No. 1492-A3B8



3-Phase Bus Bars with Auxiliary Contact

Figure 40 - Cat. No. 1492-A3B1H

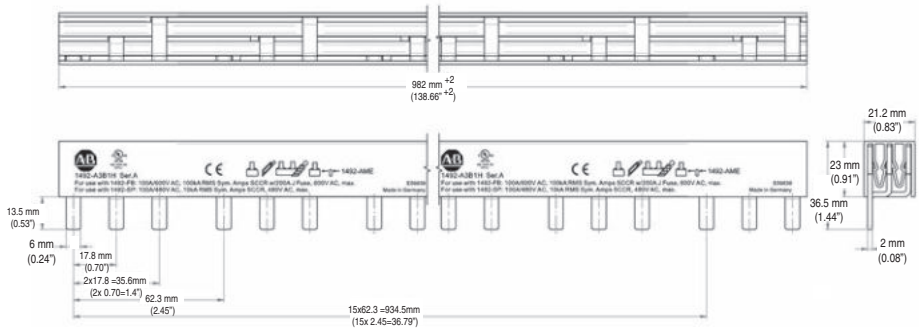
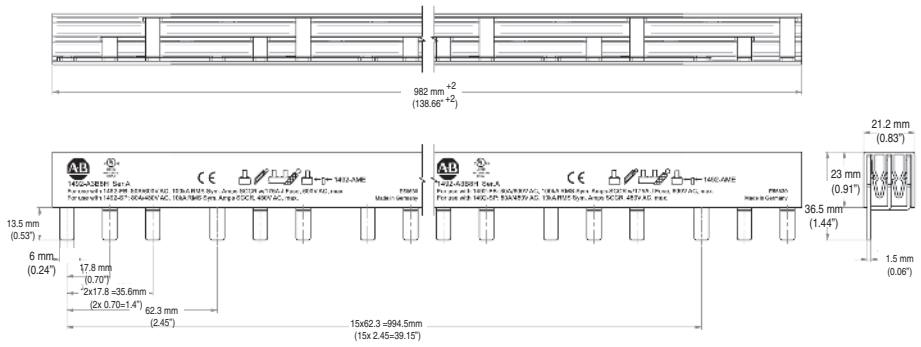


Figure 41 - Cat. No. 1492-A3B8H



Bus Bar Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 42 - Cat. No. 1492-AAT1S

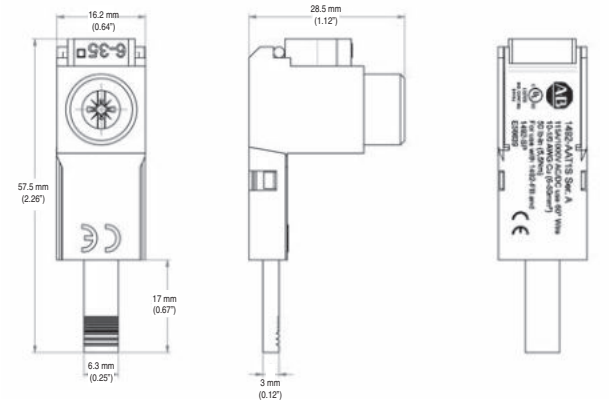


Figure 43 - Cat. No. 1492-AAT1LP

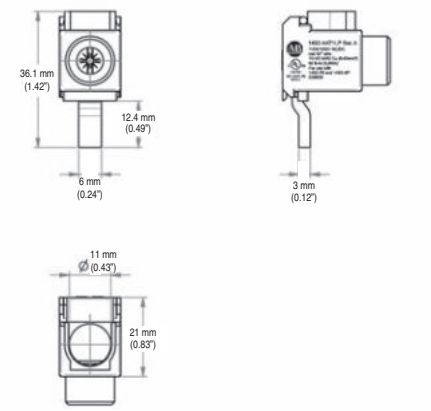


Figure 44 - Cat. No. 1492-AAT2

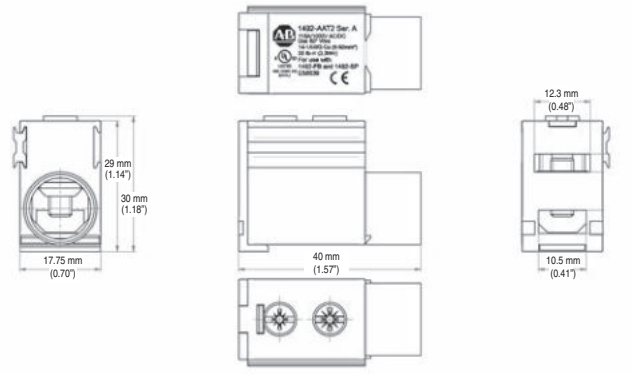


Figure 45 - Cat. No. 1492-A1E

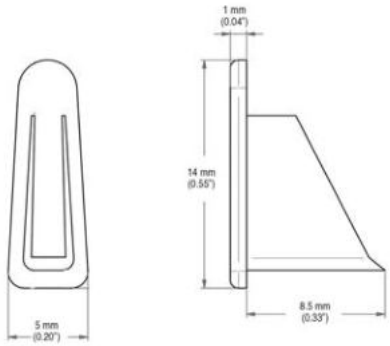


Figure 46 - Cat. No. 1492-AME

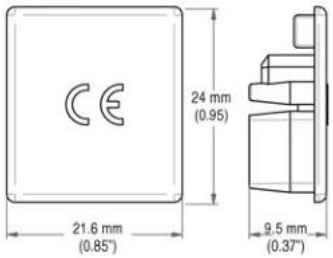
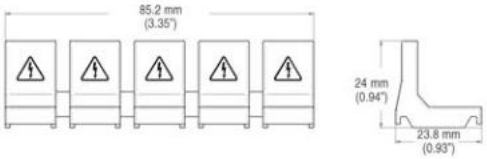
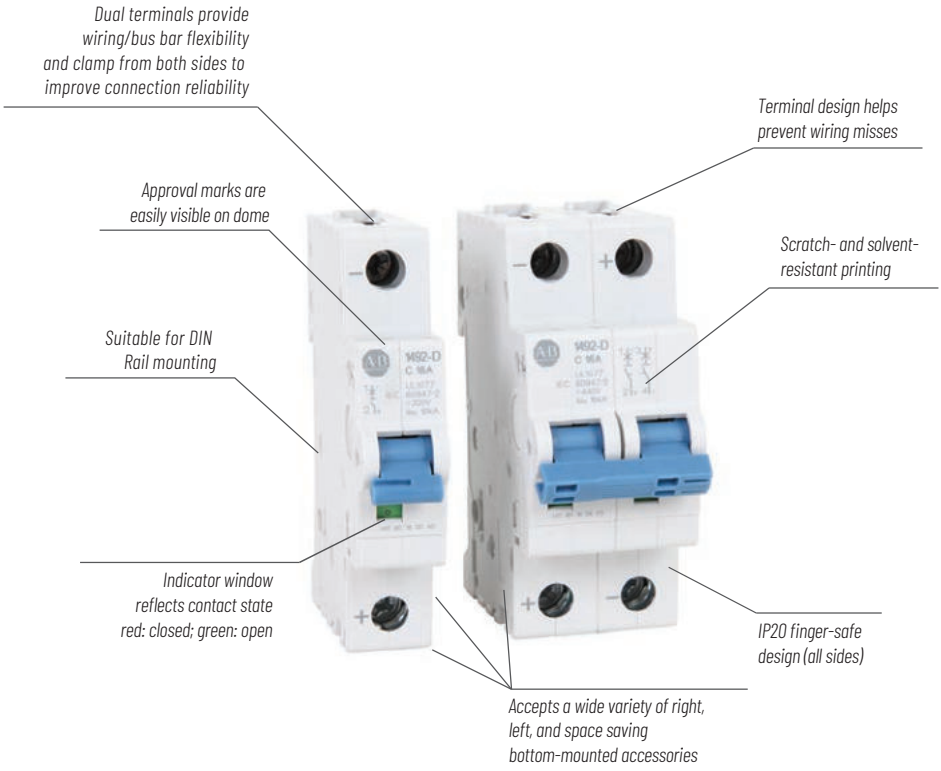


Figure 47 - Cat. No. 1492-AAP





Bulletin 1492-D Miniature Circuit Breakers provide overcurrent and short circuit protection for higher voltage DC circuits. These devices are also Miniature Circuit Breakers as defined by IEC Standards.

These thermal-magnetic breakers are offered in two pole variants and a wide range of current ratings to match the appropriate level of protection for your application. They may be used with UL 508 Listed bus bars for convenience in panel assembly, a wide range of left-, right- and space saving bottom-mount accessories, and lock out attachments for safety during maintenance.

Features include:

- Specially designed for higher voltage DC circuits with a permanent magnet to direct the arc into the arc splitters
- Dual terminals provide a more secure connection of up to four wires, or two wires and a bus bar
- Existing installations can be easily upgraded to include an auxiliary using the bottom mounted auxiliary contact options, which require no DIN Rail space
- Installation of up to six accessories on the same circuit breaker
- Superior shock and vibration resistance to prevent nuisance tripping
- Terminal design helps prevent wiring misses by directing wires into the terminal openings, even while tightening
- Single and multi-pole toggle mount lock out attachments available for Lockout/Tagout (LOTO)
- RoHS compliant and fully-recyclable device

1492-D Circuit Breakers	
Rated Voltage	UL/CSA: Max. 500V DC (2-pole) IEC: U_e Max. 440V DC (2-pole)
Interrupting Capacity	UL/CSA: 10 kA IEC: 10 kA
Current Ratings	0.5...63 A
Poles	1, 2
Trip Curves	C
Standards Compliance	UL 1077 CSA C22.2 No. 235 EN 60947-2
Certifications	UL Recognized, File No. E65138 CSA Certified, File No. 259391 CE Marked VDE Certified RoHS Compliant UKCA Marked

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492	–	D	1	C	010
		a	b	c	d

a

Voltage Type	
Code	**Description**
D	AC Circuit Breaker

b

Poles	
Code	**Description**
1	1-Pole
2	2-Pole

c

Trip Curve	
Code	**Description**
C	Trip Curve C

d

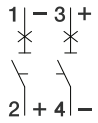
Rated Current (I_n)	
Code	**Current [A]**
005	0.5
010	1
016	1.6
020	2
030	3
040	4
060	6
080	8
100	10
130	13
160	16
200	20
250	25
320	32
400	40
500	50
630	63

Product Selection

1-Pole DC Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 I_n
	[A]	Cat. No.
 	0.5	1492-D1C005
	1	1492-D1C010
	1.6	1492-D1C016
	2	1492-D1C020
	3	1492-D1C030
	4	1492-D1C040
	6	1492-D1C060
	8	1492-D1C080
	10	1492-D1C100
	13	1492-D1C130
	16	1492-D1C160
	20	1492-D1C200
	25	1492-D1C250
	32	1492-D1C320
	40	1492-D1C400
	50	1492-D1C500
	63	1492-D1C630

2-Pole DC Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	Trip Curve C Inductive 5...10 I_n
	[A]	Cat. No.
 	0.5	1492-D2C005
	1	1492-D2C010
	1.6	1492-D2C016
	2	1492-D2C020
	3	1492-D2C030
	4	1492-D2C040
	6	1492-D2C060
	8	1492-D2C080
	10	1492-D2C100
	13	1492-D2C130
	16	1492-D2C160
	20	1492-D2C200
	25	1492-D2C250
	32	1492-D2C320
	40	1492-D2C400
	50	1492-D2C500
	63	1492-D2C630

Specifications

Electrical Ratings		
Poles		1, 2
Tripping characteristics		C
Rated current (I_n)		0.5...63 A
Rated frequency (f)		0 Hz (DC only)
Rated insulation voltage U_i per IEC/EN 60664-1		250V AC (phase to ground) 440V AC (phase to phase)
Overvoltage category		III
Pollution degree		3
Data per UL/CSA		
Rated voltage	1-pole	250V DC
	2-pole	500V DC
Rated interrupting capacity per UL 1077		10 kA
Application Codes Supplementary Protector for DC application;	1-pole	TC2, OLO, SC: U1, 250V DC, 10 kA
	2-pole	TC2, OLO, SC: U1, 500V DC, 10 kA
Reference temperature for tripping characteristics		25 °C (77 °F)
Electrical endurance		6,000 operations
Data per IEC/EN 60947-2		
Rated operational voltage (U_e)	1-pole	220V DC
	2-pole	440V DC
Highest supply or utilization voltage (U_{max})	1-pole	250V DC
	2-pole	500V DC
Min. operating voltage		12V DC
Rated ultimate short-circuit breaking capacity (I_{cu})		10 kA
Rated service short-circuit breaking capacity (I_{cs})		10 kA
Rated impulse withstand voltage $U_{imp.}$ (1.2/50µs)		4 kV (test voltage 6.2 kV at sea level, 5 kV at 2,000 m)
Dielectric test voltage		2 kV (50/60 Hz, 1 min.)
Reference temperature for tripping characteristics		55 °C (131 °F)
Electrical endurance 1 cycle (2s - ON, 13s - OFF, $I_n \leq 32$ A), 1 cycle (2s - ON, 28s - OFF, $I_n > 32$ A)		1,500 operations
Mechanical Data		
Housing		Insulation group II, RAL 7035
Indicator window		red ON/green OFF
Protection degree per EN 60529		IP20, IP40 in enclosure with cover
Mechanical endurance		20,000 operations
Shock resistance per IEC/EN 60068-2-27		25 g – 2 shocks - 13 ms
Vibration resistance per IEC/EN 60068-2-6		5g – 20 cycles at 5...150...5 Hz with load 0.8 x I_n

Environmental		
Environmental conditions (damp heat) per IEC/EN 60068-2-30		28 cycles with 55 °C (131 °F)/90-96% and 25 °C (-13 °F)/95-100%
Ambient temperature (1)		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire (2) – solid, stranded (front/back terminal slot)		35/35 mm^2
		18...4/18...10 AWG
Cross-section of wire – flexible (front/back terminal slot)		25/10 mm^2
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG
		2-4 wires (3), 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm^2
Tightening torque	IEC	2.8 N•m
	UL/CSA	AWG 18...16: 13.3 lb•in AWG 14...10: 17.7 lb•in AWG 8...4: 39.8 lb•in
Screwdriver		No. 2 Pozidriv
Mounting		DIN Rail (EN 60715, 35 mm) with fast clip
Mounting position		Any
Supply		Note polarity of device
Approximate Dimensions and Weight		
Pole dimension (H x D x W)		88 x 69 x 17.5 mm
Pole weight		125 g (4.5 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Shunt trip		Yes

(1) 35 mm^2 self-declared, not included in IEC/EN approval.
(2) See Table 7 and Table 8 for ambient temperature derating information.
(3) Wires must be of like size and stranding. Up to two wires per terminal slot.

Power Loss Due to Current

Rated Current [A]	Power Loss Per Pole [W]	Rated Current [A]	Power Loss Per Pole [W]
0.5	1.4	13	2.3
1	1.4	15	2.4
2	1.8	16	2.5
3	1.6	20	2.5
4	1.8	25	3.2
5	1.9	30	3.5
6	2.0	32	3.7
7	1.1	40	4.5
8	1.5	50	4.5
10	2.1	63	5.4

The installation of several devices side by side with rated current on all poles requires a correction factor to the rated current (not required if spacers are used).

Zero-stack Derating

No. of Adjacent Devices	Correction Factor
1	1
2.3	0.9
4.5	0.8
≥ 6	0.75

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 48 - 1-Pole Devices

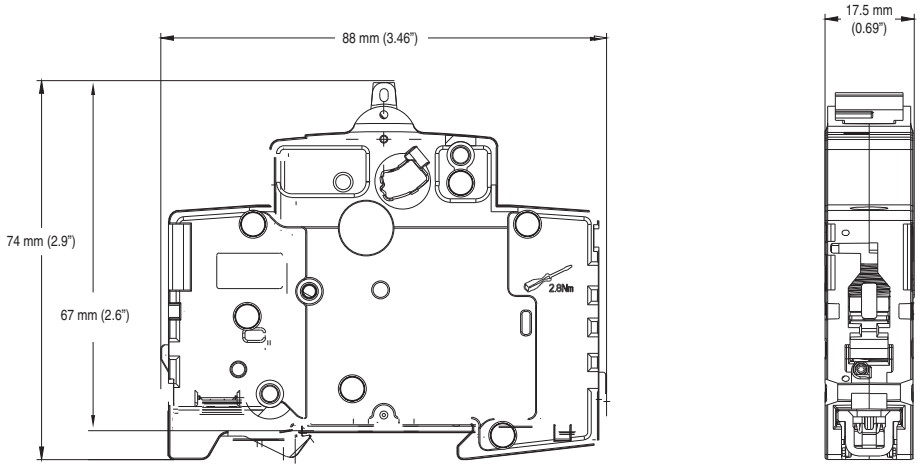
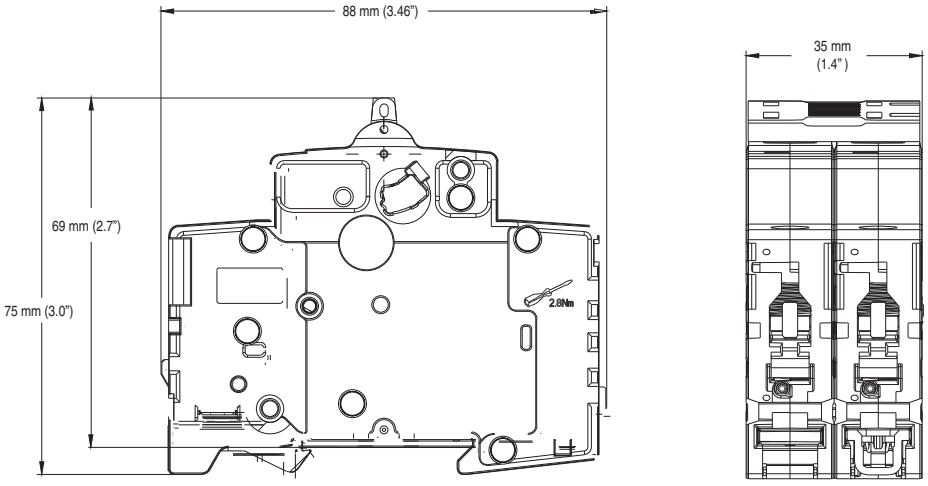


Figure 49 - 2-Pole Devices



Ambient Temperature Derating

- Application below 0 °C (32 °F) is for non-condensing atmosphere. Care should be taken for applications at or below 0 °C (32 °F). These devices are not certified to operate correctly in the presence of ice.

Table 7 - Bulletin 1492-D Temperature Derating, UL Applications—Reference Temperature 25 °C (77 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]										
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	25 (77)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.2	1.2	1.1	0.9	1	1.0	1.0	0.9	0.9
1.6	1.8	1.8	1.8	1.8	1.8	1.5	1.6	1.6	1.5	1.5	1.5
2	2.3	2.3	2.3	2.3	2.3	1.9	2	2.0	1.9	1.9	1.8
3	3.5	3.5	3.5	3.5	3.4	2.8	3	3.0	2.9	2.8	2.7
4	4.6	4.6	4.6	4.6	4.5	3.8	4	3.9	3.8	3.7	3.6
6	6.9	6.9	6.9	6.9	6.8	5.6	6	5.9	5.7	5.6	5.5
8	9.2	9.2	9.2	9.2	9.1	7.5	8	7.9	7.6	7.4	7.3
10	11.5	11.5	11.5	11.5	11.4	9.4	10	9.9	9.6	9.3	9.1
13	15.0	15.0	15.0	15.0	14.8	12.2	13	12.8	12.4	12.0	11.8
16	18.4	18.4	18.4	18.4	18.2	15.0	16	15.8	15.3	14.8	14.6
20	23.0	23.0	23.0	23.0	22.7	18.8	20	19.7	19.1	18.5	18.2
25	28.8	28.8	28.8	28.8	28.4	23.5	25	24.6	23.9	23.1	22.8
32	36.8	36.8	36.8	36.8	36.3	30.1	32	31.5	30.6	29.6	29.1
40	46.0	46.0	46.0	46.0	45.4	37.6	40	29.4	38.2	37.0	36.4
50	57.5	57.5	57.5	57.5	56.8	47.0	50	49.3	47.8	46.3	45.5
63	72.5	72.5	72.5	72.5	71.5	59.2	63	62.1	60.2	58.3	57.3

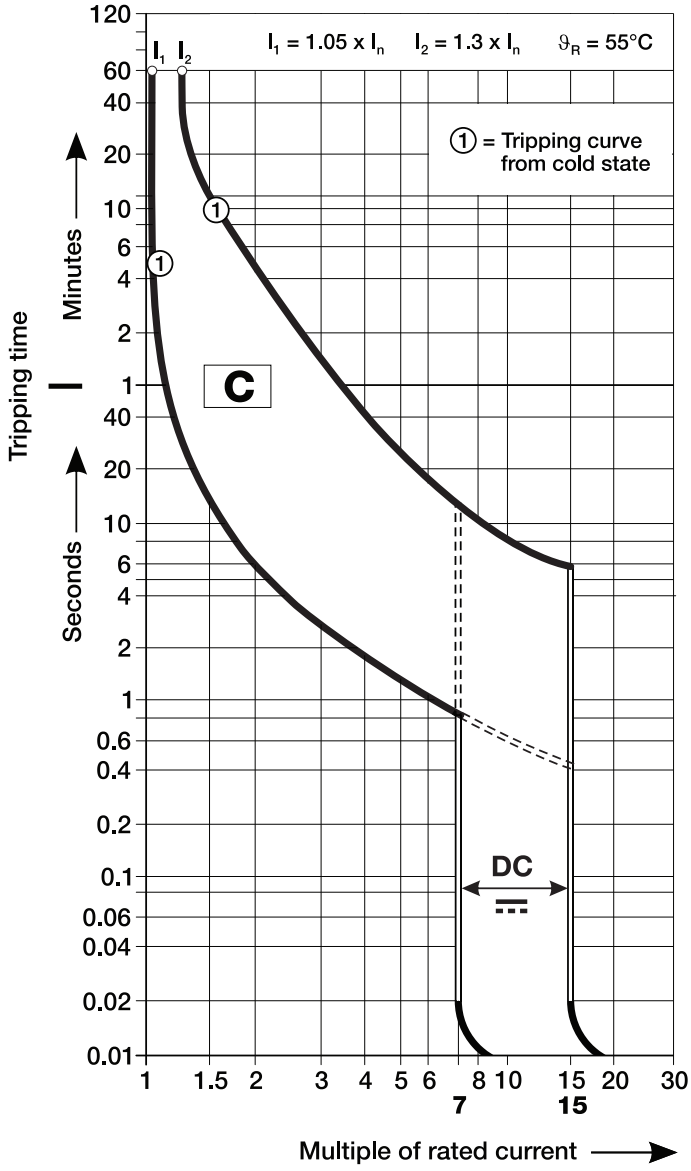
Table 8 - Bulletin 1492-D Temperature Derating, IEC Applications—Reference Temperature 55 °C (131 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5
1	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1
1.6	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6
2	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.0	2
3	3.7	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	3
4	5.0	4.9	4.8	4.7	4.5	4.4	4.3	4.2	4.1	4
6	7.4	7.4	7.2	7.0	6.8	6.6	6.5	6.3	6.1	6
8	9.9	9.8	9.6	9.3	9.1	8.8	8.6	8.4	8.1	8
10	12.4	12.3	12.0	11.7	11.4	11.1	10.8	10.5	10.2	10
13	16.1	15.9	15.5	15.1	14.8	14.4	14.0	13.6	13.2	13
16	19.8	19.6	19.1	18.6	18.2	17.7	17.2	16.7	16.2	16
20	24.8	24.5	23.9	23.3	22.7	22.1	21.5	20.9	20.3	20
25	31.0	30.6	29.9	29.1	28.4	27.6	26.9	26.1	25.4	25
32	39.7	39.2	38.2	37.3	36.3	35.4	34.4	33.4	32.5	32
40	49.6	49.0	47.8	46.6	45.4	44.2	43.0	41.8	40.6	40
50	62.0	61.3	59.8	58.3	56.8	55.3	53.8	52.3	50.8	50
63	78.1	77.2	75.3	73.4	71.5	69.6	67.7	65.8	63.9	63

Tripping Characteristics

- I_1 is the lower trip range. If the overcurrent condition is 1.04 x Rated Current (I_n) the breaker does not trip. At a level of 1.05 x I_n, the breaker trips according to the trip curve.
- I_2 is the higher trip range. The breaker must trip at that level. The tripping time follows the trip curve.

Figure 50 - C Curve



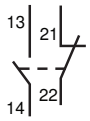
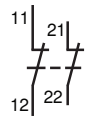
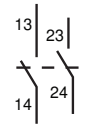
Accessories

Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip		UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	110...415V AC 110...250V DC	110...415V AC 110...250V DC	189-AST1
			UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	12...60V AC/DC	12...60V AC/DC	189-AST2
	Auxiliary/Signal Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-ASCR3
	Auxiliary Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AR3
		1 N.O. + 1 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR11
		2 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR02
		2 N.O. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR20

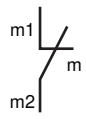
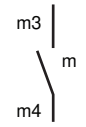
(1) A maximum of one C.O. type signal contact, and two C.O. type auxiliary contacts ***OR*** three C.O. type auxiliary contacts may be installed with or without one shunt trip per 1492-D.
(2) A maximum of two 189-AR11, -AR02, or -AR20 auxiliary contacts may be installed per 1492-D. They may not be combined with shunt trips or C.O. type contacts.
(3) A maximum of four right mount accessories of any type may be installed per 1492-D. The shunt trip must be mounted closest to 1492-D, then the signal contact, then the auxiliary contact(s). For allowed combinations, see Figure 51 and Table 9.

Left Mount

Photo	Product Description (1)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL11
		2 N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL02
		2 N.O. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL20

(1) Only one left mount auxiliary contact may be installed per 1492-D.

Bottom Mount

Photo	Product Description (1)	Contacts	Standards Compliance	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C. 	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB01
		1 N.O. 	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB10

(1) Only one bottom mount auxiliary contact may be installed per 1492-D.
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

Toggle Mount

Photo	Product Description		Cat. No.
	Lock-out attachment	for 1-pole MCB	189-ALOA1
		for multi-pole MCB	189-ALOA2

Figure 51 - Bulletin 1492-D Accessory Installation

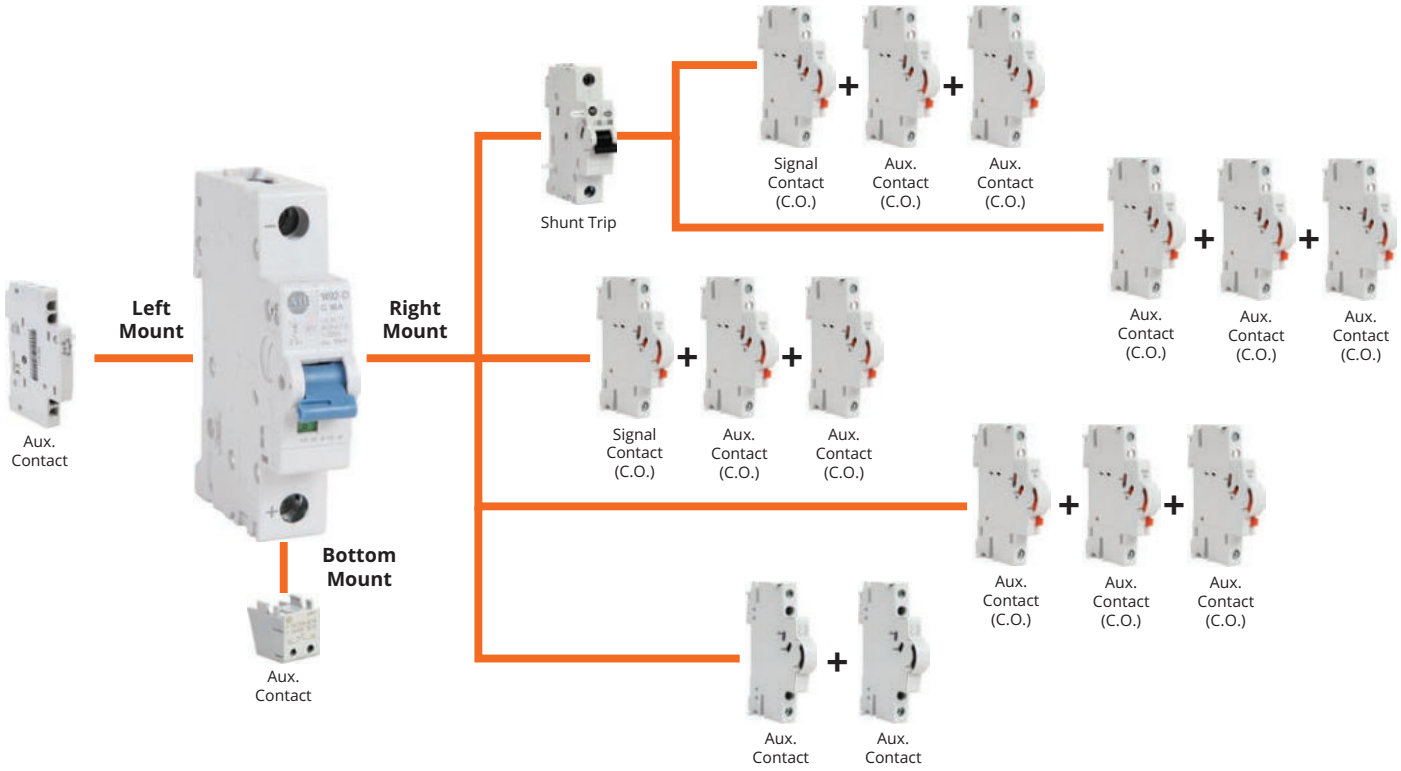


Table 9 - Bulletin 1492-D Accessory Compatibility

Type	Cat. No.	Mounting Location	Contacts
Shunt Trip	189-AST1	Right	–
	189-AST2	Right	–
Aux/Signal Contact	189-ASCR3	Right	1 C.O.
Auxiliary Contact	189-AR3	Right	1 C.O.
	189-AR11	Right	1 N.O. + 1 N.C.
	189-AR02	Right	2 N.C.
	189-AR20	Right	2 N.O.
	189-AL11	Left	1 N.O. + 1 N.C.
	189-AL02	Left	2 N.C.
	189-AL20	Left	2 N.O.
	189-AB01	Bottom	1 N.C.
	189-AB10	Bottom	1 N.O.

Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 52 - Cat. Nos. 189-AST1 and 189-AST2

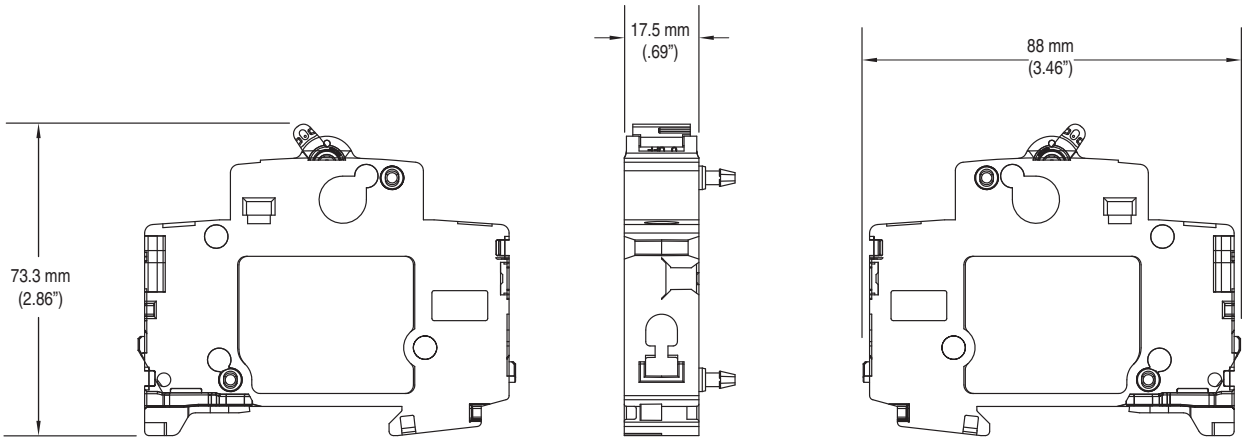


Figure 53 - Cat. No. 189-ASCR3

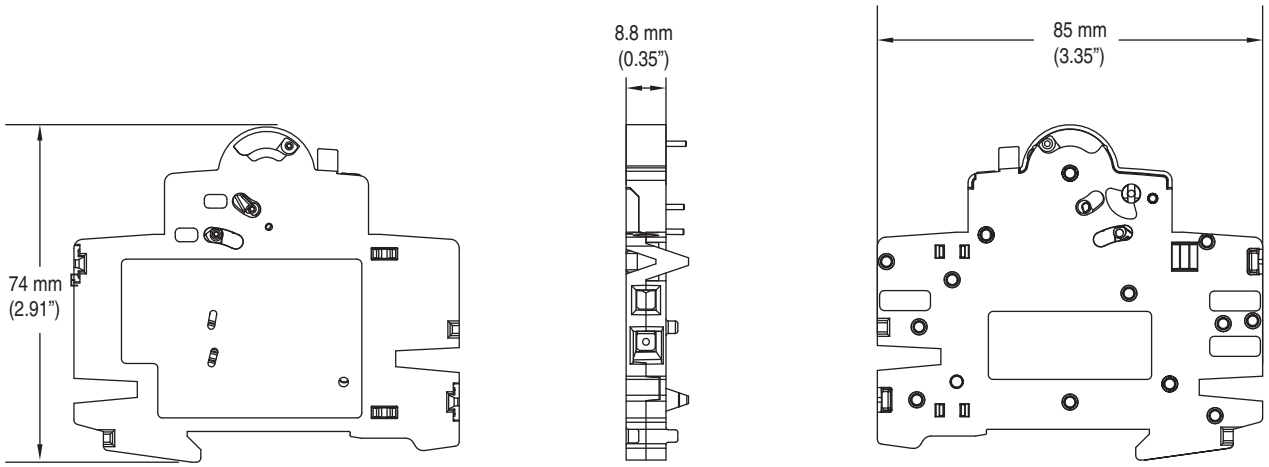


Figure 54 - Cat. No. 189-AR3

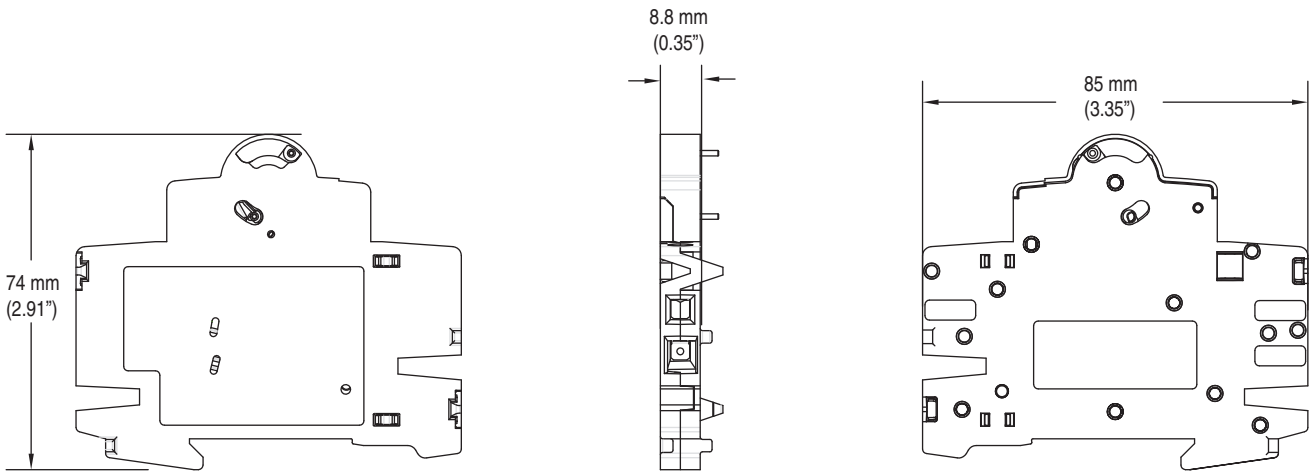


Figure 55 - Cat. Nos. 189-AR11, 189-AR02, 189-AR20

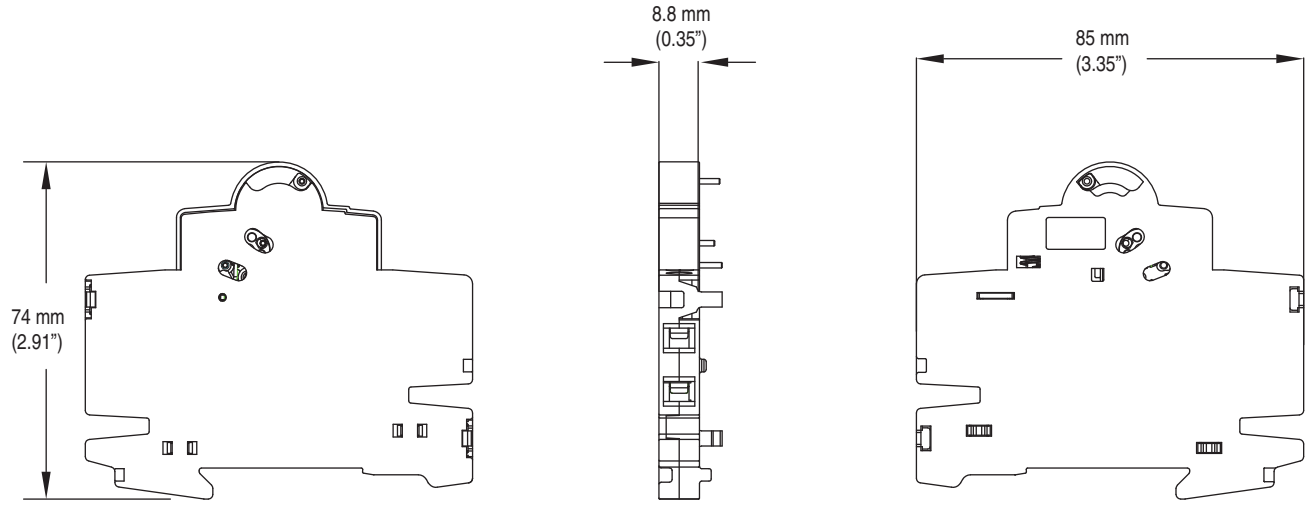


Figure 56 - Cat. Nos. 189-AL11, 189-AL02, and 189-AL20

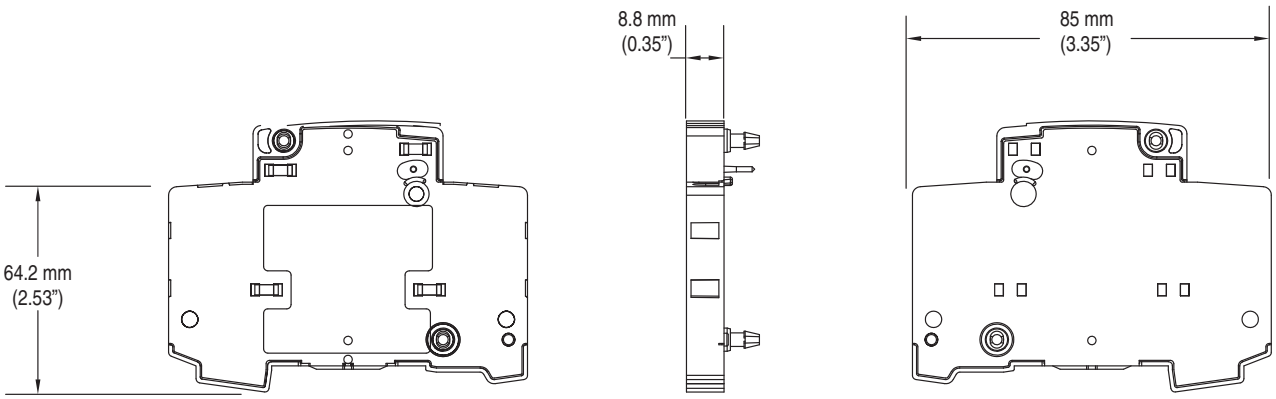
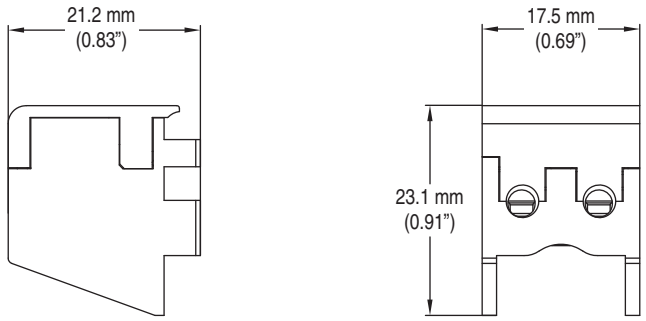


Figure 57 - Cat. Nos. 189-AB01 and 189-AB10



Bus Bars

1492-D Bus Bars

Description	Pins	Rated Current [A] (1)	Pkg. Qty.	Cat. No.(2)
1-Phase	57	100 A	1	1492-A1B1
	57	80 A	1	1492-A1B8
1-Phase with aux. contact	37	100 A	1	1492-A1B1H
	37	80 A	1	1492-A1B8H
2-Phase	56	100 A	1	1492-A2B1
	56	80 A	1	1492-A2B8
2-Phase with aux. contact	46	100 A	1	1492-A2B1H
	46	80 A	1	1492-A2B8H

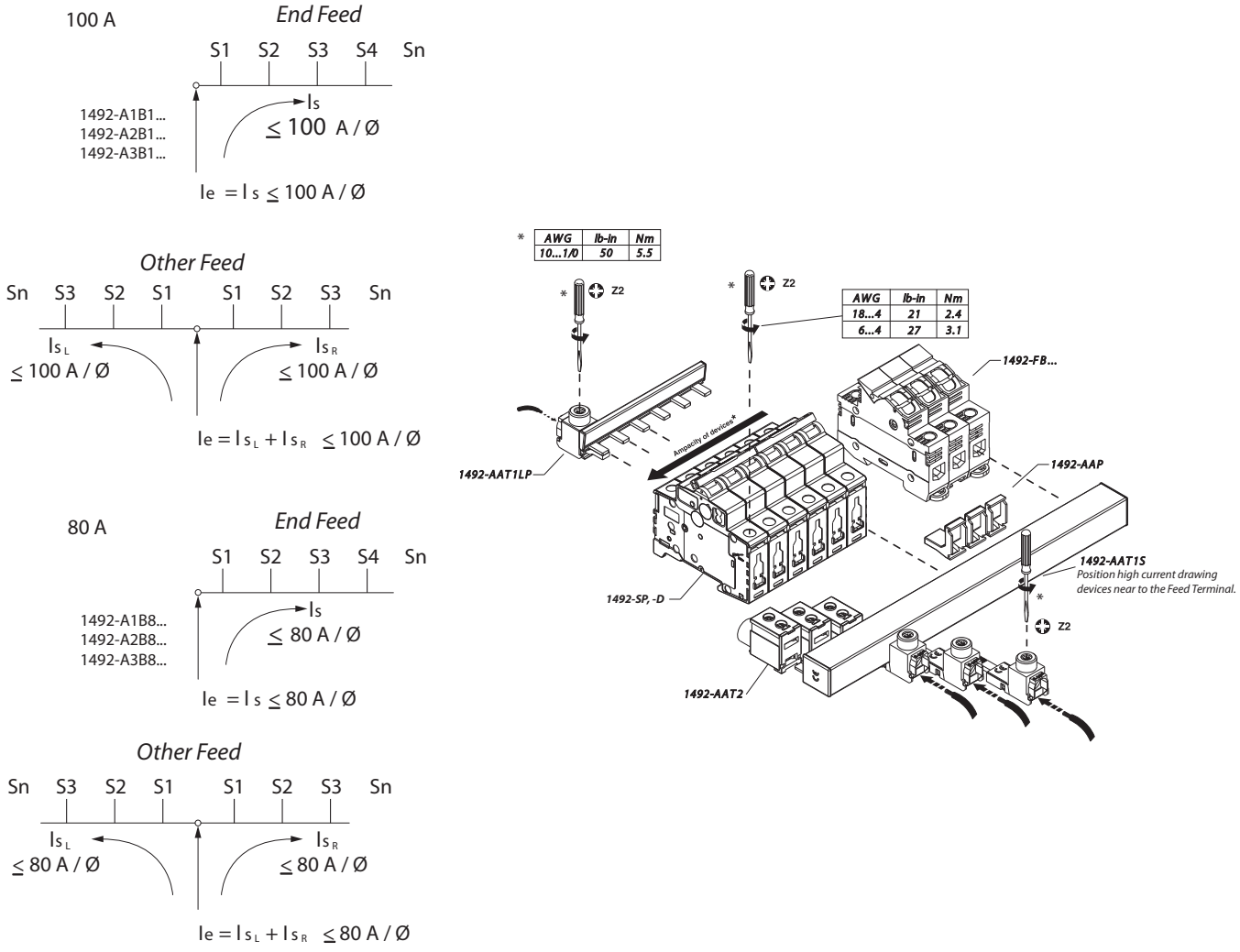
(1) See Figure 58 for Feeder Terminal and Bus Bar Current Distribution
(2) cULus, UL508, EN 60947-1, CE Marked

1492-SP Bus Bar Accessories

Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed Lugs, 35 mm^2 • offset lug, low profile • occupy one terminal or phase on the breaker • for 1-phase bus bar	10	1492-AAT1LP
Terminal Power Feed Lugs, 35 mm^2 • straight lug • occupy one terminal or phase on the breaker • for 2- and 3-phase bus bars	10	1492-AAT1S
Dedicated Power Feed Lugs, 50 mm^2 • attach and mount to the bus bar pin instead of the 1492-D terminal • add more height to the bus bar installation.	10	1492-AAT2
End Cover for 1-phase bus bar	10	1492-A1E
End Cover for 2- or 3-phase bus bar	10	1492-AME
Protective Shroud for unused pins	10	1492-AAP

(1) cULus, UL 508, EN 60947-1, CE Marked

Figure 58 - Feeder Terminal and Bus Bar Current Distribution



Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

1-Phase Bus Bars

Figure 59 - Cat. No. 1492-A1B1

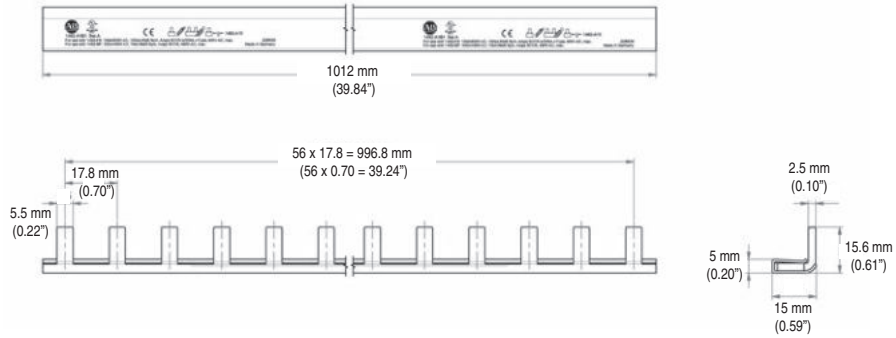
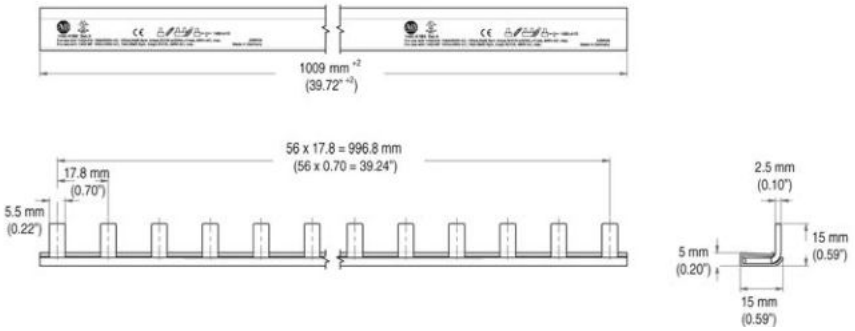


Figure 60 - Cat. No. 1492-A1B8



1-Phase Bus Bars with Auxiliary Contact

Figure 61 - Cat. No. 1492-A1B1H

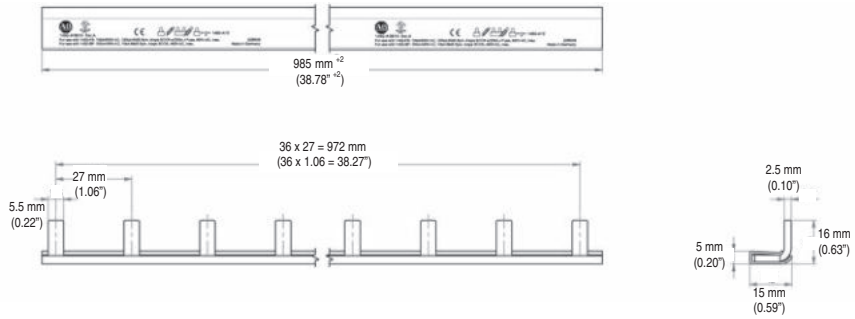
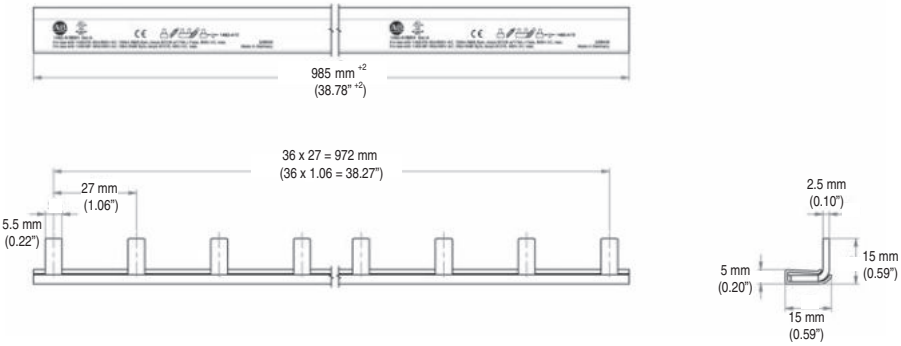


Figure 62 - Cat. No. 1492-A1B8H



2-Phase Bus Bars

Figure 63 - Cat. No. 1492-A2B1

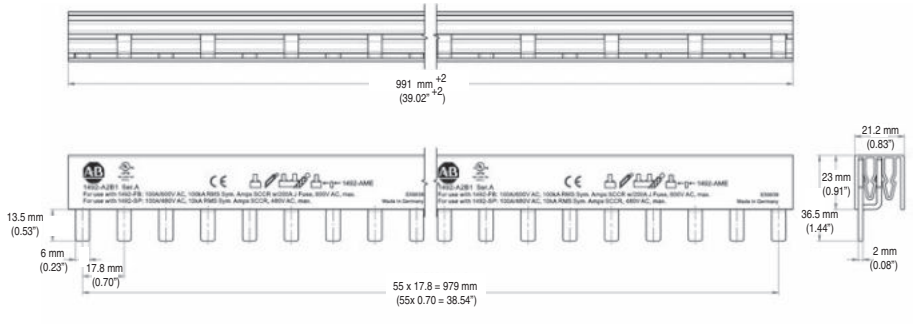
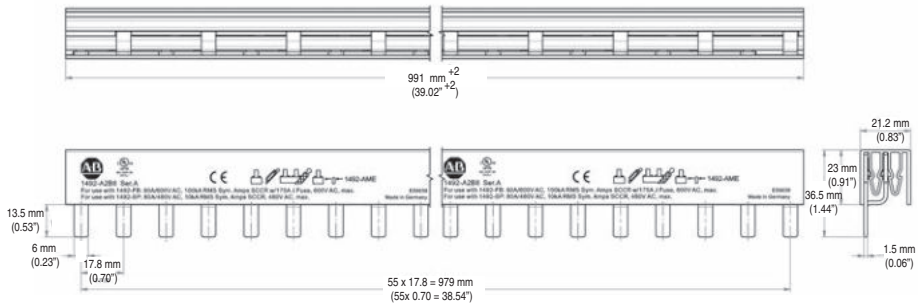


Figure 64 - Cat. No. 1492-A2B8



2-Phase Bus Bars with Auxiliary Contact

Figure 65 - Cat. No. 1492-A2B1H

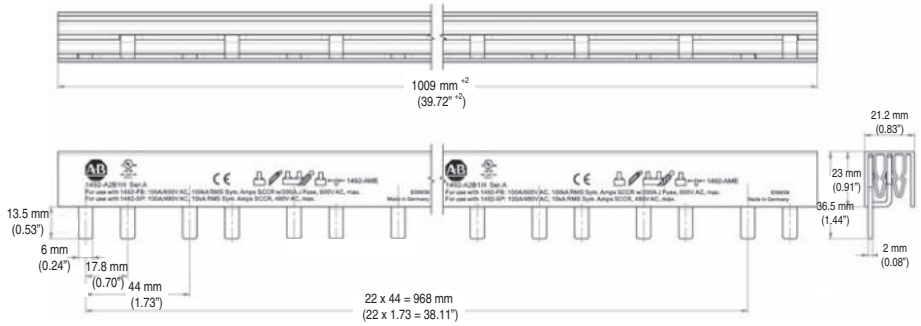
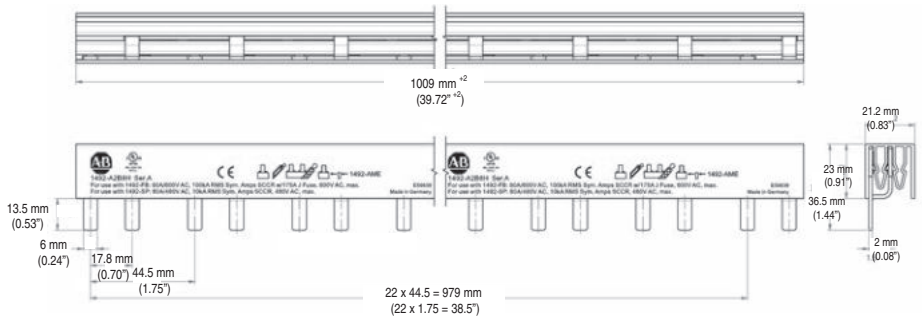


Figure 66 - Cat. No. 1492-A2B8H



Bus Bar Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 67 - Cat. No. 1492-AAT1S

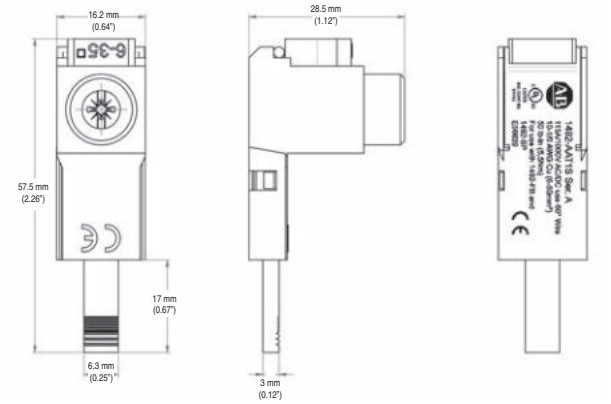


Figure 68 - Cat. No. 1492-AAT1LP

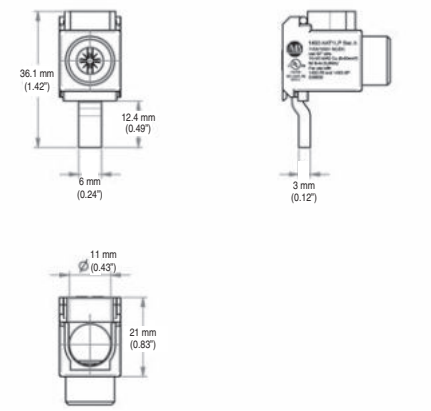


Figure 69 - Cat. No. 1492-AAT2

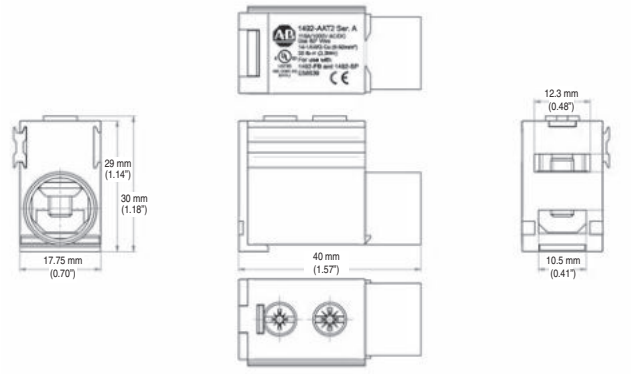


Figure 70 - Cat. No. 1492-A1E

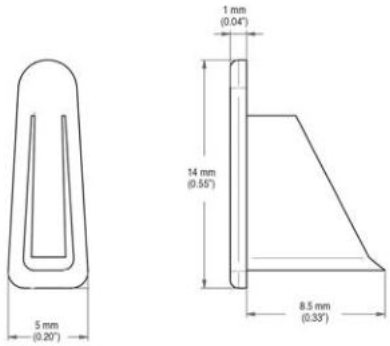


Figure 71 - Cat. No. 1492-AME

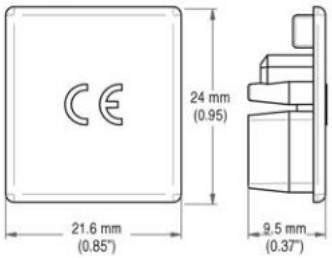
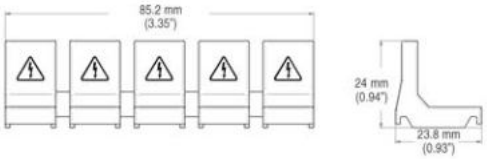
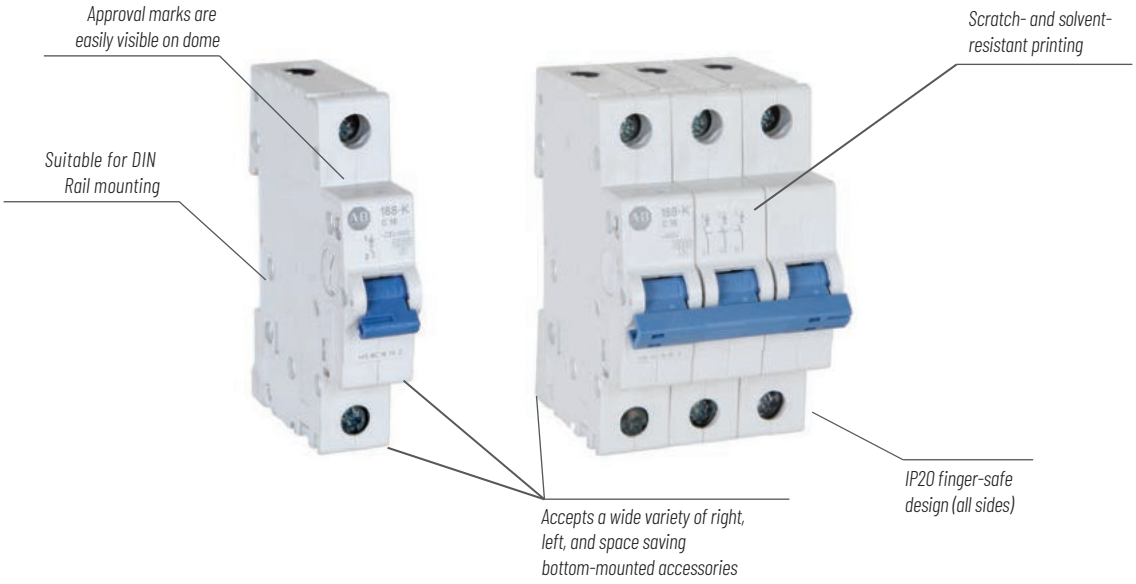


Figure 72 - Cat. No. 1492-AAP





Bulletin 188 Regional Circuit Breakers are protective devices applied at the equipment level. They are offered as a broad portfolio of pole variants, current ratings and trip curves to match the appropriate level of protection for your application. They may be used with IEC rated bus bars for convenience in panel assembly. A wide range of left-, right- and space saving bottom-mount accessories (common to the Bulletin 1492-SP devices) is available.

Bulletin 188 Regional Circuit Breakers have regional certifications only. They are available in China and Europe.

Features include:

- Current limiting
- Fast breaking time
- Broad portfolio of pole variants, current ratings and trip curves
- Available with 6 kA (188-K) and 10 kA (188-J) interrupting capacity
- Installation of up to six accessories on the same circuit breaker
- Existing installations can be easily upgraded to include an auxiliary using the bottom mounted auxiliary contact options
- Superior shock and vibration resistance to help prevent nuisance tripping
- Reversible line and load connections
- Single and multi-pole lock out attachments available for Lockout/Tagout (LOTO)
- RoHS compliant and fully recyclable device
- Suitable for extreme ambient conditions

188 Regional Circuit Breakers	
Rated Voltage	IEC: U_e Max. 230/400V AC
Interrupting Capacity	IEC: 6 kA, 10 kA
Current Ratings	0.5...63 A
Poles	1, 2, 3, 4, 1+N, 3+N
Trip Curves	B, C, D
Standards Compliance	EN 60898-1 GB 10963
Certifications	CE Marked CCC Certified VDE Certified RoHS Compliant UKCA Marked

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

188	-	J	1	C	010	-	N
		a	b	c	d		e

a

Interrupt Rating	
Code	**Description**
J	Regional Circuit Breaker, 10 kA
K	Regional Circuit Breaker, 6 kA

b

Poles	
Code	**Description**
1	1-Pole
2	2-Pole
3	3-Pole
4	4-Pole

c

Trip Curve	
Code	**Description**
B	Trip Curve B
C	Trip Curve C
D	Trip Curve D

d

Rated Current (I_n)	
Code	**Current [A]**
005	0.5
010	1
020	2
030	3
040	4
060	6
080	8
100	10
130	13
160	16
200	20
250	25
320	32
400	40
500	50
630	63

e

+ Neutral (for 1+N and 3+N configurations)	
Code	**Description**
	Can be left blank
N	+ Neutral

Product Selection

1-Pole Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  1-pole	0.5	–	188-J1C005	188-J1D005	–	188-K1C005	188-K1D005
	1	–	188-J1C010	188-J1D010	–	188-K1C010	188-K1D010
	2	–	188-J1C020	188-J1D020	–	188-K1C020	188-K1D020
	3	–	188-J1C030	188-J1D030	–	188-K1C030	188-K1D030
	4	–	188-J1C040	188-J1D040	–	188-K1C040	188-K1D040
	6	188-J1B060	188-J1C060	188-J1D060	188-K1B060	188-K1C060	188-K1D060
	8	188-J1B080	188-J1C080	188-J1D080	188-K1B080	188-K1C080	188-K1D080
	10	188-J1B100	188-J1C100	188-J1D100	188-K1B100	188-K1C100	188-K1D100
	13	188-J1B130	188-J1C130	188-J1D130	188-K1B130	188-K1C130	188-K1D130
	16	188-J1B160	188-J1C160	188-J1D160	188-K1B160	188-K1C160	188-K1D160
	20	188-J1B200	188-J1C200	188-J1D200	188-K1B200	188-K1C200	188-K1D200
	25	188-J1B250	188-J1C250	188-J1D250	188-K1B250	188-K1C250	188-K1D250
	32	188-J1B320	188-J1C320	188-J1D320	188-K1B320	188-K1C320	188-K1D320
	40	188-J1B400	188-J1C400	188-J1D400	188-K1B400	188-K1C400	188-K1D400
	50	188-J1B500	188-J1C500	188-J1D500	188-K1B500	188-K1C500	188-K1D500
	63	188-J1B630	188-J1C630	188-J1D630	188-K1B630	188-K1C630	188-K1D630

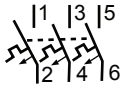
1-Pole + Neutral Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  1-pole +N	0.5	–	188-J1C005-N	188-J1D005-N	–	188-K1C005-N	188-K1D005-N
	1	–	188-J1C010-N	188-J1D010-N	–	188-K1C010-N	188-K1D010-N
	2	–	188-J1C020-N	188-J1D020-N	–	188-K1C020-N	188-K1D020-N
	3	–	188-J1C030-N	188-J1D030-N	–	188-K1C030-N	188-K1D030-N
	4	–	188-J1C040-N	188-J1D040-N	–	188-K1C040-N	188-K1D040-N
	6	188-J1B060-N	188-J1C060-N	188-J1D060-N	188-K1B060-N	188-K1C060-N	188-K1D060-N
	8	188-J1B080-N	188-J1C080-N	188-J1D080-N	188-K1B080-N	188-K1C080-N	188-K1D080-N
	10	188-J1B100-N	188-J1C100-N	188-J1D100-N	188-K1B100-N	188-K1C100-N	188-K1D100-N
	13	188-J1B130-N	188-J1C130-N	188-J1D130-N	188-K1B130-N	188-K1C130-N	188-K1D130-N
	16	188-J1B160-N	188-J1C160-N	188-J1D160-N	188-K1B160-N	188-K1C160-N	188-K1D160-N
	20	188-J1B200-N	188-J1C200-N	188-J1D200-N	188-K1B200-N	188-K1C200-N	188-K1D200-N
	25	188-J1B250-N	188-J1C250-N	188-J1D250-N	188-K1B250-N	188-K1C250-N	188-K1D250-N
	32	188-J1B320-N	188-J1C320-N	188-J1D320-N	188-K1B320-N	188-K1C320-N	188-K1D320-N
	40	188-J1B400-N	188-J1C400-N	188-J1D400-N	188-K1B400-N	188-K1C400-N	188-K1D400-N
	50	188-J1B500-N	188-J1C500-N	188-J1D500-N	188-K1B500-N	188-K1C500-N	188-K1D500-N
	63	188-J1B630-N	188-J1C630-N	188-J1D630-N	188-K1B630-N	188-K1C630-N	188-K1D630-N

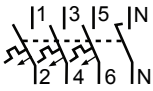
2-Pole Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  2-pole	0.5	–	188-J2C005	188-J2D005	–	188-K2C005	188-K2D005
	1	–	188-J2C010	188-J2D010	–	188-K2C010	188-K2D010
	2	–	188-J2C020	188-J2D020	–	188-K2C020	188-K2D020
	3	–	188-J2C030	188-J2D030	–	188-K2C030	188-K2D030
	4	–	188-J2C040	188-J2D040	–	188-K2C040	188-K2D040
	6	188-J2B060	188-J2C060	188-J2D060	188-K2B060	188-K2C060	188-K2D060
	8	188-J2B080	188-J2C080	188-J2D080	188-K2B080	188-K2C080	188-K2D080
	10	188-J2B100	188-J2C100	188-J2D100	188-K2B100	188-K2C100	188-K2D100
	13	188-J2B130	188-J2C130	188-J2D130	188-K2B130	188-K2C130	188-K2D130
	16	188-J2B160	188-J2C160	188-J2D160	188-K2B160	188-K2C160	188-K2D160
	20	188-J2B200	188-J2C200	188-J2D200	188-K2B200	188-K2C200	188-K2D200
	25	188-J2B250	188-J2C250	188-J2D250	188-K2B250	188-K2C250	188-K2D250
	32	188-J2B320	188-J2C320	188-J2D320	188-K2B320	188-K2C320	188-K2D320
	40	188-J2B400	188-J2C400	188-J2D400	188-K2B400	188-K2C400	188-K2D400
	50	188-J2B500	188-J2C500	188-J2D500	188-K2B500	188-K2C500	188-K2D500
	63	188-J2B630	188-J2C630	188-J2D630	188-K2B630	188-K2C630	188-K2D630

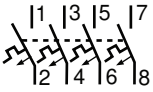
3-Pole Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  3-pole	0.5	–	188-J3C005	188-J3D005	–	188-K3C005	188-K3D005
	1	–	188-J3C010	188-J3D010	–	188-K3C010	188-K3D010
	2	–	188-J3C020	188-J3D020	–	188-K3C020	188-K3D020
	3	–	188-J3C030	188-J3D030	–	188-K3C030	188-K3D030
	4	–	188-J3C040	188-J3D040	–	188-K3C040	188-K3D040
	6	188-J3B060	188-J3C060	188-J3D060	188-K3B060	188-K3C060	188-K3D060
	8	188-J3B080	188-J3C080	188-J3D080	188-K3B080	188-K3C080	188-K3D080
	10	188-J3B100	188-J3C100	188-J3D100	188-K3B100	188-K3C100	188-K3D100
	13	188-J3B130	188-J3C130	188-J3D130	188-K3B130	188-K3C130	188-K3D130
	16	188-J3B160	188-J3C160	188-J3D160	188-K3B160	188-K3C160	188-K3D160
	20	188-J3B200	188-J3C200	188-J3D200	188-K3B200	188-K3C200	188-K3D200
	25	188-J3B250	188-J3C250	188-J3D250	188-K3B250	188-K3C250	188-K3D250
	32	188-J3B320	188-J3C320	188-J3D320	188-K3B320	188-K3C320	188-K3D320
	40	188-J3B400	188-J3C400	188-J3D400	188-K3B400	188-K3C400	188-K3D400
	50	188-J3B500	188-J3C500	188-J3D500	188-K3B500	188-K3C500	188-K3D500
	63	188-J3B630	188-J3C630	188-J3D630	188-K3B630	188-K3C630	188-K3D630

3-Pole + Neutral Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  3-pole + N	0.5	–	188-J3C005-N	188-J3D005-N	–	188-K3C005-N	188-K3D005-N
	1	–	188-J3C010-N	188-J3D010-N	–	188-K3C010-N	188-K3D010-N
	2	–	188-J3C020-N	188-J3D020-N	–	188-K3C020-N	188-K3D020-N
	3	–	188-J3C030-N	188-J3D030-N	–	188-K3C030-N	188-K3D030-N
	4	–	188-J3C040-N	188-J3D040-N	–	188-K3C040-N	188-K3D040-N
	6	188-J3B060-N	188-J3C060-N	188-J3D060-N	188-K3B060-N	188-K3C060-N	188-K3D060-N
	8	188-J3B080-N	188-J3C080-N	188-J3D080-N	188-K3B080-N	188-K3C080-N	188-K3D080-N
	10	188-J3B100-N	188-J3C100-N	188-J3D100-N	188-K3B100-N	188-K3C100-N	188-K3D100-N
	13	188-J3B130-N	188-J3C130-N	188-J3D130-N	188-K3B130-N	188-K3C130-N	188-K3D130-N
	16	188-J3B160-N	188-J3C160-N	188-J3D160-N	188-K3B160-N	188-K3C160-N	188-K3D160-N
	20	188-J3B200-N	188-J3C200-N	188-J3D200-N	188-K3B200-N	188-K3C200-N	188-K3D200-N
	25	188-J3B250-N	188-J3C250-N	188-J3D250-N	188-K3B250-N	188-K3C250-N	188-K3D250-N
	32	188-J3B320-N	188-J3C320-N	188-J3D320-N	188-K3B320-N	188-K3C320-N	188-K3D320-N
	40	188-J3B400-N	188-J3C400-N	188-J3D400-N	188-K3B400-N	188-K3C400-N	188-K3D400-N
	50	188-J3B500-N	188-J3C500-N	188-J3D500-N	188-K3B500-N	188-K3C500-N	188-K3D500-N
	63	188-J3B630-N	188-J3C630-N	188-J3D630-N	188-K3B630-N	188-K3C630-N	188-K3D630-N

4-Pole Regional Circuit Breakers

Photo/Wiring Diagram	Continuous Current Rating (I_n)	10 kA Interrupting Capacity			6 kA Interrupting Capacity		
		Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n	Trip Curve B Resistive or Slightly Inductive 3...5 x I_n	Trip Curve C Inductive 5...10 x I_n	Trip Curve D Highly Inductive 10...20 x I_n
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  4-pole	0.5	–	188-J4C005	188-J4D005	–	188-K4C005	188-K4D005
	1	–	188-J4C010	188-J4D010	–	188-K4C010	188-K4D010
	2	–	188-J4C020	188-J4D020	–	188-K4C020	188-K4D020
	3	–	188-J4C030	188-J4D030	–	188-K4C030	188-K4D030
	4	–	188-J4C040	188-J4D040	–	188-K4C040	188-K4D040
	6	188-J4B060	188-J4C060	188-J4D060	188-K4B060	188-K4C060	188-K4D060
	8	188-J4B080	188-J4C080	188-J4D080	188-K4B080	188-K4C080	188-K4D080
	10	188-J4B100	188-J4C100	188-J4D100	188-K4B100	188-K4C100	188-K4D100
	13	188-J4B130	188-J4C130	188-J4D130	188-K4B130	188-K4C130	188-K4D130
	16	188-J4B160	188-J4C160	188-J4D160	188-K4B160	188-K4C160	188-K4D160
	20	188-J4B200	188-J4C200	188-J4D200	188-K4B200	188-K4C200	188-K4D200
	25	188-J4B250	188-J4C250	188-J4D250	188-K4B250	188-K4C250	188-K4D250
	32	188-J4B320	188-J4C320	188-J4D320	188-K4B320	188-K4C320	188-K4D320
	40	188-J4B400	188-J4C400	188-J4D400	188-K4B400	188-K4C400	188-K4D400
	50	188-J4B500	188-J4C500	188-J4D500	188-K4B500	188-K4C500	188-K4D500
	63	188-J4B630	188-J4C630	188-J4D630	188-K4B630	188-K4C630	188-K4D630

Specifications

General Data			
Poles			1, 2, 3, 4, 1+N, 3+N
Tripping characteristics			B, C, D
Rated current (I_n)			0.5...63 A
Rated frequency (f)			50/60 Hz
Rated insulation voltage U_i per IEC/EN 60664-1			250V AC (phase to ground) 440V AC (phase to phase)
Overvoltage category			III
Pollution degree			2
Data per IEC/EN 60898-1			
Rated operational voltage (U_e)	1-pole		230/400V AC
	1-pole + N		230V AC
	2-, 3-, 4-, 3-pole + N		400V AC
Highest supply or utilization voltage (U_{max})	AC	1-pole	253/440V AC
		1-pole + N	253V AC
		2-, 3-, 4-, 3-pole + N	440V AC
	DC (1)	1-pole	48V DC
		2-pole	96V DC
Min. operating voltage			12V AC, 12V DC
Rated short-circuit capacity (I_{cn})	188-J		10 kA
	188-K		6 kA
Energy limiting class (B, C up to 40 A)			3
Rated impulse withstand voltage $U_{imp.}$ (1.2/50µs)			4 kV (test voltage 6.2 kV at sea level, 5 kV at 2,000 m)
Dielectric test voltage			2 kV (50/60 Hz, 1 min.)
Reference temperature for tripping characteristics			B, C, D: 30 °C (86 °F)
Electrical endurance 1 cycle (2s - ON, 13s - OFF, $I_n \leq 32$ A), 1 cycle (2s - ON, 28s - OFF, $I_n > 32$ A)			$I_n < 30$ A: 20,000 ops (AC) $I_n \geq 30$ A: 10,000 ops. (AC); 1,000 ops. (DC)

(1) IEC DC ratings self-declared.

Mechanical Data		
Housing		Insulation group II, RAL 7035
Indicator window		None
Protection degree per EN 60529		IP20, IP40 in enclosure with cover
Mechanical endurance		20,000 operations
Shock resistance per IEC/EN 60068-2-27		25 g – 2 shocks – 13 ms
Vibration resistance per IEC/EN 60068-2-6		5g – 20 cycles at 5...150...5 Hz with load 0.8 x I_n
Environmental		
Environmental conditions (damp heat) per IEC/EN 60068-2-30		28 cycles with 55 °C (131 °F)/90-96% and 25 °C (-13 °F)/95-100%
Ambient temperature (1)		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Cage terminal
Cross-section of wire – solid, stranded		0.75...25 mm^2
Cross-section of wire – flexible		0.75...16 mm^2
Tightening torque	IEC	2.0 N•m
Screwdriver		No. 2 Pozidriv
Mounting		DIN Rail (EN 60715, 35 mm) with fast clip
Mounting position		Any
Supply		Optional
Approximate Dimensions and Weight		
Pole dimension (H x D x W)		85 x 69 x 17.5 mm
Pole weight		115 g (4.4 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Shunt trip		Yes

(1) See Table 10 for ambient temperature derating information.

Power Loss Due to Current

Rated Current [A]	Power Loss Per Pole [W]
0.5	1.4
1	1.4
2	1.8
3	1.5
4	1.8
6	2.0
8	1.5
10	2.1
13	2.3
16	2.5
20	2.5
25	3.2
32	3.7
40	4.8
50	4.5
63	5.2

The installation of several devices side by side with rated current on all poles requires a correction factor to the rated current (not required if spacers are used).

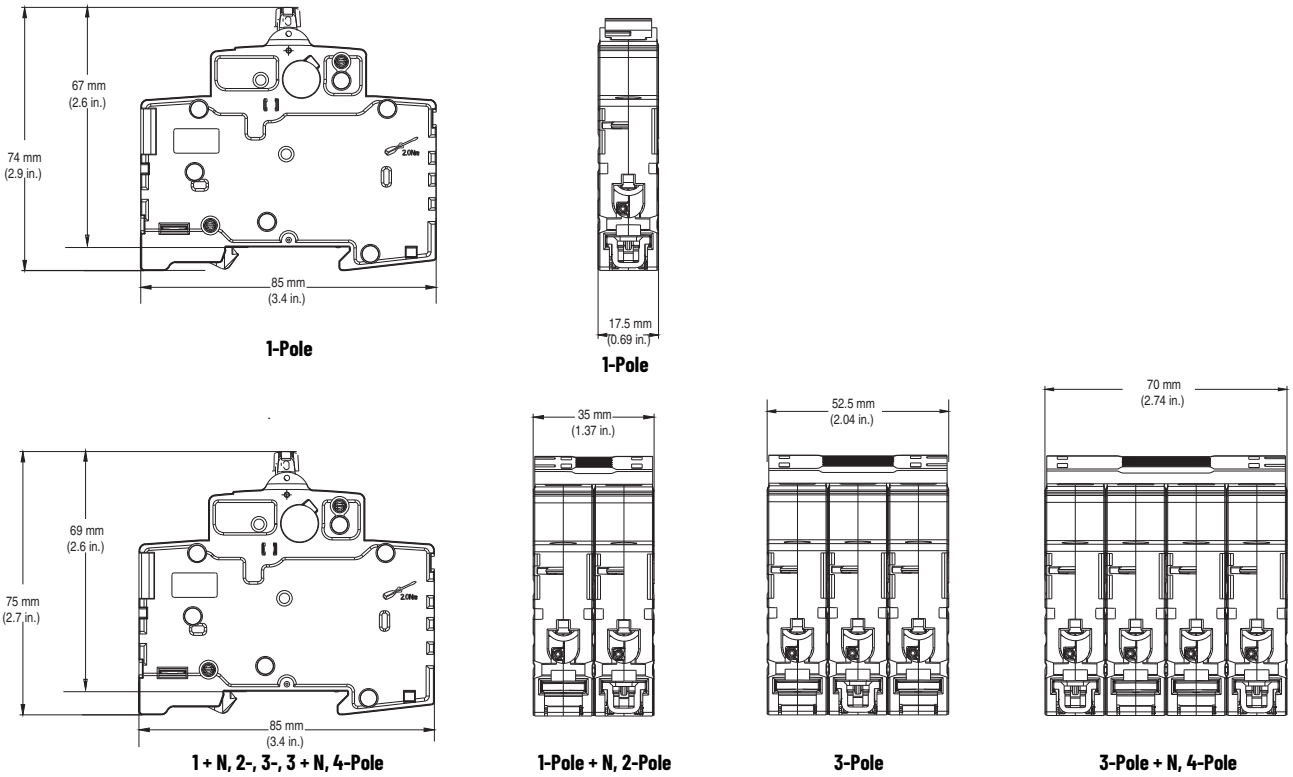
Zero-stack Derating

No. of Adjacent Devices	Correction Factor
1	1
2.3	0.9
4.5	0.8
≥ 6	0.75

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 73 - Bulletin 188-J, -K Devices



Ambient Temperature Derating

Application below 0 °C (32 °F) is for non-condensing atmosphere. Care should be taken for applications at or below 0 °C (32 °F). These devices are not certified to operate correctly in the presence of ice.

Table 10 - Bulletin 188-J, -K Temperature Derating, IEC Applications—Reference Temperature 30 °C (86 °F)

Current Rating [A]	Ambient Temperature [°C (°F)]									
	-25 (-13)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	55 (131)
0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1	1.2	1.2	1.1	1.1	1.1	1.0	1	1.0	0.9	0.9
2	2.3	2.3	2.2	2.2	2.1	2.1	2	1.9	1.9	1.9
3	3.5	3.5	3.4	3.3	3.2	3.1	3	2.9	2.8	2.8
4	4.7	4.6	4.5	4.4	4.2	4.1	4	3.9	3.8	3.7
6	7.0	6.9	6.7	6.5	6.4	6.2	6	5.8	5.6	5.6
8	9.3	9.2	9.0	8.7	8.5	8.2	8	7.8	7.5	7.4
10	11.7	11.5	11.2	10.9	10.6	10.3	10	9.7	9.4	9.3
13	15.1	15.0	14.6	14.2	13.8	13.4	13	12.6	12.2	12.0
16	18.6	18.4	17.9	17.4	17.0	16.5	16	15.5	15.0	14.8
20	23.3	23.0	22.4	21.8	21.2	20.6	20	19.4	18.8	18.5
25	29.1	28.8	28.0	27.3	26.5	25.8	25	24.3	23.5	23.1
32	37.3	36.8	35.8	34.9	33.9	33.0	32	31.0	30.1	29.6
40	46.6	46.0	44.87	43.6	42.4	41.2	40	38.8	37.6	37.0
50	58.3	57.5	56.0	54.5	53.0	51.5	50	48.5	47.0	46.3
63	73.4	72.5	70.6	68.7	66.8	64.9	63	61.1	61.1	59.2

Tripping Characteristics

- DC trip curves – When using 188-J/-K devices on DC applications or DC loads, please see AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating (I_n).
  - For B trip curve = 4.5…7.5 x rated current (I/I_n).
  - For C trip curve = 7.5…15 x rated current (I/I_n).
  - For D trip curve = 15…30 x rated current (I/I_n).
- The thermal trip times remain the same for both AC and DC applications.
- I_1 is the lower trip range. If the overcurrent condition is 1.04 x Rated Current (I_n) the breaker does not trip. At a level of 1.05 x I_n, the breaker trips according to the trip curve.
- I_2 is the higher trip range. The breaker must trip at that level. The tripping time follows the trip curve.

Figure 74 - B Curve

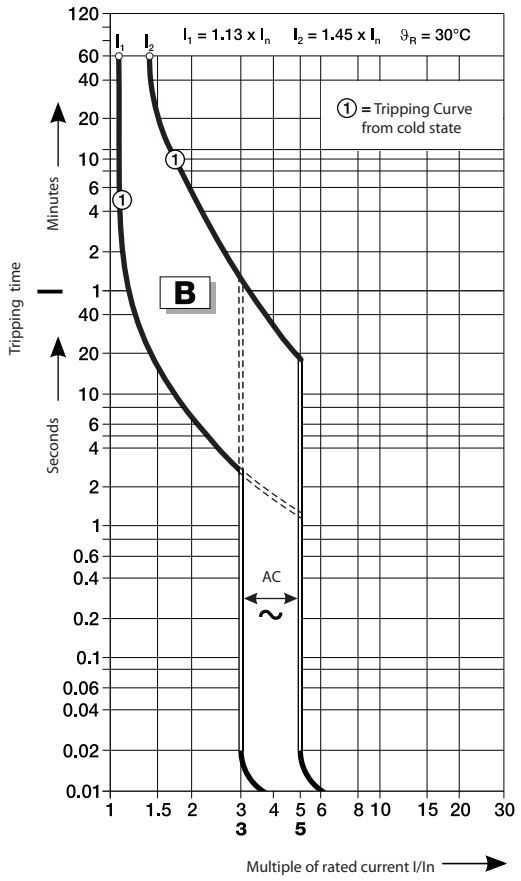


Figure 75 - C Curve

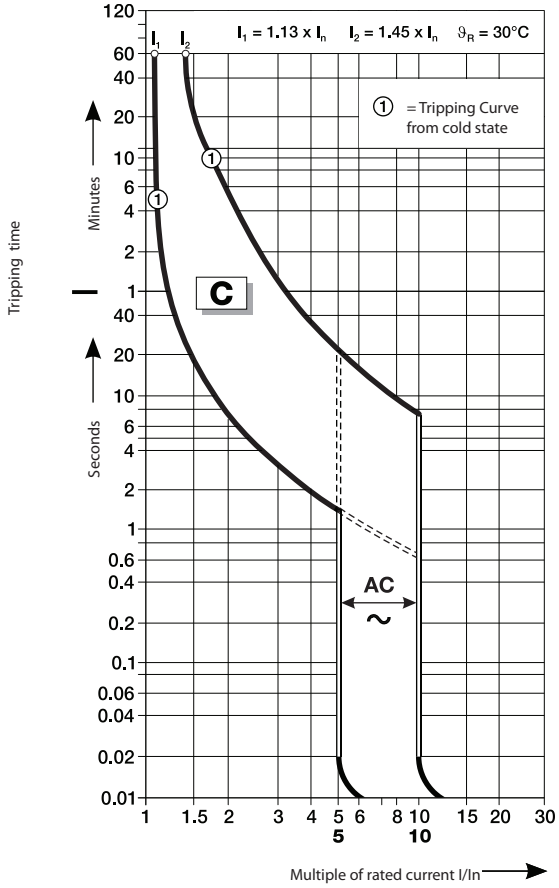
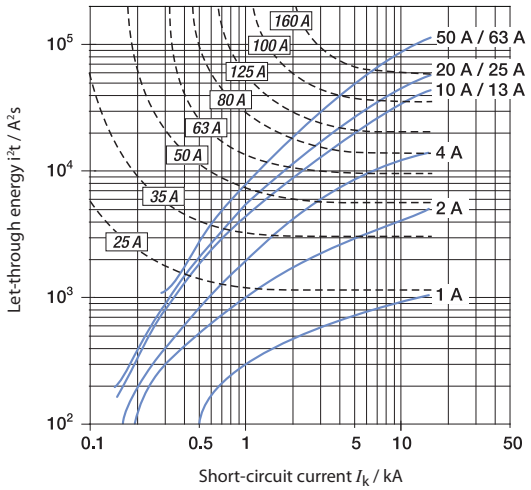


Figure 76 - B and C Curve – 230/400V AC Let-through Energy



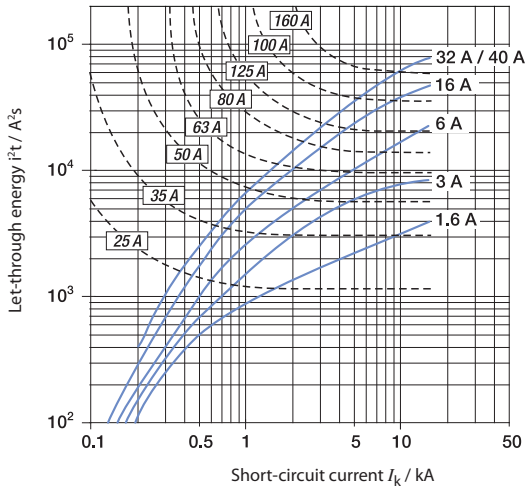


Figure 77 - D Curve

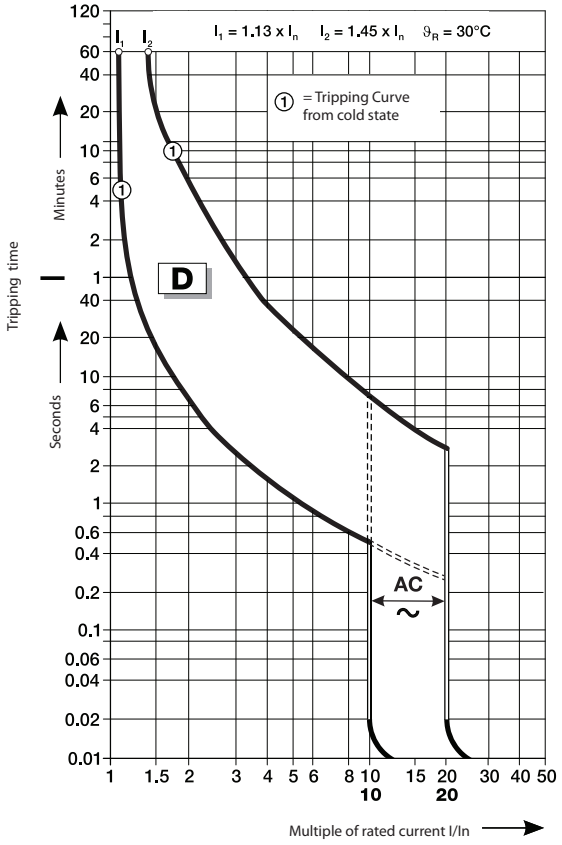
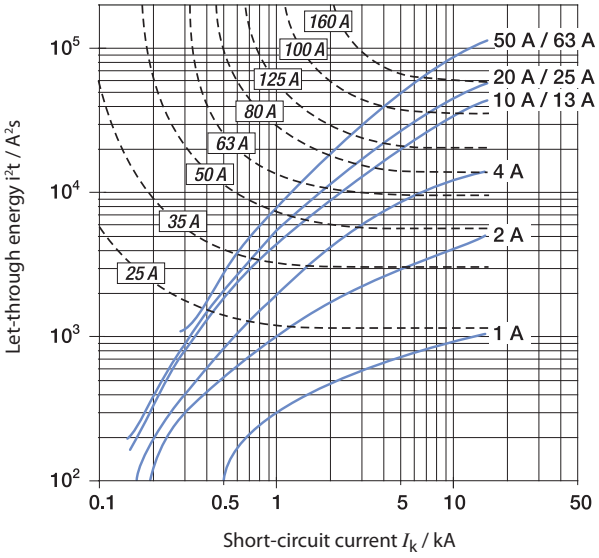
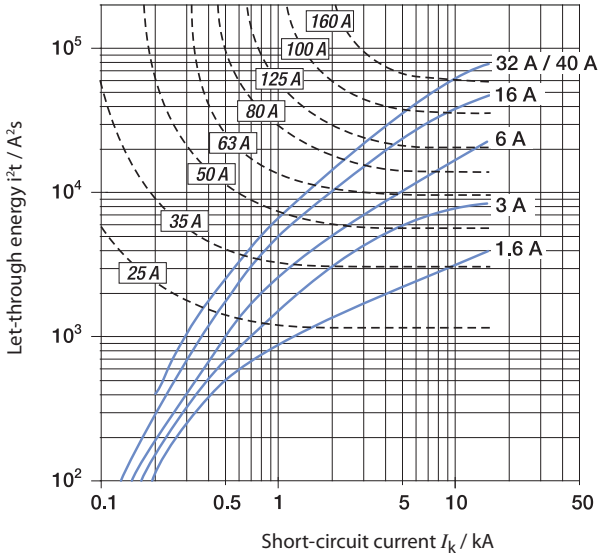


Figure 78 - D Curve – 230/400V AC Let-through Energy



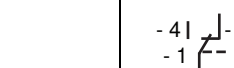
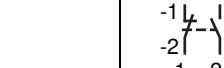
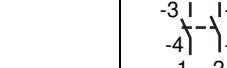


Accessories

Right Mount

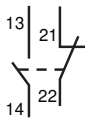
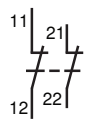
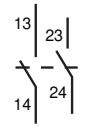
Photo	Product Description (1) (2) (3)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip		UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	110...415V AC 110...250V DC	110...415V AC 110...250V DC	189-AST1
			UL 1077 CSA 22.2 No. 235	UL Recognized CSA Certified CE Marked	12...60V AC/DC	12...60V AC/DC	189-AST2
	Auxiliary/Signal Contact • only operates when the protective device trips	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-ASCR3

Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AR3
		1 N.O. + 1 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR11
		2 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR02
		2 N.O. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR20

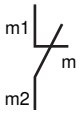
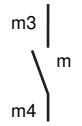
(1) A maximum of one C.O. type signal contact, and two C.O. type auxiliary contacts ***OR*** three C.O. type auxiliary contacts may be installed with or without one shunt trip for each Bul. 188 breaker.
(2) A maximum of two 189-AR11, -AR02, or -AR20 auxiliary contacts may be installed for each Bul. 188 breaker. They may not be combined with shunt trips or C.O. type contacts.
(3) A maximum of four right mount accessories of any type may be installed for each Bul. 188 breaker. The shunt trip must be mounted closest to 188, then the signal contact, then the auxiliary contact(s). For allowed combinations, see Figure 79 and Table 11.

Left Mount

Photo	Product Description (1)	Contacts	Standards Compliance	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL11
		2 N.C. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL02
		2 N.O. 	EN 60947-5-1	CE Marked	–	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AL20

(1) Only one left mount auxiliary contact may be installed per Bul. 188 breaker.

Bottom Mount

Photo	Product Description (1)	Contacts	Standards Compliance	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C.  	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB01
		1 N.O.  	UL1077 CSA C22.2 No.235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked CCC Certified	2 A @ 230V AC 2 A @ 50V DC	2 A @ 230V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AB10

(1) Only one bottom mount auxiliary contact may be installed per Bul. 188 breaker.
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

Toggle Mount

Photo	Product Description		Cat. No.
	Lock-out attachment	for 1-pole MCB	189-ALOA1
		for multi-pole MCB	189-ALOA2

Figure 79 - Bulletin 188-J, -K Accessory Installation

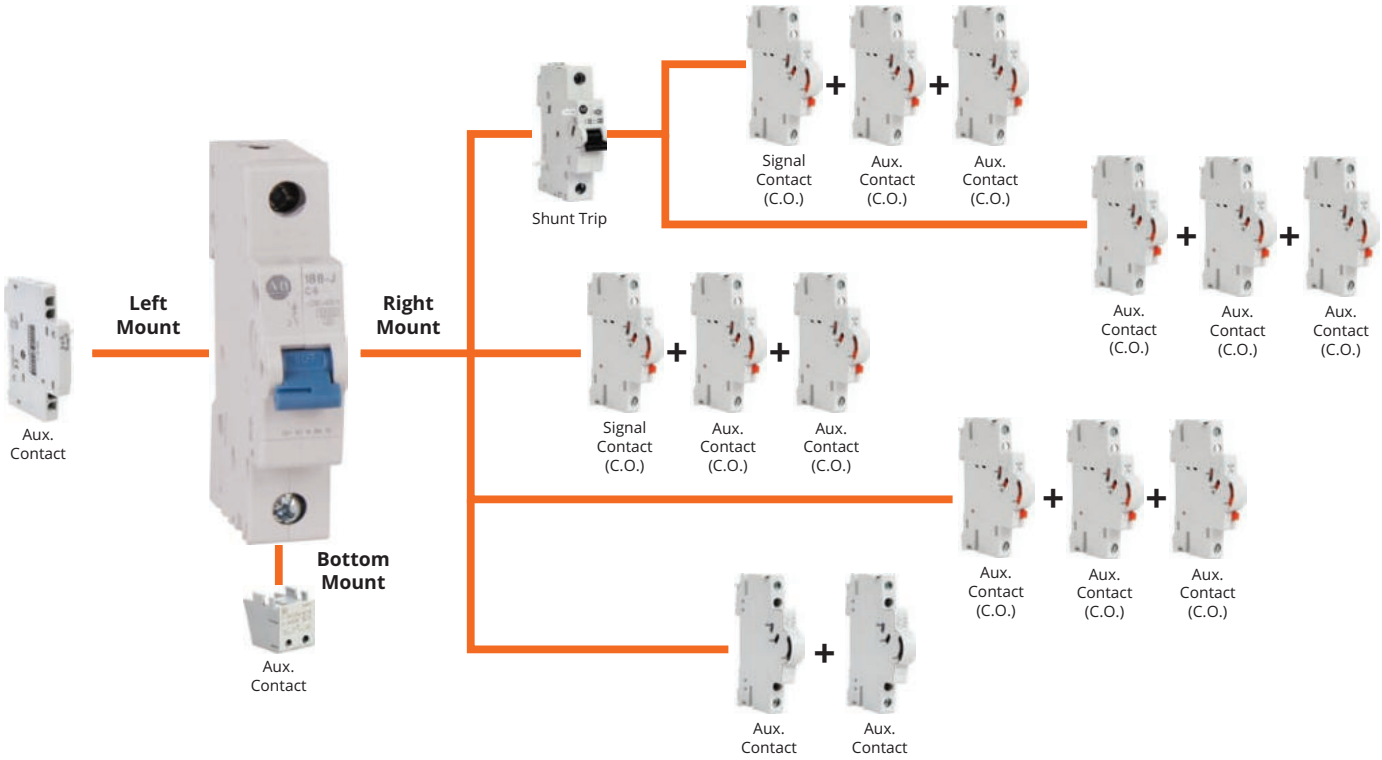


Table 11 - Bulletin 188-J, -K Accessory Compatibility

Type	Cat. No.	Mounting Location	Contacts
Shunt Trip	189-AST1	Right	–
	189-AST2	Right	–
Aux/Signal Contact	189-ASCR3	Right	1 C.O.
Auxiliary Contact	189-AR3	Right	1 C.O.
	189-AR11	Right	1 N.O. + 1 N.C.
	189-AR02	Right	2 N.C.
	189-AR20	Right	2 N.O.
	189-AL11	Left	1 N.O. + 1 N.C.
	189-AL02	Left	2 N.C.
	189-AL20	Left	2 N.O.
	189-AB01	Bottom	1 N.C.
	189-AB10	Bottom	1 N.O.

Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 80 - Cat. Nos. 189-AST1 and 189-AST2

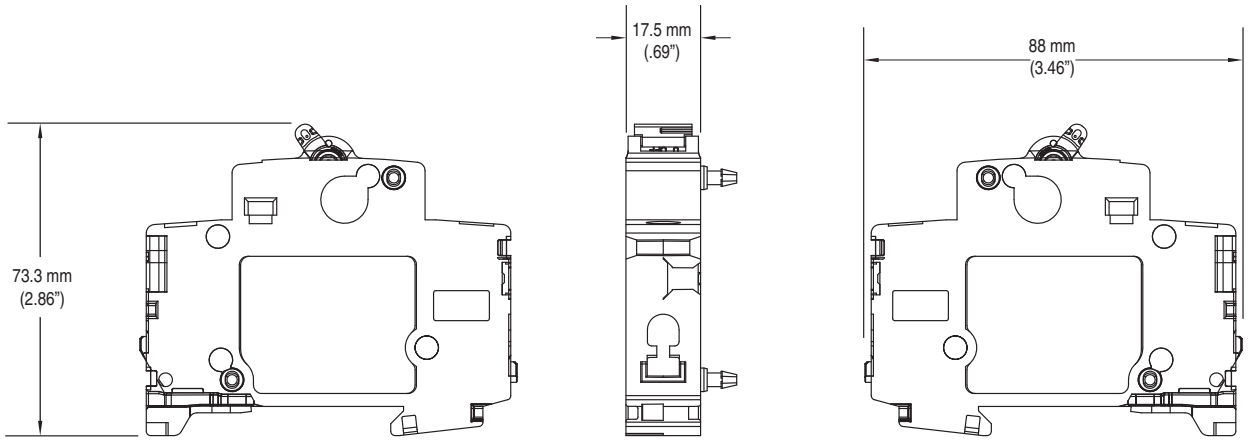


Figure 81 - Cat. No. 189-ASCR3

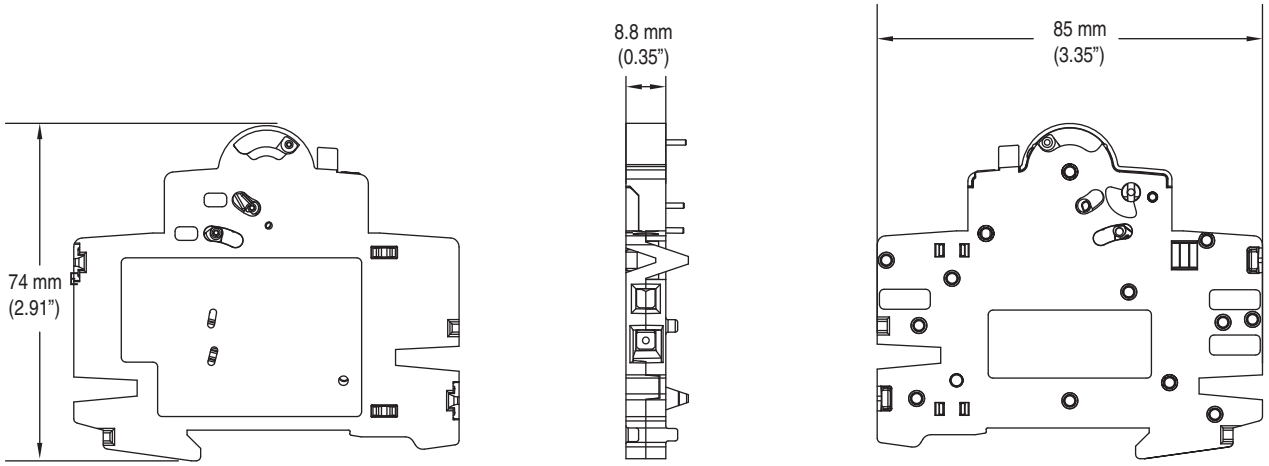


Figure 82 - Cat. No. 189-AR3

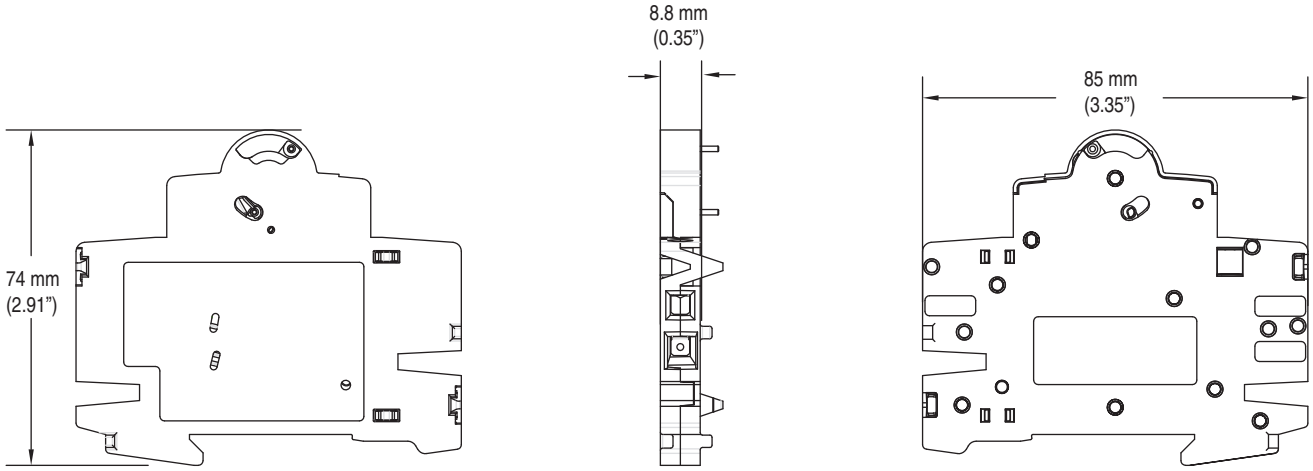


Figure 83 - Cat. Nos. 189-AR11, 189-AR02, 189-AR20

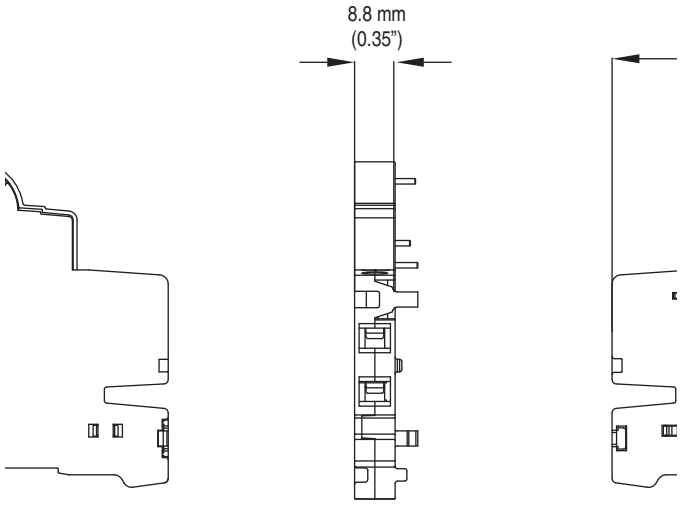


Figure 84 - 189-AL11, 189-AL02, and 189-AL20

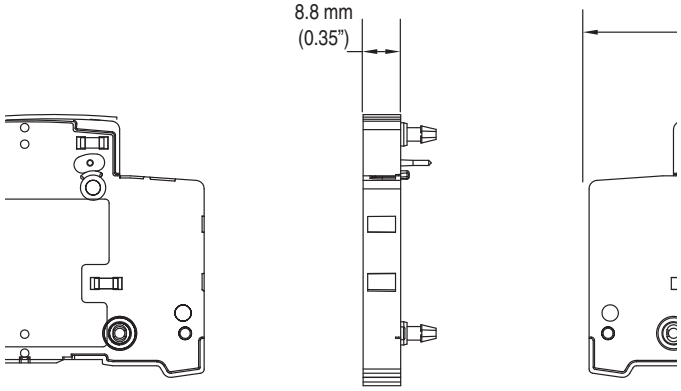
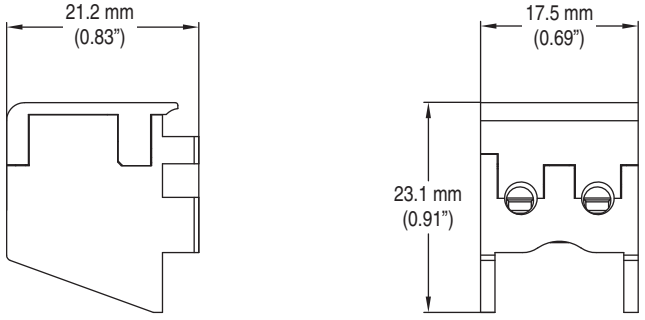


Figure 85 - Cat. Nos. 189-AB01 and 189-AB10



Bus Bars

188 Bus Bars

Description	Pins	Pkg. Qty.	Cat. No. (1)
1-Phase	60	1	189-CL1
	12	20	189-CL112
	6	20	189-CL106
	2	20	189-CL102
1-Phase with aux contact	38	1	189-CL1H
	9	20	189-CL1H09
	6	20	189-CL1H06
	2	20	189-CL1H02
2-Phase	58	10	189-CL2
	12	10	189-CL212
	6	10	189-CL206
	4	1	189-CL204
2-Phase with aux contact	44	10	189-CL2H
	10	10	189-CL2H10
	6	10	189-CL2H06
	4	1	189-CL2H04
3-Phase	60	10	189-CL3
	12	10	189-CL312
	6	10	189-CL306
3-Phase with aux contact	48	1	189-CL3H
	12	10	189-CL3H12
	6	10	189-CL3H06
4-Phase	56	1	189-CL4
	8	10	189-CL408
4-Phase with aux contact	48	1	189-CL4H
2-Phase MCB to RCD	4	10	189-CL204
4-Phase MCB to RCD	8	10	189-CL408

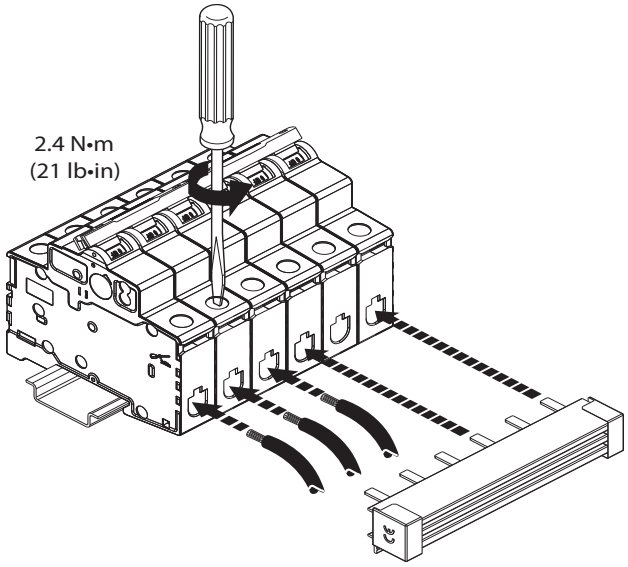
(1) These devices are CE Marked, but not certified to any UL, CSA, or other standard.

188 Bus Bar Accessories[1]

Description	Pkg. Qty.	Cat. No. [2]
Terminal Power Feed, 6...25 mm^2	10	189-CLT25
Terminal Power Feed, 6...50 mm^2	10	189-CLT50
Dedicated Power Feed, 50 mm^2	10	189-CLT50D
For 1-phase bus bar	10	189-CL1EC
For 2- or 3-phase bus bar	10	189-CL3EC
For 4-phase bus bar	10	189-CL4EC
Protective Shroud for unused pins	10	189-CLPS

(1) Dedicated Power Feed Lugs attach and mount to the bus bar pin instead of the breaker terminal. It adds height to the bus bar installation.
Terminal Power Feed Lugs occupy one terminal or phase on the breaker.
(2) These devices are CE Marked, but not certified to any UL, CSA, or other standard.

Figure 86 - Cat. No. 189-CL Bus Bar Installation



Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

1-Phase Bus Bars

Figure 87 - Cat. No. 189-CL1

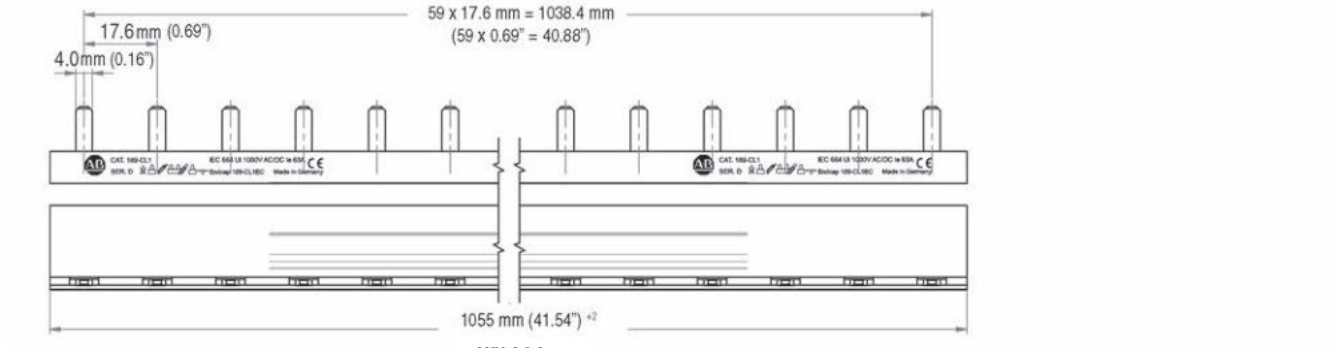


Figure 88 - Cat. No. 189-CL112

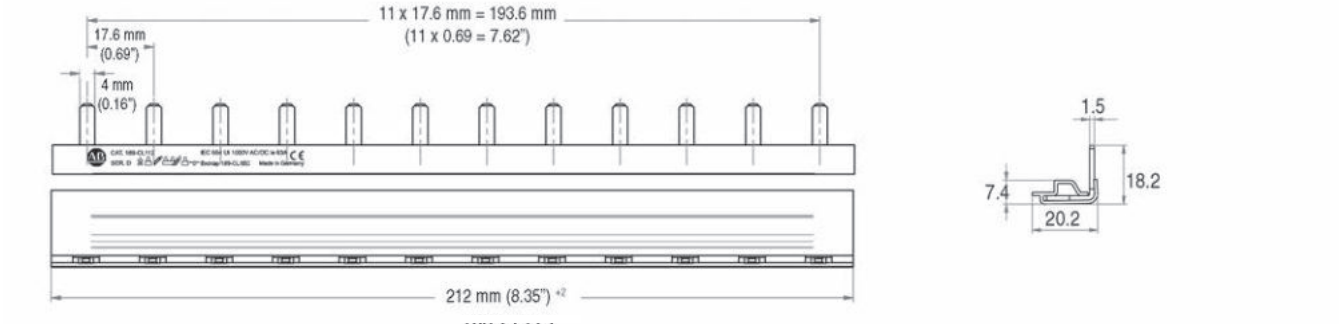


Figure 89 - Cat. No. 189-CL106

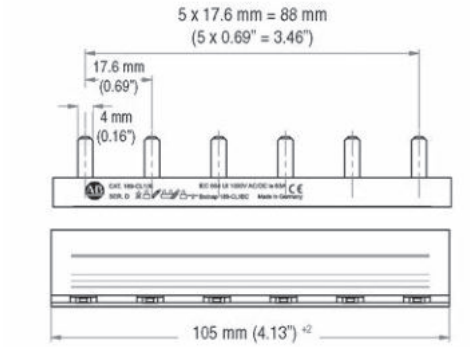
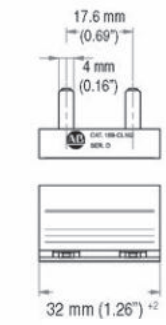


Figure 90 - Cat. No. 189-CL102



1-Phase Bus Bars with Auxiliary Contact

Figure 91 - Cat. No. 189-CL1H

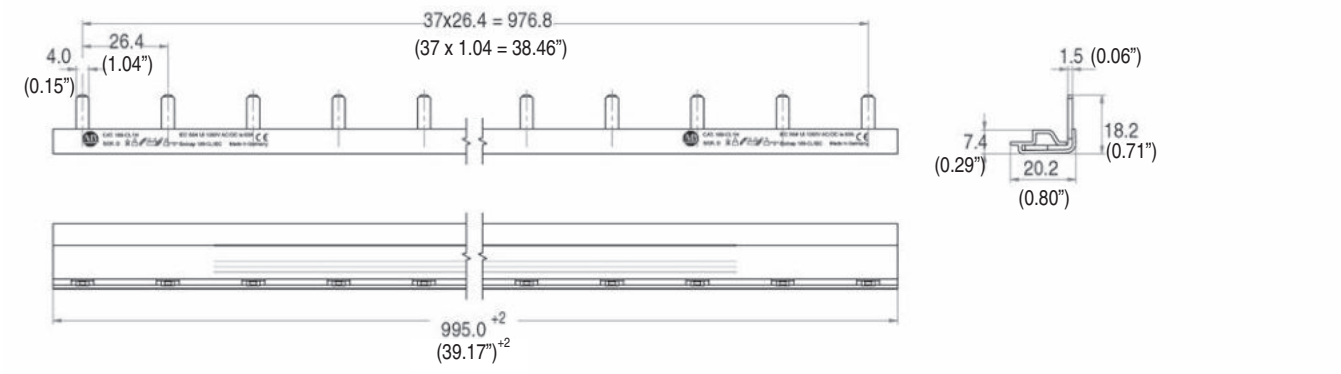


Figure 92 - Cat. No. 189-CL1H09

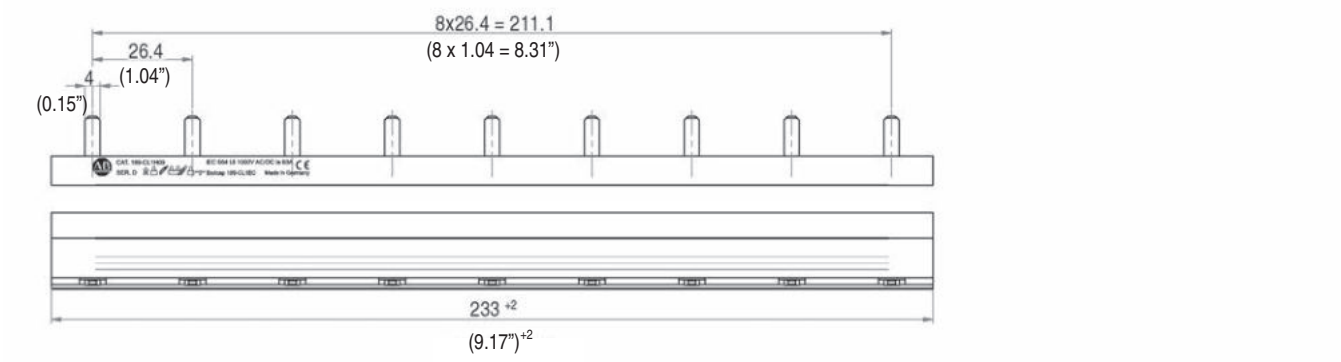


Figure 93 - Cat. No. 189-CL1H06

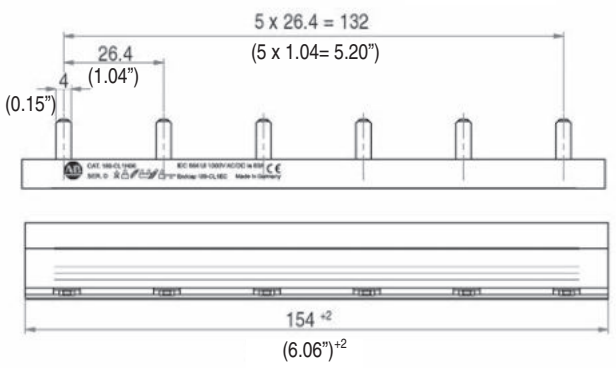
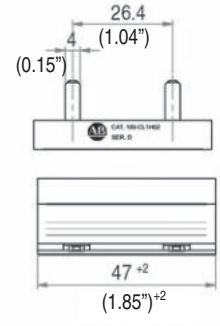


Figure 94 - Cat. No. 189-CL1H02



2-Phase Bus Bars

Figure 95 - Cat. No. 189-CL2

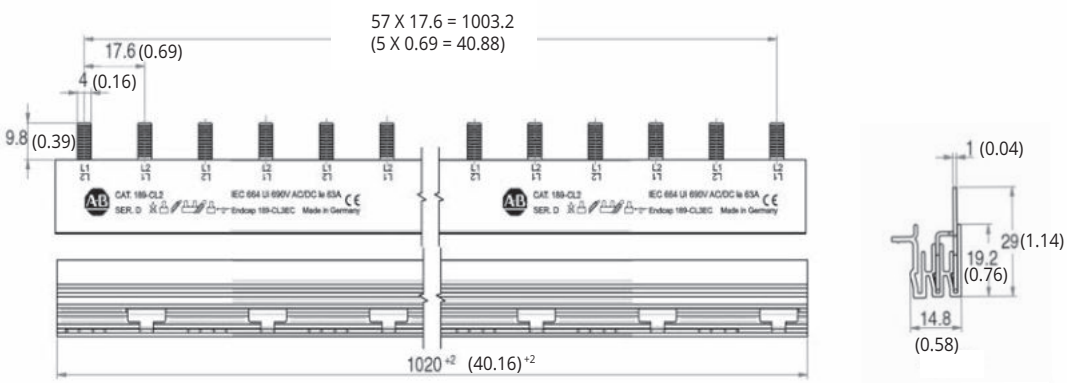


Figure 96 - Cat. No. 189-CL212

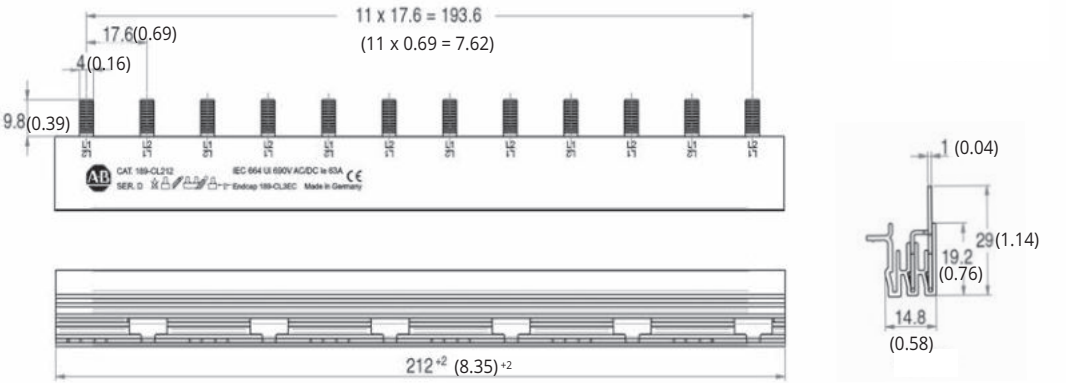


Figure 97 - Cat. No. 189-CL206

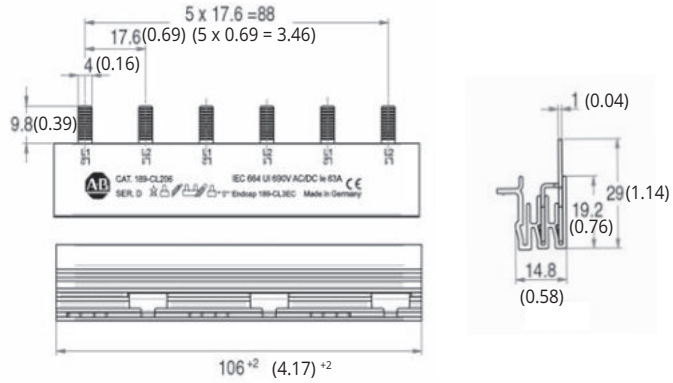
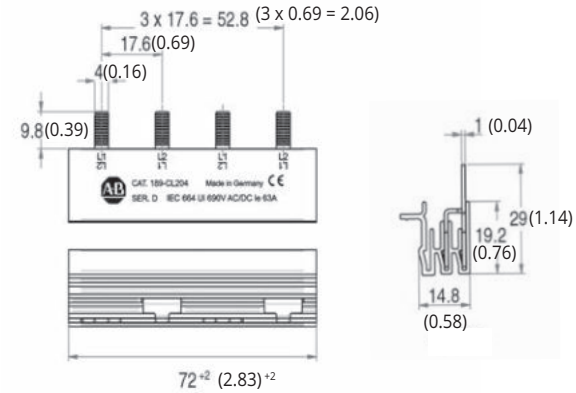


Figure 98 - Cat. No. 189-CL204



2-Phase Bus Bars with Auxiliary Contact

Figure 99 - Cat. No. 189-CL2H

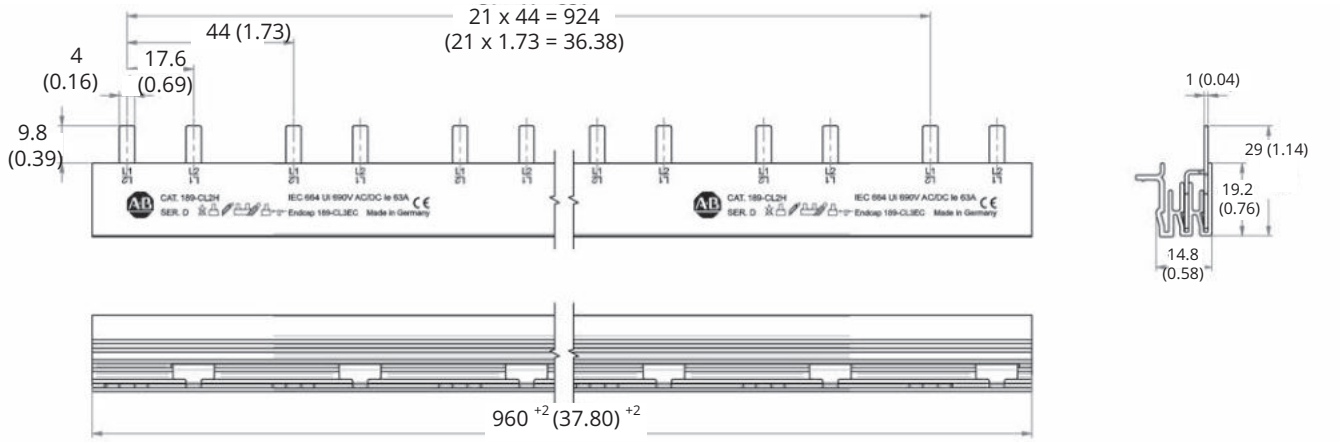


Figure 100 - Cat. No. 189-CL2H10

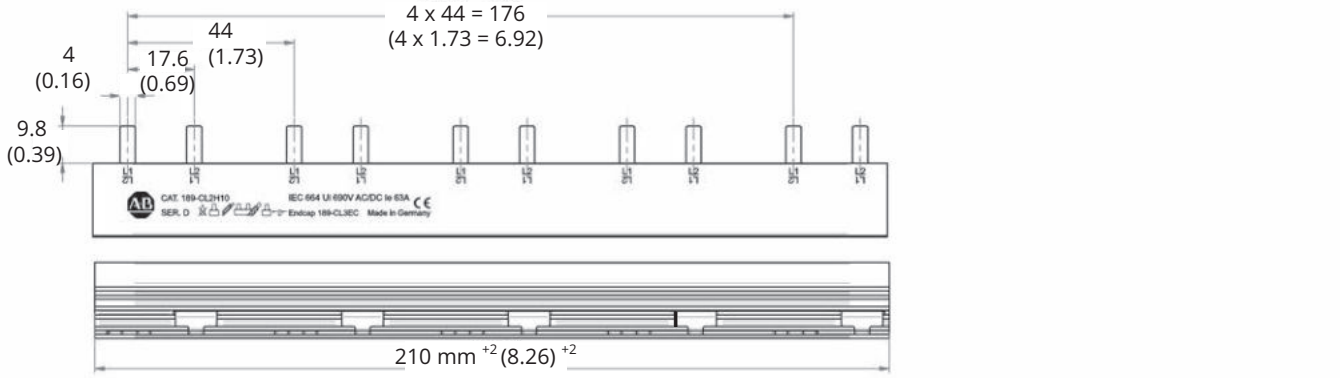


Figure 101 - Cat. No. 189-CL2H06

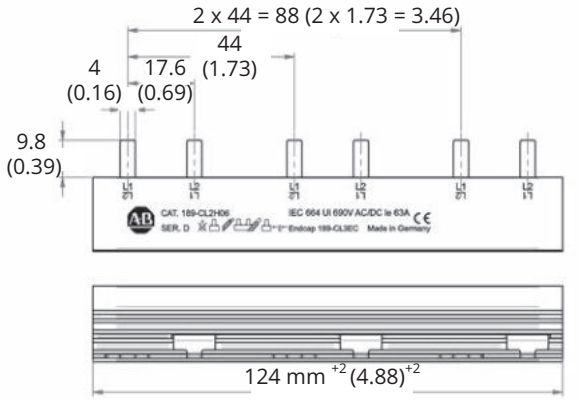
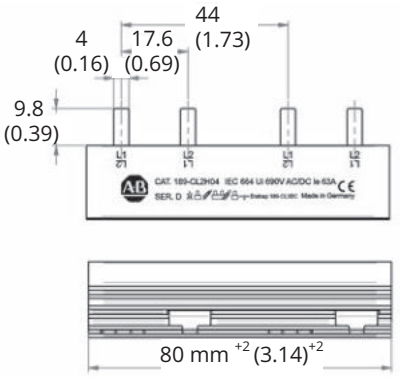


Figure 102 - Cat. No. 189-CL2H04



3-Phase Bus Bars

Figure 103 - Cat. No. 189-CL3

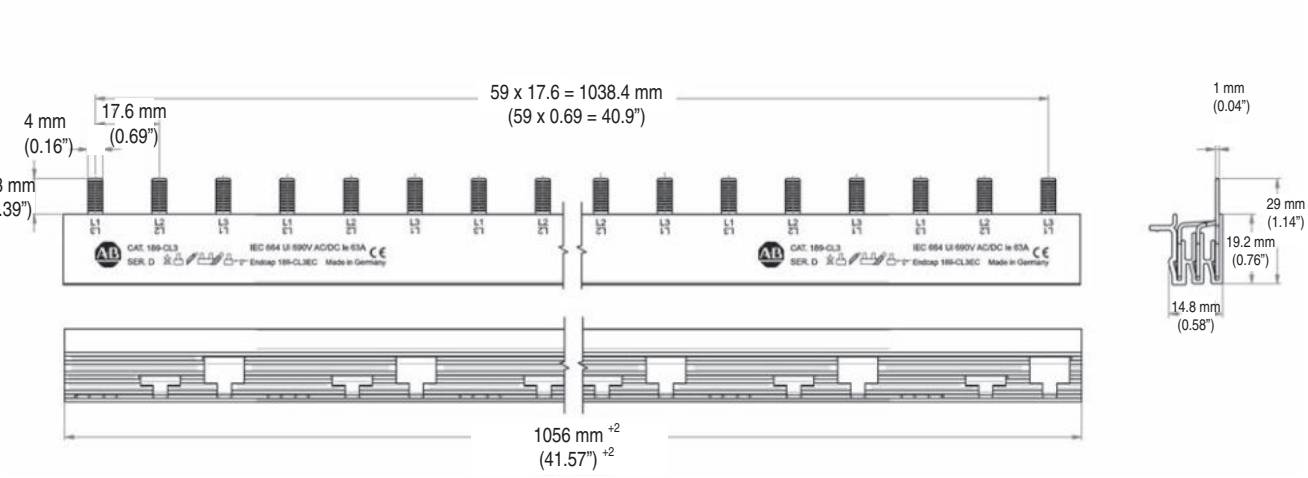


Figure 104 - Cat. No. 189-CL312

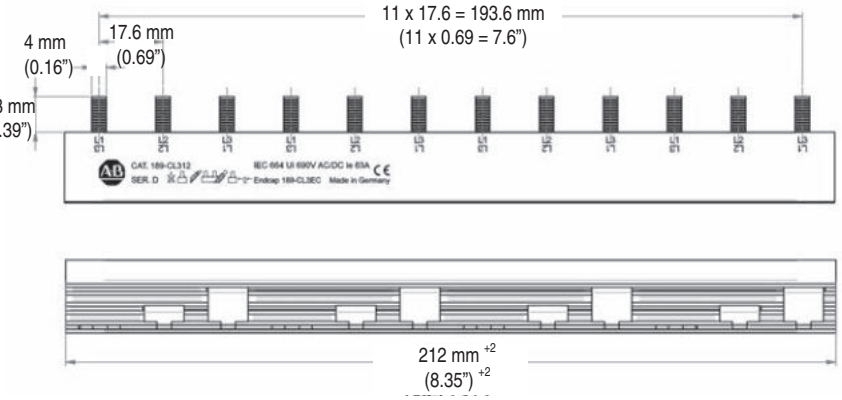
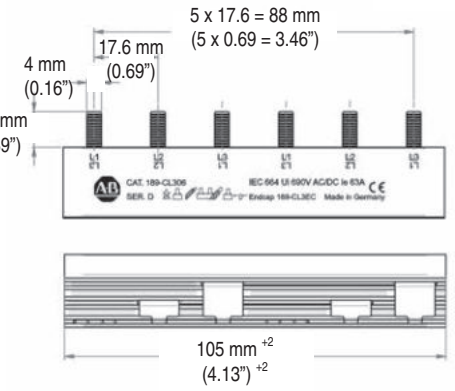


Figure 105 - Cat. No. 189-CL306



3-Phase Bus Bars with Auxiliary Contact

Figure 106 - Cat. No. 189-CL3H

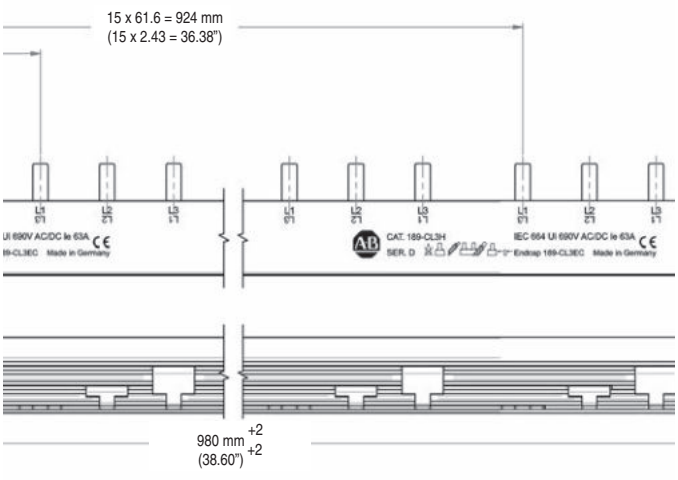


Figure 107 - Cat. No. 189-CL3H12

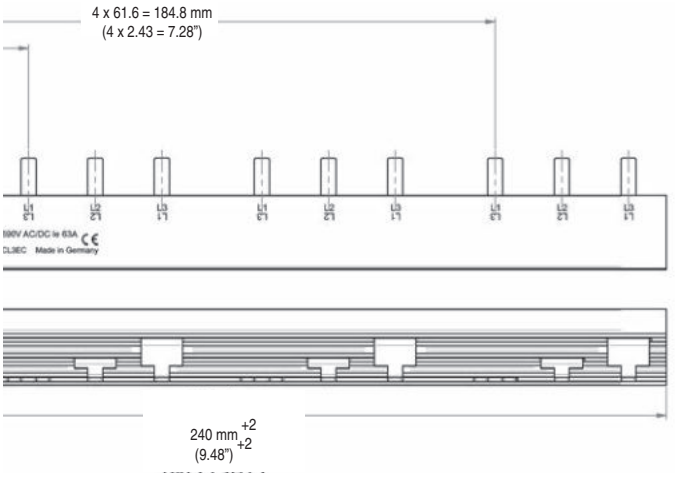
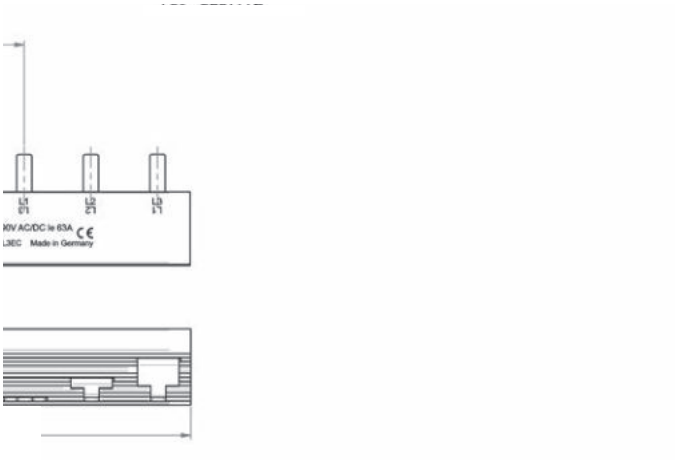


Figure 108 - Cat. No. 189-CL3H06



4-Phase Bus Bars

Figure 109 - Cat. No. 189-CL4

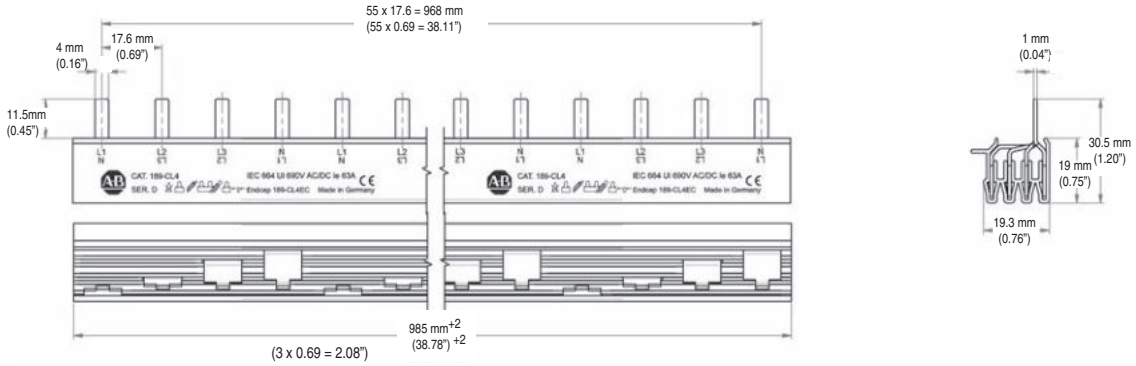
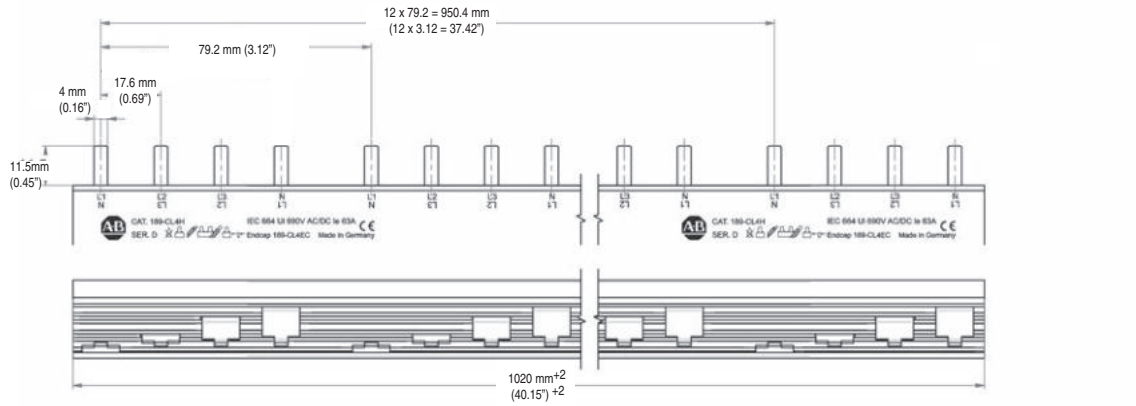


Figure 110 - Cat. No. 189-CL4H (with auxiliary contact)



2- and 4-Phase Bus Bars for connection to 1492-RCD

Figure 111 - Cat. No. 189-CL204

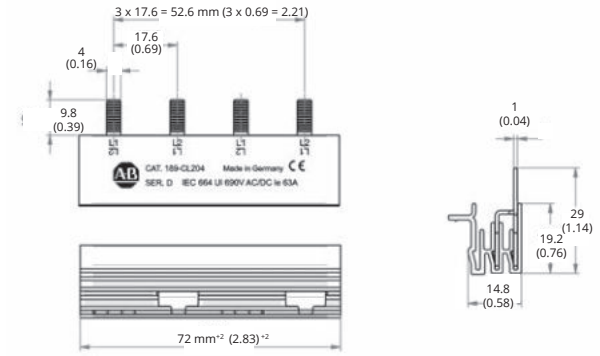
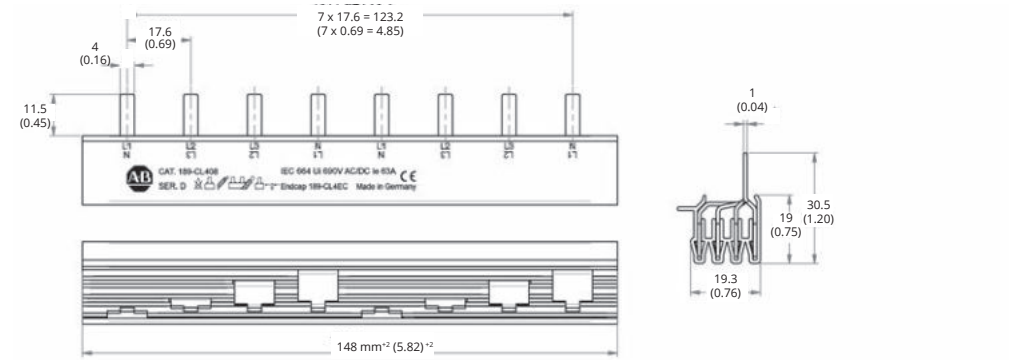


Figure 112 - Cat. No. 189-CL408



Bus Bar Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 113 - Cat. No. 189-CLT25

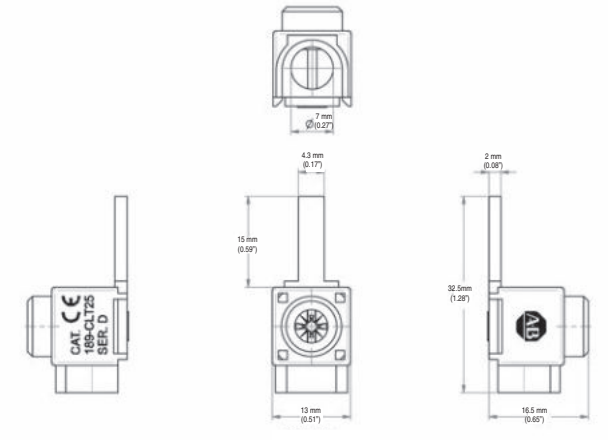


Figure 114 - Cat. No. 189-CLT50

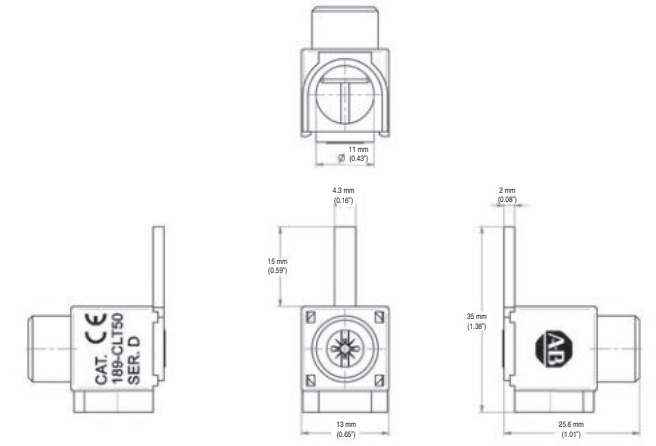


Figure 115 - Cat. No. 189-CLT50D

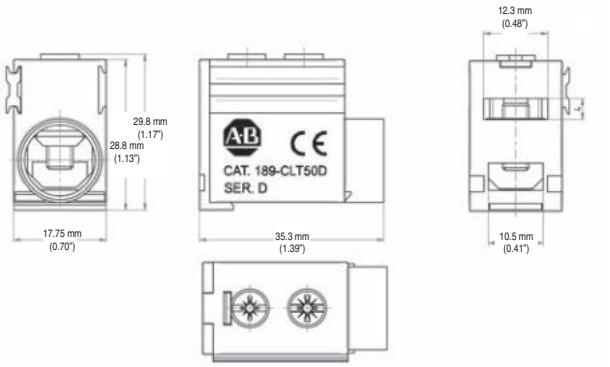


Figure 116 - Cat. No. 189-CL1EC

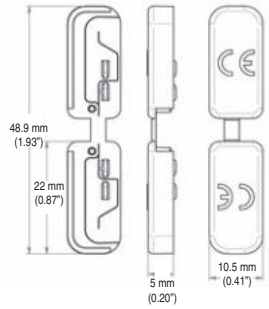


Figure 117 - Cat. No. 189-CL3EC

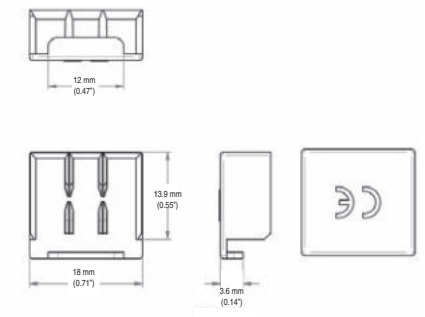
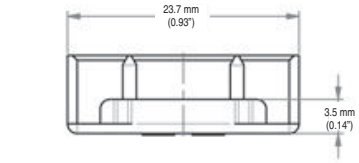


Figure 118 - Cat. No. 189-CL4EC



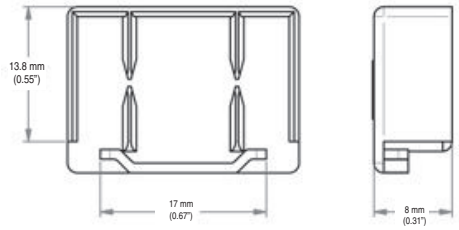
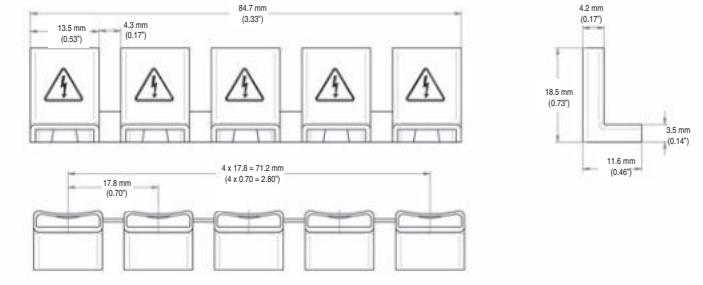
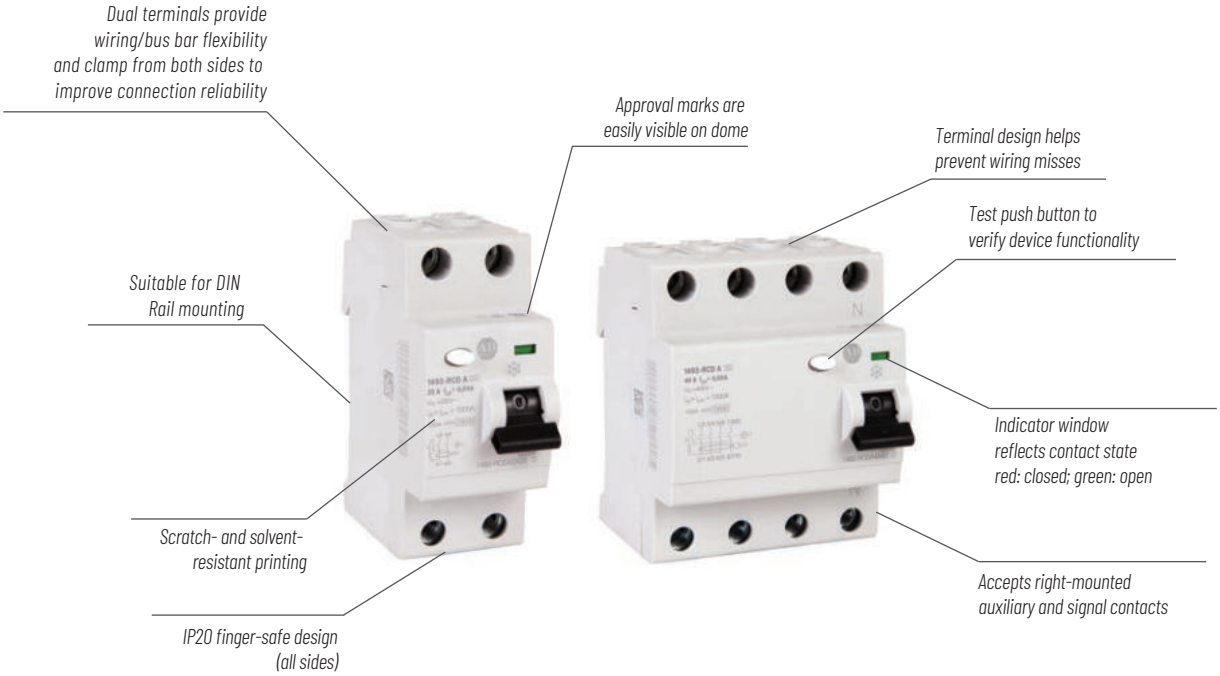


Figure 119 - Cat. No. 189-CLPS





The Bulletin 1492-RCD line includes Residual Current Devices (RCDs), also known as Residual Current Circuit Breakers, for detecting and interrupting leakage current to ground. By detecting small leakage currents and disconnecting all ungrounded connectors quickly, RCDs can prevent injury to exposed personnel and damage to equipment.

RCDs are used in series with miniature circuit breakers for additional circuit protection from not only overload and short circuit, but also ground fault. Many short circuits begin as undetected ground faults. Using an RCD in an application may detect problems before costly equipment damage and downtime occurs.

These devices are Type A Residual Current Devices to IEC Standards.

Features include:

- Provides protection against current leakage to ground (earth) caused by an insulation loss between a live conductor and an exposed conductive part (such as an abraded wire, or a grounded person touching the live conductor)
- Suitable for protection against AC and pulsating DC (rectified AC) earth leakage current
- 30 mA sensitivity devices for personnel protection (consult local requirements)
- 100, 300, and 500 mA sensitivity devices for equipment protection
- Dual terminals allow a more secure connection of two wires, or both a wire and bus bar
- Reversible line and load connections

(1) Catalog numbers with -US suffix are not EN or VDE certified.

1492-RCD Residual Current Devices	
Current Ratings	25, 40, 63, 80 A
Rated Sensitivity $I\Delta_n$	30, 100, 300, 500 mA
Poles	2, 4
Standards Compliance	UL 1053 ANSI/NFPA 70 EN 61008 (1) CSA C22.2 No.144 GB 16916
Certifications	cURus Recognized, File No. E53935 CE Marked CCC Certified VDE Certified (1) RCM Certified RoHS Compliant UKCA Marked

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492	–	RCDA	2	A	25		
		a	b	c	d	e	f

a

Type	
Code	**Description**
RCDA	Residual Current Device, Type A

b

Poles	
Code	**Description**
2	2-Pole
4	4-Pole

c

Sensitivity $I\Delta_n$	
Code	**Rated Sensitivity [mA]**
A	30
B	100
C	300
D	500

d

Rated Current (I_n)	
Code	**Current [A]**
25	25
40	40
63	63
80	80

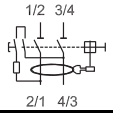
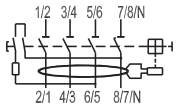
e

Delay Option (available on select 4-pole devices)	
Code	**Description**
	Can be left blank
S	With Delay

f

United States 110V Option (available on select 30 mA sensitivity versions)	
Code	**Description**
	Can be left blank
US	United States 110V

Product Selection

						
Sensitivity	**Rated Current**	**2-Pole (1-Pole + Neutral)**		**4-Pole (3-Pole + Neutral)**		
[mA]	**[A]**	**U_t min = 110V**	**U_t min = 170V**	**U_t min = 110V**	**With Delay**	**U_t min = 170V**
30	25	1492-RCDA2A25-US	1492-RCDA2A25	1492-RCDA4A25-US	–	1492-RCDA4A25
	40	1492-RCDA2A40-US	1492-RCDA2A40	1492-RCDA4A40-US	–	1492-RCDA4A40
	63	–	–	1492-RCDA4A63-US	–	1492-RCDA4A63
	80	–	–	–	–	1492-RCDA4A80
100	25	1492-RCDA2B25	–	1492-RCDA4B25	–	–
	40	1492-RCDA2B40	–	1492-RCDA4B40	1492-RCDA4B40S	–
	63	–	–	1492-RCDA4B63	1492-RCDA4B63S	–
300	25	1492-RCDA2C25	–	1492-RCDA4C25	–	–
	40	1492-RCDA2C40	–	1492-RCDA4C40	1492-RCDA4C40S	–
	63	–	–	1492-RCDA4C63	1492-RCDA4C63S	–
	80	–	–	1492-RCDA4C80	–	–
500	25	–	–	1492-RCDA4D25	–	–
	40	–	–	1492-RCDA4D40	–	–
	63	–	–	1492-RCDA4D63	–	–
	80	–	–	1492-RCDA4D80	–	–
Diagram						

Specifications

General Data		
Poles		2, 4
Rated current (I_n)		25, 40, 63, 80 A
Rated sensitivity $I\Delta_n$	2-pole	30, 100, 300 mA
	4-pole	30, 100, 300, 500 mA
Electrical Ratings		
Rated short-circuit strength		10 kA with 63 A gG/gL back-up fuse, 10 kA with 80 A gG/gL back-up fuse for 80 A device
Rated operational voltage U_e per IEC/EN		230/400V AC
Rated voltage U_e per UL		480Y/277V AC
Max. operating voltage of circuit test		254V AC
Min. operating voltage of circuit test		110V (1)
Rated frequency		50/60 Hz
Rated conditional short-circuit		10 kA (SCPD - fuse gG 100 A)
Rated residual breaking capacity		1 kA
Rated impulse withstand voltage U_{imp} (1.2/50 µs)		4 kV
Dielectric test voltage at ind. freq. for 1 min.		2.5 kV
Electrical endurance		10,000 operations
Mechanical Data		
Indicator window		Red ON/green OFF
Protection degree	Housing	IP4X
	Terminals	IP2X
Environmental		
Ambient temperature (with daily average +35 °C)		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Mechanical endurance		20,000 operations

(1) U_t min = 170V for selected 30 mA sensitivity types as indicated in the product selection chart on page 84.

Installation		
Terminal type		Dual terminal
Cross-section of wire - solid, stranded, flexible (front/back terminal slot)	25...63 A	25/25 mm^2
		18...4 AWG
	80 A	35/35 mm^2
		18...2 AWG
Cross-section of bus bars (front/back terminal slot)	25...63 A	10/10 mm^2
	80 A	16/16 mm^2
Tightening torque	25...63 A	2.8 N•m (25 lb•in)
	80 A	4.8 N•m (43 lb•in)
Mounting		DIN Rail EN 60715 (35 mm) with fast clip device
Supply		Optional
Approximate Dimensions and Weight		
Dimensions (H x D x W)	2-pole	88 x 67 x 35 mm (3.46 x 2.64 x 1.38 in)
	4-pole	88 x 67 x 70 mm (3.46 x 2.64 x 2.76 in)
Weight	2-pole	200 g (7.05 oz.)
	4-pole	350 g (12.35 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes

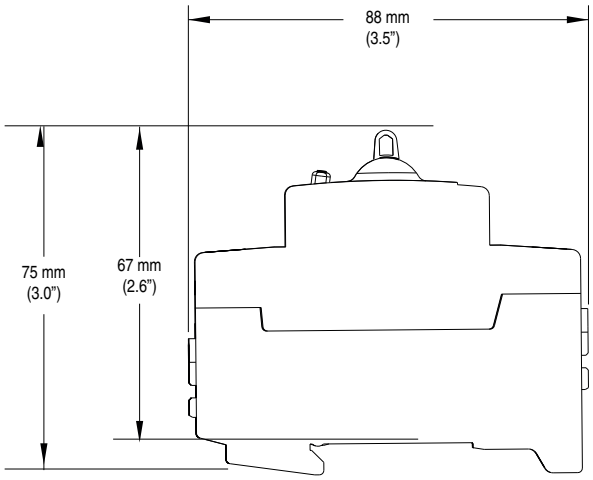
Power Loss Due to Current

Rated Current [A]	Power Loss [W]	
	2-pole Devices	4-pole Devices
25	1	1.3
40	2.4	3.2
63	3.2	4.4
80	8.8	33.3

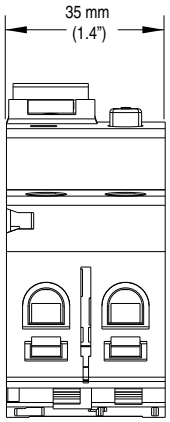
Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

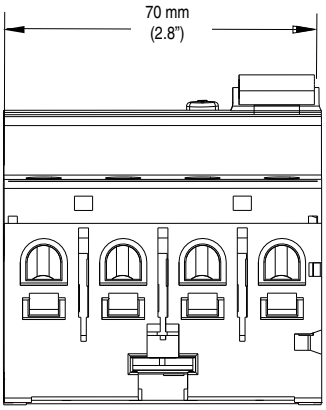
Figure 120 - Bulletin 1492-RCD Devices



2- and 4-pole devices



2-pole devices



4-pole devices

Accessories

Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards Compliance	Certifications	UL/CSA Max Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary/Signal Contact • Signal contact activates only when the breaker is tripped	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-ASCR3
	Auxiliary Contact	1 N.O./N.C. (1 C.O.) 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 480V AC 2 A @ 277V AC 1.5 A @ 125V DC 2 A @ 60V DC 4 A @ 24V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 1.5 A @ 110V (DC-12) 1 A @ 220V (DC-12) 4 A @ 24V (DC-13) 2 A @ 60V (DC-13)	189-AR3
		1 N.O. + 1 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR11
		2 N.C. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR02
		2 N.O. 	UL 1077 CSA 22.2 No. 235 EN 60947-5-1 GB 14048.5	UL Recognized CSA Certified CE Marked VDE Certified CCC Certified	1 A @ 400V AC 2 A @ 230V AC 1 A @ 50V DC 2 A @ 30V DC	2 A @ 230V (AC-14) 1 A @ 400V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50V (DC-12) 2 A @ 30V (DC-13) 1 A @ 50V (DC-13)	189-AR20

(1) A maximum of one C.O. type signal contact, and one C.O. type auxiliary contact ***OR*** two C.O. type auxiliary contacts may be installed per 1492-RCD.
(2) A maximum of one 189-AR11, -AR02, or -AR20 auxiliary contact may be installed per 1492-RCD. They may not be combined with C.O. type contacts.
(3) A maximum of three accessories of any type may be installed per 1492-RCD. The signal contact must be mounted closest to the RCD, then the auxiliary contact(s). For allowed combinations, see Figure 121 and Table 12.

Figure 121 - Bulletin 1492-RCD Accessory Installation

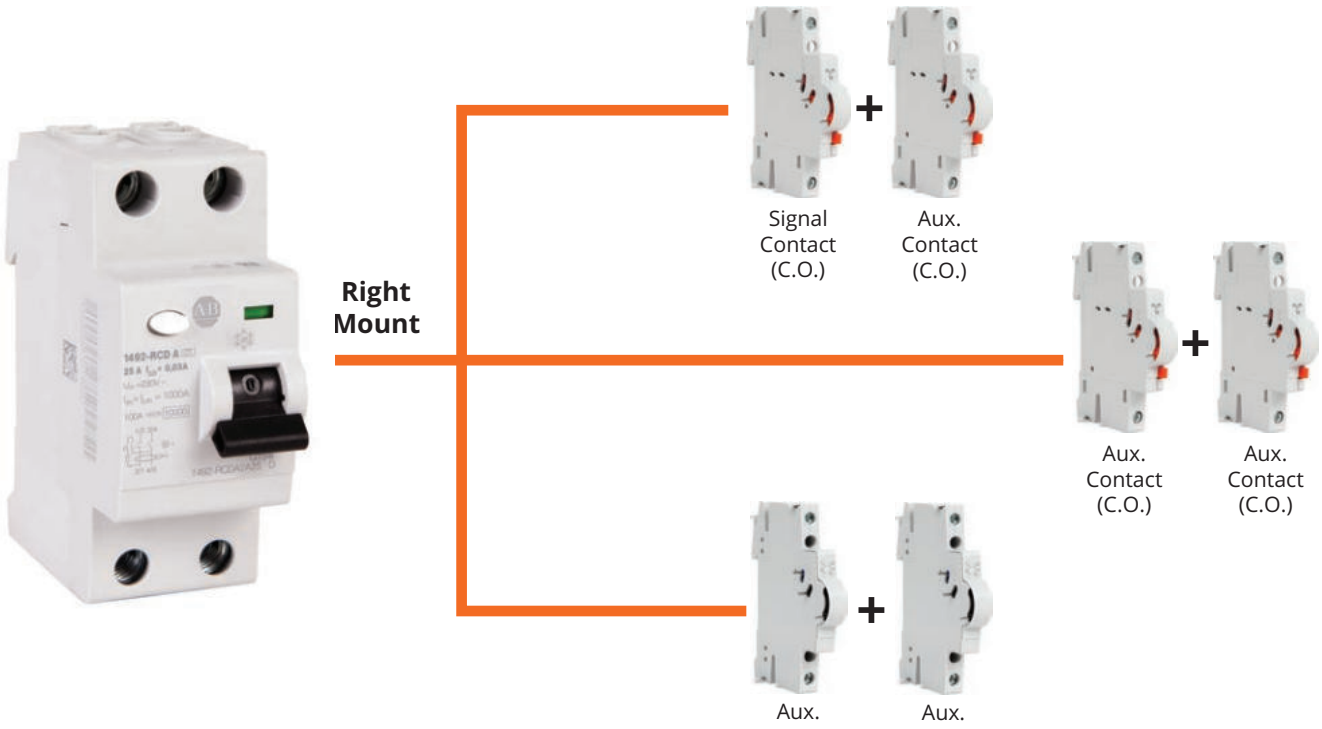


Table 12 - Bulletin 1492-RCD Accessory Compatibility

Type	Cat. No.	Mounting Location	Contacts
Aux/Signal Contact	189-ASCR3	Right	1 C.O.
Auxiliary Contact	189-AR3	Right	1 C.O.
	189-AR11	Right	1 N.O. + 1 N.C.
	189-AR02	Right	2 N.C.
	189-AR20	Right	2 N.O.

Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 122 - Cat. No. 189-ASCR3

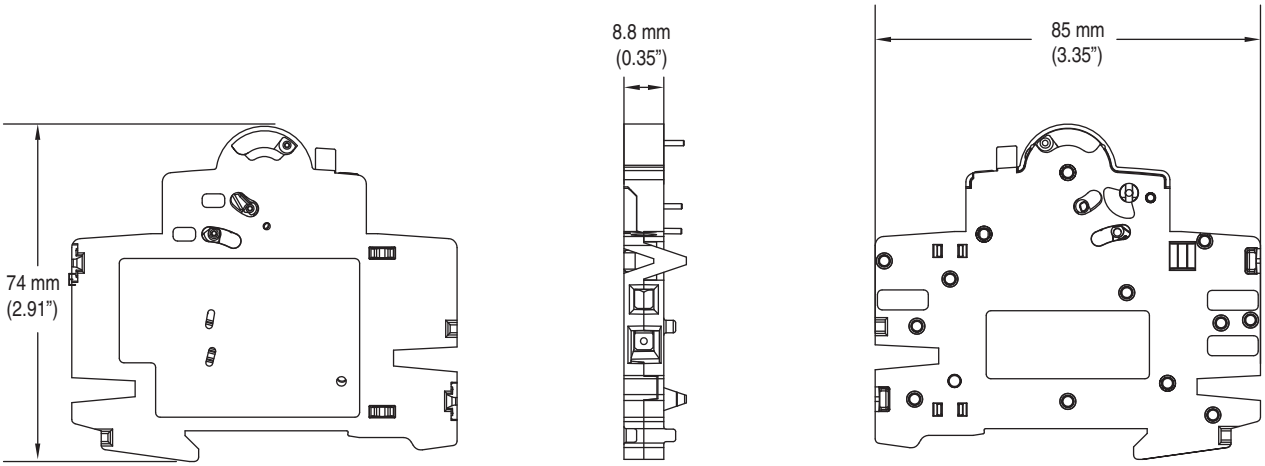


Figure 123 - Cat. No. 189-ASCR3

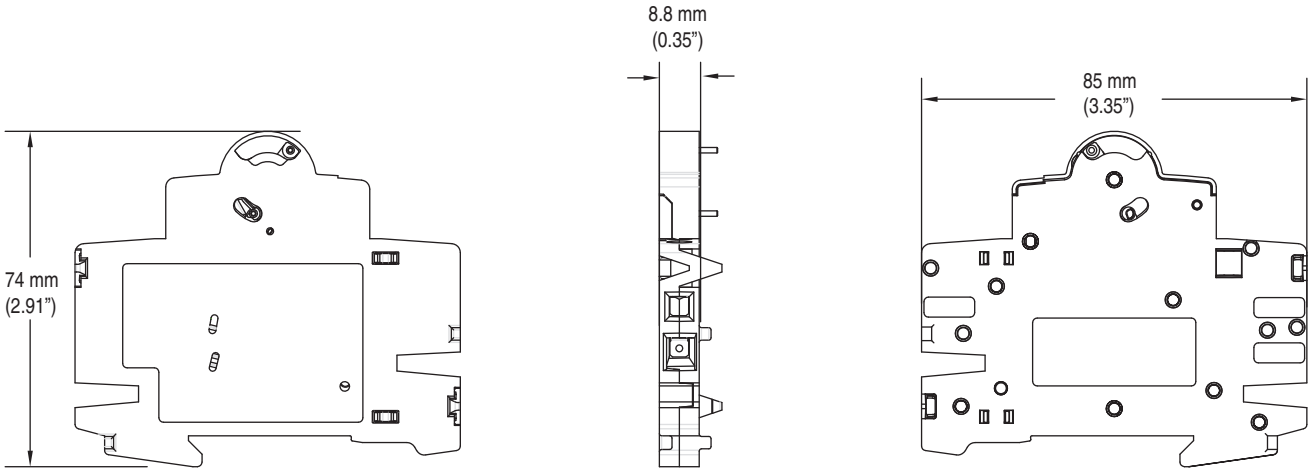
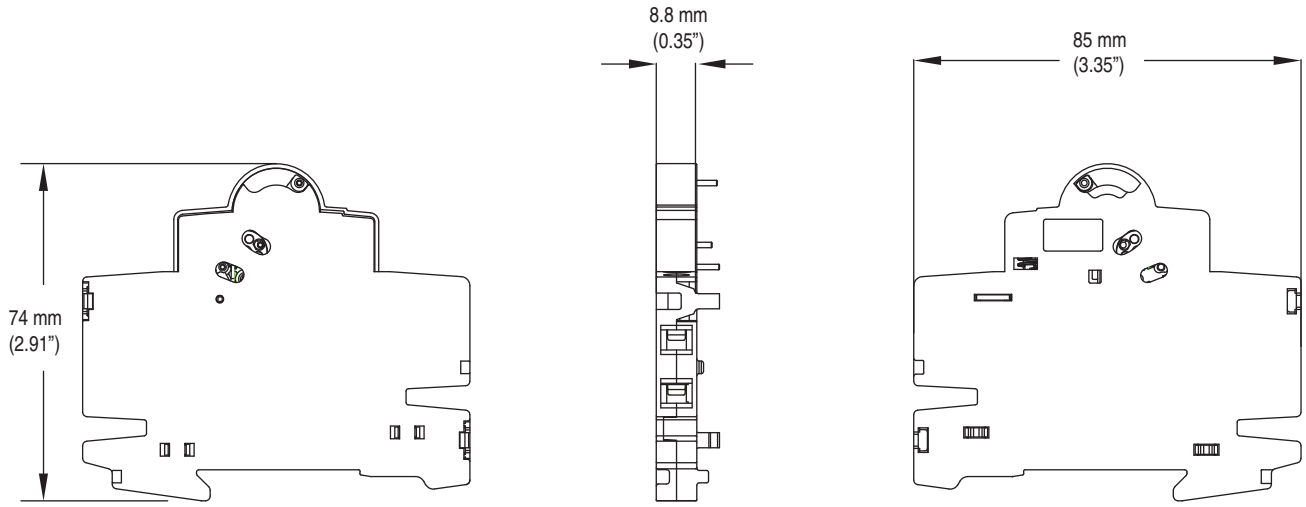


Figure 124 - Cat. Nos. 189-AR11, -AR02, and -AR20



Bus Bars

1492-RCD Cuttable Bus Bars

Description	Pins	Pkg. Qty.	Cat. No. (1)
2-Phase MCB to RCD	4	10	189-CL204
4-Phase MCB to RCD	8	10	189-CL408

(1) These devices are CE Marked, but not certified to any UL, CSA, or other standard.

1492-RCD Bus Bar Accessories(1)

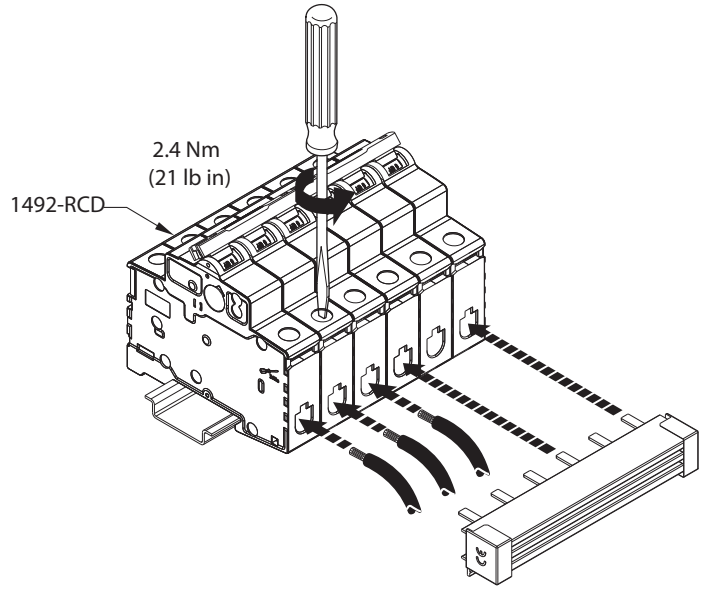
Description	Pkg. Qty.	Cat. No.(2)
Terminal Power Feed, 6...25 mm^2	10	189-CLT25
Terminal Power Feed, 6...50 mm^2	10	189-CLT50
Dedicated Power Feed, 50 mm^2	10	189-CLT50D
For 2-phase bus bar (3)	10	189-CL3EC
For 4-phase bus bar	10	189-CL4EC
Protective Shroud for unused pins	10	189-CLPS

(1) Dedicated Power Feed Lugs attach and mount to the bus bar pin instead of the device terminal. It adds height to the bus bar installation.
Terminal Power Feed Lugs occupy one terminal or phase on the device.

(2) These devices are CE Marked, but not certified to any UL, CSA, or other standard.

(3) Cat. No. 189-CL3EC also used for 2- and 3-phase MCB bus bars.

Figure 125 - Cat. No. 189-CL Bus Bar Installation



Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 126 - Cat. No. 189-CL204 2- Phase Bus Bars

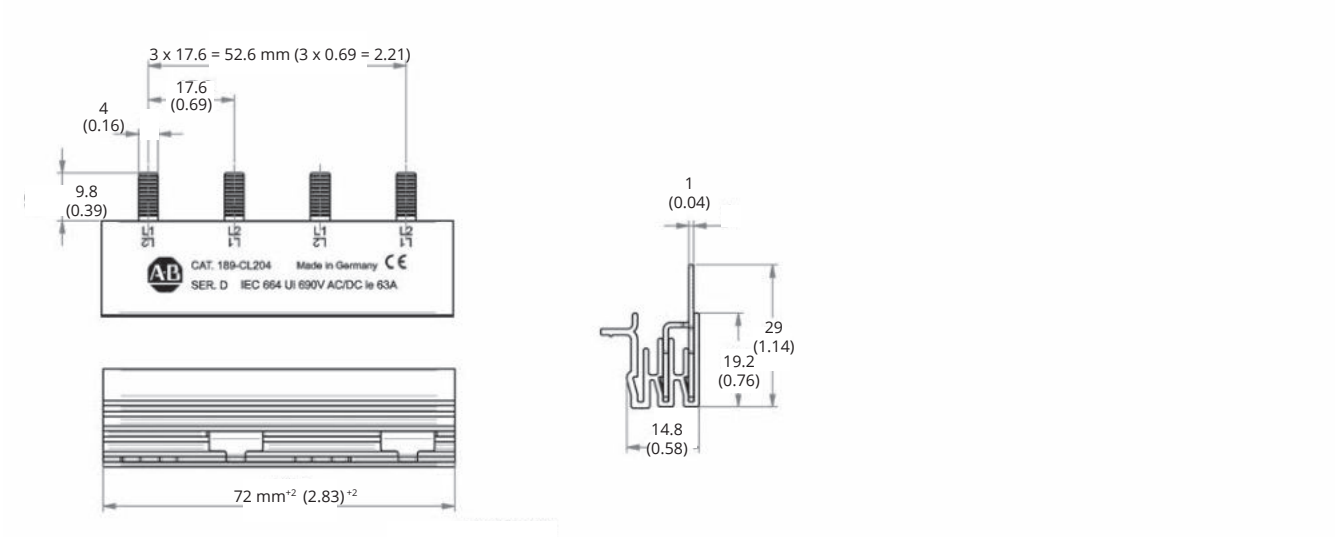
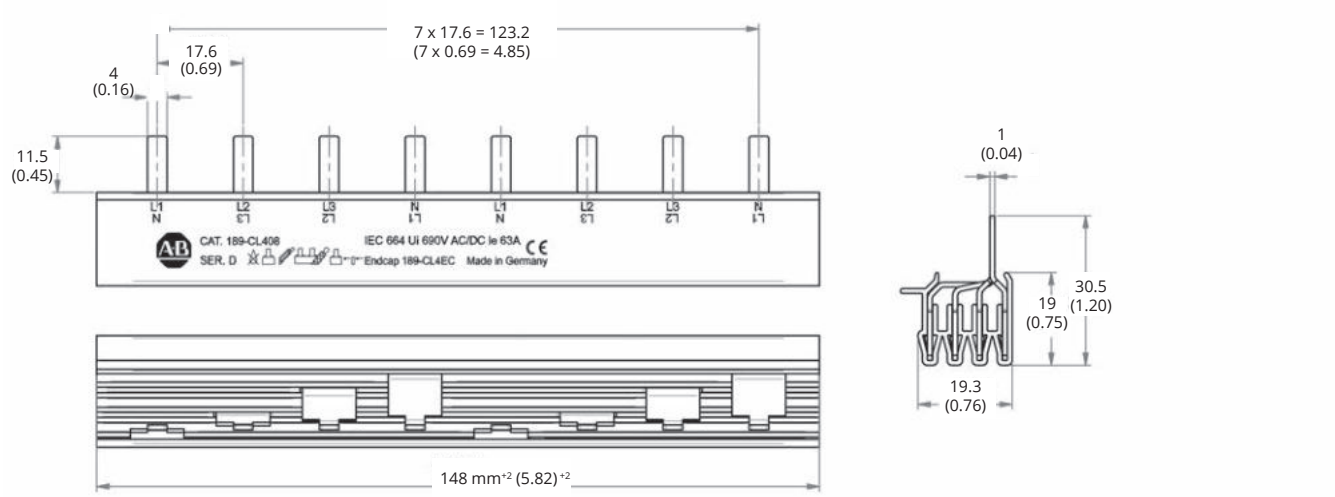


Figure 127 - Cat. No. 189-CL408 4-Phase Bus Bars



Bus Bar Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 128 - Cat. No. 189-CLT25

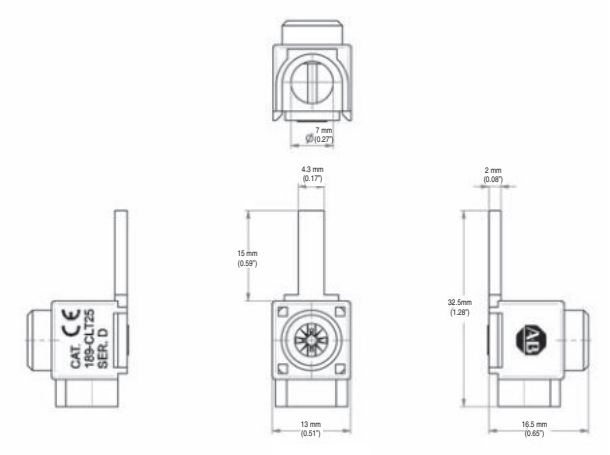


Figure 129 - Cat. No. 189-CLT50

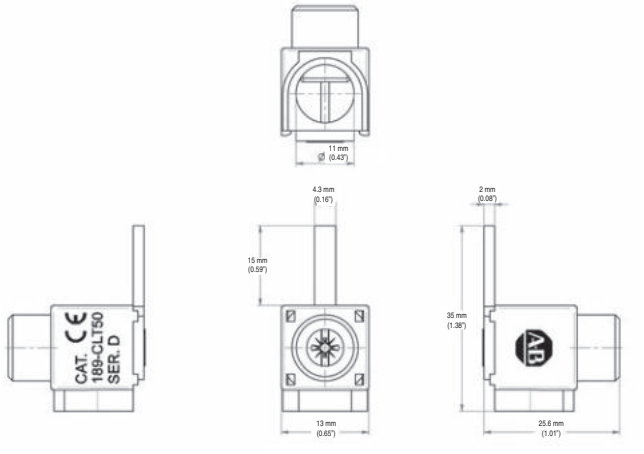


Figure 130 - Cat. No. 189-CLT50D

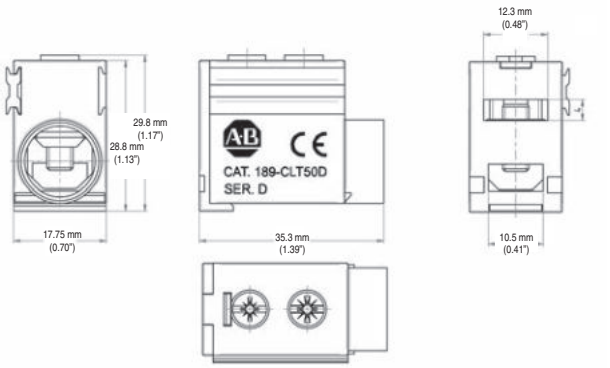


Figure 131 - Cat. No. 189-CL3EC

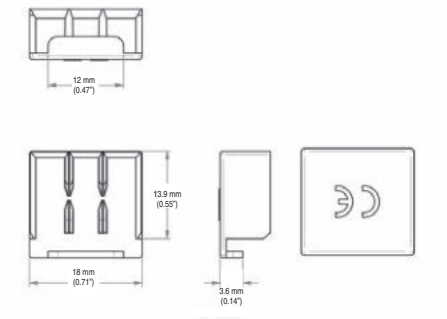
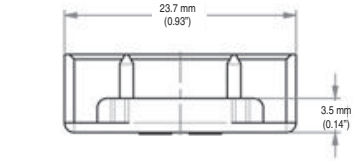


Figure 132 - Cat. No. 189-CL4EC



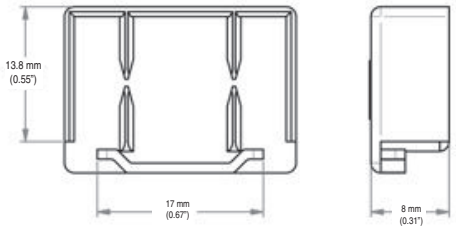
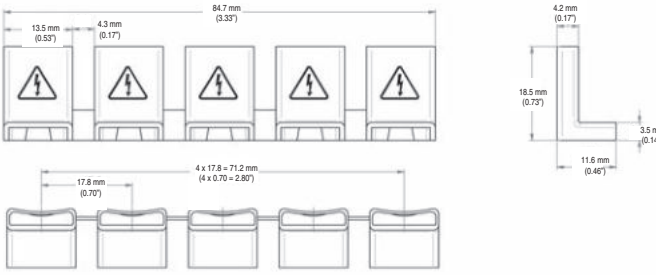
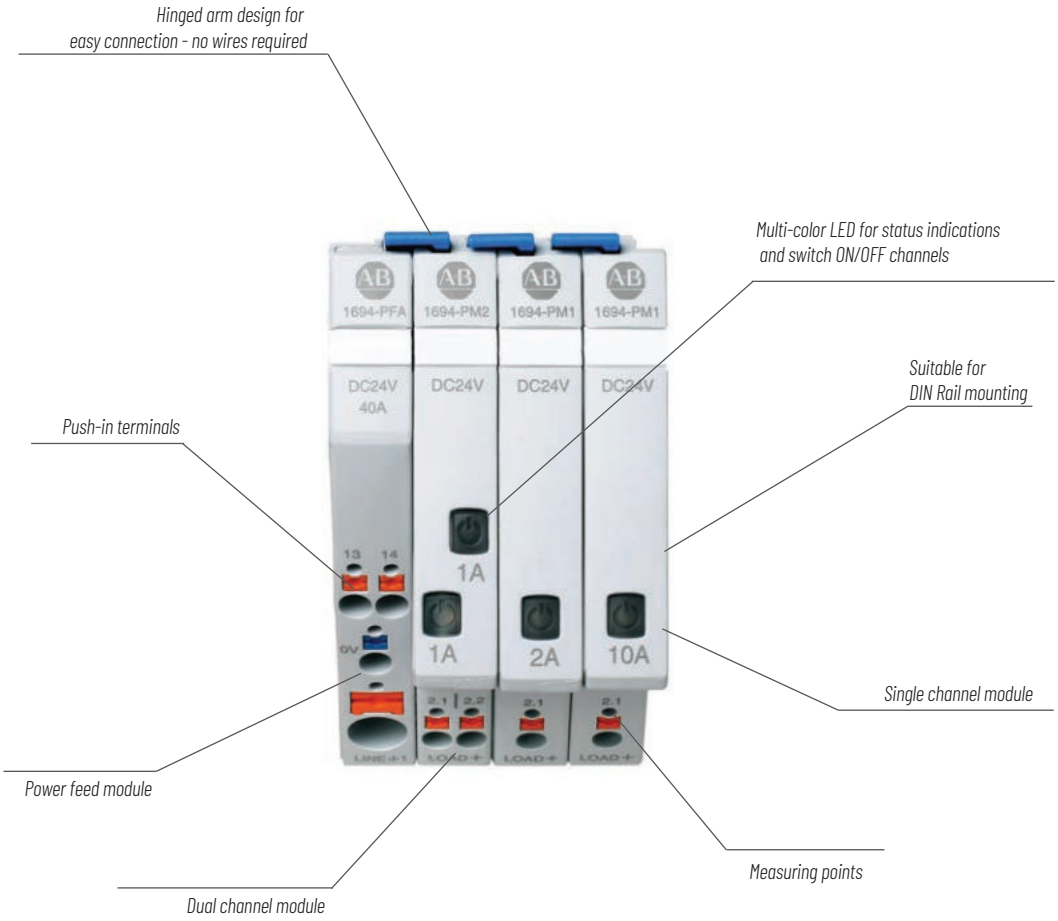


Figure 133 - Cat. No. 189-CLPS





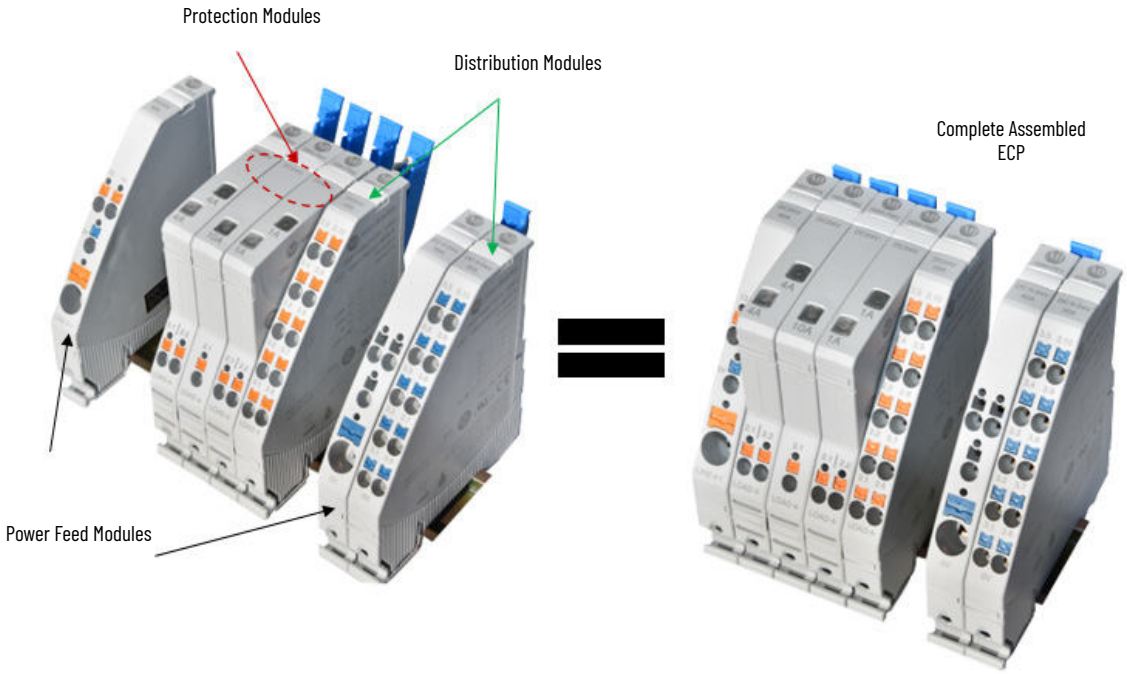
Bulletin 1694 Electronic Circuit Protection (ECP) Modules protect the secondary circuit of 24V DC switched mode power supplies. The modular system can handle multiple channels or 40 A of total current consumption. Designed for 24V DC circuits, 1694 Electronic Circuit Protectors provide comprehensive protection against short circuit and overcurrent conditions while allowing for inrush current.

Features include:

- Clear status indication by means of multicolor light-emitting diode (LED) and auxiliary contact (located in power feed)
- Selective load protection by means of electronic trip curve
- No tools required at commissioning
- Width per channel only 12.5 mm (1-channel) or 6.25 mm (2-channel)

1694 Electronic Circuit Protectors	
Voltage	24V DC (18...30V DC)
Output Current	1 A...10 A (1-channel) 1 A/1 A...6 A/6 A (2-channel) 1 A...4 A NEC Class 2
Standards Compliance	UL 2367, File No. E350272 UL 1310 NEC Class 2 cULus508, File No. E56639
Certifications	CE Marked RoHS Compliant China RoHS Morocco EMC WEEE RCM Certified EAC Certified UKCA Marked

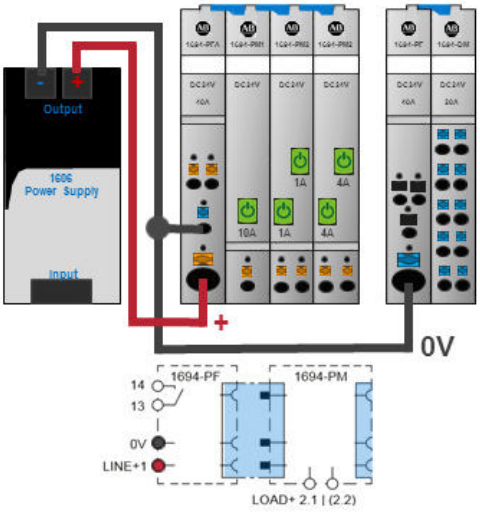
Assembly Example

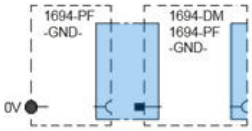


Power Feed Options

IMPORTANT These are sample schematic diagrams for 24V DC power connection. Load connections to protection modules are not displayed. Number of protection modules may vary. The power supply shown is a representation.

Cat. No. 1694-PF1244 or -PFA1244 Left Mount Power Feed Module (standard)



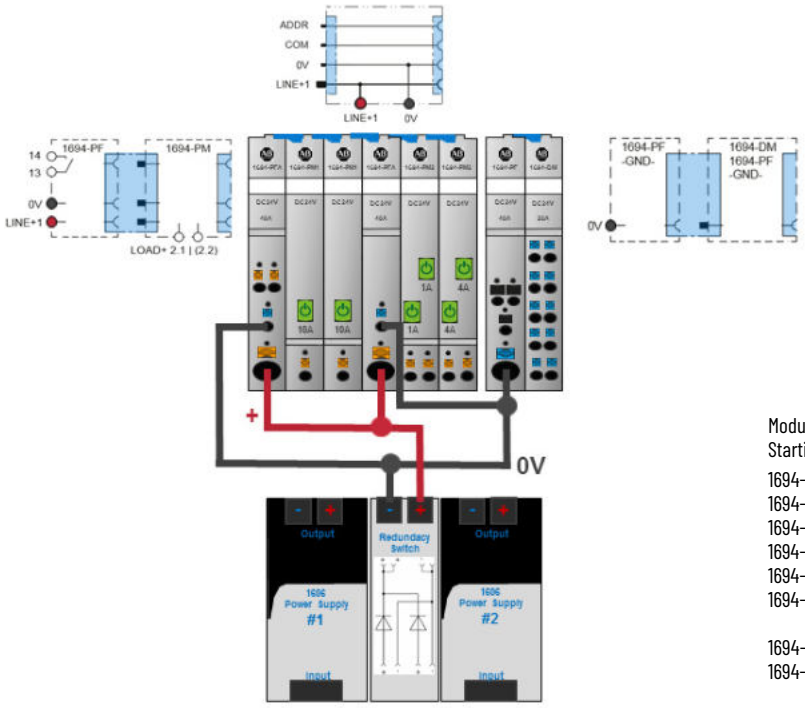


Module configuration in sample schematic diagram
Starting from left position:
1694-PFA1244
1694-PM110
1694-PM211
1694-PM244

1694-PF1G4
1694-DM3G2

Cat. No. 1694-PF3L4C Mid or Right Mount Power Feed Module

Typical application: the power supply is connected to both power feed modules. This can be used for redundancy power distribution. AUX contacts (13/14) of the left mount power feed, cat. no. 1694-PFA1244, can be used for signalizing tripping information to a PLC.



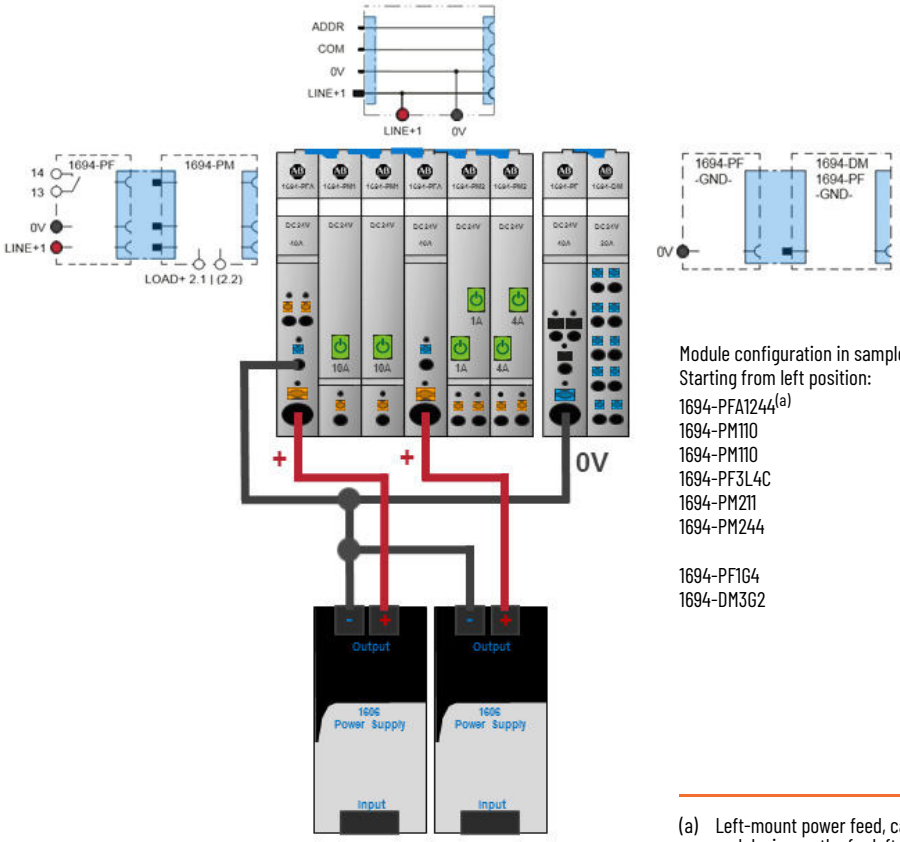
Module configuration in sample schematic diagram
Starting from left position:
1694-PFA1244[a]
1694-PM110
1694-PM110
1694-PF3L4C
1694-PM211
1694-PM244

1694-PF1G4
1694-DM3G2

(a) Left-mount power feed, cat. no. 1694-PFA1244 or 1694-PF1244, must be connected as end device on the far left position. If not mounted, there is a non-connected blue hinged arm to the far left mount protection module (in example to cat. no. 1694-PM110).

Cat. No. 1694-PF3L4C Mid or Right Mount Power Feed Module

Typical application: can be used to connect two power supplies in parallel. Use case: The original assembly required a 10 A power supply. Now, the assembly is extended and the new current consumption = 20 A. AUX contacts (13/14) of the left mount power feed, cat. no. 1694-PFA1244, can be used for signalizing tripping information to the PLC.



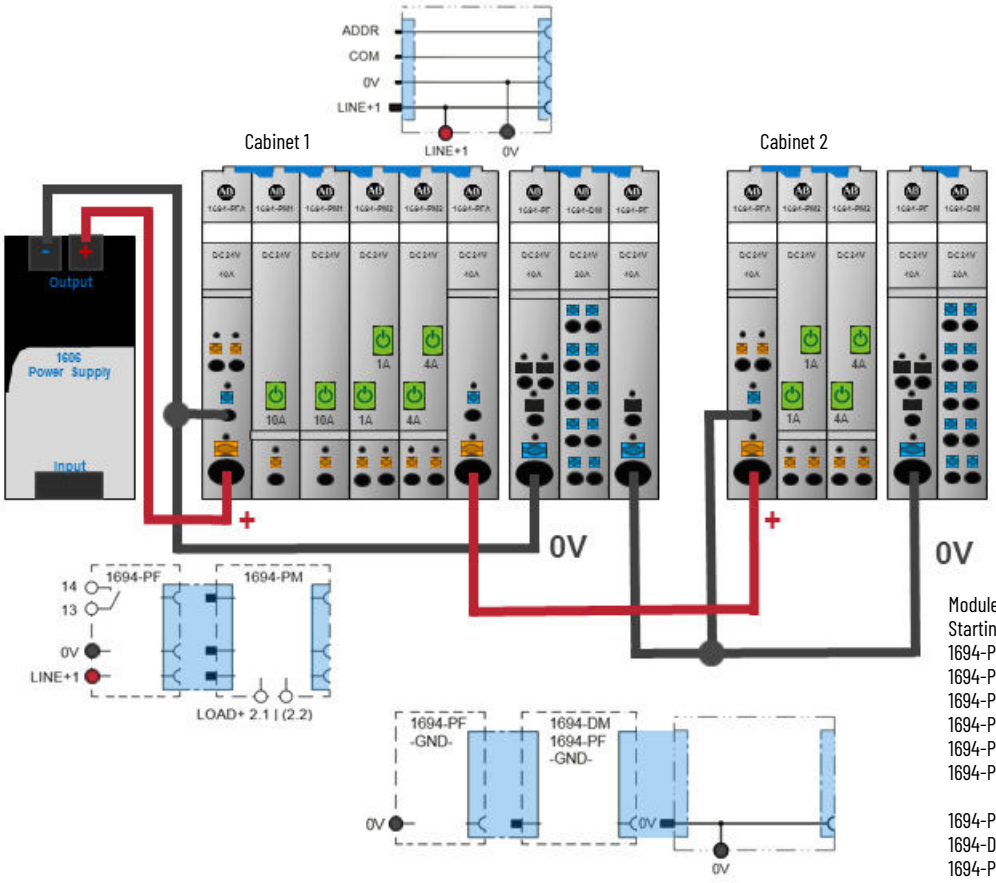
Module configuration in sample schematic diagram
Starting from left position:
1694-PFA1244[a]
1694-PM110
1694-PM110
1694-PF3L4C
1694-PM211
1694-PM244

1694-PF1G4
1694-DM3G2

(a) Left-mount power feed, cat. no. 1694-PFA1244 or 1694-PF1244, must be connected as end device on the far left position. If not mounted there is a non-connected blue hinged arm to the far left mounted protection module (in example given to cat. no. 1694-PM110).

Cat. No. 1694-PF3L4C Mid or Right Mount Power Feed Module

Typical application: the mid/right mount power feed module, cat. no. 1694-PF3L4C, can be used for distributing the 24V DC (+ and 0V) to another decentralized cabinet. Power consumption of the Bulletin 1694 electronic circuit protector assembly in Cabinet 1 and power consumption of the Bulletin 1694 electronic circuit protector assembly in Cabinet 2 cannot exceed 40 A.

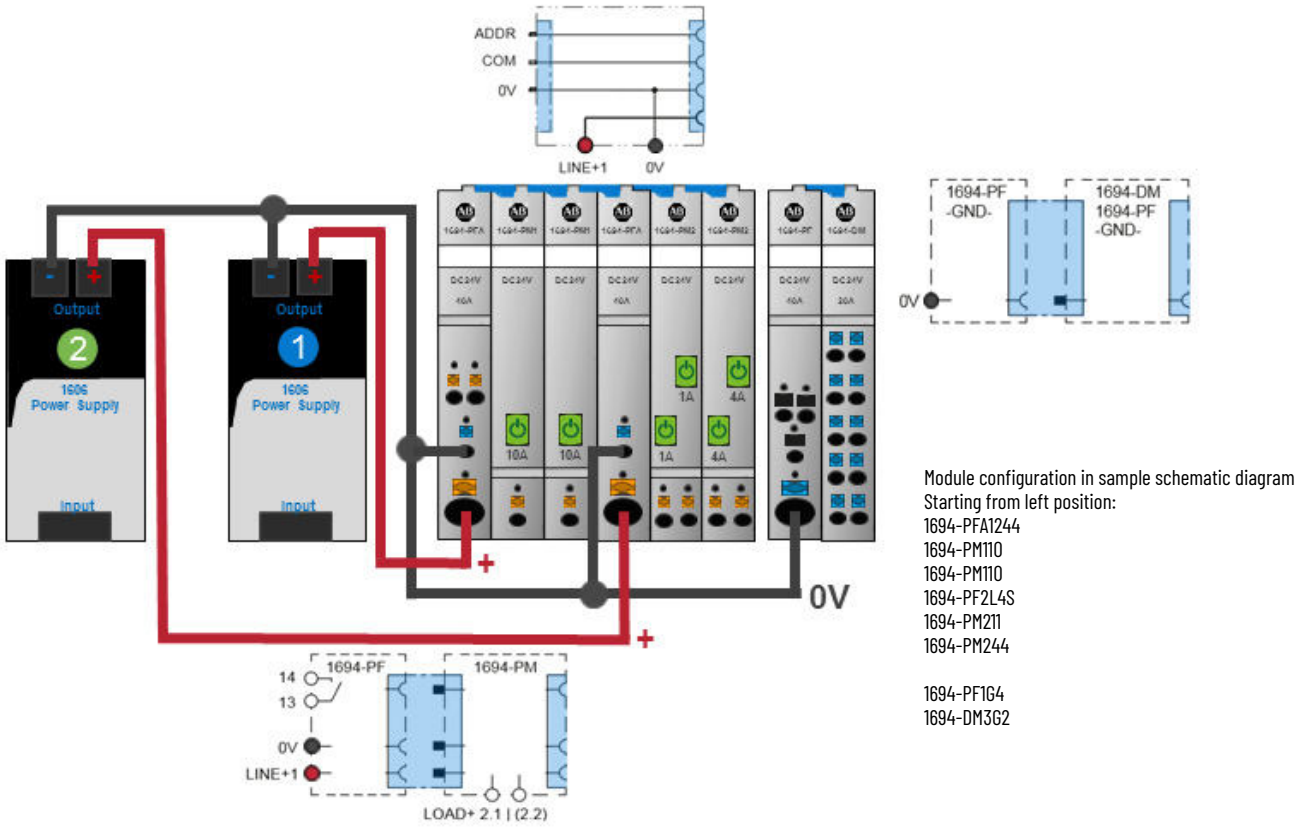


Module configuration in sample schematic diagram
Starting from left position (Cabinet 1 only):
1694-PFA1244
1694-PM110
1694-PM110
1694-PM211
1694-PM244
1694-PF3L4C

1694-PF1G4
1694-DM3G2
1694-PF3G4

Cat. No. 1694-PF2L4S Mid Mount Power Feed Module

Typical application: different sections of a machine for example, power supply 1 for sensors, power supply 2 for actuators. The tripping information of the whole assembly is connected with the AUX contact (13/14) on the left mount power feed, cat. no. 1694-PFA1244, if an uninterruptible power supply (UPS) is used as a supply for certain circuits and protectors.

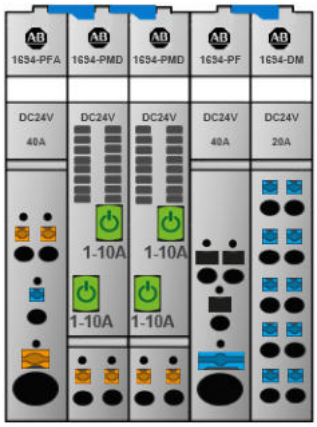


Module configuration in sample schematic diagram
Starting from left position:
1694-PFA1244
1694-PM110
1694-PM110
1694-PF2L4S
1694-PM211
1694-PM244

1694-PF1G4
1694-DM3G2

Cat. No. 1694-PMD2A10 Adjustable Current Protection Module

Protection Module, cat. no. 1694-PMD2A10, can be used in standard, non-communicating assemblies. See the following example:



IMPORTANT Standard protection modules (Cat. No. 1694-PM_) can not be used in IO-Link configurations. For adjustable current Protection Module (Cat. No. 1694-PMD2A10) product selection, see Bulletin 1694 Electronic Circuit Protectors - Communication Devices on page 103.

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

Power Feed Modules[a]

1694	-	PFA	1	24	4
		a	b	c	d



a

Module Type	
Code	**Description**
PF	Power Feed Module Standard
PFA	Power Feed Module Standard with AUX Contact

b

Mounting Position	
Code	**Description**
1	Left
2	Middle
3	Middle or Right

c

Function	
Code	**Description**
24	Line (24V DC input)
L	Line
G	Ground

d

Max Current	
Code	**Description**
4	40 A
4C[1]	Line Connected
4S[1]	Line Separated

(1) With line option only.

Protection Modules

1694	-	PM	1	4	-	CL2
		a	b	c		d



a

Module Voltage	
Code	**Description**
PM	Protection Module

b

Number of Channels	
Code	**Description**
1	1-channel
2	2-channels

c

Output Current Rating	
Code	**Description**
1	1 A
2	2 A
3	3 A
4	4 A
6	6 A
8	8 A
10	10 A
11	1 A, 1 A
22	2 A, 2 A
33	3 A, 3 A
44	4 A, 4 A
66	6 A, 6 A

d

Rating	
Code	**Description**
blank	No options
CL2[1]	Class 2

(1) Class 2 (100 VA) = 1 A...4 A

(a) For an adjustable current protection module, see Bulletin 1694 Electronic Circuit Protectors - Communication Devices on page 103.

Distribution Modules

1694	–	DM	1	L	2
		a	b	c	d



a

Module Type	
Code	**Description**
DM	Distribution Module

b

Terminal Designator	
Code	**Description**
1	10 Terminals (1 x Line entry/ 9 x Load +)
2	10 Terminals (2 x Line entry separate/ 4 x Load + each)
3	10 terminals GND

c

Function	
Code	**Description**
L	Line
G	Ground

d

Max Current	
Code	**Description**
2	20 A

Product Selection

Power Feed Modules

Mounting Position	Supply Voltage	Max Current [A]	Aux Contact	Pkg. Qty.	Cat. No.
Left	24V DC	40	No	1	1694-PF1244
	24V DC	40	Yes	1	1694-PFA1244
	0V Ground	40	No	1	1694-PF1G4
Middle	24V DC	40, Line Separated	No	1	1694-PF2L4S
Middle or Right	24V DC	40, Line Connected	No	1	1694-PF3L4C
	0V Ground	40	No	1	1694-PF3G4

Protection Modules

Number of Channels	Fixed or Adjustable Current	Current [A]	Class 2	Pkg. Qty.	Cat. No.
1	Fixed	1	–	4	1694-PM11
			Yes	4	1694-PM11-CL2
		2	–	4	1694-PM12
			Yes	4	1694-PM12-CL2
		3	–	4	1694-PM13
			Yes	4	1694-PM13-CL2
		4	–	4	1694-PM14
			Yes	4	1694-PM14-CL2
		6	–	4	1694-PM16
		8	–	4	1694-PM18
		10	–	4	1694-PM110
2	Fixed	1	–	4	1694-PM211
			Yes	4	1694-PM211-CL2
		2	–	4	1694-PM222
			Yes	4	1694-PM222-CL2
		3	–	4	1694-PM233
			Yes	4	1694-PM233-CL2
		4	–	4	1694-PM244
			Yes	4	1694-PM244-CL2
		6	–	4	1694-PM266

Distribution Modules

Description	Pkg. Qty.	Cat. No.
10 Terminals, 1 x Line, 9 x Load, I_{max} 20 A	1	1694-DM1L2
10 Terminals, 2 x Line, 4 x Load, I_{max} 20 A	1	1694-DM2L2
10 Terminals, Ground, I_{max} 20 A	1	1694-DM3G2

Specifications

Electrical Ratings	
Operating voltage	24V DC (18..30V DC)
Operating current	Max. 40 A
Rated current	1...10 A fixed current
Environmental	
Operating temperature	-25°...+60°C (-13...140°F)
Storage temperature	-40°...+70°C (-40...158°F)
Humidity/Damp heat	96 hrs/95% climate class 3K3
Degree of pollution	2
Degree of protection	IP 20

Construction		
Terminal wire gauge	Push-in terminal PT10	AWG 20 ...8 (0.5mm^2 to 10mm^2)
	Push-in terminal PT2.5	AWG 24 ...14 (0.14mm^2 to 2.5mm^2)
Termination type		Push-in
Weight per module lb. (g)		approx. 0.13 (60)

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 134 - Power Feed Modules

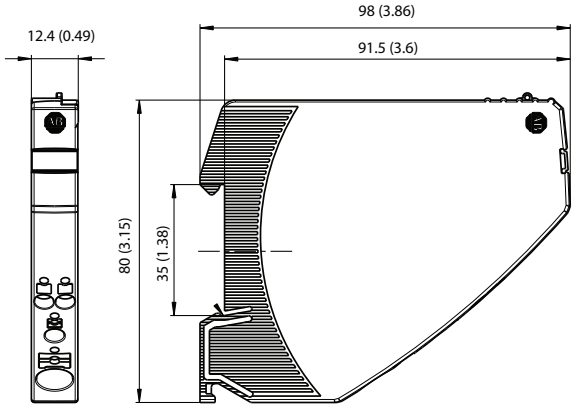


Figure 135 - Protection Modules

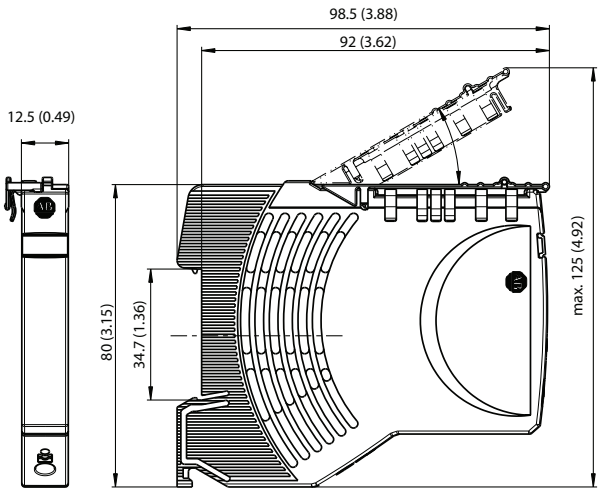
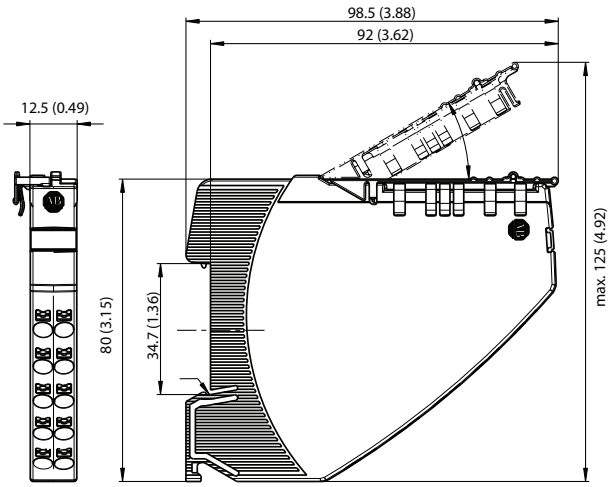


Figure 136 - Distribution Modules





Bulletin 1694 Electronic Circuit Protection (ECP) communication devices offer the same basic functionality as the standard, non-communication devices of the Bulletin 1694 product line. The communication versions of the protection modules allow for monitoring and parameter setting. A two-channel protection module allows adjustable current from 1...10 A.

The communication power feed allows for IO-Link communication via a plug-in connector. This connector uses a cable to link to the IO-Link Master.

Features include:

- Monitoring of current, voltage, and trip counter
- Remote reset capability
- Warning threshold for nominal current selectable
- Adjustable current setting for corresponding module

1694 Electronic Circuit Protectors	
Voltage	24V DC (18...30V DC)
Output Current	1 A...10 A (1-channel) 1 A/1 A...6 A/6 A (2-channel) 1 A...4 A NEC Class 2
Standards Compliance	UL 2367, File No. E350272 UL 1310 NEC Class 2 cULus508, File No. E56639
Certifications	CE Marked RoHS Compliant China RoHS Morocco EMC WEEE RCM Certified EAC Certified UKCA Marked

IO-Link Sample System

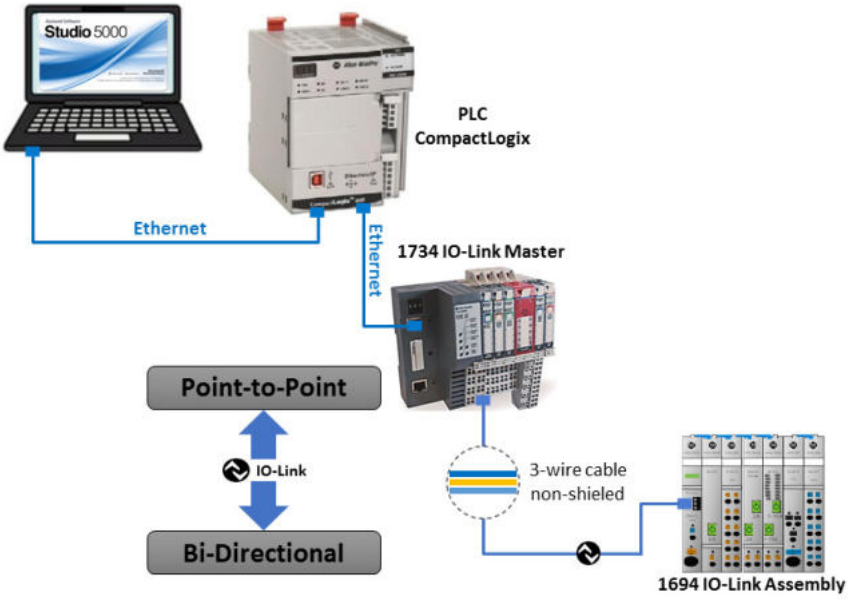
IMPORTANT This is a Rockwell Automation sample system. IO-Link communication works with any IO-Link Master/System components.

This is a short overview of IO-Link technology. For more details please see the IO-Link specification published on the IO-Link community web page https://io-link.com.

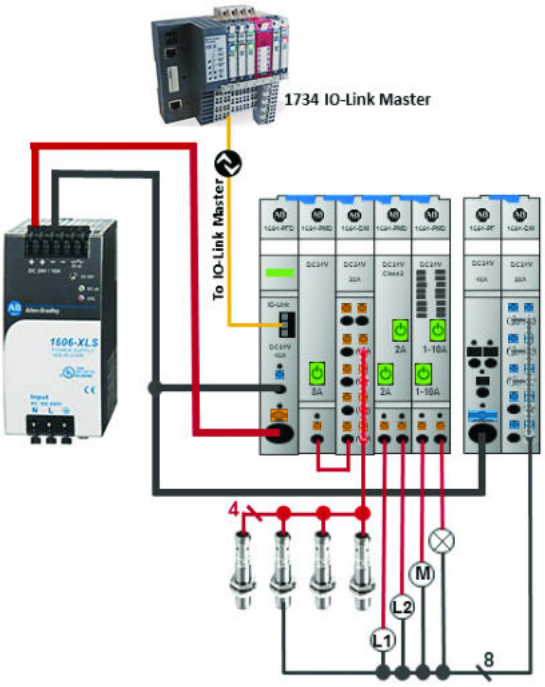
The IO-Link technology is an open point-to-point communication standard and was launched as (IS) IEC 61131-9. IO-Link is now the globally standardized technology developed initially mainly for sensor and actuator communication with a field bus system. This technology provides benefits to both original equipment manufacturers (OEMs) and end users.

IO-Link provides a point-to-point link between the I/O module and device that is used for transferring detailed diagnostics, device identity information, process data, and parameterization.

IO-Link communication is based on a structure in which the master controls the interface access to the IO-Link device. The option of using the intelligence that is integrated into the IO-Link device provides you with new commissioning methods. Benefits range from reduced installation time during startup to increased diagnostics over the lifetime of the machine.



1694 IO-Link Application Example



Module configuration in sample schematic diagram
Starting from left position:
1694-PFD1244
1694-PMD18
1694-DM1L2
1694-PMD222-CL2
1694-PMD2A10
1694-PF1G4
1694-DM3G2

IMPORTANT Distribution modules for +24V DC (Line) and 0V GND can be used universally for standard and IO-Link assemblies. The same statement is valid for 0V GND power feed modules.

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

Power Feed Module

1694	-	PFD	1	24	4
		a	b	c	d



a

Module Type	
Code	**Description**
PFD	Power Feed Module IO-Link

b

Mounting Position	
Code	**Description**
1	Left

c

Function	
Code	**Description**
24	Line (24V DC input)

d

Max Current	
Code	**Description**
4	40 A

Protection Modules

1694	-	PMD	1	4	-	CL2
		a	b	c		d



a

Module Voltage	
Code	**Description**
PMD	Protection Module IO-Link

b

Number of Channels	
Code	**Description**
1	1-channel
2	2-channels

c

Output Current Rating	
Code	**Description**
1	1 A
2	2 A
3	3 A
4	4 A
6	6 A
8	8 A
10	10 A
11	1 A, 1 A
22	2 A, 2 A
33	3 A, 3 A
44	4 A, 4 A
66	6 A, 6 A
A10	Adjustable 1...10 A

d

Rating	
Code	**Description**
blank	No options
CL2[1]	Class 2

(1) Class 2 (100 VA) = 1 A...4 A

Distribution Modules

IMPORTANT Distribution modules for +24V DC (Line) and 0V GND can be used universally for standard and IO-Link assemblies. The same statement is valid for 0V GND power feed modules.

Product Selection

Power Feed Module +24V DC (Line)

Mounting Position	Supply Voltage	Max Current [A]	Aux Contact	Pkg. Qty.	Cat. No.
Left	24V DC	40	No	1	1694-PFD1244

Protection Modules

Number of Channels	Fixed or Adjustable Current	Current [A]	Class 2	Pkg. Qty.	Cat. No.
1	Fixed	8	–	4	1694-PMD18
		10	–	4	1694-PMD110
2	Fixed	1	–	4	1694-PMD211
			Yes	4	1694-PMD211-CL2
		2	–	4	1694-PMD222
			Yes	4	1694-PMD222-CL2
		3	–	4	1694-PMD233
			Yes	4	1694-PMD233-CL2
		4	–	4	1694-PMD244
			Yes	4	1694-PMD244-CL2
		6	–	4	1694-PMD266
	Adjustable	1...10	–	4	1694-PMD2A10

Specifications

Electrical Ratings		
Operating voltage		24V DC (18..30V DC)
Operating current		Max. 40 A
Rated current		1...10 A fixed current 1...10 A adjustable current
Environmental		
Operating temperature		-25...+60 °C (-13...140 °F)
Storage temperature		-40...+70 °C (-40...158 °F)
Humidity/Damp heat		96 hrs/95% climate class 3K3
Degree of pollution		2
Degree of protection		IP 20
Construction		
Terminal wire gauge	Push-in terminal PT10	AWG 20...8 (0.5...10mm^2)
	Push-in terminal PT2.5	AWG 24...14 (0.14...2.5mm^2)
Termination type		Push-in
Weight per module lb. (g)		Approximately 0.13 (60)

Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 137 - Power Feed Module

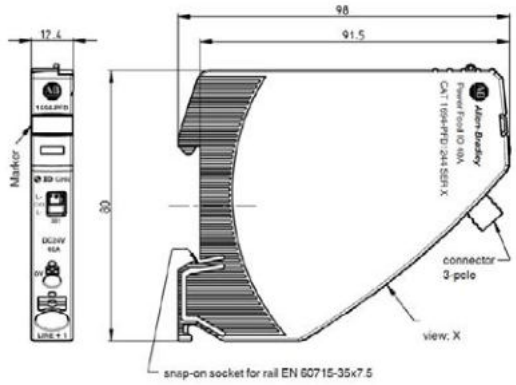
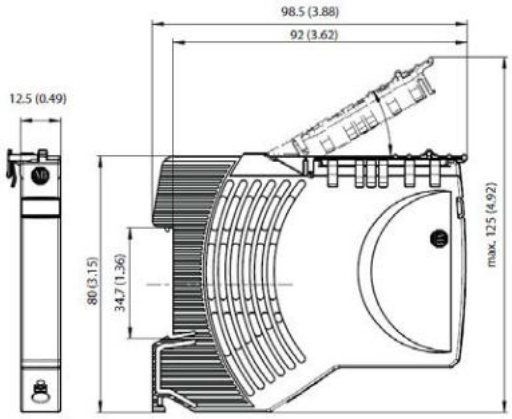
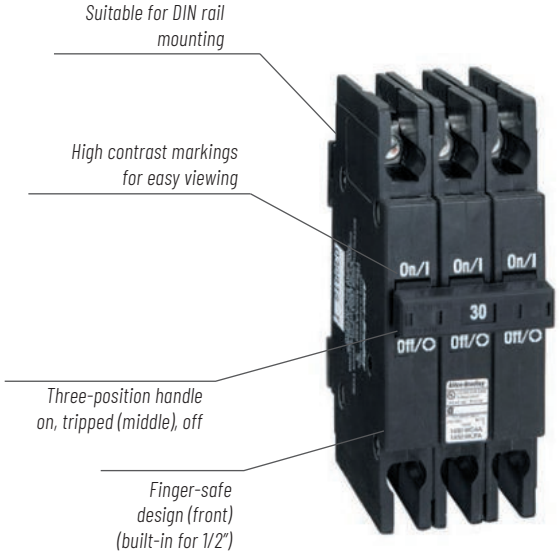
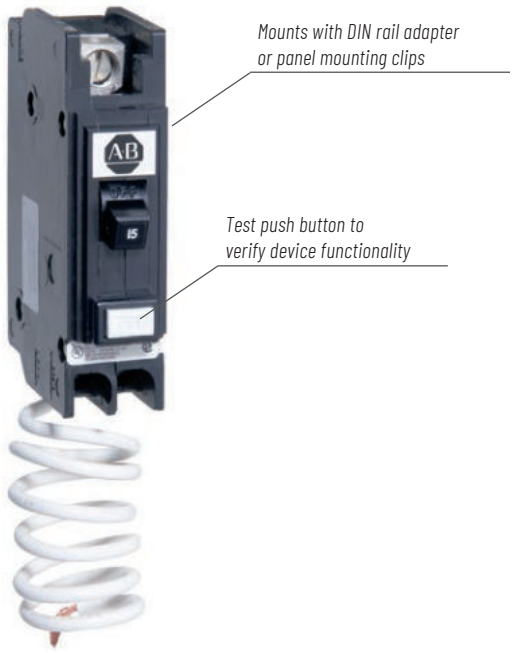


Figure 138 - Protection Modules





1492-MCA/MCB



1492-MCE/MCG

1492-MCA Circuit Breakers

Bulletin 1492-MC thermal-magnetic Circuit Breakers are general-purpose devices suitable for branch circuit protection in industrial applications. They combine thermal and magnetic trip actions and provide accurate overload and short-circuit protection for conductors and connected equipment.

Features include:

- Thermal-magnetic protection
- 10 kA interrupting capacity

1492-MCE/MCG Ground Fault Circuit Breakers

This line of ground fault sensing breakers are designed, manufactured, and certified to North American and the equivalent CSA standards.

Bulletin 1492-MCE devices are Ground Fault Equipment Protectors (GFEPs) that protect from low-level fault currents. With a sensing threshold of 30 mA, these devices are suitable for equipment protection.

Bulletin 1492-MCG devices are Ground Fault Circuit Interrupters (GFCIs) that protect from low-level fault currents. With a sensing threshold of 5 mA, these devices are suitable for personnel protection.

Bulletin 1492-MCGA devices are GFCIs with inherit self-test capability, as required by the UL 943 standard.

Features include:

- UL 489 circuit breaker with GFCI (5 mA sensitivity) or GFEP (30 mA sensitivity)
- 10 kA interrupting capacity

1492-MC Circuit Breakers	
Rated Voltage	120/240V AC, 240V AC
Interrupting Capacity	10 kA
Current Ratings	10...60 A
Poles	1, 2, 3
Standards Compliance	UL 489 CSA C22.2 No. 5 HACR (10...100 A) SWD (15 and 20 A) for Switching Duty for fluorescent lighting applications
1492-MCE only	UL 1053 CSA C22.2 No. 144
1492-MCG only	UL 943 CSA C22.2 No. 144
Certifications	UL Listed, File No. E197878 CSA Certified, File No. 216034

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492-MC	A	A	1	15
	a	b	c	d

a

Device Type	
Code	**Description**
A	1/2 in. wide/pole (DIN Rail mounting)
E	GFEP (30 mA)
G	GFCI (5 mA)

b

Interrupting Capacity	
Code	**Description**
A	10 kA A1-C
AT	10 kA A1-C – with self test capability (GFCI only)

c

Poles	
Code	**Description**
1	1-pole
2	2-pole
2H	(240V AC)
3	3-pole

d

Rated Current (I_n)	
Code	**Current [A]**
10	10
15	15
20	20
25	25
30	30
35	35
40	40
45	45
50	50
55	55
60	60

Product Selection

Cat. No. 1492-MCA Branch Circuit Breakers

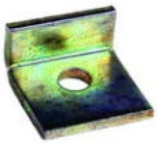
Photo	Continuous Ampere Rating @ 40 °C (104 °F)	Width per Pole	120/240V AC		Width per Pole	240V AC	
			1-Pole	2-Pole		2-Pole	3-Pole
	[A]	[in.]	Cat. No.	Cat. No.	[in]	Cat. No.	Cat. No.
	10	1/2	1492-MCAA110	1492-MCAA210	–	–	–
	15	1/2	1492-MCAA115	1492-MCAA215	1/2	1492-MCAA2H15	1492-MCAA315
	20	1/2	1492-MCAA120	1492-MCAA220	1/2	1492-MCAA2H20	1492-MCAA320
	25	1/2	1492-MCAA125	1492-MCAA225	1/2	1492-MCAA2H25	1492-MCAA325
	30	1/2	1492-MCAA130	1492-MCAA230	1/2	1492-MCAA2H30	1492-MCAA330
	35	1/2	1492-MCAA135	1492-MCAA235			
	40	1/2	1492-MCAA140	1492-MCAA240			
	45	1/2	1492-MCAA145	1492-MCAA245			
	50	1/2	1492-MCAA150	1492-MCAA250			
	55	1/2	1492-MCAA155	1492-MCAA255			
	60	1/2	1492-MCAA160	1492-MCAA260			

Cat. No. 1492-MCE/MCG Ground Fault Circuit Breakers

Photo	Continuous Ampere Rating @ 40 °C (104 °F)	Width per Pole	120V AC	120/240V AC (1)
			1-Pole	2-Pole
	[A]	[in]	Cat. No.	Cat. No.
	GFEP (30 mA Sensitivity)			
	15	1	1492-MCEA115	1492-MCEA215
	20	1	1492-MCEA120	1492-MCEA220
	25	1	1492-MCEA125	1492-MCEA225
	30	1	1492-MCEA130	1492-MCEA230
	40	1	1492-MCEA140	1492-MCEA240
	50	1	–	1492-MCEA250
	GFCI (5 mA Sensitivity)			
	15	1	1492-MCGAT115	1492-MCGAT215
	20	1	1492-MCGAT120	1492-MCGAT220
	25	1	1492-MCGAT125	1492-MCGAT225
	30	1	1492-MCGAT130	1492-MCGAT230
	40	1	1492-MCGAT140	1492-MCGAT240
	50	1	–	1492-MCGAT250

(1) These devices are for grounded neutral 240V Wye systems only.

Accessories

Device Description			1-Pole	2- and 3-Pole
	Locking Attachment for Circuit Breaker	1492-MCAAxxx	1492-AMCAL1	1492-AMCALM
	DIN Rail Adapter • for GFCI and GFEP devices • use two per pole		1492-AMCDIN1	
	Panel Mounting Clips • for GFCI and GFEP devices • use two per device		1492-AMCP1	

Specifications

Electrical Ratings	
Rated voltage	See rated voltage tables
Continuous current rating @ 40°C (104°F)	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 A
Rated short circuit capability	See interrupting capacity tables
Environmental	
Operating temperature	0…60 °C (32…140 °F) (non-condensing)
Shipment and short term storage limits	-40 °C…+80 °C (-40…176 °F)
Degree of protection	1/2 in. wide circuit breakers are finger safe from front per IEC.
Mechanical	
Mounting	DIN rail
Wire size	See terminal table
Terminal torque	
Recommended wire strip length	

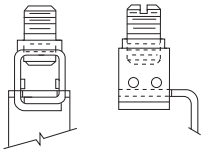
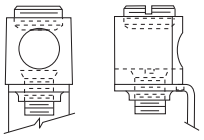
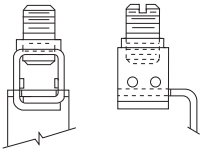
Cat. No.	Rated Voltage		Interrupting Capacity (rms Symmetrical Amperes)	
	[V AC]	[V DC] (1)	AC Rating [kA]	DC Rating [kA] (1)
1492-MCAA1xx	120/240	24, 48, 62.5	10	3
1492-MCAA2xx				
1492-MCAA2Hxx	240	24, 48, 62.5		3
1492-MCAA3xx				

(1) Rating as supplementary protector.

Cat. No.	Rated Voltage	Interrupting Capacity (rms Symmetrical Amperes)
	[V AC]	AC Rating [kA]
1492-MCEA1xx	120	10
1492-MCEA2xx	120/240 (1)	
1492-MCGAT1xx	120	
1492-MCGAT2xx	120/240 (1)	

(1) These devices are for grounded neutral 240V Wye systems only.

Terminal Specifications

Line and Load Terminals	Continuous Current Rating	Wire Type	Wire Range [AWG]	Terminal Torque	Line Strip Length	For Use With
	10…60 A	Copper (Cu)	14…10	2.3 N•m (20 lb•in)	7/16 in. (11 mm)	1492-MCAAxxx
			8	2.8 N•m (25 lb•in)		
			6…4	3.0 N•m (27 lb•in)		
Line 	15…50 A		14…10	2.3 N•m (20 lb•in)	9/16 in. (14.3 mm)	1492-MCEAxxx
			8	2.8 N•m (25 lb•in)	–	
Load 			6…4	3.0 N•m (27 lb•in)	–	1492-MCGATxxx

Application Information

Selection of a Bulletin 1492-MC circuit breaker with appropriate circuit protection includes consideration of:

- Circuit voltage
- Circuit frequency
- Available short circuit current
- Continuous current rating
- Application considerations
- Special operating conditions

The following discussion is based upon National Electric Code and UL requirements. Similar considerations are appropriate for Canadian applications.

Circuit Voltage

Bulletin 1492-MC circuit breakers are rated by voltage class. Applications should not exceed the listed voltage range.

Circuit Frequency

Bulletin 1492-MC circuit breakers may be applied to frequencies from DC up to 60 Hz without derating. For applications above 60...400 Hz, contact your local Rockwell Automation sales office or Allen-Bradley distributor with specific application information for the derating of the circuit breakers.

Available Short Circuit Current

Bulletin 1492-MC circuit breakers should only be applied in those applications in which the available short-circuit (or fault) current is less than or equal to the interrupting rating shown in the Voltage and Interrupting Ratings table on page 113.

Continuous Current Rating

Bulletin 1492-MC circuit breakers are rated in RMS amperes at an ambient temperature of 40 °C (104 °F) per UL 489 (CSA 22.2 No. 5.1). This temperature is the ambient temperature external to an industrial enclosure. If a circuit breaker is applied in a temperature that exceeds the 40 °C (104 °F) ambient, then the circuit breaker should be derated. Contact your local Rockwell Automation sales office or Allen-Bradley distributor for derating information.

Application Considerations

The selection of a specific ampere rating for a specific application is dependent on the type of load and duty cycle and is governed by the National Electric Code (Canadian Electric Code) and UL/CSA. In general the codes require that overcurrent protection is at the current supply and at points where wire sizes are reduced. In addition the codes state that conductors be protected according to their current carrying capacity. There are specific situations that require application consideration, such as motor circuit, and guidelines for the selection for transformer protection.

Bulletin 1492-MC circuit breakers are "non-100% rated" as defined by UL 489 Part 7.1.4.2. As such, the circuit breaker rating should be loaded to no more than 80% of its rating if it is used with continuous loads.

Branch Circuits:

Bulletin 1492-MC circuit breakers may be used to protect branch circuits. A branch circuit is the wiring portion of a system extending beyond the final overcurrent device protecting the circuit.

Use the guidelines established in NEC, CEC, UL, and CSA to determine the specific device.

Coordinated Overcurrent Protection

Where an orderly shutdown is required to minimize the hazards to personnel and equipment, a system of coordination based upon the faulted or overloaded circuit is isolated by selective operation of only the overcurrent protective device closest to the overcurrent condition.

You should select devices that meet this requirement.

References: NEC 240.12. Also see CEC.

Self Test Capability (GFCI only)

Per UL 943 (5.16/6.30), GFCI devices have built-in self test capability. The self test is an internal, automated function running in the background. For more information please see the UL 943 standard.

Tripping Characteristics

- I_1 is the lower trip range. If the overcurrent condition is left of the curve, the breaker does not trip. At a condition to the right of the curve, the breaker trips according to the trip curve.
- I_2 is the higher trip range. The breaker must trip at that level. The tripping time follows the trip curve.

Figure 139 - Time Current Curve — 1-Pole Circuit Breaker

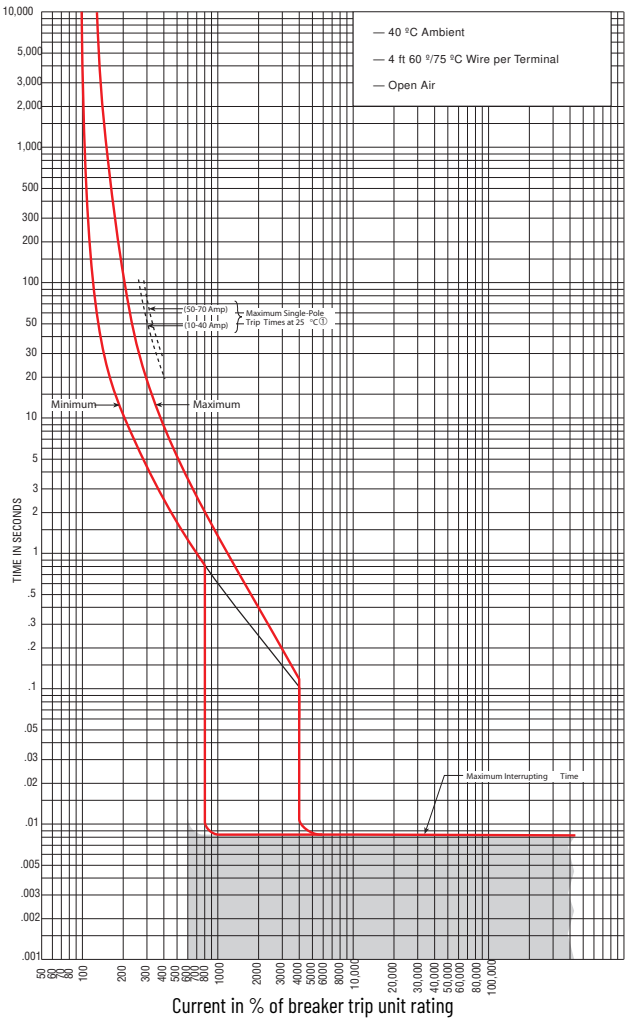


Figure 140 - Time Current Curve — 2-Pole Circuit Breaker

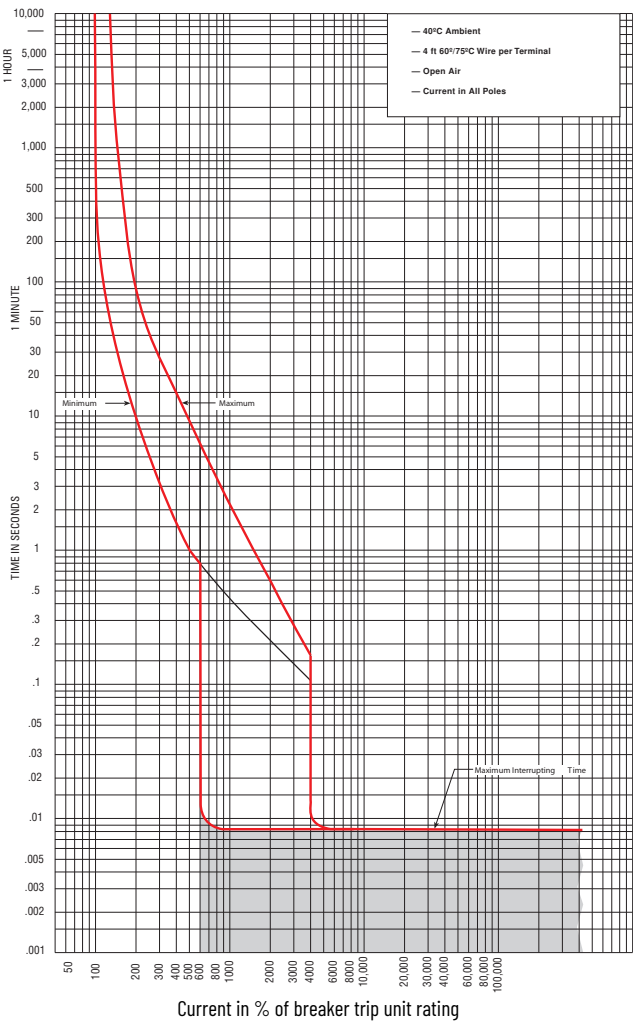
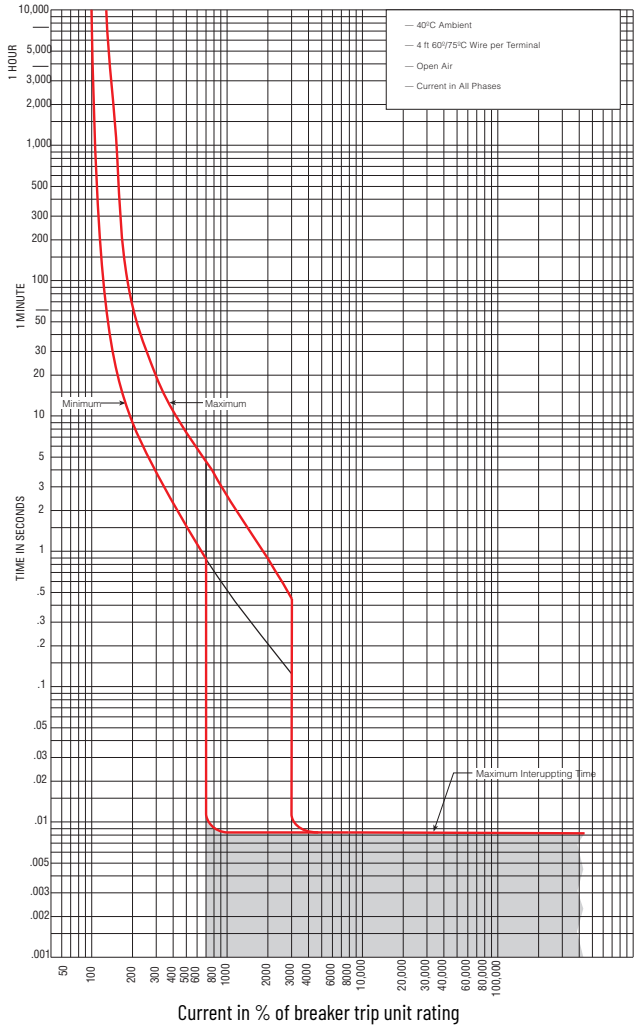


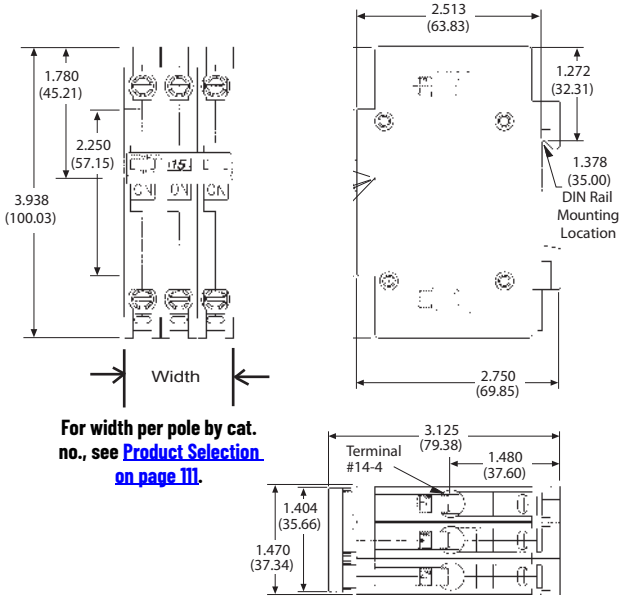
Figure 141 - Time Current Curve — 3-Pole Circuit Breaker



Approximate Dimensions

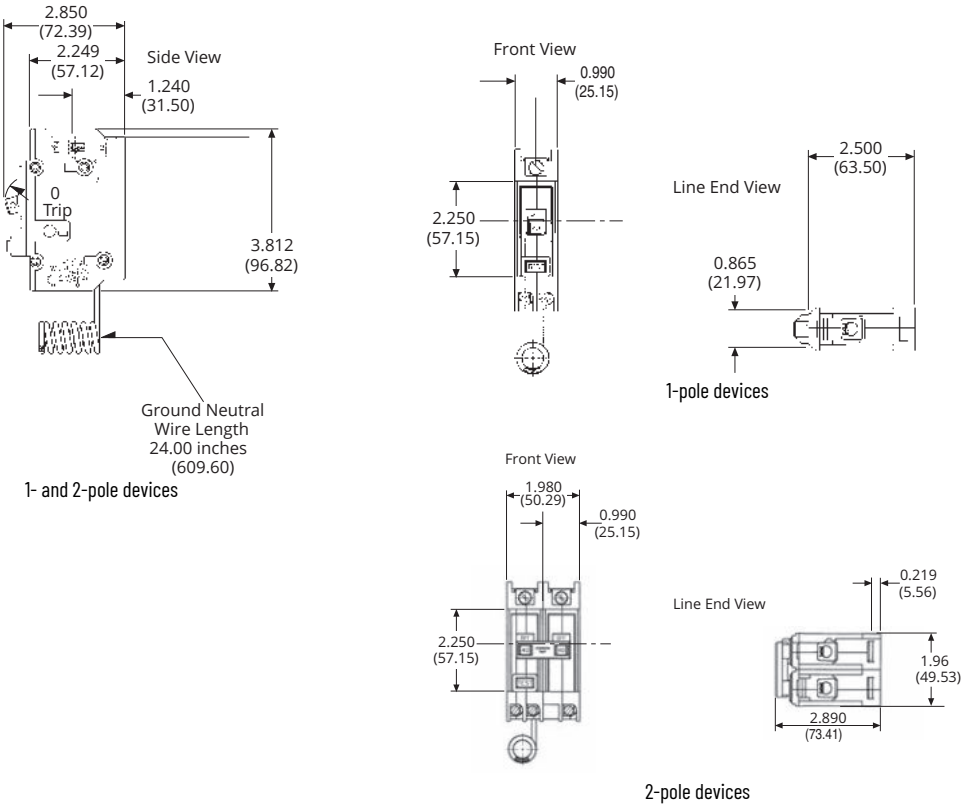
Dimensions are shown in inches (mm). Dimensions are not intended for manufacturing purposes.

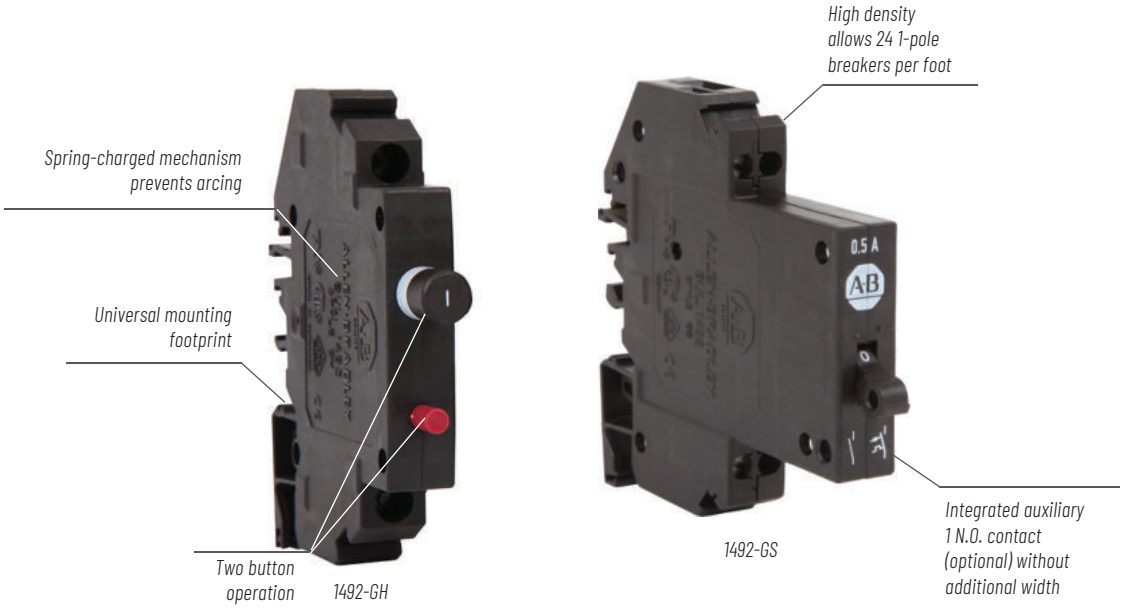
Figure 142 - Cat. No. 1492-MCA Branch Circuit Breakers; 1-, 2-, and 3-Pole Devices (3-Pole shown)



For width per pole by cat. no., see Product Selection on page 111.

Figure 143 - Cat. No. 1492-MCE, -MCG Ground Fault Circuit Breakers; 1- and 2-pole Devices





Bulletin 1492-GH/-GS High-density Miniature Circuit Breakers are thermal-magnetic type supplementary protectors. These products are a high-density design often used when panel space (width) is a premium. Up to 24 one-pole breakers can be mounted per foot.

Features include:

- Low current ratings and numerous rated currents for precise circuit requirements
- Can be ordered with auxiliary contacts that do not add any additional space
- AC and DC voltage ratings in one convenient device
- A positively trip-free mechanism (breaker operation cannot be defeated by holding the handle in the ON position)
- Superior shock and vibration resistance capabilities; to help prevent nuisance tripping

1492-GS/GH Supplementary Protectors	
Rated Voltage	-GH: 250V AC 50/60 Hz -GS: 480Y/277V AC 50/60 Hz
Current Ratings	-GH: 0.2...15 A -GS: 0.2...25 A
Poles	-GH: 1 -GS: 1, 2, 3
Standards Compliance	UL 1077 CSA C22.2 No.235 EN 60934
Certifications	UL Recognized, File No. E65138 CSA Certified, File No. 72348 CE Marked VDE Certified RoHS Compliant UKCA Marked

1492-GH Supplementary Protectors

Bulletin 1492-GH breakers are 1-pole devices. They use a push-to-set mechanism for circuit actuation and come with a manual trip button for manually opening the circuit.

1492-GS Supplementary Protectors

Bulletin 1492-GS breakers are available in 1-, 2-, and 3-pole devices. They use a toggle style handle mechanism for circuit actuation. These breakers may also be ordered with an internally mounted N.O. auxiliary contact that requires no additional mounting space.

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492-GH Supplementary Protectors

1492	–	GH	002
		a	b

a

Poles	
Code	**Description**
GH	1-Pole

b

Rated Current (I_n)	
Code	**Current [A]**
002	0.2
005	0.5
008	0.8
010	1
012	1.2
015	1.5
020	2
025	2.5
030	3
040	4
050	5
070	7
100	10
150	15

1492-GS Supplementary Protectors

1492	–	GS1G	002	H1
		a	b	c

a

Poles	
Code	**Description**
GS1G	1-Pole
GS2G	2-Pole
GS3G	3-Pole

b

Rated Current (I_n)	
Code	**Current [A]**
002	0.2
005	0.5
008	0.8
010	1
012	1.2
015	1.5
020	2
025	2.5
030	3
040	4
050	5
060	6
070	7
080	8
100	10
120	12
150	15
160	16
200	20
250	25

c

Auxiliary Contact	
Code	**Description**
	Can be left blank
H1	With 1 N.O. integrated auxiliary contact (only 1 may be added per device)

Product Selection

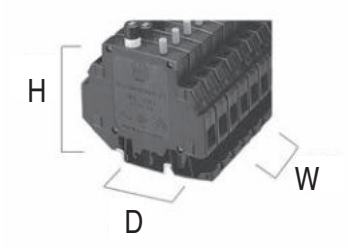
Amperage [A]	1492-GH	1492-GS		
	1-Pole	1-Pole	2-Pole	3-Pole
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
0.2	1492-GH002	1492-GS1G002	1492-GS2G002	1492-GS3G002
0.5	1492-GH005	1492-GS1G005	1492-GS2G005	1492-GS3G005
0.8	1492-GH008	1492-GS1G008	1492-GS2G008	1492-GS3G008
1	1492-GH010	1492-GS1G010	1492-GS2G010	1492-GS3G010
1.2	1492-GH012	—	—	—
1.5	1492-GH015	1492-GS1G015	1492-GS2G015	1492-GS3G015
2	1492-GH020	1492-GS1G020	1492-GS2G020	1492-GS3G020
2.5	1492-GH025	1492-GS1G025	1492-GS2G025	1492-GS3G025
3	1492-GH030	1492-GS1G030	1492-GS2G030	1492-GS3G030
4	1492-GH040	1492-GS1G040	1492-GS2G040	1492-GS3G040
5	1492-GH050	1492-GS1G050	1492-GS2G050	1492-GS3G050
6	—	1492-GS1G060	1492-GS2G060	1492-GS3G060
7	1492-GH070	1492-GS1G070	1492-GS2G070	1492-GS3G070
8	—	1492-GS1G080	1492-GS2G080	1492-GS3G080
10	1492-GH100	1492-GS1G100	1492-GS2G100	1492-GS3G100
12	—	1492-GS1G120	1492-GS2G120	1492-GS3G120
15	1492-GH150	1492-GS1G150	1492-GS2G150	1492-GS3G150
16	—	1492-GS1G160	1492-GS2G160	1492-GS3G160
20	—	1492-GS1G200	1492-GS2G200	1492-GS3G200
25	—	1492-GS1G250	1492-GS2G250	1492-GS3G250
Integrated Auxiliary Contact	—	Add suffix — H1 for integrated N.O. auxiliary contact (only one may be added per device)		

Specifications

	1492-GH	1492-GS		
	1-Pole	1-Pole	2-Pole	3-Pole
UL/CSA	200 A (Not to exceed 100 x rated A)	0.2…16 A	5 kA C1 (2 kA C1 for 65V DC — 1-pole)	
		18…25 A	2 kA C1	
IEC/EN 60934 (CBE)	—	0.2…5 A	400 A	
		6…25 A	800 A	
Maximum voltage ratings	250V AC, 50/60 Hz 65V DC	480Y/277V AC, 50/60 Hz 65V DC		
Temperature range	-40…+149 °F (-40…+65 °C) non-condensing			
Operating life	6,000 operations @ rated current			
Housing material	Glass-filled Polyamide 6.6			
Shock	25 G, 11 ms duration			
Vibration	5 G (10…500 Hz)			
Dielectric strength	1,500V AC	1,600V AC		
Insulation resistance	100 MΩ @ 500V DC			
Terminal type	Tubular screw with self-lifting box lug			
Wire size	#22…10 AWG			
Recommended wire strip length	0.44 in. (11.2 mm)	Main terminal — 0.51 in. (13 mm) aux terminal — 0.41 in. (10.4 mm)		
Terminal torque	1.3…1.4 N•m (10…12 lb•in)	0.656 N•m (5 lb•in)		
N.O. auxiliary contact rating	—	1.0 A AC or DC (resistive load)		

Approximate Dimensions

Dimensions are shown in inches (mm). Dimensions are not intended for manufacturing purposes.



	1492-GH	1492-GS		
	1-Pole	1-Pole	2-Pole	3-Pole
Height	3.15 in. (80 mm)	3.15 in. (80 mm)		
Depth	2.89 in. (73.4 mm)	3.48 in. (88.4 mm)		
Width	0.49 in. (12.4 mm)	0.49 in. (12.4 mm)	0.98 in. (24.9 mm)	1.47 in. (37.3 mm)

Application Information

UL 1077, CSA C22.2 #235

In North America, miniature circuit breakers are recognized as supplementary protectors and are intended for use as overcurrent protection within an appliance or other electrical equipment where branch circuit protection is already provided or not required. Internationally, these products are rated to IEC standards as circuit breakers for equipment (CBE).

Selection Information

High-density supplementary protector/miniature circuit breaker applications include, but are not limited to, the protection of test equipment, control instrumentation, solenoids, and power supplies. The wide range of current values and the use of a thermal magnetic trip system allows for a variety of applications where a very accurate and compact breaker is required.

To select a miniature circuit breaker, use the following procedure:

1. Determine the inrush correction factor from the following table.

Inrush Ratio Correction Table					
Inrush Ratio	1:1 to 1:4	1:5	1:6	1:7	1:8
Correction Factor	1:3	1:4	1:5	1:6	1:7

For resistive loads, use an inrush correction factor of 1.0.

2. Determine the temperature correction factor from the following table.

Ambient Temperature Correction Table							
Ambient Temperature	70 °F (21.1 °C	100 °F (37.8 °C)	120 °F (48.9 °C)	140 °F (60 °C)	160 °F (71.1 °C)	180 °F (82.2 °C)	200 °F (93.3 °C)
Factor	1.0	1.1	1.2	1.3	1.4	1.5	1.6

3. Determine the sealed current of the load being protected.
4. Multiply the sealed current by the two correction factors and select the closest higher ampere rating.

EXAMPLE For a solenoid with sealed current of 0.5 A, an inrush ratio of 1:8, and an ambient temperature of +110 °F, (0.5 x 1.7 x 1.15 = 0.9775), select the 1.0 A miniature circuit breaker. Tripping time of the miniature circuit breaker is determined from the table below. Divide the miniature circuit breaker value by the temperature correction factor from the Ambient Temperature Correction Table to determine the actual rated current referenced in the table below.

Tripping Times in Seconds at 70 °F (21.1 °C)								
Percent Rated Current	100%	200%	300%	400%	500%	600%	1000%	2000% Greater
Tripping Times (Seconds)	No Trip	10...40	3...18	1.5...9	0.8...6	0.003...4	0.009...2	Max. 0.02

When several breakers are rail mounted adjacent to each other, the no-trip current is 80% of rated current at 70 °F (21.1 °C). Using selection tables, select Bulletin 1492-GH/-GS that allows full load current nearest without exceeding application current. Also, check that inrush current is less than trip range of 6...10 I_n.

Tripping Characteristics

When several breakers are rail mounted adjacent to each other, the no-trip current is 80% of rated current at 70 °F (21.1 °C).

Figure 144 - Time Current Curve –1492-GH

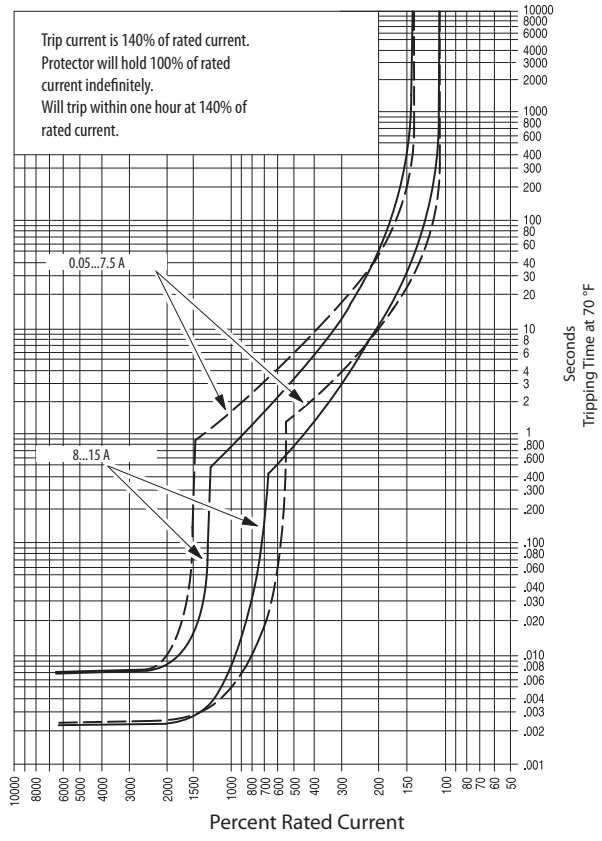
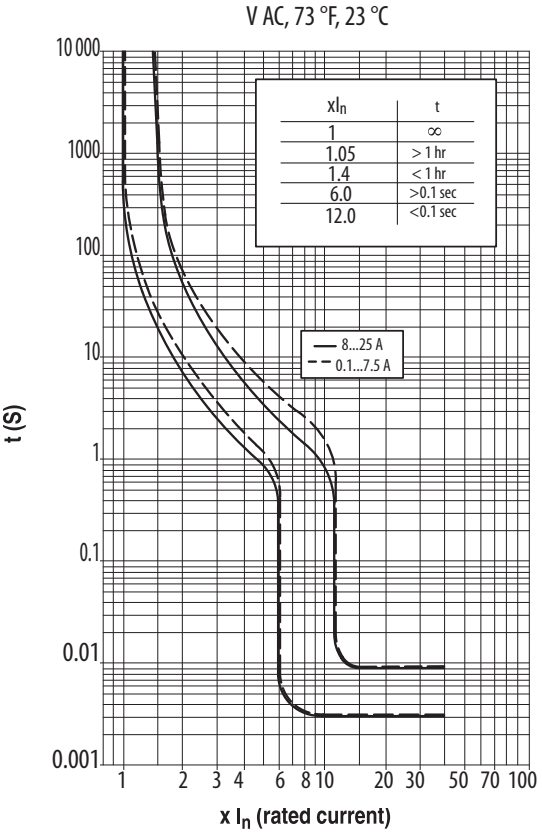
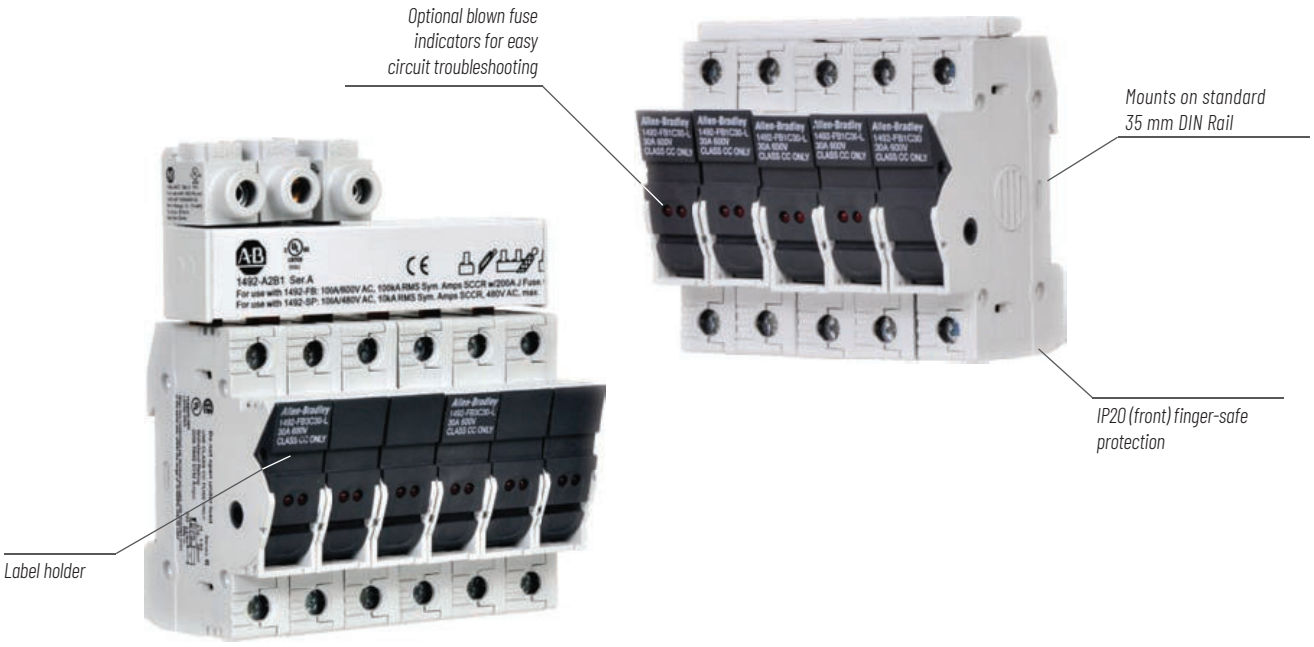


Figure 145 - Time Current Curve –1492-GS





The 1492-FB fuse holder family is designed for use in many OEM applications, such as power supplies, equipment protection, primary and secondary control transformers, solenoids, lighting and heater loads, and drives.

Bulletin 1492-FB fuse holders provide a safe and convenient means for installation of Class CC, J, and 10 x 38 mm fuses. To support correct fuse type installation, the Class CC fuse holder is designed to reject a 10 x 38 mm fuse. The Class J fuse holder rejects all fuses other than a Class J fuse.

All Allen-Bradley Class CC, J, and 10 x 38 mm fuse holders are UL Listed and CSA Certified for branch circuit protection. They are excellent for wire protection, small motor loads, and group protection of small motor loads. The 10 x 38 mm fuse holder is also CE Marked for 10 x 38 mm fuses.

Features include:

- Compact size requires less panel space than open-style fuse holders
- Handle isolates the fuse from top-wired power when installing or removing fuse
- Terminals are shipped in open position and ready for wiring
- Suitable for use in field wiring applications

1492-FB Fuse Holders		
Poles	1, 2, 3	
Fuse Types	10 x 38 mm fuse	30 A
	Class CC	30 A
	Class J	30 A, 60 A
Voltage	10 x 38 mm fuse	UL: Max 600V AC/DC IEC: 690V AC/DC
	Class CC	UL: Max 600V AC/DC
	Class J	UL: Max 600V AC/DC
Standards Compliance	10 x 38 mm fuse	UL 4248-1 CSA 22.2 No. 39 EN 60947-1 & 3 GB 14048.3
	Class CC	UL 4248-4 CSA 22.2 No. 39 GB 14048.3
	Class J	UL 4248-8 CSA 22.2 No. 39 GB 14048.3 (30 A only)
Certifications	UL Listed, File No. E34648 CSA Certified, File No. 71101 CE Marked RoHS Compliant UKCA Marked CCC (10 x 38 mm and Class CC only)	

Catalog Number Explanation

Examples that are given in this section are not intended to be used for product selection. Not all combinations generate a valid catalog number. Use ProposalWorks™ software to configure the PC. ProposalWorks software is available from rok.auto/systemtools.

1492	-	FB1	C30	-	L
		a	b		c

a

Poles	
Code	**Description**
FB1	1-Pole
FB2	2-Pole
FB3	3-Pole

b

Fuse Type	
Code	**Description**
M30	10 x 38 mm, 30 A
C30	Class C, 30 A
J30 (1)	Class J, 30 A
J60 (1)	Class J, 60 A

c

With Indication	
Code	**Description**
	Can be left blank
L	With indication 110...600V AC/DC
D1 (2)	With indication 12...72V AC/DC

(1) Bus bars do not fit on Class J fuse holders.
(2) For 1-pole Class CC and 10 x 38 mm fuses only.

Product Selection

Description		For 10 x 38 mm Fuse	For Class CC Fuse	For Class J Fuse (1)	
		30 A	30 A (2)	30 A	60 A
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
1-Pole	Fuse Block, 600V AC/DC	1492-FB1M30 (3)	1492-FB1C30	1492-FB1J30	1492-FB1J60
	Fuse Block with Indication, 110...600V AC/DC	1492-FB1M30-L (3)	1492-FB1C30-L	1492-FB1J30-L	1492-FB1J60-L
	Fuse Block with Indication, 12...72V	1492-FB1M30-D1	1492-FB1C30-D1	—	—
	Package Quantity	12	12	6	6
2-Pole	Fuse Block, 600V AC/DC	1492-FB2M30 (3)	1492-FB2C30	1492-FB2J30	1492-FB2J60
	Fuse Block with Indication, 110...600V AC/DC	1492-FB2M30-L (3)	1492-FB2C30-L	1492-FB2J30-L	1492-FB2J60-L
	Package Quantity	6	6	3	3
3-Pole	Fuse Block, 600V AC/DC	1492-FB3M30 (3)	1492-FB3C30	1492-FB3J30	1492-FB3J60
	Fuse Block with Indication, 110...600V AC/DC	1492-FB3M30-L (3)	1492-FB3C30-L	1492-FB3J30-L	1492-FB3J60-L
	Package Quantity	4	4	2	2

(1) Bus bars do not fit on Class J fuse holders.
(2) All major fuse brands and current ranges have been evaluated for this fuse holder. Because of the heat they generate, the following fuses must be derated:
Mersen ATQR 1.25 I = 0.42 A max.
Mersen ATQR 1.40 I = 0.47 A max.
(3) 690V when used in IEC applications.

Marking Systems

	Description	Size	Pkg. Qty.	Cat. No.
	Fuse holder Identification Slide-in Markers • Blank marker squares slip into molded slot • 100 markers/card	5 mm x 5 mm	5 cards	1492-MC5X5
		6 mm x 5 mm		1492-MC6X5
	ClearMultiprint™ Markers	5 mm x 5 mm	1 roll (1220/roll)	1492-MTCPC5X5
		6 mm x 5 mm	1 roll (1020/roll)	1492-MTCPC6X5
	ClearMultiprint roller • For use with ClearMultiprint marking system	–	1	1492-PROLLTBCPC

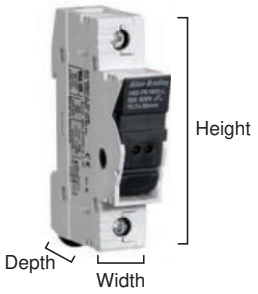
Specifications

Product Type (n = number of poles)		10 x 38 mm	CC	J30 (1)	J60 (1)
		1492-FBnM30 "B" 1492-FB1M30-D1 "B" 1492-FBnM30-L "B"	1492-FBnC30 "B" 1492-FB1C30-D1 "B" 1492-FBnC30-L "B"	1492-FBnJ30 "B" 1492-FBnJ30-L "B"	1492-FBnJ60 "B" 1492-FBnJ60-L "B"
For Fuse Type:		10 x 38 mm	Class CC	Class J	
Maximum voltage AC/DC		600V, 690V (IEC)	600V	600V	
Maximum current		30 A, 32 A (IEC)	30 A	30 A	60 A
Maximum current withstand (UL/CSA)		Fuse dependent 50 kA max UL	200 kA sym	200 kA sym	
Temperature range	Operating	-20…+120 °C (-4…+248 °F)			
	Storage	-40…+120 °C (-40…+248 °F)			
Thermal stability		acceptable thermal temperature: -40…120 °C (-40…248 °F)			
Conductor material		Copper, stranded			
Conductor strip length		0.43 in. (11 mm)		0.79 in. (20 mm)	
Conductor range	1 wire per terminal	#18…4 AWG (0.75…25 mm^2)		#18…1 AWG (0.75…50 mm^2)	#14…1 AWG (2.5…50 mm^2)
	2 wires (2) per terminal	#18…8 AWG (0.75…10 mm^2)		#18…6 AWG (0.75…16 mm^2)	#14…6 AWG (2.5…16 mm^2)
Terminal tightening torque		#18…8 AWG: 22 lb•in #6…4 AWG: 26 lb•in 0.75…25 mm^2: 2.5 N•m		35 lb•in (4 N•m)	

(1) Bus bars do not fit on Class J fuse holders.
(2) Both wires must be same size

Approximate Dimensions

Dimensions are shown in inches (mm). Dimensions are not intended for manufacturing purposes.



Dimension		For10 x 38 mm fuse	For Class CC Fuse	For Class J Fuse	
		30 A	30 A	30 A	60 A
Height		3.19 in. (81 mm)	3.19 in. (81 mm)	4.65 in. (118 mm)	4.65 in. (118 mm)
Depth		2.51 in. (64 mm)	2.51 in. (64 mm)	2.76 in. (70 mm)	3.23 in. (82 mm)
Width	1-Pole	0.71 in. (18 mm)	0.71 in. (18 mm)	1.41 in. (36 mm)	1.57 in. (40 mm)
	2-Pole	1.41 in. (36 mm)	1.41 in. (36 mm)	2.83 in. (72 mm)	3.15 in. (80 mm)
	3-Pole	2.13 in. (54 mm)	2.13 in. (54 mm)	4.25 in. (108 mm)	4.72 in. (120 mm)

Bus Bars

Bus bars do not fit on Class J fuse holders.

Table 13 - 1492-FB Bus Bars

Description	Pins	Rated Current [A] (1)	Pkg. Qty.	Cat. No. (2)
1-Phase	57	100 A	1	1492-A1B1
	57	80 A	1	1492-A1B8
2-Phase	56	100A	1	1492-A2B1
	56	80 A	1	1492-A2B8
3-Phase	57	100A	1	1492-A3B1
	57	80 A	1	1492-A3B8

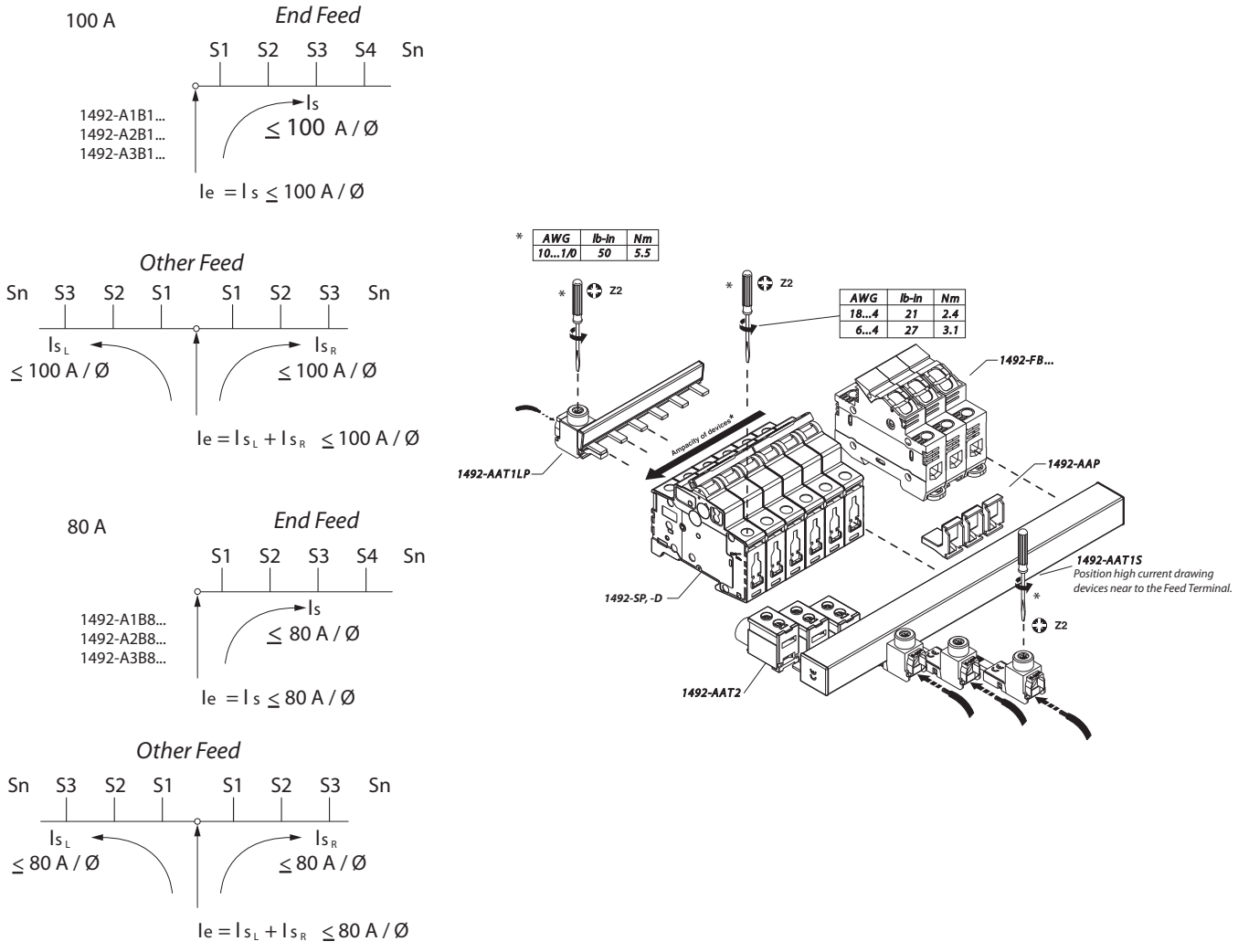
(1) See Figure 146 for Feeder Terminal and Bus Bar Current Distribution.
(2) cULus, UL508, EN 60947-1, CE Marked.

Table 14 - 1492-FB Bus Bar Accessories(1)

Description		Pkg. Qty.	Cat. No.(2)
Terminal Power Feed, 35 mm^2	for 1-phase bus bar	10	1492-AAT1LP
	for 2- or 3-phase bus bar	10	1492-AAT1
Dedicated Power Feed, 50 mm^2		10	1492-AAT2
End Cover	for 1-phase bus bar	10	1492-A1E
	for 2- or 3-phase bus bar	10	1492-AME
Protective Shroud for unused pins		10	1492-AAP

(1) Dedicated Power Feed Lugs attach and mount to the bus bar pin instead of the device terminal. It adds height to the bus bar installation.
Terminal Power Feed Lugs occupy one terminal or phase on the device.
(2) cULus, UL508, EN 60947-1, CE Marked.

Figure 146 - Feeder Terminal and Bus Bar Current Distribution



Bus Bar Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

1-Phase Bus Bars

Figure 147 - Cat. No. 1492-A1B1

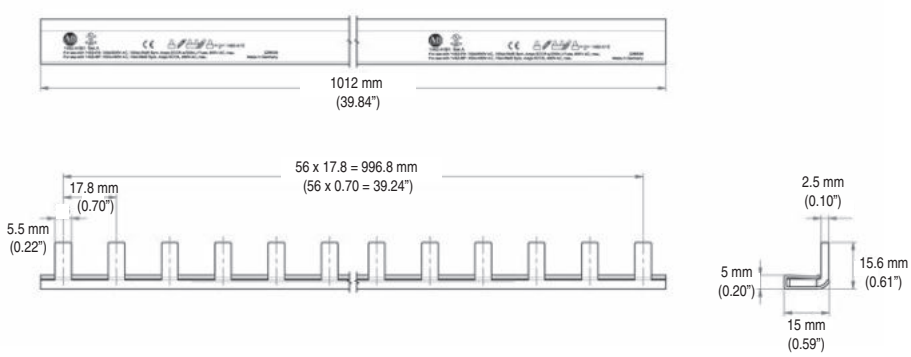
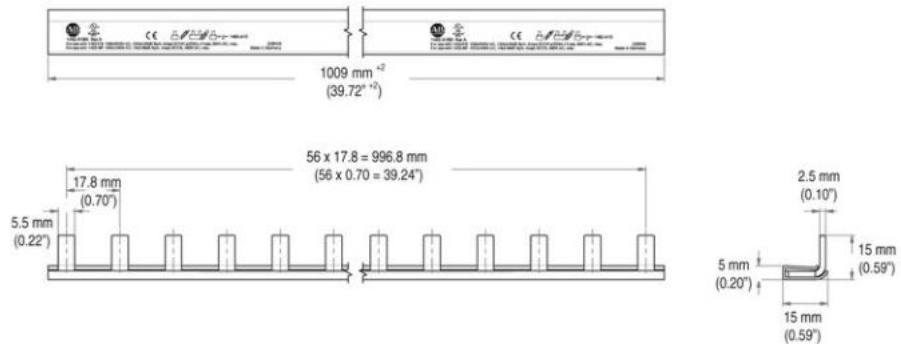


Figure 148 - Cat. No. 1492-A1B8



2-Phase Bus Bars

Figure 149 - Cat. No. 1492-A2B1

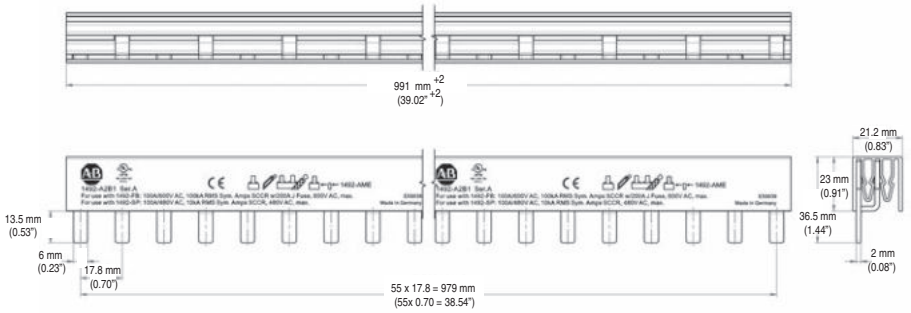
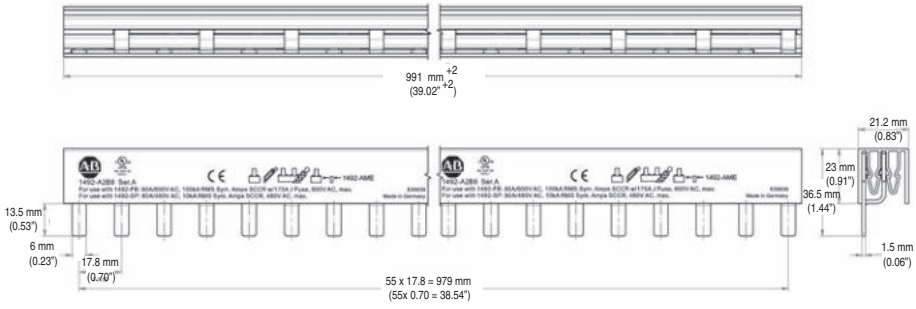


Figure 150 - Cat. No. 1492-A2B8



3-Phase Bus Bars

Figure 151 - Cat. No. 1492-A3B1

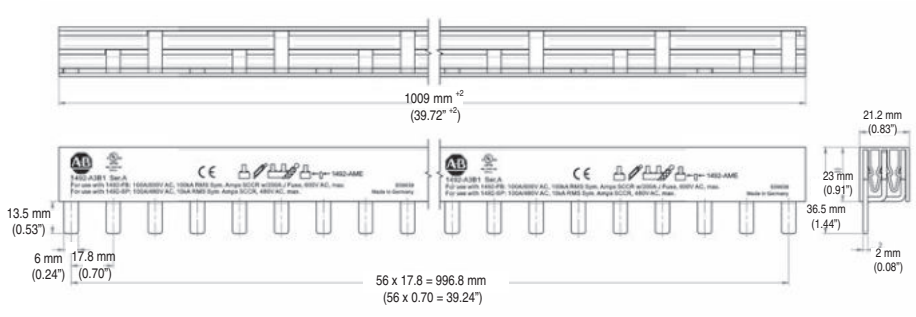
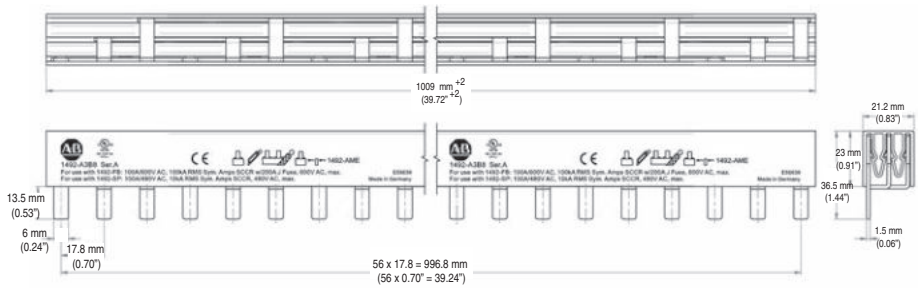


Figure 152 - Cat. No. 1492-A3B8



Bus Bar Accessory Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Figure 153 - Cat. No. 1492-AAT1

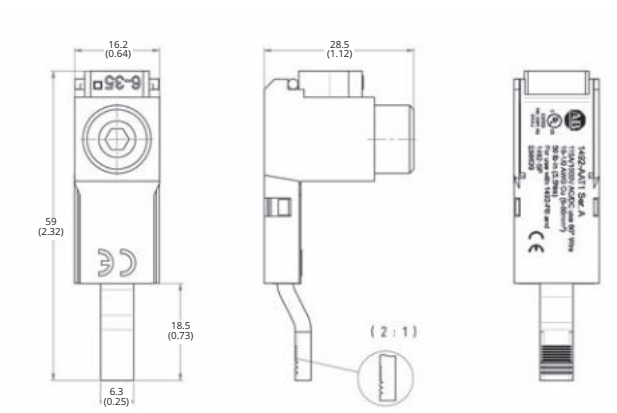


Figure 154 - Cat. No. 1492-AAT1LP

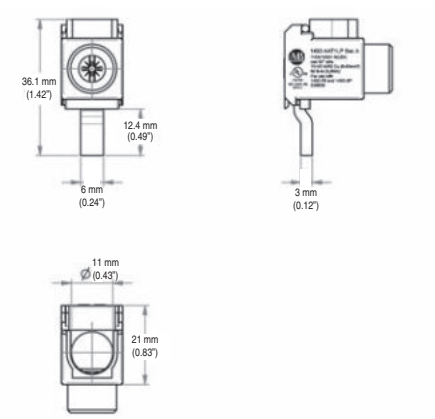


Figure 155 - Cat. No. 1492-AAT2

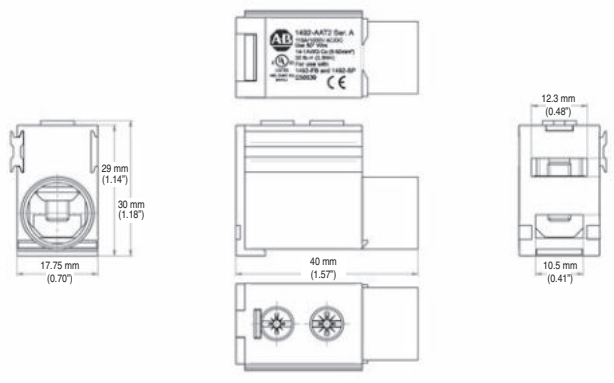


Figure 156 - Cat. No. 1492-A1E

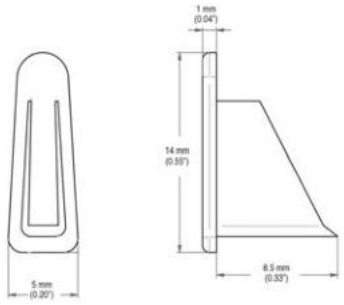


Figure 157 - Cat. No. 1492-AME

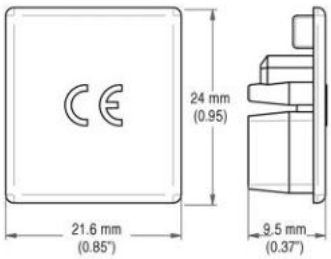
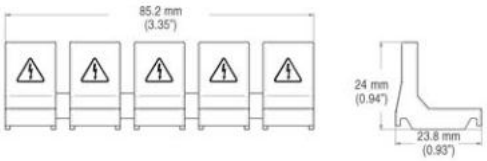


Figure 158 - Cat. No. 1492-AAP



Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
Circuit Breaker Brochure, 140G-BR001	Overview of the full line of Allen-Bradley® circuit breakers and motor protection devices.
EtherNet/IP Network Devices User Manual, ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication IC-AT001	Provides an overview of American motor circuit design based on methods that are outlined in the NEC.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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