



# Control Circuit and Load Protection

Bulletin Numbers 188, 1489, 1492, 1694



**Allen-Bradley**  
by ROCKWELL AUTOMATION

Selection Guide

Original Instructions

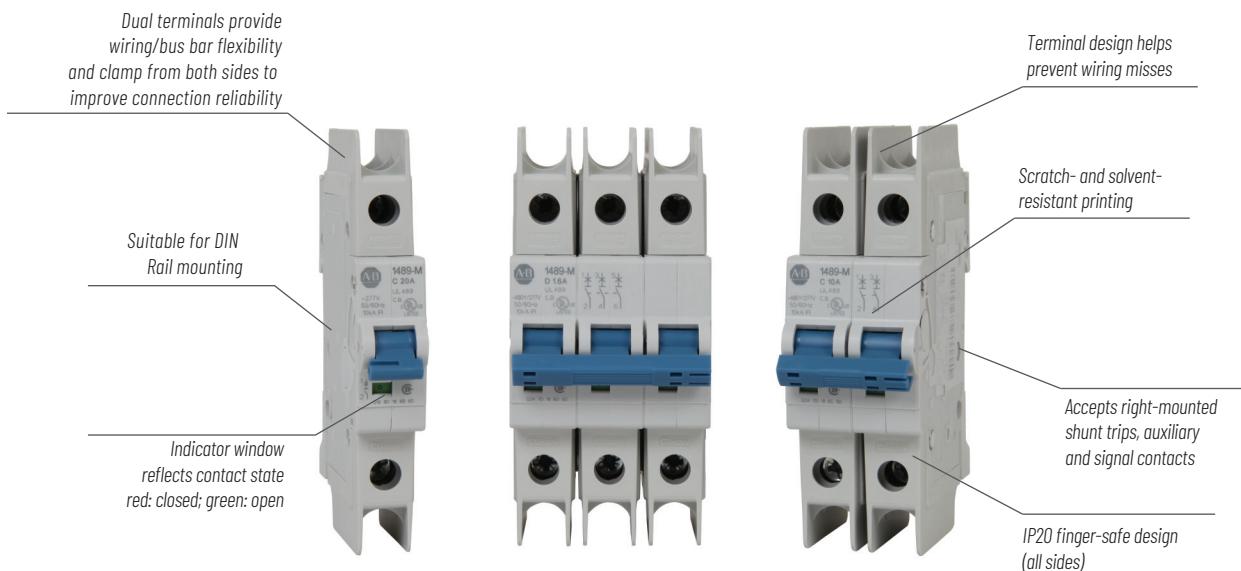
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## What's New

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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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.

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

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1489 - **M** **1** **C** **005**

<b>a</b>	
<b>Voltage Type</b>	
<b>Code</b>	<b>Description</b>
M	AC Circuit Breaker

<b>b</b>	
<b>Poles</b>	
<b>Code</b>	<b>Description</b>
1	1-Pole
2	2-Pole
3	3-Pole

<b>c</b>	
<b>Trip Curve</b>	
<b>Code</b>	<b>Description</b>
C	Trip Curve C
D	Trip Curve D

<b>d</b>	
<b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
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

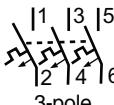
## 1-Pole Circuit Breakers

Photo/ Wiring Diagram	UL/CSA Max. Voltage	IEC/EN Max. Voltage	Continuous Current Rating ( $I_n$ )	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
			[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
	C Curve: 277V AC, 48V DC D Curve: 240V AC, 48V DC		40	1489-M1C400	1489-M1D400
			50	1489-M1C500	1489-M1D500
			60	1489-M1C600	1489-M1D600
			63	1489-M1C630	1489-M1D630
240V AC, 48V DC					

## 2-Pole Circuit Breakers

Photo/ Wiring Diagram	UL/CSA Max. Voltage	IEC/EN Max. Voltage	Continuous Current Rating ( $I_n$ )	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$		
			[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		
			40	1489-M2C400	1489-M2D400		
			50	1489-M2C500	1489-M2D500		
			60	1489-M2C600	1489-M2D600		
			63	1489-M2C630	1489-M2D630		
C Curve: 480Y/277V AC, 96V DC D Curve: 240V AC, 96V DC							
240V AC, 96V DC							

## 3-Pole Circuit Breakers

Photo/ Wiring Diagram	UL/CSA Max. Voltage	IEC/EN Max. Voltage	Continuous Current Rating ( $I_n$ )	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
			[A]	Cat. No.	Cat. No.
	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	240V AC	40	1489-M3C400	1489-M3D400
			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	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	0.5...40 A	480Y/277V AC	
			50...63 A	240V AC	
			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	
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		400 V 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 ( $I_{cs}$ )				$\leq 40$ 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	
Electrical endurance				$I_n < 30$ A: 20,000 ops. (AC) $I_n \geq 30$ A: 10,000 ops. (AC) 1,000 ops. (DC)	
1 cycle (2s - ON, 13s - OFF, $I_n \leq 32$ A), 1 cycle (2s - ON, 28s - OFF, $I_n > 32$ A)					

(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	
Vibration resistance per IEC/EN 60068-2-6	5g - 20 cycles at 5...150...5 Hz with load $0.8 I_n$	
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 (2)	-25...+55 °C (-13...+131 °F)	
Storage temperature	-40...+70 °C (-40...+158 °F)	
Installation		
Terminal	Dual terminal	
Cross-section of wire (3) - solid, stranded (front/back terminal slot)	35/35 mm <sup>2</sup> 18...4/18...10 AWG	
Cross-section of wire - flexible (front/back terminal slot)	25/10 mm <sup>2</sup> 1 wire, 18...4 AWG	
Multi-wire rating per UL, CSA	2-4 wires (4), 18...10 AWG	
Cross-section of bus bars (back terminal slot)	10 mm <sup>2</sup>	
	IEC	2.8 N·m
Tightening torque	UL/CSA	AWG 18...16: 13.3 in·lb, AWG 14...10: 17.7 in·lb, AWG 8...4: 39.8 in·lb
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	

(2) Refer to the ambient temperature derating tables.

(3) 35 mm self-declared, not included in IEC/EN approval.

(4) 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	—	—

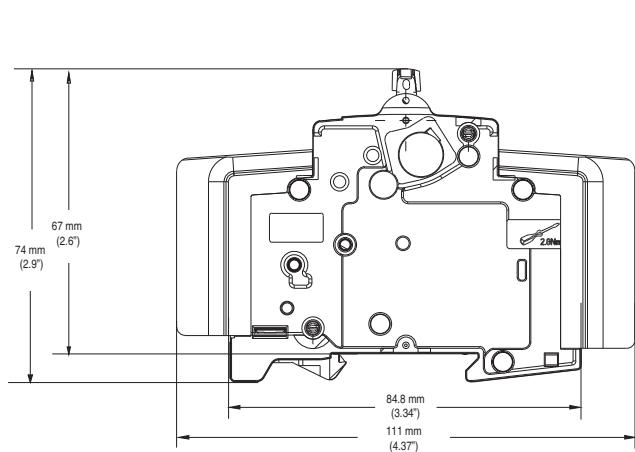
## Zero-stack Derating

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

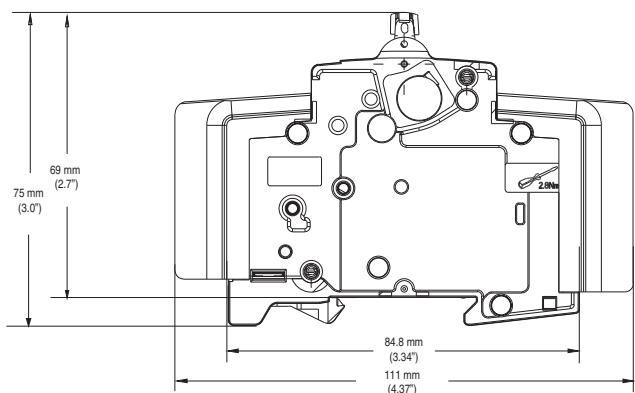
No. of Adjacent Devices	Factor
1	1
2,3	0.9
4,5	0.8
≥ 6	0.75

# Approximate Dimensions

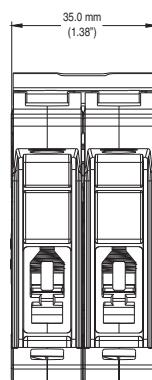
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



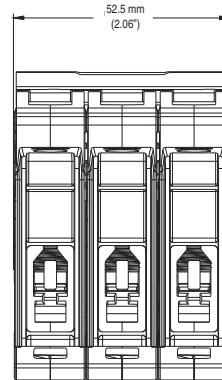
1 Pole



2- 3 Pole



2-Pole



3-Pole

# Application Information

## Circuit Voltage

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

## Circuit Frequency

The Bulletin 1489-M 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

The Bulletin 1489-M circuit breakers should only be applied 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

The 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. The Type C characteristic will suit 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, a circuit breaker will open ("clear the circuit") automatically at some total time that will be 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.

The Bulletin 1489-M circuit breakers are "non-100% rated" as defined by UL 489, para 7.1.4.2. As such, the circuit breaker's rating should be loaded to no more than 80% if used with continuous loads.

Line and load may be reversed. The Bulletin 1489-M 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. The user 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 will 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 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

- The Bulletin 1489-M 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.
- Follow standard IEC application considerations for temperature rating in different ambient temperatures.
- Application below 0 °C is for non-condensing atmosphere. Care should be taken for applications below 0 °C. These devices are not certified to operate correctly in the presence of ice.

Bulletin 1489-M  
Temperature Derating, UL  
Reference temperature = 40 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	3.2	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

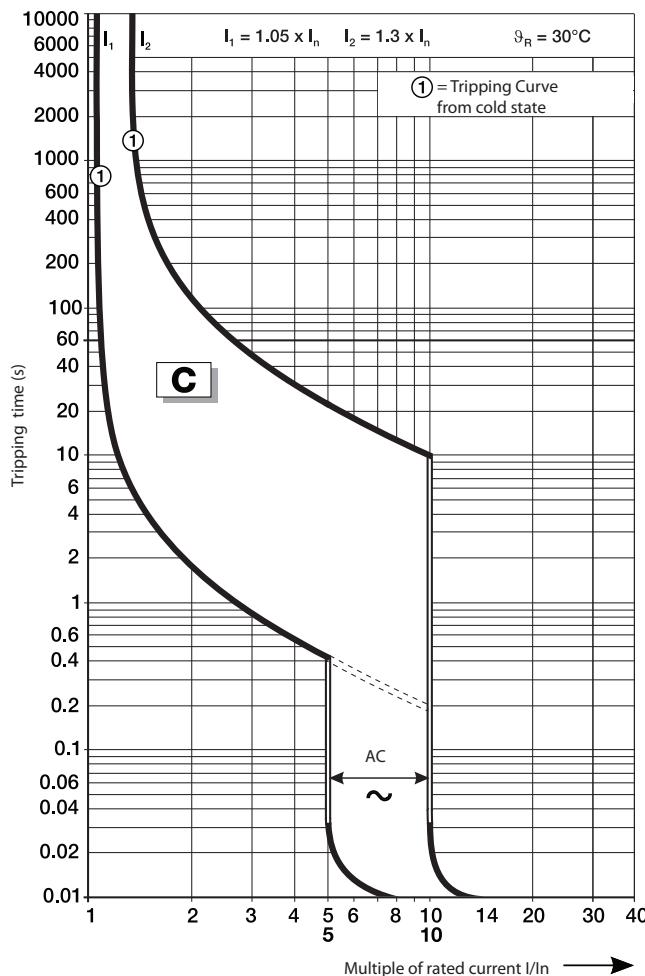
Bulletin 1489-M  
Temperature Derating, IEC  
Reference temperature = 30 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	1.0	1	1.0	1	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	2.1	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

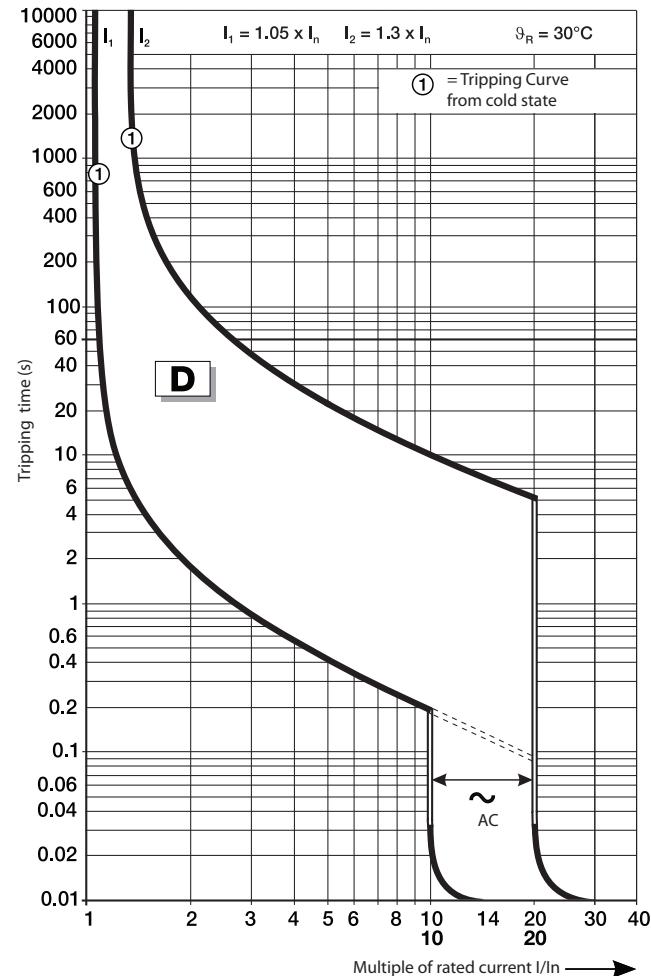
# Tripping Characteristics

- DC trip curves – When using 1489-M\_ on DC applications or DC loads, please refer to 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 C trip curve = 7.5 to 15 multiple of the rated current ( $I / I_n$ ).
- For D trip curve = 15 to 30 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

C Curve

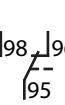
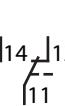


D Curve



# Accessories

## Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip		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	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	1A @ 480V AC 2A @ 277V AC 1.5A @ 125V DC 2A @ 60V DC 4A @ 24V DC	2A @ 230V (AC-14) 1A @ 400V (AC-14) 1.5A @ 110V (DC-12) 1A @ 220V (DC-12) 4A @ 24V (DC-13) 2A @ 60V (DC-13)	1489-AMRS3
	Auxiliary Contact	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	1A @ 480V AC 2A @ 277V AC 1.5A @ 125V DC 2A @ 60V DC 4A @ 24V DC	2A @ 230V (AC-14) 1A @ 400V (AC-14) 1.5A @ 110V (DC-12) 1A @ 220V (DC-12) 4A @ 24V (DC-13) 2A @ 60V (DC-13)	1489-AMRA3

(1) A maximum of two auxiliary contacts **OR** one signal contact and one auxiliary contact may be installed with or without one shunt trip per 1489-M.

If a shunt trip is not used, two signal contacts may be installed per 1489-M.

(2) A maximum of three accessories may be installed per 1489-M. The shunt trip must be mounted closest to the 1489-M, then the signal contact, then the auxiliary contact(s).

For allowed combinations, and installation instructions please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

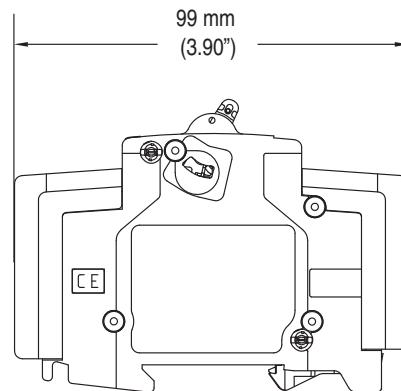
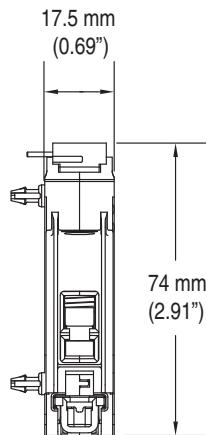
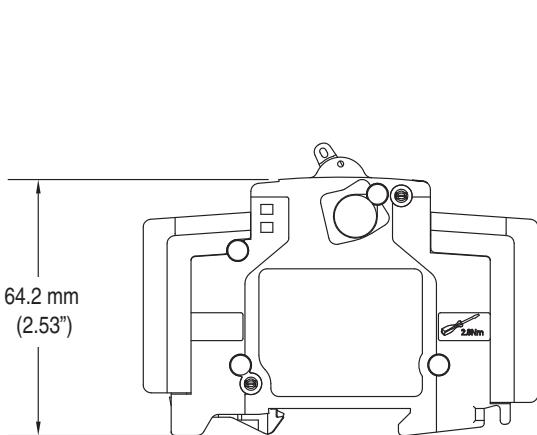
(3) The shunt trips are allowed two wires per terminal (one wire per terminal slot). The signal and auxiliary contacts are allowed up to two wires per terminal.

## Toggle Mount

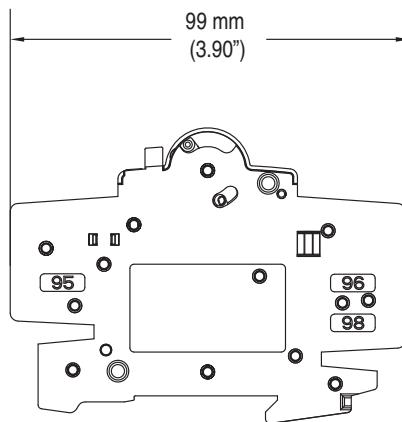
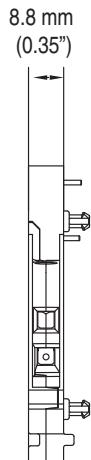
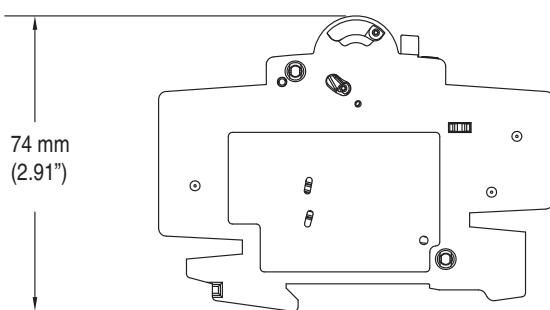
Photo	Product Description	Cat. No.
	Lock-out attachment for 1-pole MCB	189-ALOA1
	Lock-out attachment for multi-pole MCB	189-ALOA2

## Accessory Approximate Dimensions

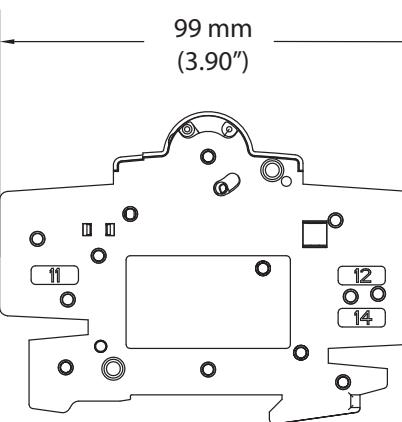
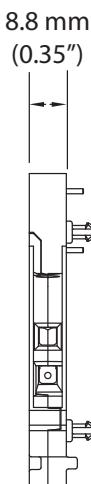
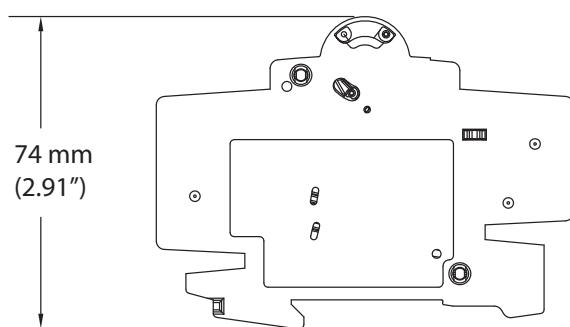
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



1489-AMST1 and 1489-AMST2



1489-AMRS3



1489-AMRA3

# Bus Bars

## 1489-M Bus Bars

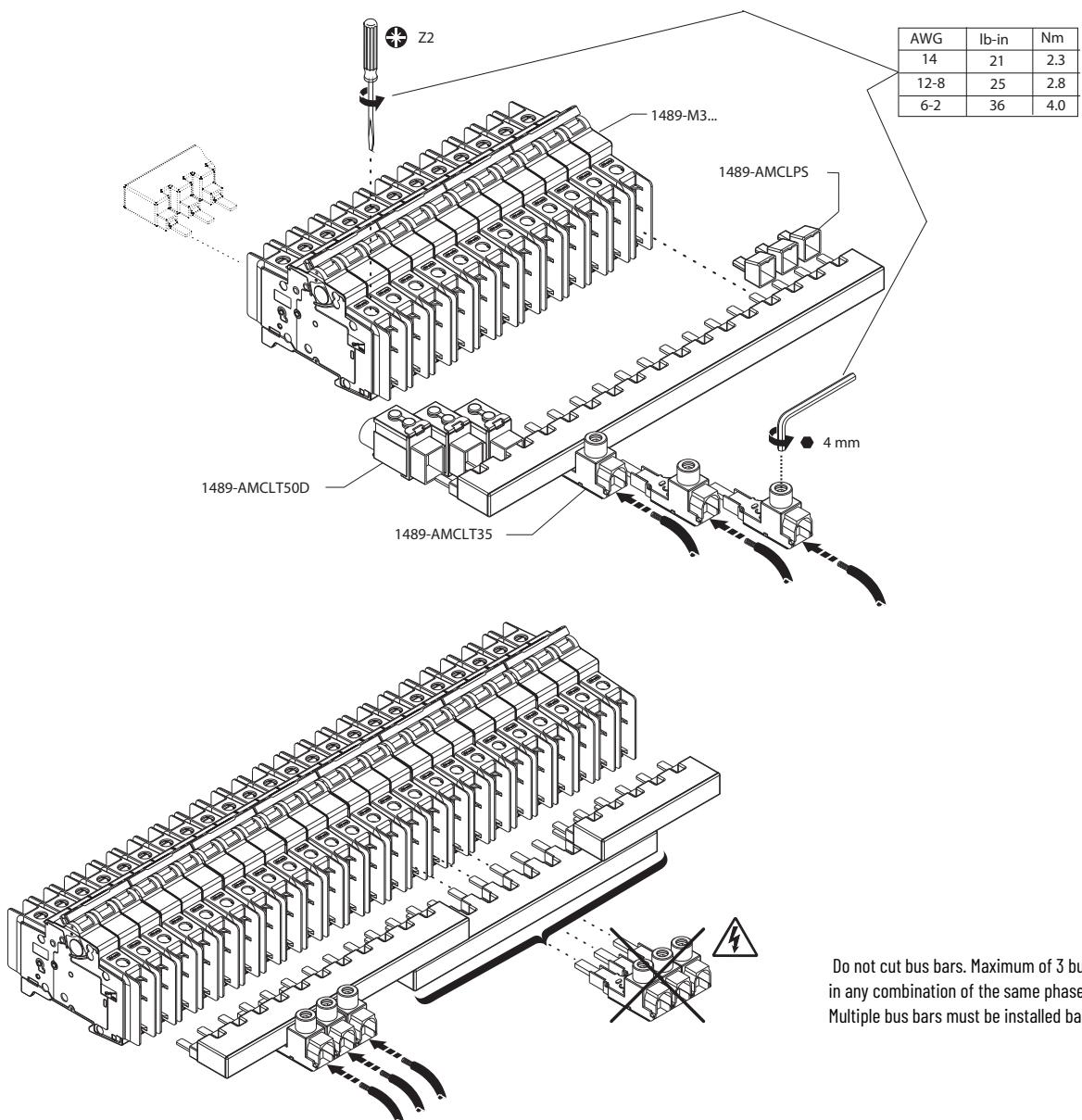
Phase	No. of Pins	No. of Circuit Breakers	Pkg. Qty.	Cat. No. (1)(2)
1-Phase	6	6	10	1489-AMCL106
	12	12	10	1489-AMCL112
	18	18	10	1489-AMCL118
2-Phase	6	3	10	1489-AMCL206
	12	6	10	1489-AMCL212
	18	9	10	1489-AMCL218
3-Phase	6	2	10	1489-AMCL306
	12	4	10	1489-AMCL312
	18	6	10	1489-AMCL318

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

(2) Maximum of three bus bars allowed

## 1489-M Bus Bar Accessories

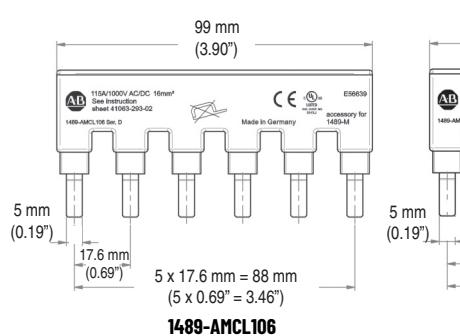
Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed, 35 mm <sup>2</sup>	10	1489-AMCLT35
Dedicated Power Feed, 50 mm <sup>2</sup>	10	1489-AMCLT50D
Protective Shroud (for unused pins)	10	1489-AMCLPS



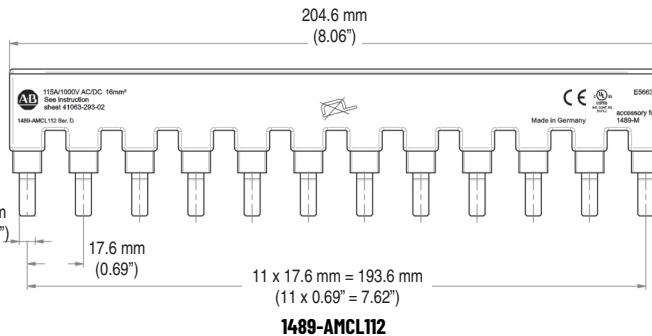
## Bus Bar Approximate Dimensions

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

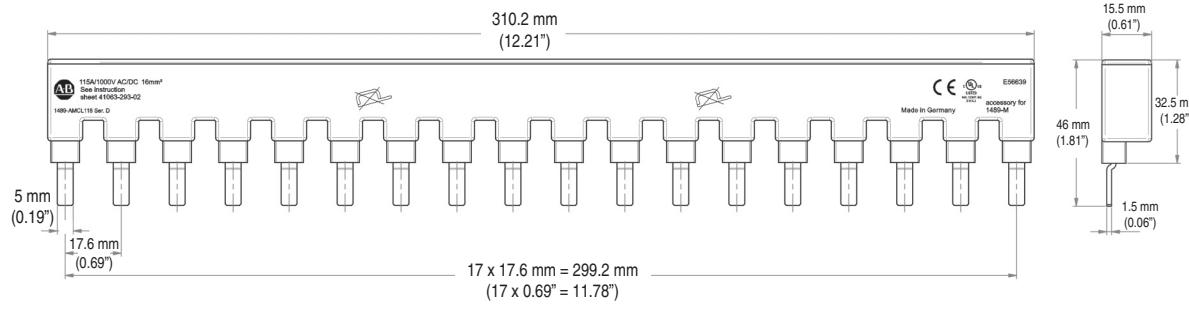
### 1-Phase Bus Bars



1489-AMCL106

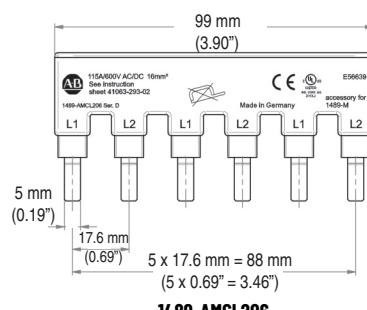


1489-AMCL112

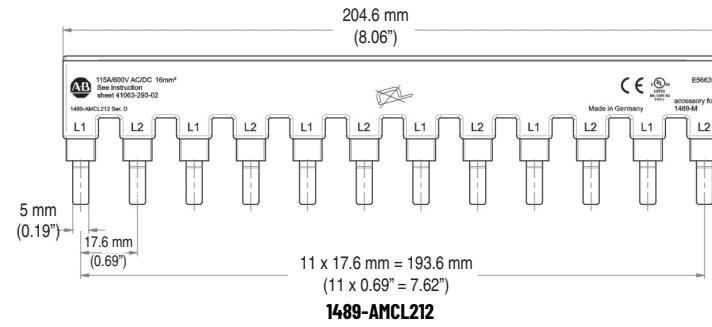


1489-AMCL118

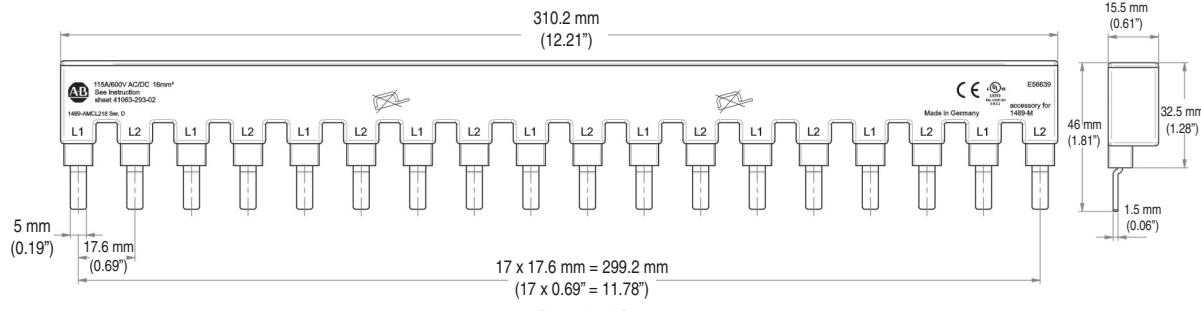
### 2-Phase Bus Bars



1489-AMCL206



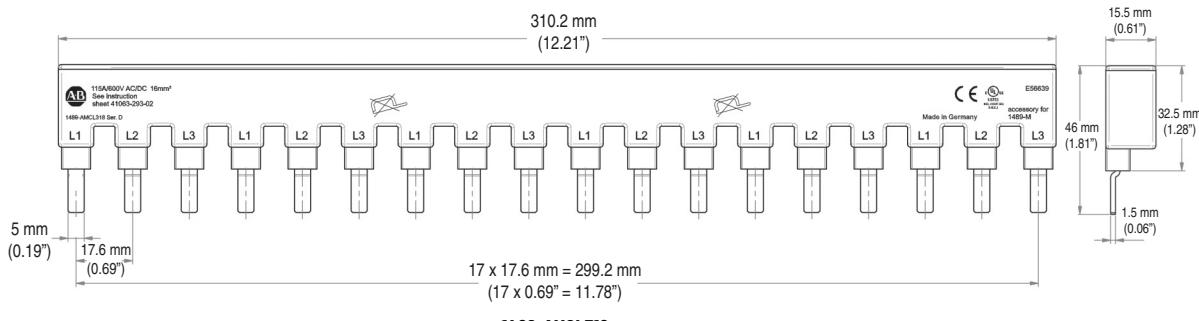
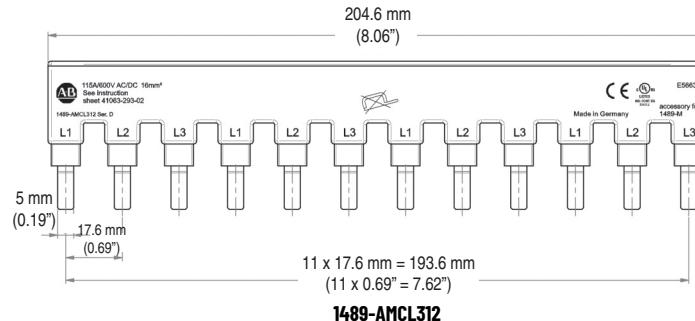
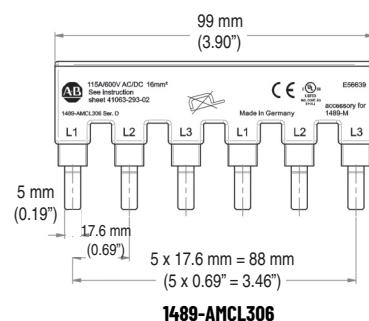
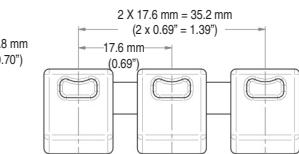
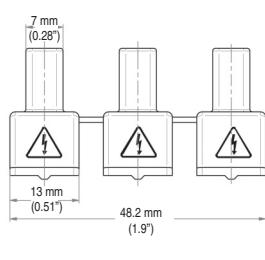
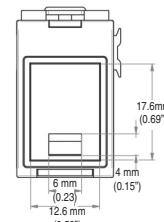
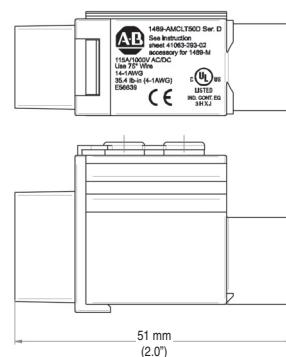
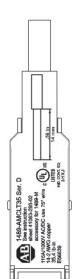
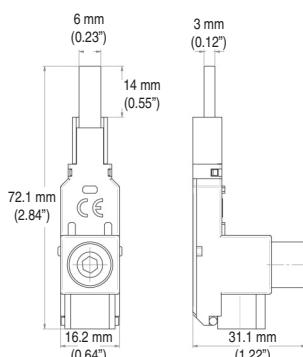
1489-AMCL212



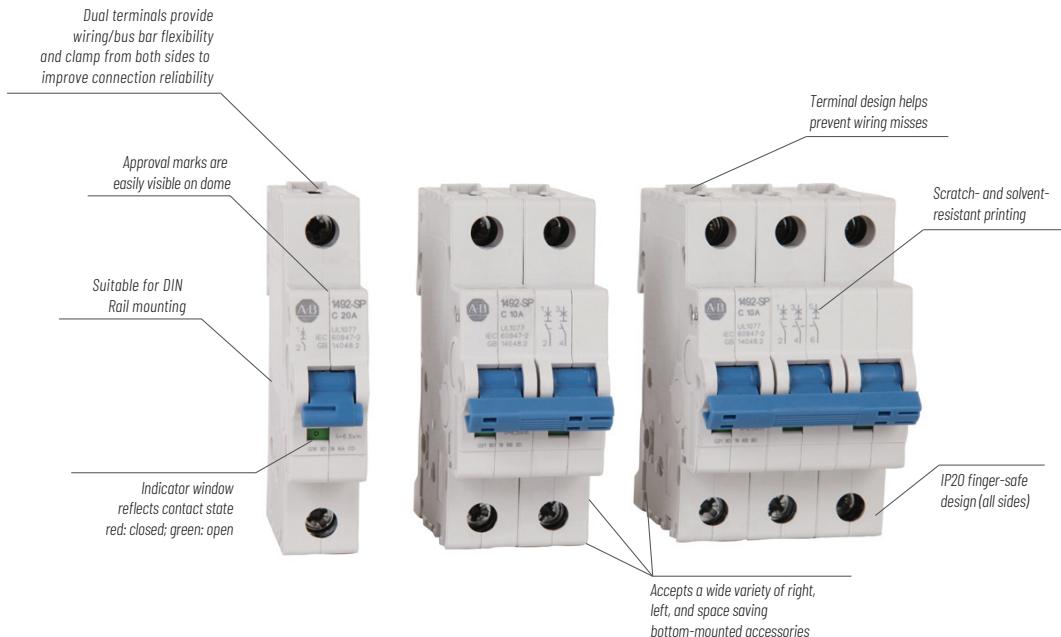
1489-AMCL218

**3-Phase Bus Bars**

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

**Bus Bar Accessory Approximate Dimensions**

# 1492-SP Supplementary Protectors



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.

- Current limiting
- Fast breaking time
- Existing installations can be easily upgraded to include an auxiliary using the bottom mounted auxiliary contact options, which require no DIN Rail space
- 40 °C 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

<b>Rated Voltage</b>	UL/CSA: Max. 480Y/277V AC IEC: U <sub>e</sub> 230/400V AC
<b>Interrupting Capacity</b>	UL/CSA: 5...10 kA IEC: 15 kA
<b>Current Ratings</b>	0.5...63 A
<b>Poles</b>	1, 2, 3, 1+N, 3+N
<b>Trip Curves</b>	B, C, D
<b>Standards Compliance</b>	UL 1077 CSA C22.2 No. 235 EN 60947-2 GB 14048.2
<b>Certifications</b>	UL Recognized, File No. E65138 <sup>(1)</sup> CSA Certified, File No. 25939 <sup>(1)</sup> DNV GL Type Approval CE Marked CCC Certified VDE Certified RoHS Compliant

(1) 1+N and 3+N devices are not UL recognized or CSA certified.

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1492 - **SPM** **1** **C** **010** **N**

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>
----------	----------	----------	----------	----------

<b>Voltage Type</b>	
<b>Code</b>	<b>Description</b>
SPM	AC Supplementary Protector

<b>Trip Curve</b>	
<b>Code</b>	<b>Description</b>
B	Trip Curve B
C	Trip Curve C
D	Trip Curve D

<b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
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

<b>+ Neutral</b> (available for 1+N and 3+N configurations)	
<b>Code</b>	<b>Description</b>
	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 $3...5 I_n$	Trip Curve C Inductive $5...10 I_n$	Trip Curve D Highly Inductive $10...20 I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.
	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

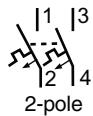
## 1-Pole + Neutral Supplementary Protectors<sup>(1)</sup>

Photo/Wiring Diagram	Continuous Current Rating ( $I_n$ )	Trip Curve B Resistive or Slightly Inductive $3...5 I_n$	Trip Curve C Inductive $5...10 I_n$	Trip Curve D Highly Inductive $10...20 I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.
	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.

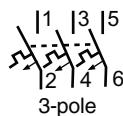
## 2-Pole Supplementary Protectors

Photo/Wiring Diagram	Continuous Current Rating ( $I_n$ )	Trip Curve B Resistive or Slightly Inductive $3...5 I_n$	Trip Curve C Inductive $5...10 I_n$	Trip Curve D Highly Inductive $10...20 I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.
	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 $3...5 I_n$	Trip Curve C Inductive $5...10 I_n$	Trip Curve D Highly Inductive $10...20 I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.
	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<sup>(1)</sup>

Photo/Wiring Diagram	Continuous Current Rating ( $I_n$ )	Trip Curve B Resistive or Slightly Inductive $3...5 I_n$	Trip Curve C Inductive $5...10 I_n$	Trip Curve D Highly Inductive $10...20 I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.
	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		250 V 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		480Y/277V AC		
Rated interrupting capacity per UL 1077		$\leq 32 \text{ A}: 10 \text{ kA (AC)}$ ; $> 32 \text{ A}: 5 \text{ kA (AC)}$ ; $0.5...63 \text{ A}: 10 \text{ kA (DC)}$		
Application Supplementary <sup>(1)</sup> protector for general use; application codes: <b>TC1:</b> [1P] OLO 277V AC, [2P, 3P] OLO 480Y/277V AC; <b>SC:</b> 10 kA (0.5...32 A), 5 kA (35...63 A), U2 480Y/277V AC; FW3				
Ref. temperature for tripping 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 <sup>(2)</sup>	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 ( $I_{cs}$ )		$\leq 40 \text{ A}: 11.25 \text{ kA}$ $> 40 \text{ A}: 7.5 \text{ kA}$		
Rated impulse withstand voltage $U_{imp.}$ (1.2/ $50\mu\text{s}$ )		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		
Electrical endurance		$I_n < 30 \text{ A}: 20,000 \text{ ops (AC)}$ $I_n \geq 30 \text{ A}: 10,000 \text{ ops. (AC)}$ 1,000 ops. (DC)		
1 cycle (2s - ON, 13s - OFF, $I_n \leq 32 \text{ A}$ ), 1 cycle (2s - ON, 28s - OFF, $I_n > 32 \text{ A}$ )				

(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
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 $I_n$
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 <sup>(1)</sup>		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire <sup>(2)</sup> - solid, stranded (front / back terminal slot)		35 / 35 mm <sup>2</sup> 18...4 / 18...10 AWG
Cross-section of wire - flexible (front / back terminal slot)		25 / 10 mm <sup>2</sup>
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG 2-4 wires <sup>(3)</sup> , 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm <sup>2</sup>
Tightening torque	IEC	2.8 N•m
	UL/CSA	AWG 18...16: 13.3 in•lb. AWG 14...10: 17.7 in•lb. AWG 8...4: 39.8 in•lb.
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) Refer to the ambient temperature derating tables.

(2) 35 mm<sup>2</sup> 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**

<b>Rated Current</b>	<b>Power Loss Per Pole</b>	<b>Rated Current</b>	<b>Power Loss Per Pole</b>
<b>[A]</b>	<b>[W]</b>	<b>[A]</b>	<b>[W]</b>
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

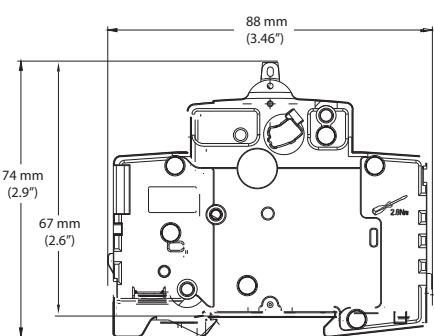
**Zero-stack Derating**

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

<b>No. of Adjacent Devices</b>	<b>Factor</b>
1	1
2.3	0.9
4.5	0.8
≥ 6	0.75

# Approximate Dimensions

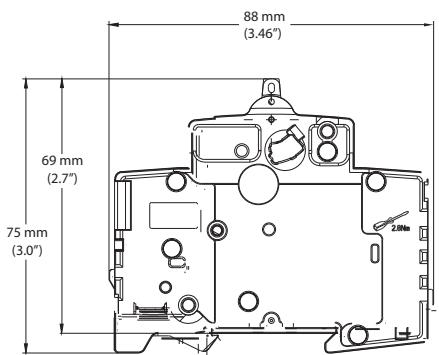
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



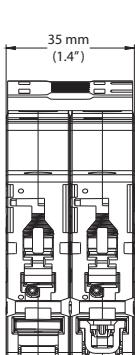
1 Pole



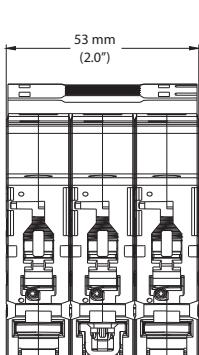
1 Pole



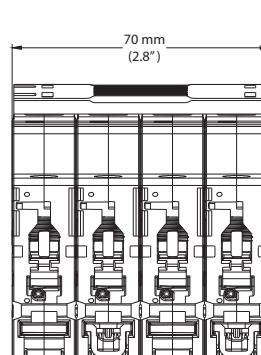
1 Pole + N, 2-, 3-, 3 Pole + N



1 Pole + N, 2-Pole



3-Pole



3-Pole + N

# Ambient Temperature Derating

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

Bulletin 1492-SP

Temperature Derating, UL

Reference temperature = 40 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	1.0	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	3.2	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
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
63	78.2	77.0	74.7	72.3	70.0	67.7	65.3	63	60.7	59.5

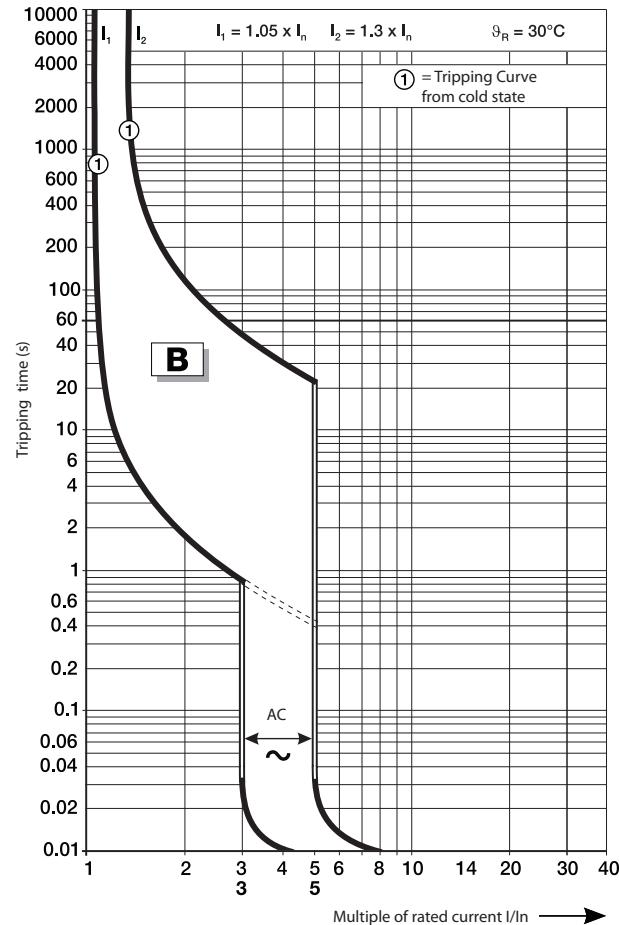
Bulletin 1492-SP  
Temperature Derating, IEC  
Reference temperature = 30 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	1.0	1	1.0	1	1.0	0.9
2	2.4	2.4	2.3	2.2	2.1	2	2.1	2	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
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
63	75.8	74.7	72.3	70.0	67.7	65.3	63	60.7	58.3	57.2

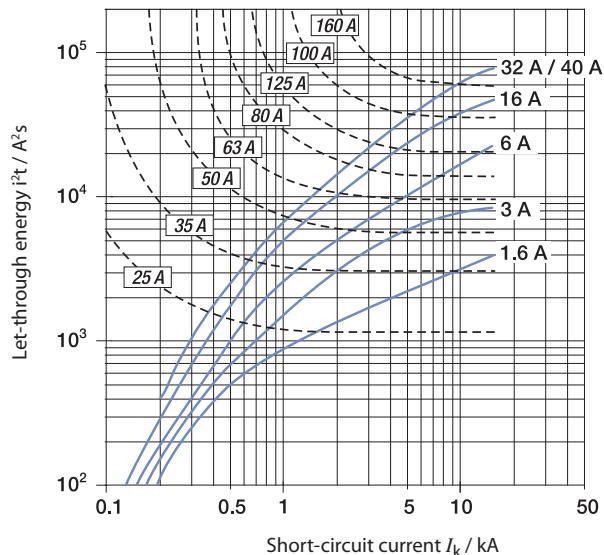
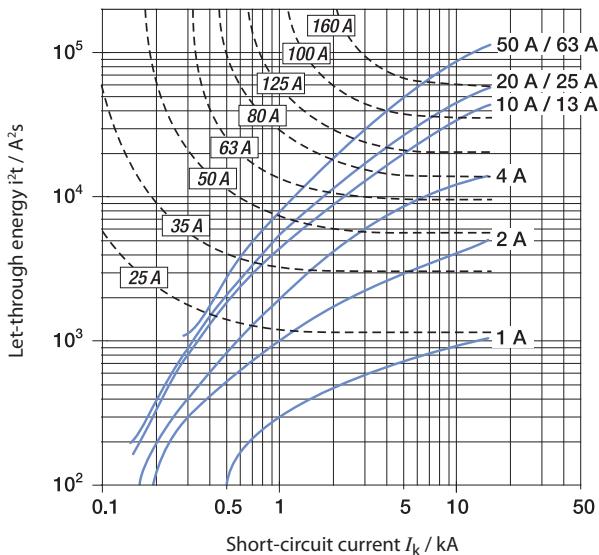
# Tripping Characteristics

- DC trip curves – When using 1492-SPM\_ on DC applications or DC loads, please refer to 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 to 7.5 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

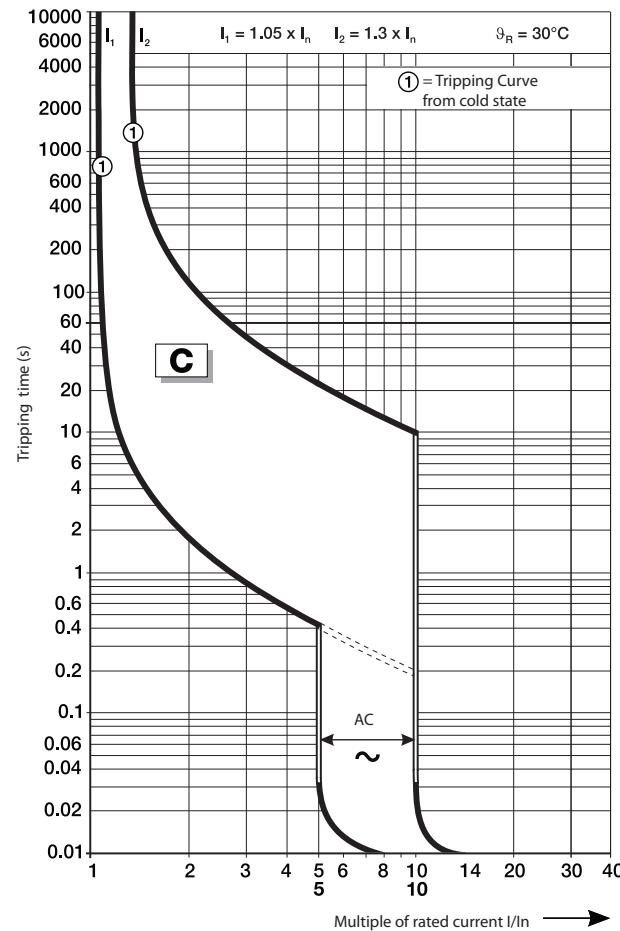
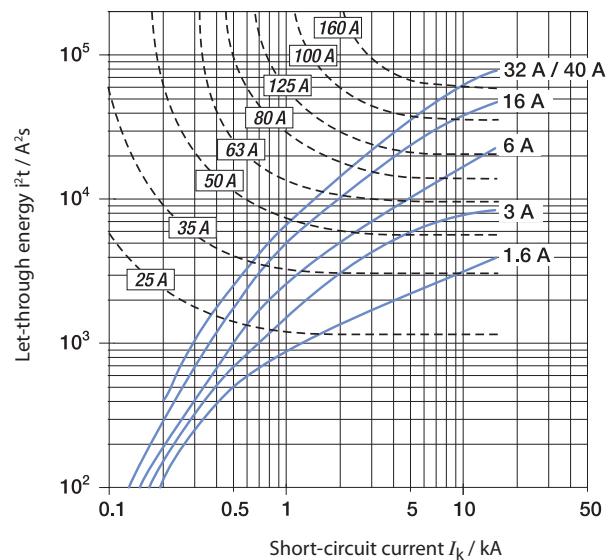
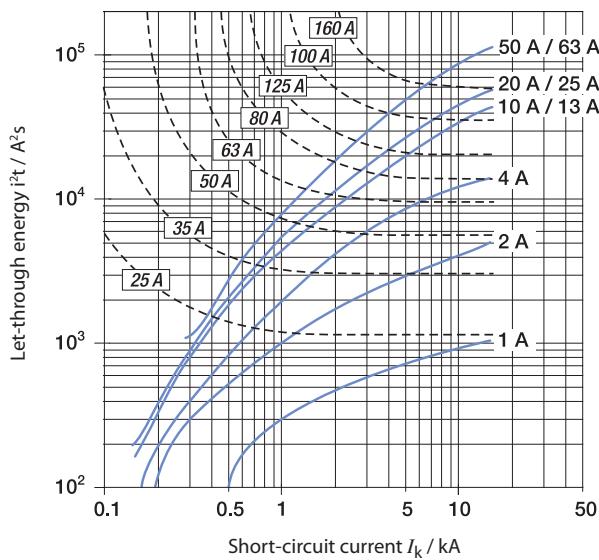
## B Curve



## B and C Curve - 230/400V AC Let-through Energy

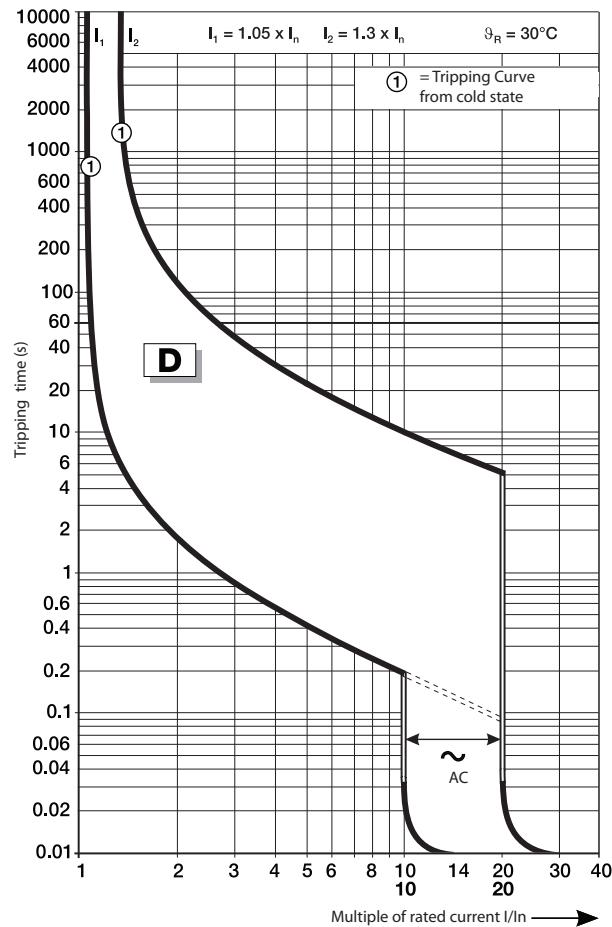


- DC trip curves – When using 1492-SPM\_ on DC applications or DC loads, please refer to AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating ( $I_n$ ).
- For C trip curve = 7.5 to 15 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

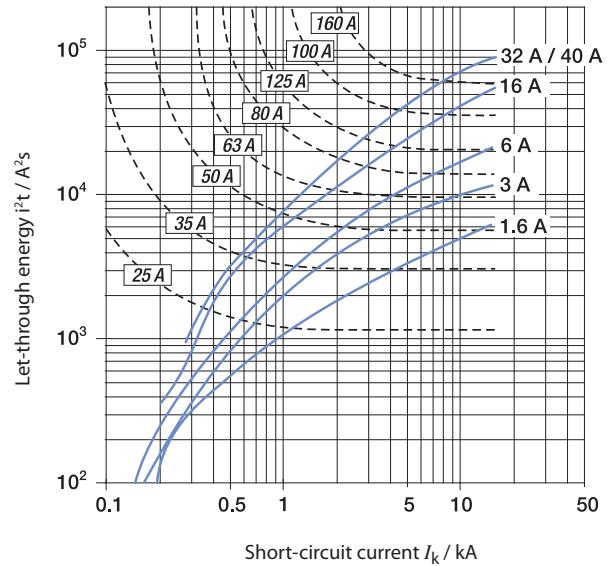
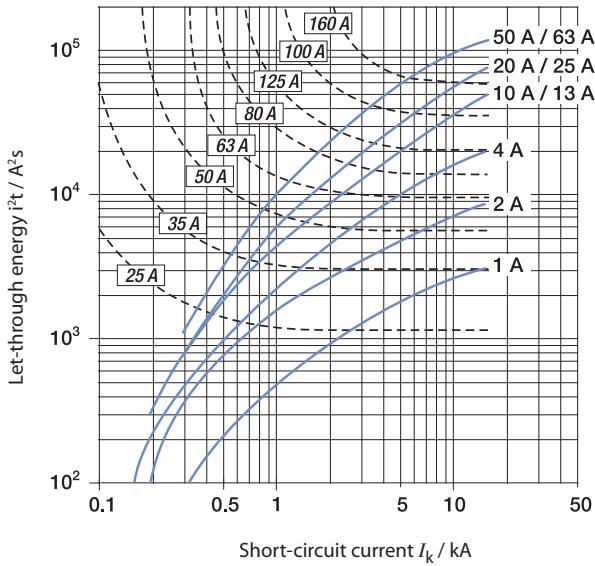
**C Curve****B and C Curve - 230/400V AC Let-through Energy**

- DC trip curves – When using 1492-SPM.. on DC applications or DC loads, please refer to 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 D trip curve = 15 to 30 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

## D Curve

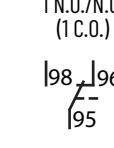
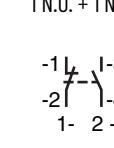
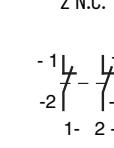
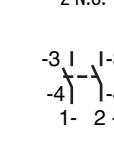


## D Curve - 230/400V AC Let-through Energy



# Accessories

## Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-ASCR3
	Auxiliary Contact	1 N.O./N.C. (1 C.O.) - 4   - 2 - 1   - 1 - 3 - - 2   - 4 1 - 2 -	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30 V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30 V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30 V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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-SP.

(2) A maximum of two 189-AR11, -AR02, or -AR20 auxiliary contacts may be installed per 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 per 1492-SP. The shunt trip must be mounted closest to 1492-SP, then the signal contact, then the auxiliary contact(s).

For allowed combinations, and installation instructions please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

**Left Mount**

Photo	Product Description (1)	Contacts	Standards	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 13   21 --- 14   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL11
		2 N.C. 11   21 --- 12   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL02
		2 N.O. 13   23 --- 14   24	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL20

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

**Bottom Mount**

Photo	Product Description (1)	Contacts	Standards	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C. m1   m --- m2	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB01
		1 N.O. m3   m --- m4	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB10

(1) Only one bottom mount auxiliary contact may be installed per 1492-SP.

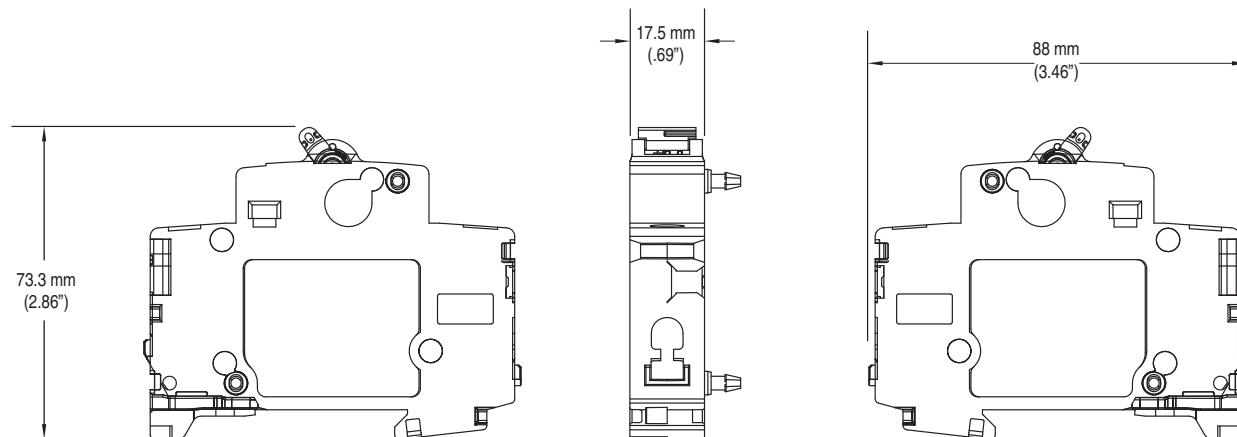
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

**Toggle Mount**

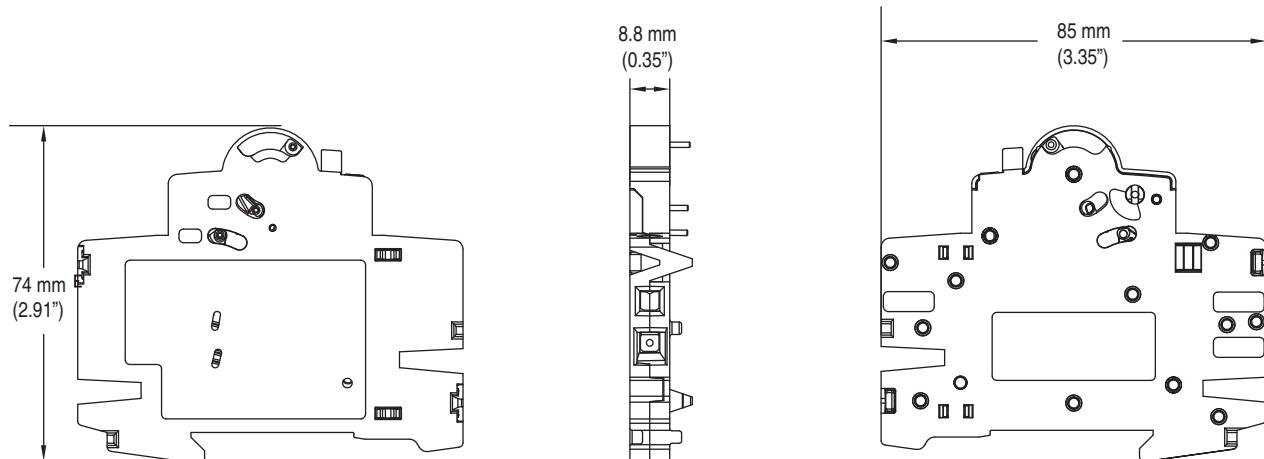
Photo	Product Description	Cat. No.
	Lock-out attachment for 1-pole MCB	189-AL0A1
	Lock-out attachment for multi-pole MCB	189-AL0A2

## Accessory Approximate Dimensions

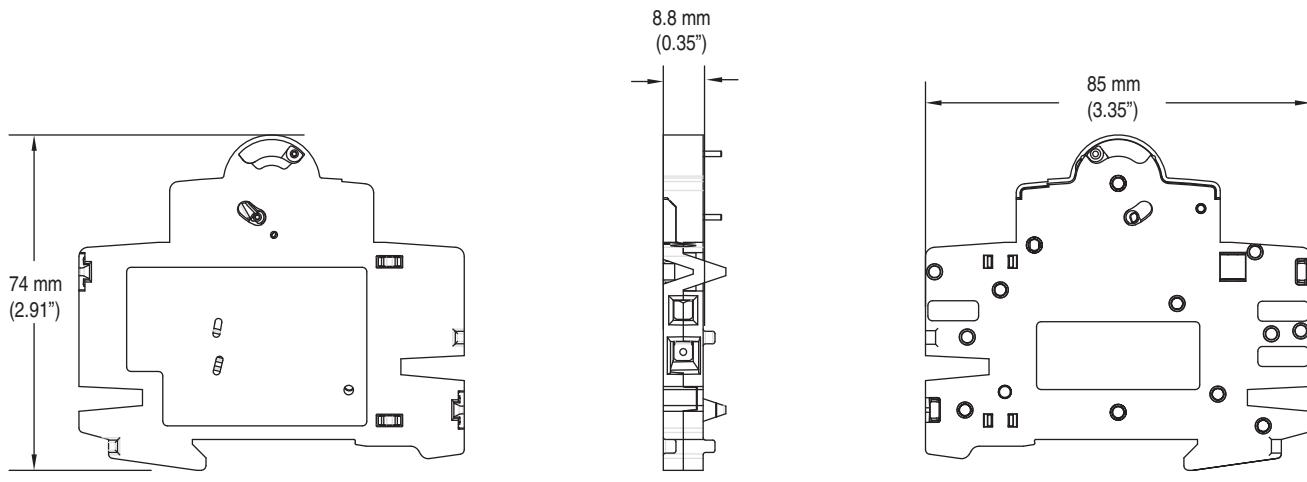
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-AST1 and 189-AST2

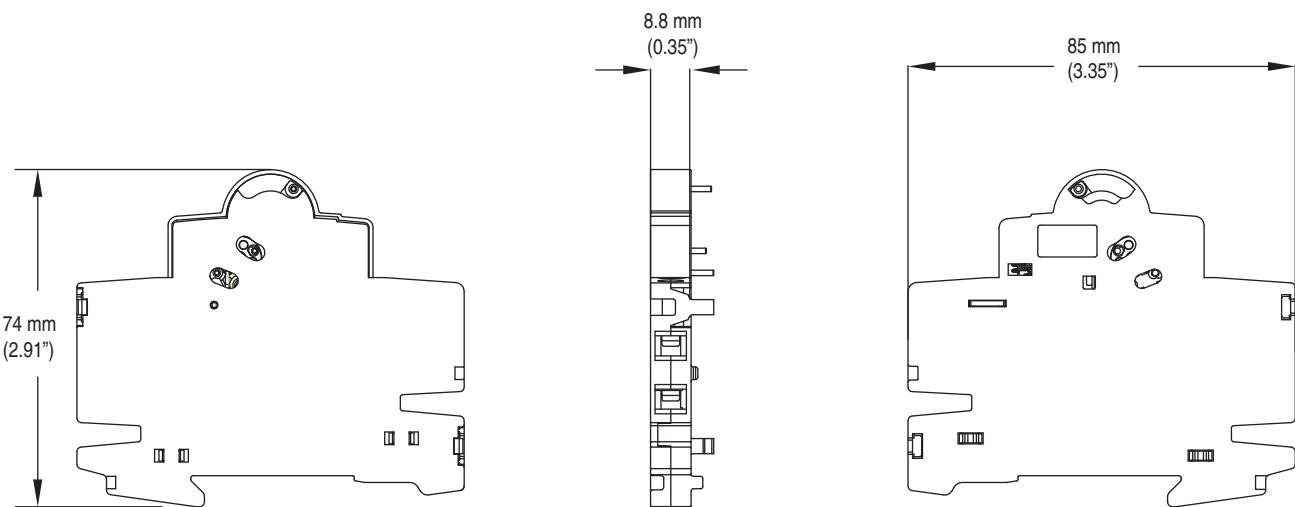


189-ASCR3

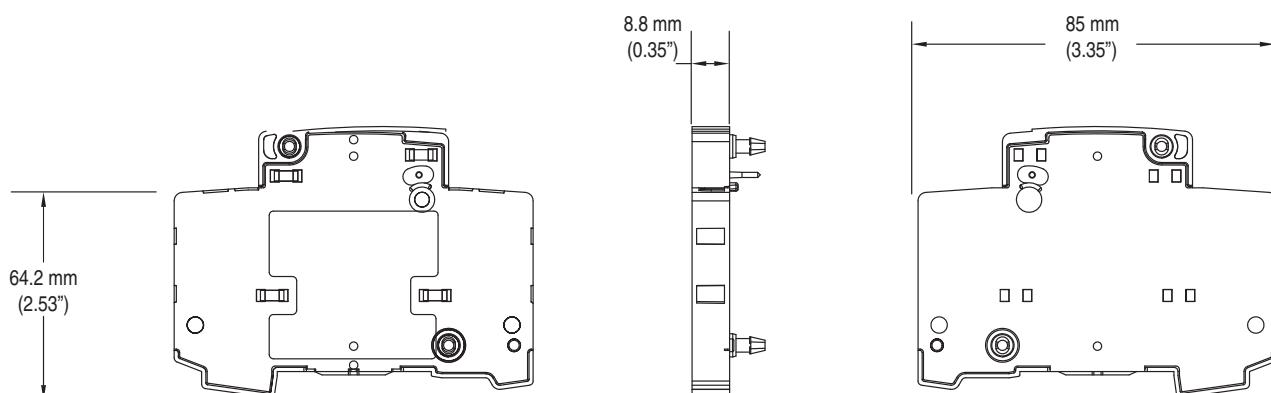


189-AR3

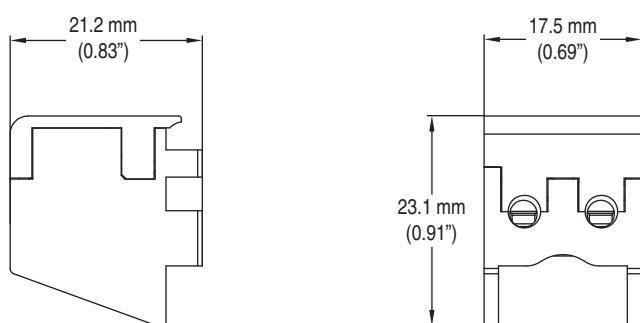
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-AR11, 189-AR02, 189-AR20



189-AL11, 189-AL02, and 189-AL20



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

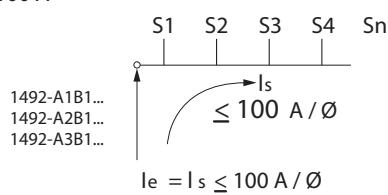
(1) Refer to the diagrams below for Feeder Terminal &amp; Bus Bar Current Distribution

(2) cULus, UL508, EN 60947-1, CE Marked

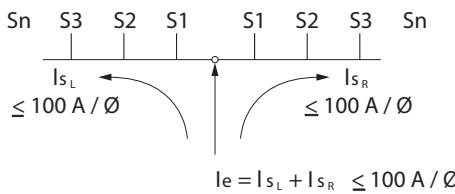
## Feeder Terminal & Bus Bar Current Distribution

100 A

End Feed

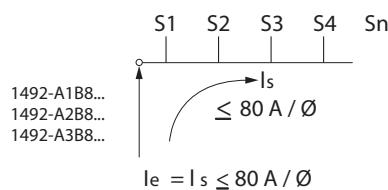


Other Feed

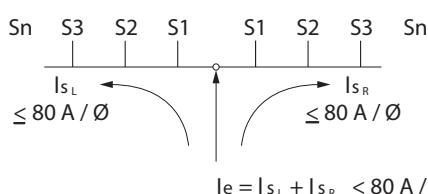


80 A

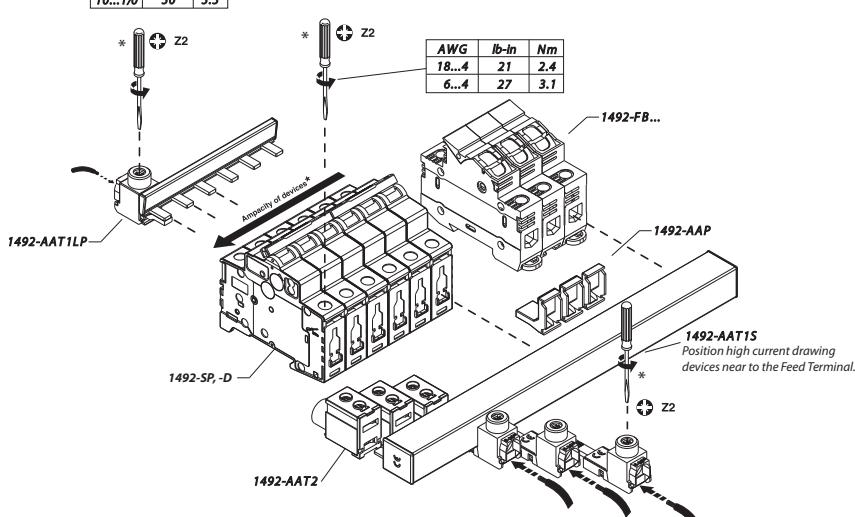
End Feed



Other Feed

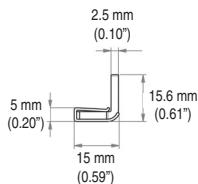
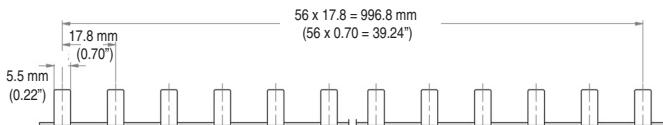
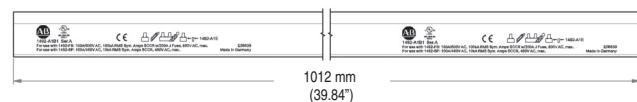


\* AWG 10...1.0 lb-in 50 Nm 5.5

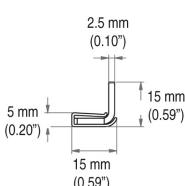
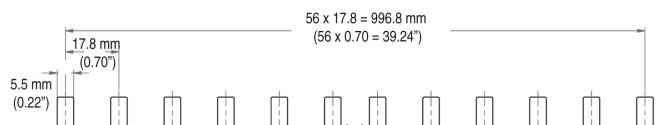
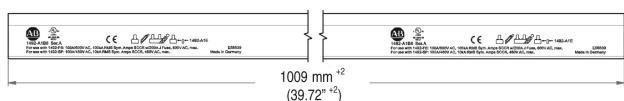


## Bus Bar Approximate Dimensions

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

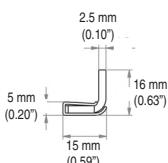
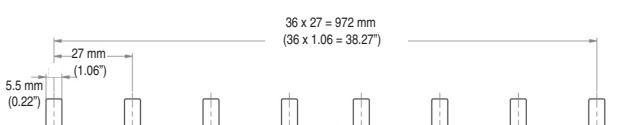
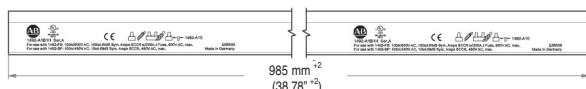


1492-A1B1

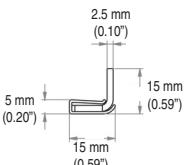
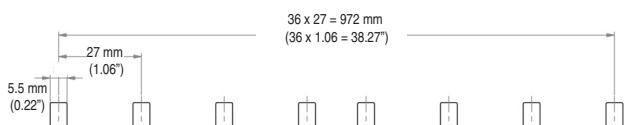
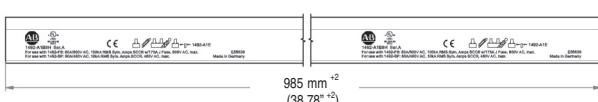


1492-A1B8

### 1-Phase Bus Bars, with Auxiliary Contact

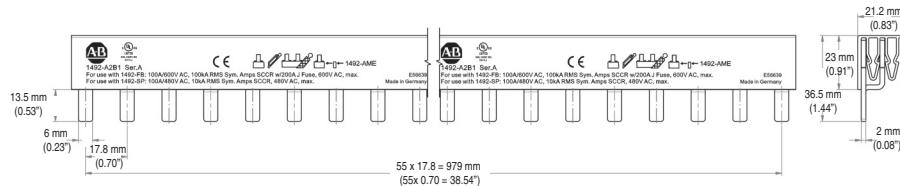
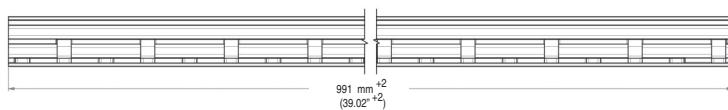


1492-A1B1H

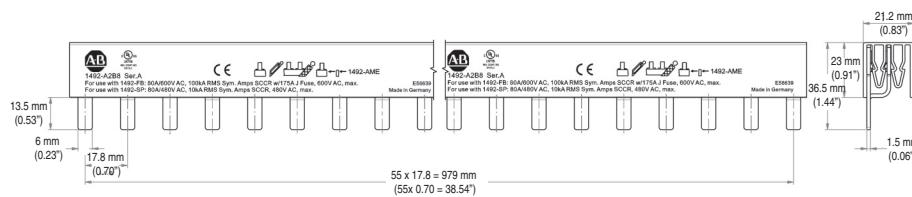


1492-A1B8H

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

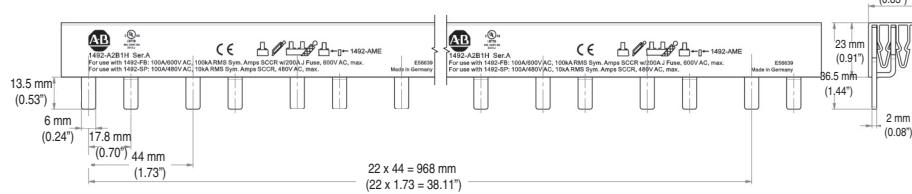
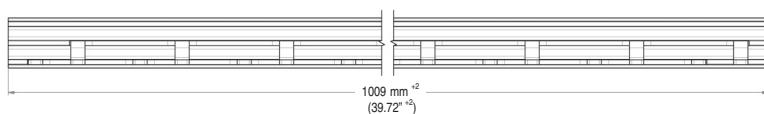


1492-A2B1

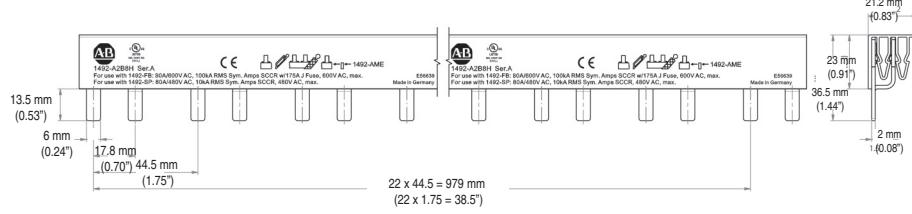
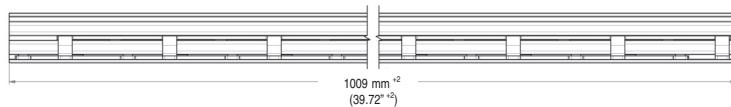


1492-A2B8

## 2-Phase Bus Bars, with Auxiliary Contact

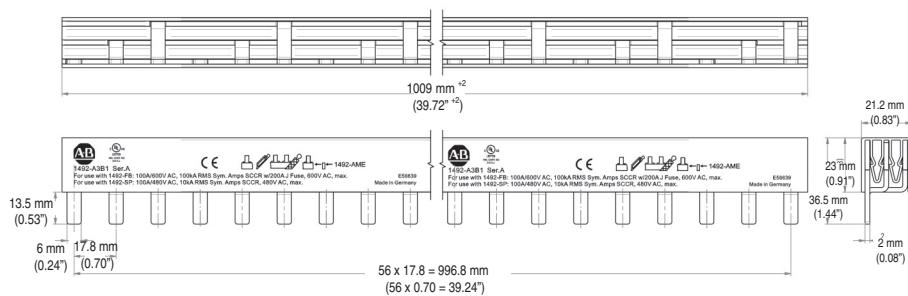


1492-A2B1H

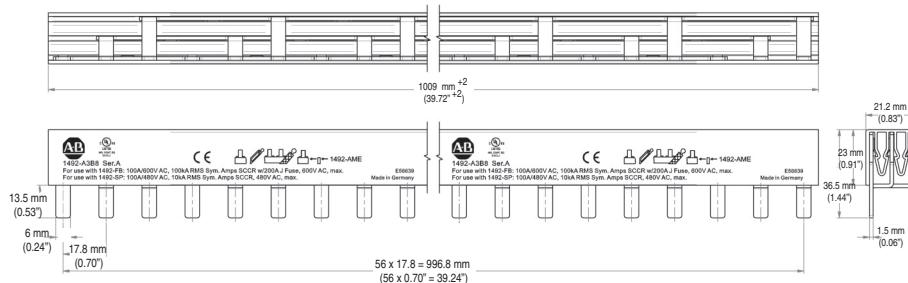


1492-A2B8H

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

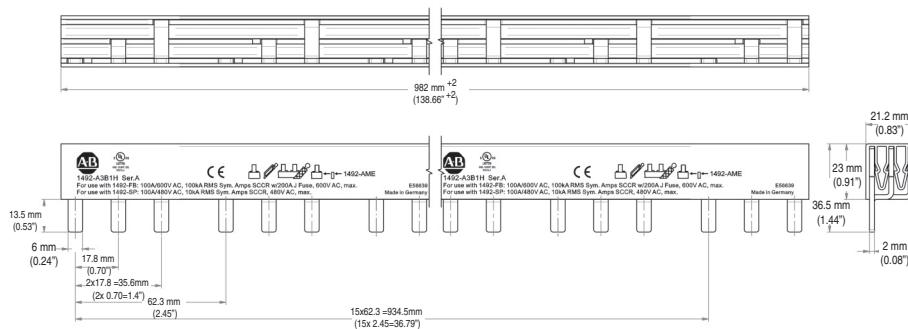


1492-A3B1

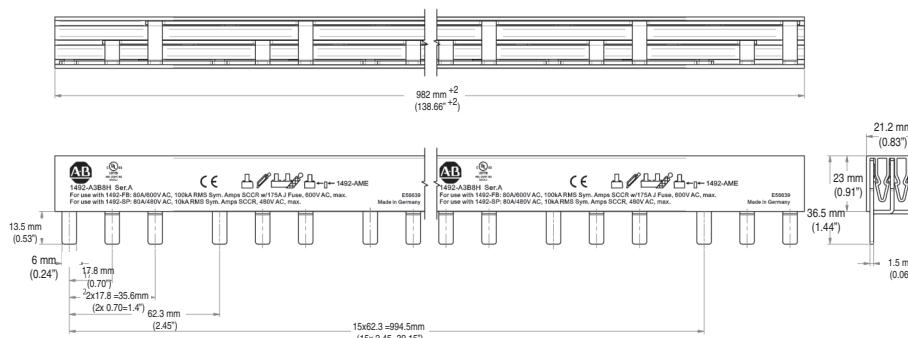


1492-A3B8

### 3-Phase Bus Bars, with Auxiliary Contact



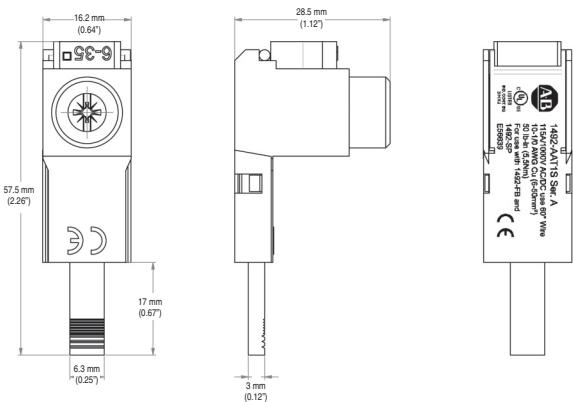
1492-A3B1H



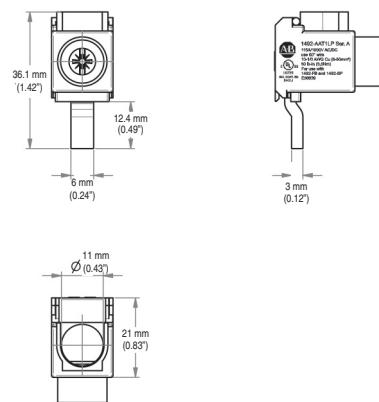
1492-A3B8H

## Bus Bar Accessory Approximate Dimensions

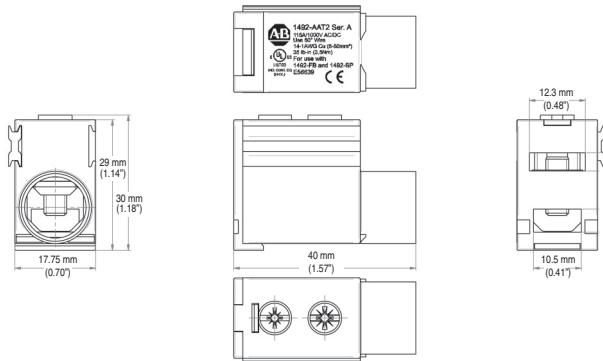
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



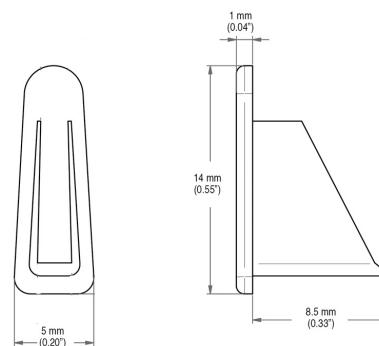
1492-AAT1S



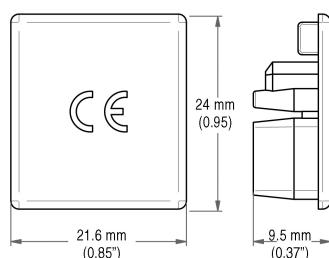
1492-AAT1LP



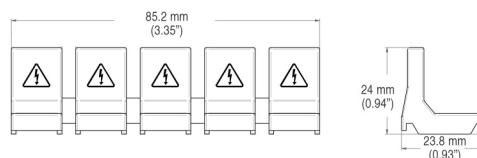
1492-AAT2



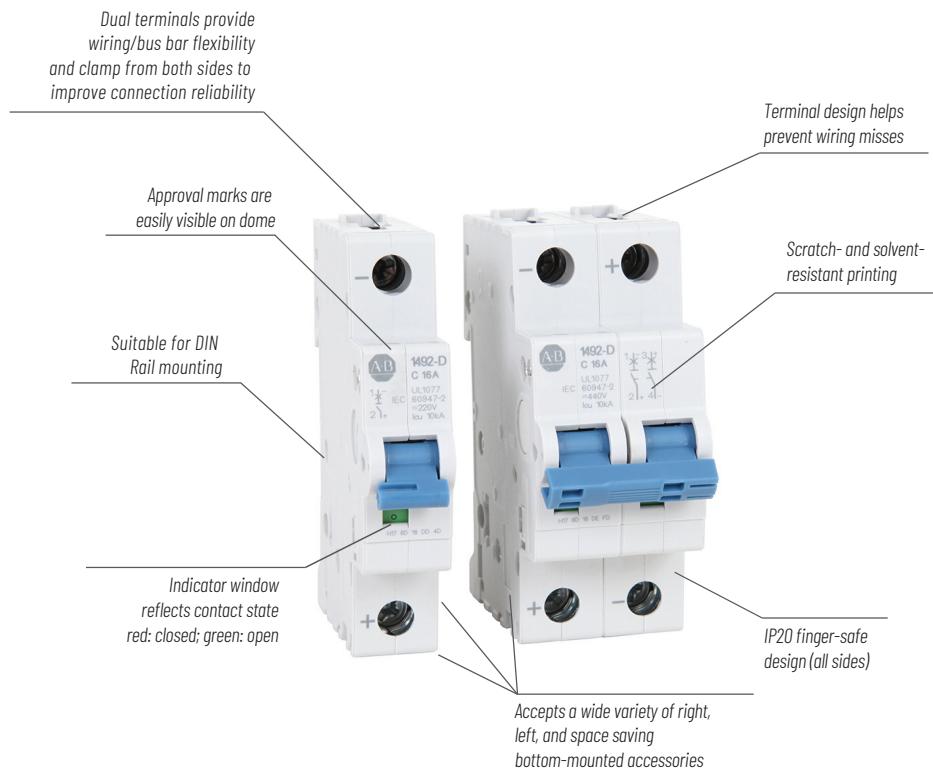
1492-A1E



1492-AME



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.

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

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1492 - **D** **1** **C** **010**

<b>a</b>	
<b>Voltage Type</b>	
<b>Code</b>	<b>Description</b>
D	AC Circuit Breaker

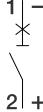
<b>b</b>	
<b>Poles</b>	
<b>Code</b>	<b>Description</b>
1	1-Pole
2	2-Pole

<b>c</b>	
<b>Trip Curve</b>	
<b>Code</b>	<b>Description</b>
C	Trip Curve C

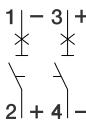
<b>d</b>	
<b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
005	0.5
010	1
016	1.6
020	2
030	3
040	4
060	6
080	8
100	10
130	13
160	16
200	20
250	25
320	32
400	40
500	50
630	63

# 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)	
Overshoot category	III	
Pollution degree	3	
Data per UL/CSA		
Rated voltage	1-pole 2-pole	250V DC 500V DC
Rated interrupting capacity per UL 1077		10 kA
Application	Supplementary Protector for DC application use; application codes: TC2, OLO, SC: U1, 250V DC, 10kA (1 pole); TC2, OLO, SC: U1, 500V DC, 10kA (2 pole)	
Reference temperature for tripping characteristics	25 °C	
Electrical endurance	6,000 operations	
Data per IEC/EN 60947-2		
Rated operational voltage ( $U_e$ )	1-pole 2-pole	220V DC 440 V DC
Highest supply or utilization voltage ( $U_{max}$ )	1-pole 2-pole	250V DC 500 V 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	
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 $I_n$
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 <sup>(1)</sup>		-25...+55 °C (-13...+131 °F)
Storage temperature		-40...+70 °C (-40...+158 °F)
Installation		
Terminal		Dual terminal
Cross-section of wire <sup>(2)</sup> - solid, stranded (front/back terminal slot)		35/35 mm <sup>2</sup> 18...4/18...10 AWG
Cross-section of wire - flexible (front/back terminal slot)		25/10 mm <sup>2</sup>
Multi-wire rating per UL, CSA		1 wire, 18...4 AWG 2-4 wires <sup>(3)</sup> , 18...10 AWG
Cross-section of bus bars (back terminal slot)		10 mm <sup>2</sup>
Tightening torque		2.8 N·m AWG 18...16: 13.3 in·lb, AWG 14...10: 17.7 in·lb, AWG 8...4: 39.8 in·lb
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<sup>2</sup> self-declared, not included in IEC/EN approval.

(2) Refer to the ambient temperature derating tables.

(3) Wires must be of like size and stranding. Up to two wires per terminal slot.

**Power Loss Due to Current**

<b>Rated Current</b>	<b>Power Loss Per Pole</b>	<b>Rated Current</b>	<b>Power Loss Per Pole</b>
<b>[A]</b>	<b>[W]</b>	<b>[A]</b>	<b>[W]</b>
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

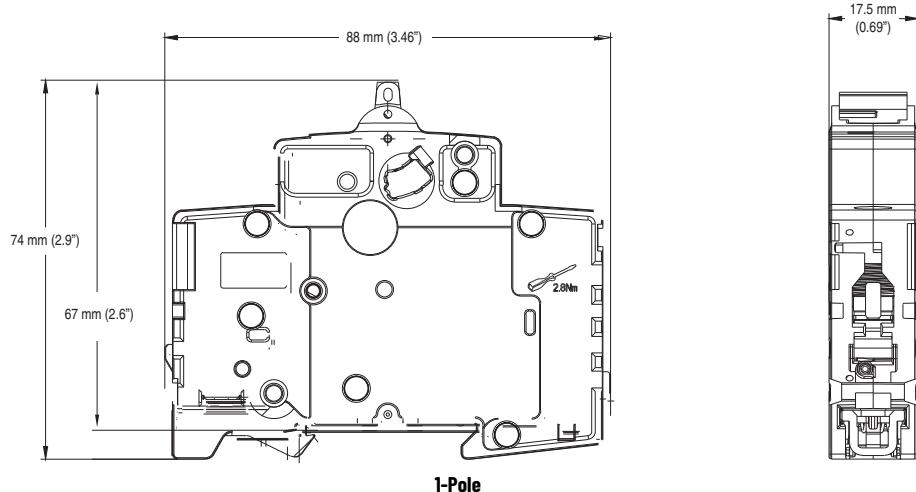
**Zero-stack Derating**

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

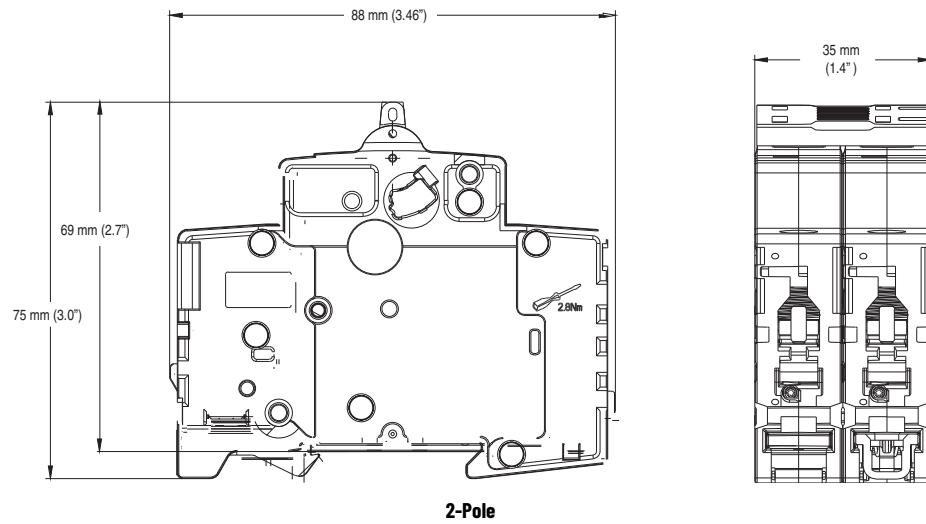
<b>No. of Adjacent Devices</b>	<b>Factor</b>
1	1
2.3	0.9
4.5	0.8
$\geq 6$	0.75

# Approximate Dimensions

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



1-Pole



2-Pole

# Ambient Temperature Derating

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

## Bulletin 1492-D

### Temperature Derating, UL

Reference temperature = 25 °C

Current Rating (A)	Ambient temperature (°C)										
	-25	-20	-10	0	10	20	25	30	40	50	55
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	39.4	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

## Bulletin 1492-D

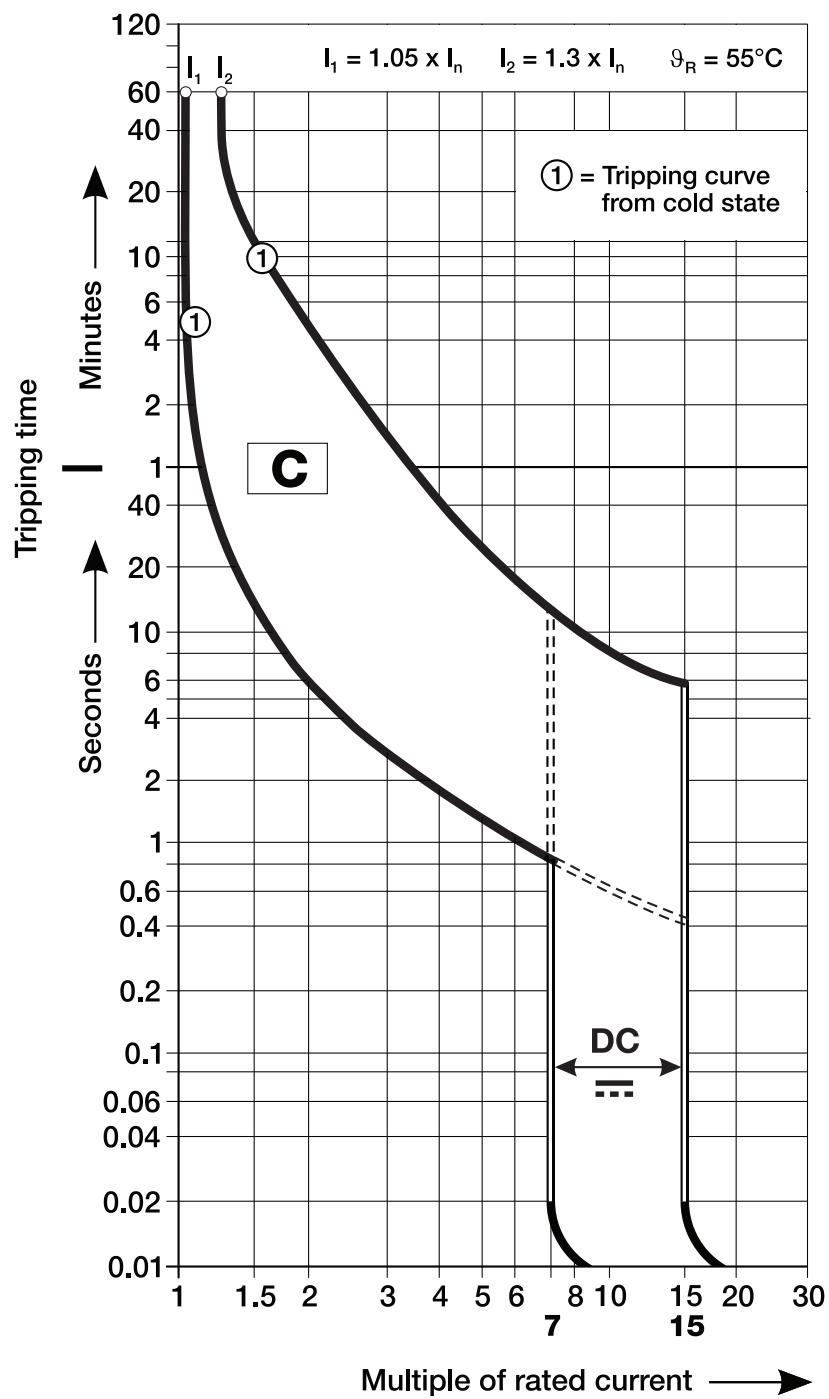
### Temperature Derating, IEC

Reference temperature = 55 °C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	1.2	1.1	0.9	1	1.0	1.0	0.9
1.6	1.8	1.8	1.8	1.8	1.8	1.5	1.6	1.6	1.5	1.5
2	2.3	2.3	2.3	2.3	2.3	1.9	2	2.0	1.9	1.8
3	3.5	3.5	3.5	3.5	3.4	2.8	3	3.0	2.9	2.8
4	4.6	4.6	4.6	4.6	4.5	3.8	4	3.9	3.8	3.6
6	6.9	6.9	6.9	6.9	6.8	5.6	6	5.9	5.7	5.5
8	9.2	9.2	9.2	9.2	9.1	7.5	8	7.9	7.6	7.4
10	11.5	11.5	11.5	11.5	11.4	9.4	10	9.9	9.6	9.3
13	15.0	15.0	15.0	15.0	14.8	12.2	13	12.8	12.4	12.0
16	18.4	18.4	18.4	18.4	18.2	15.0	16	15.8	15.3	14.8
20	23.0	23.0	23.0	23.0	22.7	18.8	20	19.7	19.1	18.5
25	28.8	28.8	28.8	28.8	28.4	23.5	25	24.6	23.9	23.1
32	36.8	36.8	36.8	36.8	36.3	30.1	32	31.5	30.6	29.6
40	46.0	46.0	46.0	46.0	45.4	37.6	40	39.4	38.2	37.0
50	57.5	57.5	57.5	57.5	56.8	47.0	50	49.3	47.8	46.3
63	72.5	72.5	72.5	72.5	71.5	59.2	63	62.1	60.2	58.3

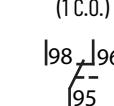
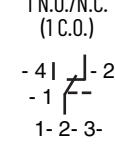
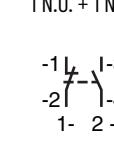
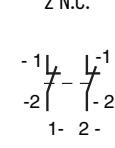
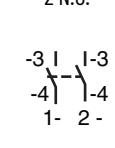
# Tripping Characteristics

C Curve



# Accessories

## Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Shunt Trip	 C1 C2	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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, and installation instructions please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

**Left Mount**

Photo	Product Description (1)	Contacts	Standards	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 13   21 --- 14   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL11
		2 N.C. 11   21 --- 12   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL02
		2 N.O. 13   23 --- 14   24	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C. m1   --- m2	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB01
		1 N.O. m3   --- m4	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB10

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

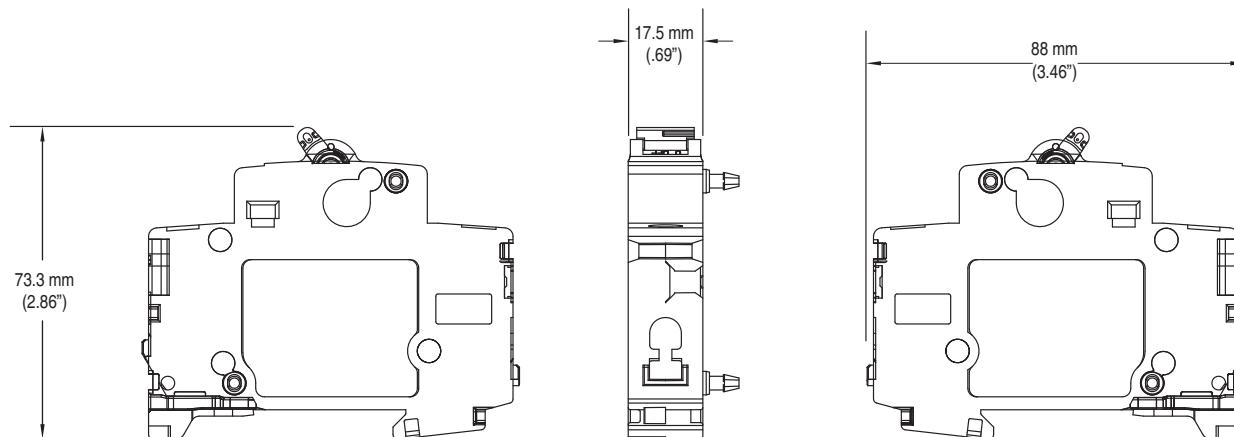
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

**Toggle Mount**

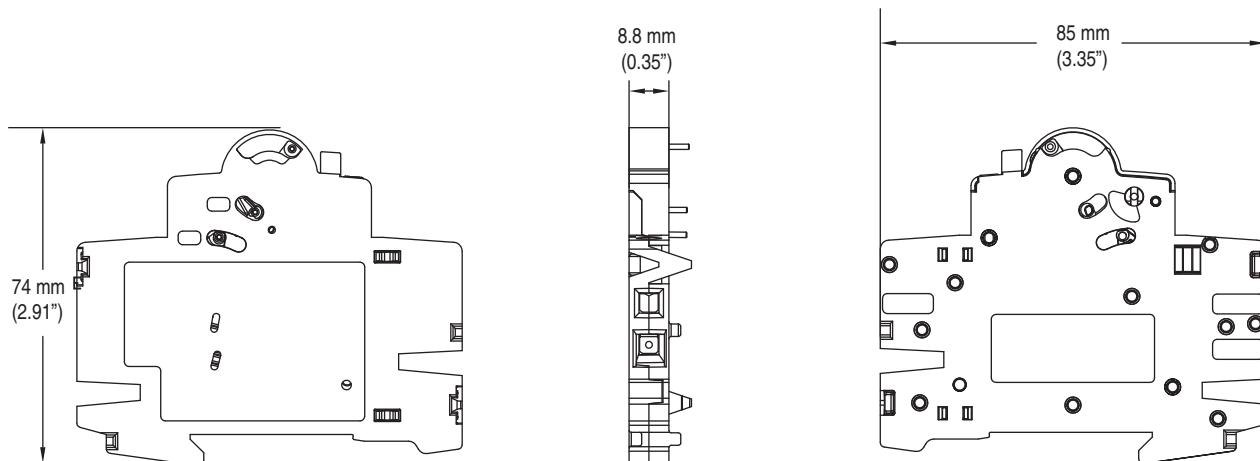
Photo	Product Description	Cat. No.
	Lock-out attachment for 1-pole MCB	189-ALOA1
	Lock-out attachment for multi-pole MCB	189-ALOA2

## Circuit Breaker Accessory Approximate Dimensions

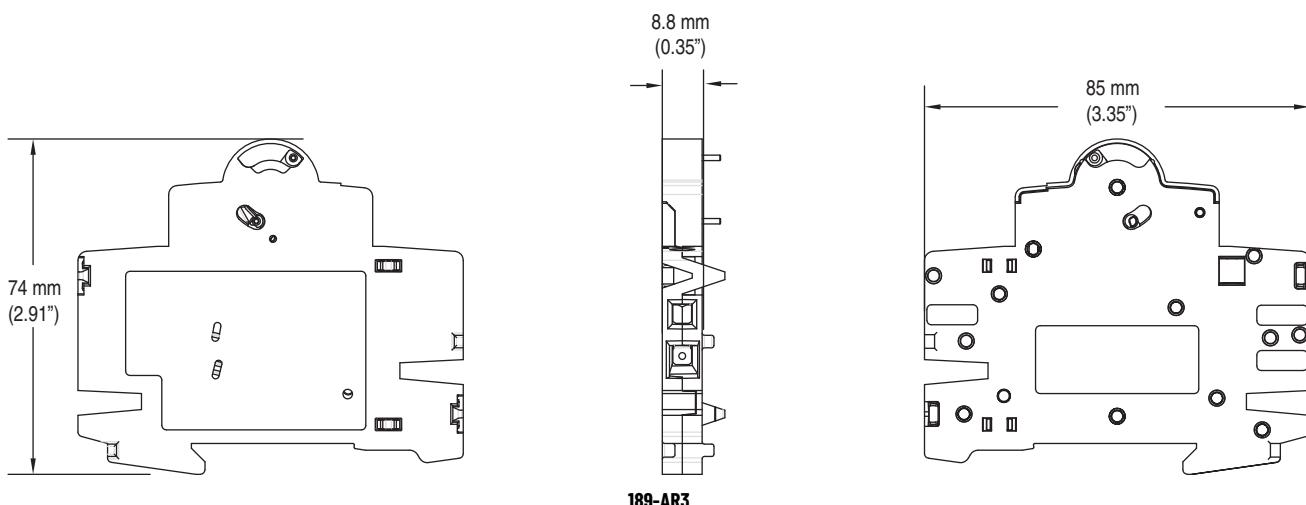
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-AST1 and 189-AST2

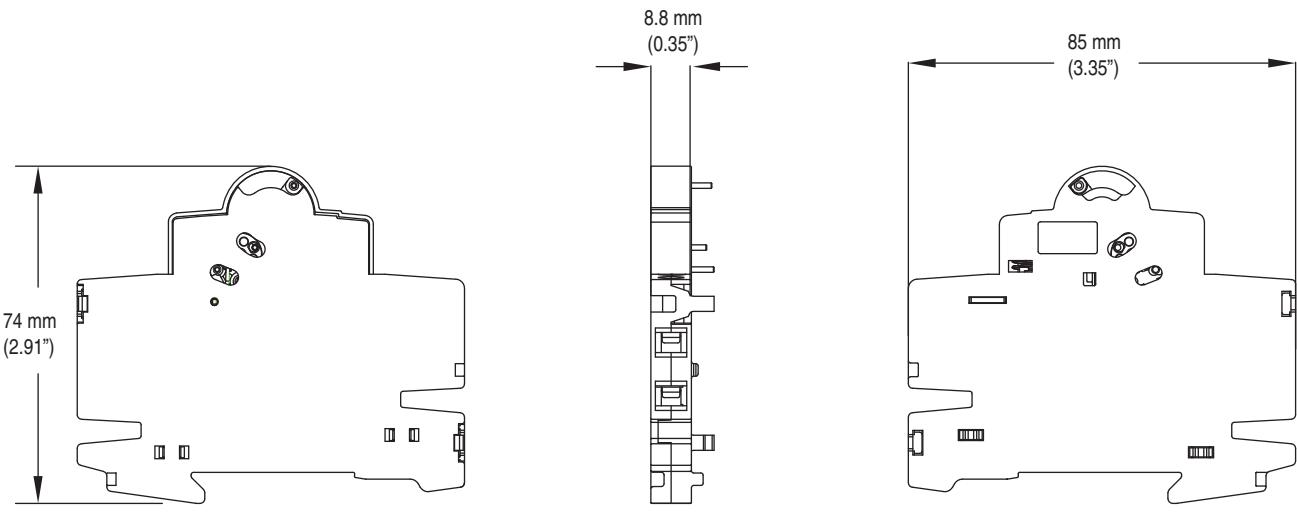


189-ASCR3

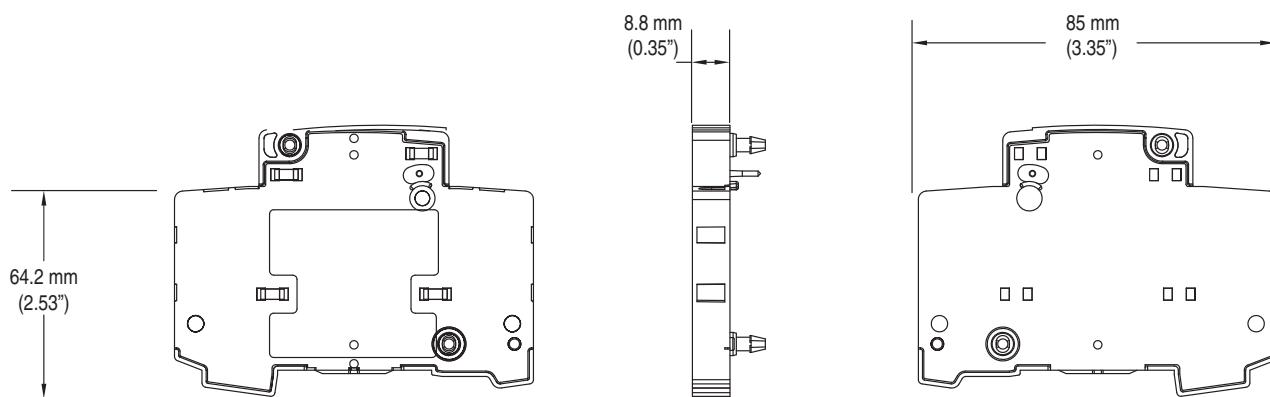


189-AR3

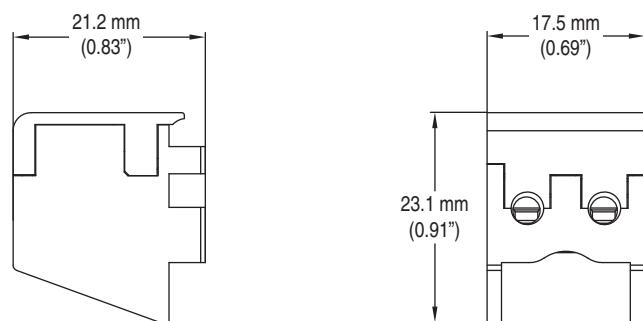
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-AR11, 189-AR02, 189-AR20



189-AL11, 189-AL02, and 189-AL20



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

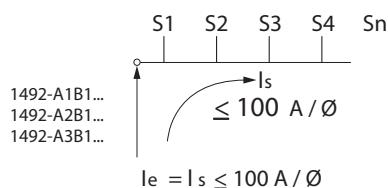
(1) Refer to the diagrams below for Feeder Terminal & Bus Bar Current Distribution

(2) cULus, UL508, EN 60947-1, CE Marked

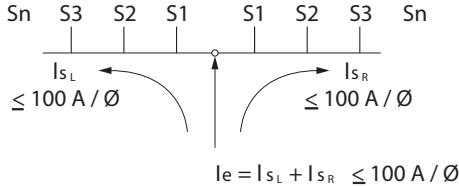
## Feeder Terminal & Bus Bar Current Distribution

100 A

End Feed

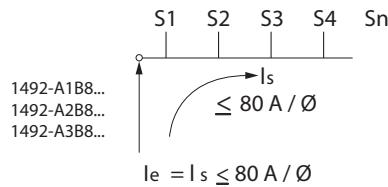


Other Feed

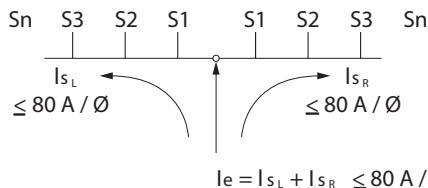


80 A

End Feed

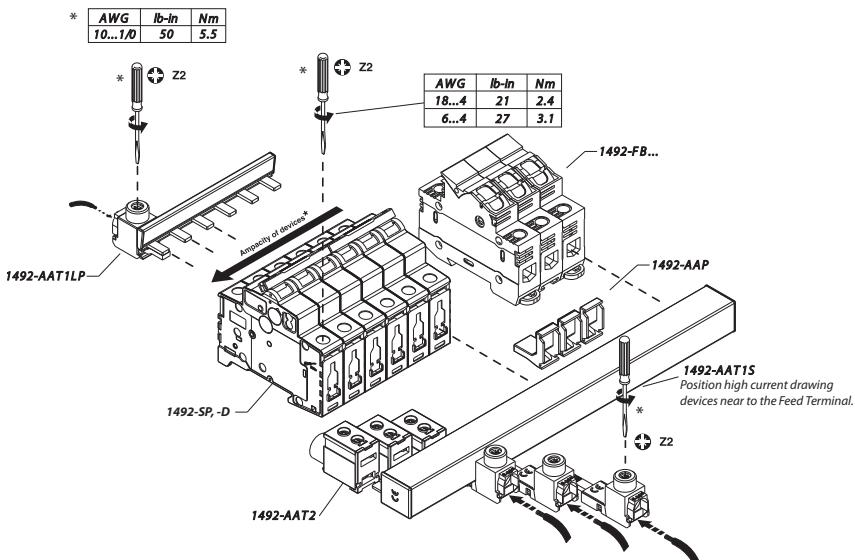


Other Feed



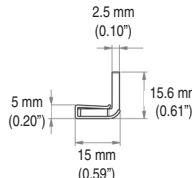
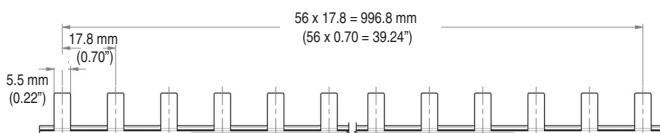
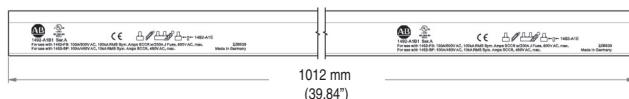
## 1492-D Bus Bar Accessories

Description	Pkg. Qty.	Cat. No. (2)
Terminal Power Feed, 35 mm <sup>2</sup> , straight lug	10	1492-AAT1S
Terminal Power Feed, 35 mm <sup>2</sup> , offset lug, low profile	10	1492-AAT1LP
Dedicated Power Feed, 50 mm <sup>2</sup>	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

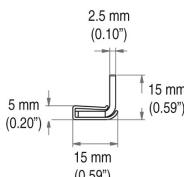
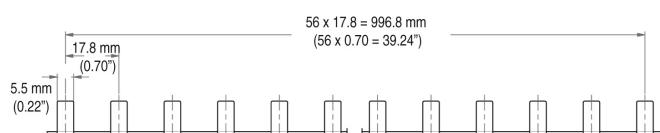
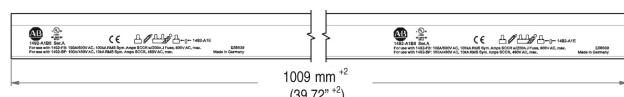


## Bus Bar Approximate Dimensions

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

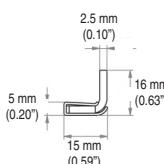
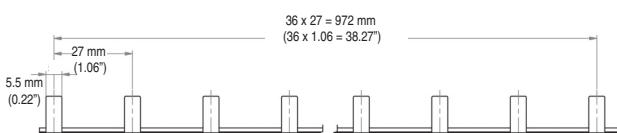
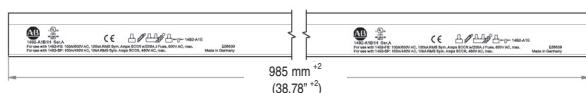


1492-A1B1

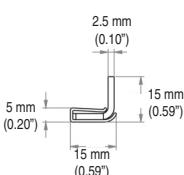
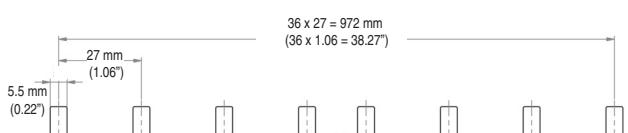
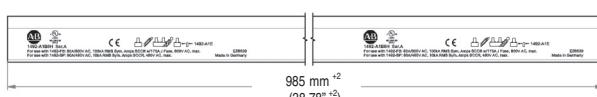


1492-A1B8

### 1-Phase Bus Bars, with Auxiliary Contact

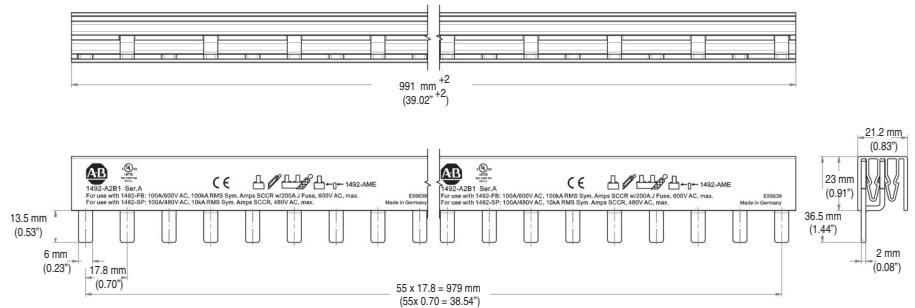


1492-A1B1H

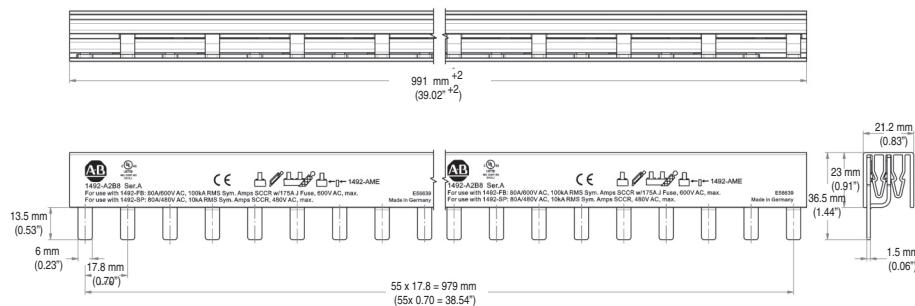


1492-A1B8H

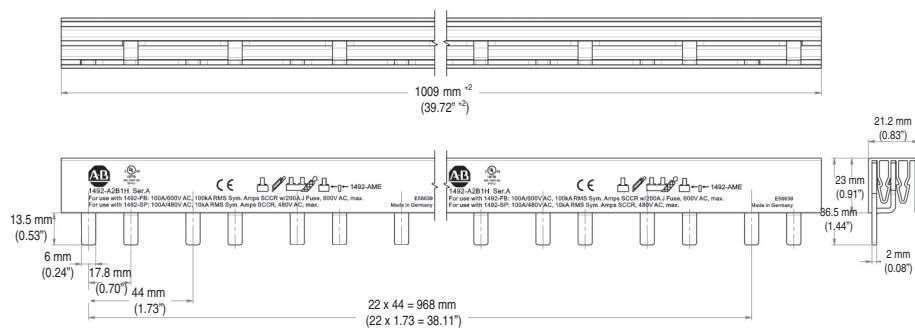
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



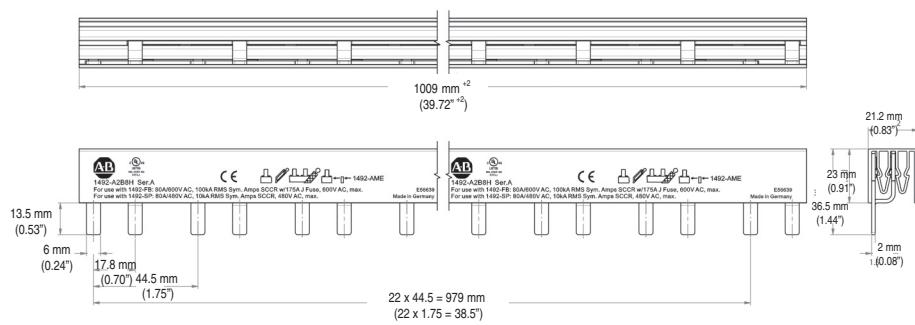
1492-A2B1



1492-A2B8



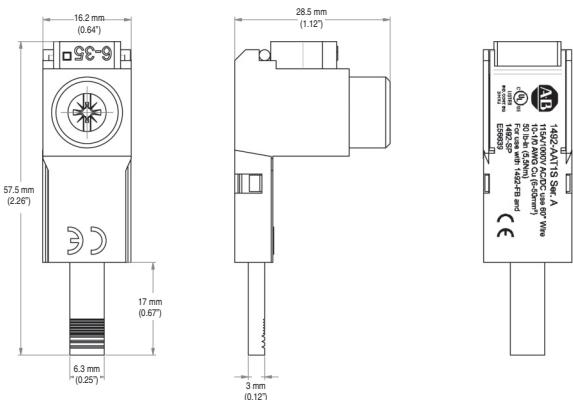
1492-A2B1H



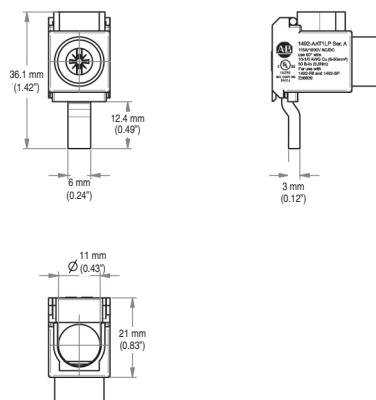
1492-A2B8H

## Bus Bar Accessory Approximate Dimensions

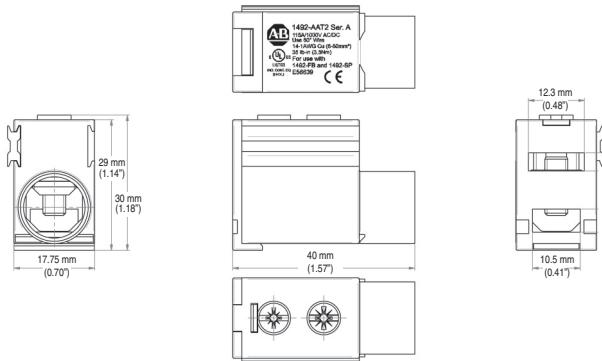
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



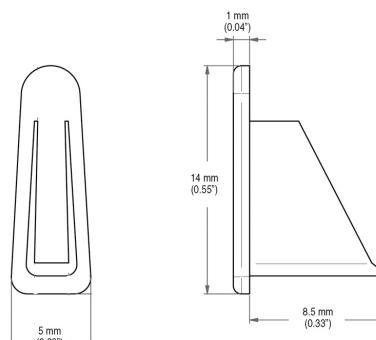
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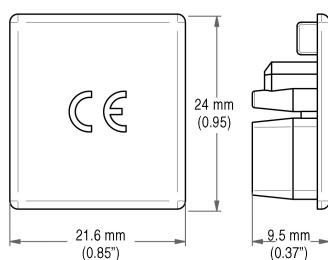
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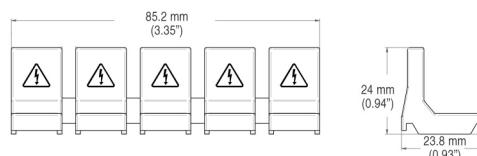
1492-AAT2



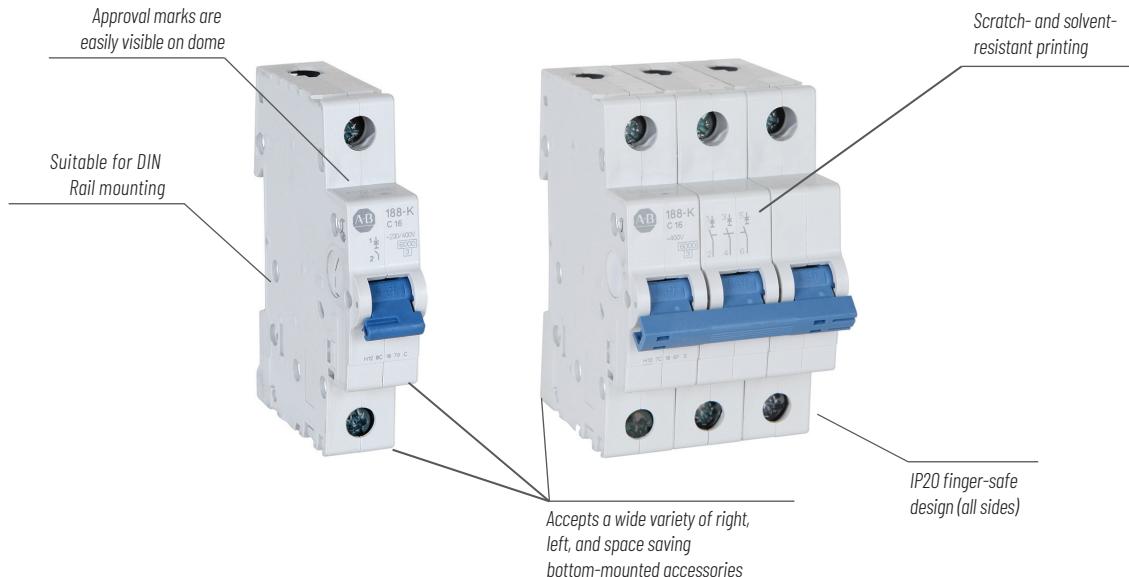
1492-A1E



1492-AME



1492-AAP



Bulletin 188 thermal magnetic 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) are available.

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

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

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

188 - **J** **1** **C** **010** - **N**

**a**      **b**      **c**      **d**      **e**

<b>a</b> Interrupt Rating	
Code	Description
J	Regional Circuit Breaker, 10 kA
K	Regional Circuit Breaker, 6 kA

<b>c</b> Trip Curve	
Code	Description
B	Trip Curve B
C	Trip Curve C
D	Trip Curve D

<b>d</b> 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

<b>e</b> + Neutral (for 1+N and 3+N configurations)	
Code	Description
	Can be left blank
N	+ Neutral

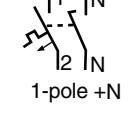
<b>b</b> Poles	
Code	Description
1	1-Pole
2	2-Pole
3	3-Pole
4	4-Pole

# 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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
		[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  <b>1-pole</b>	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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
		[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
  <b>1-pole + N</b>	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

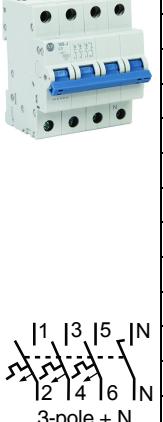
## 2-Pole Regional Circuit Breakers

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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	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 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$	Trip Curve B Resistive or Slightly Inductive 3...5 $I_n$	Trip Curve C Inductive 5...10 $I_n$	Trip Curve D Highly Inductive 10...20 $I_n$
	[A]	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	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 ( $U_{max}$ )	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
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 $I_n$
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	Cage terminal
Cross-section of wire - solid, stranded	0.75...25 mm <sup>2</sup>
Cross-section of wire - flexible	0.75..16 mm <sup>2</sup>
Tightening torque	IEC
Screwdriver	2.0 N·m
Mounting	No. 2 Pozidriv
Mounting position	DIN Rail (EN 60715, 35 mm) with fast clip
Supply	Any
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) Refer to the Ambient Temperature Derating tables.

## Power Loss Due to Current

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

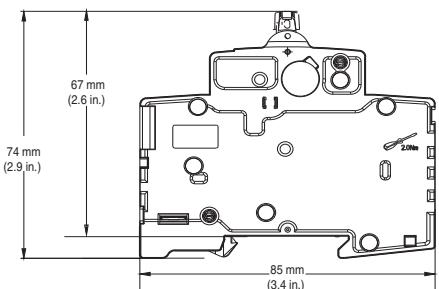
## Zero-stack Derating

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

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

# Approximate Dimensions

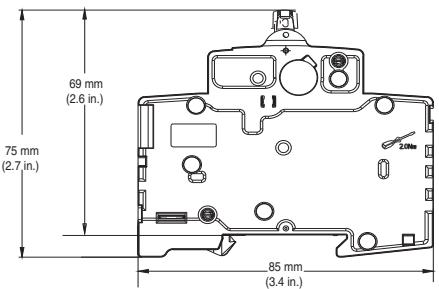
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



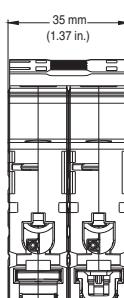
1-Pole



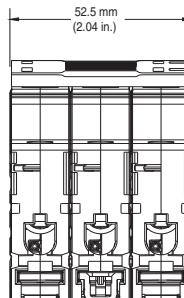
1-Pole



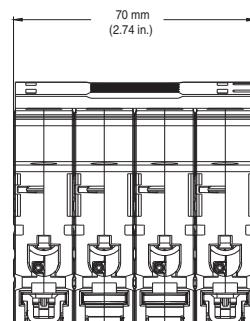
1+N, 2-, 3-, 3+N, 4-Pole



1-Pole + N, 2-Pole



3-Pole



3+N, 4-Pole

## Ambient Temperature Derating

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

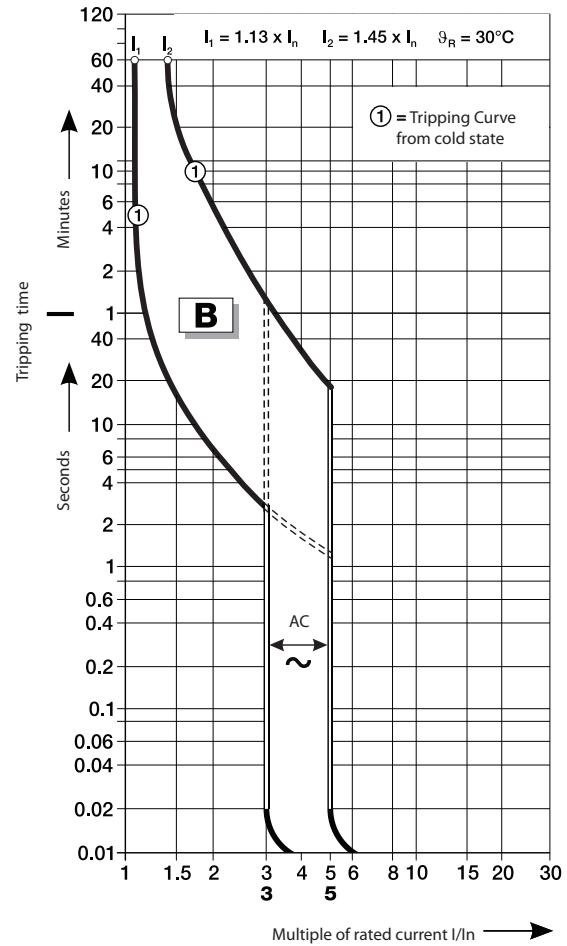
Bulletin 188-J, -K  
Temperature Derating, IEC  
Reference temperature = 30°C

Current Rating (A)	Ambient temperature (°C)									
	-25	-20	-10	0	10	20	30	40	50	55
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	1.0	1.0	0.9	0.9
2	2.3	2.3	2.2	2.2	2.1	2.1	2.0	1.9	1.9	1.9
3	3.5	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.8
4	4.7	4.6	4.5	4.4	4.2	4.1	4.0	3.9	3.8	3.7
6	7.0	6.9	6.7	6.5	6.4	6.2	6.0	5.8	5.6	5.6
8	9.3	9.2	9.0	8.7	8.5	8.2	8.0	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	44.8	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	59.2	58.3

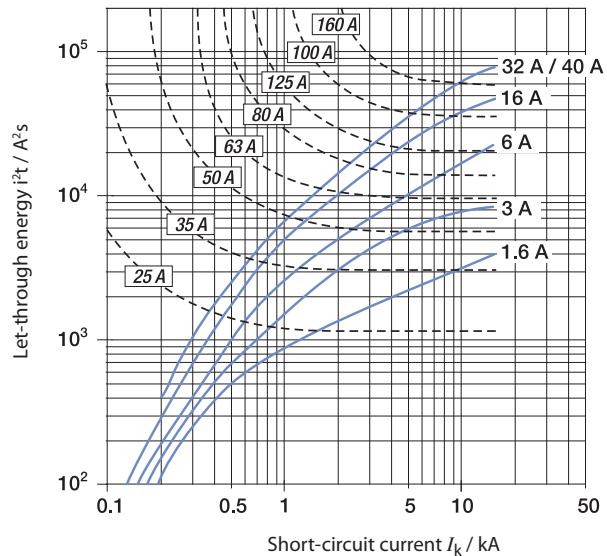
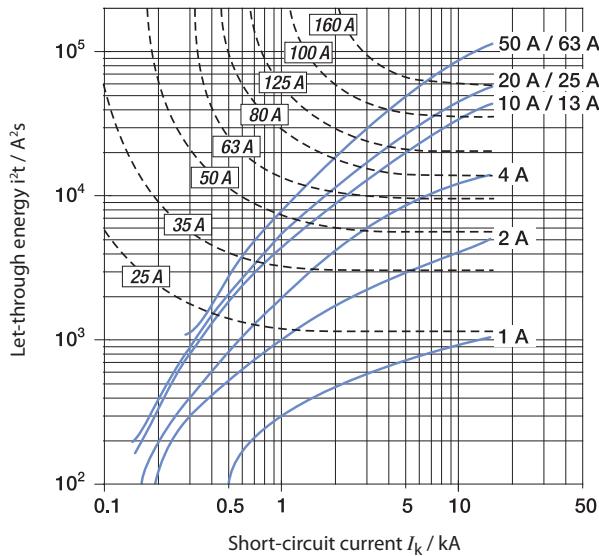
# Tripping Characteristics

- DC trip curves - When using 188-J/K.. on DC applications or DC loads, please refer to 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 to 7.5 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

## B Curve

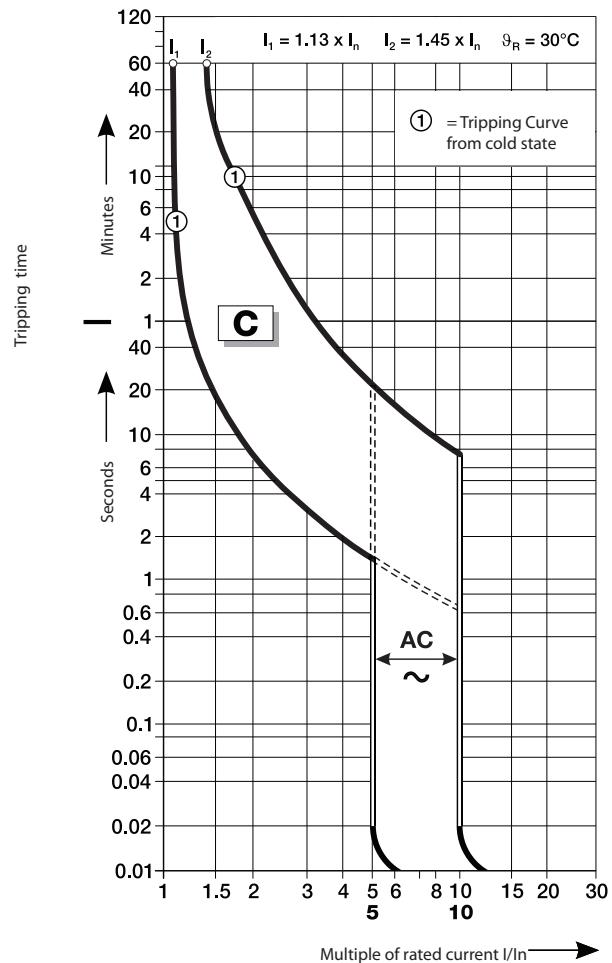


**B and C Curve - 230/400V AC Let-through Energy**

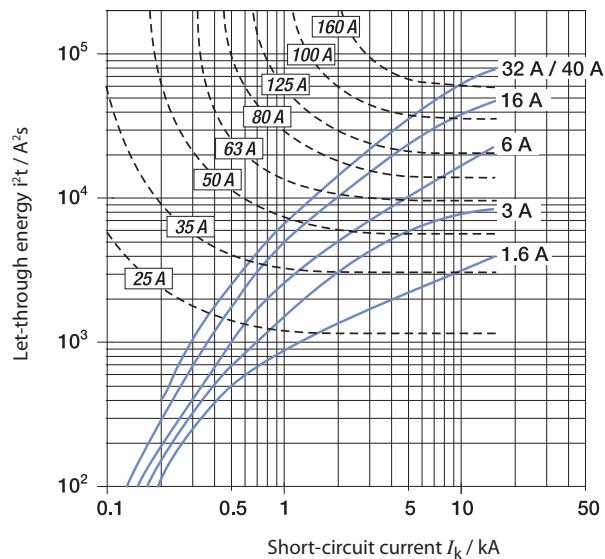
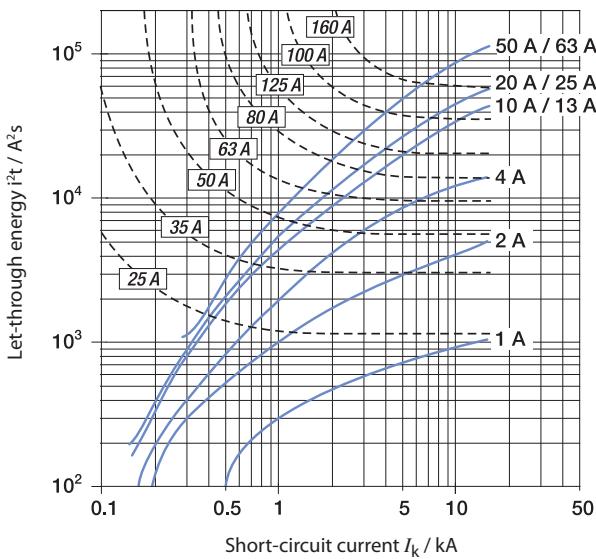


- DC trip curves - When using 188-J-K.. on DC applications or DC loads, please refer to AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating ( $I_n$ ).
- For C trip curve = 7.5 to 15 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

### C Curve

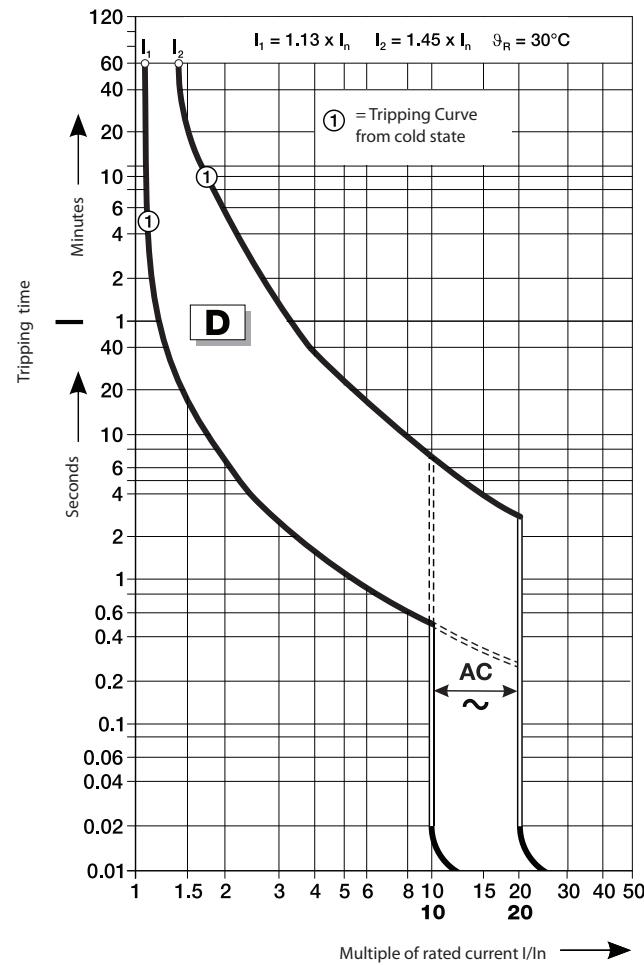


### B and C Curve - 230/400V AC Let-through Energy

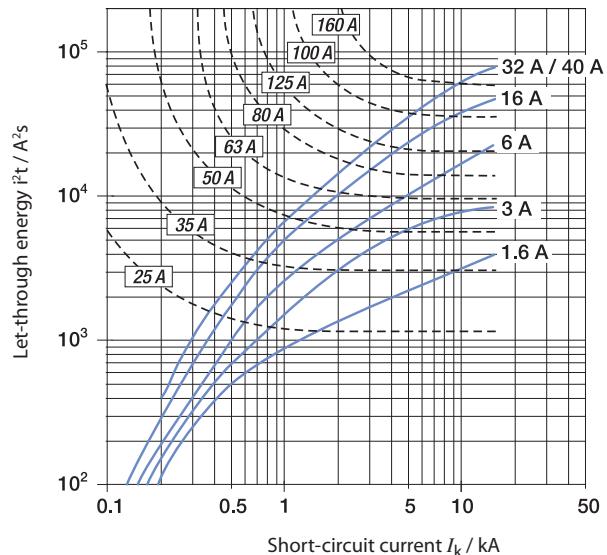
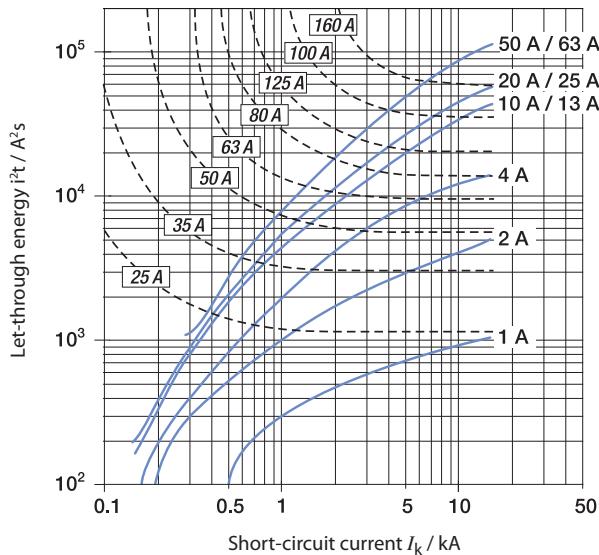


- DC trip curves - When using 188-J-/K- on DC applications or DC loads, please refer to AC trip curves and times and use a factor of 1.5 for the magnetic instantaneous trip times the continuous current rating ( $I_n$ ).
- For D trip curve = 15 to 30 multiple of the rated current ( $I / I_n$ ).
- The thermal trip times remain the same for both AC and DC applications.

### D Curve

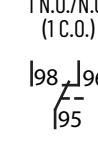
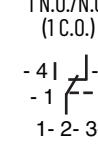
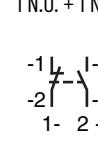
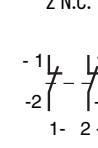
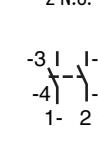


### D Curve - 230/400V AC Let-through Energy



# Accessories

## Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (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 188.

(2) A maximum of two 189-AR11, -AR02, or -AR20 auxiliary contacts may be installed per 188. 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 188. The shunt trip must be mounted closest to 188, then the signal contact, then the auxiliary contact(s).

For allowed combinations, and installation instructions please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

**Left Mount**

Photo	Product Description (1)	Contacts	Standards	Certifications	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.O. + N.C. 13   21 --- 14   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL11
		2 N.C. 11   21 --- 12   22	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL02
		2 N.O. 13   23 --- 14   24	EN 60947-5-1	CE Marked	—	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AL20

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

**Bottom Mount**

Photo	Product Description (1)	Contacts	Standards	Certifications (2)	UL/CSA Max. Current/Voltage	IEC Ratings Current/Voltage	Cat. No.
	Auxiliary Contact	1 N.C. m1   --- m2	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB01
		1 N.O. m3   --- m4	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 @ 230 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AB10

(1) Only one bottom mount auxiliary contact may be installed per 188.

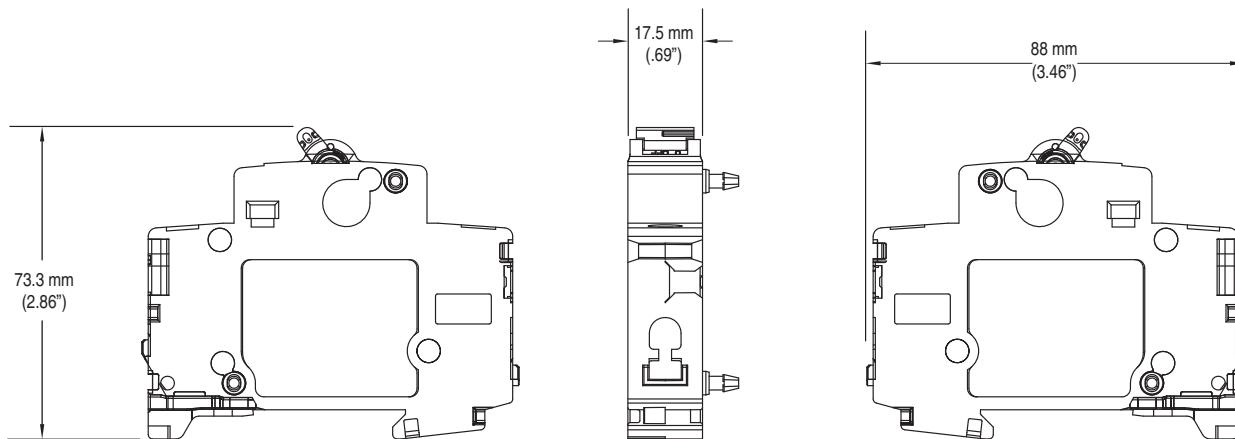
(2) Bottom mount auxiliaries show a CE Mark on the product instruction sheet and packaging, but not on the product itself.

**Toggle Mount**

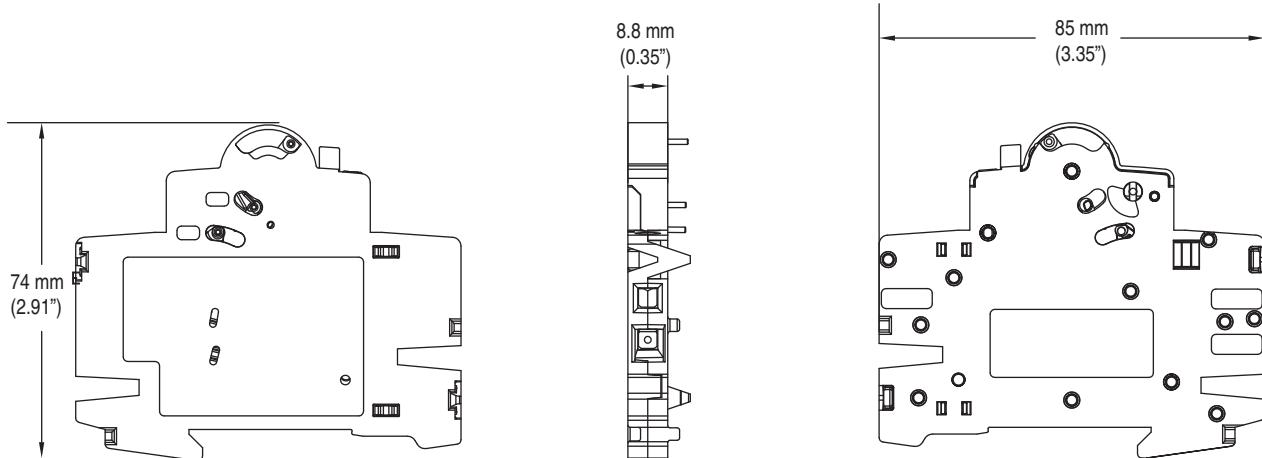
Photo	Product Description	Cat. No.
	Lock-out attachment for 1-pole MCB	189-ALOA1
	Lock-out attachment for multi-pole MCB	189-ALOA2

## Accessory Approximate Dimensions

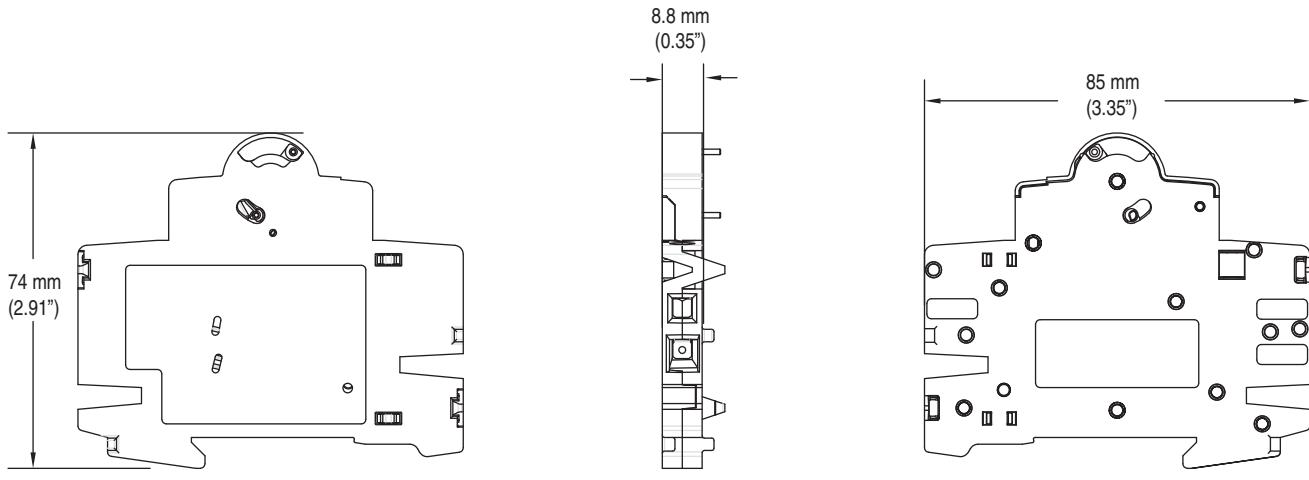
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



**189-AST1 and 189-AST2**

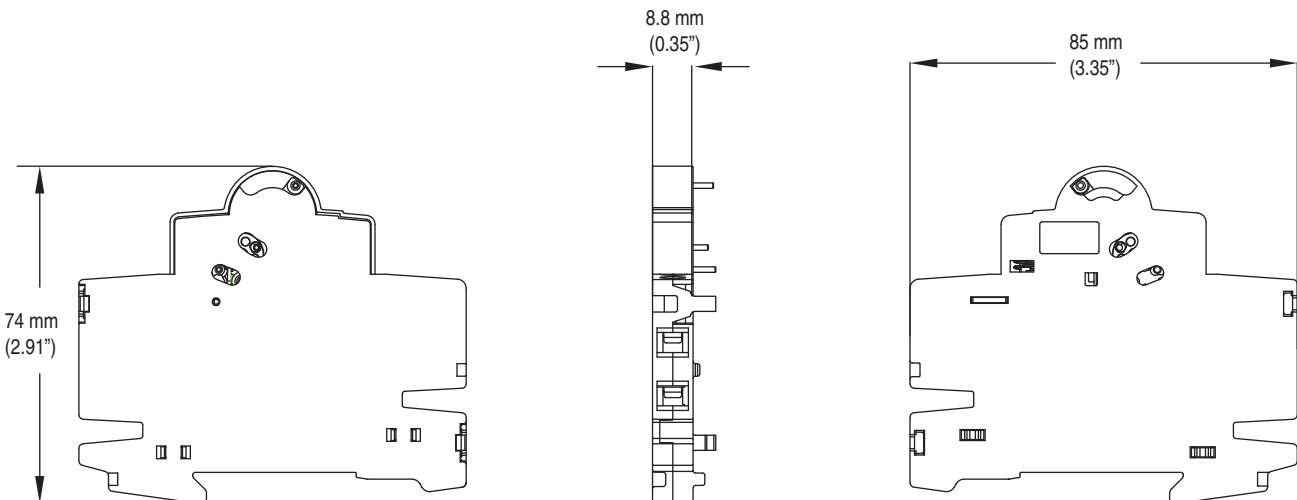


**189-ASCR3**

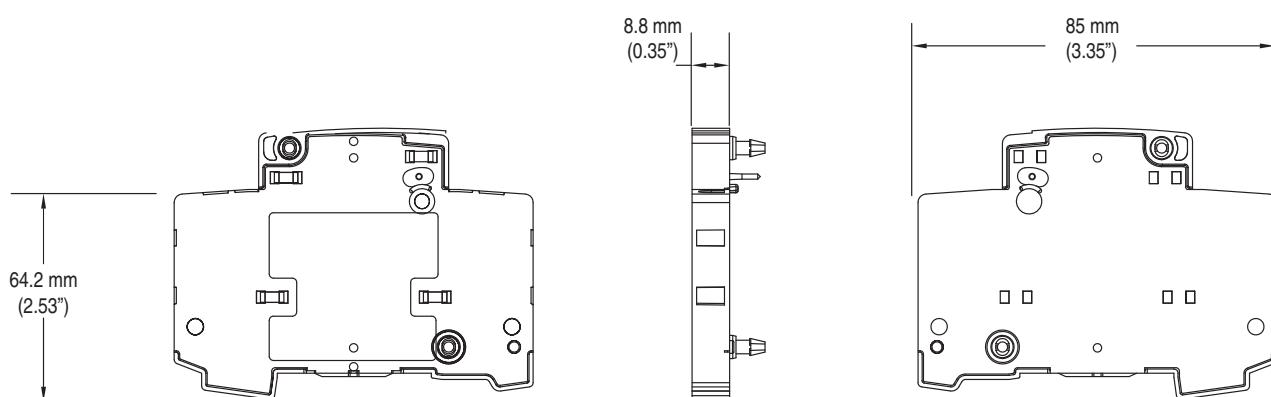


**189-AR3**

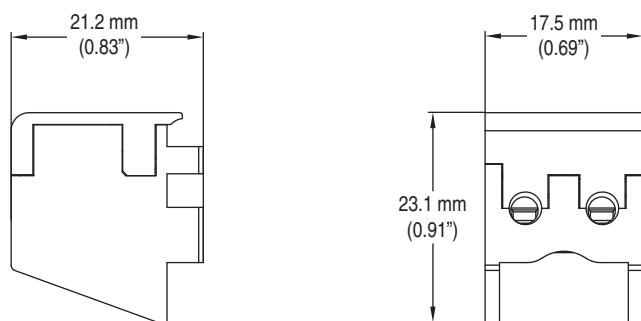
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-AR11, 189-AR02, 189-AR20



189-AL11, 189-AL02, and 189-AL20



189-AB01 and 189-AB10

# Bus Bars

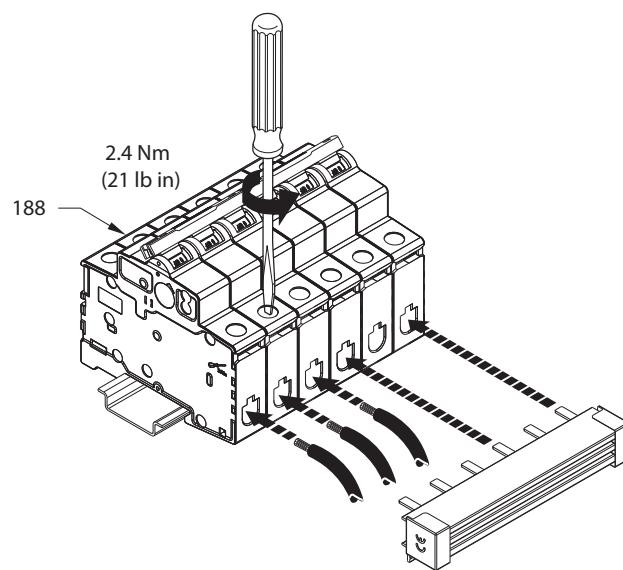
## 188 Bus Bars

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

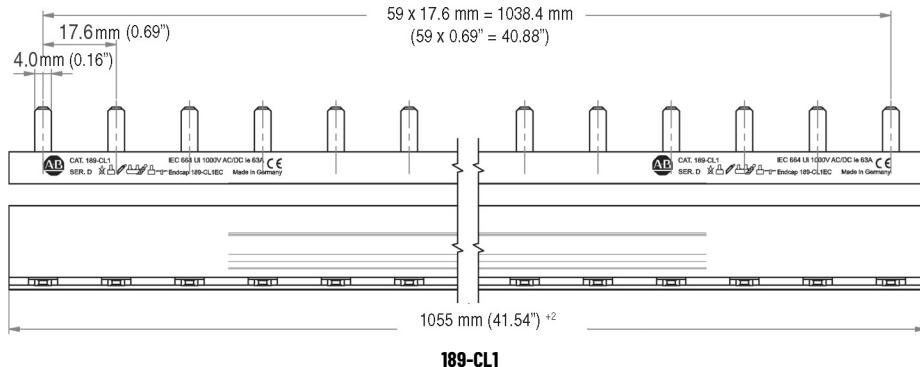
Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed, 6...25 mm <sup>2</sup>	10	189-CLT25
Terminal Power Feed, 6...50 mm <sup>2</sup>	10	189-CLT50
Dedicated Power Feed, 50 mm <sup>2</sup>	10	189-CLT50D
For 1-phase bus bar	10	189-CL1EC
For 2- or 3-phase bus bar	10	189-CL3EC
For 4-phase bus bar	10	189-CL4EC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



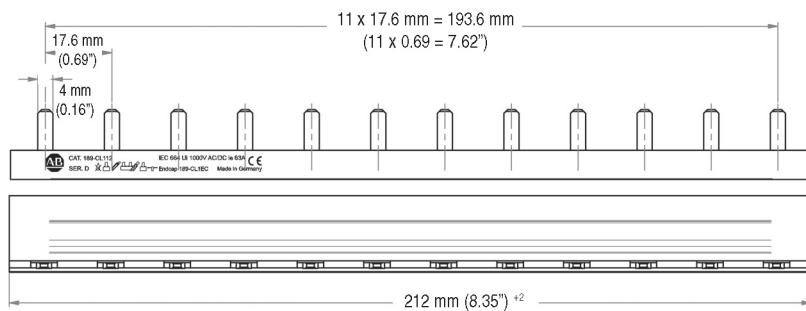
## Bus Bar Approximate Dimensions

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

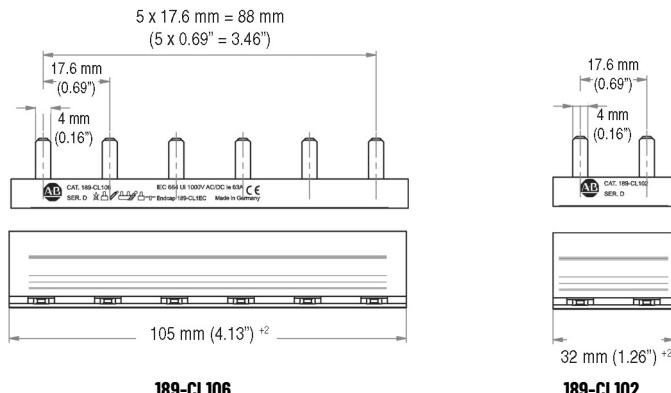
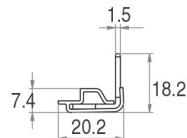
### 1-Phase Bus Bars



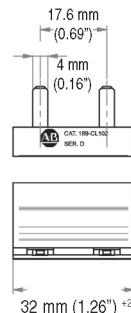
189-CL1



189-CL112



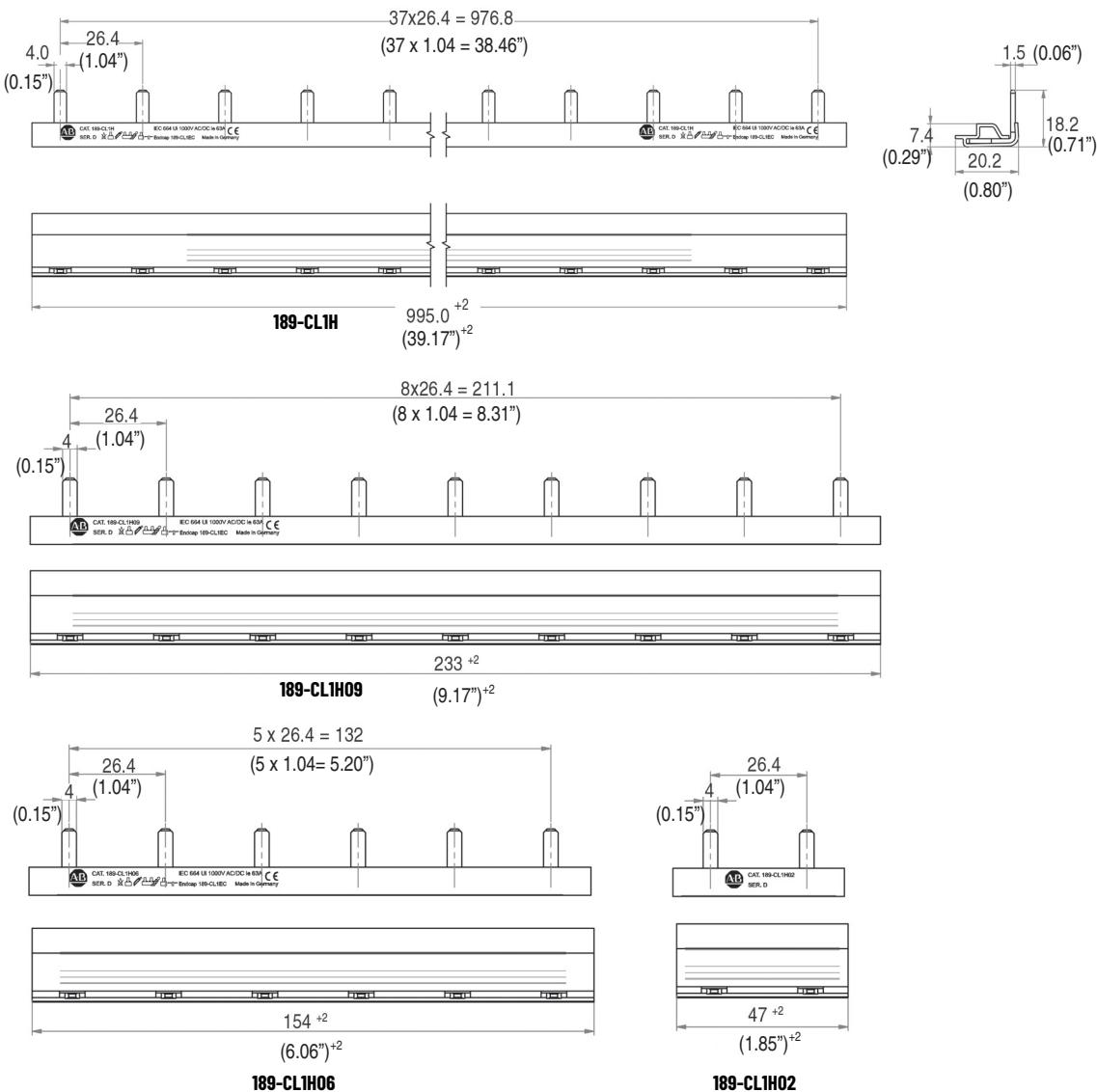
189-CL106



189-CL102

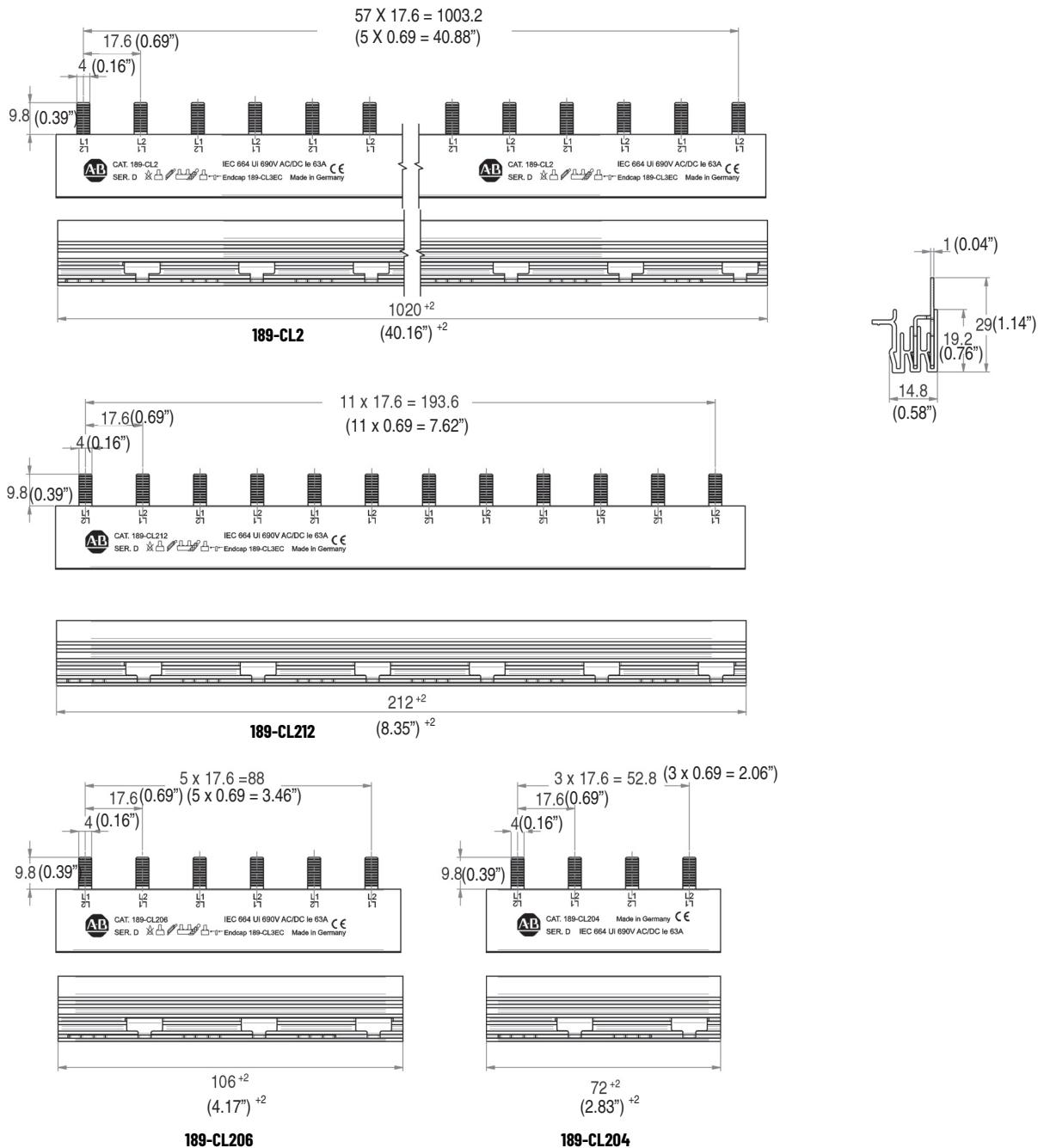
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

## 1-Phase Bus Bars, with Auxiliary Contact



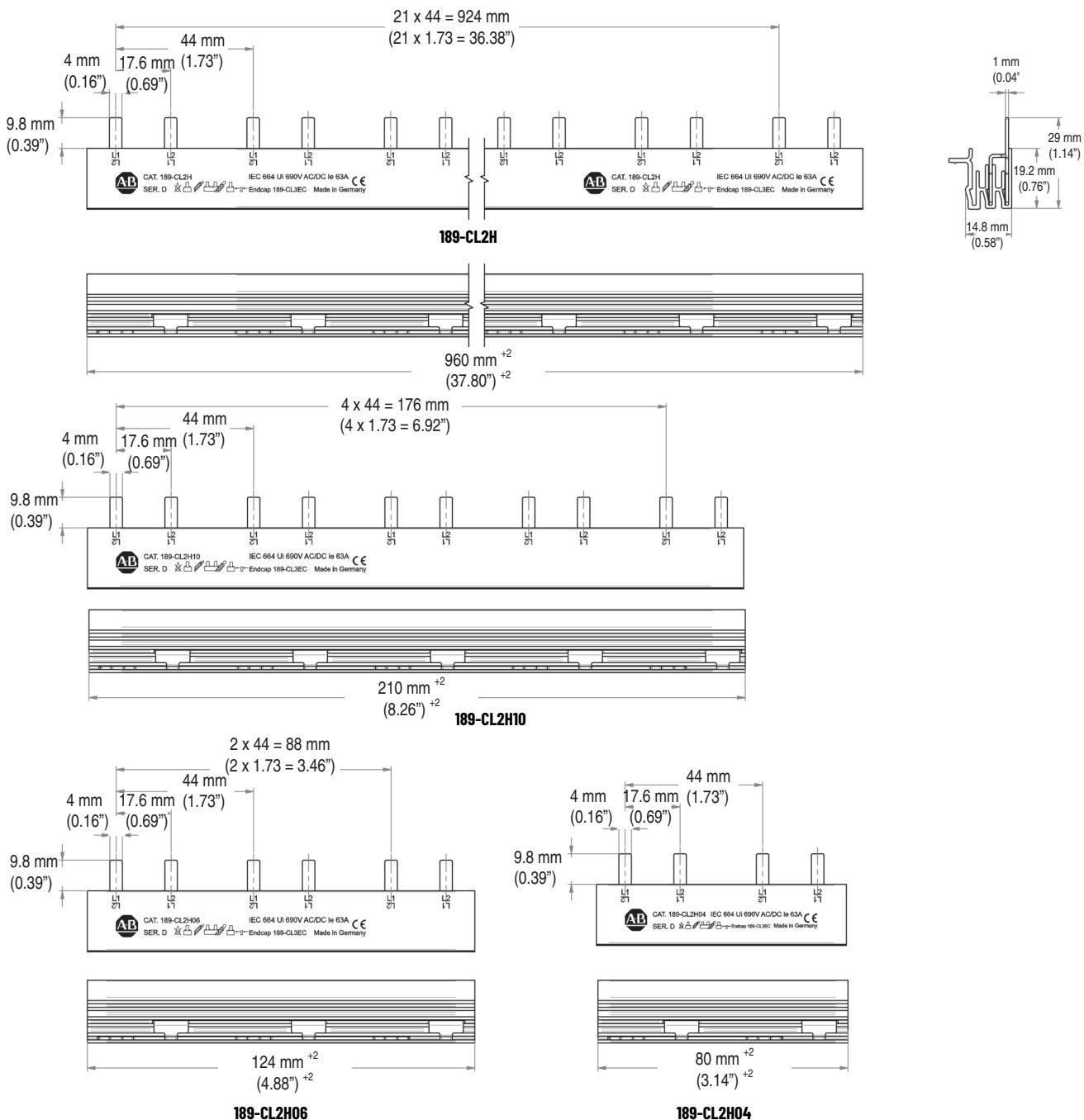
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

## 2-Phase Bus Bars



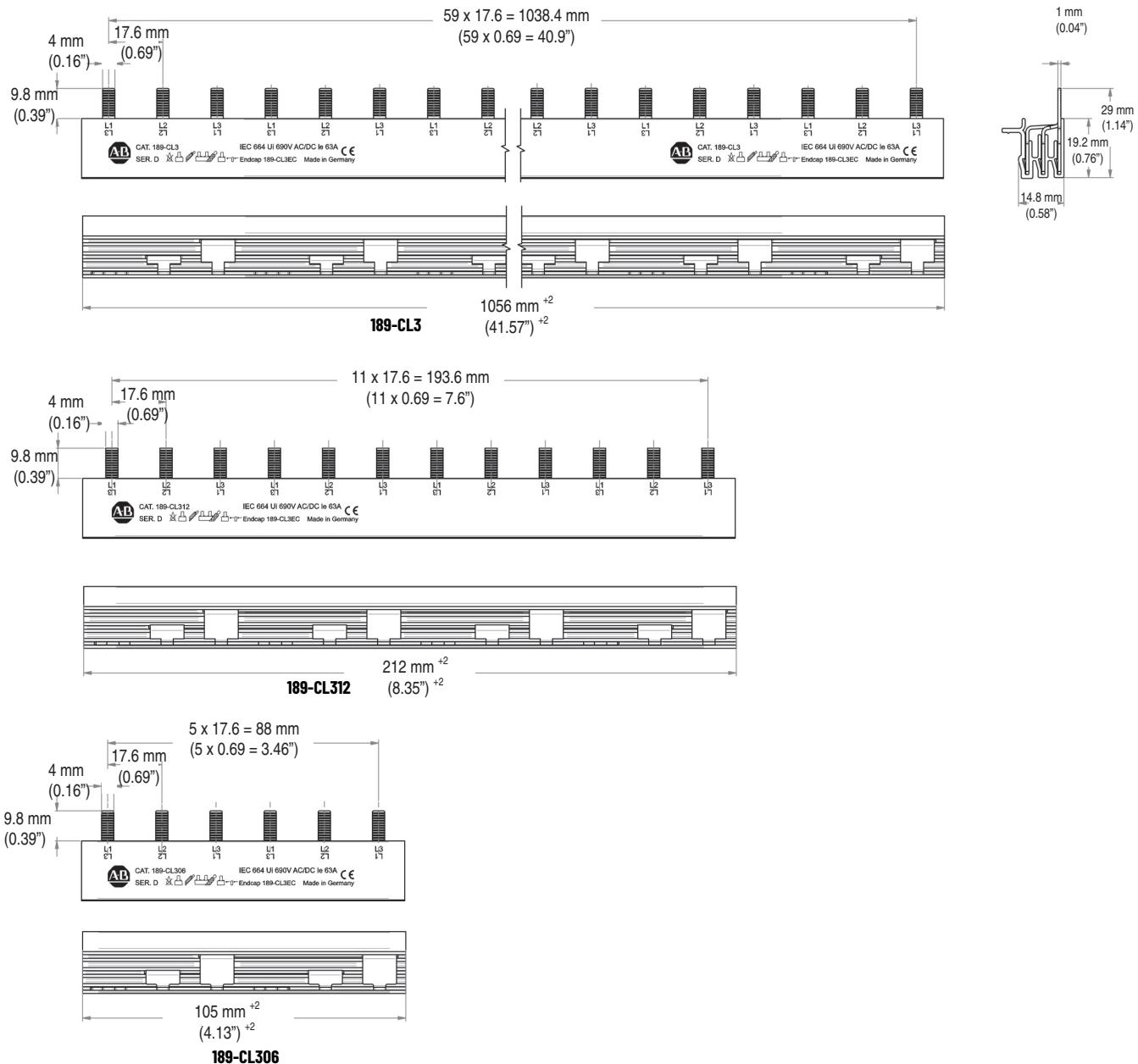
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

## 2-Phase Bus Bars, with Auxiliary Contact



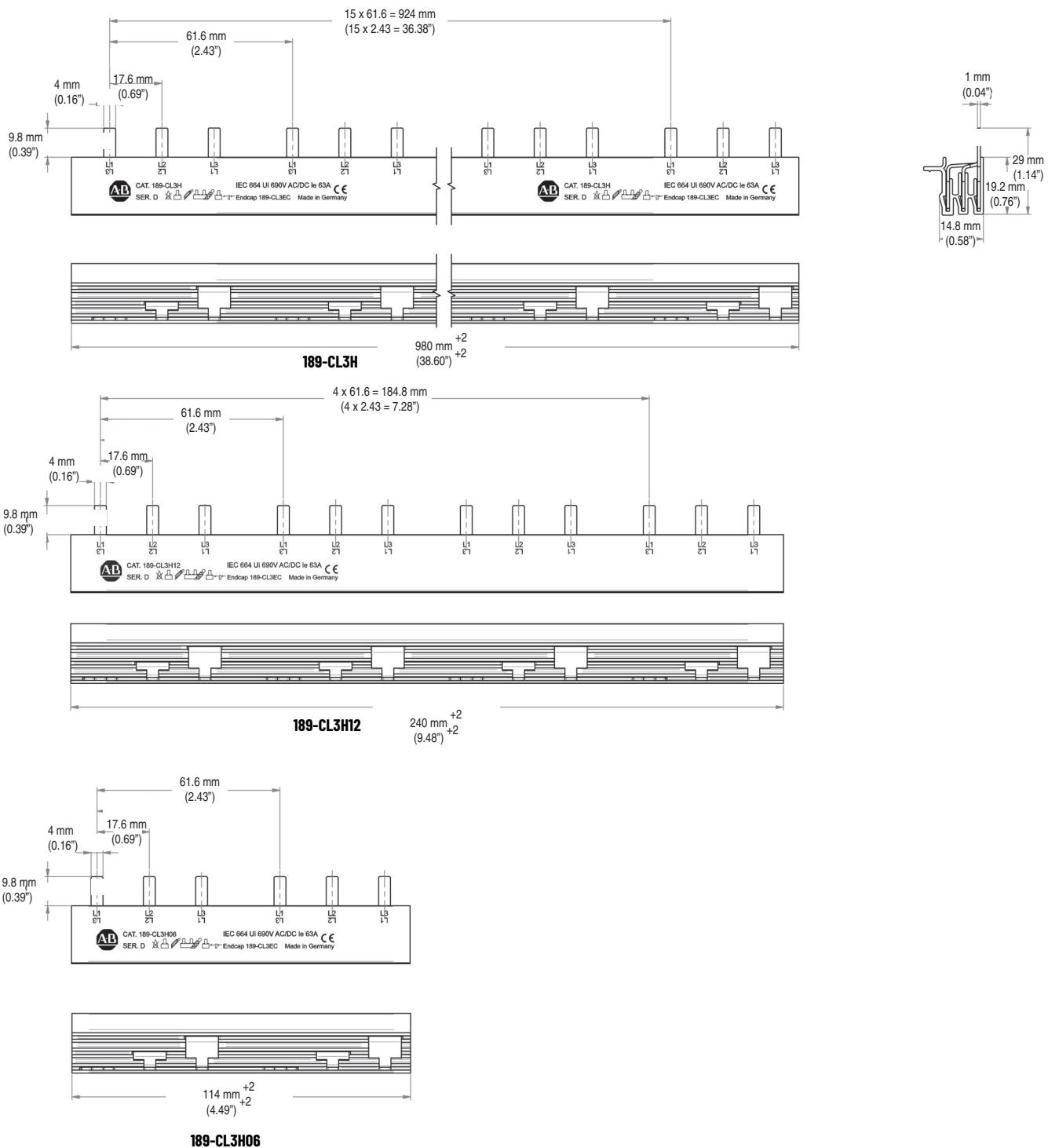
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

### 3-Phase Bus Bars



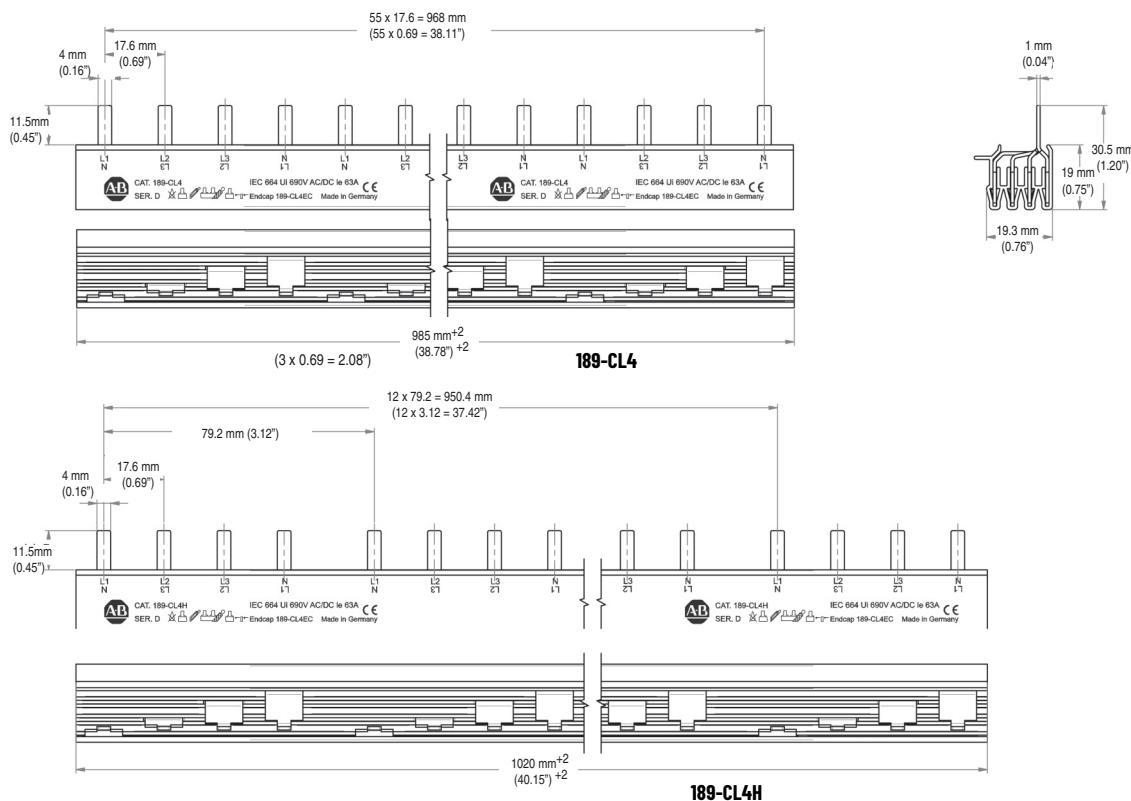
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

### 3-Phase Bus Bars, with Auxiliary Contact

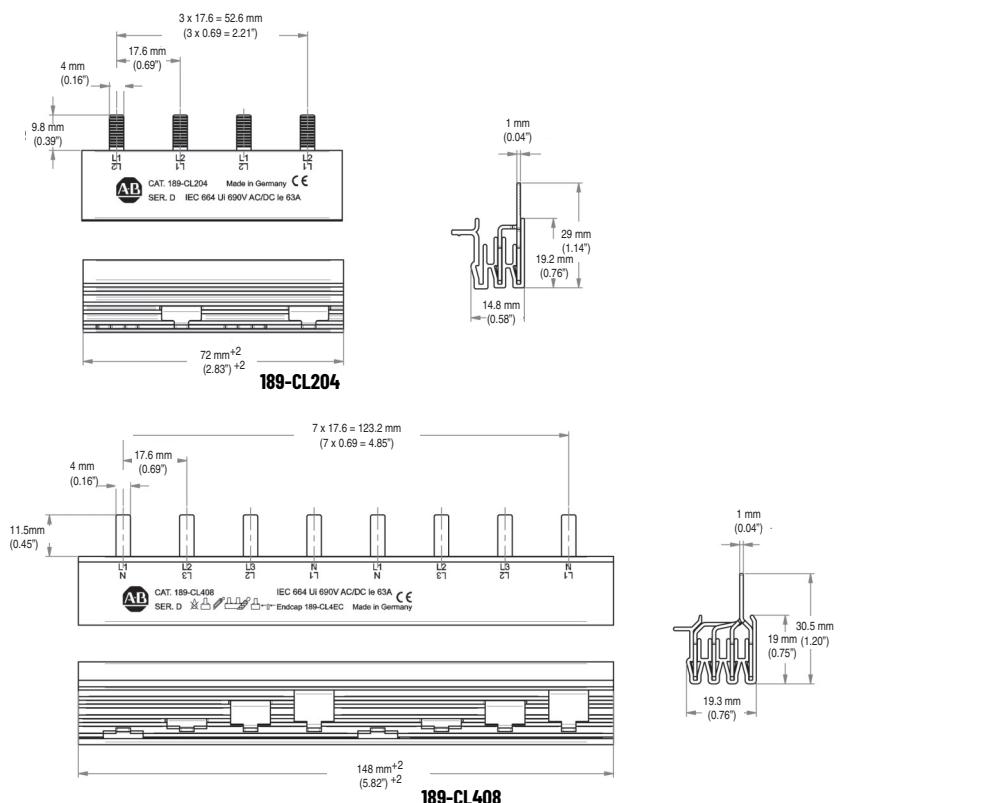


Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

#### 4-Phase Bus Bars

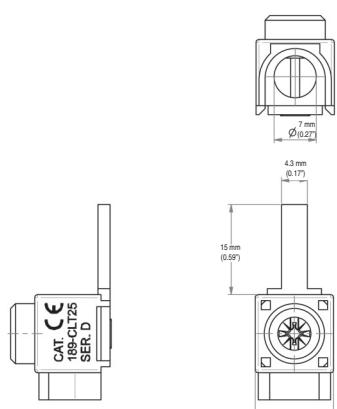


#### 2- and 4-Phase Bus Bars for connection to 1492-RCD

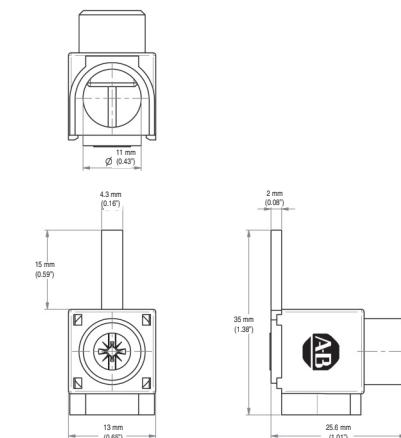
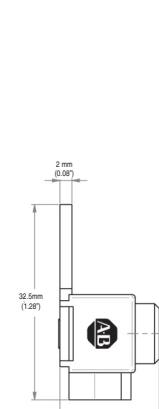


## Bus Bar Accessory Approximate Dimensions

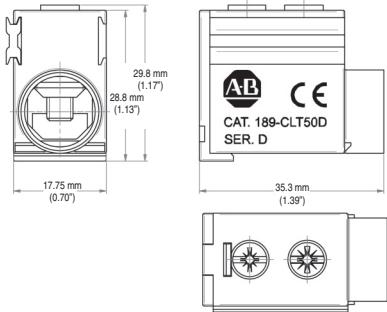
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



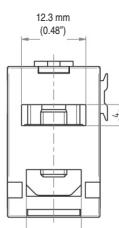
189-CLT25



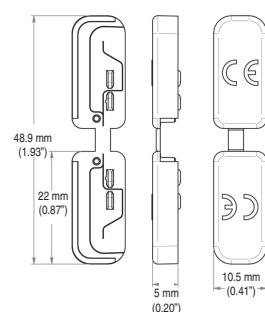
189-CLT50



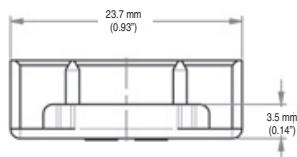
189-CLT50D



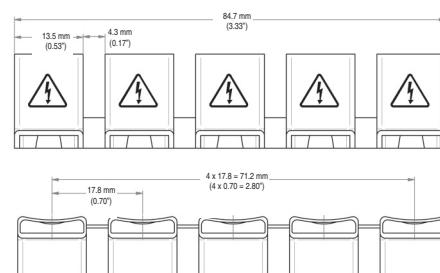
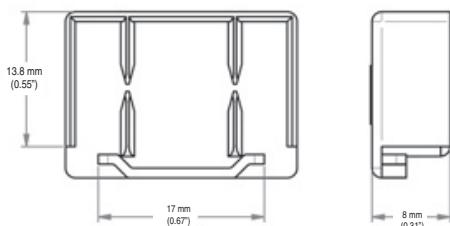
189-CL1EC



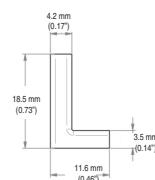
189-CL3EC

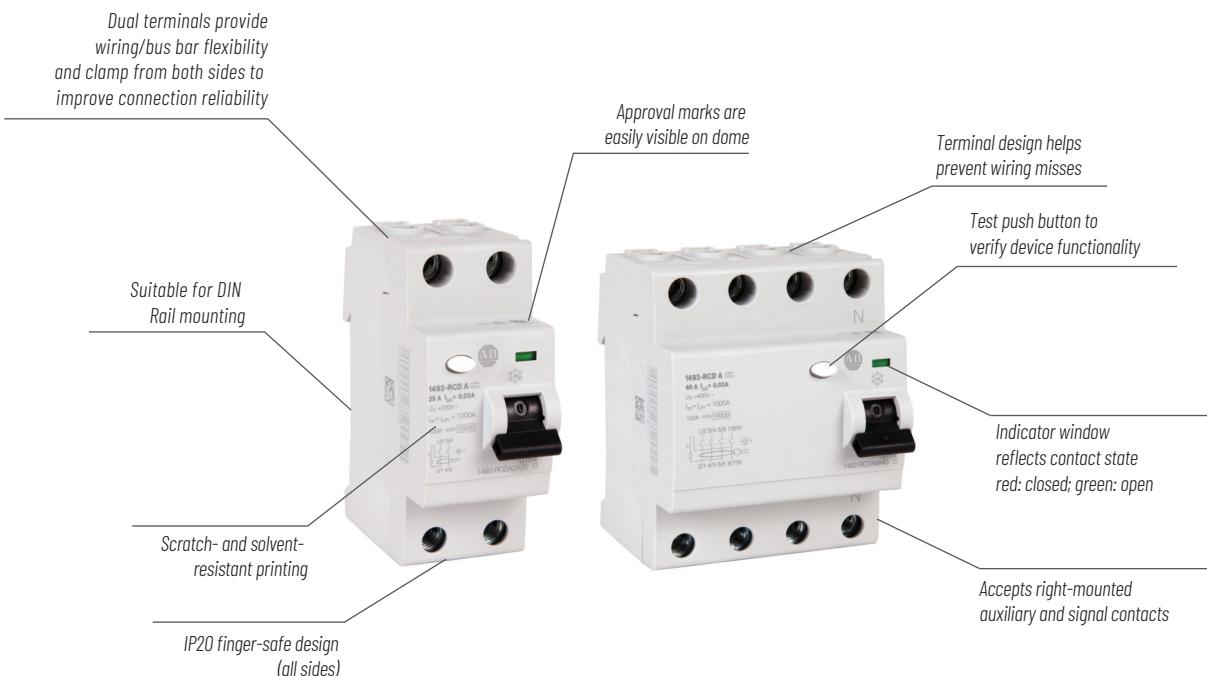


189-CL4EC



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.

- 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	
<b>Current Ratings</b>	25, 40, 63, 80 A
<b>Rated Sensitivity <math>I_{A_n}</math></b>	30, 100, 300, 500 mA
<b>Poles</b>	2, 4
<b>Standards Compliance</b>	UL 1053 ANSI/NFPA 70 EN 61008 <sup>(1)</sup> CSA C22.2 No.144 GB 16916
<b>Certifications</b>	cURus Recognized, File No. E53935 CE Marked CCC Certified VDE Certified <sup>(1)</sup> RCM Certified RoHS Compliant

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1492 - **RCDA** **2** **A** **25**

**a**      **b**      **c**      **d**      **e**      **f**

<b>a</b> <b>Type</b>	
<b>Code</b>	<b>Description</b>
RCDA	Residual Current Device, Type A

<b>b</b> <b>Poles</b>	
<b>Code</b>	<b>Description</b>
2	2-Pole
4	4-Pole

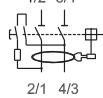
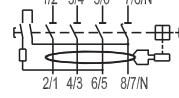
<b>c</b> <b>Sensitivity <math>I\Delta_n</math></b>	
<b>Code</b>	<b>Rated Sensitivity [mA]</b>
A	30
B	100
C	300
D	500

<b>d</b> <b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
25	25
40	40
63	63
80	80

<b>e</b> <b>Delay Option</b> (available on select 4-pole devices)	
<b>Code</b>	<b>Description</b>
	Can be left blank
S	With Delay

<b>f</b> <b>United States 110V Option</b> (available on select 30 mA sensitivity versions)	
<b>Code</b>	<b>Description</b>
	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]	$U_t \text{ min} = 110V$	$U_t \text{ min} = 170V$	$U_t \text{ min} = 110V$	With Delay	$U_t \text{ min} = 170V$
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

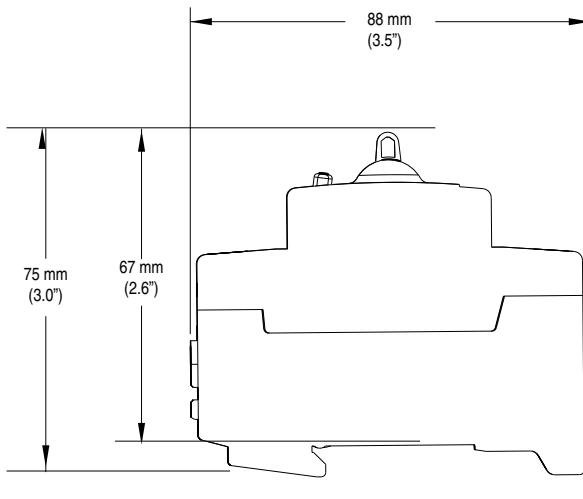
General Data	
Poles	2, 4
Rated current ( $I_n$ )	25, 40, 63, 80 A
Rated sensitivity $I_{\Delta n}$	2-pole 30, 100, 300 mA
	4-pole 30, 100, 300, 500 mA
Electrical Ratings	
Rated short-circuit strength	10 kA with 63 A gG/gL back-up fuse,
	10 kA with 80 A gG/gL back-up fuse for 80 A device
Rated operational 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 <sup>(1)</sup>
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 82](#).

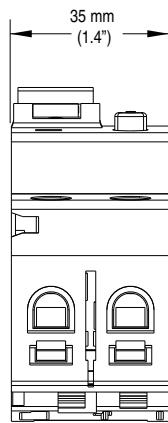
Installation		
Terminal type		Dual terminal
Cross-section of wire - solid, stranded, flexible (front/back terminal slot)	25...63 A	25/25 mm <sup>2</sup>
		18...4 AWG
	80 A	35/35 mm <sup>2</sup>
		18...2 AWG
Cross-section of bus bars (front/back terminal slot)	25...63 A	10/10 mm <sup>2</sup>
	80 A	16/16 mm <sup>2</sup>
Tightening torque	25...63 A	2.8 N•m
		25 in•lb
	80 A	4.8 N•m
		43 in•lb
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
	4-pole	88 x 67 x 70 mm
Weight	2-pole	200 g (7.1 oz.)
	4-pole	350 g (12.3 oz.)
Combination with Auxiliary Elements		
Auxiliary contact		Yes
Signal contact		Yes
Power Loss Due to Current		
Rated Current	Power Loss 2-pole	Power Loss 4-pole
[A]	[W]	[W]
25	1	1.3
40	2.4	3.2
63	3.2	4.4
80	8.8	33.3

# Approximate Dimensions

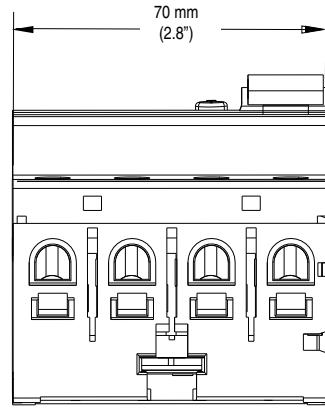
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



2-, 4-Pole



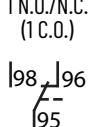
2-Pole



4-Pole

# Accessories

## Right Mount

Photo	Product Description (1) (2) (3)	Contacts	Standards	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC 2 A @ 60 V (DC-13)	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-ASCR3
		1 N.O./N.C. (1 C.O.) - 4   - 1 - 2 - 1   - 1 - 2 - 3 -	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 @ 480 V AC 2 A @ 277 V AC 1.5 A @ 125 V DC 2 A @ 60 V DC 4 A @ 24 V DC 2 A @ 60 V (DC-13)	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 1.5 A @ 110 V (DC-12) 1 A @ 220 V (DC-12) 4 A @ 24 V (DC-13) 2 A @ 60 V (DC-13)	189-AR3
		1 N.O. + 1 N.C. - 1   - 1 - 3 - 2   - 1 - 4 1 - 2 -	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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AR11
		2 N.C. - 1   - 1 - 1 - 2   - 1 - 2 1 - 2 -	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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AR02
		2 N.O. - 3   - 1 - 3 - 4   - 1 - 4 1 - 2 -	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 @ 400 V AC 2 A @ 230 V AC 1 A @ 50 V DC 2 A @ 30 V DC	2 A @ 230 V (AC-14) 1 A @ 400 V (AC-14) 2 A @ 30V (DC-12) 1 A @ 50 V (DC-12) 2 A @ 30 V (DC-13) 1 A @ 50 V (DC-13)	189-AR20

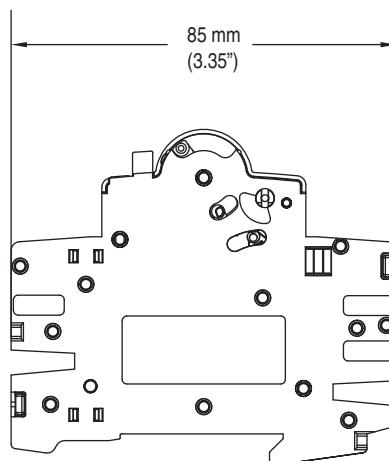
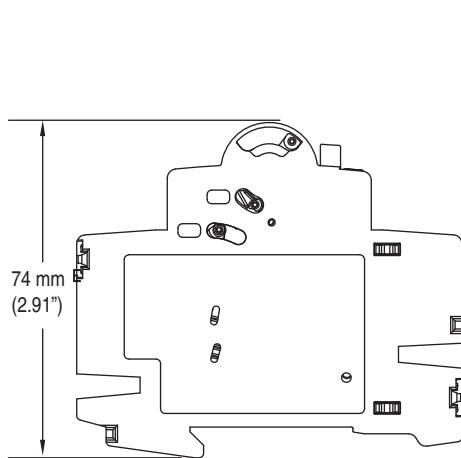
(1) A maximum of one C.O. type signal contact, and one C.O. type auxiliary contact **OR** two C.O. type auxiliary contacts may be installed per 1492-RCD.

(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.

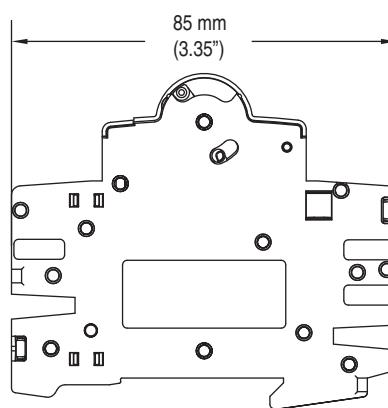
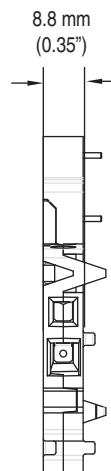
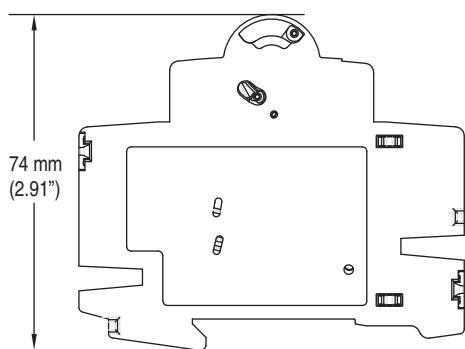
(3) A maximum of three accessories of any type may be installed per 1492-RCD. The signal contact must be mounted closest to the RCD, then the auxiliary contact(s). For allowed combinations, and installation instructions please contact your local Rockwell Automation sales office or Allen-Bradley distributor.

## Accessory Approximate Dimensions

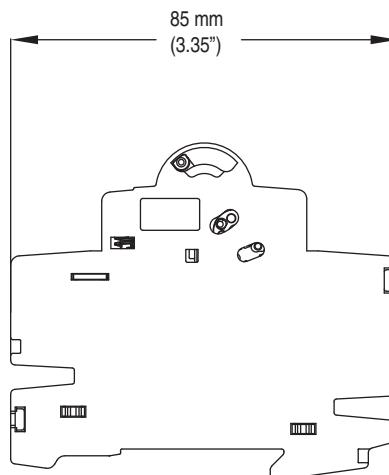
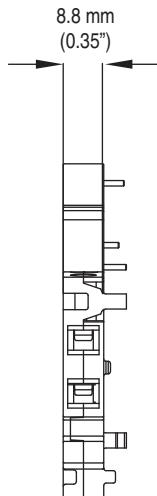
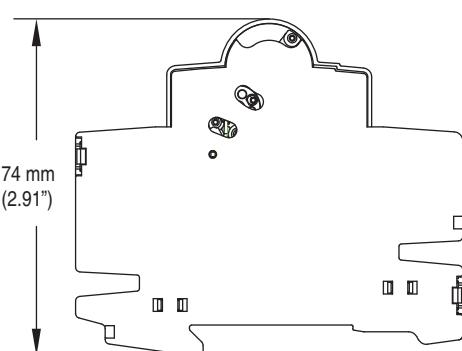
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



189-ASCR3



189-AR3



189-AR11, 189-AR02, 189-AR20

# Bus Bars

## 1492-RCD Cuttable Bus Bars

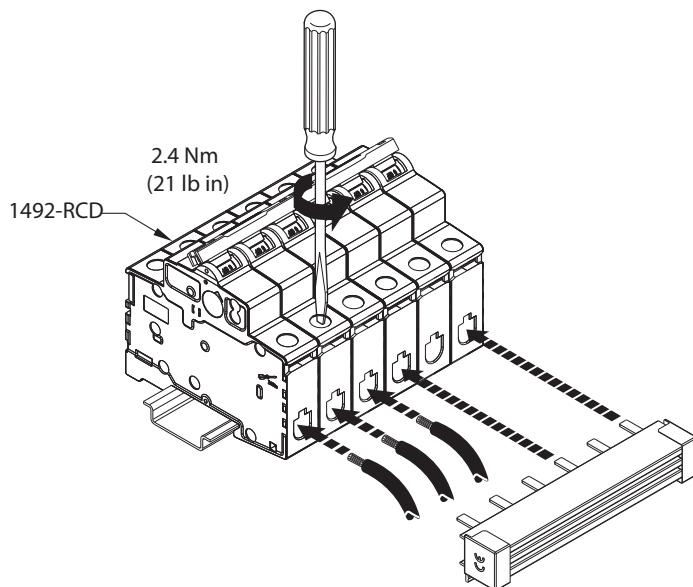
Description	Pins	Pkg. Qty.	Cat. No. (1)
2-Phase MCB to RCD	4	10	189-CL204
4-Phase MCB to RCD	8	10	189-CL408

## 1492-RCD Bus Bar Accessories

Description	Pkg. Qty.	Cat. No. (1)
Terminal Power Feed, 6...25 mm <sup>2</sup>	10	189-CLT25
Terminal Power Feed, 6...50 mm <sup>2</sup>	10	189-CLT50
Dedicated Power Feed, 50 mm <sup>2</sup>	10	189-CLT50D
For 2-phase bus bar <sup>(2)</sup>	10	189-CL3EC
For 4-phase bus bar	10	189-CL4EC
Protective Shroud for unused pins	10	189-CLPS

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

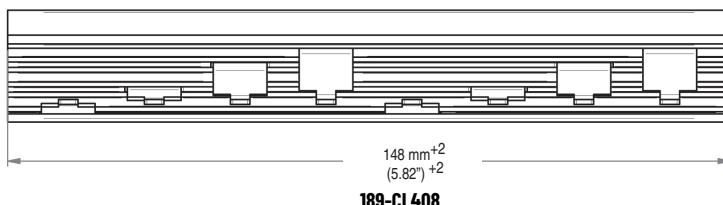
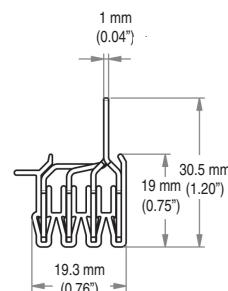
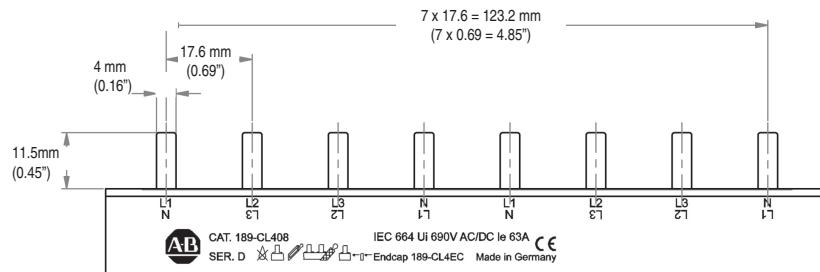
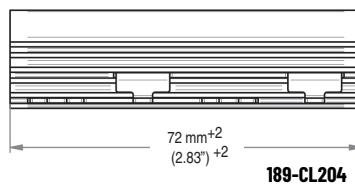
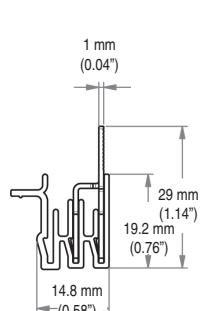
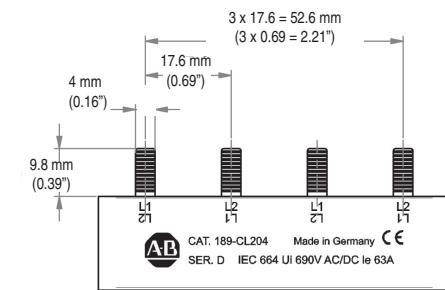
(2) 189-CL3EC also used for 2- and 3-phase MCB bus bars.



## Bus Bar Approximate Dimensions

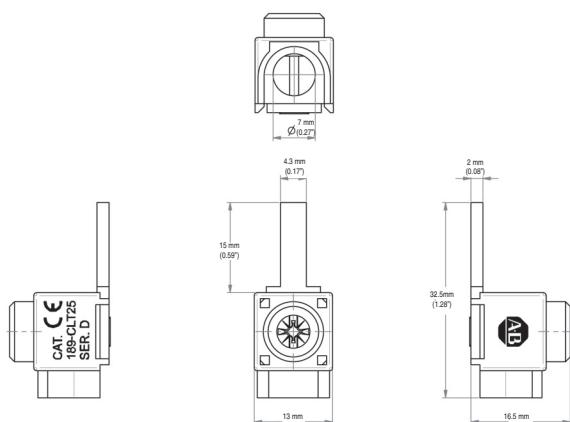
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

### 2- and 4-Phase Bus Bars

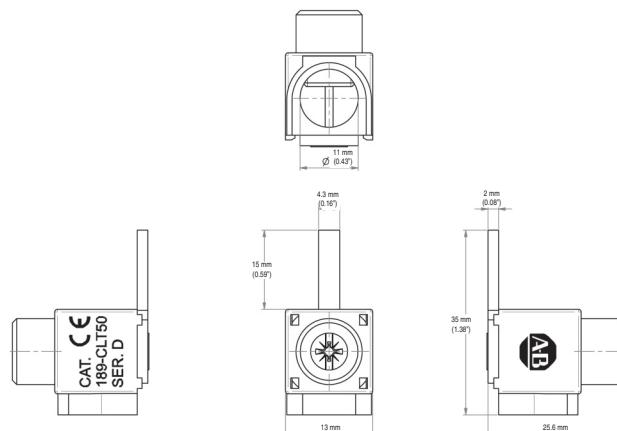


## Bus Bar Accessory Approximate Dimensions

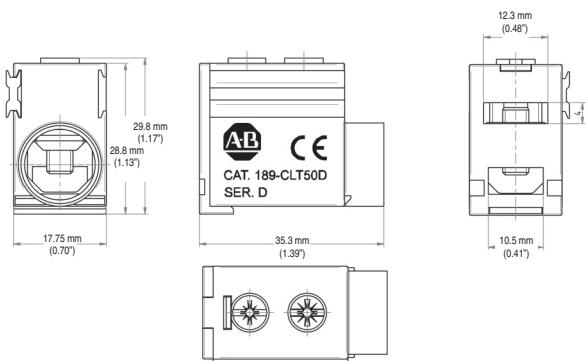
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



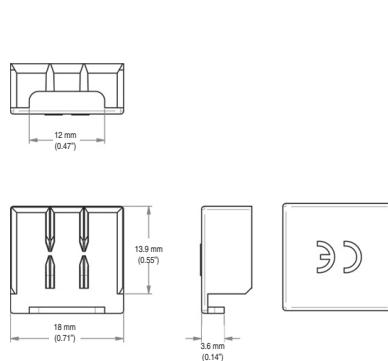
189-CLT25



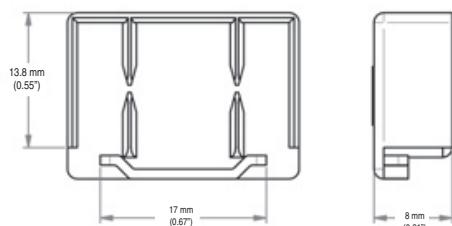
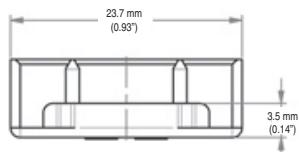
189-CLT50



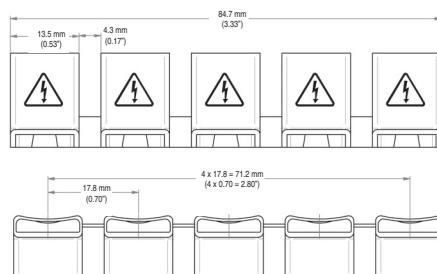
189-CLT50D



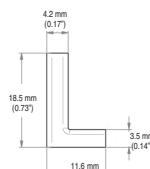
189-CL3EC

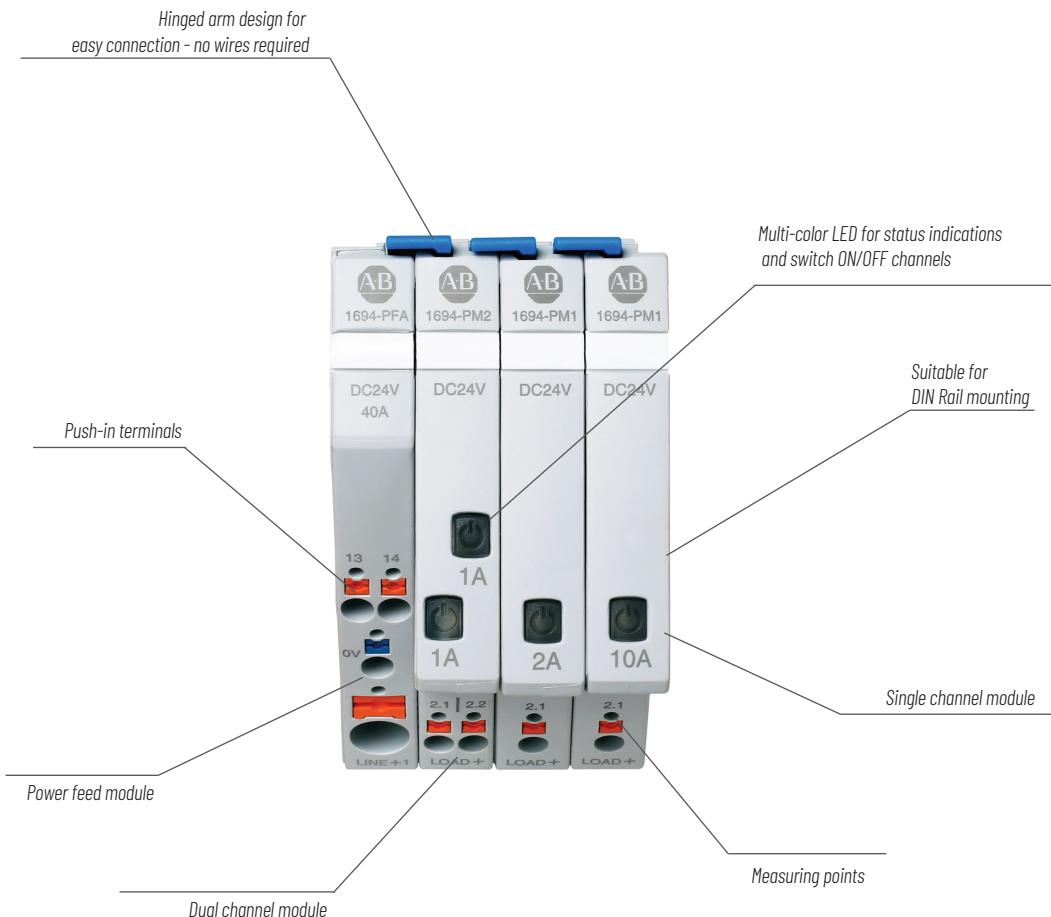


189-CL4EC



189-CLPS



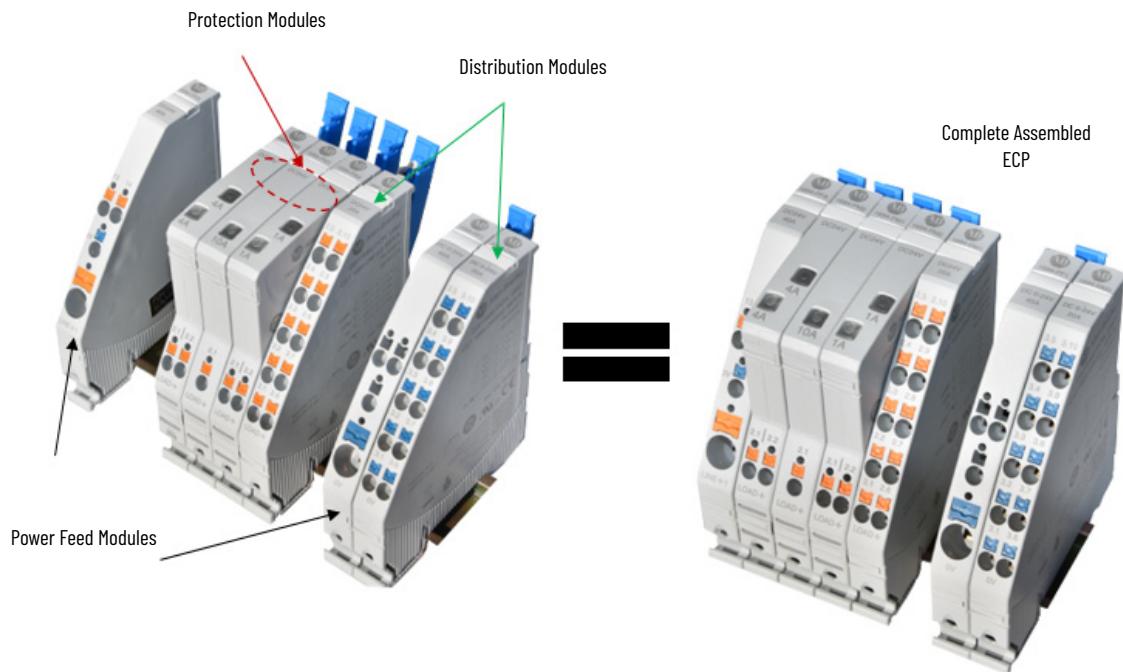


Bulletin 1694 Electronic Circuit Protection (ECP) Modules protect the secondary circuit of 24V DC switched mode power supplies. The modular system can handle multiple channels or 40 A of total current consumption. Designed for 24V DC circuits, 1694 Electronic Circuit Protectors provide comprehensive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

- Clear status indication by means of multicolor 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	
<b>Voltage</b>	24V DC (18...30V DC)
<b>Output Current</b>	1 A...10 A (1-channel) 1 A/1 A...6 A/6 A (2-channel) 1 A...4 A NEC Class 2
<b>Standards Compliance</b>	UL 2367, File No. E350272 UL 1310 NEC Class 2 cULus508, File No. E56639
<b>Certifications</b>	CE Marked RoHS Compliant China RoHS Morocco EMC WEEE

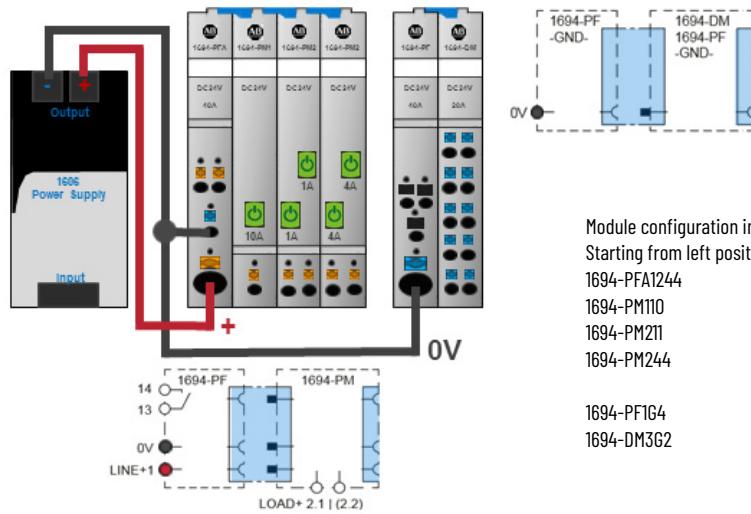
# Assembly Example



# 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.

## 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

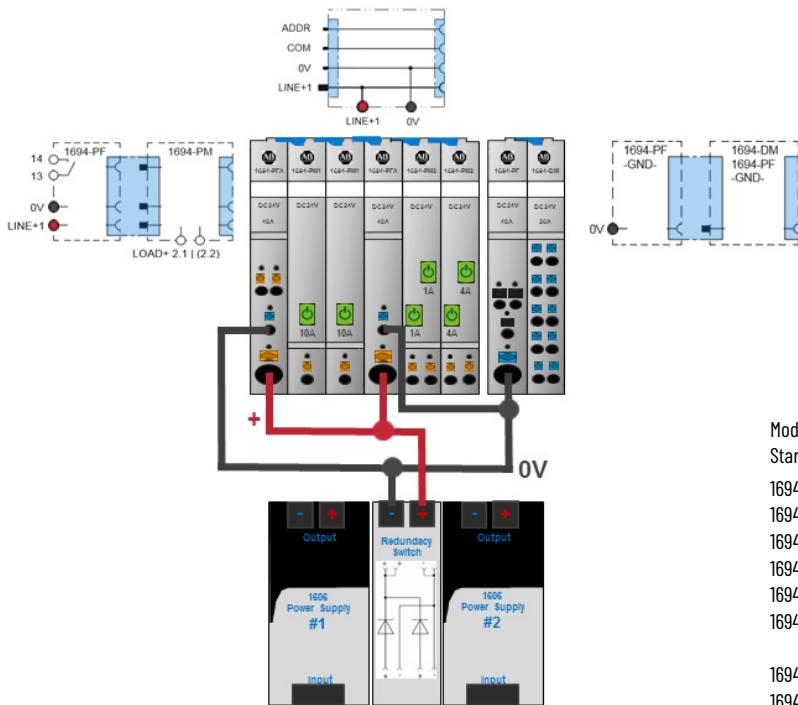
1694-PM244

1694-PF1G4

1694-DM3G2

## 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, catalog number 1694-PFA1244 can be used for signalizing tripping information to PLC.



Module configuration in sample schematic diagram

Starting from left position:

1694-PFA1244<sup>(a)</sup>

1694-PM110

1694-PM110

1694-PF3L4C

1694-PM211

1694-PM244

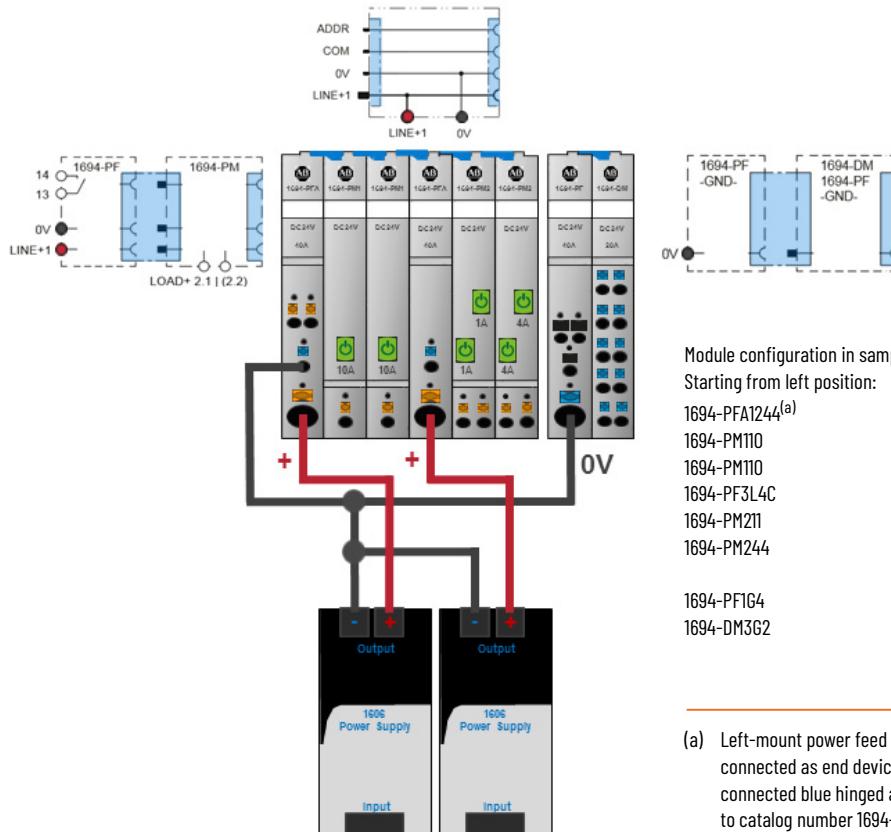
1694-PFIG4

1694-DM3G2

- (a) Left-mount power feed catalog number 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 catalog number 1694-PM110).

## 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, catalog number 1694-PFA1244 can be used for signalizing tripping information to PLC.



Module configuration in sample schematic diagram

Starting from left position:

1694-PFA1244<sup>(a)</sup>

1694-PM110

1694-PM110

1694-PF3L4C

1694-PM211

1694-PM244

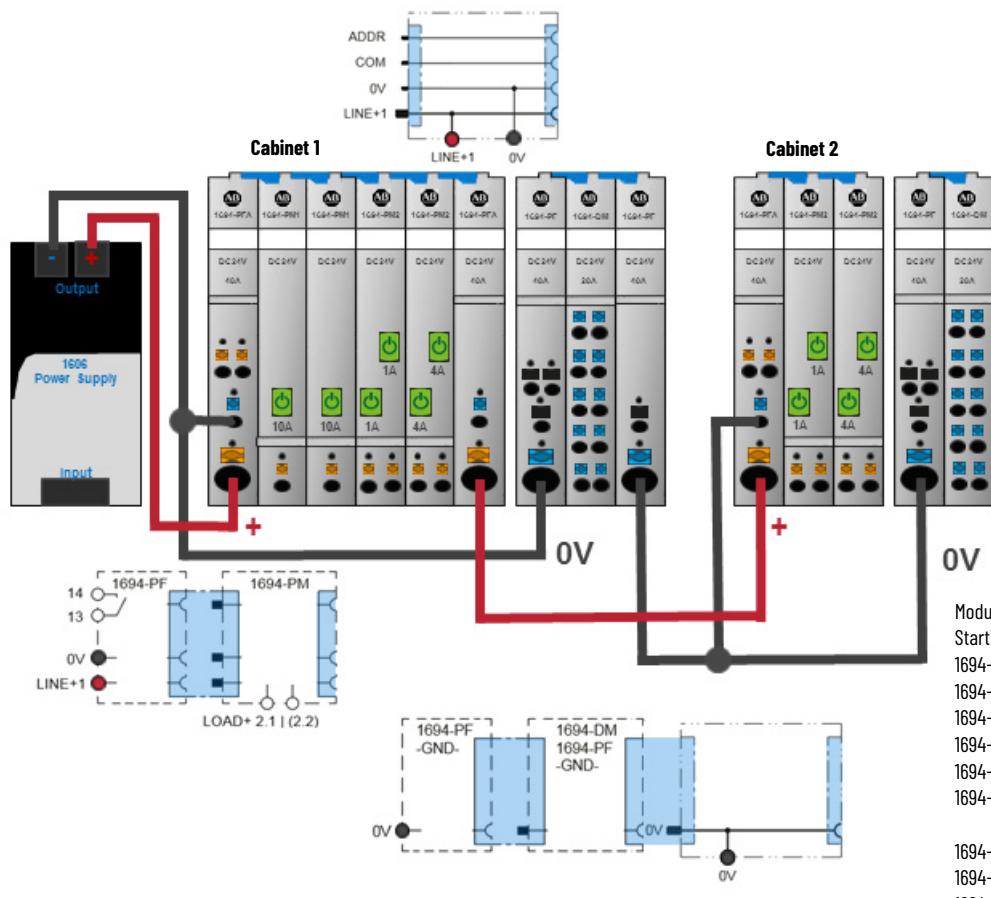
1694-PF1G4

1694-DM36G

- (a) Left-mount power feed catalog number 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 catalog number 1694-PM110).

## 1694-PF3L4C Mid or Right Mount Power Feed Module

Typical application: the mid/right mount power feed module catalog number 1694-PF3L4C can be used for distributing the 24V DC (+ and 0V) to another decentralized cabinet. Power consumption of 1694 assembly in Cabinet 1 and power consumption of 1694 assembly in Cabinet 2 cannot exceed 40 A.

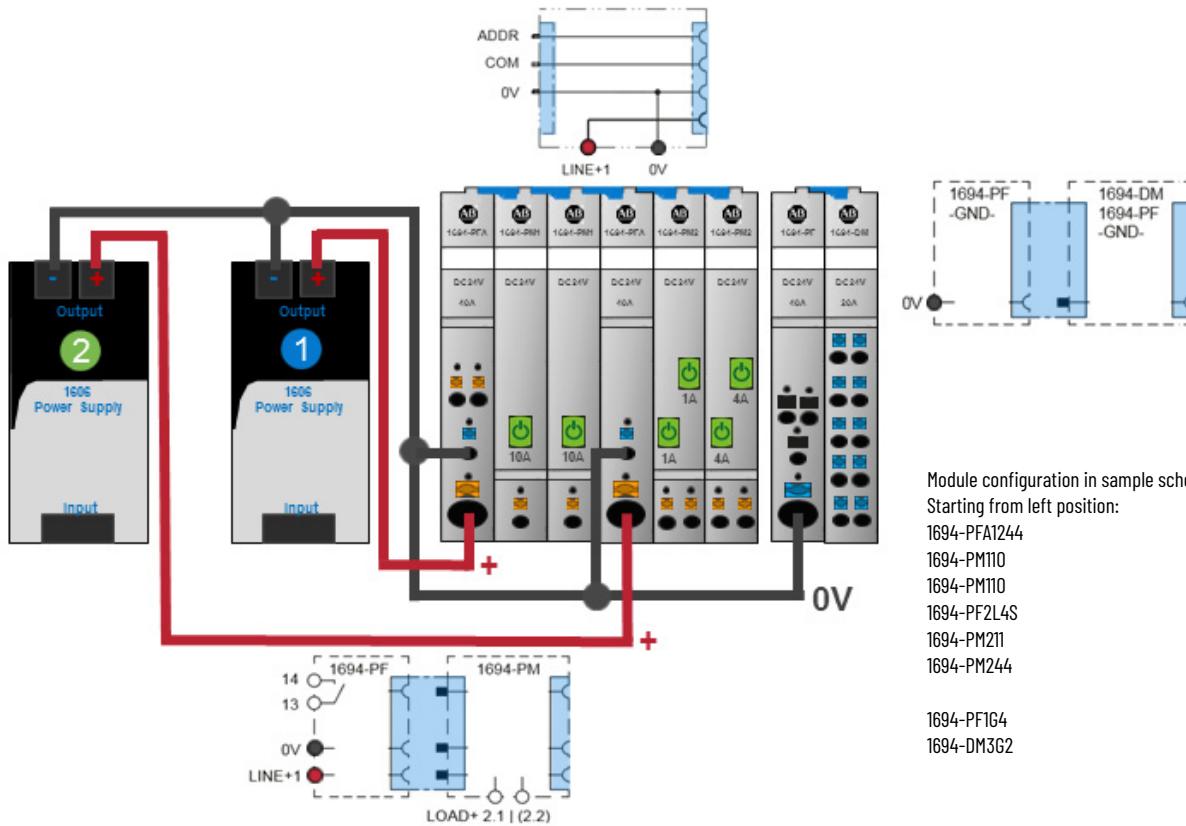


Module configuration in sample schematic diagram  
Starting from left position (Cabinet 1 only):

- 1694-PFA1244
- 1694-PM110
- 1694-PM110
- 1694-PM211
- 1694-PM244
- 1694-PF3L4C
- 1694-PF1G4
- 1694-DM3G2
- 1694-PF3G4

## 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 left mount 1694-PFA1244. If a 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-PF2L4S

1694-PM211

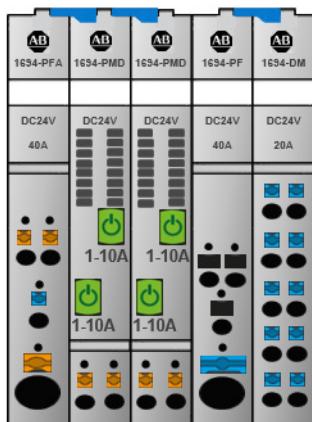
1694-PM244

1694-PF1G4

1694-DM3G2

## 1694-PMD2A10 Adjustable Current Protection Module

Protection Module, catalog number 1694-PMD2A10 can be used in standard, non-communicating assemblies. See following example:



Module configuration in sample schematic diagram  
Starting from left position:

1694-PFA1244

1694-PMD2A10

1694-PMD2A10

1694-PF1G4

1694-DM3G2

**IMPORTANT** Standard protection modules (1694-PM<sub>n</sub>) can not be used in I/O-Link configurations. For adjustable current Protection Module (Cat. No. 1694-PMD2A10) product selection, see 1694 Electronic Circuit Protectors - Communication Devices [Protection Modules](#) on page 106.

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

## Power Feed Modules<sup>(a)</sup>



1694 - **PFA** **1** **24** **4**

<b>a</b> Module Type		<b>b</b> Mounting Position		<b>c</b> Function	
Code	Description	Code	Description	Code	Description
PF	Power Feed Module Standard	1	Left	24	Line (24 V DC input)
PFA	Power Feed Module Standard with AUX Contact	2	Middle	L	Line
		3	Middle or Right	G	GND

<b>d</b> Max Current	
Code	Description
4	40 A
4C <sup>(1)</sup>	Line Connected
4S <sup>(1)</sup>	Line Separated

(1) With line option only.

## Protection Modules



1694 - **PM** **1** **4** - **CL2**

<b>a</b> Module Voltage		<b>b</b> Number of Channels		<b>c</b> Output Current Rating	
Code	Description	Code	Description	Code	Description
PM	Protection Module	1	1-channel	1	1 A
		2	2-channels	2	2 A
		3		3	3 A
		4		4	4 A
		6		6	6 A
		8		8	8 A
		10		10	10 A
		11		11	1 A, 1 A
		22		22	2 A, 2 A
		33		33	3 A, 3 A
		44		44	4 A, 4 A
		66		66	6 A, 6 A

<b>d</b> Rating	
Code	Description
blank	No options
CL2 <sup>(1)</sup>	Class 2

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

(a) For an adjustable current Protection Module, see 1694 Electronic Circuit Protectors - Communication Devices [Protection Modules on page 106](#).

## 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	GND

**d**

Max Current	
Code	Description
2	20 A

# Product Selection

## Power Feed Modules

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

## Protection Modules

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

## Distribution Modules

Description	Pkg. Qty.	Cat. No.
10 Terminals, 1xLINE, 9xLOAD, Imax 20A	1	1694-DM1L2
10 Terminals, 2xLINE, 4xLOAD, Imax 20A	1	1694-DM2L2
10 Terminals, Ground, Imax 20A	1	1694-DM3G2

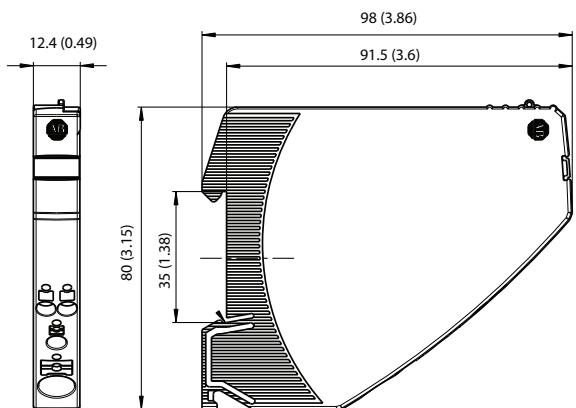
# Specifications

<b>Electrical Ratings</b>	
Operating voltage	24V DC (18...30V DC)
Operating current	Max. 40 A
Rated current	1...10 A fixed current
<b>Environmental</b>	
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
<b>Construction</b>	
Terminal wire gauge	Push-in terminal PT10 AWG20 ...AWG8 (0.5mm <sup>2</sup> to 10mm <sup>2</sup> ) Push-in terminal PT2.5 AWG24 ...AWG14 (0.14mm <sup>2</sup> to 2.5mm <sup>2</sup> )
Termination type	Push-in
Weight per module lb. (g)	approx. 0.13 (60)

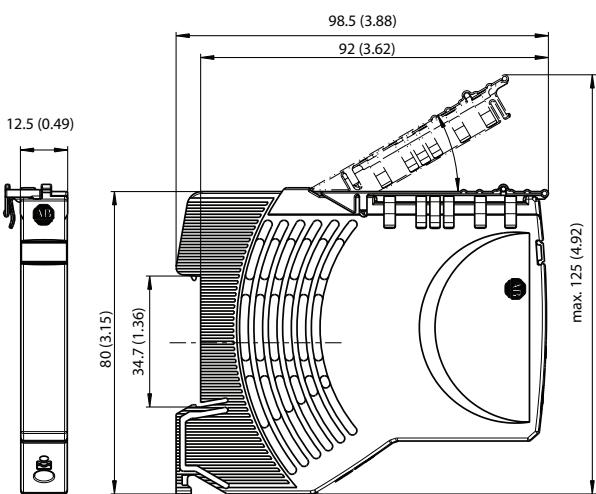
# Approximate Dimensions

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

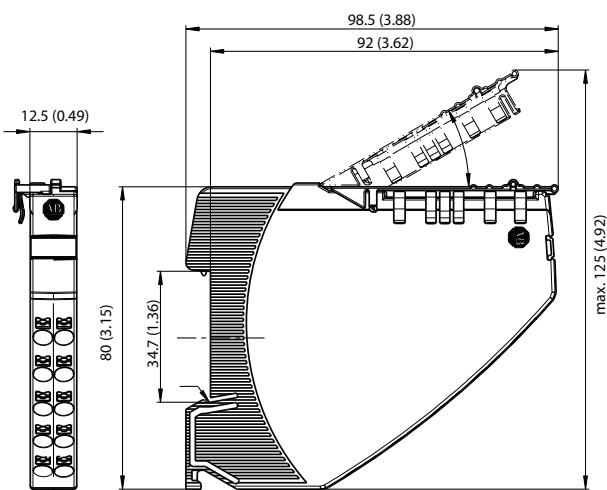
## Power Feed Modules



## Protection Modules



## Distribution Modules



## 1694 Electronic Circuit Protectors - Communication Devices



Bulletin 1694 Electronic Circuit Protection (ECP) offer the same basic functionality as the standard, non-communication devices of the 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 links, via a cable, to the IO-Link Master.

- 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	
<b>Voltage</b>	24V DC (18...30V DC)
<b>Output Current</b>	1A...10 A (1-channel) 1A/1A...6 A/6 A (2-channel) 1A...4 A NEC Class 2
<b>Standards Compliance</b>	UL 2367, File No. E350272 UL 1310 NEC Class 2 cULus508, File No. E56639
<b>Certifications</b>	CE Marked RoHS Compliant China RoHS Morocco EMC WEEE

# IO-Link Sample System

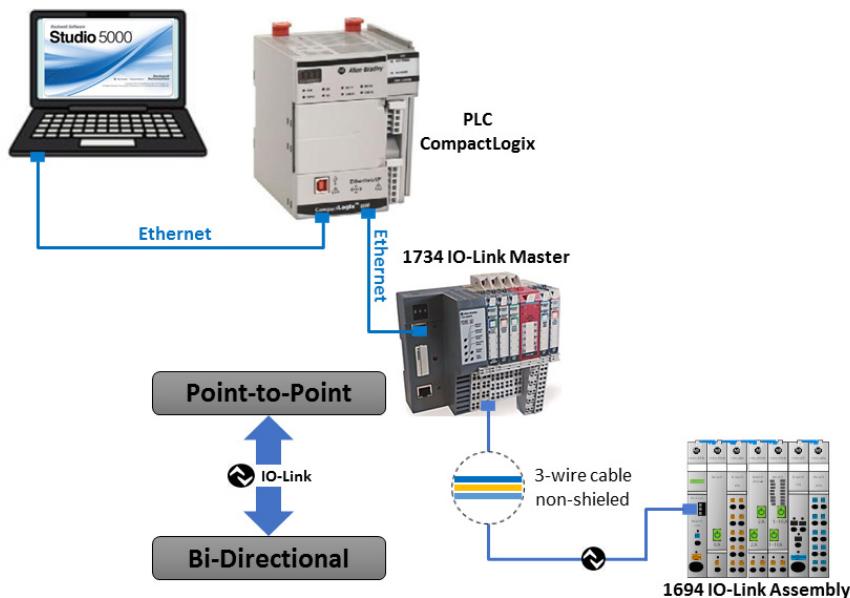
**IMPORTANT** This is a Rockwell Automation sample system. IO-Link communication works with any IO-Link Master/System components

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

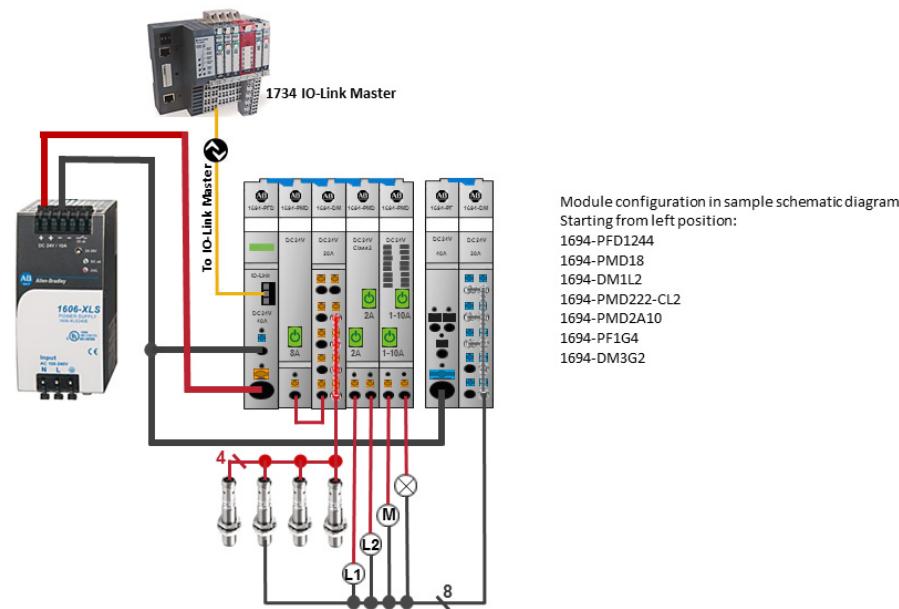
The IO-Link technology is an open point-to-point communication standard and was launched as (IS) IEC 61131-9. IO-Link is now the globally standardized technology developed initially mainly for sensor and actuator communication with a field bus system. This technology provides benefits to both original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



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

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

## Power Feed Module



1694 - **PFD** **1** **24** **4**

**a**

Module Type	
Code	Description
PFD	Power Feed Module IO-Link

**b**

Mounting Position	
Code	Description
1	Left

**c**

Function	
Code	Description
24	Line (24 V DC input)

**d**

Max Current	
Code	Description
4	40 A

## Protection Modules



1694 - **PMD** **1** **4** - **CL2**

**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

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

## Distribution Modules

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

# Product Selection

## Power Feed Module +24V DC (Line)

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

## Protection Modules

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

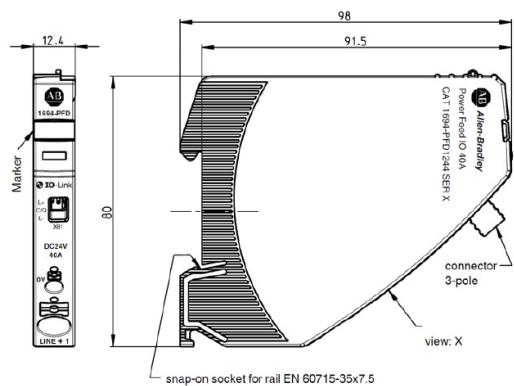
# Specifications

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 Push-in terminal PT2.5	AWG 20...8 (0.5...10mm <sup>2</sup> ) AWG 24...14 (0.14...2.5mm <sup>2</sup> )
Termination type	Push-in	
Weight per module lb. (g)	approx. 0.13 (60)	

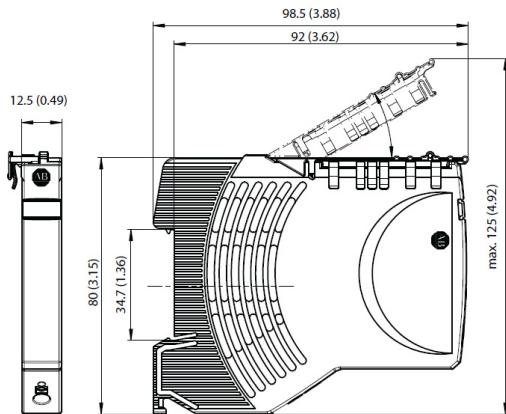
# Approximate Dimensions

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

## Power Feed Module



## Protection Modules





## 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.

- 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.

The 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.

The 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.

The 1492-MCGA devices are Ground Fault Circuit Interrupters (GFCIs) with inherit self test capability as required by the UL 943 standard.

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

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

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1492-MC	A a	A b	1 c	15 d
a	b	c	d	
<b>Device Type</b>				
<b>Code</b>	<b>Description</b>			
A	1/2 in. wide/pole (DIN Rail mounting)			
E	GFEP (30 mA)			
G	GFCI (5 mA)			
<b>Interrupting Capacity</b>				
<b>Code</b>	<b>Description</b>			
A	10 kA AIC			
AT	10 kA AIC – with self test capability (GFCI only)			
<b>Poles</b>				
<b>Code</b>	<b>Description</b>			
1	1-pole			
2	2-pole			
2H	(240V AC)			
3	3-pole			
<b>Rated Current (<math>I_n</math>)</b>				
<b>Code</b>	<b>Current [A]</b>			
10	10			
15	15			
20	20			
25	25			
30	30			
35	35			
40	40			
45	45			
50	50			
55	55			
60	60			

# Product Selection

## 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.	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	—	—	—

## 1492-MCE/MCG Ground Fault Circuit Breakers

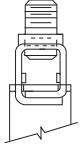
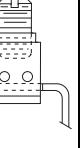
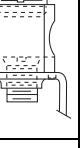
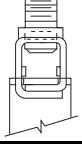
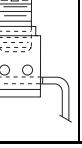
Photo	Continuous Ampere Rating @ 40 °C (104 °F)	Width per Pole	120V AC		120/240V AC <sup>(1)</sup>	
			1-Pole	2-Pole	1-Pole	2-Pole
			[A]	[in.]	Cat. No.	Cat. No.
<b>GFEP (30 mA Sensitivity)</b>						
	15	1	1492-MCEA115	1492-MCEA215	—	—
	20	1	1492-MCEA120	1492-MCEA220	—	—
	25	1	1492-MCEA125	1492-MCEA225	—	—
	30	1	1492-MCEA130	1492-MCEA230	—	—
	40	1	1492-MCEA140	1492-MCEA240	—	—
	50	1	—	1492-MCEA250	—	—
<b>GFCI (5 mA Sensitivity)</b>						
	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-MCAxxxx	1492-AMCAL1	1492-AMCALM
DIN Rail Adapter for GFCI and GFEP, use two per pole		1492-AMCDIN1	
Panel Mounting Clips for GFCI and GFEP, use two per device		1492-AMCP1	

## Terminals

Line and Load Terminals	Continuous Current Rating	Wire Type	Wire Range [AWG]	Terminal Torque	Line Strip Length	Cat. No.
 	10...60 A	Copper (Cu)	14...10	20 lb•in (2.3 N•m)	7/16 in.	1492-MCAxxxx
			8	25 lb•in (2.8 N•m)		
			6...4	27 lb•in (3.0 N•m)		
 	15...50 A	Copper (Cu)	14...10	20 lb•in (2.3 N•m)	9/16 in.	1492-MCExxxx
			8	25 lb•in (2.8 N•m)	—	
 			6...4	27 lb•in (3.0 N•m)	—	1492-MCGATxxx

# 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] <sup>(1)</sup>	AC Rating [kA]	DC Rating [kA] <sup>(1)</sup>
1492-MCAA1xx	120/240	24, 48, 62.5	10	3
1492-MCAA2xx				3
1492-MCAA2Hxx	240	24, 48, 62.5	10	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	120/240 <sup>(1)</sup>	10	
1492-MCEA2xx	120/240 <sup>(1)</sup>			
1492-MCGAT1xx	120			
1492-MCGAT2xx	120/240 <sup>(1)</sup>			

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

# 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 Rockwell Automation 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.

## Continuous Current Rating

Bulletin 1492-MC circuit breakers are rated in RMS amperes at a 40 °C (104 °F) ambient temperature 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's rating should be loaded to no more than 80%, if 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.

Guidelines established in NEC, CEC, UL, and CSA should be used to determine the specific device. The examples on page, also apply to the 1492-MC devices.

## 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.

The user should select devices that meet this requirement.

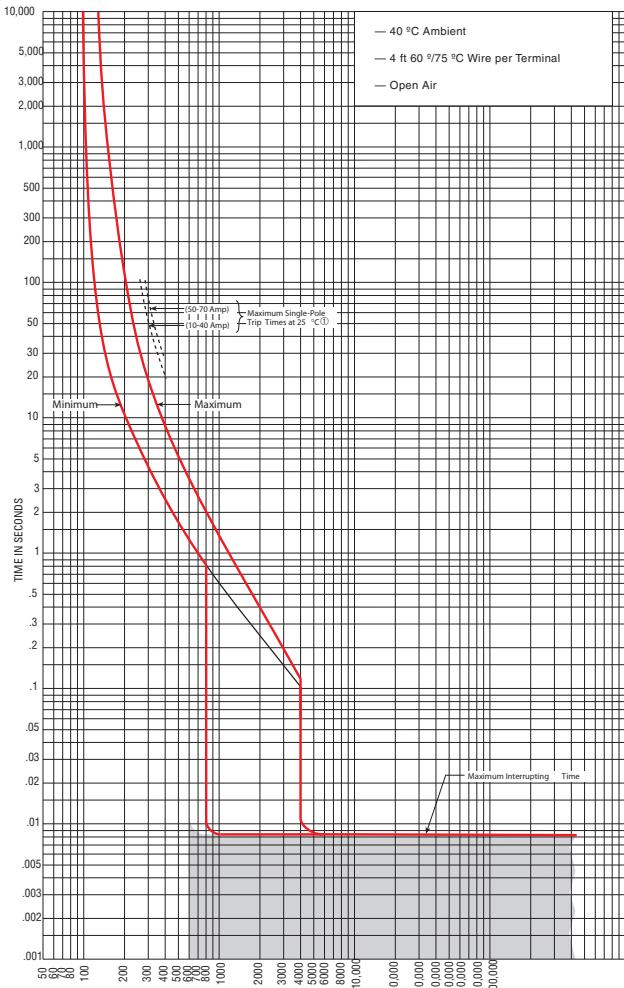
References: NEC 240.12. Also see CEC.

## Self Test Capability (GFCI only)

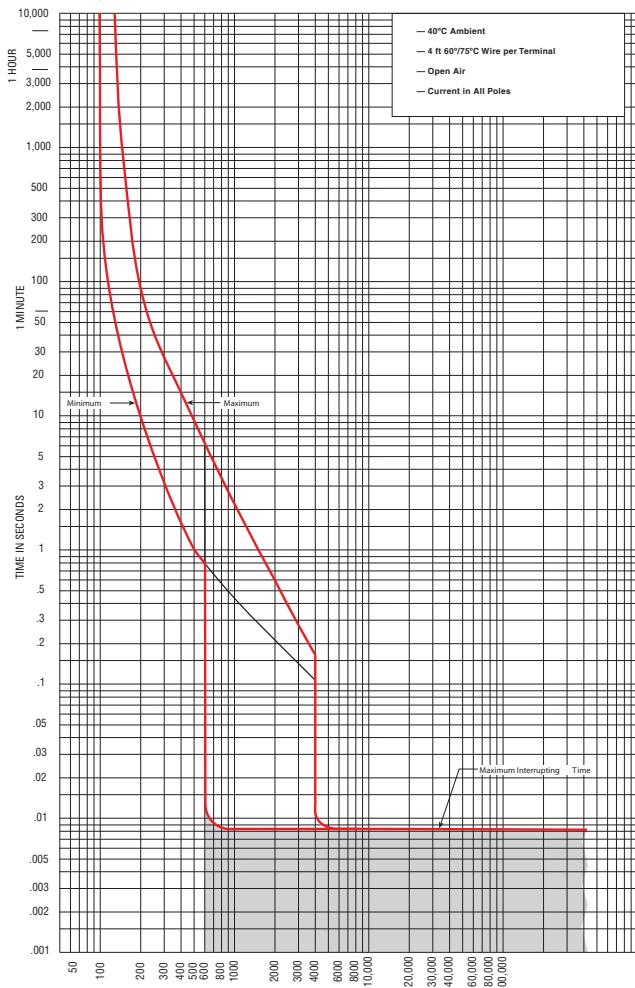
Per UL 943 (5.16 / 6.30), GFCI devices have built-in self test capability. The self test is an internal, automated function running in the background. For more information please refer to UL 943 standard.

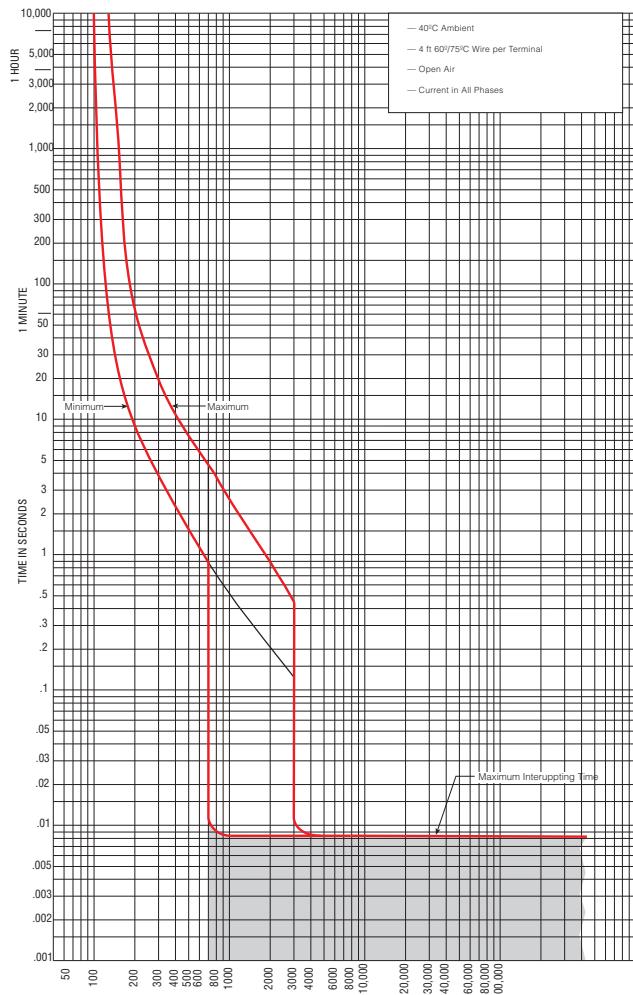
# Tripping Characteristics

Time Current Curve — 1-Pole Circuit Breaker



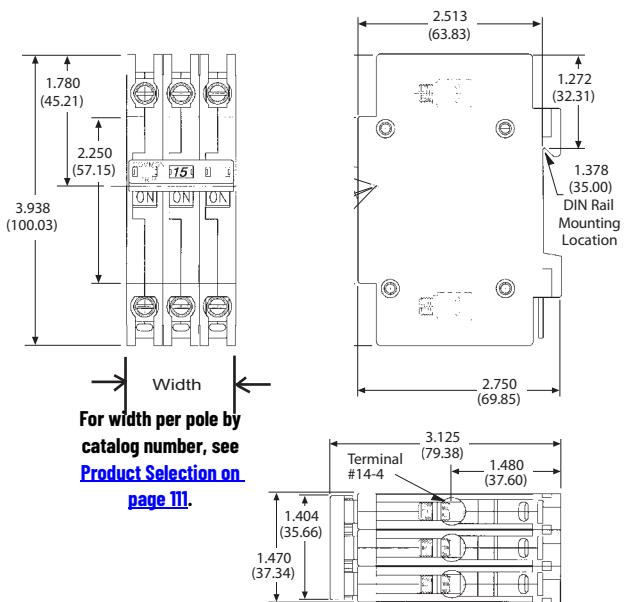
Time Current Curve — 2-Pole Circuit Breaker



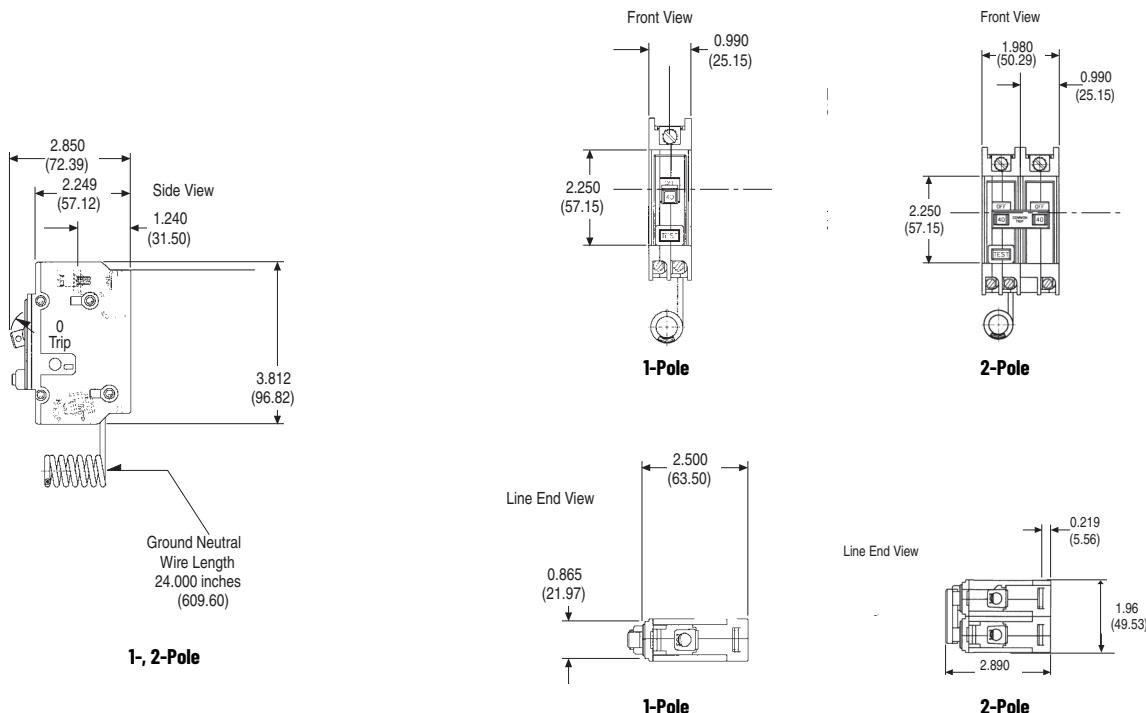
**Time Current Curve — 3-Pole Circuit Breaker**

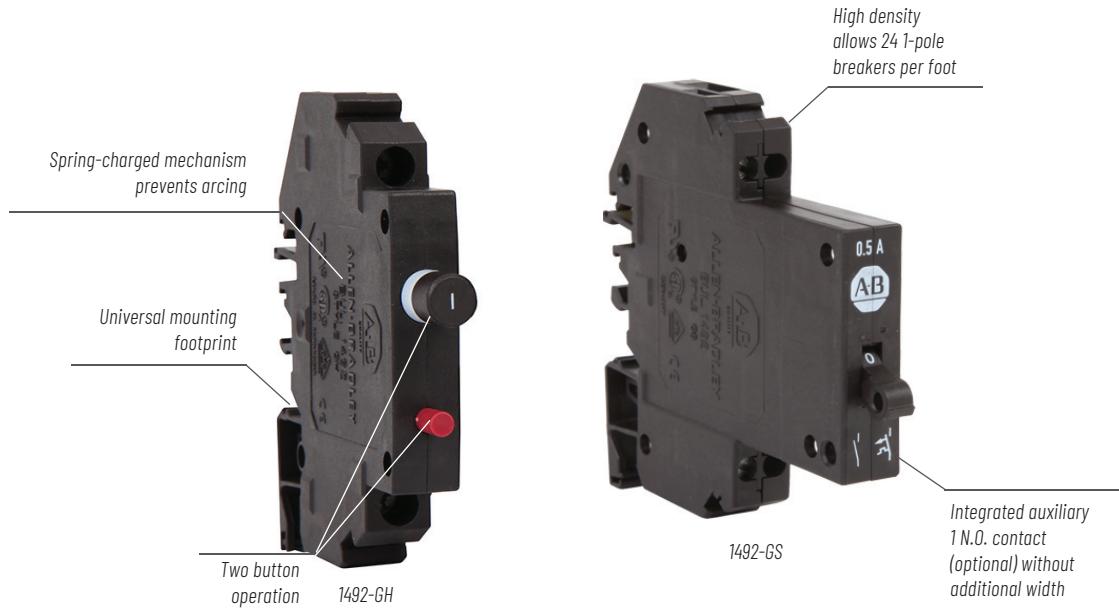
# Approximate Dimensions

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



**1-, 2-, 3-Pole (3-Pole shown)**





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.

- 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-GH Supplementary Protectors

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

## 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 given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

1492 - **GH** **002**  
**a**      **b**

<b>a</b>	
<b>Poles</b>	
<b>Code</b>	<b>Description</b>
GH	1-Pole

<b>b</b>	
<b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
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 - **GS1G** **002** **H1**  
**a**      **b**      **c**

<b>a</b>	
<b>Poles</b>	
<b>Code</b>	<b>Description</b>
GS1G	1-Pole
GS2G	2-Pole
GS3G	3-Pole

<b>b</b>	
<b>Rated Current (<math>I_n</math>)</b>	
<b>Code</b>	<b>Current [A]</b>
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

<b>c</b>	
<b>Auxiliary Contact</b>	
<b>Code</b>	<b>Description</b>
	Can be left blank
H1	With 1 N.O. integrated auxiliary contact

# Product Selection

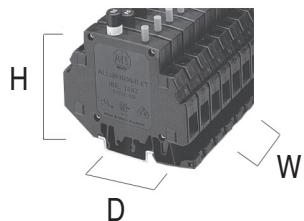
Amperage [A]	1492-GH	1492-GS		
	1-Pole	1-Pole	2-Pole	3-Pole
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
0.2	1492-GH002	1492-GS1G002	1492-GS2G002	1492-GS3G002
0.5	1492-GH005	1492-GS1G005	1492-GS2G005	1492-GS3G005
0.8	1492-GH008	1492-GS1G008	1492-GS2G008	1492-GS3G008
1	1492-GH010	1492-GS1G010	1492-GS2G010	1492-GS3G010
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 (only one may be added per device)		

# Specifications

	<b>1492-GH</b>	<b>1492-GS</b>					
	<b>1-Pole</b>	<b>1-Pole</b>	<b>2-Pole</b>	<b>3-Pole</b>			
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	6000 operations @ rated current						
Housing material	Glass-filled Polyamide 6.6						
Shock	25 G, 11 ms duration						
Vibration	5 G (10...500 Hz)						
Dielectric strength	1500V AC	1600V 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.



	<b>1492-GH</b>	<b>1492-GS</b>		
	<b>1-Pole</b>	<b>1-Pole</b>	<b>2-Pole</b>	<b>3-Pole</b>
Height	3.15 in. (80 mm)		3.15 in. (80 mm)	
Depth	2.89 in. (73.4 mm)		3.48 in. (88.5 mm)	
Width	0.49 in. (12.4 mm)	0.49 in. (12.5 mm)	0.98 in. (25 mm)	1.47 in. (37.5 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/minature 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
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.

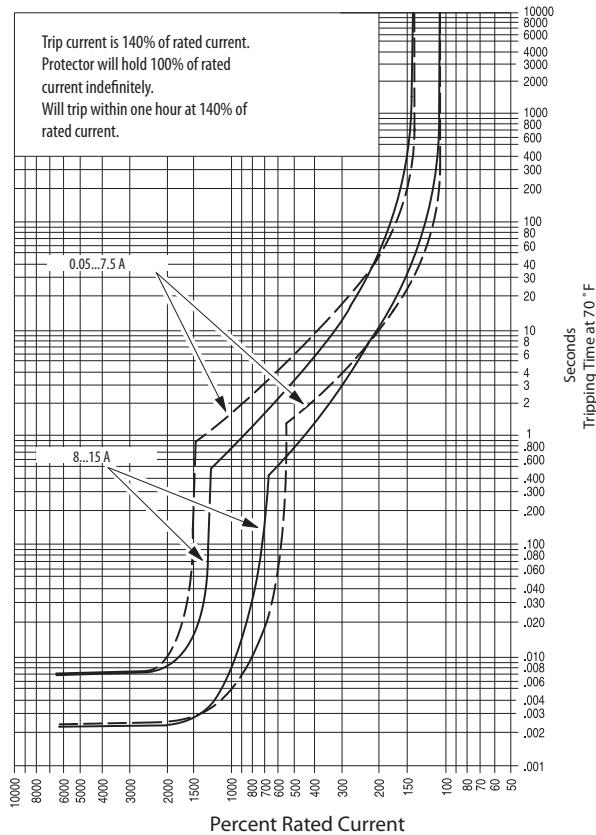
**EXAMPLE** For a solenoid with sealed current of 0.5 A, an inrush ratio of 1:8, and an ambient temperature of +110 °F,  $(0.5 \times 1.7 \times 1.15 = 0.9775)$ , select the 1.0 A miniature circuit breaker. Tripping time of the miniature circuit breaker is determined from the table below. Divide the 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

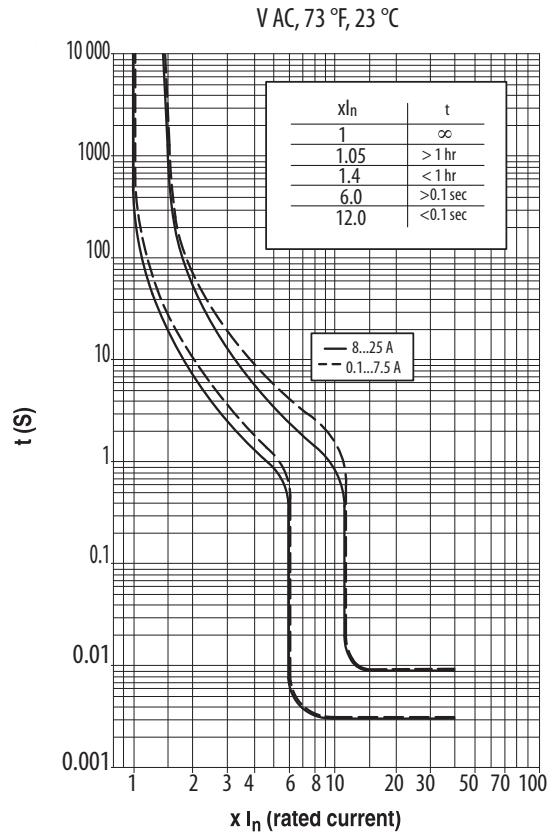
When several breakers are rail mounted adjacent to each other, the no-trip current will be 80% of rated current at 70 °F (21.1 °C). Using selection tables, select Bulletin 1492-GH/GS that allows full load current nearest without exceeding application current. Also, check that inrush current is less than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

# Tripping Characteristics

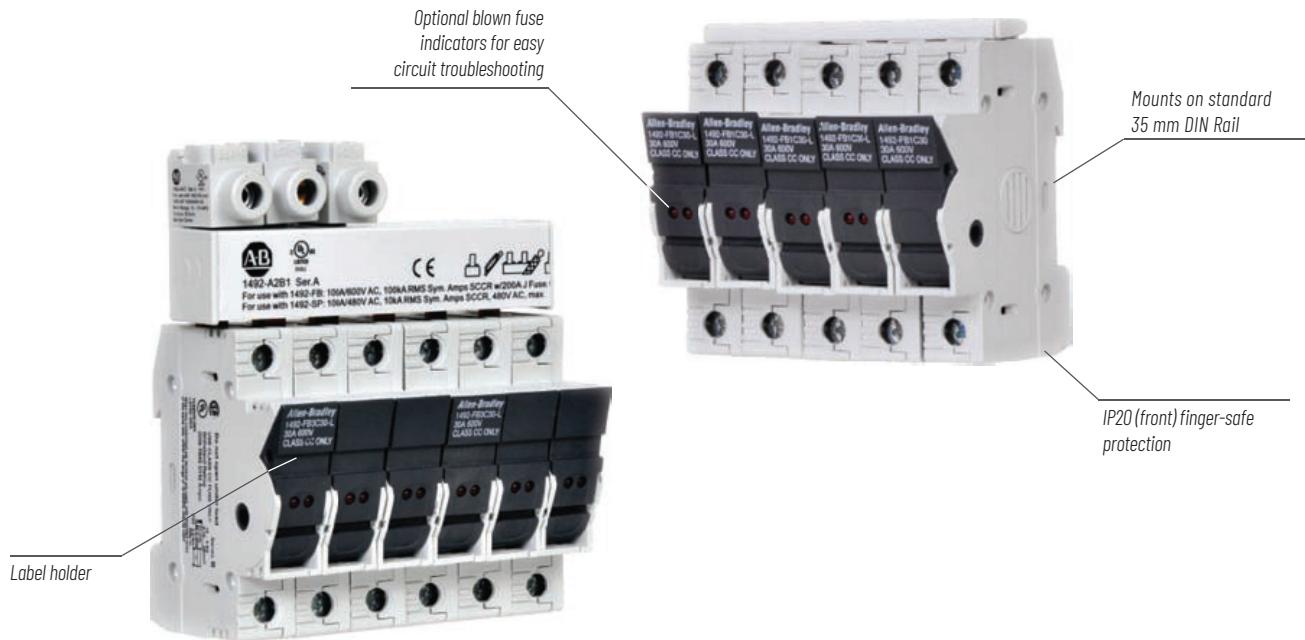
Time Current Curve -1492-GH



Time Current Curve -1492-GS



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



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 Midget fuses. To support correct fuse type installation, the Class CC fuse holder is designed to reject a Midget fuse or international 10 x 38 mm fuse. The Class J fuse holder will reject all fuses other than a Class J fuse.

All Allen-Bradley Class CC, J, and Midget 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 Midget fuse holder is also CE Marked for 10 x 38 mm IEC Midget fuses.

- 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	Midget 30 A Class CC 30 A Class J 30 A Class J 60 A	
Standards Compliance	Midget	UL 4248-1 CSA 22.2 No. 39 EN 60947-1 & 3
	Class CC	UL 4248-4 CSA 22.2 No. 39
Certifications	Class J	UL 4248-8 CSA 22.2 No. 39
	UL Listed, File No. E34648 CSA Certified, File No. 71101 CE Marked RoHS Compliant	

# Catalog Number Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; some combinations may not produce a valid catalog number.

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	Midget Type 30 Amp
C30	C Class 30 Amp
J30 <sup>(1)</sup>	J Class 30 Amp
J60 <sup>(1)</sup>	J Class 60 Amp

**c**

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

(1) Bus bars do not fit on Class J fuse holders.

# Product Selection

Description		For Midget Fuse	For Class CC Fuse	For Class J Fuse <sup>(1)</sup>	
		30 A	30 A <sup>(2)</sup>	30 A	60 A
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
1-Pole	Fuse Block	1492-FB1M30	1492-FB1C30	1492-FB1J30	1492-FB1J60
	Fuse Block with Indication, 110...600V (3)	1492-FB1M30-L	1492-FB1C30-L	1492-FB1J30-L	1492-FB1J60-L
	Fuse Block with Indication, 12...72V	1492-FB1M30-D1	1492-FB1C30-D1	—	—
	Pieces per Carton	12	12	6	6
2-Pole	Fuse Block	1492-FB2M30	1492-FB2C30	1492-FB2J30	1492-FB2J60
	Fuse Block with Indication, 110...600V (3)	1492-FB2M30-L	1492-FB2C30-L	1492-FB2J30-L	1492-FB2J60-L
	Pieces per Carton	6	6	3	3
	Fuse Block	1492-FB3M30	1492-FB3C30	1492-FB3J30	1492-FB3J60
3-Pole	Fuse Block with Indication, 110...600V (3)	1492-FB3M30-L	1492-FB3C30-L	1492-FB3J30-L	1492-FB3J60-L
	Pieces per Carton	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. Due to 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.

## Accessories

Description	Size	Pkg. Quantity	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

# Specifications

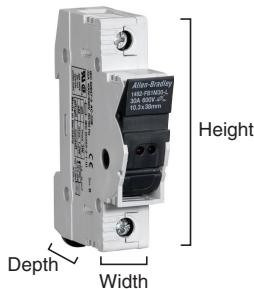
Product Type (n = number of poles)	M	CC	J30 <sup>(1)</sup>	J60 <sup>(1)</sup>		
	1492-FBnM30 "B" 1492-FBnM30-D1 "B" 1492-FBnM30-L "B"	1492-FBnC30 "B" 1492-FBnC30-D1 "B" 1492-FBnC30-L "B"	1492-FBnJ30 "B" 1492-FBnJ30-L "B"	1492-FBnJ60 "B" 1492-FBnJ60-L "B"		
For Fuse Type:	Midget 13/32" x 1-1/2" (10 x 38 mm)		Class CC			
Maximum voltage AC/DC	600V, 690V (IEC)		600V			
Maximum current	30 A, 32 A (IEC)		30 A	60 A		
Maximum current withstand (UL/CSA)	Fuse dependent 50 kA max UL	200 kA sym		200 kA sym		
Operating temperature range	-4...+130 °F, -20...+55 °C					
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 <sup>2</sup> )	#18...1 AWG (0.75...50 mm <sup>2</sup> )	#14...1 AWG (2.5...50 mm <sup>2</sup> )		
	2 wires <sup>(2)</sup> per terminal	#18...8 AWG (0.75...10 mm <sup>2</sup> )	#18...6 AWG (0.75...16 mm <sup>2</sup> )	#14...6 AWG (2.5...16 mm <sup>2</sup> )		
Terminal tightening torque	#18...8 AWG: 22 lb•in #6...4 AWG: 26 lb•in 0.75...25 mm <sup>2</sup> : 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	For Midget Fuse		For Class CC 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)
	2-Pole	1.41 in. (36 mm)	1.41 in. (36 mm)	2.83 in. (72 mm)
	3-Pole	2.13 in. (54 mm)	2.13 in. (54 mm)	4.25 in. (108 mm)

# Bus Bars

## 1492-FB Bus Bars<sup>(1)</sup>

Description	Pins	Rated Current [A] <sup>(2)</sup>	Pkg. Qty.	Cat. No. (3)
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

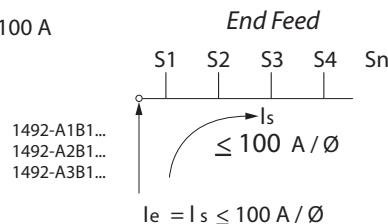
(1) Bus bars do not fit on Class J fuse holders.

(2) Refer to the diagrams below for Feeder Terminal & Bus Bar Current Distribution

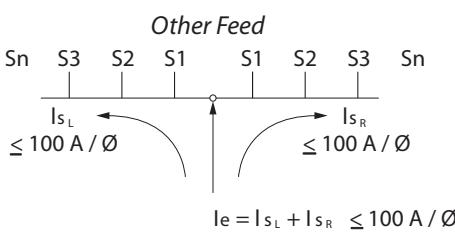
(3) cULus, UL508, EN 60947-1, CE Marked

## Feeder Terminal & Bus Bar Current Distribution

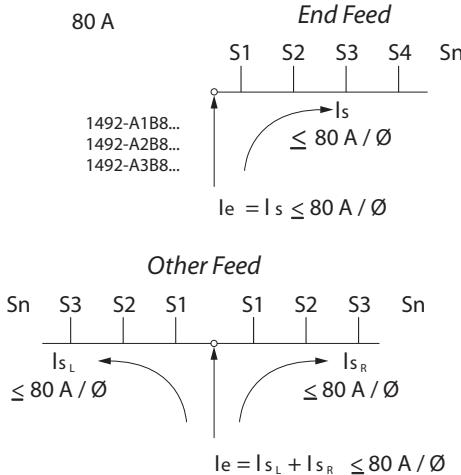
100 A



End Feed

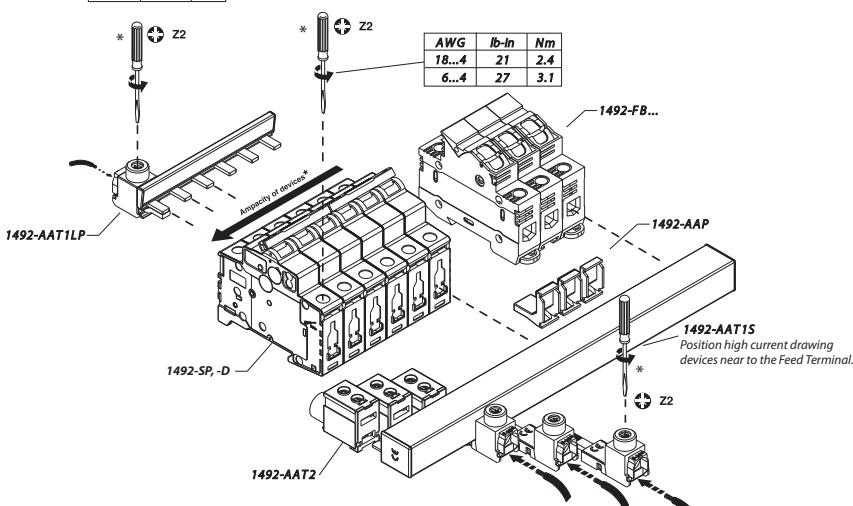


80 A



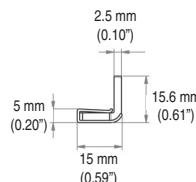
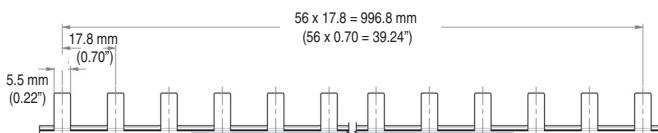
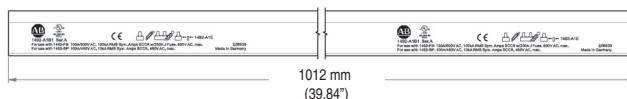
\* AWG      lb-in      Nm

10...1.0      50      5.5

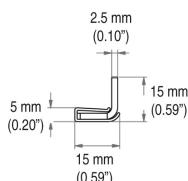
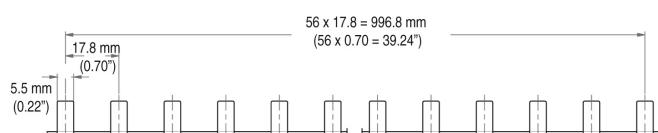
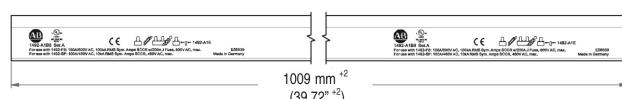


## Bus Bar Approximate Dimensions

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

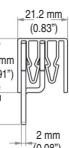
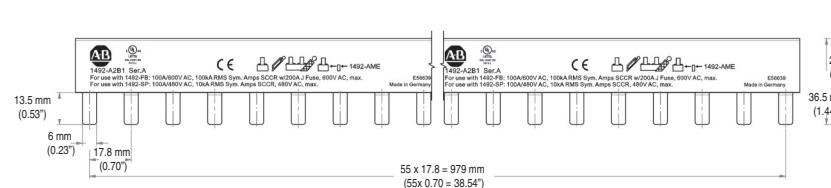


1492-A1B1

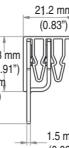
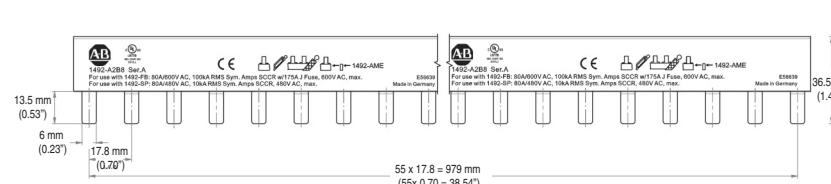
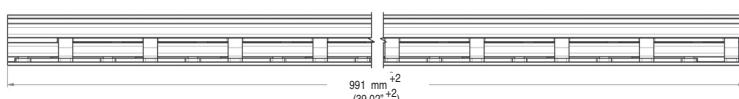


1492-A1B8

## 2-Phase Bus Bars

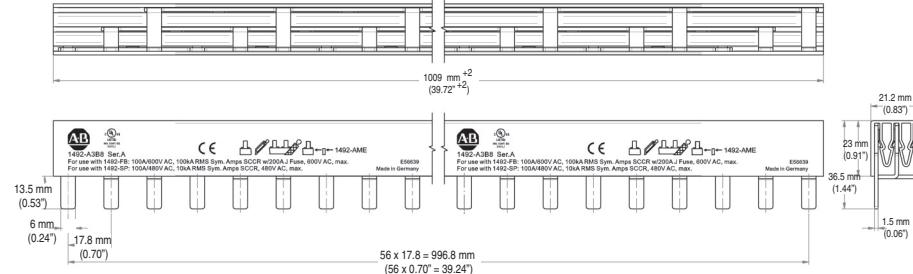
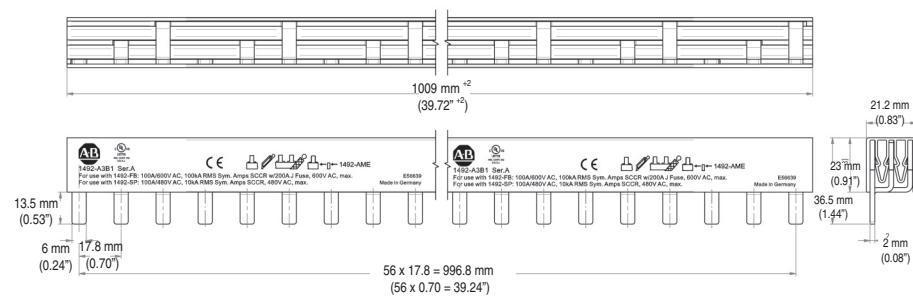


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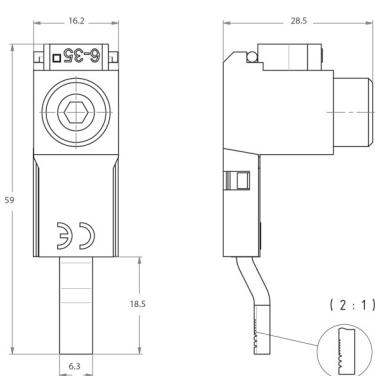
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Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

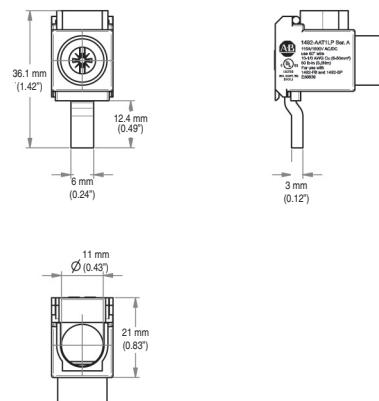
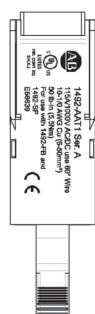


## Bus Bar Accessory Approximate Dimensions

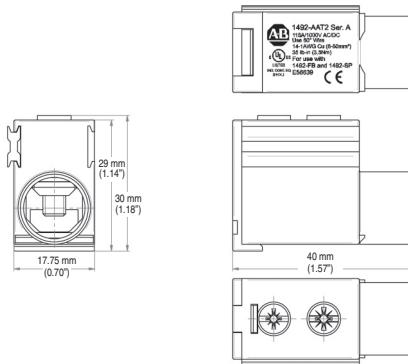
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



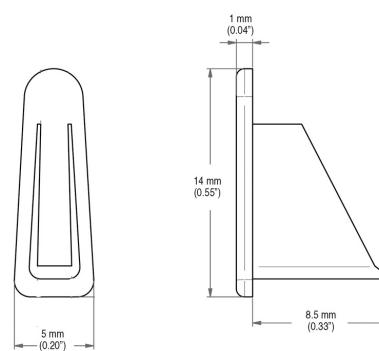
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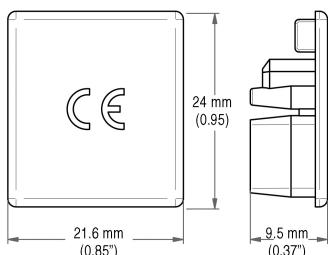
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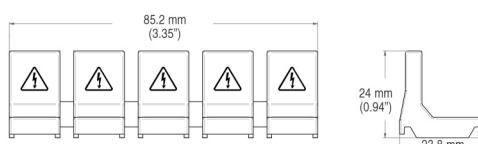
1492-AAT2



1492-A1E



1492-AME



1492-AAP

**Notes:**

## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Circuit Breaker Brochure, <a href="#">140G-BR001</a>	Overview of the full line of Allen-Bradley® circuit breakers and motor protection devices.
EtherNet/IP Network Devices User Manual, <a href="#">ENET-UM006</a>	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, <a href="#">ENET-RM002</a>	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, <a href="#">SECURE-RM001</a>	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.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication <a href="#">IC-TD002</a>	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 <a href="#">SGI-11</a>	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 <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="#">rok.auto/certifications</a> .	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at [rok.auto/literature](#).

# Rockwell Automation Support

Use these resources to access support information.

<b>Technical Support Center</b>	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	<a href="http://rok.auto/support">rok.auto/support</a>
<b>Knowledgebase</b>	Access Knowledgebase articles.	<a href="http://rok.auto/knowledgebase">rok.auto/knowledgebase</a>
<b>Local Technical Support Phone Numbers</b>	Locate the telephone number for your country.	<a href="http://rok.auto/phonesupport">rok.auto/phonesupport</a>
<b>Literature Library</b>	Find installation instructions, manuals, brochures, and technical data publications.	<a href="http://rok.auto/literature">rok.auto/literature</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	<a href="http://rok.auto/pcdc">rok.auto/pcdc</a>

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Rockwell Automation maintains current product environmental compliance information on its website at [rok.auto/pec](http://rok.auto/pec).

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