

DC MINIATURE CIRCUIT BREAKERS



c3controls' line of Series 1110 Direct Current (DC) Miniature Circuit Breakers (MCBs) provide reliable short circuit and overload protection for all your DC industrial control, transportation, energy storage system and photovoltaic applications. Our DC MCBs offer a wide range of pole sizes, amperage ranges, and trip curves providing superior performance and flexible application environments.



Section 34

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PROVEN



Conformity to Standards:
DC Miniature Circuit Breakers
 UL 489B
 CSA C22.2 No. 305

Certifications:
 UL File#: E533935
 UL File#: E533935

Accessories:
 UL 489

UL File#: E508090

Visit c3controls.com to download product certifications.

NOTE: The scope (range, description, price, specifications, dimensions, etc.) of the product featured in this section is subject to change without notice. Refer to c3controls.com for product updates.

DC MINIATURE CIRCUIT BREAKERS

c3controls knows the importance of clean energy in ensuring a more sustainable future. That's why we're proud to offer Direct Current Miniature Circuit Breakers to support and protect the transition to renewable energy and mission critical applications.

DELIVERING SUPERIOR PRODUCT QUALITY AND MANUFACTURING EXCELLENCE

<p>✓ Proven</p>	<p>Our Series 1110 DC Miniature Circuit Breakers are UL Listed per UL489B, the standard for DC photovoltaic systems and are compliant to the RoHS directives. </p>
<p>✓ Compact</p>	<p>Only 17.5mm wide per pole for reduced panel area and lower installed costs.</p>
<p>✓ Wide Range of Operation</p>	<p>Rated 250V DC per pole for up to 1000V DC with current ratings from 0.5A to 63A.</p>
<p>✓ Easy to Install</p>	<p>35mm DIN rail mounting for fast and easy installation and removal.</p>
<p>✓ Visible Markings</p>	<p>High visibility labels and markings can be seen from the front and side of the device for easy identification.</p>
<p>✓ Added Safety</p>	<p>Line and load side IP20 guarded finger-safe terminals prevent accidental contact with live parts, while allowing ring, fork, and bare wire connections.</p>
<p>✓ Customizable Options</p>	<p>With up to 10 shorting link / jumper configurations, there is a plethora of options to suit all applications.</p>
<p>✓ Limited Lifetime Warranty*</p>	<p>Every product is backed by our limited lifetime warranty—unmatched in the industry—bringing you quality components that perform in the most demanding applications.</p>
<p>✓ Advantage Pricing</p>	<p>Our approach to product development, manufacturing, and focus on servicing the OEM and Electrical Equipment Builder reduces cost. The result—the best value in the industry.</p>

*See c3controls Terms & Conditions

Single Pole



Two Pole



Three Pole



Four Pole



UNIQUE PRODUCT LINE FEATURES

FULL-RANGE CIRCUIT PROTECTION



Available in one, two, three, and four pole constructions, C or D trip curves, and include both magnetic and thermal elements for overload and short circuit protection.

SHORT CIRCUIT CURRENT RATING



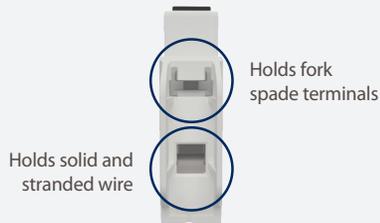
10kA short circuit current rating on all constructions — the highest interruption rating in the market.

TRIP-FREE DESIGN



Holding the operating handle in the ON position will not prevent the miniature circuit breaker from tripping.

WIRING MADE EASY



Holds fork spade terminals

Holds solid and stranded wire

Captive screws make it impossible to lose screws when wiring and our box lug design terminals will accept a wide range of copper wire sizes.

POLARIZED DESIGN



Provides an extra grade of unidirectional protection for overloads and short circuits. Correct wiring is required to achieve circuit protection performance.

SAFETY



All c3controls miniature circuit breakers have built-in IP20 finger-safe protection from accidental contact. Also, breaker status is clearly indicated via the color-coded status window.

FIND IT FAST

DC Miniature Circuit Breakers



- Certifications
- Specifications
- Dimension Drawings
- Installation Instructions
- Easy to Buy

www.c3controls.com

IT'S EASY TO BUILD YOUR OWN CIRCUIT BREAKER

Simply pick the code number from each of the sections below and combine them to build your part number.

**DC Miniature Circuit Breakers
UL 489B Branch Circuit Breakers**

1110 - CB **2** -

I II III IV V VI VII

Example: To build one of our most popular DC Miniature Circuit Breakers, the part number would be **1110 + CB + III + IV + 2 + VI + VII** or **1110-CB1C2D10-SB**



I. PRODUCT TYPE

CODE	DESCRIPTION
1110	Series 1110 DC Miniature Circuit Breaker

II. DEVICE TYPE

CODE	DESCRIPTION
CB	UL 489B Circuit Breaker / Branch Protection

III. NUMBER OF POLES

CODE	DESCRIPTION	LIST
1	Single Pole	\$ 58.00
2	Two Pole	\$116.00
3	Three Pole	\$174.00
4	Four Pole	\$232.00

IV. TRIP CHARACTERISTICS

CODE	DESCRIPTION
C	Trip Curve C
D	Trip Curve D

V. FRAME SIZE

CODE	DESCRIPTION
2	17.5mm Frame per Pole

VI. OPERATING CURRENT

CODE	DESCRIPTION
C50	0.5A
D10	1.0A
D16	1.6A
D20	2.0A
D30	3.0A
D40	4.0A
D50	5.0A
D60	6.0A
D70	7.0A
D80	8.0A
U10	10A
U13	13A
U15	15A
U16	16A
U20	20A
U25	25A
U30	30A
U32	32A
U40	40A
U50	50A
U60	60A
U63	63A

VII. SHORTING LINK / JUMPER CONFIGURATIONS

CODE	DESCRIPTION
FOR ALL POLE CONFIGURATIONS	
(Blank)	No Shorting Link (Jumper)
FOR 2 POLE	
SB	Shorting Link (Jumper) at Bottom
ST	Shorting Link (Jumper) at Top
FOR 3 POLE	
SB	Shorting Link (Jumper) at Bottom
ST	Shorting Link (Jumper) at Top
STB	Shorting Link (Jumper) connected at Top first then Bottom
SBT	Shorting Link (Jumper) connected at Bottom first then Top
FOR 4 POLE	
STLT	Shorting Link (Jumper) connected at Top keeping Load in Between
SBB	Shorting Link (Jumper) connected Both at Bottom
SBLB	Shorting Link (Jumper) connected at Bottom keeping Load in Between
SBTB	Shorting Link (Jumper) connected at Bottom then Top then Bottom
STBT	Shorting Link (Jumper) connected at Top then Bottom then Top

DISCOUNT
SCHEDULE

F

UL 489B BRANCH CIRCUIT BREAKERS

c3controls Series 1110 Direct Current Miniature Circuit Breakers were designed and manufactured for all your DC industrial control, transportation, energy storage system, and photovoltaic applications. With both thermal and magnetic trip elements for overload and short circuit protection, these breakers provide high voltage DC circuit protection and fully meet UL 489B, the standard for DC photovoltaic systems. They are available in one, two, three, and four pole configurations with current ratings from 0.5A to 63A.

Product features include:

- Line/load reversible construction makes field wiring error-proof.
- Combination head terminal screws allow the use of “straight”, “phillips”, or “posidrive” screwdrivers for fast and reliable wiring.
- Compact 17.5mm width per pole construction reduces panel size and mounts onto 35mm DIN rail.
- Dual style terminals accept stranded wire 0.82mm² - 26.7mm² (#18 - #3 AWG) and busbar stabs, and are IP20 guarded against accidental contact with live parts.
- Trip-free design provides assurance that holding the operating handle in the ON position will not prevent the miniature circuit breaker from tripping.
- Up to 22 unique current rating configurations from 0.5 to 63A for a broad range of applications.
- Dual trip curve offering (Trip Curves C & D) provides individual load protection pertaining to direct current for situations like renewable energy generation using solar arrays, energy transfer with micro-grids using battery packs, emergency storage and use with Uninterruptible Power Supplies (UPS).



SOME OF OUR POPULAR CONFIGURATIONS:

DC MINIATURE CIRCUIT BREAKERS		
CATALOG NUMBER	DESCRIPTION	LIST
1110-CB1C2D10-SB	DC Miniature Circuit Breaker, UL 489B, 1 Pole, Trip Curve C, 1.0A, Jumper at Bottom	\$ --
1110-CB1C2U10	DC Miniature Circuit Breaker, UL 489B, 1 Pole, Trip Curve C, 10A	\$ --
1110-CB2C2U30	DC Miniature Circuit Breaker, UL 489B, 2 Pole, Trip Curve C, 30A	\$ --
1110-CB2D2U16-SB	DC Miniature Circuit Breaker, UL 489B, 2 Pole, Trip Curve D, 16A, Jumper at Bottom	\$ --
1110-CB4D2U60-SBTB	DC Miniature Circuit Breaker, UL 489B, 4 Pole, Trip Curve D, 60A, Jumper Connected at Bottom then Top then Bottom	\$ ---

**SIDE MOUNTED
AUXILIARY CONTACT**



Our side mounted auxiliary contacts allow remote indication of the status of a circuit breaker or supplementary protector to which it is attached. These contacts come with IP20 guarded terminals and snap onto the left side of the circuit breaker or supplementary protector without the use of tools.

Ratings: AC12 - 6A @ 240V AC (50/60Hz)
DC12 - 1A @ 130V DC
2A @ 48V DC
6A @ 24V DC

CODE	DESCRIPTION	LIST
1100-SA211	1 Normally Open and 1 Normally Closed	\$ 52.60

**SIDE MOUNTED
SHUNT-TRIP MODULES**



Shunt-trip modules enable the circuit breaker or supplementary protector to trip, there by cutting off the power supply to any machine or equipment remotely. These modules snap onto the right side of the circuit breaker or supplementary protector without the use of tools. IP20 guarded terminals protect against accidental contact with live parts and can be used in conjunction with auxiliary contacts.

CODE	DESCRIPTION	LIST
1100-SRXD	110V AC, 50/60Hz	\$ 96.20
1100-SRXF	230V AC, 50/60Hz	\$ 96.20

**SIDE MOUNTED AUXILIARY
CONTACTS WITH ALARM**



This accessory provides remote indication when a circuit breaker or supplementary protector is tripped. The trip can be a result of an overload, short-circuit, operation of shunt-trip accessory, or undervoltage/overvoltage module. Features IP20 guarded terminals to protect against accidental contact with live parts and snaps-on and installs without the use of tools.

Ratings: AC12 - 3A @ 400V AC (50/60Hz)
6A @ 230V AC (50/60Hz)

CODE	DESCRIPTION	LIST
1100-STA211	1 Normally Open and 1 Normally Closed	\$ 67.60



HEAVY DUTY LOCK-OFF ATTACHMENT



This lock-off attachment when used with a padlock ensures that no unauthorized person switches the circuit breaker or supplementary protector to the ON state after a trip.



CODE	DESCRIPTION	LIST
1100-L01	Lock-Off Attachment	\$ 9.80

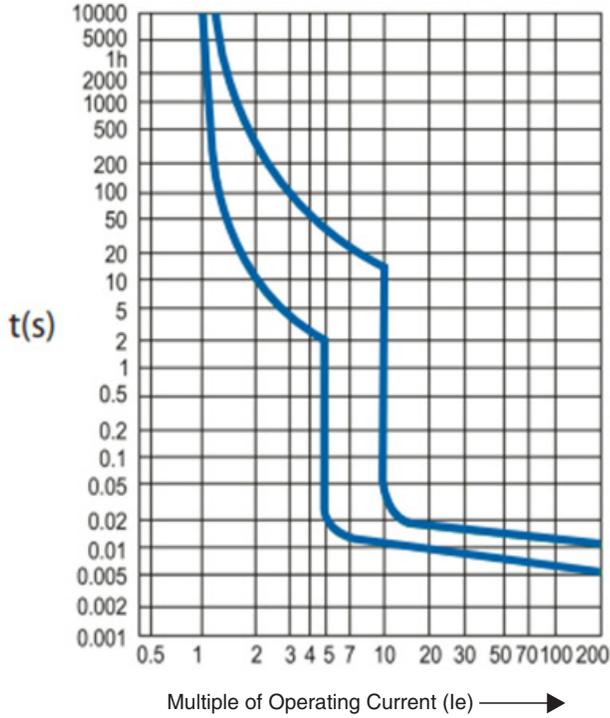
SPECIFICATIONS:

		ELECTRICAL			
		1 POLE	2 POLE	3 POLE	4 POLE
ELECTRICAL GENERAL					
	UNITS				
Rated Operating Current	A	0.5 - 63			
Electrical Life	Ops.	6,000			
Tripping Curves		C, D			
ELECTRICAL UL/CSA APPLICATIONS					
Conformity to Standards		UL 489B, CSA C22.2 No. 305 as Photovoltaic Breakers			
DC Rated Operating Voltage	VDC	250	500	750	1000
MAXIMUM SHORT CIRCUIT RATING					
@ 250 VDC	kA	10			
@ 500 VDC	kA	10			
@ 750 VDC	kA	10			
@ 1000 VDC	kA	10			

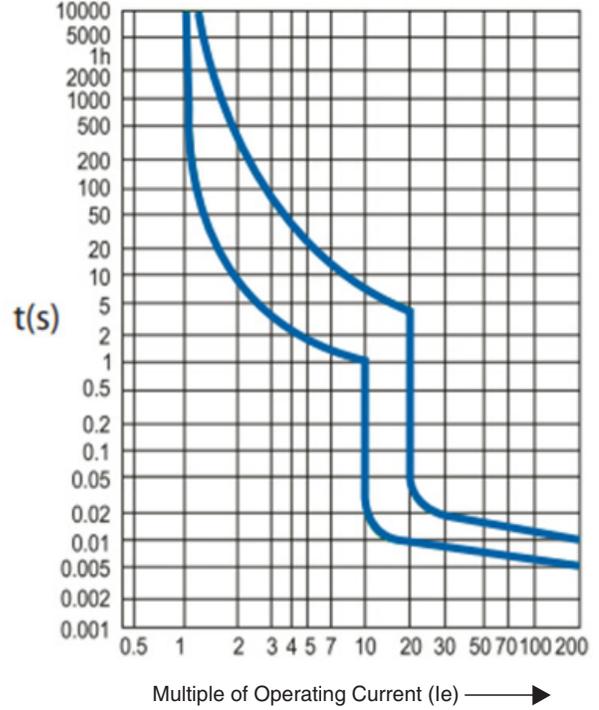
		MECHANICAL, ENVIRONMENTAL & CONSTRUCTION			
		1 POLE	2 POLE	3 POLE	4 POLE
MECHANICAL					
	UNITS				
Mechanical Endurance	Ops.	20,000			
ENVIRONMENTAL					
Ambient Operating Temperature	°C / °F	-20 to 50 / -4 to 122			
Ambient Storage Temperature	°C / °F	-25 to 80 / -13 to 176			
Calibration Temperature	°C / °F	40 / 104			
Altitude	m / ft.	2,000 / 6,562			
Shock	G	15			
CONSTRUCTION					
Poles (availability)		1, 2, 3 and 4 Pole			
Mounting		Standard 35mm DIN Rail			
Width of MCB		17.5mm			
Terminal Screws		Captive			
INGRESS PROTECTION					
Line & Load Terminations	IP	20			
WEIGHT					
	kgs	0.125	0.25	.37	0.50
	lbs	0.275	0.55	0.825	1.10
CONDUCTOR SIZE					
UL/CSA	AWG	1 x #18 ~ #3, 2 x #18 ~ #10			
Solid, Stranded, Fine Stranded	mm ²	1 x 0.82 ~ 26.7			
TERMINAL WIRING CONNECTION					
Wire Type		Copper wire only, 75°C			
TERMINAL TORQUE					
	Nm / lb-in.	2.5 / 22.2			
CONTACT INDICATION		Green and Red			
DESIGN		Trip Free Design (breaker cannot be defeated by holding the handle in the "ON" position)			
ROHS COMPLIANCE		For RoHS compliance documentation by product, refer to c3controls.com			

TRIP CURVES

TRIP CURVE C
(for DC : 7 - 15 x Ie)



TRIP CURVE D
(for DC : 10 - 21 x Ie)

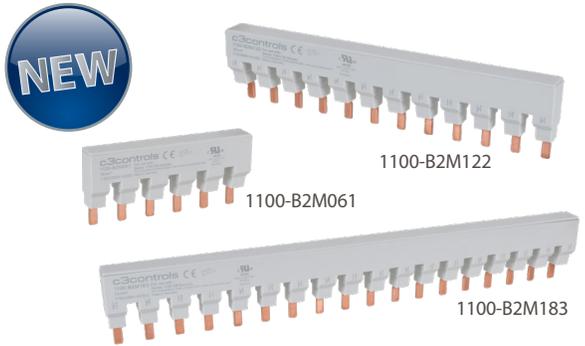


BUS BAR SYSTEM FOR SERIES 1100-CB (UL 489), 1100-SP (UL 1077) & 1110-CB (UL 489B) DEVICES

Bus bars are expertly designed for most efficient MCB installation, offering a dependable solution. Tailored for the needs of contemporary installations, this bus bar boasts a compact design that maximizes space without sacrificing performance.

- **Compatible:** Our bus bar is specifically engineered to work seamlessly with UL 489, UL 1077 and UL 489B miniature circuit breakers, ensuring versatile application.
- **Panel Space Savings:** Its streamlined design facilitates efficient use of panel space, resulting in a more organized and compact electrical configuration.
- **Reduced Maintenance:** Compared to transitional wiring, the MCB Bus Bar requires minimal to no maintenance, helping to significantly reduce upkeep costs and downtime.
- **High Electrical Ratings:** Designed to support demanding electrical loads, the 115A MCB Bus Bar adheres to strict industry standards for performance and reliability, making it ideal for both commercial and industrial environments.

115A BUS BARS



CODE	NO. OF PINS	NO. OF BREAKERS	PHASE	LIST
FOR USE WITH 1 POLE DEVICES				
1100-B2M061	6	6	1	\$ 38.00
1100-B2M121	12	12	1	\$ 69.00
1100-B2M181	18	18	1	\$106.00
FOR USE WITH 2 POLE DEVICES				
1100-B2M062	6	3	2	\$ 43.00
1100-B2M122	12	6	2	\$ 86.00
1100-B2M182	18	9	2	\$127.00
FOR USE WITH 3 POLE DEVICES				
1100-B2M063	6	2	3	\$ 47.00
1100-B2M123	12	4	3	\$ 89.00
1100-B2M183	18	6	3	\$136.00

DISCOUNT SCHEDULE **F**

ACCESSORIES FOR USE WITH BUS BARS



CODE	DESCRIPTION	LIST
1100-B2MPS	Protective Shroud (for 3 unused pins)	\$ 7.00
1100-B2MTF	Terminal Power Feed, 35mm ²	\$ 50.00
1100-B2MDF	Dedicated Power Feed, 50mm ²	\$ 50.00

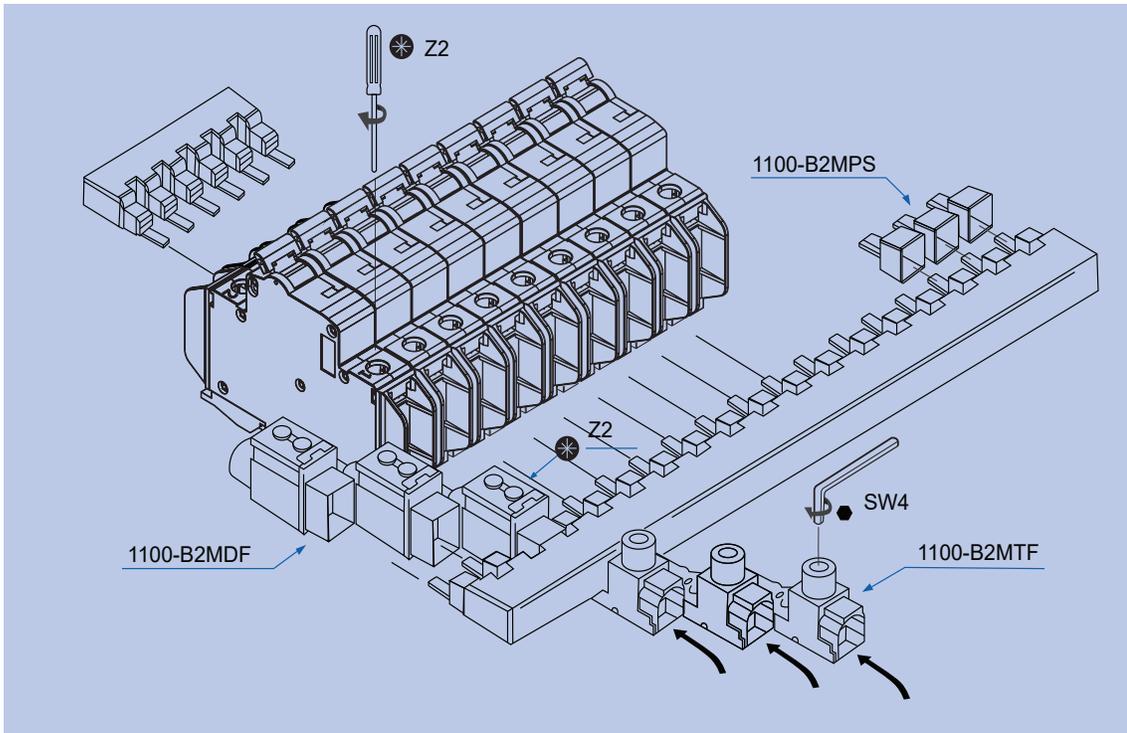
DISCOUNT SCHEDULE **F**

SPECIFICATIONS:

BUS BAR SYSTEM				
GENERAL	UNITS	1100-B2MXXX BUS BAR	1100-B2MTF TERMINAL FEED	1100-B2MDF DEDICATED FEED
Operational Voltage	VAC		480	
	VDC		500	
Impulse Withstand Voltage	kV		9.5	
Rated Operational Current	A		115	
Wire Range	AWG / mm ²	—	#14 - #8 / 2.5 - 10	#6 - #2 / 16 - 35
Tightening Torque	lb-in / Nm	—	21 / 2.3	40 / 4.5
Wire Strip Length	in / mm	—	0.56 / 14	
Wire Type		—	Copper wire only, 60/75°C	
Cross Section	mm ²	16.5	—	
Certifications		 UL 489 File #: E537465 IEC : 60947-2		
ROHS COMPLIANCE		For RoHS compliance documentation by product, refer to www.c3controls.com .		

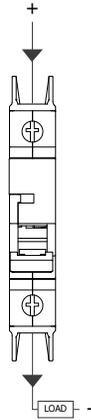
- Suitable for use on circuits capable of delivering not more than 10,000 RMS symmetrical amperes for MCBs rated up to 32 A, and 5,000 RMS symmetrical amperes for MCBs rated up to 63 A, at a maximum of 500 Volts
- The bus bars and power feeds are suitable for 115A when mounted in an enclosure with dimensions of 30x30x10 inches or larger. For smaller enclosures, they are suitable for 80A.
- For UL 489B devices, it is applicable only for up to 2-pole DC miniature circuit breakers.

BUS BAR SYSTEMS FOR SERIES 1110-CB (UL 489B) DEVICES



**CIRCUIT DIAGRAM
- 1 POLE**

1110-CB1*2***

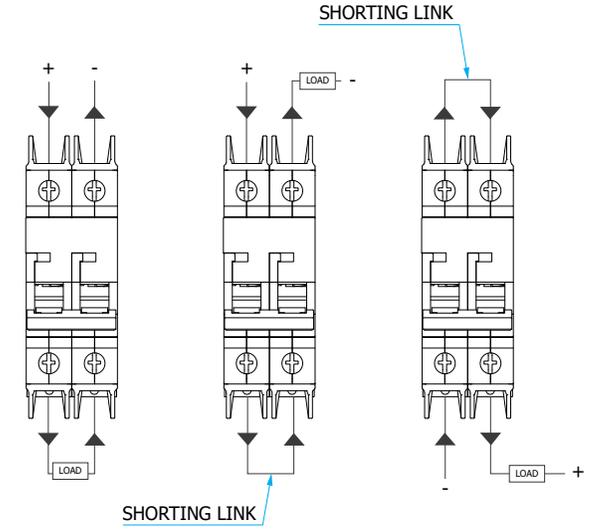


**CIRCUIT DIAGRAMS
- 2 POLE**

1110-CB2*2****

1110-CB2*2***-SB

1110-CB2*2***-ST



NOTE: **** Represents the trip curve and operating current codes. Refer to page 4.

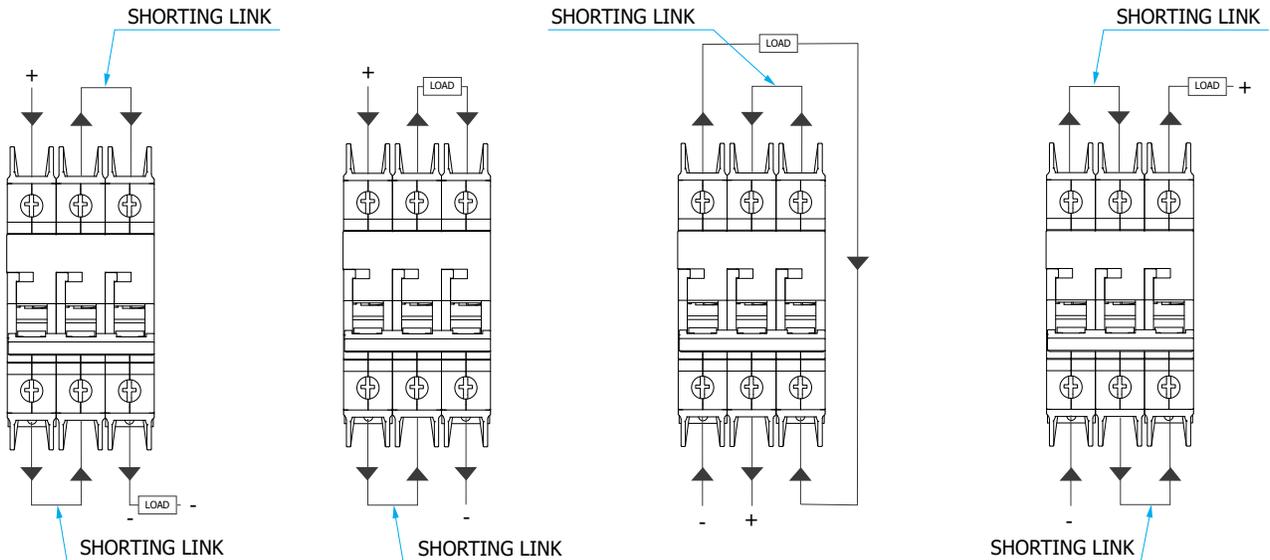
CIRCUIT DIAGRAMS - 3 POLE

1110-CB3*2***-SBT

1110-CB3*2***-SB

1110-CB3*2***-ST

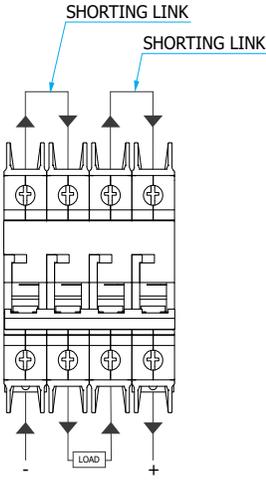
1110-CB3*2***-STB



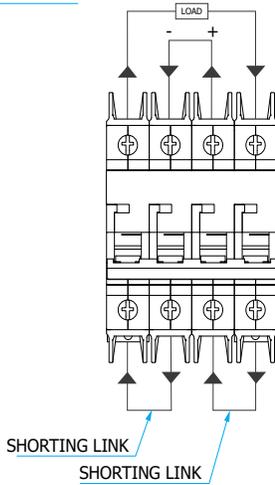
NOTE: **** Represents the trip curve and operating current codes. Refer to page 4.

CIRCUIT DIAGRAMS - 4 POLE

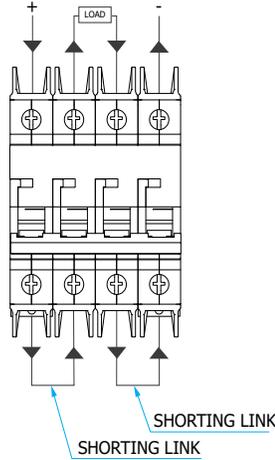
1110-CB4*2***-STT



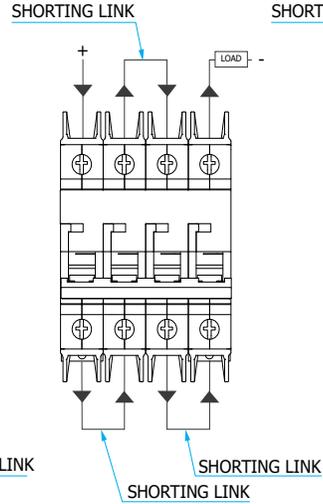
1110-CB4*2***-SBB



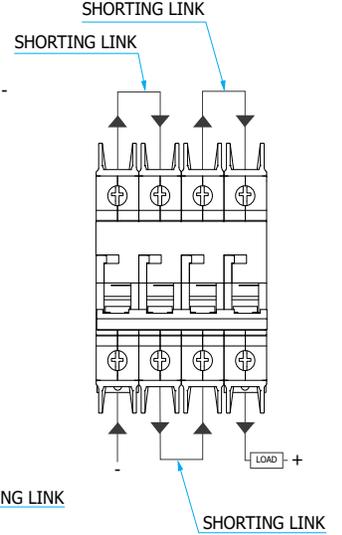
1110-CB4*2***-SBLB



1110-CB4*2***-SBT



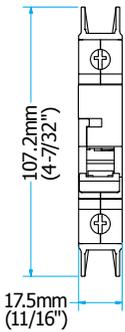
1110-CB4*2***-STBT



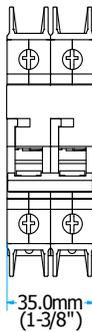
NOTE: **** Represents the trip curve and operating current codes. Refer to page 4.

DIMENSIONS

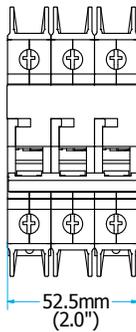
1 POLE



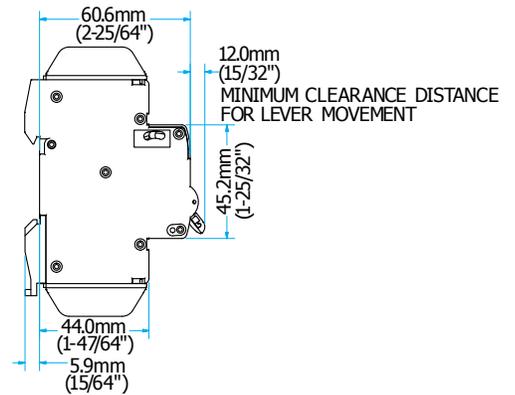
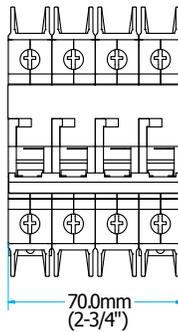
2 POLE



3 POLE

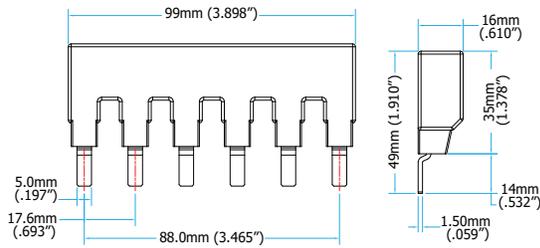


4 POLE



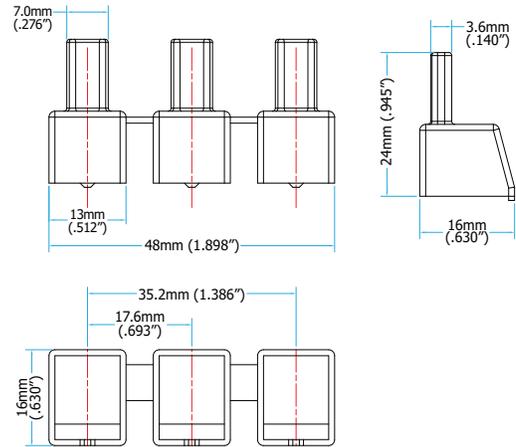
BUS BARS - 115A, 6 PINS

1100-B2M061, B2M062 & B2M063



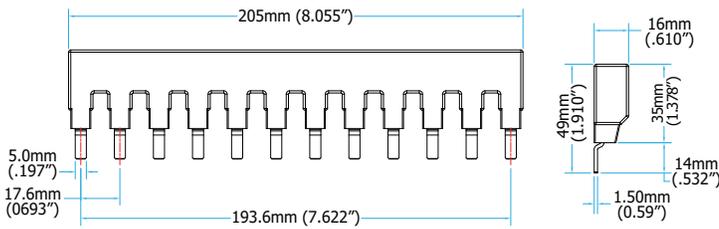
PROTECTIVE SHROUD

1100-B2MPS



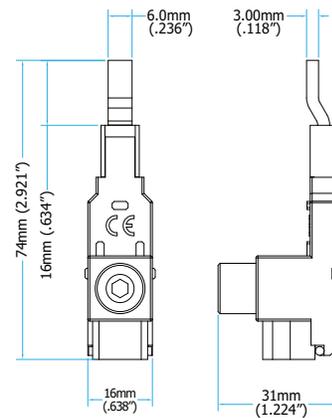
BUS BARS - 115A, 12 PINS

1100-B2M121, B2M122 & B2M123



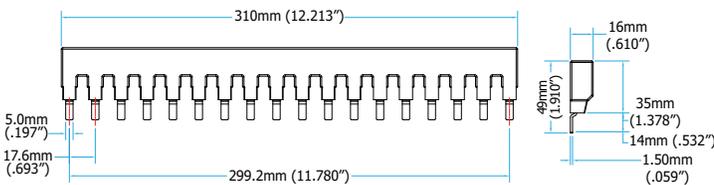
TERMINAL POWER FEED

1100-B2MTF



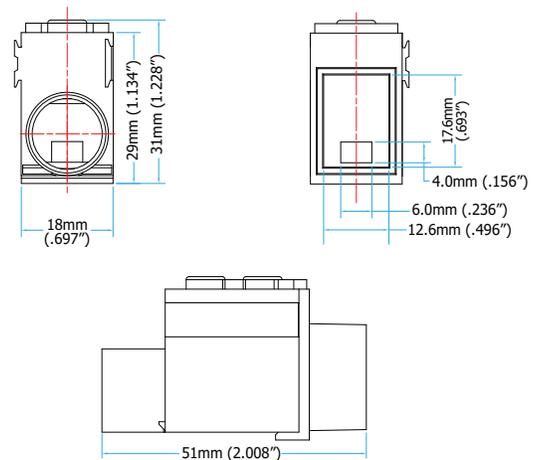
BUS BARS - 115A, 18 PINS

1100-B2M181, B2M182 & B2M183



DEDICATED POWER FEED

1100-B2MDF



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