OVERLOAD RELAYS

series 320

Need reliable, accurate overload and phase-loss protection for your motors? c3controls' Series 320 Bimetallic Overload Relays provide unmatched protection and can be directly installed on all Series 300 Contactors, saving you time and panel space. Plus, cULus and CE markings make them applicable worldwide.

Section 6

PROVEN

Conformity to Standards:
UL 508, 60947-4-1
CSA C22.2 No. 14
IEC 60947-1, 60947-4-1

Certifications:
UL File #: E68568 (Guide NKCR, NKCR7)

CE Marked (per EU Low Voltage Directive 2006/95/EC and RoHS Directive 2011/65/EU)

Visit c3controls.com to download product certifications.

REVISION 07.2026

OVERLOAD RELAYS

c3controls offers a comprehensive line of Motor Control products designed and manufactured to meet the needs of the machine builder. We promise durable products at a price that gives you an edge, and we guarantee same-day shipping. Check out all the features of our Series 320 Overload Relays below!

DELIVERING SUPERIOR PRODUCT QUALITY AND MANUFACTURING EXCELLENCE

✓ **Proven**	Our Series 320 Overload Relays are UL Listed and CE marked meeting global standards requirements.
✓ **Reliability**	Trip Class 10 for reliable and accurate protection against overload conditions. Trips within 10 seconds when carrying a current of 720%.
✓ **Trip Indication**	Visible trip indication to provide clear indication of what device tripped, simplifies troubleshooting in panels.
✓ **Visible Markings**	High visibility labels and markings; dual IEC and NEMA terminal markings for ease of wiring anywhere in the world.
✓ **Modular Design**	Modular design allows Series 320 Overload Relays to be direct mounted onto Series 300 Contactors.
✓ **Visible Certifications**	Our product certifications and electrical ratings are clearly marked on the outside of the devices for easy reference during installation.
✓ **Added Safety**	IP20 guarded terminals with dual terminal markings prevent accidental contact with live parts.
✓ **36-Month Warranty***	Every product is backed by our 36-Month Warranty—giving you confidence in the quality, reliability, and performance of components designed for the most demanding applications.
✓ **Guaranteed Same-Day Shipping***	Product availability reduces inventory, and improves cash-flow—saving you money. With c3controls any order for standard catalog items received by 6:00pm ET is guaranteed to ship same-day.
✓ **Advantage Pricing**	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.

*See c3controls Terms & Conditions

"When I evaluate components for our machines I consider three things: quality, price, and lead-time. All are equally important, and most manufacturers can only deliver on any two out of the three. c3controls delivers all three without fail. We get quality products at a price that's remained competitive since we first began doing business with them back in 2006, and what we buy is always in stock."

Annie Carbajal, Purchasing Manager • **Aqueous Technologies**

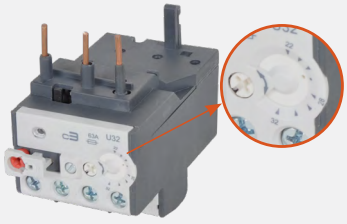
320-B1 320-B2 320-B3 320-B4 320-B5

UNIQUE PRODUCT LINE FEATURES

HIGH FAULT SCCR

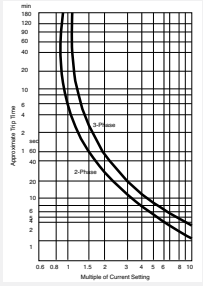
High fault short circuit current rating of 100kA @ 480V and 600V with Class J fuses, provides safety and reliability in high fault applications.

ADJUSTABLE CURRENT SETTING



Full load current adjustment ratio of approximately 1:1.5 enables overload relay to be set to exact FLA of motor.

PHASE LOSS SENSITIVITY



Single phase sensitivity to protect motors against damaging phase loss conditions.

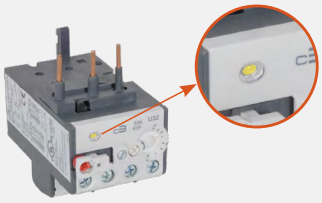
SELECTABLE RESET MODE

Manual or automatic reset and test modes, and stop button all in a single device for convenient control circuit wiring.

SEAMLESS COMPATIBILITY

Series 320-B2 Overload Relays direct mount onto all Series 300 Non-Reversing and Series 310, 9A to 25A AC/DC, Reversing Contactors and Series 320-B1 Overload Relays direct mount onto all Series 300/310 Miniature Non-Reversing and Reversing Contactors.

TRIP TEST FUNCTION



Trip test function standard on all c3controls Series 320-B2 to 320-B5, allows for easier installation, testing, and troubleshooting.

Motor Control Device Solutions

c3controls motor control devices are the perfect solution for manufacturers who want proper motor control and superior motor protection without having to overpay or compromise on quality. In fact, we engineer so much performance and flexibility into our products, we can deliver a remarkably better value than our competitors.

c3controls products deliver like no other.

LEADING THE INDUSTRY
with our compact miniature 10HP contactors and control relays. One frame size (AC or DC)—28% reduction in panel area.

Ensures the protection of equipment and user.

Seamless Compatibility

Contactors, overload relays and motor protection circuit breakers are designed by c3controls to work together, with common connections and accessories, resulting in a high functioning compact starter.

Compact

The small size of c3controls motor control devices, plus features like common accessories, enable assembly into smaller control panels for lower installed costs.

Reliable Protection

Contactors provide the repeated on/off switching for the motor and are designed for motor, actuator, solenoid, and other power switching applications. Overload relays provide Trip Class 10 protection against overload and phase-loss conditions, and have ambient temperature compensation for motor protection in high temperature environments.

Motor protection circuit breakers provide overload, phase-loss and short circuit protection, can be used by themselves as manual motor controllers or with contactors in group motor installations, and can achieve Type 2 coordination for optimum performance.

Type E self-protected combination manual motor controllers provide disconnecting means, branch circuit protection, motor control and motor overload protection all in a single device.

Proven

Our motor control devices are UL Listed and CE marked, meeting global standards requirements for use anywhere in the world.

NFPA 70 - National Electrical Code (NEC)

Understanding what functions are needed in your motor control circuit is critical when selecting motor control devices. Engineers benefit from the standards and codes established to ensure safety and protection to personnel and equipment.

More than just knowing the standards, c3controls, as a manufacturer of motor control products, has the application expertise you need to select the right products.

c3controls & Article 430 - Motors, Motor Circuits and Controllers

	To Supply	NEC Part	c3controls Product Series		
Motor disconnecting means		Part IX	 330	 630	 Type E: 330 630
Motor branch-circuit, short circuit, and ground-fault protection		Part IV			 Type E: 330 630
Motor circuit conductor		Part II			
Motor controller		Part VII	 300/310 330	 620 630	 Type E: 330 630
Motor control circuits		Part VI			
Motor overload protection		Part III	 320 330	 620 630	 Type E: 330 630
Motor		Part I			

Our motor control products align with Article 430 Part VII, Motor Controller, of the NFPA 70, the National Electrical Code.

IT'S EASY TO BUILD YOUR OWN OVERLOAD RELAY

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

Bimetallic Overload Relays

320-B ____

/ //

Example: To build one of our most popular Overload Relays, the part number would be 320-B + II or 320-B2U32

I. OVERLOAD RELAY TYPE

CODE	DESCRIPTION
320-B	Bimetallic Overload Relay

Our Series 320 Bimetallic Overload Relays are available in five frame sizes for motor full load currents from 0.28 ~ 112A.

DISCOUNT SCHEDULE F

II. OVERLOAD RELAY FRAME SIZE AND CURRENT ADJUSTMENT RANGE

CODE	INSTALLS ON CONTACTOR	CURRENT ADJUSTMENT RANGE	LIST
1C40	-M07, -M09, -M12, -M16	0.28 ~ 0.40	$ 57.00
1C63	-M07, -M09, -M12, -M16	0.40 ~ 0.63	$ 57.00
1C80	-M07, -M09, -M12, -M16	0.56 ~ 0.80	$ 57.00
1D12	-M07, -M09, -M12, -M16	0.8 ~ 1.2	$ 57.00
1D18	-M07, -M09, -M12, -M16	1.2 ~ 1.8	$ 57.00
1D28	-M07, -M09, -M12, -M16	1.8 ~ 2.8	$ 57.00
1D40	-M07, -M09, -M12, -M16	2.8 ~ 4.0	$ 57.00
1D63	-M07, -M09, -M12, -M16	4.0 ~ 6.3	$ 57.00
1D80	-M07, -M09, -M12, -M16	5.6 ~ 8.0	$ 57.00
1U10	-M07, -M09, -M12, -M16	7.0 ~ 10.0	$ 57.00
1U12	-M07, -M09, -M12, -M16	8.0 ~ 12.5	$ 57.00
1U15	-M07, -M09, -M12, -M16	10 ~ 15	$ 57.00
1U17	-M07, -M09, -M12, -M16	11 ~ 17	$ 57.00
2C40	-S09, -S12, -S18, -S25, -S32, -S40	0.28 ~ 0.40	$ 62.00
2C63	-S09, -S12, -S18, -S25, -S32, -S40	0.40 ~ 0.63	$ 62.00
2C80	-S09, -S12, -S18, -S25, -S32, -S40	0.56 ~ 0.80	$ 62.00
2D12	-S09, -S12, -S18, -S25, -S32, -S40	0.80 ~ 1.2	$ 62.00
2D18	-S09, -S12, -S18, -S25, -S32, -S40	1.2 ~ 1.8	$ 62.00
2D28	-S09, -S12, -S18, -S25, -S32, -S40	1.8 ~ 2.8	$ 62.00
2D40	-S09, -S12, -S18, -S25, -S32, -S40	2.8 ~ 4.0	$ 62.00
2D63	-S09, -S12, -S18, -S25, -S32, -S40	4.0 ~ 6.3	$ 62.00
2D80	-S09, -S12, -S18, -S25, -S32, -S40	5.6 ~ 8.0	$ 62.00
2U10	-S09, -S12, -S18, -S25, -S32, -S40	7.0 ~ 10.0	$ 62.00
2U12	-S09, -S12, -S18, -S25, -S32, -S40	8.0 ~ 12.5	$ 62.00
2U15	-S09, -S12, -S18, -S25, -S32, -S40	10 ~ 15	$ 62.00
2U17	-S09, -S12, -S18, -S25, -S32, -S40	11 ~ 17	$ 62.00
2U23	-S09, -S12, -S18, -S25, -S32, -S40	15 ~ 23	$ 62.00
2U32	-S09, -S12, -S18, -S25, -S32, -S40	22 ~ 32	$ 62.00
3U40	-S32, -S40	25 ~ 40	$ 94.00
4U50	-S50, -S65, -S80	32 ~ 50	$107.00
4U57	-S50, -S65, -S80	40 ~ 57	$107.00
4U63	-S50, -S65, -S80	50 ~ 63	$107.00
4U70	-S50, -S65, -S80	57 ~ 70	$107.00
5U80	-S95, -S105	63 ~ 80	$125.00
5U97	-S95, -S105	78 ~ 97	$125.00
5X11	-S95, -S105	90 ~ 112	$125.00

Some of Our Popular Configurations:

BIMETALLIC OVERLOAD RELAYS

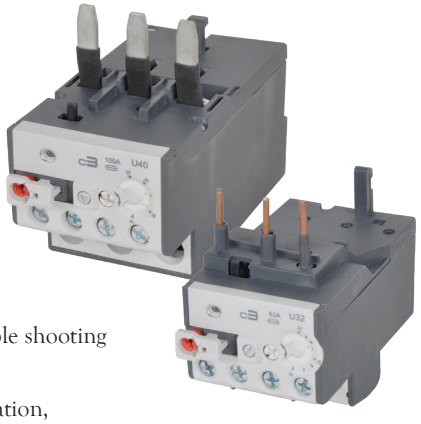
CATALOG NUMBER	DESCRIPTION	LIST
320-B1D80	5.6 ~ 8.0A Overload Relay for Installation on 300-M07 Contactor	$ 57.00
320-B2U10	7 ~ 10A Overload Relay for Installation on 300-S09 Contactor	$ 62.00
320-B2U23	15 ~ 23A Overload Relay for Installation on 300-S25 Contactor	$ 62.00
320-B3U40	25 ~ 40A Overload Relay for Installation on 300-S40 Contactor	$ 94.00
320-B4U50	32 ~ 50A Overload Relay for Installation on 300-S50 Contactor	$107.00
320-B5U97	78 ~ 97A Overload Relay for Installation on 300-S95 Contactor	$125.00

MOMENTARY RESET PUSH BUTTONS

actuate the reset function of a Series 320 Overload Relay from outside the enclosure. *See Section 15 Page 25.*

Available Frame Sizes for Overload Relays

Bimetallic Overload Relays



c3controls Series 320 Bimetallic Overload Relays provide a thermal Trip Class 10 overload protection for single and three phase motors, and phase loss protection for three phase motors. Other features like IP20 guarded terminals with dual terminal markings, integral stop button, and direct mounting will help you reduce your total installed costs and enhance the features and performance of your equipment. Just look and see what our Series 320 Overload Relays have to offer.

Product features include:

- High fault short circuit rating of 100kA @ 480V and 600V with Class J Fuses, provides safety and reliability in high fault applications.
- Visible trip indication provides clear indication of what device has tripped and simplifies trouble shooting in panels with many contactors.
- Trip test function standard on Series 320-B2 to 320-B5 overload relays, allows for easier installation, testing, and troubleshooting.
- Series 320-B1 and 320-B2 Overload Relays direct mount onto Series 310 Miniature Reversing Contactors and Series 310, 9A to 25A, Reversing Contactors. The result is seamless compatibility and a high performing multi-function solution.
- Enhanced markings and high visibility labels for ease of troubleshooting and maintenance.
- Series 320-B1 Overload Relays for use with Series 300 Miniature Contactors.
- Series 320-B1 Overload Relays include integral connection to auxiliary and coil terminations for ease of wiring during installation when installed on Series 300 Miniature Contactors.
- Series 320-B1 Overload Relays share the same great features and benefits of the larger frame sizes.
- Trip Class 10 for reliable and accurate protection against overload conditions.
- Single-phase sensitivity to protect motors against damaging phase loss conditions.
- Direct mounting to all contactors, Miniature and Standard.
- Dual IEC and NEMA terminal markings for ease of wiring anywhere in the world.
- IP20 guarded terminals prevent accidental contact with live parts.
- Combination head terminal screws allow the use of straight, phillips or posidrive screwdrivers. Allen head screws on 320-B4 and 320-B5 overload relays make it easy to apply the proper terminal tightening torque for secure conductor connections.
- Stop button for convenient and economical control circuit wiring.
- Ambient temperature compensation ensures reliable motor protection even in high temperature environments.
- Electrically isolated and integral 1 Normally Open and 1 Normally Closed auxiliary contacts.
- Selectable reset mode (manual or automatic).

UNIQUE PRODUCT FEATURES

A – Automatic Reset Only
AUTO – Automatic Reset and Test
H – Manual Reset Only
HAND – Manual Reset and Test

c3controls Series 320 Bimetallic Overload Relays feature a multi-function reset button enabling the user to select the reset mode – manual or automatic and whether or not to enable the test function. *All of this is achieved with just one unit, reducing your inventory!*

When the reset button is pressed, with the test function enabled, the Normally Open (NO) contact closes and the Normally Closed (NC) contact opens to verify the control circuit functionality. In addition, the NC contact can be used in a "Stop" circuit. With the test function disabled, the NO and NC contacts do not change state when the reset button is pressed – preventing unauthorized personnel from operating the control circuit.

Multiple functions in a single device help you to reduce inventory and customize the overload relay operation to provide the performance and features you need for your specific application.

SPECIFICATIONS:

ELECTRICAL AND ENVIRONMENTAL SPECIFICATIONS						
		320-B1	320-B2	320-B3	320-B4	320-B5
ELECTRICAL GENERAL						
	UNITS					
Current Setting Range	A	0.28 ~ 17	0.28 ~ 32	25 ~ 50	40 ~ 80	63 ~ 112
Operating Frequency	Hz	0 ~ 400				
Power Dissipation per Pole	W	0.9 ~ 1.4	1.3 ~ 2.0	1.3 ~ 2.0	1.9 ~ 4.8	3.0 ~ 4.8
ELECTRICAL UL/CSA APPLICATIONS						
MAIN CIRCUITS						
Rated Operating Voltage, Ue	VAC	600				
Standard Short Circuit Current	kA	5	5	5	10	10
Standard Short Circuit Maximum Fuse Size*	A	60	90	125	200	250
High Fault Short Circuit Current	kA	100	100	100	100	100
High Fault Maximum Fuse Size (Class J)*	A	30	60	60	100	150
CONTROL CIRCUITS						
Pilot Duty Rating	AC	C600				
	DC	R300				
ELECTRICAL IEC APPLICATIONS						
MAIN CIRCUITS						
Rated Insulation Voltage, Ui	V	690				
Rated Impulse Voltage, Uimp	kV	6				
Rated Operating Voltage, Ue	VAC	690				
Maximum Rated Operating Current, Ie	A	17	32	50	80	112
Maximum Fuse Size*	A	40	63	100	125	250
CONTROL CIRCUITS						
Rated Insulation Voltage, Ui	V	690				
Rated Operating Current, Ie						
AC-15						
@ 24V AC	A	4				
@ 48V AC	A	3.5				
@ 60V AC	A	3.5				
@ 120V AC	A	3				
@ 230V AC	A	2				
@ 400V AC	A	1.5				
@ 500V AC	A	0.5				
@ 690V AC	A	0.3				
DC-13						
@ 24V DC	A	1				
@ 48V DC	A	0.5				
@ 60V DC	A	0.5				
@ 110V DC	A	0.25				
@ 220V DC	A	0.1				
@ 250V DC	A	0.1				
Maximum Fuse Size (gL/gG)	A	6				
ENVIRONMENTAL						
Ambient Operating Temperature	°C / °F	-25 to +60 / -13 to +140				
Ambient Storage Temperature	°C / °F	-40 to +70 / -40 to +158				
Altitude	m/ft.	2,000 / 6,562				

*Varies by current adjustment range of overload relay.

CONSTRUCTION SPECIFICATIONS

		320-B1	320-B2	320-B3	320-B4	320-B5
CONSTRUCTION						
	UNITS					
Number of Poles	ul	3				
Trip Class	ul	10				
Pollution Degree	ul	3				
INGRESS PROTECTION						
Main Circuit Terminals	ul	IP20 (with wires connected)				
Control Circuit Terminals	ul	IP20				
WEIGHT	kg	0.15	0.15	0.31	0.31	0.37
	lbs.	0.33	0.33	0.68	0.68	0.82
CONDUCTOR SIZE						
MAIN CIRCUITS						
UL/CSA	AWG	14 ~ 6	14 ~ 6	18 ~ 2	18 ~ 2	8 ~ 1/0
Solid	mm²	2 ~ 14	2 ~ 14	0.8 ~ 34	0.8 ~ 34	8 ~ 54
Stranded	mm²	2 ~ 14	2 ~ 14	0.8 ~ 34	0.8 ~ 34	8 ~ 54
Fine Stranded	mm²	2 ~ 14	2 ~ 14	0.8 ~ 34	0.8 ~ 34	8 ~ 54
Terminal Torque	Nm	1.4 ~ 2.3	1.4 ~ 2.3	4 ~ 6	4 ~ 6	5 ~ 6.5
	Lb-in.	12 ~ 20	12 ~ 20	35 ~ 55	35 ~ 53	44 ~ 57
CONTROL CIRCUITS						
UL/CSA	AWG	2 x 18 ~ 12				
Solid	mm²	2 x 0.8 ~ 4				
Stranded	mm²	2 x 0.8 ~ 4				
Fine Stranded	mm²	2 x 0.8 ~ 4				
Terminal Torque	Nm	1.4 ~ 2.3				
	Lb-in.	12 ~ 20				
ROHS COMPLIANCE		For RoHS compliance documentation by product, refer to c3controls.com.				

SEPARATE MOUNTING ADAPTERS

320-BSMA2

320-BSMA4

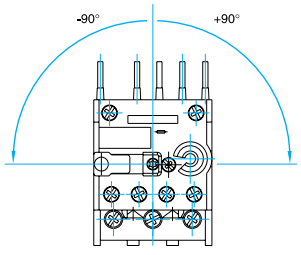
Separate mounting adapters enable Series 320 Overload Relays to be installed separately from a contactor on a 35mm DIN rail or with fixing screws to a panel.

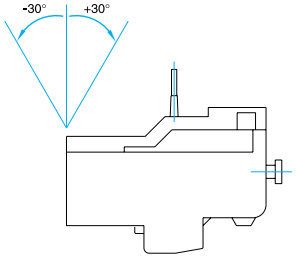
DISCOUNT SCHEDULE F

CODE	FOR USE WITH	LIST
320-BSMA2	320-B2*** Overload Relays	$23.00
320-BSMA4	320-B3*** and 320-B4*** Overload Relays	$28.00
320-BSMA5	320-B5*** Overload Relays	$35.00

NOTE: *** Represents the overload relay current adjustment range code. Refer to page 6.

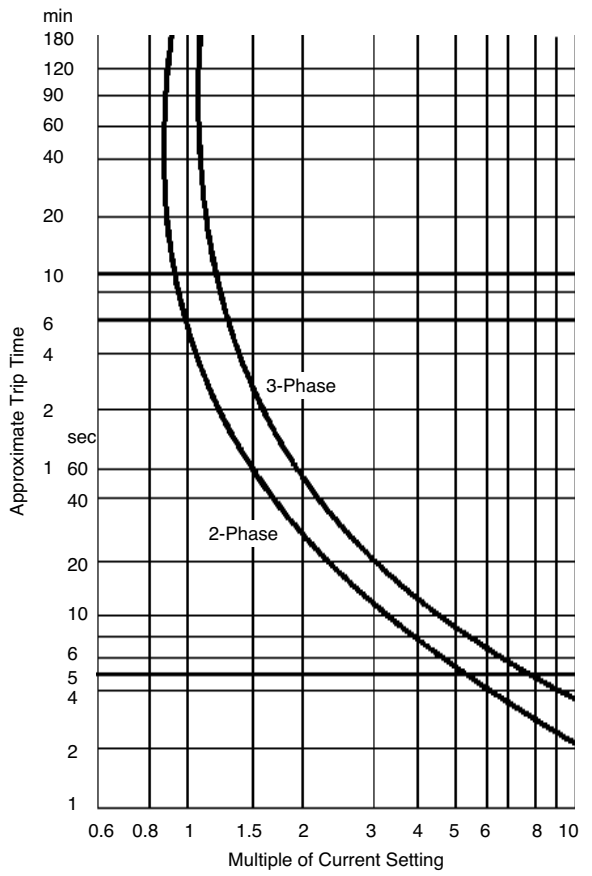
MOUNTING POSITIONS



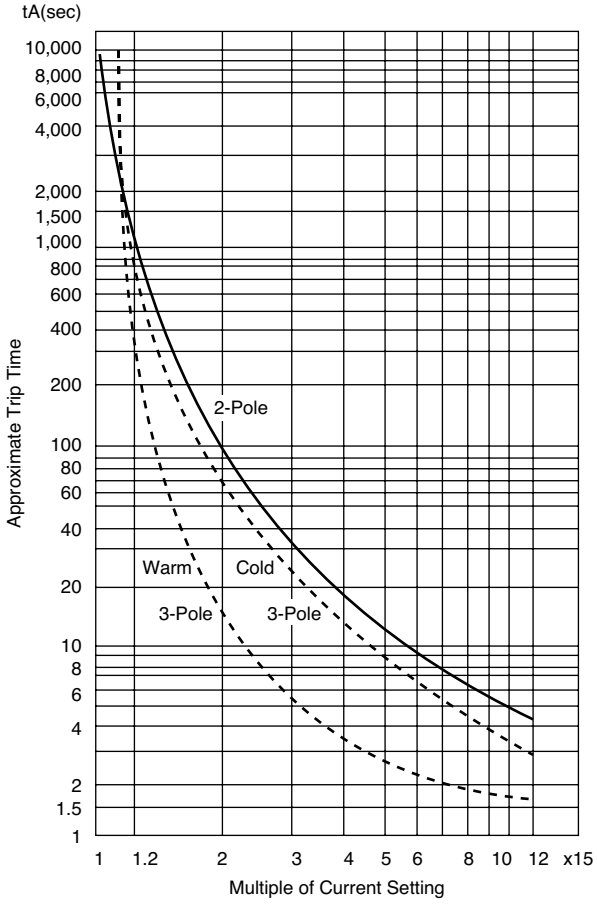


TRIP CHARACTERISTICS

320-B1***, 320-B2***, 320-B3*** & 320-B4***



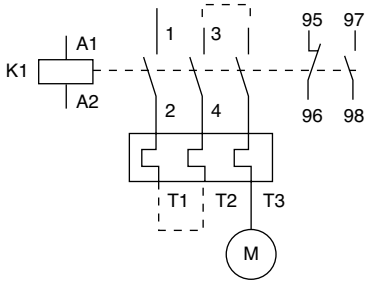
320-B5***



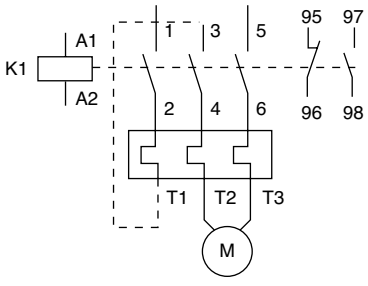
NOTE: ***Represents the overload relay current adjustment range code. Refer to page 6.

CIRCUIT DIAGRAMS

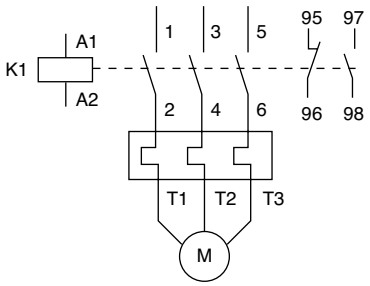
1-Phase



2-Phase

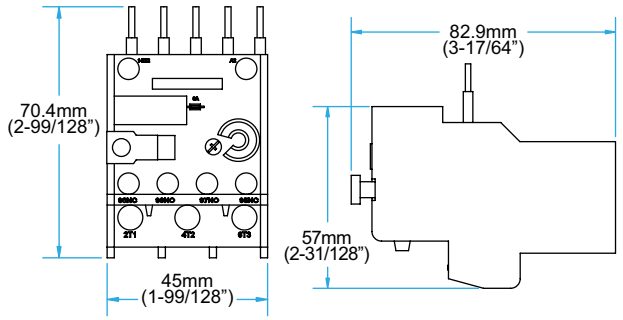


3-Phase

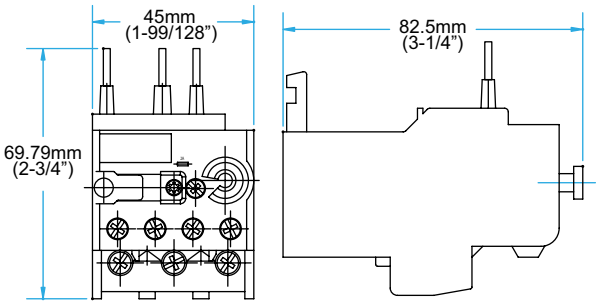


SERIES 320 BIMETALLIC OVERLOAD RELAYS

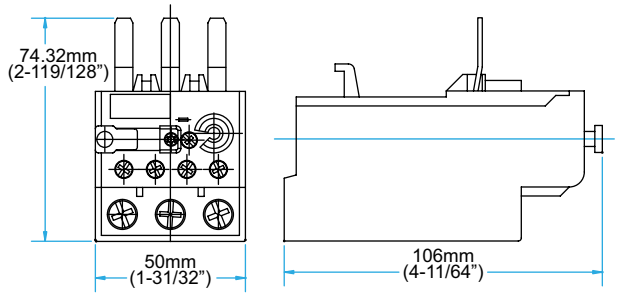
320-B1***



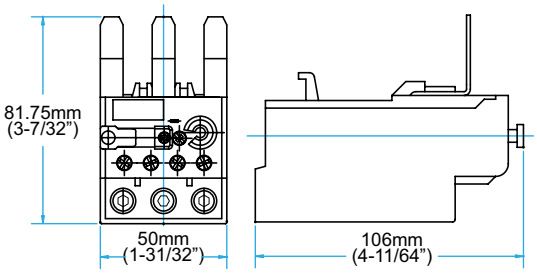
320-B2***



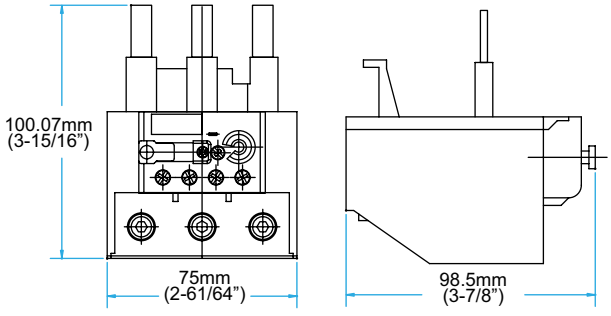
320-B3***



320-B4***



320-B5***

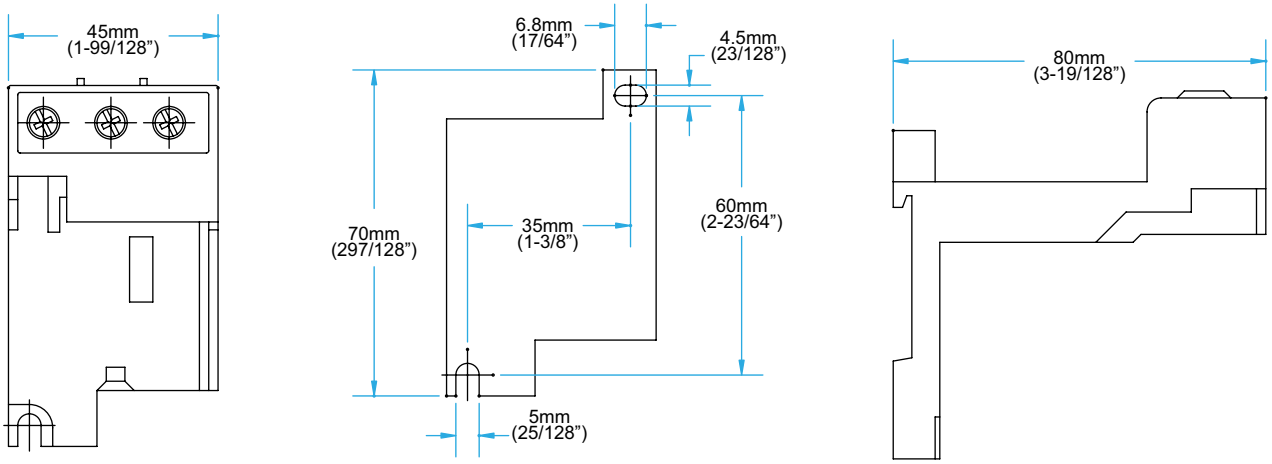


NOTE: ***Represents the overload relay current adjustment range code. Refer to page 6.

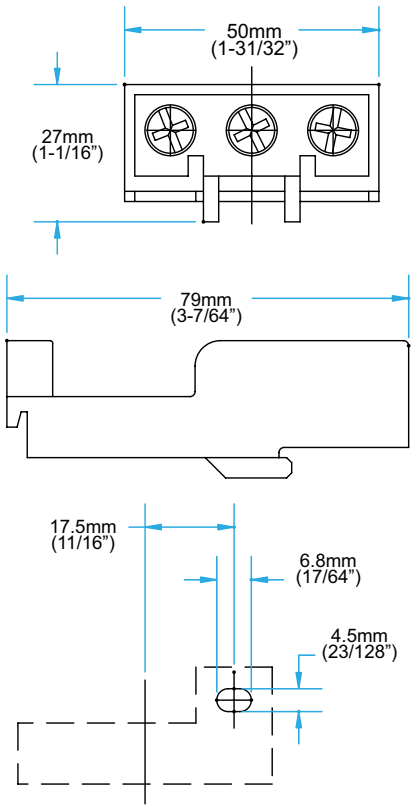
VISIT C3CONTROLS.COM TO DOWNLOAD CAD DRAWINGS

SERIES 320 SEPARATE MOUNTING ADAPTERS

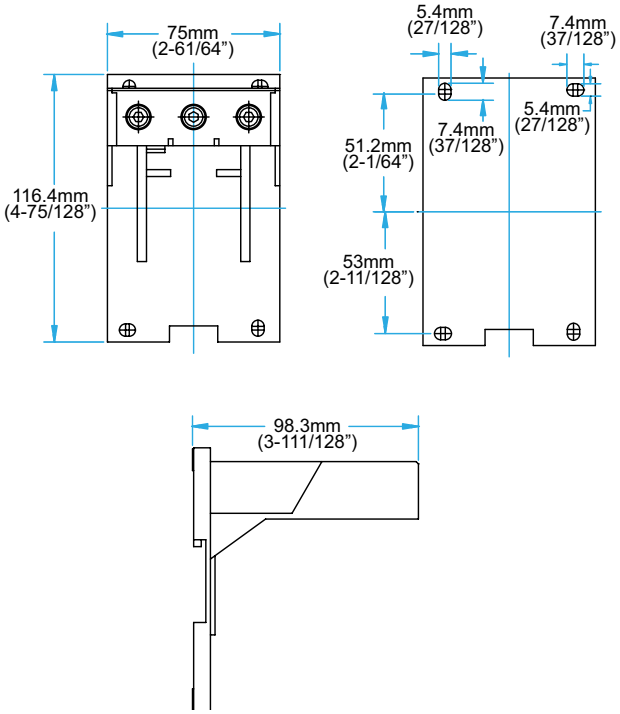
320-BSMA2 Separate Mounting Adapter for use with 320-B2***



320-BSMA4 Separate Mounting Adapter for use with 320-B3*** or 320-B4***



320-BSMA5 Separate Mounting Adapter for use with 320-B***



NOTE: ***Represents the overload relay current adjustment range code. Refer to page 6.