

This document must be retained for future reference.

It is the responsibility of the person installing the electrical equipment to ensure that the installation meets the requirements of the IET wiring regulations and is therefore 'fit for purpose'. Factors such as correct selection of components, cable sizing, protective devices and Earth bonding are all critical and should be checked prior to full testing and power-up. Any other regulations applicable to the equipment being installed such as the Machinery Directive and current health and safety legislation must also be adhered to.

All connections (including factory made) must be checked for the correct tightness prior to commissioning of the electrical installation. All connections should also be inspected periodically to ensure correct tightness.

DO NOT USE POWER TOOLS ON THESE PRODUCTS



Technical Data: MC1 series 3 pole mini contactors, Overload Relays, Auxiliary Contacts, Surge suppressors, interlocks and wiring modules



Mini Contactors, Thermal Overload Relays & Accessories

Europa Mini Contactors, Tor's and accessories are compact family of control devices for switching motors and other logic control circuits. These products are ideal in applications where panel space is a premium and device modularity is required to satisfy virtually any application requirement. Common accessories enable the devices to be customized for each application. For motor overload protection, Overload Relays can be directly mounted to mini contactors.

The AC 3 phase Mini Contactors offer good power handling capability in a compact housing and can also be coupled together with the mechanical interlock and insulated wiring modules to achieve a compact reversing contactor.

Product Features Include

- Removable / replaceable ID Marker for MC Series Contactors and CR Series Control Relay, Device identification marker for labeling contactors and front mounted auxiliary contacts simplifies trouble shooting in panels with many contactors.
- Markings and labels, high visibility label for ease of troubleshooting and maintenance.
- Compact size – one frame size for all devices within the 9A & 16A rated product ranges.
- Modular design and common snap-on accessories are easily installed without the use of tools, lowering assembly and installation costs.
- Front Mounted auxiliary contacts and surge suppressors install directly on top of the single front mounted mechanical interlock when used in the Mini reversing contactor configuration.
- Miniature contactors compatible with directly mounted MC1-TR series overload Relays with current ratings from 0.28 to 17A.
- Over load relays are Class 10 with selectable manual or automatic reset, and provide phase loss sensitivity.
- IP20 guarded terminals with dual terminal markings prevent accidental contact with live parts.
- 35mm DIN rail mounting for fast and easy installation and removal without the use of tools, panel mounting for more secure installation in high shock and vibration applications.

AC Coil Voltage

Coil voltages available in 50/60Hz 24V, 230V & 400V AC, 100V 50Hz AC



- CE, EN60947-4-1
- Maximum terminal capacity – 2.5 mm²
- Maximum tightening torque – 1.2 Nm
- Ambient operating temperature = -5°C to +40°C
- Weight = 0.18Kg
- Contactor operation times – Closing = 8-20 mSec. opening = 6 to 13mSec.
- Coil consumption – pick up = 16VA, Hold-in = 2-4VA
- Dimensions (mm): H=52 x W=45 x D=58

MC1-09 4kW 9A AC3 (20A AC1) 3 Pole

Part Number	Description
MC1-09P3010A024B	24V AC 50/60 Hz, 1 N/O Aux
MC1-09P3010A110F	110V AC 50 Hz, 1 N/O Aux
MC1-09P3010A230B	230V AC 50/60 Hz, 1 N/O Aux
MC1-09P3010A400B	400V AC 50/60 Hz, 1 N/O Aux
MC1-09P3001A024B	24V AC 50/60 Hz, 1 N/C Aux
MC1-09P3001A110F	110V AC 50 Hz, 1 N/C Aux
MC1-09P3001A230B	230V AC 50/60 Hz, 1 N/C Aux
MC1-09P3001A400B	400V AC 50/60 Hz, 1 N/C Aux

MC1-09 4kW 9A AC3 (20A AC1) 3 Pole

Part Number	Description
MC1-09P3010A024B	24V AC 50/60 Hz, 1 N/O Aux
MC1-09P3010A110F	110V AC 50 Hz, 1 N/O Aux
MC1-09P3010A230B	230V AC 50/60 Hz, 1 N/O Aux
MC1-09P3010A400B	400V AC 50/60 Hz, 1 N/O Aux
MC1-09P3001A024B	24V AC 50/60 Hz, 1 N/C Aux
MC1-09P3001A110F	110V AC 50 Hz, 1 N/C Aux
MC1-09P3001A230B	230V AC 50/60 Hz, 1 N/C Aux
MC1-09P3001A400B	400V AC 50/60 Hz, 1 N/C Aux

Part Number Break Down

MC1-	Mini Contactor
09P	09P = 9A, 16P = 16A
30	Main Contact - 3 x N/O
10	Auxiliary Contacts - 10 = 1 x N/O, 01 = 1 x N/C
A	Coil Type - A=AC
024	AC Coil Voltage - 024V, 110V, 230V, 400V
B	Frequency - B = 50/60Hz, F=50Hz

Technical Specification	Units	MC1-09P	MC1-16P
Electrical General			
Rated Operating Frequency		AC: 50Hz (110V Only) 50/60Hz	
IEC RATINGS			
Rated Insulation Voltage, UI	V	690	
Rated Impulse Voltage withstand, Uimp	KV	4	
Rated Operating Voltage, Ue	V	690	
Rated Thermal Current, Ith for Ambient Temperature < 55 C	A	20	22
Making Capacity	A	90	160
Breaking Capacity			
Ue < 400V	A	72	128
Ue =500V	A	72	128
Ue =690V	A	54	96
AC - 1 Operating Current, Ie			
At 55 C	A	20.0	22.0
At 70 C	A	16.0	17.6
AC - 3 Operating Current, Ie			
220 ~ 240V	A	9.0	16.0
380 ~ 400V	A	9.0	16.0
415 ~ 440V	A	9.0	16.0
500V	A	7.5	13.0
660 ~ 690V	A	6.0	9.7
AC - 3 Operating Power, Pe			
220 ~ 240V	KW	2.2	4.5
380 ~ 400V	KW	4.0	7.5
415 ~ 440V	KW	4.5	7.5
500V	KW	4.5	7.5
660 ~ 690V	KW	4.5	7.5
AC - 4 Operating Current, Ie			
220 ~ 240V	A	7.5	13.3
380 ~ 400V	A	7.5	13.3
415 ~ 440V	A	7.5	13.3
500V	A	6.3	10.8
660 ~ 690V	A	5.0	8.1
AC - 4 Operating Power, Pe			
220 ~ 240V	KW	1.5	3.0
380 ~ 400V	KW	3.0	5.5
415 ~ 440V	KW	3.0	5.5
500V	KW	3.0	5.5
660 ~ 690V	KW	4.0	5.5
AC - 4 Operating Current, Ie @ 200,000 Operations			
220 ~ 240V	A	2.7	4.8
380 ~ 400V	A	2.7	4.8
415 ~ 440V	A	2.7	4.8
500V	A	2.3	3.9
660 ~ 690V	A	1.8	2.9
AC - 4 Operating Power, Pe @ 200,000 Operations			
220 ~ 240V	KW	0.55	1.1
380 ~ 400V	KW	1.1	1.5
415 ~ 440V	KW	1.1	1.5
500V	KW	1.1	2.2
660 ~ 690V	KW	1.1	2.2
Maximum Electrical Switching Rate			
AC - 1	Ops./Hr.	300	
AC - 3	Ops./Hr.	600	
AC - 4	Ops./Hr.	300	
Electrical Endurance, AC -3 at Maximum Rated 3 Phase Operating Power (@ 400V)	Ops. (mill.)	1.3	1.1
Short Circuit Coordination	KA	5	
Type "1" gL/gG	A	35	35
Type "2" gL/gG	A	20	25

Technical Specification	Units	MC1-09P	MC1-16P
Environmental			
Ambient Operating Temperature		-5 to + 40°C (-13 to +131 F)	
Ambient Storage		-55 to +80°C (-67 to +176 F)	
Construction			
Ingress Protection			
Main Circuits		IP20	
Control Circuit Terminations		IP20	
Weight	Kg	0.18	
Terminal Capacity			
Solid	mm ²	1 x 0.5 ~ 2.5	
Stranded	mm ²	1 x 0.5 ~ 2.5	
Tightening Torque	Nm	1 ~ 1.2	
Electrical Endurance			
@ Maximum Rated 3 Phase Operating Power (400V)		1.1	
Coil Characteristics			
Rated Insulation Voltage, UI	V	690	
Operating Limits			
50Hz, 60Hz, 50/60Hz			
Operating	xUc	0.8 ~ 1.1	
Pick-Up	xUc	0.40 ~ 0.76	
Sealed	xUc	0.25 ~ 0.65	
Coil Consumption			
50Hz, 60Hz, 50/60Hz			
Pick-Up	VA	16	
Hold-In	VA	2 ~ 4	
Operating Times			
AC			
Pick-Up	msec	8 ~ 20	
Drop-Out	msec	6 ~ 13	
Power Dissipation			
50Hz, 60Hz, 50/60Hz			
	VA	3	
Power Factor			
Closed	cos θ	0.27	
Open	cos θ	0.8	
Mechanical			
Mechanical Endurance	Ops.(mill)	10	
Maximum Mechanical Switching Rate	Ops./Hr	2000	

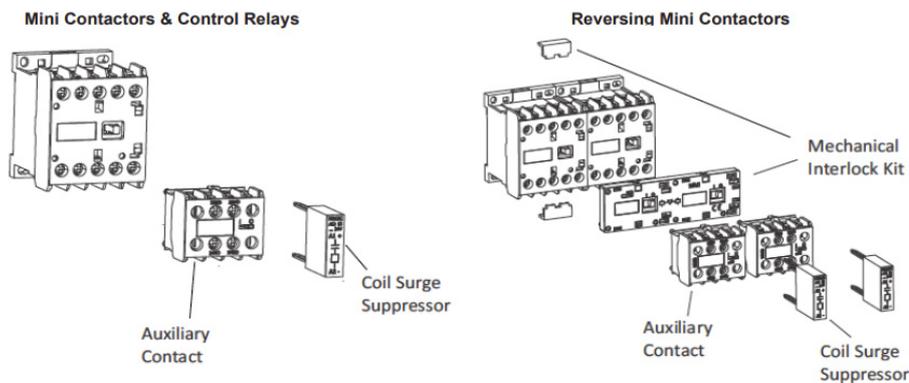
Auxiliary Contact Specifications

		MC1 Series (Built in Aux)	MC1-FA
IEC RATINGS			
Rated insulation Voltage, Ui	V	690	
Rated Operating Voltage, Ue	V	690	
Rated Thermal Current, Ith for Ambient Temperature < 55 C	A	10	10
Making Capacity, Ue < 400V, AC-15	A	10 x Ie (AC-15)	10
Breaking Capacity, Ue < 400V, AC-15	A	10 x Ie (AC-15)	30.0
AC-15			
< 240V	A	10.0	10.0
380 ~ 400V	A	6.0	5.0
415 ~ 440V	A	5.0	5.0
500V	A	4.0	4.0
660 ~ 690V	A	2.0	-
DC-13			
24V	A	6.0	1.5
48V	A	4.0	-
60V	A	1.5	0.5
110V	A	0.7	0.4
220 ~ 240V	A	0.35	0.2

Short Circuit Coordination			
gL/gG	A	10	10
Electrical Endurance	Ops.(mill.)		1.0
Mechanical			
Mechanical Endurance	Ops.(mill.)		10
Environmental			
Ambient Operating Temperature			-5 to +40 C
Ambient Storage Temperature			-55 to +80 C
Construction			
Terminal Capacity			
Solid	mm ²		2 X 0.5 ~ 2.5
Stranded	mm ²		2 X 0.5 ~ 2.5
Tightening Torque	Nm		1 ~ 1.2

Accessories for Mini Contactors

The complete range of Mini Contactors share common accessories including auxiliary contacts, mechanical interlock, reversing wiring modules, surge suppressors. Designing starter assemblies and panels is easy – you don't have to remember which auxiliary is required for each contactor as they all work together. Installation is easy too – once you learn how to install each accessory, it's always the same no matter what contactor it's being installed on. If simple design and assembly isn't enough – you'll also reduce your inventory and maximize its flexibility, because unique accessories are not required for each size contactor.



Auxiliary Contacts



Front mounted auxiliary contact modules feature IP20 guarded terminals to protect against accidental contact with live parts. The modules are available in 2 and 4 circuit configurations. The device identification marker simplifies troubleshooting in panels with many devices. These modules snap on and install without the use of tools.

- Current range 10A (Max) @ AC-15, 240V
- Maximum terminal capacity – 2.5 mm²
- Maximum tightening torque – 1.2 Nm
- Ambient operating temperature = -5°C to +40°C
- Dimensions (mm): H=27 x W=37 x D=32

Part Number	Description
MC1-FA11	Front Mounted Aux Contact - 1NO, 1NC
MC1-FA22	Front Mounted Aux Contact - 2 NO, 2NC
MC1-FA20	Front Mounted Aux Contact - 2NO
MC1-FA02	Front Mounted Aux Contact - 2NC
MC1-FA04	Front Mounted Aux Contact - 4NC
MC1-FA40	Front Mounted Aux Contact - 4NO
MC1-FA31	Front Mounted Aux Contact - 1NC 3NO
MC1-FA13	Front Mounted Aux Contact - 3NC 1NO

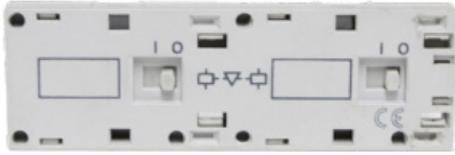
Wiring Modules



Reversing contactor power wiring modules make field assembly of reversing contactors easy.

Part Number	Description
MC1-RWM16LIS	LINE SIDE Wiring Module
MC1-RWM16LDS	LOAD SIDE Wiring Module

Mechanical Interlock



The mechanical interlock module is used in conjunction with 2 MC1 contactors and the wiring modules to configure a forward and reverse motor contactor. Basically, the mechanical interlock converts the 2 contactors into an exclusive switch, ensuring that only one contactor can have the power connections engaged at any one time by mechanically 'locking-out' the other contactor power connections.

The insulated wiring modules are used as a quick and convenient method of linking the common connections on the line and load side of both contactors. To achieve a common load side connection to the motor for both forward and reverse direction, the contactors are designated as 'reverse' and 'forward'.

The wiring module connects the 'forward' to the 'reverse' contactor but the phases are reversed between reverse and forward contactor. This ensures that when the reverse contactor is engaged, the motor will run in reverse and when the forward contactor is engaged the motor will run forward.

See circuit diagram for non-reversing contactor

Part Number	Description
MC1-MI	Front mounted mechanical Interlock

Surge Suppressors



Front mounted surge suppressors protect sensitive electronic components from damaging line voltage spikes. Installed without tools, these modules can be used with other accessories from the MC1 range.

Part Number	Description
RC Type	
MC1-RCA024B	12-24V 50/60Hz
MC1-RCA048B	24-48V 50/60Hz
MC1-RCA127B	50-127V 50/60Hz
MC1-RCA250B	130-250V 50/60Hz
MC1-RCA510B	400-510V 50/60Hz

Part Number	Description
Varistor Type	
MC1-VSAD048	12-48VAC/12-60VDC
MC1-VSAD127	50-127VAC / 60-180VDC
MC1-VSAD250	130-250VAC / 180-300VDC
MC1-VSA510	400-510 VAC

Bimetallic Overload Relays



Bimetallic Overload Relays provide thermal Trip Class 10 overload protection for single and three phase motors, and phase loss protection for three phase. Other features like IP20 guarded terminals with dual terminal markings, integral stop button, and direct mounting will help to reduce the total installed costs and enhance the features and performance of your equipment.

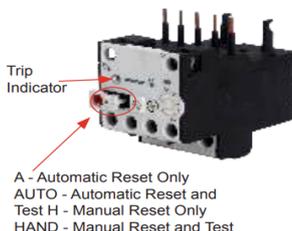
- Maximum terminal capacity (Main) – 16 mm²
- Maximum tightening torque (Main)– 2.3 Nm
- Maximum terminal capacity (Control) – 4 mm²
- Maximum tightening torque (Control) – 1.2 Nm
- Ambient operating temperature = -5°C to +40°C
- Weight = 0.15Kg
- Dimensions (mm) H=84 x W=45 x D=57 (not including connection pins)

Features

- MC1-TR series Overload Relays for use with MC1 Series Mini Contactors.
- Includes integral connection to auxiliary and coil terminations for ease of wiring during installation when installed on MC1 Series Mini Contactors.
- 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 MC1 series contactors.
- IP20 guarded terminals prevent accidental contact with live parts.
- Combination head terminal screws allow the use of straight, phillips or posidrive screwdrivers.
- Ambient temperature compensation ensures reliable motor protection even in high temperature environments.

Part Number	Description
MC1-TR0.40	0.28 - 0.4A Current Setting Range for use with MC1-09
MC1-TR0.63	0.4 - 0.63A Current Setting Range for use with MC1-09
MC1-TR0.80	0.56 - 0.8A Current Setting Range for use with MC1-09
MC1-TR1.20	0.8 - 1.2A Current Setting Range for use with MC1-09
MC1-TR1.80	1.2 - 1.8A Current Setting Range for use with MC1-09
MC1-TR2.80	1.8 - 2.8A Current Setting Range for use with MC1-09
MC1-TR4.00	2.8 - 4.0A Current Setting Range for use with MC1-09
MC1-TR6.30	4.0 - 6.3A Current Setting Range for use with MC1-09
MC1-TR8.0	5.6 - 8.0A Current Setting Range for use with MC1-09
MC1-TR10.0	7.0 - 10.0A Current Setting Range for use with MC1-16
MC1-TR12.5	8.0 - 12.5A Current Setting Range for use with MC1-16
MC1-TR15.0	10 - 15A Current Setting Range for use with MC1-16
MC1-TR17.0	10 - 15A Current Setting Range for use with MC1-16

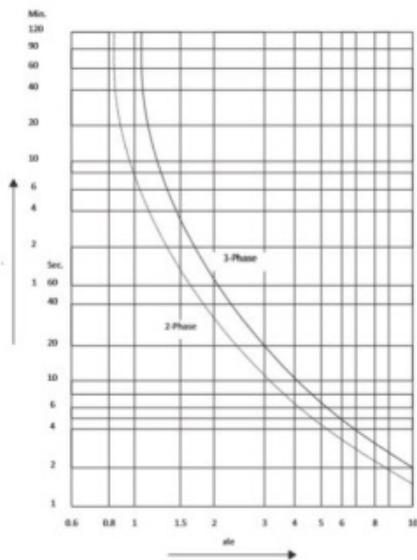
Unique Product Feature



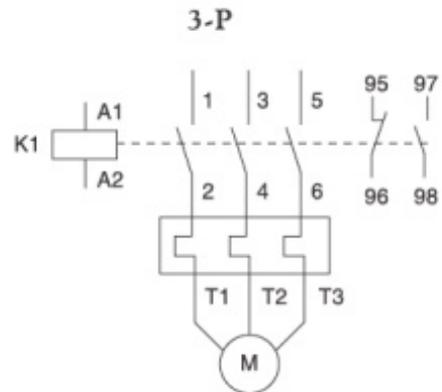
MC1-TR series Bimetallic Overload Relays feature a multi-function reset button enabling the user to select the reset mode-manual or automatic and whether or not to enable the test function. When the reset button is pressed, with the reset function enabled, the Normally Open (NO) contact closes and the Normally Closed (NC) contact opens to verify the control circuit functionality. In addition, the NC contact can be used in a "Stop" circuit. Multiple functions in a single device help to reduce inventory and customize the overload relay operation to provide the performance and features required for the specific application.

Technical Specification	Units	MC1-TR
Electrical General		
Current setting range	A	0.28 ~ 17
Operating Frequency	Hz	0 ~ 400
Power Dissipation per pole	W	0.9 ~ 1.4
IEC Ratings		
Main Circuits		
Rated Insulation Voltage,Ui	KV	690
Rated Impulse Voltage withstand, Uimp	VAC	6
Rated Operating Voltage, Ue	A	690
Maximum Rated Operating Current, Ie	A	17
Short Circuit Current, Ie	A	5kA
Maximum fuse size in type "1" gL/gG	A	60
Maximum fuse size in type "2" gL/gG		35
Control Circuits		
Rated Insulation Voltage,Ui		690
Rated Operating Current, Ie	A	
AC-15		
24V	A	4
48V	A	3.5
60V	A	3.5
110~120V	A	3.00
220~240V	A	2.00
400~415V	A	1.50
500V	A	0.50
660~690V	A	0.30
DC-13		
24V	A	1.00
48V	A	0.50
60V	A	0.50
110V	A	0.25
220V	A	0.10
250V	A	0.10
Short Circuit Coordination		
gL/gG	A	6
Environmental General		
Ambient Temperature	Units	-5 to +40°C
Ambient Storage Temperature		-40 to +70°C
Construction		
Number of Poles		3
Trip Class		10
Pollution Degree		3
Ingress Protection		
Main Circuit Terminals		IP20
Control Circuit Terminals		IP20
Weight		
Conductor Size	Kg.	0.15
Main Circuit Terminals		
Solid		
Stranded	mm ²	2.5 ~ 16
Terminal Torque	mm ²	2.5 ~ 16
	Nm	1.4 ~ 2.3
Control Circuits		
Solid	mm ²	1 ~ 4
Stranded	mm ²	1 ~ 4
Terminal Torque	Nm	1.2
ROHs Compliance		Yes

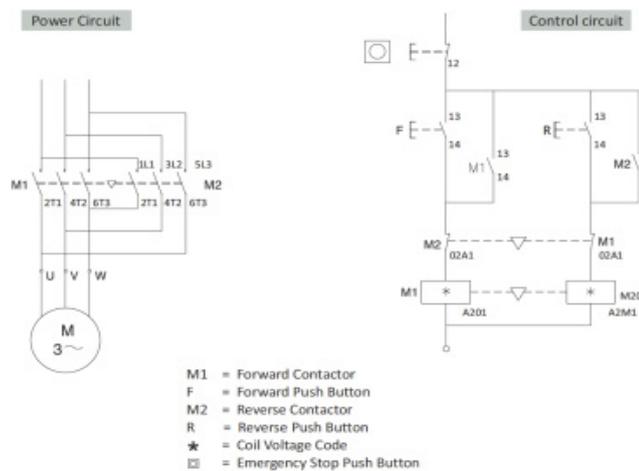
Bimetallic Overload Relay Trip Characteristics



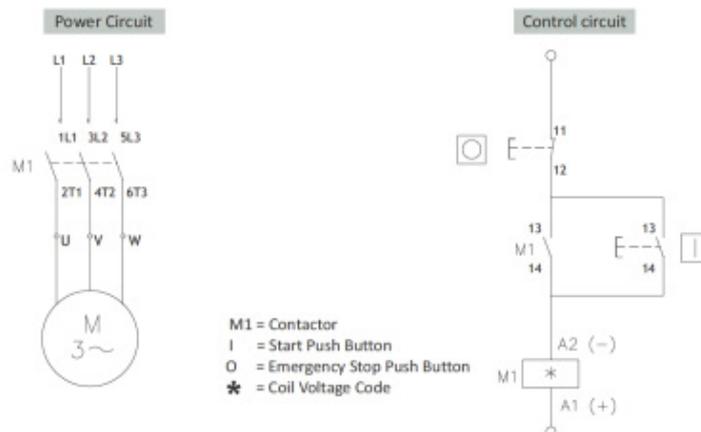
Circuit Diagrams



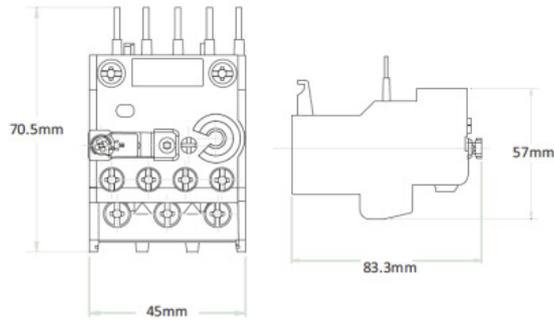
RC Reversing Contactor Circuit Diagram



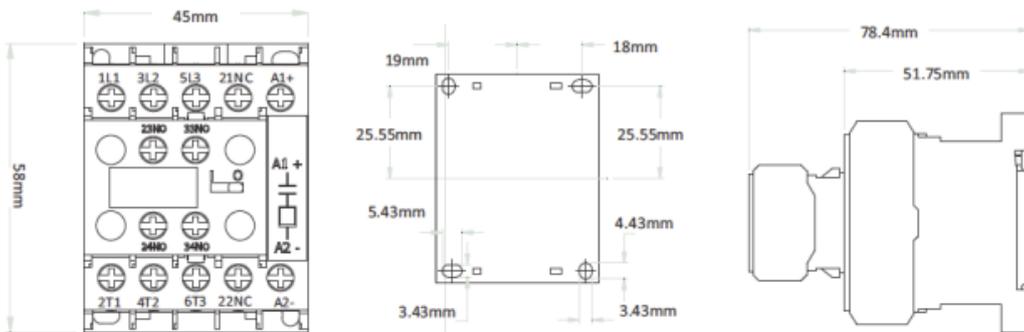
SC Non - Reversing Contactor Circuit Diagrams



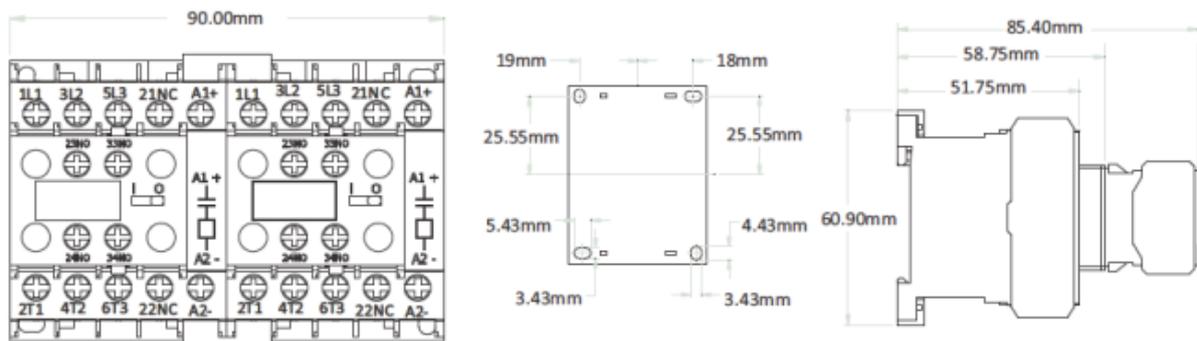
Bimetallic Overload Relays



Mini Non - Reversing Contactor with Auxiliary Contacts & Surge Suppressor



Mini Reversing Contactor with Auxiliary Contacts & Surge Suppressor



Mini Reversing Contactor with Auxiliary Contacts & Surge Suppressor

