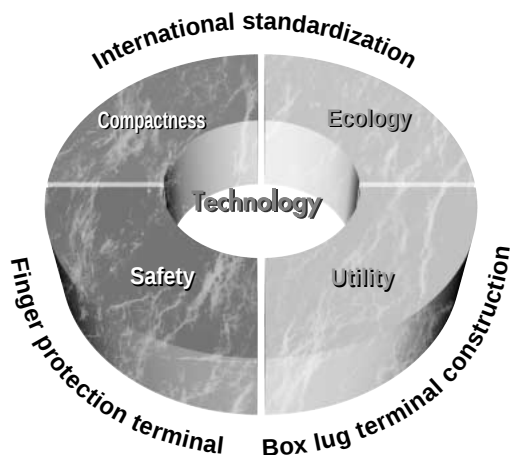


DUO series Contactors

SC-M and SC-E series

General information

In addition to the five basic concepts of the existing SC series of magnetic contactors and motor starters — international standardization, compactness, safety, utility, and ecology — the SC-M and SC-E series take the line-up to the next step in utility with a new finger protection terminal and box lug terminal construction.



SC-M series

2.2 to 4kW, 400V AC

■ Description

Optimal 45mm-wide mini-magnetic contactors for small-capacity induction motor control. A wide range of accessories ensures the flexibility to meet user needs.

SC-E series

4 to 75kW, 400V AC

■ Description

Models SC-E02 to SC-E4 have a 3-pole main circuit structure. Available in three frame sizes, 43mm, 54mm, and 67mm wide, they enable a significantly reduced mounting area. Models SC-E5 to SC-E7 use an IC-controlled SUPER MAGNET to ensure high operating reliability.

International standardization

IEC 60947-4-1, EN 60947-4-1, VDE 0660

UL 508, CSA C 22.2, JIS C 8201-4-1

Compactness

- SC-M01, M02: 45mm wide
- SC-E02 to E05: 43mm wide, SC-E1 to E2S: 54mm wide
- SC-E3, E4: 67mm wide, SC-E5: 88mm wide
- Reducing mounting area

Safety

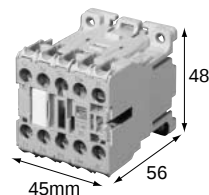
- Terminals with finger-touch protection (DIN 57106/ VDE 0106 Teil100)

Utility

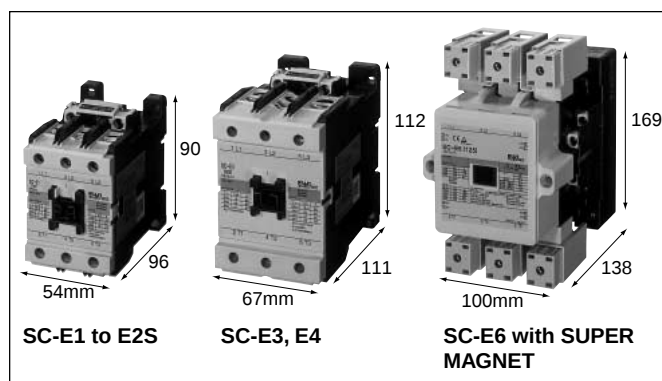
- Box lug terminal construction
- Long electrical life
- Reduction of wiring work

Ecology

- Reducing power consumption
- Recycled thermoplastic resin used for plastic parts.
- The names of materials are indicated on all major parts to facilitate their recycling.



SC-M01, M02



■ Quick reference guide

Contactor	Non-reversing Reversing	SC-M01	SC-M02	SC-E02	SC-E03	SC-E04	SC-E05	SC-E1
		SC-M01RM	SC-M02RM	SC-E02RM	SC-E03RM	SC-E04RM	SC-E05RM	SC-E1RM
								
		KK02-292	KK02-292	AF01-12	AF01-11	AF01-10	KK01-105	AF01-8
Motor capacity 3-phase AC-3 (kW)								
200–240V		1.5	3	2.2	3	4	5.5	7.5
380–440V		2.2	4	4	5.5	7.5	11	15
Rated operational current AC-3 (A)								
200–240V		6	9	9	12	18	25	32
380–440V		6	9	9	12	18	25	32
Rated thermal current AC-1 (A)		20	20	20	20	25	32	50
Auxiliary contact Non-reversing		1NO, 1NC	1NO, 1NC	–	–	–	–	–
Dimensions (mm) W×H×D AC operated		45×48×56			43×81×81			54×90×96
Non-reversing DC operated		45×48×68			43×81×108			54×90×121.5
Standard		IEC 60947-4-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						
Further information		Page 02/35			Page 02/43			
Thermal overload relay (standard type)				TK-E02	TK-E02	TK-E02	TK-E02	TK-E2
 								
				KK01-86	KK01-86	KK01-86	KK01-86	KK01-88
Ampere setting range (A)		–	–	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13 12–18	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13 12–18 16–22 20–25	4–6 5–8 6–9 7–11 9–13 12–18 18–26 24–36
Dimensions W×H×D (mm)					53×60.5×80.5			54×78.5×97
Standard		IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						
Further information		Page 02/65						

DUO series Contactors

SC-M and SC-E series

General information

Contactors Non-reversing Reversing 	SC-E2 SC-E2RM	SC-E2S SC-E2SRM	SC-E3 SC-E3RM	SC-E4 SC-E4RM	SC-E5 SC-E5RM	SC-E6 SC-E6RM	SC-E7 SC-E7RM	
								
	AF01-7	AF01-6	AF01-5	AF01-4	AF01-3	AF01-2	AF01-1	
	Motor capacity 3-phase AC-3 (kW) 200–240V 380–440V	11 18.5	15 22	18.5 30	22 40	30 55	37 60	45 75
	Rated operational current AC-3 (A) 200–240V 380–440V	40 40	50 50	68 65	80 80	105 105	125 125	150 150
	Rated thermal current AC-1 (A)	60	65	100	105	150	150	200
	Auxiliary contact Non-reversing	–	–	–	–	2NO+2NC	2NO+2NC	2NO+2NC
	Dimensions (mm) W×H×D AC operated Non-reversing DC operated	54×90×96 54×90×121.5		67×112×111 67×112×130		88×155×132	100×169×138	115×175×140
	Standard	IEC 60947-4-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						
	Further information	Page 02/43						
Thermal overload relay (standard type) 	TK-E2	TK-E2	TK-E3	TK-E3	TK-E5	TK-E6	TK-E6	
								
	KK01-88	KK01-88	KK01-87	KK01-87	KK01-85	KK01-84	KK01-84	
	Ampere setting range (A)	4–6 5–8 6–9 7–11 9–13 12–18 18–26 24–36 32–42	4–6 5–8 6–9 7–11 9–13 12–18 18–26 24–36 32–42 40–50 44–54	7–11 9–13 12–18 18–26 24–36 28–40 34–50 45–65 48–68	7–11 9–13 12–18 18–26 24–36 28–40 34–50 45–65 48–68 64–80	18–26 24–36 28–40 34–50 45–65 65–95 85–105	45–65 53–80 65–95 85–125	45–65 53–80 65–95 85–125 110–160
	Dimensions W×H×D (mm)	54×78.5×97		68×89.5×107.5		76.5×105×106	100×122×123	
	Standard	IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						
	Further information	Page 02/65						

SC-M series magnetic contactors / Non-reversing

■ Features

- 45mm-wide compact magnetic contactors
- Terminal block with easy wiring that prevents the accidental finger touch to live parts.
- Snap-on mounting to 35mm-wide top hat rail (DIN)
- Electrical durability of one million operations
- Two models with low power consumption (1.2W and 2W at 24V DC) as well as standard DC-operation models
- Many optional accessories: Auxiliary contact block, coil surge suppression unit, and solid-state time-delay unit

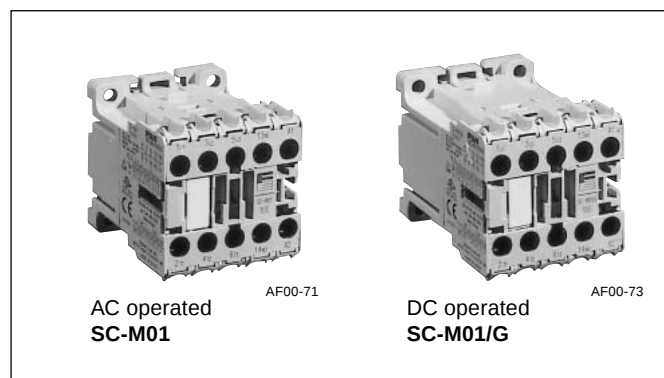
■ Standards

IEC 60947-4-1, EN 60947-4-1, VDE 0660

UL 508, CSA C 22.2, JIS C 8201-4-1, JEM 1038

■ Types and ratings

• Non-reversing



Operating coil	Max. motor capacity (kW)				Rated operational current (A)						Rated thermal current (A)	Auxiliary contact arrangement	Type
	3-phase motor AC-3				3-phase motor AC-3				Resistive load AC-1				
	200 240V	380 440V	500V	600 690V	200 240V	380 440V	500V	600 690V	200 240V	380 440V			
AC operated	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO 1NC	SC-M01
	3	4	4	4	9	9	6.5	5	20	20	20	1NO 1NC	SC-M02
DC operated	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO 1NC	SC-M01/G
	3	4	4	4	9	9	6.5	5	20	20	20	1NO 1NC	SC-M02/G
DC operated (Low power consumption 24V DC 1.2W)	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO 1NC	SC-M01/G1
	3	4	4	4	9	9	6.5	5	20	20	20	1NO 1NC	SC-M02/G1
DC operated (Low power consumption 24V DC 2W)	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO 1NC	SC-M01/G2
	3	4	4	4	9	9	6.5	5	20	20	20	1NO 1NC	SC-M02/G2

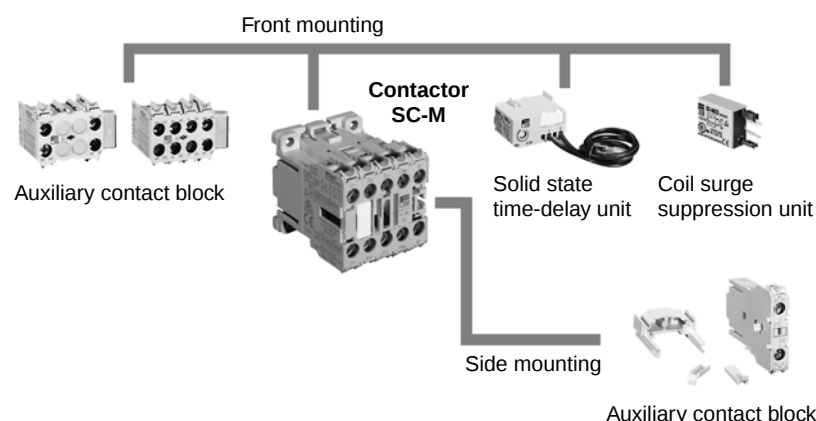
Note: Ratings conform to IEC 60947-4-1

■ Accessories

A full range of accessories with the emphasis on utility.

Contactors: SC-M series

Thermal overload relays: TK-M series



■ Type number nomenclature

SC-M01/G

Operating coil

Blank: AC operated

G: 12–220V DC operated,
power consumption 3W

G1: 24V DC operated,
power consumption 1.2W

G2: 24V DC operated,
power consumption 2W

Max. motor capacity

M01: 2.2kW at 380–440V

M02: 4kW at 380–440V

■ Ordering information

Specify the following:

1. Type number
2. Operating coil order voltage (See page 02/37)
3. Auxiliary contact arrangement

DUO series Contactors

SC-M series

SC-M series magnetic contactors/Reversing

■ Features

- Ideal for the forward-reverse operation of 3-phase motors or plugging stops.
- Mechanical interlock
- 90mm wide (same as two magnetic contactors)
- Snap-on mounting to 35mm-wide top hat rail (DIN).

■ Standards

IEC 60947-4-1, EN 60947-4-1, VDE 0660
UL 508, CSA C 22.2, JIS C 8201-4-1, JEM 1038

■ Types and ratings

• Reversing

Operating coil	Max. motor capacity (kW)				Rated operational current (A)						Rated thermal current (A)	Auxiliary contact arrangement	Type
	3-phase motor AC-3				3-phase motor AC-3				Resistive load AC-1				
	200 240V	380 440V	500V	600 690V	200 240V	380 440V	500V	600 690V	200 240V	380 440V			
AC operated	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M01RM
	3	4	4	4	9	9	6.5	5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M02RM
DC operated	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M01RM/G
	3	4	4	4	9	9	6.5	5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M02RM/G
DC operated (Low power consumption 24V DC 1.2W)	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M01RM/G1
	3	4	4	4	9	9	6.5	5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M02RM/G1
DC operated (Low power consumption 24V DC 2W)	1.5	2.2	3	3	6	6	5	3.5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M01RM/G2
	3	4	4	4	9	9	6.5	5	20	20	20	1NO × 2 *1 1NC × 2 *2	SC-M02RM/G2

Notes: Ratings conform to IEC 60947-4-1

^{*1} The reversing magnetic contactors with 1NOx2 auxiliary contacts cannot be arranged to form an electrical interlock circuit by themselves. When using the contactors, be sure to arrange an electrical interlock circuit externally to prevent short-circuit accidents from simultaneous switching.

^{*2} The reversing magnetic contactors with 1NCx2 auxiliary contacts can be arranged to form an electrical interlock circuit with additional wiring. When using the contactors, arrange an electrical interlock circuit internally or externally to prevent short-circuit accidents from simultaneous switching.

■ Type number nomenclature

SC-M01RM/G

Operating coil

Blank: AC operated
G: 12–220V DC operated,
power consumption 3W
G1: 24V DC operated,
power consumption 1.2W
G2: 24V DC operated,
power consumption 2W

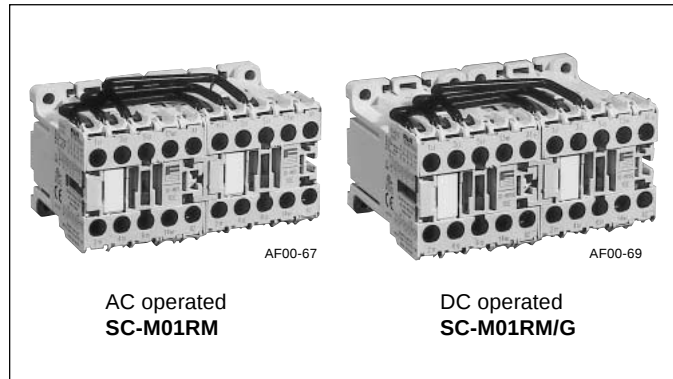
Max. motor capacity

M01RM: 2.2kW at 380–440V
M02RM: 4kW at 380–440V

■ Ordering information

Specify the following:

1. Type number
2. Operating coil order voltage (See page 02/37)
3. Auxiliary contact arrangement



■ Performance data

Frame size	Making capacity (A)	Breaking capacity (A)	Operating cycles per hour	Voltage	Durability (operations)	
					Electrical	Mechanical
M01	72	60	1200	200/240V AC 380/440V AC	1 million	5 million
M02	108	90	1200	200/240V AC 380/440V AC	1 million	5 million

■ Auxiliary contact ratings

Conforming to IEC 60947 5-1, BSEN 60947 5-1 VDE 0660

Rated thermal current	Making and breaking current	Rated operational current				Minimum voltage and current
		AC		DC		
		Voltage	AC-15(Ind. load)	Voltage	DC-13(Ind. load)	
16A	120V AC 60A	120V	6A	24V	5A	17V DC 5mA
	220V AC 60A	220V	6A	48V	3.5A	
	440V AC 30A	440V	3A	110V	1.2A	
	600V AC 15A	600V	1.5A	220V	0.6A	

■ Operating coil

• AC coil

Order voltage	Coil operating voltage and frequency
AC24V	24V AC 50Hz / 24–26V AC 60Hz
AC48V	48V AC 50Hz / 48–52V AC 60Hz
AC100V	100V AC 50Hz / 100–110V AC 60Hz
AC110V	100–110V AC 50Hz / 110–120V AC 60Hz
AC120V	110–120V AC 50Hz / 120–130V AC 60Hz
AC200V	200V AC 50Hz / 200–220V AC 60Hz
AC220V	200–220V AC 50Hz / 220–240V AC 60Hz
AC240V	220–240V AC 50Hz / 240–260V AC 60Hz
AC380V	346–380V AC 50Hz / 380–420V AC 60Hz
AC400V	380–400V AC 50Hz / 400–440V AC 60Hz
AC440V	415–440V AC 50Hz / 440–480V AC 60Hz
AC500V	480–500V AC 50Hz / 500–550V AC 60Hz

• DC coil

Order voltage	Coil operating voltage
DC12V	12V DC
DC24V	24V DC
DC48V	48V DC
DC60V	60V DC
DC100V	100V DC
DC110V	110V DC
DC120V	120V DC
DC200V	200V DC
DC210V	210V DC
DC220V	220V DC

Note: For G1, G2 types, 24V DC only

■ Coil characteristics

• AC operated

Type	Power consumption (VA) *1		Watt loss (W)	Operating voltage range (V)		Operating time (ms)	
	Inrush	Sealed		Pick-up voltage	Drop-out voltage	Coil ON	Coil OFF
SC-M01	50/60Hz	50/60Hz	50/60Hz			Contact ON	Contact OFF
SC-M02	32/36	6/6	1.5/1.6	0.8–1.1Us *2	0.35–0.55Us *1	7–12	6–13

Notes: *1 Coil ratings: 200V 50Hz, 220V 60Hz

*2 Us: Coil rated voltage

• DC operated

Type	Power consumption (W)		Time constant (ms)	Operating voltage range (V)		Operating time (ms)	
	Inrush	Sealed		Pick-up voltage	Drop-out voltage	Coil ON	Coil OFF
SC-M01/G						Contact ON	Contact OFF
SC-M02/G	3	3	35	0.8–1.1Us *	0.2–0.4Us *	24–27	5–8
SC-M01/G1	1.2	1.2	55	0.8–1.25Us *	0.2–0.3Us *	25–45	5–9
SC-M02/G1							
SC-M01/G2	2	2	45	0.7–1.25Us *	0.2–0.35Us *	25–45	5–8
SC-M02/G2							

Note: * Us: Coil rated voltage

DUO series Contactors

SC-M series

■ UL and CSA approved

• Contactor ratings Conforming to UL 508, CSA 22.2

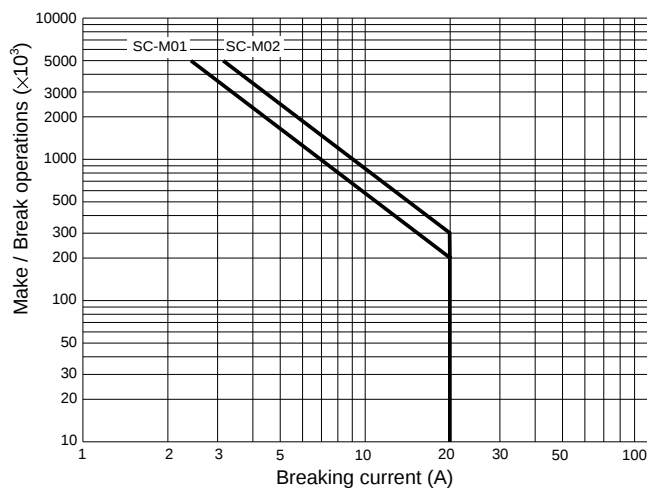
Operating coil	Max. motor capacity (Hp)				Rated operational current (A)				Rated thermal current (A)	Auxiliary contact arrangement	Type
	3-phase motor 200V	220 240V	400 480V	550 600V	3-phase motor 200V	220 240V	400 480V	550 600V			
AC operated	1.5	1.5	3	3	6.9	6	4.8	3.9	20	1NO 1NC	SC-M01
	3	3	5	5	11	9.6	7.6	6.1	20	1NO 1NC	SC-M02
DC operated	1.5	1.5	3	3	6.9	6	4.8	3.9	20	1NO 1NC	SC-M01/G
	3	3	5	5	11	9.6	7.6	6.1	20	1NO 1NC	SC-M02/G
DC operated (Low power consumption 24V DC 1.2W)	1.5	1.5	3	3	6.9	6	4.8	3.9	20	1NO 1NC	SC-M01/G1
	3	3	5	5	11	9.6	7.6	6.1	20	1NO 1NC	SC-M02/G1
DC operated (Low power consumption 24V DC 2W)	1.5	1.5	3	3	6.9	6	4.8	3.9	20	1NO 1NC	SC-M01/G2
	3	3	5	5	11	9.6	7.6	6.1	20	1NO 1NC	SC-M02/G2

• Auxiliary contact ratings

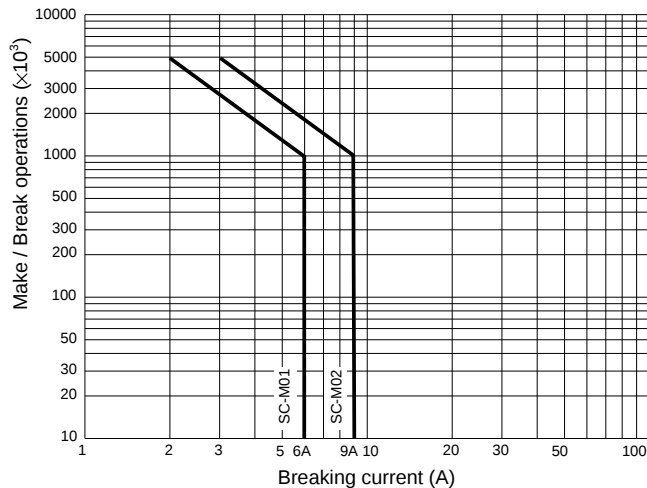
Rated thermal current (A)	Making and breaking current (A)					
	AC (Rating code: A600)			DC (Rating code: Q600)		
	Volts	Make	Break	Volts	Make	Break
16	120	60	6	125	0.55	0.55
	240	30	3	250	0.27	0.27
	480	15	1.5	301-600	0.1	0.1
	600	12	1.2			

■ Electrical durability

• AC-1 duty / 380 to 440V AC



• AC-3 duty / 380 to 440V AC



■ Optional accessories

• Auxiliary contact blocks

The front mounting auxiliary contact block allows two or four auxiliary contacts to be added without increasing the mounting area of the magnetic contactors. The side mounting auxiliary

contact block allows two auxiliary contacts to be added to the magnetic contactors without increasing the depth.

Mounting	No. of contacts	Contact arrangement	Type
Front mounting	4	4NO 3NO+1NC 2NO+2NC 1NO+3NC 4NC	SZ-MA40 SZ-MA31 SZ-MA22 SZ-MA13 SZ-MA04
	2	2NO 1NO+1NC 2NC	SZ-MA20 SZ-MA11 SZ-MA02
Side mounting	1	1NO 1NC	SZ-MAS10 SZ-MAS01

The auxiliary contact blocks can be used in combination with the magnetic contactors listed in the following table. The front mounting and side mounting auxiliary contact blocks cannot be used together.

Auxiliary contact block				Used with							
Mounting	No. of additional contacts	Contact arrangement	Type	SC-M01, SC-M02		SC-M01/G, SC-M02/G		SC-M01/G1, SC-M02/G1		SC-M01/G2, SC-M02/G2	
				1NO	1NC	1NO	1NC	1NO	1NC	1NO	1NC
Front mounting	4	4NO 3NO+1NC 2NO+2NC 1NO+3NC 4NC	SZ-MA40 SZ-MA31 SZ-MA22 SZ-MA13 SZ-MA04	5NO	4NO+1NC	5NO	4NO+1NC	—	—	—	—
				4NO+1NC	3NO+2NC	4NO+1NC	3NO+2NC	—	—	—	—
	2	2NO 1NO+1NC 2NC	SZ-MA20 SZ-MA11 SZ-MA02	3NO	2NO+1NC	3NO	2NO+1NC	—	—	3NO	2NO+1NC
				2NO+1NC	1NO+2NC	2NO+1NC	1NO+2NC	—	—	2NO+1NC	1NO+2NC
Side mounting	1	1NO 1NC	SZ-MAS10 SZ-MAS01	2NO	1NO+1NC	2NO	1NO+1NC	—	—	2NO	1NO+1NC
	2	2×1NO 1NO+1NC 2×1NC	2× SZ-MAS10 SZ-MAS10 + SZ-MAS01 2× SZ-MAS01	3NO	2NO+1NC	3NO	2NO+1NC	—	—	3NO	2NO+1NC
				2NO+1NC	1NO+2NC	2NO+1NC	1NO+2NC	—	—	2NO+1NC	1NO+2NC
				1NO+2NC	3NC	1NO+2NC	3NC	—	—	1NO+2NC	3NC

• Coil surge suppression unit

The coil surge suppression unit on to the magnetic contactor.

Device	Operating coil voltage and frequency	Type
CR	12–60V AC 50/60Hz	SZ-MZ1
	72–250V AC 50/60Hz	SZ-MZ2
Diode	6–250V DC	SZ-MZ3

• Solid-state time-delay unit

The solid-state time-delay unit used with the magnetic contactor works as an on-delay timer.

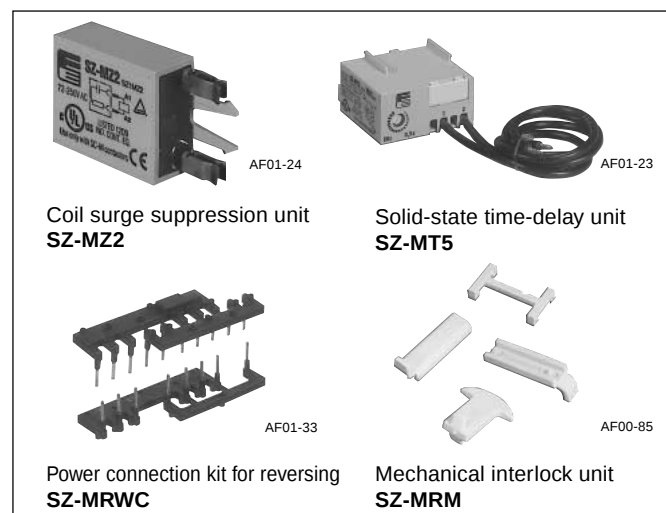
Operation	Operating coil voltage and frequency	Timing range	Type
On-delay	24–250V AC/DC 50/60Hz	0.2–24s 0.5–60s	SZ-MT2 SZ-MT5

• Mechanical interlock unit / SZ-MRM

The mechanical interlock unit provides a mechanical interlock with assembly parts to convert a magnetic contactor into a reversing magnetic contactor.

• Power connection kit for reversing / SZ-MRWC

This kit includes an electrical interlock circuit to convert a magnetic contactor into a reversing magnetic contactor.



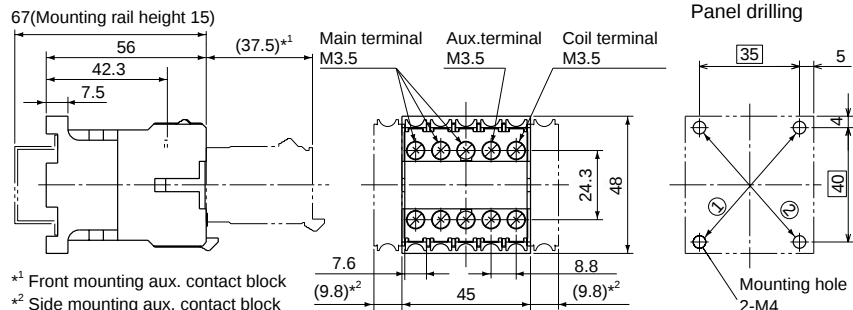
DUO series Contactors

SC-M series

Dimensions

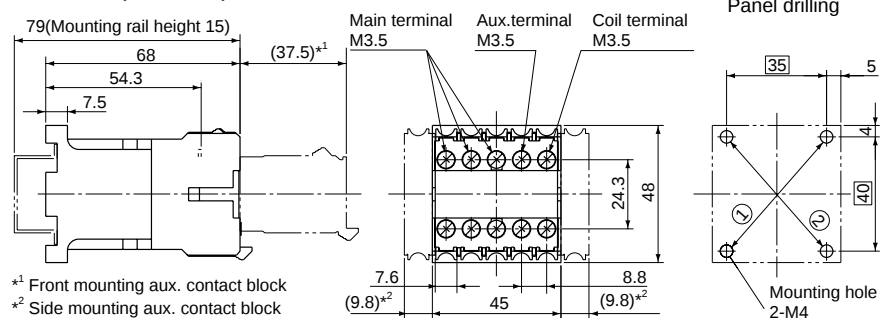
■ Dimensions, mm

• Non-reversing/AC operated SC-M01, SC-M02



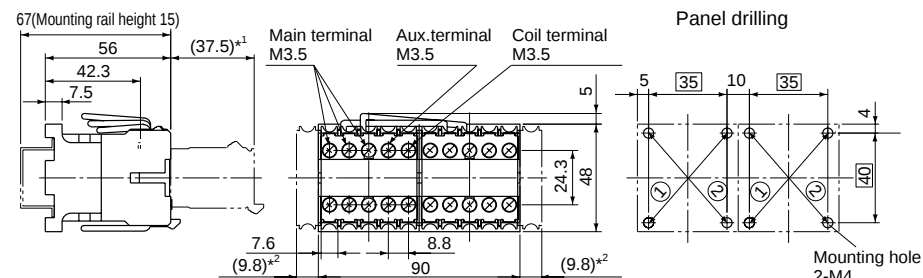
Mass: 0.17kg

• Non-reversing/DC operated SC-M01/G, M01/G1, M01/G2 SC-M02/G, M02/G1, M02/G2



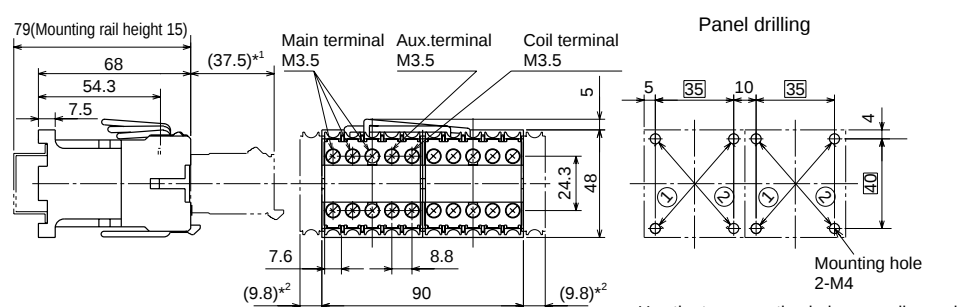
Mass: 0.23kg

• Reversing/AC operated SC-M01RM, SC-M02RM



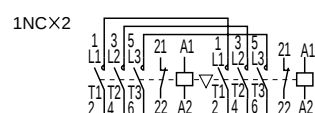
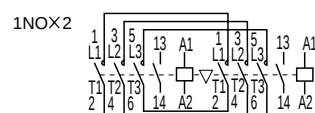
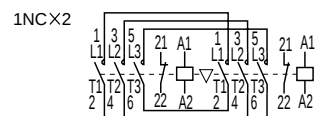
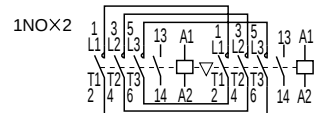
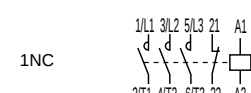
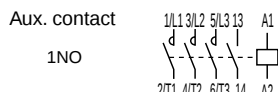
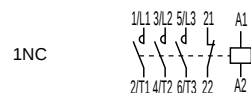
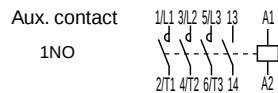
Mass : 0.36kg

• Reversing/DC operated SC-M01RM/G, M01RM/G1, M01RM/G2 SC-M02RM/G, M02RM/G1, M02RM/G2



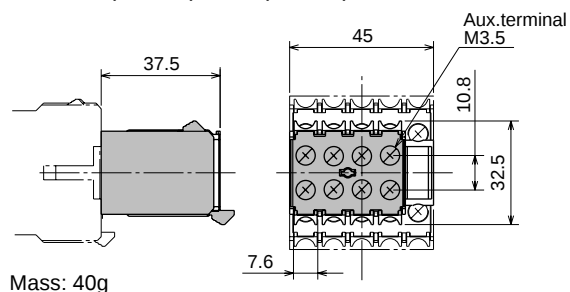
Mass : 0.48kg

■ Wiring diagrams

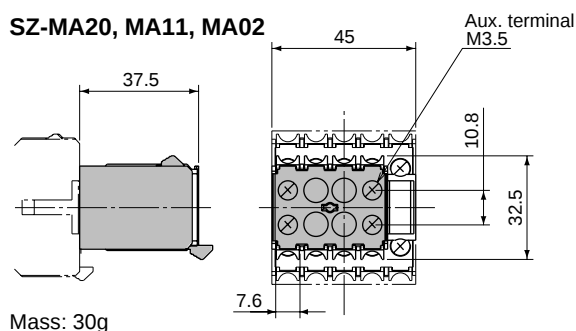


■ Dimensions, mm

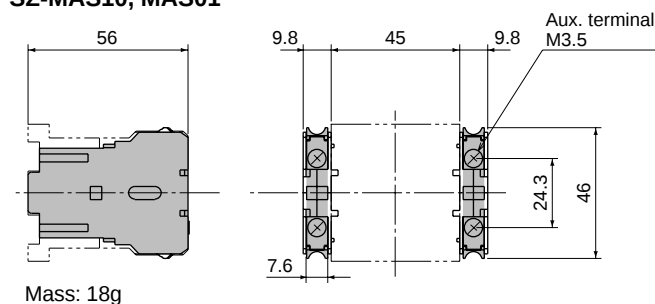
• Auxiliary contact blocks/Front mounting
SZ-MA40, MA31, MA22, MA13, MA04



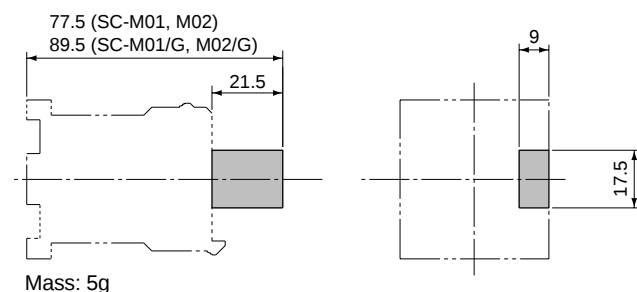
SZ-MA20, MA11, MA02



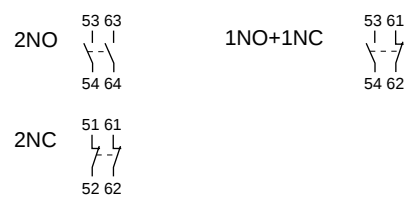
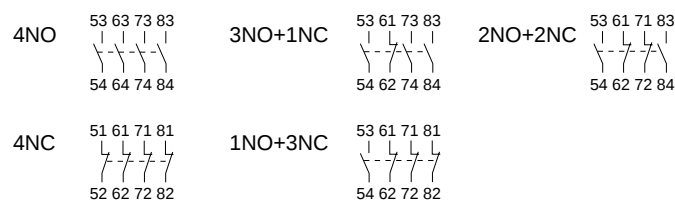
• Aux. contact blocks / Side mounting
SZ-MAS10, MAS01



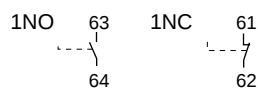
• Coil surge suppression unit
SZ-MZ1, MZ2, MZ3



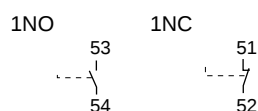
■ Wiring diagrams



Aux. contact
• Mounted on the right side

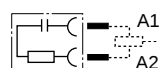


• Mounted on the left side

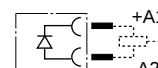


Internal circuit

• Built-in CR

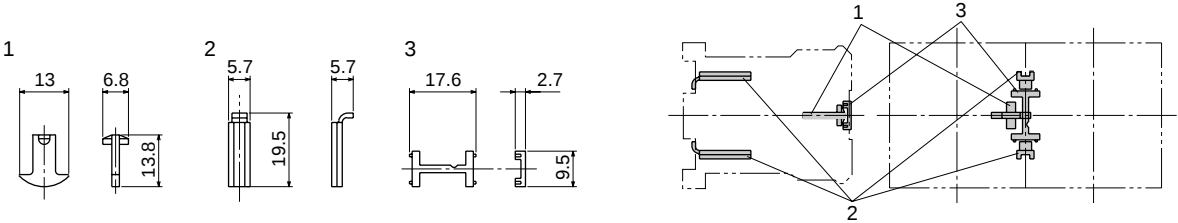


• Built-in diode



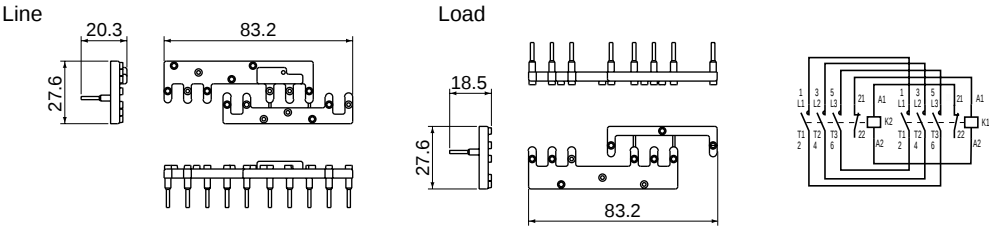
DUO series Contactors
SC-M series
Dimensions

■ Dimensions, mm
• Mechanical interlock unit
SZ-MRM



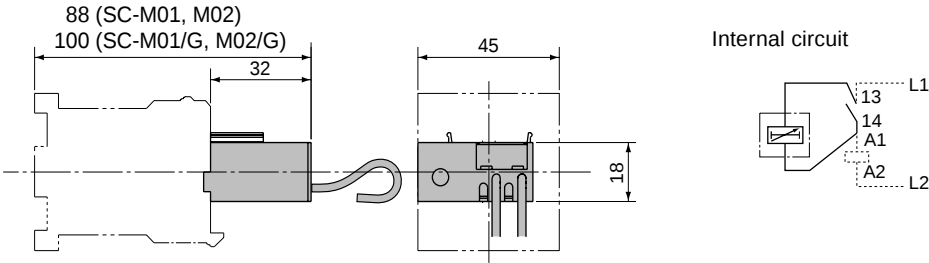
Mass: 1g (3-set)

• Power connection kit for reversing
SZ-MRM



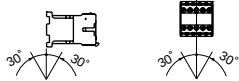
Mass: 27g

• Solid-state time-delay unit
SZ-MT2, MT5



Mass: 38g

■ Standard operating conditions

Ambient temperature	Operating: -5 to 55°C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35°C) Storage: -40 to 65°C
Humidity	45 to 85%RH
Altitude	2000m or lower
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt.
Vibration	10 to 55Hz 15m/s ²
Shock	50m/s ²
Mounting	Screw mounting, 35mm-wide top hat rail (DIN)
Mounting angle	
Standard	IEC 60947-4-1, EN 60947-4-1, VDE 0660 JIS C 8201-4-1, UL 508, CSA C22.2 TÜV (EN60947-4-1)

■ Wiring

Terminal screw	M3.5
Connectable wire size	1.25 to 2mm ² (ø1.2 to 2mm)
Applicable round crimp terminal	7.5mm (R2-3.5)
Tightening torque	0.8 to 1.0N·m
Tool	Pozi-drive screwdriver

SC-E series magnetic contactors/non-reversing

■ Features

- Models SC-E02 to SC-E4 have 3-pole main circuits and come in three sizes with widths of 43mm (up to 25A), 54mm (up to 50A), and 67mm (up to 80A).
- Models SC-E1 to SC-E7 employ a box type terminal that allows wires to be connected directly to the main circuit.
- Equipped with a finger-protection terminal structure (IP20) that prevents accidental finger touch to live parts.
- Models SC-E5 to SC-E7 use a SUPER MAGNET (AC/DC-input/DC-operate) to achieve high operating reliability.

■ Standards

IEC 60947-4-1, EN 60947-4-1, VDE 0660, JIS C 8201-4-1
UL 508, CSA C22.2

■ Type number nomenclature

SC-E02 P/G

Operating coil voltage

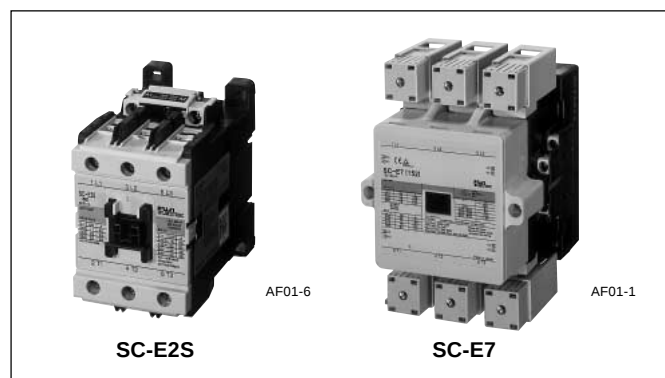
Blank: AC operated (E02 to E4)
AC/DC operated (E5 to E7)
G: DC operated (E02 to E4)

Wiring

Blank: Straight wiring connection
P: Ring terminal connection

Frame size

02 to E7



■ Ordering information

Specify the following:

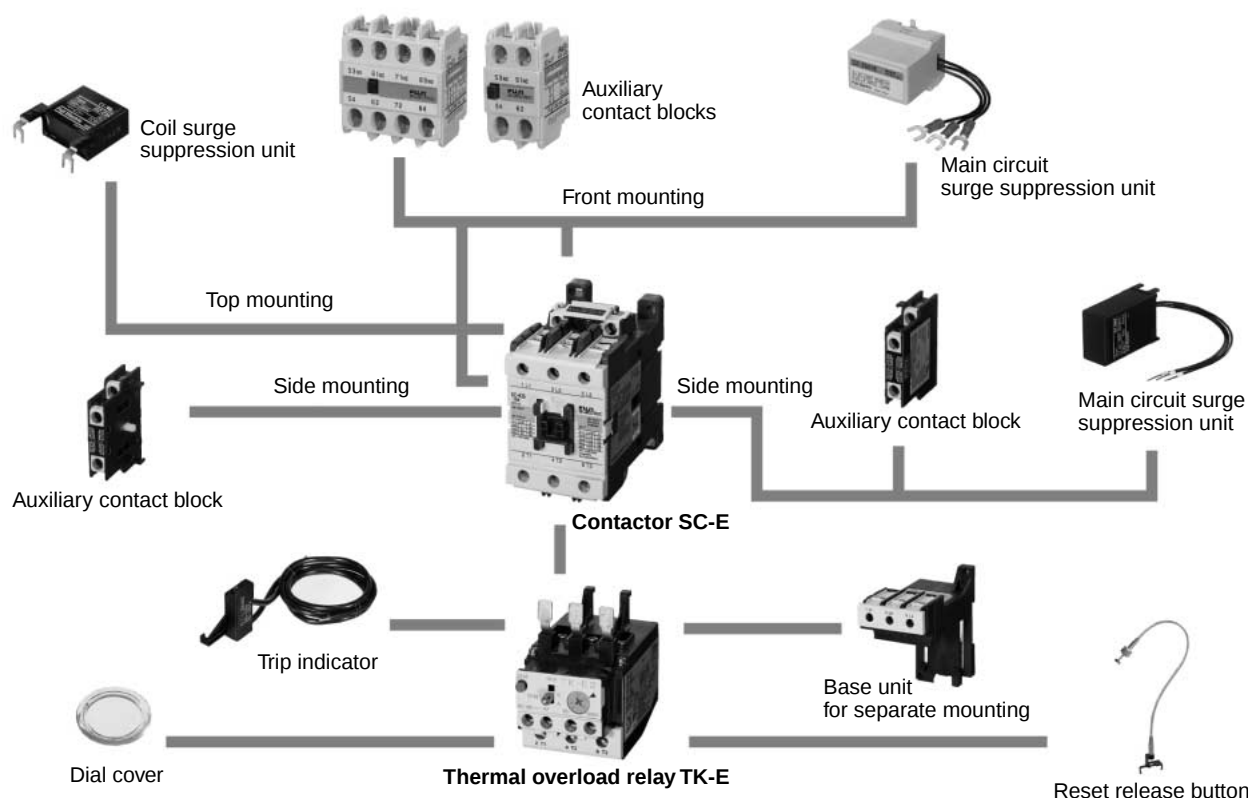
1. Type number
2. Operating coil order voltage (See page 02/51)

■ Accessories

A full range of accessories with the emphasis on utility.

Contactors: SC-E series

Thermal overload relays: TK-E series



DUO series Contactors

SC-E series

■ Types and ratings

Operating coil	Max. motor capacity (kW)				Rated operating current (A)						Rated thermal current (A)	Aux. contact arrangement	Contactor type
	3-phase AC-3				3-phase AC-3				Resistive load AC-1				
	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V			
AC operated	2.2	4	4	4	9	9	7	5	20	20	20	—	SC-E02
	3	5.5	5.5	5.5	12	12	9	7	20	20	20	—	SC-E03
	4	7.5	7.5	7.5	18	18	13	9	25	25	25	—	SC-E04
	5.5	11	11	7.5	25	25	17	9	32	32	32	—	SC-E05
	7.5	15	15	11	32	32	24	15	50	50	50	—	SC-E1
	11	18.5	18.5	15	40	40	29	19	60	60	60	—	SC-E2
	15	22	25	22	50	50	38	26	65	65	65	—	SC-E2S
	18.5	30	37	30	68	65	60	38	100	100	100	—	SC-E3
AC/DC operated	22	40	37	37	80	80	60	44	105	105	105	—	SC-E4
	30	55	55	55	105	105	85	64	150	150	150	2NO+2NC	SC-E5
	37	60	60	60	125	125	90	72	150	150	150	2NO+2NC	SC-E6
DC operated	45	75	75	90	150	150	120	103	200	200	200	2NO+2NC	SC-E7
	2.2	4	4	4	9	9	7	5	20	20	20	—	SC-E02/G
	3	5.5	5.5	5.5	12	12	9	7	20	20	20	—	SC-E03/G
	4	7.5	7.5	7.5	18	18	13	9	25	25	25	—	SC-E04/G
	5.5	11	11	7.5	25	25	17	9	32	32	32	—	SC-E05/G
	7.5	15	15	11	32	32	24	15	50	50	50	—	SC-E1/G
	11	18.5	18.5	15	40	40	29	19	60	60	60	—	SC-E2/G
	15	22	25	22	50	50	38	26	65	65	65	—	SC-E2S/G
	18.5	30	37	30	68	65	60	38	100	100	100	—	SC-E3/G
	22	40	37	37	80	80	60	44	105	105	105	—	SC-E4/G

Note :Ratings conform to IEC 60947-4-1

■ Performance data

Frame size	Making current (A)		Breaking current (A)		Operating cycles per hour	Durability (operations)	
	220V	440V	220V	440V		Electrical	Mechanical
SC-E02	108	108	90	90	1800	2 million	10 million
SC-E03	144	144	120	120	1800	1.5 million	10 million
SC-E04	216	216	180	180	1800	1.5 million	10 million
SC-E05	250	250	200	200	1200	1.5 million	10 million
SC-E1	384	384	320	320	1200	1.5 million	10 million
SC-E2	480	480	400	400	1200	1.5 million	10 million
SC-E2S	500	500	400	400	1200	1.5 million	10 million
SC-E3	816	780	680	650	1200	1.5 million	5 million
SC-E4	816	800	680	650	1200	1 million	5 million
SC-E5	1260	1260	1050	1050	1200	1 million	5 million
SC-E6	1500	1500	1250	1250	1200	1 million	5 million
SC-E7	1800	1800	1500	1500	1200	1 million	5 million

SC-E series magnetic contactors/reversing

■ Features

- Ideal for the forward-reverse operation of 3-phase motors or plugging stops.
- Mechanical interlock
- Snap-on mounting to 35mm-wide top hat rail (DIN). (E02 to E4)

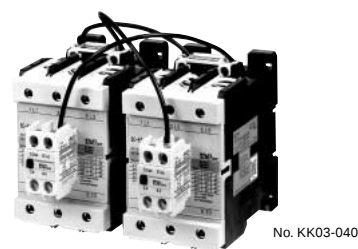
■ Type number nomenclature

SC-E2RM/G

Operating coil voltage

Blank: AC operated (E02 to E4)
AC/DC operated (E5 to E7)
G: DC operated (E02 to E4)

Frame size 02 to E7



SC-E3RM

■ Ordering information

Specify the following:

1. Type number
2. Operating coil order voltage (See page 02/51)
3. Auxiliary contact arrangement

■ Types and ratings

Operating coil	Max. motor capacity (kW)				Rated operating current (A)						Rated thermal current (A)	Aux. contact arrangement	Contactor type
	3-phase AC-3				3-phase AC-3				Resistive load AC-1				
	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V			
AC operated	2.2	4	4	4	9	9	7	5	20	20	20	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E02RM ^{*1}
	3	5.5	5.5	5.5	12	12	9	7	20	20	20	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E03RM ^{*1}
	4	7.5	7.5	7.5	18	18	13	9	25	25	25	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E04RM ^{*1}
	5.5	11	11	7.5	25	25	17	9	32	32	32	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E05RM ^{*1}
	7.5	15	15	11	32	32	24	15	50	50	50	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E1RM ^{*1}
	11	18.5	18.5	15	40	40	29	19	60	60	60	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E2RM ^{*1}
	15	22	25	22	50	50	38	26	65	65	65	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E2SRM ^{*1}
	18.5	30	37	30	68	65	60	38	100	100	100	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E3RM ^{*1}
	22	40	37	37	80	80	60	44	105	105	105	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E4RM ^{*1}
AC/DC operated	30	55	55	55	105	105	85	64	150	150	150	(2NO+2NC) × 2	SC-E5RM
	37	60	60	60	125	125	90	72	150	150	150	(2NO+2NC) × 2	SC-E6RM
	45	75	75	90	150	150	120	103	200	200	200	(2NO+2NC) × 2	SC-E7RM

Notes: • Ratings conform to IEC 60947-4-1

- ^{*1} The above types are shipped in a set containing two magnetic contactors, one SZ-RM mechanical interlock unit, two front mounting auxiliary contact blocks, and electrical interlock wiring. The power connection kit for the reversing contactor is sold separately.
- To prevent short-circuit faults when using SC-E02R to SC-E04RM types for high-speed switching, provide a time delay relay or other electrical interlock to ensure that the switching time is 15ms min.
- For combined use with an MMS, instead of ordering a reversing type, order and assemble the individual components (two magnetic contactors, one SZ-RM mechanical interlock unit, two auxiliary contact blocks, and the power connection kit (SZ-ERW□/A, SZ-ERW□/B)).

^{*1} Equipped with the SZ-A11/T, SZ-A02/T, SZ-A31/T, or SZ-A22/T front mounting auxiliary contact block.

• For motor starter use, order the power connection kit and thermal overload relay.

Type	TOR
SC-E02RM to SC-E05RM	TK-E02
SC-E1RM to SC-E2SRM	TK-E2
SC-E3RM to SC-E4RM	TK-E3
SC-E5RM to SC-E7RM	TK-E6H

DUO series Contactors

SC-E series

Types and ratings

Operating coil	Max. motor capacity (kW)				Rated operating current (A)						Rated thermal current (A)	Aux. contact arrangement	Contactor type
	3-phase AC-3				3-phase AC-3				Resistive load AC-1				
	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V	500 550V	600 690V	200 240V	380 440V			
DC operated	2.2	4	4	4	9	9	7	5	20	20	20	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E02RM/G ^{*1}
	3	5.5	5.5	5.5	12	12	9	7	20	20	20	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E03RM/G ^{*1}
	4	7.5	7.5	7.5	18	18	13	9	25	25	25	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E04RM/G ^{*1}
	5.5	11	11	7.5	25	25	17	9	32	32	32	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E05RM/G ^{*1}
	7.5	15	15	11	32	32	24	15	50	50	50	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E1RM/G ^{*1}
	11	18.5	18.5	15	40	40	29	19	60	60	60	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E2RM/G ^{*1}
	15	22	25	22	50	50	38	26	65	65	65	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E2SRM/G ^{*1}
	18.5	30	37	30	68	65	60	38	100	100	100	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E3RM/G ^{*1}
	22	40	37	37	80	80	60	44	105	105	105	(1NO+1NC) × 2, 2NC × 2 (3NO+1NC) × 2, (2NO+2NC) × 2	SC-E4RM/G ^{*1}

Notes: • Ratings conform to IEC 60947-4-1

- ^{*1} The above types are shipped in a set containing two magnetic contactors, one SZ-RM mechanical interlock unit, two front mounting auxiliary contact blocks, and electrical interlock wiring. The power connection kit for the reversing contactor is sold separately.
- To prevent short-circuit faults when using SC-E02R/G to SC-E04RM/G types for high-speed switching, provide a time delay relay or other electrical interlock to ensure that the switching time is 15ms min.
- For combined use with an MMS, instead of ordering a reversing type, order and assemble the individual components (two magnetic contactors, one SZ-RM mechanical interlock unit, two auxiliary contact blocks, and the power connection kit (SZ-ERW□/A, SZ-ERW□/B).
- ^{*1} Equipped with the SZ-A11/T, SZ-A02/T, SZ-A31/T, or SZ-A22/T front mounting auxiliary contact block.

• For motor starter use, order the power connection kit and thermal overload relay.

Type	TOR
SC-E02RM/G to SC-E05RM/G	TK-E02
SC-E1RM/G to SC-E2SRM/G	TK-E2
SC-E3RM/G to SC-E4RM/G	TK-E3
SC-E5RM/G to SC-E7RM/G	TK-E6H

Performance data

Frame size	Making current (A)		Breaking current (A)		Operating cycles per hour	Durability (operations)	
	220V	440V	220V	440V		Electrical	Mechanical
SC-E02	108	108	90	90	1800	2 million	10 million
SC-E03	144	144	120	120	1800	1.5 million	10 million
SC-E04	216	216	180	180	1800	1.5 million	10 million
SC-E05	250	250	200	200	1200	1.5 million	10 million
SC-E1	384	384	320	320	1200	1.5 million	10 million
SC-E2	480	480	400	400	1200	1.5 million	10 million
SC-E2S	500	500	400	400	1200	1.5 million	10 million
SC-E3	816	780	680	650	1200	1.5 million	5 million
SC-E4	816	800	680	650	1200	1 million	5 million
SC-E5	1260	1260	1050	1050	1200	1 million	5 million
SC-E6	1500	1500	1250	1250	1200	1 million	5 million
SC-E7	1800	1800	1500	1500	1200	1 million	5 million

SC-E series contactors, ring terminal connection types

■ Features

- The new type allows wiring with ring crimp terminals in addition to the conventional straight wiring connection. Types SC-E02P to SC-E2SP also enable straight wiring connection.
- A new slide-type terminal cover is easy to mount and remove. Up to two ring crimp terminals can be connected from the upper terminal part.
- Three module designs with widths of 43mm (up to 25A), 54mm (up to 50A), and 67mm (up to 80A) provide an ideal combination with manual motor starters for ring terminal connection.
- UL, CSA (cUL) approval is pending.



02

■ Types and rings

• Magnetic contactors

Operating coil	Max. motor capacity (kW)		Rated operational current (A)				Rated thermal current (A)	Aux. contact arrangement	Type
	3-phase AC-3		3-phase AC-3		3-phase AC-1				
	200V	380V	200V	380V	200V	380V			
	240V	440V	240V	440V	240V	440V			
AC operated	2.2	4	9	9	20	20	20	—	SC-E02P
	3	5.5	12	12	20	20	20	—	SC-E03P
	4	7.5	18	18	25	25	25	—	SC-E04P
	5.5	11	25	25	32	32	32	—	SC-E05P
	7.5	15	32	32	50	50	50	—	SC-E1P
	11	18.5	40	40	60	60	60	—	SC-E2P
	15	22	50	50	65	65	65	—	SC-E2SP
	18.5	30	68	65	100	100	100	—	SC-E3P
	22	40	80	80	105	105	105	—	SC-E4P
DC operated	2.2	4	9	9	20	20	20	—	SC-E02P/G
	3	5.5	12	12	20	20	20	—	SC-E03P/G
	4	7.5	18	18	25	25	25	—	SC-E04P/G
	5.5	11	25	25	32	32	32	—	SC-E05P/G
	7.5	15	32	32	50	50	50	—	SC-E1P/G
	11	18.5	40	40	60	60	60	—	SC-E2P/G
	15	22	50	50	65	65	65	—	SC-E2SP/G
	18.5	30	68	65	100	100	100	—	SC-E3P/G
	22	40	80	80	105	105	105	—	SC-E4P/G

• Thermal overload relays

Applicable contactor	Type	Auxiliary contact arrangement	Trip category (JIS)	No. of heater elements
Non-reversing			Resistive load AC-1	
SC-E02P, E02P/G	TK-E02	1NO+1NC	10A	3
SC-E03P, E03P/G				
SC-E04P, E04P/G				
SC-E05P, E05P/G				
SC-E1P, E1P/G	TK-N2/T	1NO+1NC	10A	3
SC-E2P, E2P/G				
SC-E2SP, E2SP/G				
SC-E3P, E3P/G	TK-N3/T	1NO+1NC	10A	3
SC-E4P, E4P/G				

• **Coil characteristics:** See page 02/50

• **dimensions:** See page 02/55

DUO series Contactors

SC-E series

■ Operating coil

• AC coil, SC-E02 to SC-E4

Order voltage	Coil operating voltage and frequency
AC24V	24V AC 50Hz / 24–26V AC 60Hz
AC48V	48V AC 50Hz / 48–52V AC 60Hz
AC100V	100V AC 50Hz / 100–110V AC 60Hz
AC110V	100–110V AC 50Hz / 110–120V AC 60Hz
AC120V	110–120V AC 50Hz / 120–130V AC 60Hz
AC200V	200V AC 50Hz / 200–220V AC 60Hz
AC220V	200–220V AC 50Hz / 220–240V AC 60Hz
AC240V	220–240V AC 50Hz / 240–260V AC 60Hz
AC380V	346–380V AC 50Hz / 380–420V AC 60Hz
AC400V	380–400V AC 50Hz / 400–440V AC 60Hz
AC440V	415–440V AC 50Hz / 440–480V AC 60Hz
AC500V	480–500V AC 50Hz / 500–550V AC 60Hz

Note: Other voltages are available in 24 to 600V AC on request.

• DC coil, SC-E02/G to SC-E4/G

Order voltage	Coil operating voltage
DC12V	12V DC
DC24V	24V DC
DC48V	48V DC
DC60V	60V DC
DC100V	100V DC
DC110V	110V DC
DC120V	120V DC
DC200V	200V DC
DC210V	210V DC
DC220V	220V DC

Note: Other voltages are available in 12 to 250V DC on request.

• AC/DC coil (SUPER MAGNET), SC-E5 to SC-E7

Order voltage	Coil operating voltage and frequency
24V	24–25V AC 50/60Hz, 24V DC
48V	48–50V AC 50/60Hz, 48V DC
100V	100–127V AC 50/60Hz, 100–120V DC *1
200V	200–250V AC 50/60Hz, 200–240V DC *2
400V	380–450V AC 50/60Hz
500V	460–575V AC 50/60Hz

Notes: • Other voltages are available in 24 to 575V AC (24 to 240V DC) on request.

*1 The coil voltage from DC power supply with single-phase full-wave rectification will be 100–110V.

*2 The coil voltage from DC power supply with single-phase full-wave rectification will be 200–220V.

■ Coil characteristics

• AC operated

Frame size	Power consumption (VA)		Power loss (W)		Pick-up voltage (V)		Drop-out voltage (V)		Operating time (ms)	
	Inrush	Sealed	200V	220V	200V	220V	200V	220V	Coil ON →	Coil OFF →
	200V 50Hz	200V 50Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	Contact ON	Contact OFF
E02 to E05	90	9	2.7	2.8	105–136	116–146	75–106	88–120	9–20	5–16
E1 to E2S	120	12.7	3.6	3.8	110–130	120–140	75–105	85–115	10–17	6–13
E3, E4	180	13.3	4.5	5	115–135	130–150	85–110	100–125	10–18	8–18
E5	80	4	3.2	3.6	140–150	140–150	60–100	60–100	39–45	27–33
E6, E7	190	4.9	3.4	3.7	140–150	140–150	60–100	60–100	31–37	30–36

• DC operated

Frame size	Power consumption (W)		Time constant (ms)	Pick-up voltage (V)	Drop-out voltage (V)	Operating time (ms)	
	Inrush	Sealed				Coil ON →	Coil OFF →
	200V	200V				Contact ON	Contact OFF
E02/G to E05/G	7	7	50	92–130	30–60	45–49	10–26
E1/G to E2S/G	9	9	60	80–120	30–70	40–50	8–17
E3/G, E4/G	12	12	70	80–120	24–60	60–70	14–21
E5	90	2.8	1	140–160	40–100	35–41	26–32
E6, E7	225	3.2	1	140–160	40–100	28–34	27–33

■ Auxiliary contact ratings

Based on IEC 60974-4-1, EN 60947-4-1, JIS C 8201-4-1

Frame size	Rated insulation voltage (V)	Rated thermal current (A)	Making and breaking capacity at AC (A)	Rated operational current (A)				Minimum operating voltage and current
				AC Voltage	AC-15 Ind. load	DC Voltage	DC-13 Ind. load	
E02 to E4 E02/G to E4/G	—	—	—	—	—	—	—	—
E5 to E7	690	10	120V 60 220V 30 440V 15 600V 12	120V 6 220V 3 440V 1.5 600V 1.2	24V 3 48V 1.5 110V 0.55 220V 0.27	3 1.5 0.55 0.27	—	5V DC, 3mA

■ Types and ratings for UL and CSA

Operating coil	Rated insulation voltage (V)	Max. motor capacity (Hp)				Rated operating current (A)				Rated thermal current (A)	Type
		3-phase motor				3-phase motor					
		200V	220 240V	400 480V	550 600V	200V	220 240V	400 480V	550 600V		
AC operated	600	2	2	5	5	7.8	6.8	7.6	6.1	20	SC-E02
		3	3	7.5	7.5	11	9.6	11	9	20	SC-E03
		5	5	10	10	17.5	15.2	14	11	25	SC-E04
		5	7.5	15	15	17.5	22	21	17	32	SC-E05
		7.5	10	25	25	25.3	28	34	27	50	SC-E1
		10	15	30	30	32.2	42	40	32	60	SC-E2
		15	20	30	30	48.3	54	40	32	65	SC-E2S
		20	25	50	50	62.1	68	65	52	100	SC-E3
		25	30	50	50	78.2	80	65	52	105	SC-E4
AC/DC operated	600	30	30	60	75	92	80	77	77	150	SC-E5
		40	40	75	100	119.6	104	96	99	150	SC-E6
		50	50	100	125	149.5	130	124	125	200	SC-E7
DC operated	600	2	2	5	5	7.8	6.8	7.6	6.1	20	SC-E02/G
		3	3	7.5	7.5	11	9.6	11	9	20	SC-E03/G
		5	5	10	10	17.5	15.2	14	11	25	SC-E04/G
		5	7.5	15	15	17.5	22	21	17	32	SC-E05/G
		7.5	10	25	25	25.3	28	34	27	50	SC-E1/G
		10	15	30	30	32.2	42	40	32	60	SC-E2/G
		15	20	30	30	48.3	54	40	32	65	SC-E2S/G
		20	25	50	50	62.1	68	65	52	100	SC-E3/G
		25	30	50	50	78.2	80	65	52	105	SC-E4/G

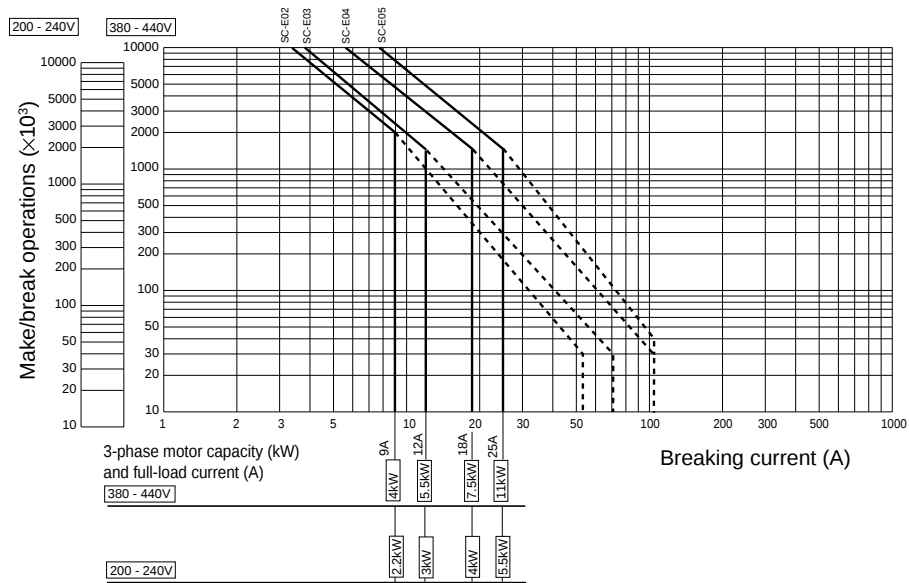
■ Auxiliary contact ratings for UL and CSA

Frame size	Rated insulation voltage (V)	Rated thermal current (A)	Making and breaking current (A)					
			AC (rating code A600)			DC (rating code Q300)		
			Voltage	Making	Breaking	Voltage	Making	Breaking
E02 to E4 E02/G to E4/G	—	—	—	—	—	—	—	—
E5 to E7	600	10	120V 240V 480V 600V	60 30 15 12	6 3 1.5 1.2	125V 250V	0.55 0.27	0.55 0.27

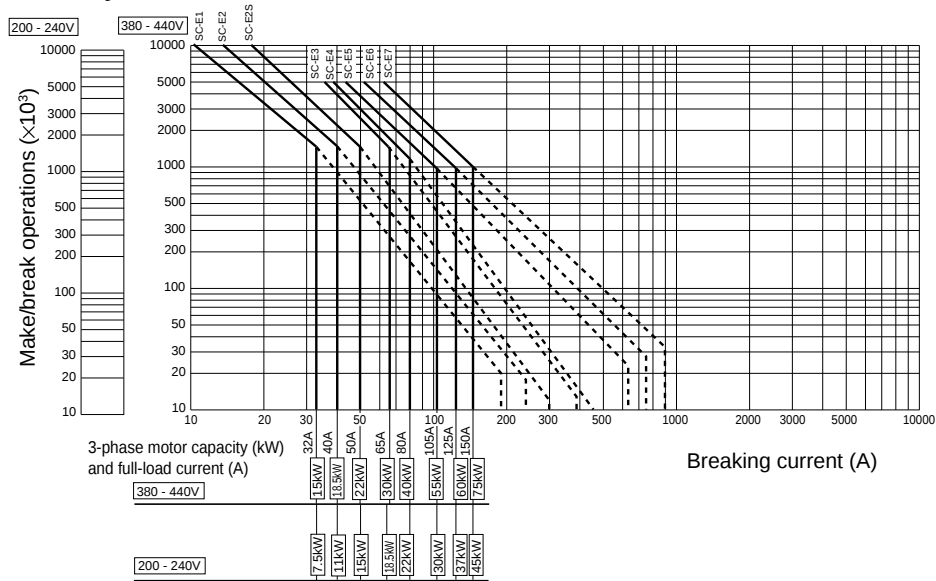
DUO series Contactors
SC-E series

■ Electrical durability

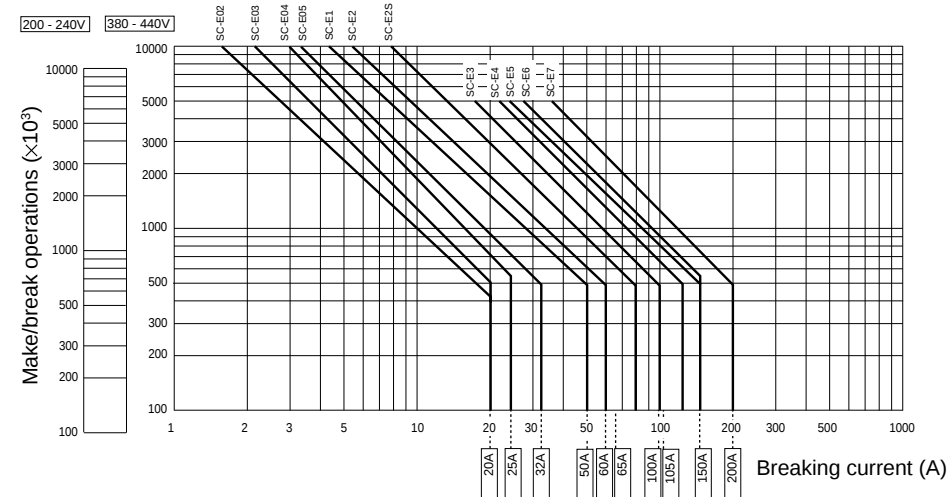
• AC-3 duty / SC-E02 to SC-E05



• AC-3 duty / SC-E1 to SC-E7



• AC-1 duty / SC-E02 to SC-E7



■ Optional accessories

• Auxiliary contact blocks with terminal covers

The front mounting auxiliary contact block allows two or four auxiliary contacts to be added without increasing the mounting area of the magnetic contactors. The side mounting auxiliary contact block allows two auxiliary contacts to be added to the magnetic contactors without increasing the depth.

Applicable contactor	Mounting	No. of contacts	Contact arrangement	Type
SC-E02 to E4	Front mounting	4	4NO 3NO+1NC 2NO+2NC	SZ-A40/T SZ-A31/T SZ-A22/T
		2	2NO 1NO+1NC 2NC	SZ-A20/T SZ-A11/T SZ-A02/T
SC-E02 to E4	Side mounting	2	1NO+1NC	SZ-AS1/T
SC-E5, E6, E7		2	1NO+1NC	SZ-AS2/T



Auxiliary contact blocks

Contact ratings

• Based on IEC and JIS

Rated thermal current (A)	Making and breaking capacity at AC (A)	Rated operational current (A)				Minimum operating voltage and current
		AC Voltage	AC-15 Ind. load	DC Voltage	DC-13 Ind. load	
10	120V 60	120V	6	24V	3	5V DC 3mA
	220V 30	220V	3	48V	1.5	
	440V 15	440V	1.5	110V	0.55	
	600V 12	600V	1.2	220V	0.27	

• Based on UL and CSA

Rated thermal current (A)	Making and breaking current (A)					
	AC (rating code A600)			DC (rating code Q300)		
	Volts	Making	Breaking	Volts	Making	Breaking
10	120V	60	6	125V	0.55	0.55
	240V	30	3	250V	0.27	0.27
	480V	15	1.5			
	600V	12	1.2			

• Main circuit surge suppression units

When contactor is energized or de-energized, a surge voltage is generated from motor circuit. This unit suppresses this surge voltage and protects electronic equipment from malfunction or damage.

Applicable contactor	Mounting	Rated voltage and frequency	CR constant	Applicable 3-phase motor	Type
SC-E02 to E05	Front mounting	250V AC	C=0.22μF	200–240V AC	SZ-ZM1E
	Side mounting	50/60Hz	R=100Ω	0.1–5.5kW	SZ-ZM2E
SC-E1 to E4	Front mounting	250V AC	C=0.33μF	200–240V AC	SZ-ZM3E
	Side mounting	50/60Hz	R=47Ω	0.1–22kW	SZ-ZM4E

• Coil surge suppression units

This unit suppresses surge voltage due to contactor ON-OFF operations, and can be easily connected to contactor coil terminals.

Applicable contactor		Operating coil voltage	Device	Operation indicator	Type
AC operated	DC operated				
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	Varistor	–	SZ-Z1
	–	100–250V AC/DC		–	SZ-Z2
		380–440V AC		–	SZ-Z3
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	Red LED	Red LED	SZ-Z6
	–	100–250V AC/DC		Red LED	SZ-Z7
		380–440V AC		–	SZ-Z31
SC-E1 to E4	SC-E1/G to E4/G	24–48V AC/DC	CR	–	SZ-Z32
	–	100–250V AC/DC		–	SZ-Z33
		380–440V AC		–	SZ-Z33
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	CR	–	SZ-Z4
	–	100–250V AC/DC		–	SZ-Z5
		100–250V AC/DC		Red LED	SZ-Z8
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	CR	Red LED	SZ-Z9
	–	100–250V AC		–	SZ-Z34
		100–250V AC		–	SZ-Z35
SC-E1 to E4	–	24–48V AC	CR	–	SZ-Z36
	SC-E1/G to E4/G	100–250V DC		–	SZ-Z37
		100–250V DC		–	SZ-Z37

Main circuit surge suppression units



Front mounting
SZ-ZM1E



Side mounting
SZ-ZM4E

Coil surge suppression unit



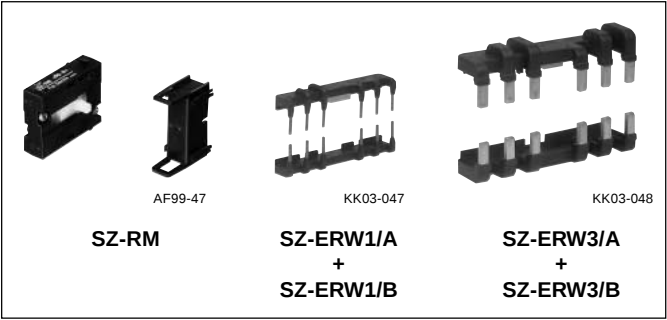
Top mounting
CR
SZ-Z4

DUO series Contactors
SC-E series
Optional accessories

• Mechanical interlock unit

The mechanical interlock unit provides a mechanical interlock with assembly parts to convert a magnetic contactor into a reversing magnetic contactor.

Applicable contactor	Type
SC-E02 to E4	SZ-RM
SC-E02/G to E4/G	

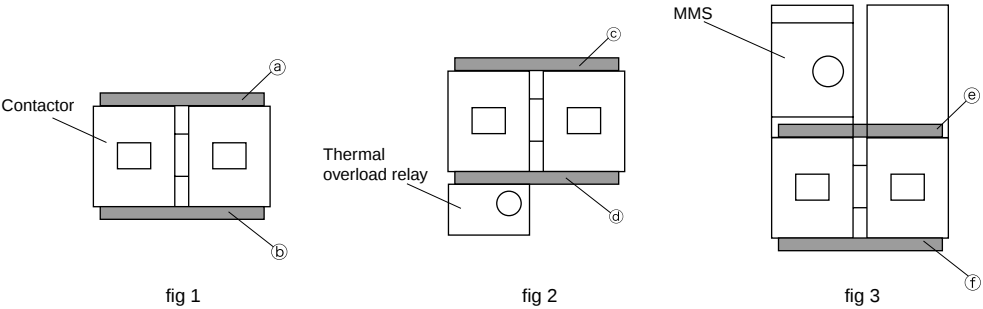


• Power connection kit for reversing (For direct connection)

Applicable contactor	Power connection kit for reversing					
	Contactor separately fig 1		Combination using thermaloverload relay fig 2		Combination using MMS fig 3	
	Line side Ⓐ	Load side Ⓑ	Line side Ⓒ	Load side Ⓓ	Line side Ⓔ	Load side Ⓕ
SC-E02RM,SC-E02RM/G	SZ-ERW1/A	SZ-ERW1/B	SZ-ERW1/A	SZ-ERW1/D	SZ-ERW1/A	SZ-ERW1/B
SC-E03RM,SC-E03RM/G						
SC-E04RM,SC-E04RM/G						
SC-E05RM,SC-E05RM/G						
SC-E1RM,SC-E1RM/G	SZ-ERW2/A	SZ-ERW2/B	SZ-ERW2/A	SZ-ERW2/D	SZ-ERW2/A	SZ-ERW2/B
SC-E2RM,SC-E2RM/G						
SC-E2SRM,SC-E2SRM/G						
SC-E3RM,SC-E3RM/G	SZ-ERW3/A	SZ-ERW3/B	SZ-ERW3/A	SZ-ERW3/D	SZ-ERW3/A	SZ-ERW3/B
SC-E4RM,SC-E4RM/G					—	—
SC-E5RM	SZ-ERW4/A	SZ-ERW4/B	—	—	—	—
SC-E6RM	SZ-ERW5/A	SZ-ERW5/B	—	—	—	—
SC-E7RM	SZ-ERW6/A	SZ-ERW6/B	—	—	—	—

• Power connection kit for reversing (For crimp terminal)

Applicable contactor	Power connection kit for reversing					
	Contactor separately fig 1		Combination using thermaloverload relay fig 2		Combination using MMS fig 3	
	Line side Ⓐ	Load side Ⓑ	Line side Ⓒ	Load side Ⓓ	Line side Ⓔ	Load side Ⓕ
SC-E02PRM,SC-E02PRM/G	SZ-EPRW1/C	SZ-EPRW1/D	SZ-EPRW1/C	SZ-EPRW1/D	SZ-ERW1/A	SZ-EPRW1/D
SC-E03PRM,SC-E03PRM/G						
SC-E04PRM,SC-E04PRM/G						
SC-E05PRM,SC-E05PRM/G						
SC-E1PRM,SC-E1PRM/G	SZ-EPRW2/C	SZ-EPRW2/D	SZ-EPRW2/C	SZ-EPRW2/D	—	—
SC-E2PRM,SC-E2PRM/G						
SC-E2SPRM,SC-E2SPRM/G						
SC-E3PRM,SC-E3PRM/G	SZ-EPRW3/C	SZ-EPRW3/D	SZ-EPRW3/C	SZ-EPRW3/D	—	—
SC-E4PRM,SC-E4PRM/G						



DUO series Contactors

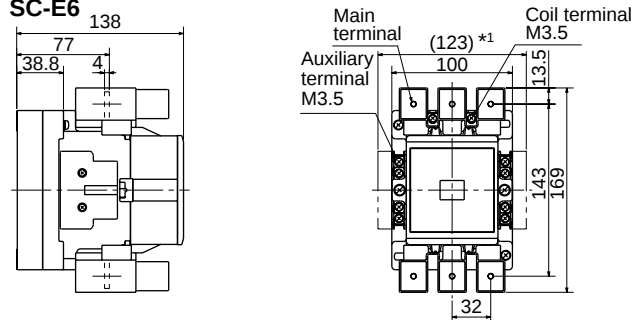
SC-E series

Dimensions

■ Dimensions, mm

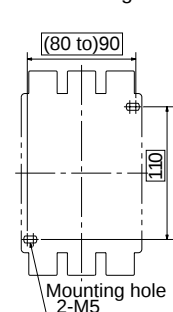
• Non-reversing/AC operated

SC-E6

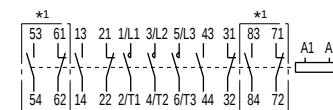


Mass: 2.55kg

Panel drilling

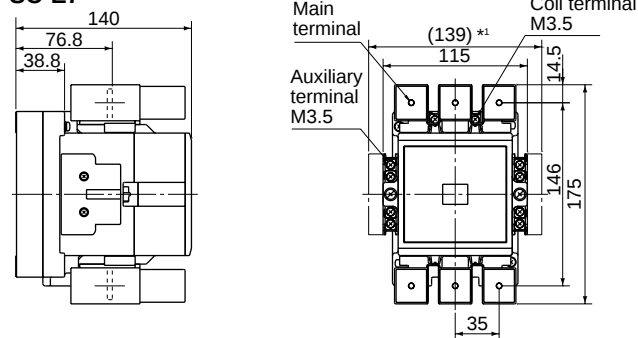


■ Wiring diagrams



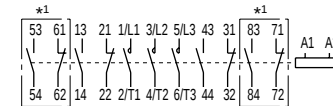
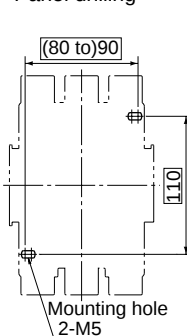
*1 In case of aux. contact 4NO+4NC

SC-E7



Mass: 2.86kg

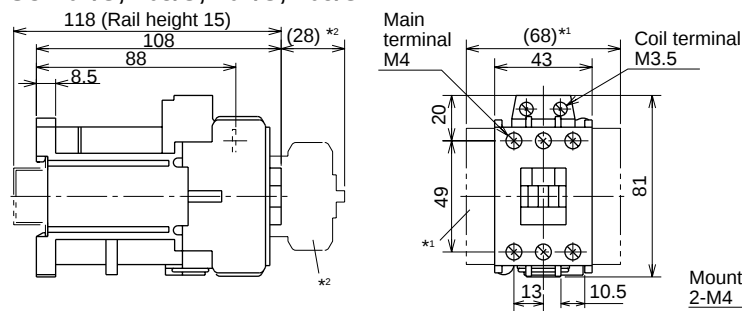
Panel drilling



*1 In case of aux. contact 4NO+4NC

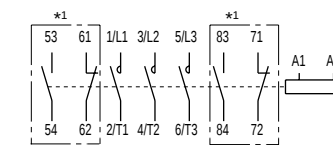
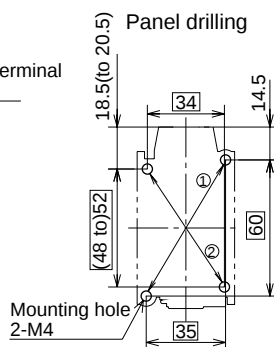
• Non-reversing/DC operated

SC-E02/G, E03/G, E04/G, E05/G



Mass: 0.59kg

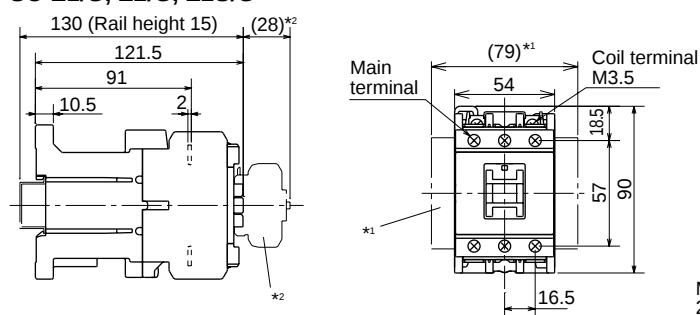
Panel drilling



*1 In case of aux. contact 2NO+2NC

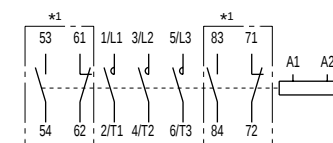
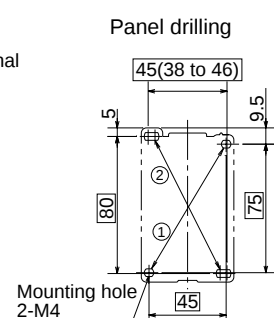
Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 35 × 60 ②: 34 × (48 to 52)

SC-E1/G, E2/G, E2S/G



Mass: 0.79kg

Panel drilling

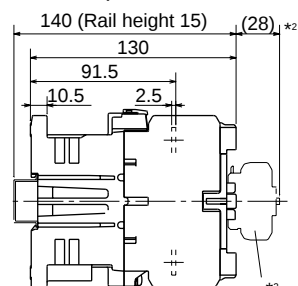


*1 In case of aux. contact 2NO+2NC

Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 45 × 75 ②: 45 (38 to 46) × 80

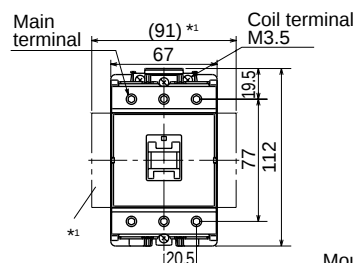
*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

■ Dimensions, mm
• Non-reversing/DC operated
SC-E3/G, E4/G

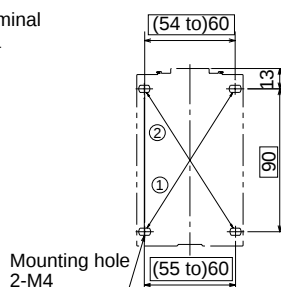


Mass: 1.4kg

*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

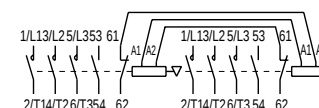


Panel drilling

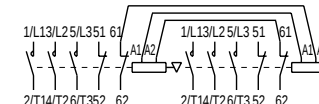


■ Wiring diagrams
SC-E02RM to E4RM

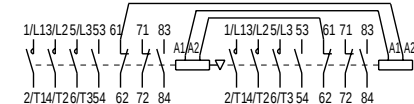
(1NO+1NC) × 2



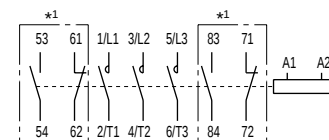
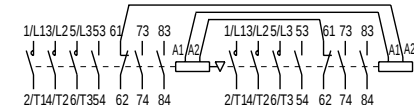
2NC × 2



(2NO+2NC) × 2



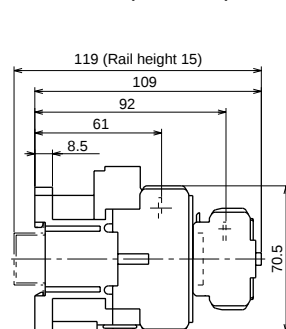
(3NO+NC) × 2



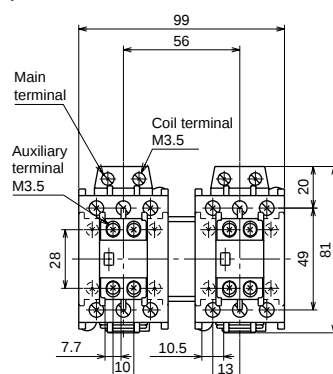
*1 In case of aux. contact 2NO+2NC

Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: (55 to) 60 × 90 ②: (54 to) 60 × 90

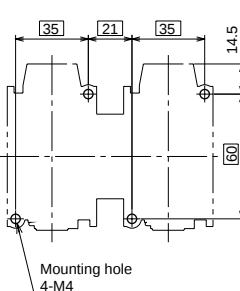
• Reversing/AC operated
SC-E02RM, E03RM, E04RM, E05RM



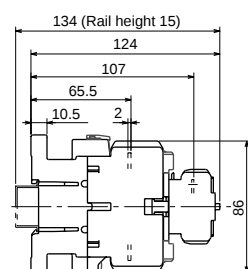
Mass : 0.8kg (AUX.4P)
0.77kg(AUX.2P)



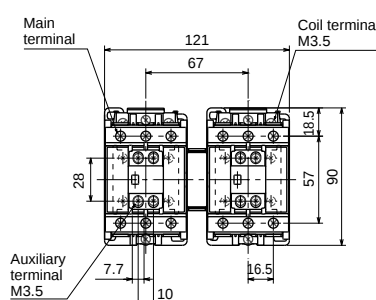
Panel drilling



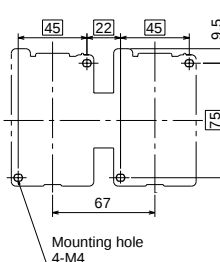
SC-E1RM, E2RM, E2SRM



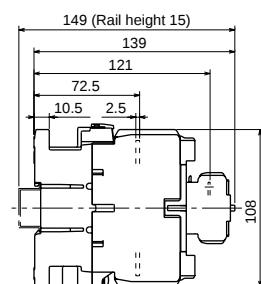
Mass : 1.3kg (AUX.4P)
1.27kg(AUX.2P)



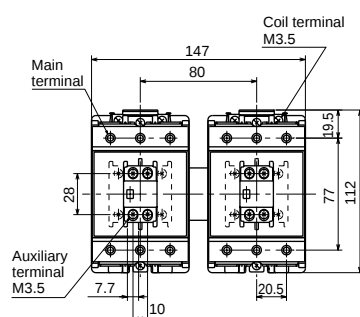
Panel drilling



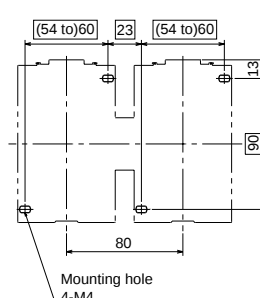
SC-E3RM, E4RM



Mass : 2.24kg(AUX.4P)
2.21kg(AUX.2P)



Panel drilling



DUO series Contactors

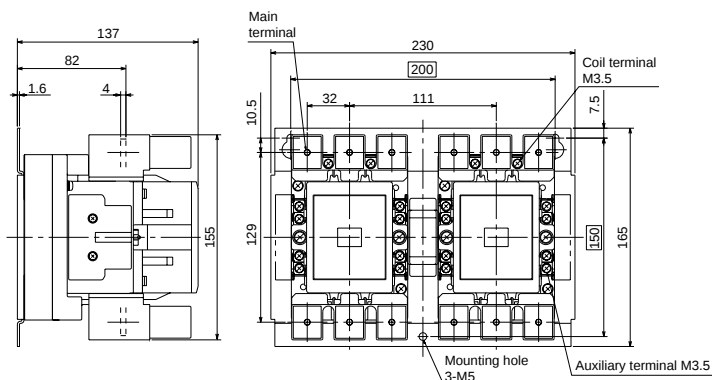
SC-E series

Dimensions

■ Dimensions, mm

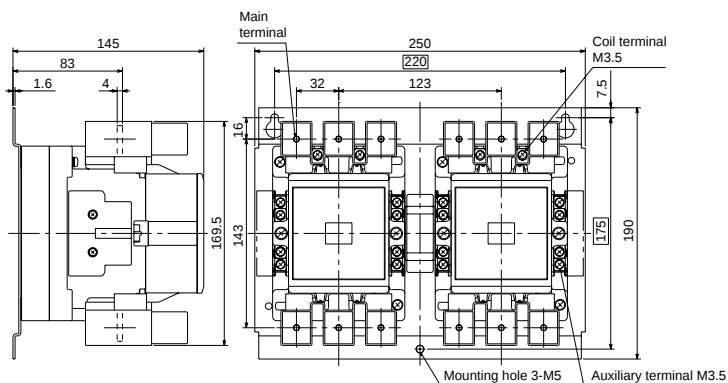
- Reversing/AC operated

SC-E5RM



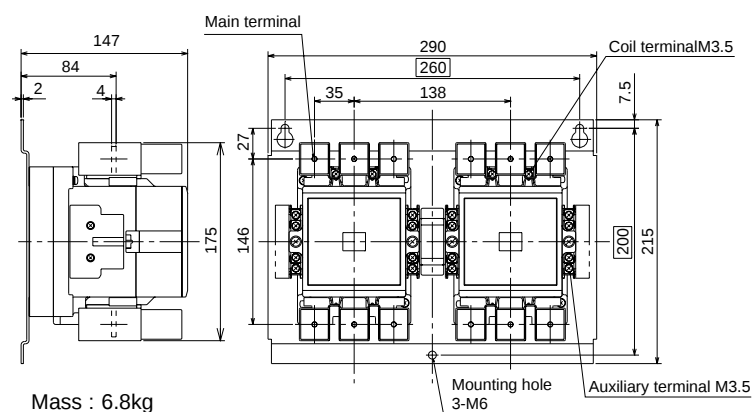
Mass : 4.64kg

SC-E6RM



Mass : 5.8kg

SC-E7RM

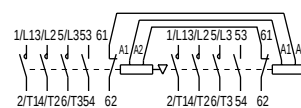


Mass : 6.8kg

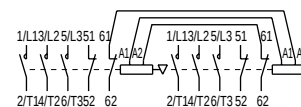
■ Wiring diagrams

SC-E5RM to E7RM

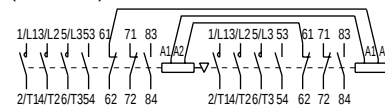
(1NO+1NC) × 2



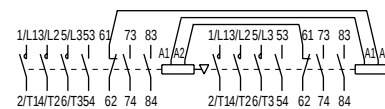
2NC × 2



(2NO+2NC) × 2



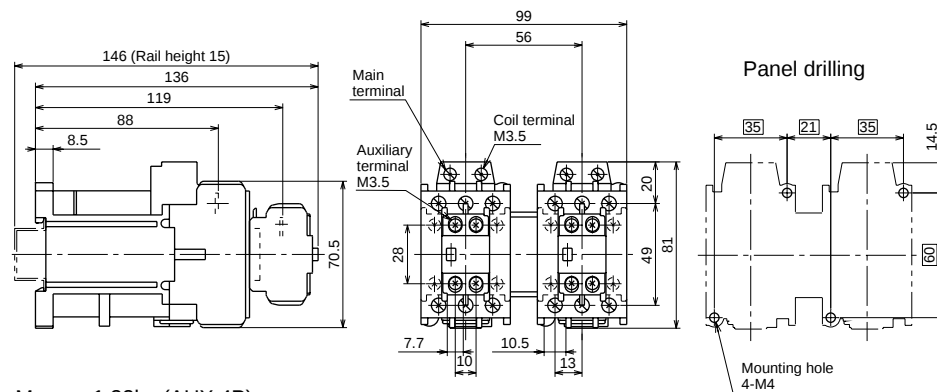
(3NO+NC) × 2



■ Dimensions, mm

• Reversing/DC operated

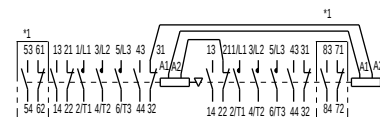
SC-02RM/G, 03RM/G, 04RM/G, 05RM/G



Mass : 1.32kg (AUX.4P)
1.29kg(AUX.2P)

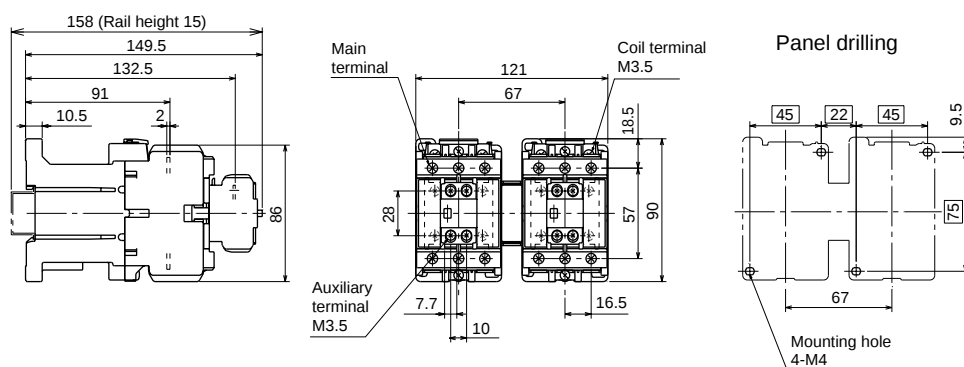
■ Wiring diagrams

SC-E5RM to E7RM



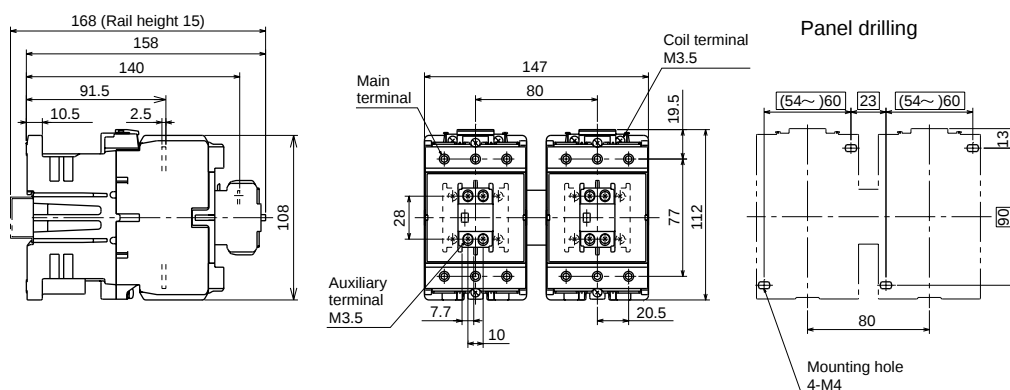
*1 In case of aux. contact (3NO+3NC) x 2

SC-E1RM/G, E2RM/G, E2SRM/G



Mass : 1.72kg (AUX.4P)
1.69kg(AUX.2P)

SC-E3RM/G, E4RM/G



Mass : 2.84kg (AUX.4P)
2.81kg(AUX.2P)

DUO series Contactors

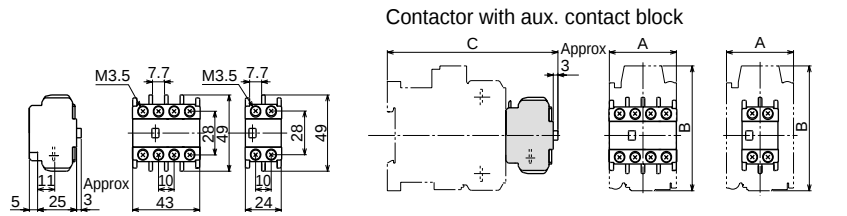
SC-E series

Dimensions

■ Dimensions, mm

- **Auxiliary contact blocks/Front mounting**

SZ-A40/T, A31/T, A22/T, A20/T, A11/T, A02/T for SC-E02 to E4

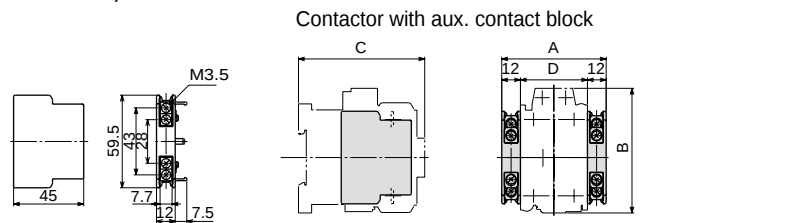


SZ-A40/T, A31/T, A22/T Mass: 36g
SZ-A20/T, A11/T, A02/T Mass: 20g

Type	A	B	C
SC-E02, E03, E04, E05	43	81	109
SC-E1, E2, E2S	54	90	124
SC-E3, E4	67	112	139

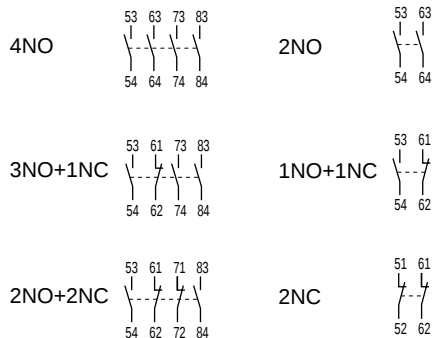
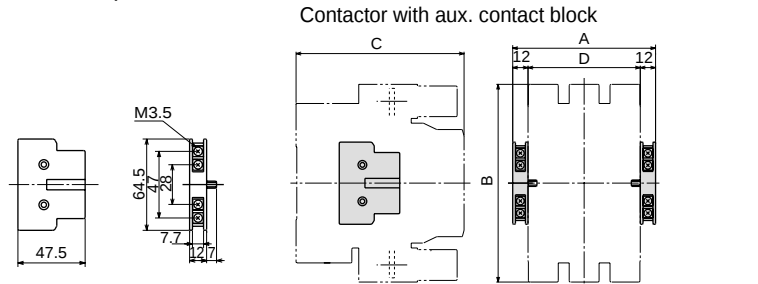
- **Auxiliary contact blocks/Side mounting**

SZ-AS1/T, for SC-E02 to E4



Type	A	B	C	D
SC-E02, E03, E04, E05	68	81	81	43
SC-E1, E2, E2S	79	90	96	54
SC-E3, E4	91	112	111	67

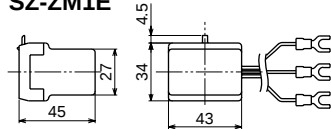
SZ-AS2/T, for SC-E5 to E7



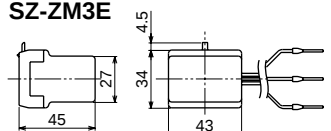
■ Dimensions, mm

• Main circuit surge suppression units

SZ-ZM1E

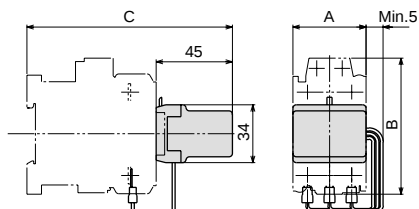


SZ-ZM3E



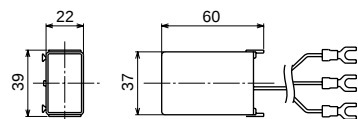
Mass: 60g

Contactor with surge suppression unit

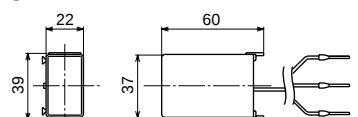


Type	A	B	C
SC-E02+SZ-ZM1E	43	81	121
SC-E03+SZ-ZM1E			
SC-E04+SZ-ZM1E			
SC-E05+SZ-ZM1E			
SC-E1+SZ-ZM3E	54	90	136
SC-E2+SZ-ZM3E			
SC-E2S+SZ-ZM3E			
SC-E3+SZ-ZM3E	67	112	151
SC-E4+SZ-ZM3E			

SZ-ZM2E

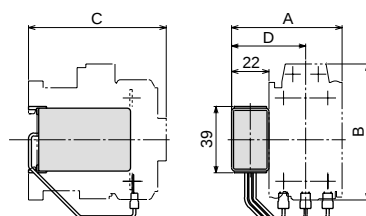


SZ-ZM4E



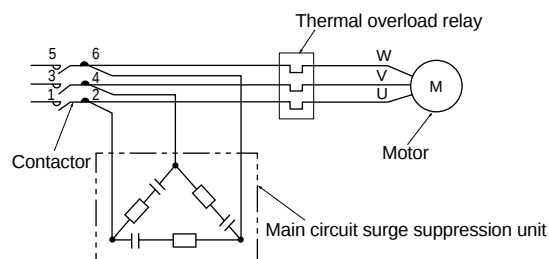
Mass: 60g

Contactor with surge suppression unit



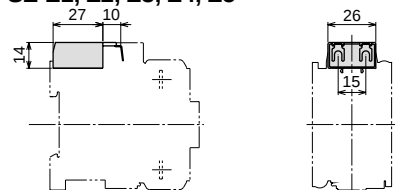
Type	A	B	C	D
SC-E02+SZ-ZM2E	65	81	81	43.5
SC-E03+SZ-ZM2E				
SC-E04+SZ-ZM2E				
SC-E05+SZ-ZM2E				
SC-E1+SZ-ZM2E				
SC-E2+SZ-ZM4E	76	90	96	49
SC-E2S+SZ-ZM4E				
SC-E3+SZ-ZM4E	89	112	111	55.5
SC-E4+SZ-ZM4E				

Connection diagram



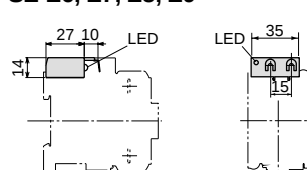
• Coil surge suppression units

SZ-Z1, Z2, Z3, Z4, Z5



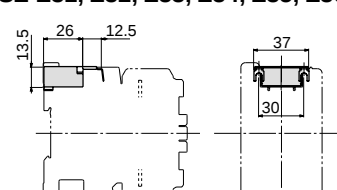
Mass: 14g

SZ-Z6, Z7, Z8, Z9



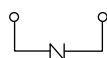
Mass: 16g

SZ-Z31, Z32, Z33, Z34, Z35, Z36, Z37

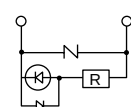


Mass: 15g

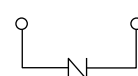
SC-E02 to E05 + SZ-Z1 to Z3
(Built-in varistor)



SC-E02 to E05 + SZ-Z6, Z7
(Built-in varistor with operating indicator)



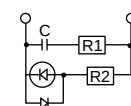
SC-E1 to E4 + SZ-Z31 to Z33
(Built-in varistor)



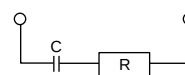
SC-E02 to E05 + SZ-Z4, Z5
(Built-in CR)



SC-E02 to E05 + SZ-Z8, Z9
(Built-in CR with operating indicator)

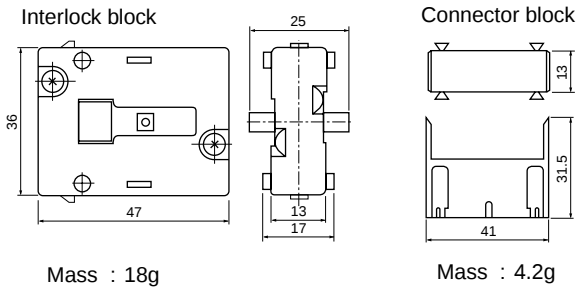


SC-E1 to E4 + SZ-Z34, Z35
(Built-in CR)
SC-E1/G to E4/G + SZ-Z36, Z37
(Built-in CR)

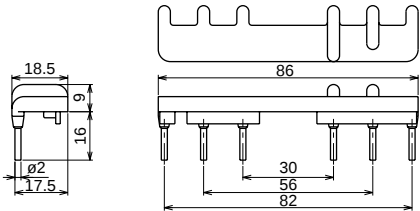


DUO series Contactors
SC-E series
Dimensions

■ Dimensions, mm
• Mechanical interlock unit
SZ-RM



• Power connection kit for reversing
For crossover wiring/SZ-ERW1/A

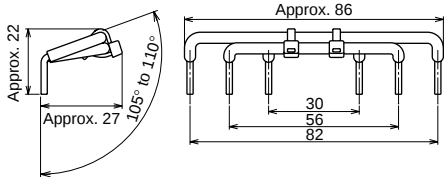


Mass : 19g

Used with	Wiring side	Wiring
SC-E02RM, E03RM, E04RM, E05RM	Line side	
SC-E02RM/G, E03RM/G, E04RM/G, E05RM/G		

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW1/D type power connection kit.

For phase replacing wiring/SZ-ERW1/D

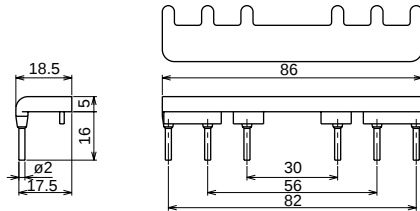


Mass : 13g

Used with	Wiring side	Wiring	Cable
SC-E02RM, E03RM, E04RM, E05RM	Load side		UL No3271 AWG12(Dia. Ø2) Color : Black
SC-E02RM/G, E03RM/G, E04RM/G, E05RM/G			

Note : Use this connection kit for assembly using the attachment tab of the thermal overload relay.

For phase replacing wiring/SZ-ERW1/B

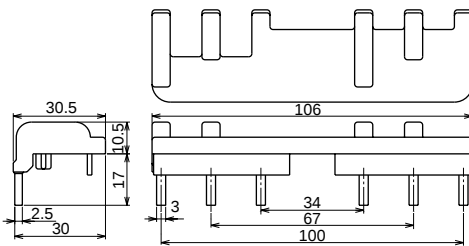


Mass : 17g

Used with	Wiring side	Wiring
SC-E02RM, E03RM, E04RM, E05RM	Load side	
SC-E02RM/G, E03RM/G, E04RM/G, E05RM/G		

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW1/D type power connection kit.

For crossover wiring/SZ-ERW2/A



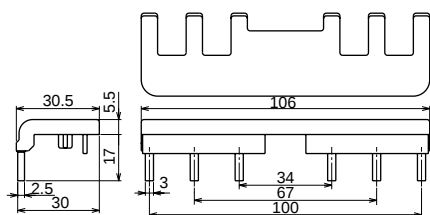
Mass : 48g

Used with	Wiring side	Wiring
SC-E1RM, E2RM, E2SRM	Line side	
SC-E1RM/G, E2RM/G, E2SRM/G		

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW2/D type power connection kit.

■ Dimensions, mm

For phase replacing wiring/SZ-ERW2/B

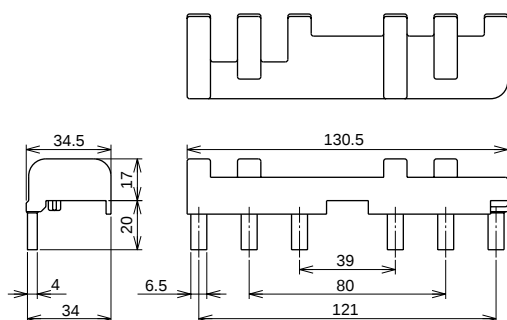


Mass : 42g

Used with	Wiring side	Wiring
SC-E1RM, E2RM, E2SRM	Load side	
SC-E1RM/G, E2RM/G, E2SRM/G		

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW2/D type power connection kit.

For crossover wiring/SZ-ERW3/A

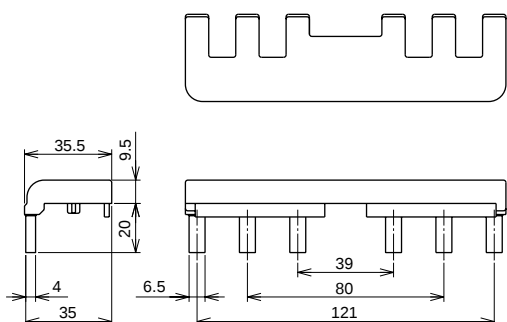


Mass : 162g

Used with	Wiring side	Wiring
SC-E3RM, E4RM	Line side	
SC-E3RM/G, E4RM/G		

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW3/D type power connection kit.

For phase replacing wiring/SZ-ERW3/B



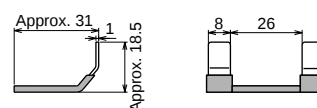
Mass : 138g

Used with	Wiring side	Wiring
SC-E3RM, E4RM	Load side	
SC-E3RM/G, E4RM/G		

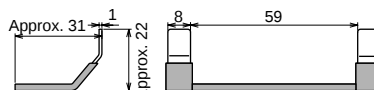
Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor. If the attachment tab is used for assembly to the magnetic contactor, interference by components will make assembly impossible. To assemble using the attachment tab, use the SZ-ERW3/D type power connection kit.

For phase replacing wiring/SZ-ERW2/D

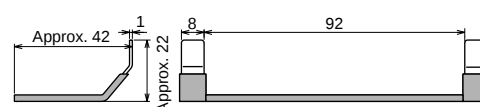
Terminal No. : 6/T3 – 2/T1



Terminal No. : 4/T2 – 4/T2



Terminal No. : 2/T1 – 6/T3



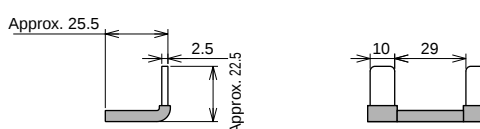
Mass : 31g

Used with	Wiring side	Wiring
SC-E1RM, E2RM, E2SRM	Load side	
SC-E1RM/G, E2RM/G, E2SRM/G		

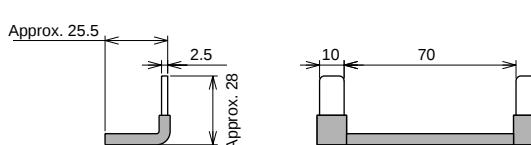
Note : Use this connection kit for assembly using the attachment tab of the thermal overload relay.

For phase replacing wiring/SZ-ERW3/D

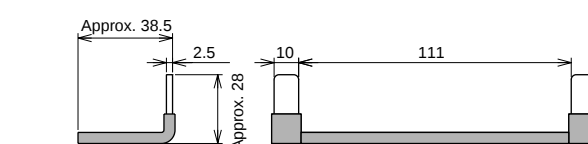
Terminal No. : 6/T3 – 2/T1



Terminal No. : 4/T2 – 4/T2



Terminal No. : 2/T1 – 6/T3



Mass : 110g

Used with	Wiring side	Wiring
SC-E3RM, E4RM	Load side	
SC-E3RM/G, E4RM/G		

Note : Use this connection kit for assembly using the attachment tab of the thermal overload relay.

DUO series Contactors

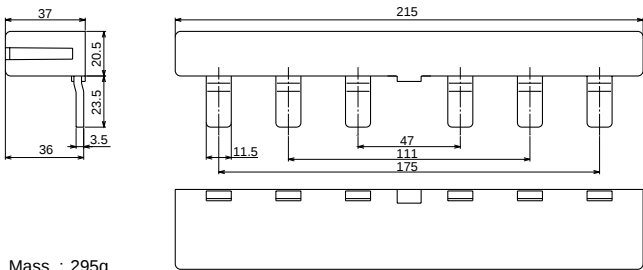
SC-E series

Dimensions

■ Dimensions, mm

For crossover wiring/SZ-ERW4/A

For phase replacing wiring/SZ-ERW4/B



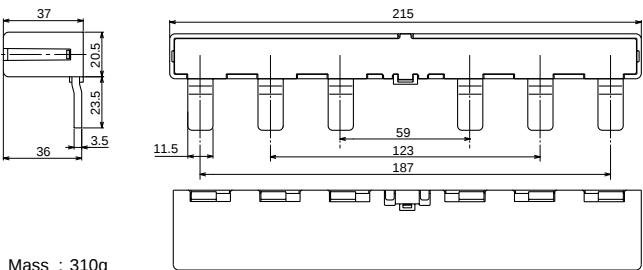
Mass : 295g

Used with	Type	Wiring side	Wiring
SC-E5RM	SZ-ERW4/A	Line side	
	SZ-ERW4/B	Load side	

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor.

For crossover wiring/SZ-ERW5/A

For phase replacing wiring/SZ-ERW5/B



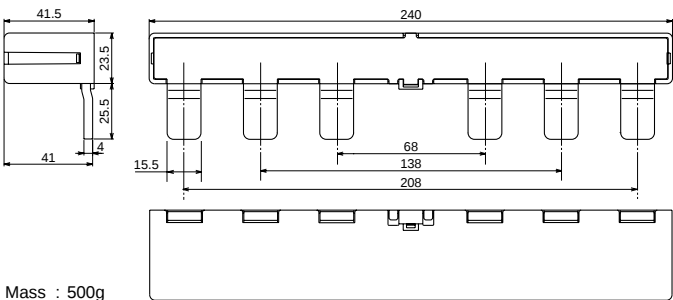
Mass : 310g

Used with	Type	Wiring side	Wiring
SC-E6RM	SZ-ERW5/A	Line side	
	SZ-ERW5/B	Load side	

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor.

For crossover wiring/SZ-ERW6/A

For phase replacing wiring/SZ-ERW6/B

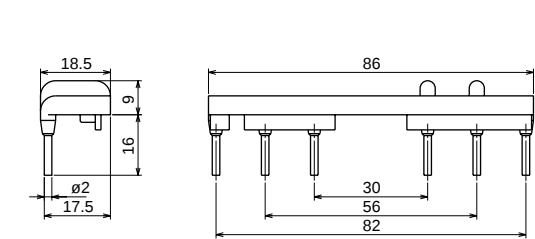


Mass : 500g

Used with	Type	Wiring side	Wiring
SC-E7RM	SZ-ERW6/A	Line side	
	SZ-ERW6/B	Load side	

Note : When using this connection kit, use a separate mounting thermal overload relay to connect to the magnetic contactor.

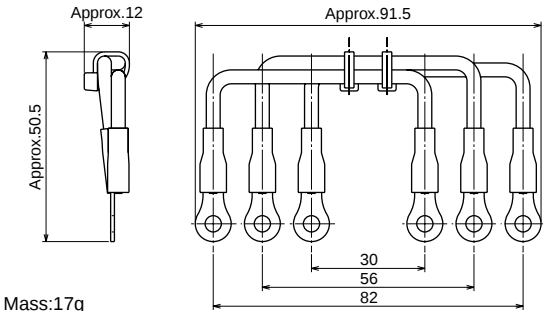
For crossover wiring (crimp terminal) /SZ-ERW1/A



Mass:19g

Used with	Wiring side	Wiring
SC-E02PRM, E03PRM, E04PRM, E05PRM	Line side	
SC-E02PRM/G, E03PRM/G, E04PRM/G, E05PRM/G		

For phase replacing (crimp terminal) /SZ-EPRW1/C



Mass:17g

Used with	Wiring side	Wiring
SC-E02PRM, E03PRM, E04PRM, E05PRM	Line side	
SC-E02PRM/G, E03PRM/G, E04PRM/G, E05PRM/G		

■ Standard operating conditions

The magnetic contactors are manufactured for use in the standard operating conditions given in the table at the right. Consult FUJI before using the magnetic contactors in different conditions.

■ Wirings

• Connection wires and terminal processing

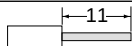
Be sure to perform wiring correctly with reference to the connections diagram. Main terminals for models SC-E02 to SC-E7 are wired using solid wires or stranded wires. Stranded wires or flexible stranded wires can be connected by twisting them together, crimping a sleeve (ferrule) onto them before connecting.

• Tightening torque

If wires are not tightened sufficiently, they may become hot or come loose and result in a fire, short-circuit, electric shock, or some other potentially dangerous situation. Be sure to tighten the wires to the torques specified in the tables below.

• Connectable wire sizes, tightening tools, tightening torques

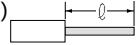
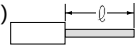
Main circuit

Contactor type	SC-E02, SC-E03, SC-E04, SC-E05
Solid wire (mm ²)	One 0.75 to 6 Two 1 to 4 or 1.5 to 6
Stranded wire (mm ²) *1	One 0.75 to 6 Two 1 to 4 or 1.5 to 6
AWG	One 18 to 10 Two 18 to 12 or 16 to 10
Sheath stripping length (mm)	
Terminal screw size	M4
Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)
Tightening torque (N·m)	1.2 to 1.5

Ambient temperature	Operating: -5 to 55°C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35°C) Storage: -40 to 65°C
Humidity	45 to 85%RH
Altitude	2000m or lower
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt
Vibration	10 to 55Hz 15m/s ²
Shock	50m/s ²
Mounting	Screw mounting, 35mm IEC top hat rail mounting (SC-E02 to SC-E4)
Mounting angle	
Standard	IEC 60947-4-1, EN 60947-4-1, VDE 0660 JIS C 8201-4-1, UL 508, CSA C22.2 TÜV (EN60947-4-1)

Control circuit

Solid or stranded wire (mm ²)	One 0.75 to 2.5 (ø1 to 1.6) Two 0.75 to 1.5 or 1.5 to 2.5
AWG	One 18 to 14 Two 18 to 14
Sheath stripping length (mm)	
Fork terminal	Max. 7.7mm wide
Terminal screw size	M3.5
Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)
Tightening torque (N·m)	0.8 to 1

Contactor type	SC-E1, E2, E2S	SC-E3, E4	SC-E5, E6	SC-E7
Top-only connection 	Solid or stranded wire (mm ²) *1 0.75 to 35 Flexible stranded wire with sleeve (mm ²) 0.75 to 25 Flexible stranded wire without sleeve (mm ²) 0.75 to 25 AWG 18 to 2 Sheath stripping length (mm)  15	1 to 70 1 to 50 1 to 50 16 to 2/0 19.5	2.5 to 70 2.5 to 50 2.5 to 50 12 to 2/0 26.5	4 to 120 2.5 to 95 4 to 95 12 to 250MCM 28.5
Bottom-only connection 	Solid or stranded wire (mm ²) *1 0.75 to 25 Flexible stranded wire with sleeve (mm ²) 0.75 to 16 Flexible stranded wire without sleeve (mm ²) 0.75 to 16 AWG 18 to 3 Sheath stripping length (mm)  12.5	1 to 50 1 to 35 1 to 35 16 to 1/0 16	2.5 to 70 2.5 to 50 2.5 to 50 12 to 2/0 26.5	4 to 120 2.5 to 95 4 to 95 12 to 250MCM 28.5
Top/bottom connection 	Solid or stranded wire (mm ²) *1 Top/bottom 0.75 to 25 Flexible stranded wire with sleeve (mm ²) Top/bottom 0.75 to 16 Flexible stranded wire without sleeve (mm ²) Top/bottom 0.75 to 16 AWG Top/bottom 18 to 3	1 to 50 1 to 35 1 to 35 16 to 1/0 16	2.5 to 70 2.5 to 50 2.5 to 50 12 to 2/0 26.5	4 to 120 2.5 to 95 4 to 95 12 to 250MCM 28.5
Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	⊙ Hex. wrench 4 (ISO 2936)		
Tightening torque (N·m)	2.5	8		
Self-locking torque (N·m) *2	1	2		

Notes: *1 Stranded wire (0 to 35mm²) consists of 7 wires or less.
Stranded wire (38 to 120mm²) consists of 19 wires or less.
Flexible stranded wire consists of more number wires than the above.

*2 The tightening bolt must be loosened in order to insert the wire. However, stop loosening the bolt when the anti-drop attachment on the bottom of the bolt reaches the top edge of the terminal. If a torque exceeding that given in the table is applied in this state, the retaining plate may come loose.

DUO series Contactors

SC-E series

Operating conditions

• Connectable wire size and tightening torque (Ring terminal connection type)

Main circuit

Contactor type	Terminal screw ^{*1}	Connectable wire size (mm ²)	Applicable ring terminal max. width (mm) ^{*2 *4}	Tightening torque (N·m)
SC-E02P to E05P	M4  	1.25 to 6	9.7 (R1.25-4 to R5.5-4)	1.2 to 1.5
SC-E1P to E2SP	M5  	2 to 22	12.4 ^{*3} (R2-5 to R22-5)	2.0 to 2.5
SC-E3P, E4P	M6  	2 to 38	16.7 ^{*3} (R2-6 to R38-6)	4.0 to 5.0

Control circuit

Contactor type	Terminal screw ^{*1}	Connectable wire size (mm ²)	Applicable ring terminal max. width (mm) ^{*2}	Tightening torque (N·m)
	Coil terminal (Contactor)	Coil terminal (Contactor)	Coil terminal (Contactor)	Coil terminal (Contactor)
SC-E02P to E4P	M3.5  	1.25 to 2 (1.2 to 2mm dia.)	7.7 (R1.25-3.5 to R2-3.5)	0.8 to 1.0

Note 1 The motor starter has plus-minus shaped terminal screws of   (M4, M5).

Note 2 Two wires or two crimp terminals can be connected to each terminal.

Note 3 Use insulation caps to use ring crimp terminals.

^{*1}  : Cross-recessed pan-head screw  : Non-oriented square washer, turtleback washer
 : Circular bright plain washer  : Cross-recessed hexagonal head bolt

^{*2} Round crimp terminal JIS C 2805

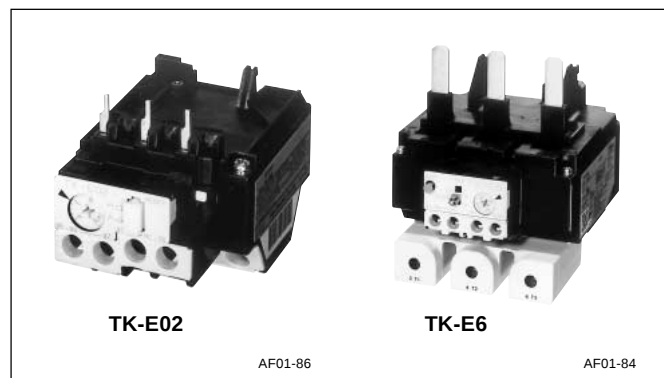
^{*3} Use crimp terminals of max. width or less. (Use narrow-width terminals made by crimp terminal manufacturers.)

^{*4} Use crimp terminal manufacturers' standard models.

TK-E series with phase-loss protective device

■ Features

- This relay protects motor windings from burning due to overloads, locked rotor current, or phase-loss.
- Maintenance and inspection safety has been improved by employing a finger protection mechanism to cover exposed terminals (conforms to DIN 57106, VDE 0106 Teil 100).
- Isolated NO and NC contacts can be used with different potentials.
- A high-precision scale for the current adjustment dial enables easy and exact current setting.
- The operating status can be visually checked with ease.
- The relays can be manually tripped. A trip-free mechanism is also provided.
- Base unit can be added to enable separate-mounting types of the TK-E02, E2, and E3 models.



■ Types and specifications

Applicable contactor Non-reversing	Type	Aux. contact	Trip category (JIS)	No. of heater elements	Power consumption per pole	Provided functions
SC-E02, E03, E04, E05 SC-E1, E2, E2S SC-E3, E4 SC-E5 SC-E6, E7 Separate mounting type	TK-E02 TK-E2 TK-E3 TK-E5 TK-E6 TK-E6H	1NO+1NC	10A	3	2.2VA 3.8VA 6.6VA 6.6VA 8.0VA	Overload, phase-loss protection Ambient temperature compensation Manual/auto reset selectable Manual trip mechanism Trip indicator

■ Ampere setting range

Order current (A)	Thermal overload relay type				
	TK-E02	TK-E2	TK-E3	TK-E5	TK-E6, E6H *
0.1	0.1–0.15				
0.13	0.13–0.2				
0.15	0.15–0.24				
0.2	0.2–0.3				
0.24	0.24–0.36				
0.3	0.3–0.45				
0.36	0.36–0.54				
0.48	0.48–0.72				
0.64	0.64–0.96				
0.8	0.8–1.2				
0.95	0.95–1.45				
1.4	1.4–2.2				
1.7	1.7–2.6				
2.2	2.2–3.4				
2.8	2.8–4.2				
4	4–6	4–6			
5	5–8	5–8			
6	6–9	6–9			
7	7–11	7–11	7–11		
9	9–13	9–13	9–13		
12	12–18	12–18	12–18		
16	16–22				
18		18–26	18–26	18–26	
20	20–25				
24		24–36	24–36	24–36	
28			28–40	28–40	
32		32–42			
34			34–50	34–50	
40		40–50			
44		44–54			
45			45–65	45–65	45–65
48			48–68		
53					53–80
64			64–80		
65			65–95 *	65–95	65–95
85			85–105 *	85–105	
85					85–125
110					110–160

Note: * Applicable only for separate-mounting type. Not applicable for use in combination with a magnetic contactor.

■ Standards

IEC 60947-4-1, EN60947-4-1
VDE 0660, JIS C 8201-4-1
UL 508, CSA C22.2
TÜV (EN60947-4-1)

■ Ordering information

Specify the following:

1. Type number
2. Ampere setting range order current

DUO series Contactors
SC-E series
Thermal overload relays

■ Auxiliary contact ratings
• Based on JIS and IEC

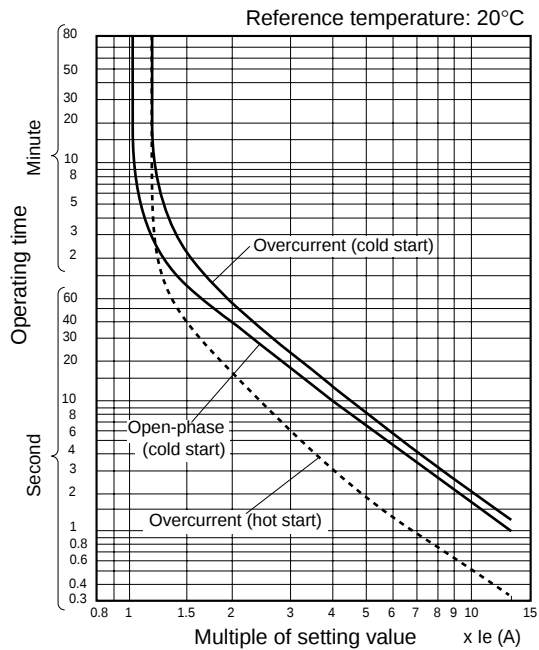
Type	Rated insulation voltage (V)	Rated thermal current (A)	Rated operational current (A)				Minimum voltage and current
			AC Voltage (V)	AC-15 Ind. load	DC Voltage (V)	DC-13 Ind. load	
TK-E02	690	5	24 100–120 200–240 380–440 500–600	3 (0.3) * 2.5 (0.3) * 2 (0.3) * 1 (0.3) * 0.6 (0.3) *	24 100–120 200–240	1.1 (0.3) 0.28 0.14	3V DC, 5mA
TK-E2 TK-E3 TK-E5 TK-E6	690	5	24 100–120 200–240 380–440 500–600	3 (0.5) * 2.5 (0.5) * 2 (0.5) * 1 (0.5) * 0.6 (0.5) *	24 100–120 200–240	1.1 (0.3) 0.28 0.14	3V DC, 5mA

Note: * In case of auto reset type NO contact.

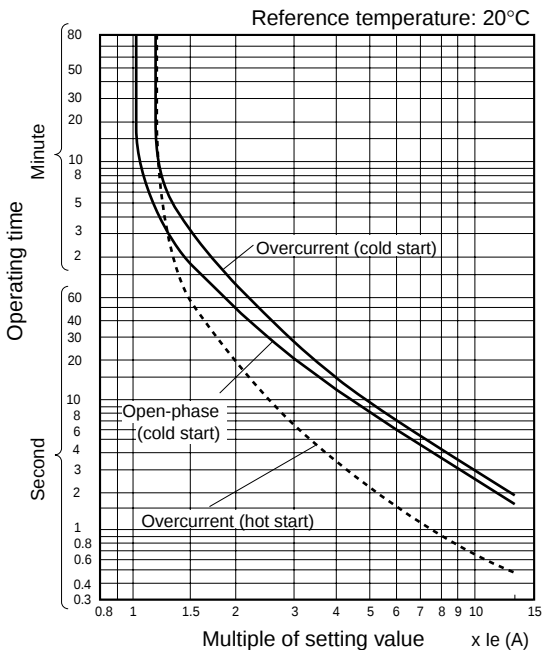
• Based on UL and CSA

Type	Rated insulation voltage (V)	Rated thermal current (A)	Making and breaking current (A)			DC (rating code R300)		
			AC (rating code B600) Voltage (V)	Making (A)	Breaking (A)	Voltage (V)	Making (A)	Breaking (A)
TK-E02	600	5	120	30	3	120	0.22	0.22
TK-E2, E3			240	15	1.5	250	0.11	0.11
TK-E5			480	7.5	0.75			
TK-E6			600	6	0.6			

■ Operating characteristics (mean value)
• TK-E02



• TK-E2 to E6, E6H



■ Optional accessories

• Base units for separate mounting

The base unit modifies thermal overload relays to separate mounting types that can be mounted to 35mm-wide IEC top hat rail or secured with screws.

Applicable thermal overload relay	Type
TK-E02	SZ-HCE
TK-E2	SZ-HDE
TK-E3	SZ-HEE

• Trip indicator

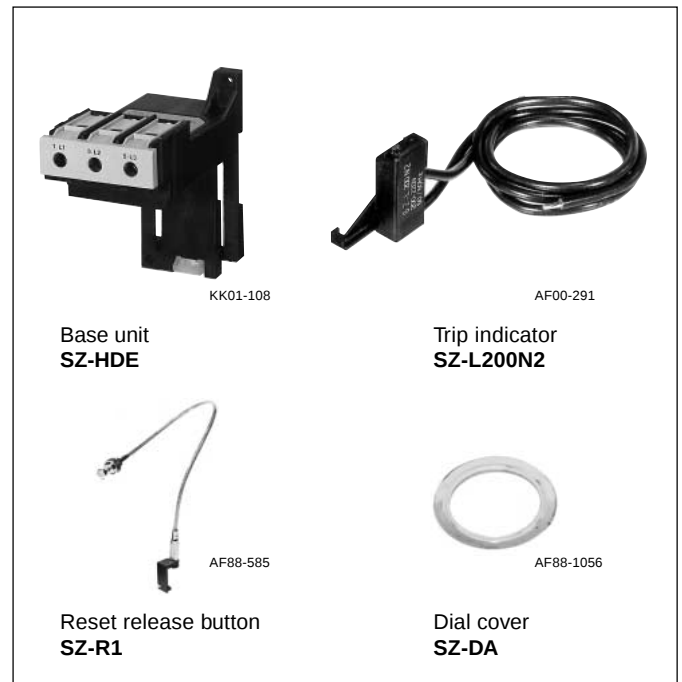
Reports any tripping action at a thermal overload relay through its LED display.

Applicable thermal overload relay	Rated voltage	Type
TK-E02	100–110V AC, 50/60Hz	SZ-L100
	200–220V AC, 50/60Hz	SZ-L200
TK-E2 to TK-E6	100–110V AC, 50/60Hz	SZ-L100N2
	200–220V AC, 50/60Hz	SZ-L200N2

• Reset release button

Reset a thermal overload relay from the rear side of the board or a distant location.

Applicable thermal overload relay	Load length (mm)	Type
TK-E02	300	SZ-R1
	500	SZ-R2
	700	SZ-R3
TK-E2 to TK-E6	300	SZ-R4
	500	SZ-R5
	700	SZ-R6



• Dial cover

Protects the setting current value of a thermal overload relay from being changed unintentionally.

Applicable thermal overload relay	Type
TK-E02 to TK-E6	SZ-DA

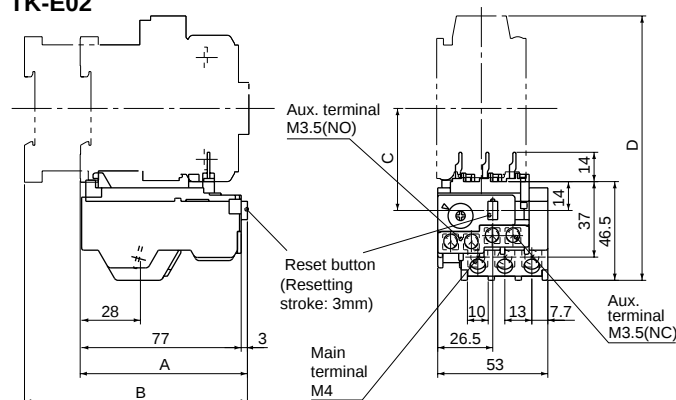
DUO series Contactors

SC-E series

Thermal overload relays

■ Dimensions, mm

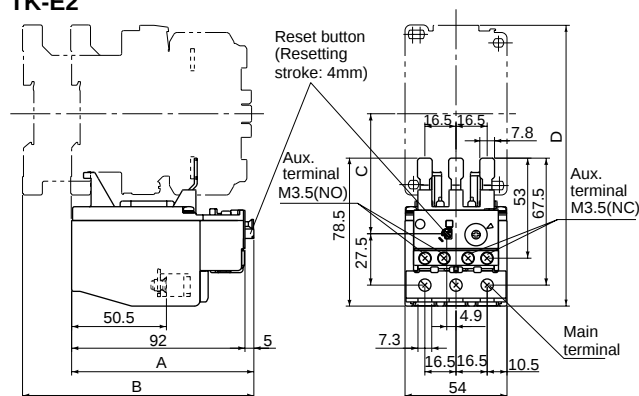
TK-E02



Contactors	A	B	C	D
SC-E02 to 05	80.5	—	49	127.5
SC-E02/G to 05/G	—	107.5	49	127.5

Mass: 0.13kg

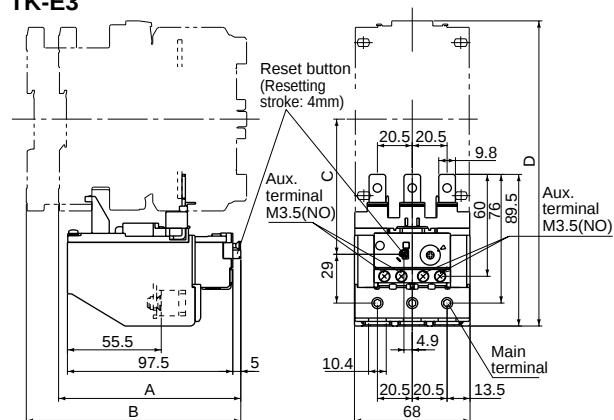
TK-E2



Contactors	A	B	C	D
SC-E1 to E2S	97	—	63.5	149
SC-E1/G to E2S/G	—	123	63.5	149

Mass: 0.25kg

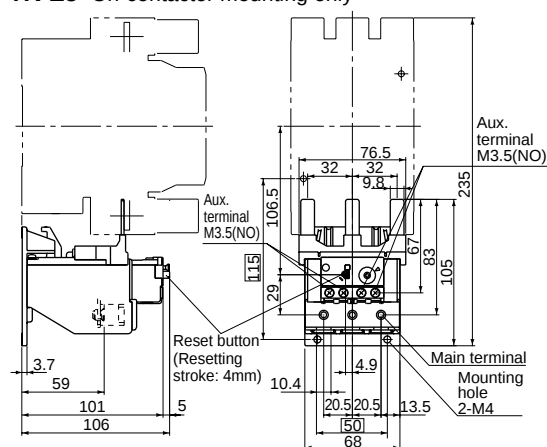
TK-E3



Contactors	A	B	C	D
SC-E3, E4	107.5	—	79.5	180
SC-E3/G, E4/G	—	126.5	79.5	180

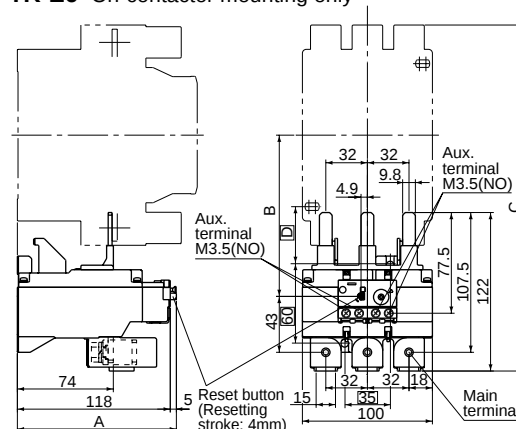
Mass: 0.34kg

TK-E5 On-contactor mounting only



Mass: 0.37kg

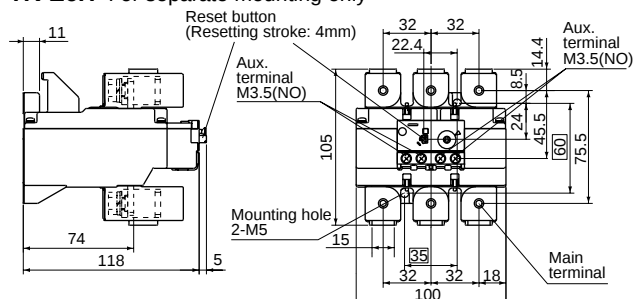
TK-E6 On-contactor mounting only



Contactors	A	B	C	D
SC-E6	123	124	266.5	45
SC-E7	123	129	274	50

Mass: 0.71kg

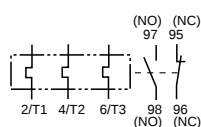
TK-E6H For separate mounting only



Mass: 0.82kg

■ Wiring diagrams

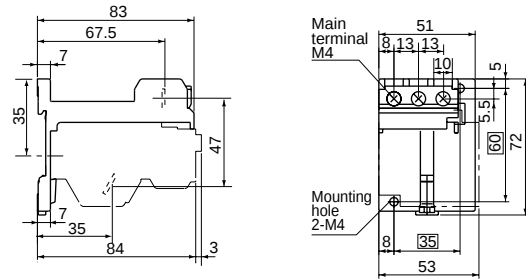
3-heater element



■ Dimensions, mm

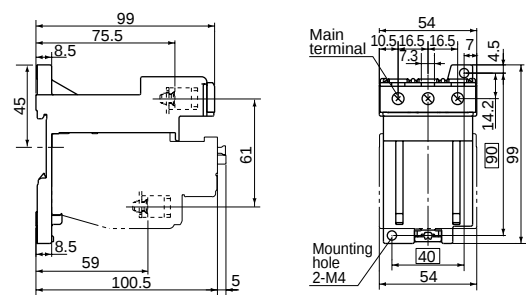
• Base units for separate mounting

SZ-HCE



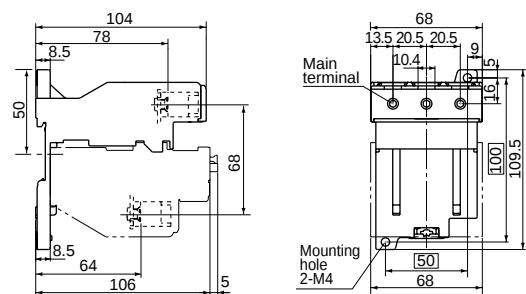
Mass: 55g

SZ-HDE



Mass: 0.1kg

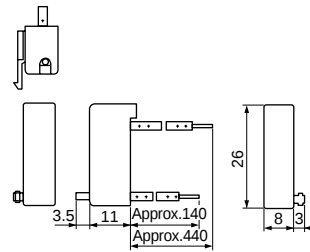
SZ-HEE



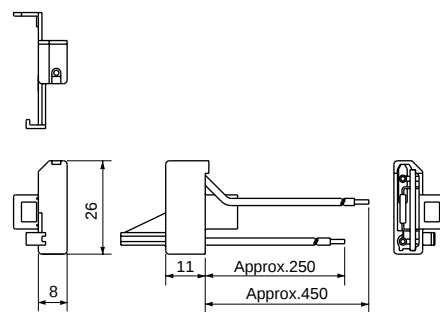
Mass: 0.15kg

• Trip indicators

SZ-L100, L200

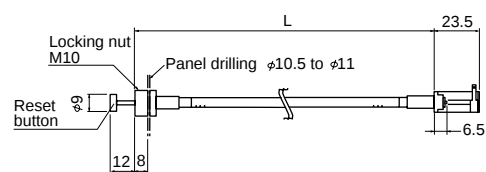


SZ-L100N2, L200N2



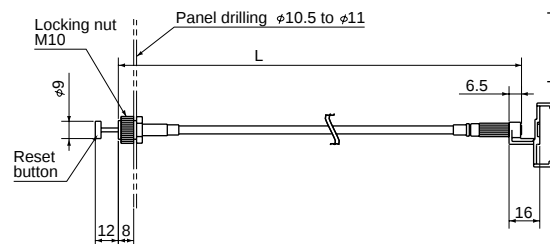
• Reset release button

SZ-R1, R2, R3



Type	L
SZ-R1	300
SZ-R2	500
SZ-R3	700

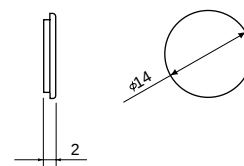
SZ-R4, R5, R6



Type	L
SZ-R4	300
SZ-R5	500
SZ-R6	700

• Dial cover

SZ-DA



DUO series Contactors

SC-E series

Thermal overload relays

■ Standard operating conditions

The thermal overload relays are manufactured for use in the standard operating conditions given in the table at the right. Consult FUJI before using the thermal overload relays in different conditions.

■ Wirings

• Connection-wires and terminal processing

Be sure to perform wiring correctly with reference to the connections diagram. Main terminals for models TK-E02 to TK-E6 are wired using solid wires or stranded wires. Stranded wires or flexible stranded wires can be connected by twisting them together, crimping a sleeve (ferrule) onto them before connecting.

• Tightening torque

If wires are not tightened sufficiently, they may become hot or come loose and result in a fire, short-circuit, electric shock, or some other potentially dangerous situation. Be sure to tighten the wires to the torques specified in the tables below.

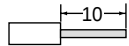
• Connectable wire sizes, tightening tools, tightening torques

Main circuit

Thermal overload relay type		TK-E02
Base unit type		SZ-HCE
Solid wire (mm ²)	One	0.75 to 4
	Two	1 to 4
Stranded wire (mm ²) *1	One	0.75 to 4
	Two	1 to 4
AWG	One	18-12
	Two	18-12
Sheath stripping length (mm)		
Terminal screw size	M4	
Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	
Tightening torque [N·m]	1.2 to 1.5	

Ambient temperature	Operating: -5 to 55°C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35°C) Storage: -40 to 65°C
Humidity	45 to 85%RH
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt
Vibration	10 to 55Hz 15m/s ²
Shock	50m/s ²

Control circuit

Solid or stranded wire (mm ²)	One	0.75 to 2.5 (ø1 to ø1.6)
	Two	0.75 to 1.5 or 1.5 to 2.5
AWG	One	18 to 14
	Two	18 to 14
Sheath stripping length (mm)		
Fork terminal	Max. 7.7mm wide (R2-3.5)	
Terminal screw size	M3.5	
Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	
Tightening torque [N·m(lb·in)]	0.8 to 1	

Thermal overload relay type		TK-E2	TK-E3	TK-E5	TK-E6, E6H
Base unit type		SZ-HDE	SZ-HEE	—	—
	Solid or stranded wire (mm ²) *1	0.75 to 22	1 to 38		16 to 70
	Flexible stranded wire with sleeve (mm ²)	0.75 to 22	1 to 38		16 to 70
	Flexible stranded wire without sleeve (mm ²)	0.75 to 22	1.5 to 38		16 to 70
	AWG	18-4	18-0		6-3/0
	Sheath stripping length (mm)	18	21		23
	Tool	⊕ Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖ Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	⊙ Hex. wrench 4 (ISO 2936)		
Tightening torque (N·m)		2.5	6		10

Notes: *1 Stranded wire (0 to 35mm²) consists of 7 wires or less.
Stranded wire (38 to 120mm²) consists of 19 wires or less.
Flexible stranded wire consists of more number wires than the above.