Fuji Electric

Innovating Energy Technology

MOTOR CONTROL

Magnetic Contactors and Thermal Overload Relays

SK Series

62C1-E-0022a

Magnetic Contactor and Thermal Overload Relay

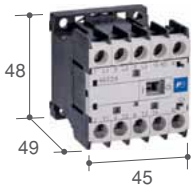
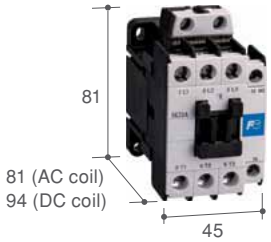
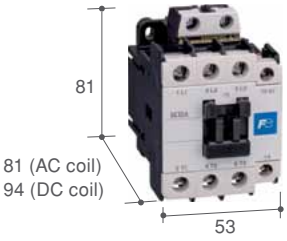
SK Series

Supporting the market for motor drive circuits such as inverters and servos

With the recent increased popularity of inverters and servo amplifiers, more companies are using magnetic contactors as primary side switches for drive control devices as well as using them as direct input motor drives (AC-3 category).
The SK Series was created to fill the need for magnetic contactors with optimized performance and specifications required for this kind of application.




SK Series Lineup

Motor ratings AC-3,AC400V	SK06: 2.2 kW SK09: 4 kW SK12: 5.5 kW	SK18: 7.5 kW SK22: 11 kW	SK32: 15 kW
Magnetic Contactor Size (mm)			
Type	SK06 SK09 SK12	SK18 SK22	SK32
Thermal Overload Relay Size (mm)			
Type	TK12	TK25	TK26

Compared to our previous products, the size is drastically reduced (SK18 to SK32 types)

AC-operated type

- Optimized product specifications and performance for use as primary side switches in drive gears, such as inverters and servo amplifiers.
  The series has been downsized to some of the smallest sizes in the world.

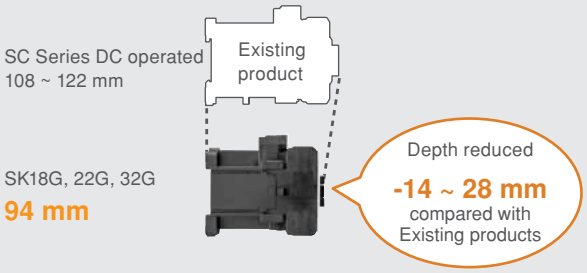
  [Comparison with previous products]
  Volume ratio: Reduced by 15 to 38%
  Width: Reduced by 8 to 11 mm
  Depth: Reduced by 15 mm (for SK32A type)

DC operated type

- The depth of DC operated SK18G through SK32G models has also been drastically reduced.

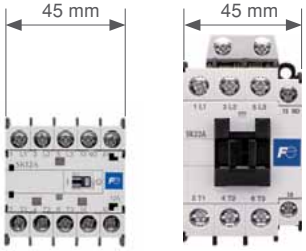
  [Comparison with previous products]
  Volume ratio: Reduced by 13 to 23%
  Width: Reduced by 8 to 11 mm
  Depth: Reduced by 14 to 28 mm

The depth of the DC-operated types has been reduced.

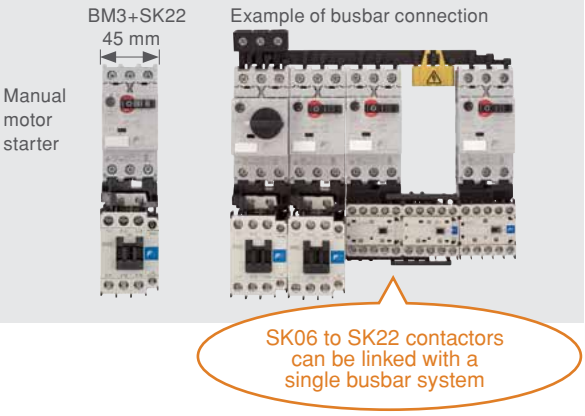


Unified width of 45 mm for SK06 to SK22 types

- The width is unified to 45 mm for SK06 to SK22 types, which is the same width as that of the BM3 series of manual motor starters. It is easier to compose a combination starter now that can realize a more compact motor starter circuit.



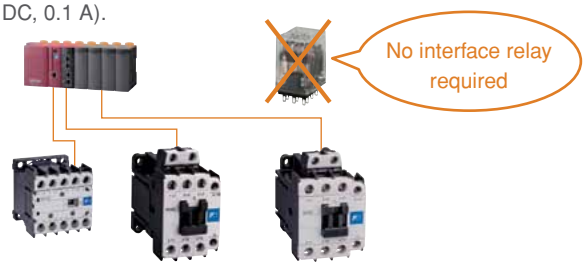
It is possible to compose a combination starter more easily.



Low power consumption

- Direct drive through PLC transistor output has been expanded to motors rated 6.5 kW (200V AC).

  [DC operated type]
  The SK18G through SK32G models use the same high efficiency polarized electromagnets used in the SK06L through SK12L models, making it possible to directly drive all models through transistor output (rated for 24 V DC, 0.1 A).



Magnet power consumption

For SK18/22/32
[DC Coil]
Standard DC coil : 2.4W
Low-power DC coil : 1.2W

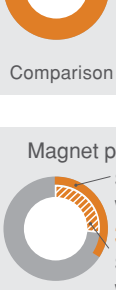
86%
of previous models

* Up to two auxiliary contactscan be added.

Comparison with FUJI SJ Series

Magnet power consumption

For SK18/22/32
[DC Coil]
Standard DC coil : 2.4W



SK18, 22 Compared with conventional products
34%
SK32 Compared with conventional products
27%

Comparison with FUJI SC Series

Standard Compliance

- Being accredited with most of the mainstream international standards, our products can be exported to any destination.

Product	Type	Compliant Standards			Certifi ed Standards				EC Directives	Certifying Body
		IEC	EN	JIS	UL	CSA	GB	KC	CE Marking	TÜV
		International	Europe	Japan	USA	Canada	China	Korea	Europe	Germany
		IEC	EN	JIS	c UL us LISTED				CE	TÜV Rheinland
Magnetic Contactors	SK□A	●	●	●	●	●	●	● *1	●	●
	SK□G	●	●	●	●	●	●	● *1	●	●
	SK□L	●	●	●	●	●	●	● *1	●	●
Thermal Overload Relays	TK12,TK25,TK26	●	●	●	●	●	●	–	●	●

Note:Legend ●: Compliance with standard models. *1 Single contacts (H) for auxiliary contact use have not been certified.

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- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult with Fuji Electric FA.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.
- Follow the regulations of industrial wastes when the product is to be discarded.
- For further questions, please contact your Fuji sales representative or Fuji Electric FA.

Magnetic-Contactors SK Series

■ Standard Models

Series			SK Series		
Frame			06	09	12
Magnetic Contactor appearance			 (KKD14-157)		
Thermal Overload Relay appearance			 (KKD14-166)		
Type	Magnetic Contactors	AC-operated types	**SK06A**	**SK09A**	**SK12A**
		DC-operated types (2.4W)	**SK06G**	**SK09G**	**SK12G**
		DC-operated types (1.2W)	**SK06L**	**SK09L**	**SK12L**
	Thermal Overload Relay		**TK12**		
Rated insulation voltage (IEC)			690V	690V	690V
Rated impulse withstand voltage (IEC)			6kV	6kV	6kV
Rated frequency			50-60Hz	50-60Hz	50-60Hz
Main circuit ratings	3-phase squirrel-cage motor capacity [kW] AC-3 IEC60947-4-1	200-240V	1.5kW	2.2kW	3kW
		380-440V	2.2kW	4kW	5.5kW
		500-550V	3kW	4kW	5.5kW
		600-690V	3kW	4kW	4kW
	Rated current Ie [A] AC-3	200-240V	6A	9A	12A
		380-440V	6A	9A	12A
		500-550V	5A	7A	9A
		600-690V	3.5A	5A	5A
	Conventional free air thermal current (Rated continuous current) Ith [A]		20A	20A	20A
Performances	Operating cycles per hour [times/hour]		1800	1800	1800
	Durability	Mechanical	10 million	10 million	10 million
		Electrical (AC-3)	1 million	1 million	1 million
Dimensions W×H×D [mm]			45×48×49	45×48×49	45×48×49
Options	Auxiliary Contact Blocks	Front mounting (2-pole)	◎		
		Front mounting (4-pole) *1	◎		
	Mechanical Interlock Unit		◎		
	Coil Surge Suppression Unit		◎		
	Main Circuit Surge Suppression Unit		◎		
Standards					

Note: *1 These products cannot be combined with the SK□L.

■ Standard Models

Series				SK Series		
Frame				18	22	32
Magnetic Contactor appearance				 (KKD14-083)		 (KKD14-179)
Thermal Overload Relay appearance				 (KKD14-095)		 (KKD14-113)
Type	Magnetic Contactors	AC-operated types		**SK18A**	**SK22A**	**SK32A**
		DC-operated types (2.4W)		**SK18G**	**SK22G**	**SK32G**
		DC-operated types (1.2W)		–	–	–
	Thermal Overload Relay			**TK25**		**TK26**
Rated insulation voltage (IEC)				690V	690V	690V
Rated impulse withstand voltage (IEC)				6kV	6kV	6kV
Rated frequency				50-60Hz	50-60Hz	50-60Hz
Main circuit ratings	3-phase squirrel-cage motor capacity [kW] AC-3 IEC60947-4-1		200-240V	4.5kW	5.5kW	7.5kW
			380-440V	7.5kW	11kW	15kW
			500-550V	7.5kW	11kW	15kW
			600-690V	7.5kW	7.5kW	11kW
	Rated current Ie [A] AC-3		200-240V	18A	22A	32A
			380-440V	18A	22A	32A
			500-550V	13A	17A	24A
			600-690V	9A	9A	15A
	Conventional free air thermal current (Rated continuous current) Ith [A]			32A	32A	40A
Performances	Operating cycles per hour [times/hour]			1800	1800	1200
	Durability	Mechanical		5 million	5 million	5 million
		Electrical (AC-3)		1 million	1 million	1 million
Dimensions W×H×D [mm]		AC-operated		45×81×81	45×81×81	53×81×81
		DC-operated		45×81×94	45×81×94	53×81×94
Options	Auxiliary Contact Blocks	Front mounting (2-pole)		◎		
		Front mounting (4-pole)		—		
		Side-mounting		◎		
	Mechanical Interlock Unit			◎		
	Coil Surge Suppression Unit			◎		
	Main Circuit Surge Suppression Unit			◎		
Standards						

■ Thermal Overload Relays

Thermal Overload Relay appearance	 (KKD14-166)	 (KKD14-095)	 (KKD14-113)
Type	**TK12**	**TK25**	**TK26**
Protection	Overload and phase-loss protection		
Ampere setting range The heating element code is given in brackets.	0.1-0.15A [P10] 0.13-0.2A [P13] 0.18-0.27A [P18] 0.24-0.36A [P24] 0.34-0.52A [P34] 0.48-0.72A [P48] 0.64-0.96A [P64] 0.8-1.2A [P80] 0.95-1.45A [P95] 1.1-1.65A [1P1]	1.4-2.1A [1P4] 1.7-2.6A [1P7] 2.2-3.4A [2P2] 2.8-4.2A [2P8] 4-6A [004] 5-7.5A [005] 6-9A [006] 7-10.5A [007] 9-13A [009] 12-18A [012]*1	16-22A [016]*1 20-26A [020]*2 26-32A [026]*2

Note: *1 For TK25, TK26 only.
*2 For TK26 only.

■ Production Models

Magnetic Contactors and Magnetic Starters

Product		Type *1	Frame size					
			06	09	12	18	22	32
Magnetic Contactors	AC-operated types	SK □ A	○	○	○	○	○	○
	DC-operated types (standard)	SK □ G	○	○	○	○	○	○
	DC-operated types (low power consumption)	SK □ L	○	○	○	–	–	–
Reversing Contactors	AC-operated types	SK □ AR	○	○	○	○	○	○
	DC-operated types (standard)	SK □ GR	○	○	○	○	○	○
	DC-operated types (low power consumption)	SK □ LR	○	○	○	–	–	–

Note: *1 In the □ mark, is replaced with the frame size.

Type Number Nomenclature

■ Type Number Nomenclature

● Type Number Nomenclature (Type Number = Product Code)

• Magnetic Contactors

SK 12 A H R - 2 01 W

Basic type number
Mini-Contactor

Frame size
06, 09, 12, 18, 22 or 32

Operating method
- A : AC-operated type
- G : DC-operated type (2.4W)
- L : DC-operated type (1.2W) SK06, 09, 12

Auxiliary contact
- Blank : Bifurcated contact
- H : Single button contact

Non-reversing or reversing
- Blank : Non-reversing
- R : Reversing

Note: Products cannot be manufactured for all possible type numbers.

Reversing conductor
- W : Wire
- M : Molded SK06, 09, 12 (Only for Combination Starter)

Note: Specify this for a reversing model.

Auxiliary contact arrangement
- 10 : 1NO
- 01 : 1NC

Coil voltage

AC operation		E	24V AC
		F	48V AC
		1	100V AC
		H	110V AC
		K	120V AC
		2	200V AC
		M	220V AC
		P	240V AC
		S	380V AC
		4	400V AC
		T	440V AC
		5	500V AC
DC operation	2.4W (G)	B	12V DC
		E	24V DC
		F	48V DC
		G	60V DC
		1	100V DC
		H	110V DC
		K	120V DC
		2	200V DC
		Y	210V DC
		M	220V DC
	1.2W (L)	B	12V DC
		E	24V DC
		F	48V DC

• Thermal Overload Relays

TK 12 W A - 009

Basic type number
- TK : 2E Thermal Overload Relay (with phase-loss detection)

Frame size
12, 25, 26

Mounting
- W : On-contactor mounting (* TK12 only)

Reset method
- Blank : Manual reset (standard)
- A : Automatic reset

Ampere setting range
- P10 : 0.1-0.15A
- P13 : 0.13-0.2A
- P18 : 0.18-0.27A
- P24 : 0.24-0.36A
- P34 : 0.34-0.52A
- P48 : 0.48-0.72A
- P64 : 0.64-0.96A
- P80 : 0.8-1.2A
- P95 : 0.95-1.45A
- 1P1 : 1.1-1.65A
- 1P4 : 1.4-2.1A
- 1P7 : 1.7-2.6A
- 2P2 : 2.2-3.4A
- 2P8 : 2.8-4.2A
- 004 : 4-6A
- 005 : 5-7.5A
- 006 : 6-9A
- 007 : 7-10.5A
- 009 : 9-13A
- 012 : 12-18A
- 016 : 16-22A
- 020 : 20-26A
- 026 : 26-32A

Auxiliary Relays

■ Type Number Nomenclature

● Type Number Nomenclature
• SK-Series Auxiliary Relays

SKH4 A H - 1 22

Basic type
SK-Series Auxiliary Relay

Operating method
A : AC-operated types
G : DC-operated types (2.4W)
L : DC-operated types (1.2W)

Auxiliary contact
Blank : Bifurcated contact
H : Single button contact

Auxiliary contact arrangement
40 : 4NO
31 : 3NO+1NC
22 : 2NO+2NC

Coil voltage

AC operation		E	24V AC
		F	48V AC
		1	100V AC
		H	110V AC
		K	120V AC
		2	200V AC
		M	220V AC
		P	240V AC
		S	380V AC
		4	400V AC
		T	440V AC
		5	500V AC
DC operation	2.4W (G)	B	12V DC
		E	24V DC
		F	48V DC
		G	60V DC
		1	100V DC
		H	110V DC
		K	120V DC
		2	200V DC
		Y	210V DC
		M	220V DC
	1.2W (L)	B	12V DC
		E	24V DC
		F	48V DC

Ratings

■ Main Circuit Ratings

● IEC-conformance Ratings (IEC 60947-4-1, EN 60947-4-1, and VDE 0660)

Type	Max. motor capacity [kW]				Operational current [A]				Conventional free air thermal current [A] (Rated thermal current)
	3-phase squirrel-cage motor (AC-3)				3-phase squirrel-cage motor (AC-3)				
	200-240V	380-440V	500-550V	600-690V	200-240V	380-440V	500-550V	600-690V	
SK06	1.5	2.2	3	3	6	6	5	3.5	20
SK09	2.2	4	4	4	9	9	7	5	20
SK12	3	5.5	5.5	4	12	12	9	5	20
SK18	4.5	7.5	7.5	7.5	18	18	13	9	32
SK22	5.5	11	11	7.5	22	22	17	9	32
SK32	7.5	15	15	11	32	32	24	15	40

Note: AC-3 electrical durability: 1,000,000 operations

● UL/CSA-conformance Ratings (UL60947-4-1A*1 and CSA C22.2)

Type	Max. motor capacity [HP]				Operational current [A]				Rated continuous current [A]
	3-phase motor				3-phase motor				
	200V	220-240V	440-480V	550-600V	200V	220-240V	440-480V	550-600V	
SK06	1-1/2	2	3	5	6.9	6.8	4.8	6.1	20
SK09	2	3	5	5	7.8	9.6	7.6	6.1	20
SK12	3	3	5	5	11	9.6	7.6	6.1	20
SK18	5	5	10	7-1/2	17.5	15.2	14	9	32
SK22	5	7-1/2	15	10	17.5	22	21	11	32
SK32	7-1/2	10	20	15	25.3	28	27	17	40

Type	Max. motor capacity [HP]			Operational current [A]			Rated continuous current [A]
	Single-phase motor			Single-phase motor			
	110-120V	200V	220-240V	110-120V	200V	220-240V	
SK06	1/2	3/4	1	9.8	7.9	8	20
SK09	3/4	1	1-1/2	13.8	9.2	10	20
SK12	1	1-1/2	2	16	11.5	12	20
SK18	1	2	2	16	13.8	12	32
SK22	1-1/2	3	3	20	19.6	17	32
SK32	2	3	5	24	19.6	28	40

Note: Use wires that are rated for 75°C.
*1 The standard for Industrial Control Equipment UL 508 has been harmonized with the relevant product standards of the IEC standard for Low-Voltage Switchgear and Controlgear IEC 60947.

Ratings

■ Auxiliary Circuit Ratings

● IEC-conformance Ratings (Standard Models: Bifurcated Contact)

Type	Conventional free air thermal current [A] (Rated thermal current)	Making and breaking current (AC)	Rated operational current [A]						Minimum voltage and current
			AC rated operational voltage [V]	AC-15 (Ind. load)	AC-12 (Res. load)	DC rated operational voltage [V]	DC-13 (Ind. load)	DC-12 (Res. load)	
SK06 **SK09** **SK12** **SKH4**	10	30	100-120	3	6	24	2	3	5V DC, 3mA
		30	200-240	3	6	48	1	2	
		10	380-440	1	6	110	0.3	1.5	
		5	500-600	0.5	3	220	0.2	0.5	
SK18 **SK22** **SK32**	10	60	100-120	6	10	24	3	5	5V DC, 3mA
		30	200-240	3	8	48	1.5	3	
		15	380-440	1.5	5	110	0.55	2.5	
		12	500-600	12	5	220	0.27	1	

Note: The failure level is 10^{-7} for a normal environment without dust, dirt, or corrosive gas.
The ratings of additional auxiliary contacts are the same as those given above.

● IEC-conformance Ratings (Single Button Contact)

Type	Conventional free air thermal current [A] (Rated thermal current)	Making and breaking current (AC)	Rated operational current [A]						Minimum voltage and current
			AC rated operational voltage [V]	AC-15 (Ind. load)	AC-12 (Res. load)	DC rated operational voltage [V]	DC-13 (Ind. load)	DC-12 (Res. load)	
SK06□H **SK09□H** **SK12□H** **SKH4□H**	10	60	100-120	6	10	24	4	8	24V DC, 10mA
		60	200-240	6	10	48	1	3.5	
		60	380-440	6	10	110	0.5	2.5	
		30	500-600	3	5	220	0.25	0.8	
SK18□H **SK22□H** **SK32□H**	10	60	100-120	6	10	24	5	10	24V DC, 10mA
		60	200-240	6	10	48	1.5	5	
		40	380-440	4	10	110	0.7	4	
		40	500-600	4	10	220	0.27	1	

Note: The failure level is 10^{-7} for a normal environment without dust, dirt, or corrosive gas.
The ratings of additional auxiliary contacts are the same as those given above.

● UL/CSA-conformance Ratings (Bifurcated Contact or Single Button Contact)

Type	Rated continuous current [A]	Rated operational current [A]						Rating code	
		AC			DC				
		Rated operational voltage [V]	Making	Breaking	Rated operational voltage [V]	Making	Breaking	AC	DC
SK06 **SK09** **SK12** **SK18** **SK22** **SK32** **SKH4**	10	120	60	6	125	0.55	0.55	A600	Q300
		240	30	3					
		480	15	1.5	250	0.27	0.27		
		600	12	1.2					

■ Operating Coil Voltages

● AC-operated Types

Type	Order voltage	Code	Coil voltage and frequency
SK06A **SK09A** **SK12A** **SK18A** **SK22A** **SK32A**	24V AC	E	24V 50Hz / 24-26V 60Hz
	48V AC	F	48V 50Hz / 48-52V 60Hz
	100V AC	1	100V 50Hz / 100-110V 60Hz
	110V AC	H	100-110V 50Hz / 110-120V 60Hz
	120V AC	K	110-120V 50Hz / 120-130V 60Hz
	200V AC	2	200V 50Hz / 200-220V 60Hz
	220V AC	M	200-220V 50Hz / 220-240V 60Hz
	240V AC	P	220-240V 50Hz / 240-260V 60Hz
	380V AC	S	346-380V 50Hz / 380-420V 60Hz
	400V AC	4	380-400V 50Hz / 400-440V 60Hz
	440V AC	T	415-440V 50Hz / 440-480V 60Hz
	500V AC	5	480-500V 50Hz / 500-550V 60Hz

● DC-operated Types (2.4W)

Type	Order voltage	Code	Coil voltage
SK06G **SK09G** **SK12G** **SK18G** **SK22G** **SK32G**	12V DC	B	12V DC
	24V DC	E	24V DC
	48V DC	F	48V DC
	60V DC	G	60V DC
	100V DC	1	100V DC
	110V DC	H	110V DC
	120V DC	K	120V DC
	200V DC	2	200V DC
	210V DC	Y	210V DC
	220V DC	M	220V DC

● DC-operated Types (1.2W)

Type	Order voltage	Code	Coil voltage
SK06L **SK09L** **SK12L**	12V DC	B	12V DC
	24V DC	E	24V DC
	48V DC	F	48V DC

■ Operating Coil Characteristics

● AC-operated Types

Type	Power consumption [VA]				Watt loss [W]		Pick-up voltage [V]		Drop-out voltage [V]		Operating times [ms]	
	Inrush		Sealed								Coil ON → Contact ON	Coil OFF → Contact OFF
	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz	50Hz	60Hz	50Hz	60Hz		
SK06A SK09A SK12A	22	25	4.5	4.5	1.2	1.3	122-135	128-138	80-89	83-96	17-26	8-11
SK18A SK22A	90	95	9	9	2.7	2.8	118-136	130-146	75-106	88-120	9-20	5-16
SK32A	90	95	9	9	2.7	2.8	118-136	130-146	75-106	88-120	9-20	5-16

Note 1. The characteristics are for the following coil ratings: 200V, 50Hz/200 to 220V, 60Hz.
Note 2. The electromagnet capacity is the same even when the rated coil voltage is not 200V AC.
Note 3. The operating times are for 200V AC, 50Hz.
Note 4. The pick-up voltage and drop-out voltage for a 100V (100V AC, 50 Hz/100 to 110V, 60Hz) coil are approximately half of the values that are given in the above table.
Note 5. The values in the above table are examples for a cold status at 20°C.

● DC-operated Types (2.4W)

Type	Power consumption [W]		Time constant [ms]	Pick-up voltage [V]	Drop-out voltage [V]	Operating times [ms]	
	Inrush	Sealed	Sealed			Coil ON → Contact ON	Coil OFF → Contact OFF
	24V	24V					
SK06G SK09G SK12G	2.4	2.4	20	10-11	4-6	22-24	5-6
SK18G SK22G	2.4	2.4	33	15-16	3.5-5	65-72	18-23
SK32G	2.4	2.4	33	15-16	3.5-5	65-72	18-23

Note 1. The characteristics are for the following coil rating: 24V DC.
Note 2. The electromagnet capacity is the same even when the rated coil voltage is not 24V DC.
Note 3. The values in the above table are examples for a cold status at 20°C.
Note 4. This operating time is based on a reference value and it is not a guaranteed operating time.

● DC-operated Types (1.2W)

Type	Power consumption [W]		Time constant [ms]	Pick-up voltage [V]	Drop-out voltage [V]	Operating times [ms]	
SK06L SK09L SK12L	Inrush	Sealed	Sealed			Coil ON → Contact ON	Coil OFF → Contact OFF
	24V	24V					
	1.2	1.2	20	13-14	4-5	30-33	8-9

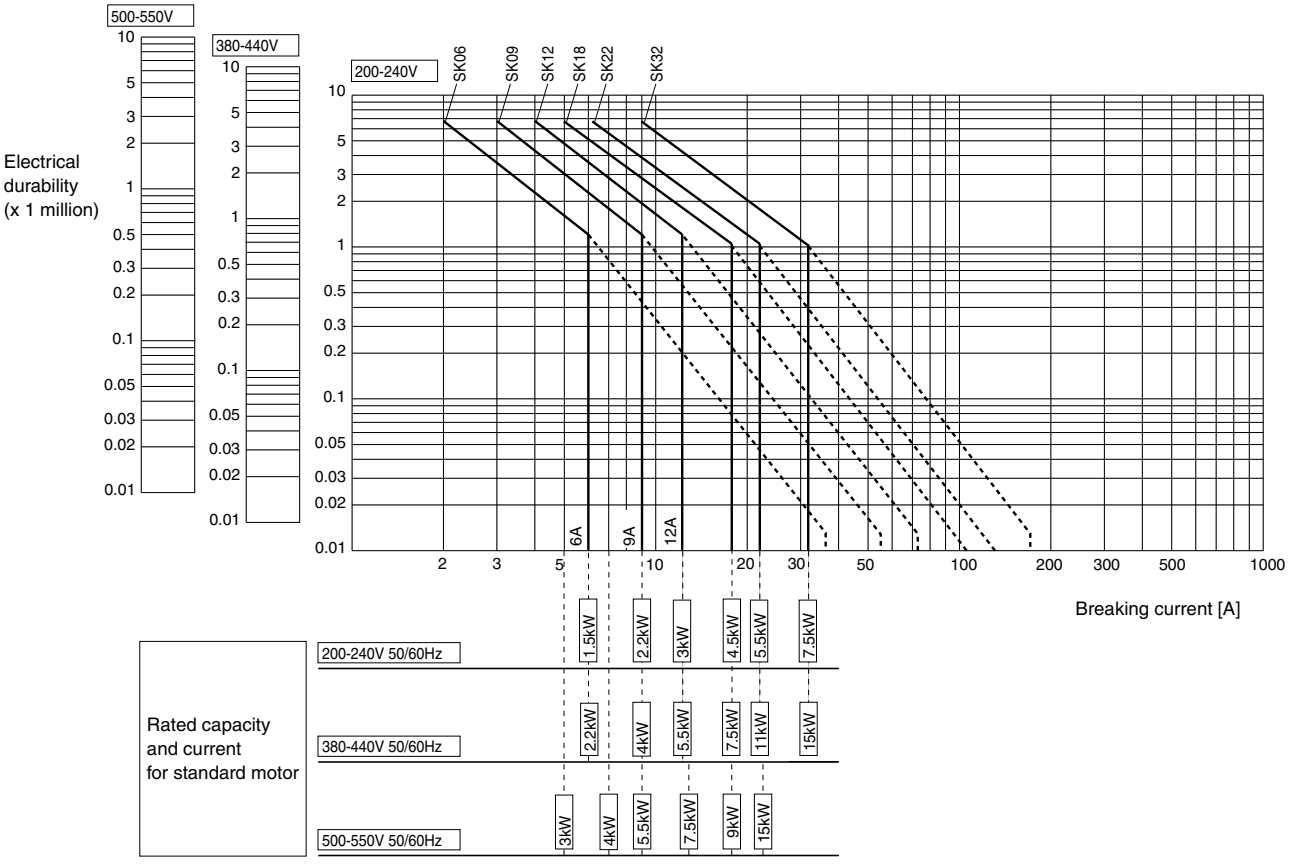
Note 1. The characteristics are for the following coil rating: 24V DC.
Note 2. The electromagnet capacity is the same even when the rated coil voltage is not 24V DC.
Note 3. The values in the above table are examples for a cold status at 20°C.
Note 4. This operating time is based on a reference value and it is not a guaranteed operating time.

■ Performances

Type	Rated operational voltage [V]	Rated operational current [A]	Making/breaking current [A]		Operating cycles per hour [times/hour]	Durability (Operations)	
			Making	Breaking		Mechanical	Electrical
SK06	220	6	72	60	1800	10 million	1 million
	440	6	72	60			
SK09	220	9	108	90			
	440	9	108	90			
SK12	220	12	144	120			
	440	12	144	120			
SK18	220	18	216	180		5 million	
	440	18	180	144			
SK22	220	22	264	220			
	440	22	220	176			
SK32	220	32	320	260	1200		
	440	32	320	256			

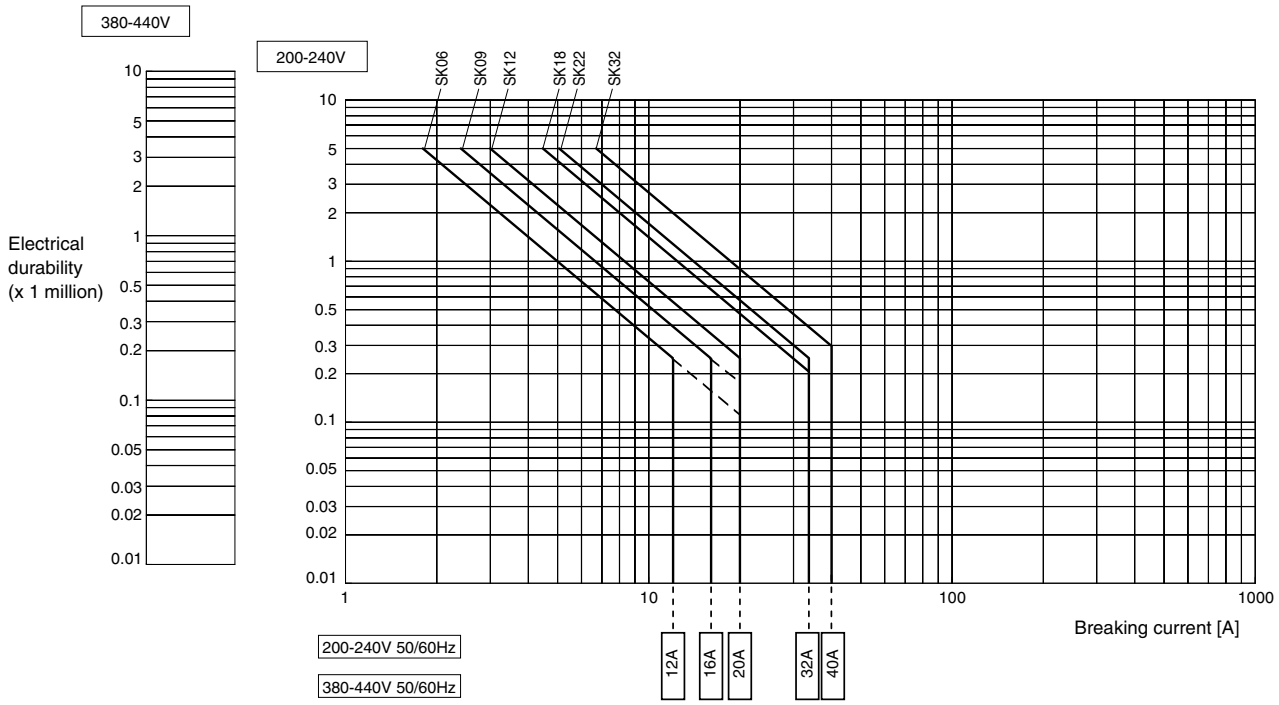
■ AC-3 Breaking Current and Electrical Durability

● SK06 to SK32



■ AC-1 Breaking Current and Electrical Durability

● SK06 to SK32



■ Coordination with Short-circuit Protection Devices (SCPD) (Based on IEC Standards)

● Prospective Short-circuit Current "r" (240V and 440V)

Magnetic Contactor	Thermal Overload Relay		Coordination type						
			Type 1			Type 2			
Type	Type	Ampere setting range [A]	Short-circuit current "r" [kA]	Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Short-circuit current "r" [kA]	Fuse (IEC 60269-1 gG and gM) rating (A)	FUJI Low-voltage Current-limiting Fuse	
				Type	Rating [A]			Type	Rating [A]
SK06	**TK12**	0.34-0.52	1	BW32SAG EW32SAG BW32SBG EW32SBG	3	1	2	BLA003	3
		0.48-0.72	1		3	1	4	BLA005	5
		0.64-0.96	1		5	1	4	BLA005	5
		0.8-1.2	1		5	1	4	BLA005	5
		0.95-1.45	1		10	1	16	BLA020	20
		1.1-1.65	1		10	1	16	BLA020	20
		1.4-2.1	1		20	1	16	BLA020	20
		1.7-2.6	1		20	1	16	BLA020	20
		2.2-3.4	1		20	1	16	BLA020	20
		2.8-4.2	1		20	1	16	BLA020	20
		4-6	1		20	1	16	BLA020	20
SK09	**TK12**	0.34-0.52	1	BW32SAG EW32SAG BW32SBG EW32SBG	3	1	2	BLA003	3
		0.48-0.72	1		3	1	4	BLA005	5
		0.64-0.96	1		5	1	4	BLA005	5
		0.8-1.2	1		5	1	4	BLA005	5
		0.95-1.45	1		10	1	16	BLA020	20
		1.1-1.65	1		10	1	16	BLA020	20
		1.4-2.1	1		20	1	16	BLA020	20
		1.7-2.6	1		20	1	16	BLA020	20
		2.2-3.4	1		20	1	16	BLA020	20
		2.8-4.2	1		20	1	16	BLA020	20
		4-6	1		20	1	16	BLA020	20
		5-7.5	1		20	1	16	BLA020	20
		6-9	1		20	1	16	BLA020	20
SK12	**TK12**	0.34-0.52	1	BW32SAG EW32SAG BW32SBG EW32SBG	3	1	2	BLA003	3
		0.48-0.72	1		3	1	4	BLA005	5
		0.64-0.96	1		5	1	4	BLA005	5
		0.8-1.2	1		5	1	4	BLA005	5
		0.95-1.45	1		10	1	16	BLA020	20
		1.1-1.65	1		10	1	16	BLA020	20
		1.4-2.1	1		20	1	16	BLA020	20
		1.7-2.6	1		20	1	16	BLA020	20
		2.2-3.4	1		20	1	16	BLA020	20
		2.8-4.2	1		20	1	16	BLA020	20
		4-6	1		20	1	16	BLA020	20
		5-7.5	1		20	1	16	BLA020	20
		6-9	1		20	1	16	BLA020	20
		7-10.5	1		20	1	16	BLA020	20
		9-13	1		30	1	16	BLA020	20
SK06	**–**		1	BW32SAG EW32SAG BW32SBG EW32SBG	30	1	16	BLA020	20
SK09	**–**		1			1	16	BLA020	20
SK12	**–**		1			1	16	BLA020	20

● Prospective Short-circuit Current "r" (240V and 440V)

Magnetic Contactor	Thermal Overload Relay		Coordination type						
			Type 1			Type 2			
Type	Type	Ampere setting range [A]	Short-circuit current "r" [kA]	Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Short-circuit current "r" [kA]	Fuse (IEC 60269-1 gG and gM) rating (A)	FUJI Low-voltage Current-limiting Fuse	
				Type	Rating [A]			Type	Rating [A]
SK18	**TK25**	0.34-0.52	3	BW50SAG EW50SAG BW50SBG EW50SBG	3	3	2	BLA003	3
		0.48-0.72	3		3	3	4	BLA005	5
		0.64-0.96	3		5	3	4	BLA005	5
		0.8-1.2	3		5	3	16	BLA020	20
		0.95-1.45	3		10	3	20	BLA030	30
		1.1-1.65	3		10	3	20	BLA030	30
		1.4-2.1	3		20	3	20	BLA030	30
		1.7-2.6	3		20	3	20	BLA030	30
		2.2-3.4	3		20	3	20	BLA030	30
		2.8-4.2	3		20	3	20	BLA030	30
		4-6	3		20	3	20	BLA030	30
		5-7.5	3		20	3	20	BLA030	30
		6-9	3		20	3	20	BLA030	30
		7-10.5	3		20	3	25	BLA040	40
		9-13	3		30	3	25	BLA040	40
		12-18	3		30	3	40	BLA060	60
SK22	**TK25**	0.34-0.52	3	BW50SAG EW50SAG BW50SBG EW50SBG	3	3	2	BLA003	3
		0.48-0.72	3		3	3	4	BLA005	5
		0.64-0.96	3		5	3	4	BLA005	5
		0.8-1.2	3		5	3	16	BLA020	20
		0.95-1.45	3		10	3	20	BLA030	30
		1.1-1.65	3		10	3	20	BLA030	30
		1.4-2.1	3		20	3	20	BLA030	30
		1.7-2.6	3		20	3	20	BLA030	30
		2.2-3.4	3		20	3	20	BLA030	30
		2.8-4.2	3		20	3	20	BLA030	30
		4-6	3		20	3	20	BLA030	30
		5-7.5	3		20	3	20	BLA030	30
		6-9	3		20	3	20	BLA030	30
		7-10.5	3		20	3	25	BLA040	40
		9-13	3		30	3	25	BLA040	40
		12-18	3		30	3	40	BLA060	60
		16-22	3		50	3	50	BLA075	75
SK32	**TK26**	0.34-0.52	3	BW50SAG EW50SAG BW50SBG EW50SBG	3	3	2	BLA003	3
		0.48-0.72	3		3	3	4	BLA005	5
		0.64-0.96	3		5	3	4	BLA005	5
		0.8-1.2	3		5	3	16	BLA020	20
		0.95-1.45	3		10	3	20	BLA030	30
		1.1-1.65	3		10	3	20	BLA030	30
		1.4-2.1	3		20	3	20	BLA030	30
		1.7-2.6	3		20	3	20	BLA030	30
		2.2-3.4	3		20	3	20	BLA030	30
		2.8-4.2	3		20	3	20	BLA030	30
		4-6	3		20	3	20	BLA030	30
		5-7.5	3		20	3	20	BLA030	30
		6-9	3		20	3	20	BLA030	30
		7-10.5	3		20	3	25	BLA040	40
		9-13	3		30	3	25	BLA040	40
		12-18	3		30	3	40	BLA060	60
		16-22	3		50	3	50	BLA075	75
		20-26	3		50	3	50	BLA075	75
		26-32	3	BW63SAG EW63SAG BW63SBG EW63SBG	63	3	50	BLA075	75
SK18	–	–	3	BW50SAG EW50SAG BW50SBG EW50SBG	50	3	50	BLA075	75
SK22	–	–	3			3	50	BLA075	75
SK32	–	–	3	BW63SAG EW63SAG BW63SBG EW63SBG	63	3	50	BLA075	75

● Rated conditional short-circuit current Iq (240V)

Magnetic Contactor	Thermal Overload Relay		Coordination type						
			Type 1			Type 2			
Type	Type	Ampere setting range [A]	Short-circuit current "Iq" [kA]	Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Short-circuit current "Iq" [kA]	Fuse (IEC 60269-1 gG and gM) rating (A)	FUJI Low-voltage Current-limiting Fuse	
				Type	Rating [A]			Type	Rating [A]
SK06	**TK12**	0.34-0.52	25	BW50RAG EW50RAG	3	50	2	BLA003	3
		0.48-0.72	25		3	50	4	BLA005	5
		0.64-0.96	25		5	50	4	BLA005	5
		0.8-1.2	25		5	50	4	BLA005	5
		0.95-1.45	25		10	50	16	BLA020	20
		1.1-1.65	25		10	50	16	BLA020	20
		1.4-2.1	25		10	50	20	BLA030	30
		1.7-2.6	25		10	50	20	BLA030	30
		2.2-3.4	25		10	50	20	BLA030	30
		2.8-4.2	25		10	50	20	BLA030	30
		4-6	25		10	50	20	BLA030	30
SK09	**TK12**	0.34-0.52	25	BW50RAG EW50RAG	3	50	2	BLA003	3
		0.48-0.72	25		3	50	4	BLA005	5
		0.64-0.96	25		5	50	4	BLA005	5
		0.8-1.2	25		5	50	4	BLA005	5
		0.95-1.45	25		10	50	16	BLA020	20
		1.1-1.65	25		10	50	16	BLA020	20
		1.4-2.1	25		10	50	20	BLA030	30
		1.7-2.6	25		10	50	20	BLA030	30
		2.2-3.4	25		10	50	20	BLA030	30
		2.8-4.2	25		10	50	20	BLA030	30
		4-6	25		10	50	20	BLA030	30
		5-7.5	25		30	50	20	BLA030	30
		6-9	25		30	50	20	BLA030	30
SK12	**TK12**	0.34-0.52	25	BW50RAG EW50RAG	3	50	2	BLA003	3
		0.48-0.72	25		3	50	4	BLA005	5
		0.64-0.96	25		5	50	4	BLA005	5
		0.8-1.2	25		5	50	4	BLA005	5
		0.95-1.45	25		10	50	16	BLA020	20
		1.1-1.65	25		10	50	16	BLA020	20
		1.4-2.1	25		10	50	20	BLA030	30
		1.7-2.6	25		10	50	20	BLA030	30
		2.2-3.4	25		10	50	20	BLA030	30
		2.8-4.2	25		10	50	20	BLA030	30
		4-6	25		10	50	20	BLA030	30
		5-7.5	25		30	50	20	BLA030	30
		6-9	25		30	50	20	BLA030	30
		7-10.5	25		30	50	20	BLA030	30
		9-13	25		30	50	20	BLA030	30
SK06	**–**	**–**	25	BW50RAG EW50RAG	30	50	20	BLA030	30
SK09	**–**	**–**	25			50	20	BLA030	30
SK12	**–**	**–**	25			50	20	BLA030	30

● Rated conditional short-circuit current Iq (240V)

Magnetic Contactor	Thermal Overload Relay		Coordination type						
			Type 1			Type 2			
Type	Type	Ampere setting range [A]	Short-circuit current "Iq" [kA]	Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Short-circuit current "Iq" [kA]	Fuse (IEC 60269-1 gG and gM) rating (A)	FUJI Low-voltage Current-limiting Fuse	
				Type	Rating [A]			Type	Rating [A]
SK18	**TK25**	0.34-0.52	10	BW50RAG EW50RAG	3	50	2	BLA003	3
		0.48-0.72	10		3	50	4	BLA005	5
		0.64-0.96	10		5	50	4	BLA005	5
		0.8-1.2	10		5	50	4	BLA005	5
		0.95-1.45	10		10	50	16	BLA020	20
		1.1-1.65	10		10	50	16	BLA020	20
		1.4-2.1	10		10	50	20	BLA030	30
		1.7-2.6	10		10	50	20	BLA030	30
		2.2-3.4	10		10	50	20	BLA030	30
		2.8-4.2	10		10	50	20	BLA030	30
		4-6	10		10	50	20	BLA030	30
		5-7.5	10		30	50	20	BLA030	30
		6-9	10		30	50	20	BLA030	30
		7-10.5	10		30	50	20	BLA030	30
		9-13	10		30	50	25	BLA040	40
		12-18	10		30	50	25	BLA040	40
SK22	**TK25**	0.34-0.52	10		3	50	2	BLA003	3
		0.48-0.72	10		3	50	4	BLA005	5
		0.64-0.96	10		5	50	4	BLA005	5
		0.8-1.2	10		5	50	4	BLA005	5
		0.95-1.45	10		10	50	16	BLA020	20
		1.1-1.65	10		10	50	16	BLA020	20
		1.4-2.1	10		10	50	20	BLA030	30
		1.7-2.6	10		10	50	20	BLA030	30
		2.2-3.4	10		10	50	20	BLA030	30
		2.8-4.2	10		10	50	20	BLA030	30
		4-6	10		10	50	20	BLA030	30
		5-7.5	10		30	50	20	BLA030	30
		6-9	10		30	50	20	BLA030	30
		7-10.5	10		30	50	20	BLA030	30
		9-13	10		30	50	25	BLA040	40
		12-18	10		30	50	25	BLA040	40
		16-22	10		50	50	25	BLA040	40
SK32	**TK26**	0.34-0.52	10		3	50	2	BLA003	3
		0.48-0.72	10		3	50	4	BLA005	5
		0.64-0.96	10		5	50	4	BLA005	5
		0.8-1.2	10		5	50	4	BLA005	5
		0.95-1.45	10		10	50	16	BLA020	20
		1.1-1.65	10		10	50	16	BLA020	20
		1.4-2.1	10		10	50	20	BLA030	30
		1.7-2.6	10		10	50	20	BLA030	30
		2.2-3.4	10		10	50	20	BLA030	30
		2.8-4.2	10		10	50	20	BLA030	30
		4-6	10		10	50	20	BLA030	30
		5-7.5	10		30	50	20	BLA030	30
		6-9	10		30	50	20	BLA030	30
		7-10.5	10		30	50	20	BLA030	30
		9-13	10		30	50	25	BLA040	40
		12-18	10		30	50	25	BLA040	40
		16-22	10		50	50	40	BLA060	60
		20-26	10		50	50	50	BLA060	60
		26-32	10	BW63RAG EW63RAG	63	50	50	BLA060	60
SK18	**–**	–	10	BW50RAG EW50RAG	50	50	25	BLA040	40
SK22	**–**	–	10			50	25	BLA040	40
SK32	**–**	–	10	BW63RAG EW63RAG	63	50	50	BLA075	75

■ UL approved Short-circuit Current Ratings (SCCR)

● Combination of Breaker and Fuse (UL60947-4-1 Type C)

Magnetic Starter			Short-circuit Current Ratings (SCCR)									
Magnetic Contactor	Thermal Overload Relay		240V AC			240V AC			600V AC		
Type	Type	Ampere setting range [A]	SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker	Current-limiting fuse
				Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	Max. rated current [A]
SK06	**TK12**	0.1-0.15	18	15	BW50RBGU EW50RBGU	25	15	BW125JAGU BW125RAGU EW125JAGU EW125RAGU	5	–	30
		0.13-0.2	18	15		25	15		5	–	30
		0.18-0.27	18	15		25	15		5	–	30
		0.24-0.36	18	15		25	15		5	–	30
		0.3-0.45	18	15		25	15		5	–	30
		0.34-0.52	18	15		25	15		5	–	30
		0.48-0.72	18	15		25	15		5	–	30
		0.64-0.96	18	15		25	15		5	–	30
		0.8-1.2	18	15		25	15		5	–	30
		0.95-1.45	18	20		25	15		5	–	30
		1.1-1.65	18	20		25	15		5	–	30
		1.4-2.1	18	20		25	20		5	–	30
		1.7-2.6	18	20		25	20		5	–	30
		2.2-3.4	18	20		25	20		5	–	30
		2.8-4.2	18	20		25	20		5	–	30
		4-6	18	20		25	20		5	–	30
SK09	**TK12**	0.1-0.15	18	15	BW50RBGU EW50RBGU	25	15	BW125JAGU BW125RAGU EW125JAGU EW125RAGU	5	–	30
		0.13-0.2	18	15		25	15		5	–	30
		0.18-0.27	18	15		25	15		5	–	30
		0.24-0.36	18	15		25	15		5	–	30
		0.3-0.45	18	15		25	15		5	–	30
		0.34-0.52	18	15		25	15		5	–	30
		0.48-0.72	18	15		25	15		5	–	30
		0.64-0.96	18	15		25	15		5	–	30
		0.8-1.2	18	15		25	15		5	–	30
		0.95-1.45	18	20		25	15		5	–	30
		1.1-1.65	18	20		25	15		5	–	30
		1.4-2.1	18	20		25	20		5	–	30
		1.7-2.6	18	20		25	20		5	–	30
		2.2-3.4	18	20		25	20		5	–	30
		2.8-4.2	18	20		25	20		5	–	30
		4-6	18	20		25	20		5	–	30
		5-7.5	18	20		25	20		5	–	30
		6-9	18	20		25	20		5	–	30
SK12	**TK12**	0.1-0.15	18	15	BW50RBGU EW50RBGU	25	15	BW125JAGU BW125RAGU EW125JAGU EW125RAGU	5	–	30
		0.13-0.2	18	15		25	15		5	–	30
		0.18-0.27	18	15		25	15		5	–	30
		0.24-0.36	18	15		25	15		5	–	30
		0.3-0.45	18	15		25	15		5	–	30
		0.34-0.52	18	15		25	15		5	–	30
		0.48-0.72	18	15		25	15		5	–	30
		0.64-0.96	18	15		25	15		5	–	30
		0.8-1.2	18	15		25	15		5	–	30
		0.95-1.45	18	20		25	15		5	–	30
		1.1-1.65	18	20		25	15		5	–	30
		1.4-2.1	18	20		25	20		5	–	30
		1.7-2.6	18	20		25	20		5	–	30
		2.2-3.4	18	20		25	20		5	–	30
		2.8-4.2	18	20		25	20		5	–	30
		4-6	18	20		25	20		5	–	30
		5-7.5	18	20		25	20		5	–	30
		6-9	18	20		25	20		5	–	30
		7-10.5	18	20		25	20		5	–	30
		9-13	18	30		25	30		5	–	30
SK06	**–**	–	18	30	BW50RBGU EW50RBGU	25	30	BW125JAGU BW125RAGU EW125JAGU EW125RAGU	5	–	30
SK09	**–**	–	18	30		25	30		5	–	30
SK12	**–**	–	18	30		25	30		5	–	30

● Combination of Breaker and Fuse (UL60947-4-1 Type C) (Continued)

Magnetic Starter			Short-circuit Current Ratings (SCCR)								
Magnetic Contactor	Thermal Overload Relay		240V AC			480V AC			600V AC		
Type	Type	Ampere setting range [A]	SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker	Current-limiting fuse
				Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	Max. rated current [A]
SK18	**TK25**	0.1-0.15	35	15	BW125JAGU EW125JAGU	35	15	BW125RAGU EW125RAGU	5	–	30
		0.13-0.2	35	15		35	15		5	–	30
		0.18-0.27	35	15		35	15		5	–	30
		0.24-0.36	35	15		35	15		5	–	30
		0.34-0.52	35	15		35	15		5	–	30
		0.48-0.72	35	15		35	15		5	–	30
		0.64-0.96	35	15		35	15		5	–	30
		0.8-1.2	35	15		35	15		5	–	30
		0.95-1.45	35	15		35	15		5	–	30
		1.1-1.65	35	15		35	15		5	–	30
		1.4-2.1	35	20		35	20		5	–	30
		1.7-2.6	35	20		35	20		5	–	30
		2.2-3.4	35	20		35	20		5	–	30
		2.8-4.2	35	20		35	20		5	–	30
		4-6	35	20		35	20		5	–	30
		5-7.5	35	20		35	20		5	–	30
		6-9	35	20		35	20		5	–	30
		7-10.5	35	20		35	20		5	–	30
		9-13	35	30		35	30		5	–	30
		12-18	35	30		35	30		5	–	50
			25	40		10	40				
SK22	**TK25**	0.1-0.15	35	15	BW125JAGU EW125JAGU	35	15	BW125RAGU EW125RAGU	5	–	30
		0.13-0.2	35	15		35	15		5	–	30
		0.18-0.27	35	15		35	15		5	–	30
		0.24-0.36	35	15		35	15		5	–	30
		0.34-0.52	35	15		35	15		5	–	30
		0.48-0.72	35	15		35	15		5	–	30
		0.64-0.96	35	15		35	15		5	–	30
		0.8-1.2	35	15		35	15		5	–	30
		0.95-1.45	35	15		35	15		5	–	30
		1.1-1.65	35	15		35	15		5	–	30
		1.4-2.1	35	20		35	20		5	–	30
		1.7-2.6	35	20		35	20		5	–	30
		2.2-3.4	35	20		35	20		5	–	30
		2.8-4.2	35	20		35	20		5	–	30
		4-6	35	20		35	20		5	–	30
		5-7.5	35	20		35	20		5	–	30
		6-9	35	20		35	20		5	–	30
		7-10.5	35	20		35	20		5	–	30
		9-13	35	30		35	30		5	–	30
		12-18	35	30		35	30		5	–	50
			25	40		10	40	BW125JAGU EW125JAGU			
		16-22	35	30		35	30	BW125RAGU EW125RAGU	5	–	50
			25	50		10	50	BW125JAGU EW125JAGU			

● Combination of Breaker and Fuse (UL60947-4-1 Type C) (Continued)

Magnetic Starter			Short-circuit Current Ratings (SCCR)								
Magnetic Contactor	Thermal Overload Relay		240V AC			480V AC			600V AC		
Type	Type	Ampere setting range [A]	SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker		SCCR [kA]	Circuit breaker	Current-limiting fuse
				Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	UL489-certified Molded Case Circuit Breaker / Earth Leakage Circuit Breaker		Max. rated current [A]	Max. rated current [A]
SK32	**TK26**	0.1-0.15	35	15	BW125JAGU EW125JAGU	35	15	BW125RAGU EW125RAGU	5	–	30
		0.13-0.2	35	15		35	15		5	–	30
		0.18-0.27	35	15		35	15		5	–	30
		0.24-0.36	35	15		35	15		5	–	30
		0.34-0.52	35	15		35	15		5	–	30
		0.48-0.72	35	15		35	15		5	–	30
		0.64-0.96	35	15		35	15		5	–	30
		0.8-1.2	35	15		35	15		5	–	30
		0.95-1.45	35	15		35	15		5	–	30
		1.1-1.65	35	15		35	15		5	–	30
		1.4-2.1	35	20		35	20		5	–	30
		1.7-2.6	35	20		35	20		5	–	30
		2.2-3.4	35	20		35	20		5	–	30
		2.8-4.2	35	20		35	20		5	–	30
		4-6	35	20		35	20		5	–	30
		5-7.5	35	20		35	20		5	–	30
		6-9	35	20		35	20		5	–	30
		7-10.5	35	20		35	20		5	–	30
		9-13	35	30		35	30		5	–	30
		12-18	35	30		35	30		5	–	50
			25	40		10	40				
		16-22	35	30		35	30		5	–	50
			25	50		10	50				
		20-26	35	30		35	30		5	–	50
			25	50		10	50	BW125JAGU EW125JAGU			
		26-32	35	30		35	30	BW125RAGU EW125RAGU	5	–	50
			25	50		10	60	BW125JAGU EW125JAGU			
SK18	**–**	–	35	30	BW125JAGU EW125JAGU	35	30	BW125RAGU EW125RAGU	5	50	50
			25	50		10	50	BW125JAGU EW125JAGU			
SK22	**–**	–	35	30		35	30	BW125RAGU EW125RAGU	5	50	50
			25	50		10	50	BW125JAGU EW125JAGU			
SK32	**–**	–	35	30	BW125JAGU EW125JAGU	35	30	BW125RAGU EW125RAGU	5	70	70
		–	25	60		10	60	BW125JAGU EW125JAGU			

● Combinations with Manual Motor Starter (UL60947-4-1 Type F)

Magnetic Contactor type	AC480Y/277V		
	Combined MMS		Short-circuit Current Rating (SCCR) [kA]
	Type	Ampere setting range [A]	
SK06	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	50
	BM3RS□-004	2.5-4	50
	BM3RS□-6P3	4-6.3	50
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
SK09	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	50
	BM3RS□-004	2.5-4	50
	BM3RS□-6P3	4-6.3	50
	BM3RS□-010	6.3-10	25
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
	BM3RH□-010	6.3-10	25
SK12	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	50
	BM3RS□-004	2.5-4	50
	BM3RS□-6P3	4-6.3	50
	BM3RS□-010	6.3-10	25
	BM3RS□-013	9-13	25
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
	BM3RH□-010	6.3-10	25
	BM3RH□-013	9-13	10

Note 1: When you use it as Type F, you need to use both a short-circuit alarm contact block BZOTKUAB and a load-side terminal cover BZOTCRE (in case of round crimped terminal type, use BZORTCRE instead).

Magnetic Contactor type	AC480Y/277V		
	Combined MMS		Short-circuit Current Rating (SCCR) [kA]
	Type	Ampere setting range [A]	
SK18	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	65
	BM3RS□-004	2.5-4	65
	BM3RS□-6P3	4-6.3	65
	BM3RS□-010	6.3-10	25
	BM3RS□-013	9-13	25
	BM3RS□-016	11-16	25
	BM3RS□-020	14-20	25
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
	BM3RH□-010	6.3-10	65
	BM3RH□-013	9-13	65
	BM3RH□-016	11-16	65
	BM3RH□-020	14-20	65
SK22	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	65
	BM3RS□-004	2.5-4	65
	BM3RS□-6P3	4-6.3	65
	BM3RS□-010	6.3-10	25
	BM3RS□-013	9-13	25
	BM3RS□-016	11-16	25
	BM3RS□-020	14-20	25
	BM3RS□-025	19-25	25
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
	BM3RH□-010	6.3-10	65
	BM3RH□-013	9-13	65
	BM3RH□-016	11-16	65
	BM3RH□-020	14-20	65
	BM3RH□-025	19-25	50

Magnetic Contactor type	AC480Y/277V		
	Combined MMS		Short-circuit Current Rating (SCCR) [kA]
	Type	Ampere setting range [A]	
SK32	BM3RS□-P40	0.25-0.4	65
	BM3RS□-P63	0.4-0.63	65
	BM3RS□-001	0.63-1	65
	BM3RS□-1P6	1-1.6	65
	BM3RS□-2P5	1.6-2.5	65
	BM3RS□-004	2.5-4	65
	BM3RS□-6P3	4-6.3	65
	BM3RS□-010	6.3-10	25
	BM3RS□-013	9-13	25
	BM3RS□-016	11-16	25
	BM3RS□-020	14-20	25
	BM3RS□-025	19-25	25
	BM3RS□-032	24-32	25
	BM3RH□-P40	0.25-0.4	65
	BM3RH□-P63	0.4-0.63	65
	BM3RH□-001	0.63-1	65
	BM3RH□-1P6	1-1.6	65
	BM3RH□-2P5	1.6-2.5	65
	BM3RH□-004	2.5-4	65
	BM3RH□-6P3	4-6.3	65
	BM3RH□-010	6.3-10	65
	BM3RH□-013	9-13	65
	BM3RH□-016	11-16	65
	BM3RH□-020	14-20	65
	BM3RH□-025	19-25	50
	BM3RH□-032	24-32	50

■ Applications for IE3 (premium efficiency) motors

IE3 (premium efficiency) motors have a 15 to 30% larger starting current compared with conventional motors.
(There are cases they may require a longer starting time.)

● Selecting magnetic contactors

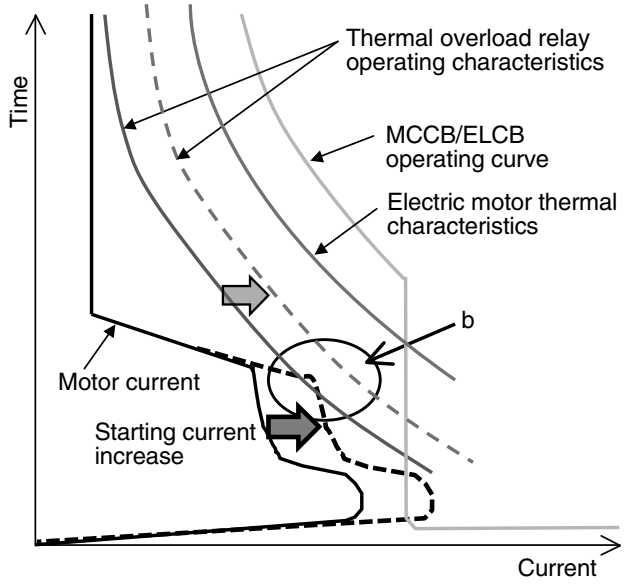
If the starting current is increased, the make/break durability of magnetic contactors is affected.
The life expectancy of magnetic contactors used in motors (AC-3 rating) is based on a starting current that is six times the rated current. If a starting current becomes larger than this (especially if it exceeds ten times the rated value), the make/break durability could be significantly reduced, or contact welding could occur. For this reason, be sure to confirm the motor's starting current and the rating of the magnetic contactor.

[What to do for a large starting current]
Choose a product while making sure that the starting current does not exceed 10 times that of the rating (AC-3) of the magnetic contactor.
There are cases where the motor's rated current could increase. In this case, choose a product while making sure it is within the range of the magnetic contactor's AC-3 rating.

● Selecting thermal relays

A larger starting current could cause it to enter the operating range of the thermal overload relay, resulting in unnecessary operation (area b in the diagram).
Therefore, be sure to confirm this matter for IE3 motor applications.
[What to do for a large starting current]
Measure 1: Raise the pick-up current value for the dial reading of the thermal overload relay to around within 5%.
Measure 2: Use a time delay thermal overload relay (class 20 or class 30).

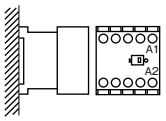
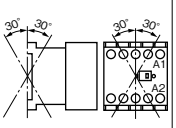
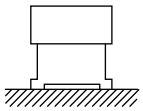
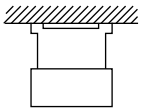
Note 1: For Measures 1 and 2, confirm compatibility with the thermal characteristics of the electric motor.
Note 2: If the motor's rated current also increases, configure the thermal overload relay setting in accordance with the motor's rated current.



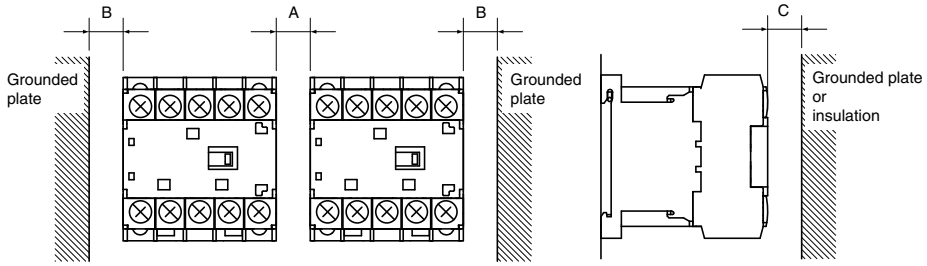
Normal Operating Conditions and Mounting

■ Normal Operating Conditions and Correct Mounting

● Standard Operating Conditions

Ambient temperature *1	–10 to 55°C with no sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35°C.)						
Ambient humidity	45% to 85% RH (with no condensation)						
Altitude	2,000 m max.						
Atmosphere	No excessive dust, smoke, corrosive gasses, inflammable gases, steam, or salts						
Storage temperature	–40 to 60°C						
Vibration resistance	10 to 55Hz, 15m/s^2						
Shock resistance	50m/s^2						
Mounting	Screw mounting 35mm-wide top hat rail (Refer to the rail mounting in the next item.)						
Mounting angle	Appearance						
	Mounting direction	Standard mounting	Angled mounting	Side mounting		Horizontal mounting	Ceiling mounting
		–	30°	Upper coil side	Lower coil side	Upper terminal side	Lower terminal side
	SK06, 09, 12A□ SKH4A□	○	○	○	*3	○	○
	SK18, 22, 32A□	○	○	*5 Right and left sides available		× *6	×
	SK06, 09, 12G□ SKH4G□	○	○	*4	○	○	○
	SK18, 22, 32G□	○	○	*5 Right and left sides available		× *6	×
	SK06, 09, 12L□ SKH4L□	○	○	*4	○	○	○
	SK06, 09, 12A□W	○	○	*7	*3, *7	*7	*7
	SK18, 22, 32A□W	○	○	*5, *7 Right and left sides available		× *6, *7	×
	SK06, 09, 12G□W	○	○	*4, *7	*7	*7	*7
	SK18, 22, 32G□W	○	○	*5, *7 Right and left sides available		× *6, *7	×
	SK06, 09, 12L□W	○	○	*4, *7	*7	*7	*7
Mounting gaps *2	Provide the mounting gaps and arc space that are given in the following table when you mount the product.						

Type	A [mm]	B [mm]	C [mm]
SK06, 09, 12	0	10	2
SK18, 22, 32	0	10	0

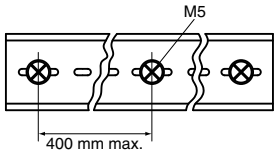


Note *1: The ambient temperature is the temperature near the product during operation.
Note *2: If Magnetic Starters are used in combination with Thermal Overload Relays and the products are used with continuous through current without providing gaps, temperature increases will reduce the life of the coil.Also, the characteristics of the Thermal Overload Relays will vary somewhat from the mutual thermal effects between the heaters.When using the products under these conditions, separate the products from each other by at least 5 mm (dimension A).
Note *3: The allowable power fluctuation range is 0.9 Us to 1.1 Us.
Note *4: The drop-out voltage is 0.05 Us to 0.7 Us.
Note *5: The mechanical durability and operating cycles per hour are reduced to 80% of those of standard installations.
Note *6: The standard type cannot be used in horizontal installations. Use the "Z109 type" instead, which was designed specifically for horizontal installations. The mechanical durability, electrical durability, and operating cycles per hour are reduced to 80% of those of standard types.
Note *7: The operational limiting current of the thermal overload relay will vary slightly.
(Note) Use screw mounting for mounting to ceilings.

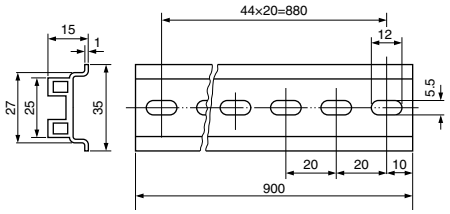
● Rail Mounting

The SK06 to SK12 Magnetic Motors and Starters can be mounted to 35mm-wide support rails. Secure the rail with the mounting pitch that is shown in the figure at the right.

Example of Applicable Rail: TH35-15AL



• Mounting Rail

Type	TH35-15AL
Material	Aluminum
External dimensions	

Follow the procedures below to mount or remove the product on the rail.

For SK06 thorough SK12 models

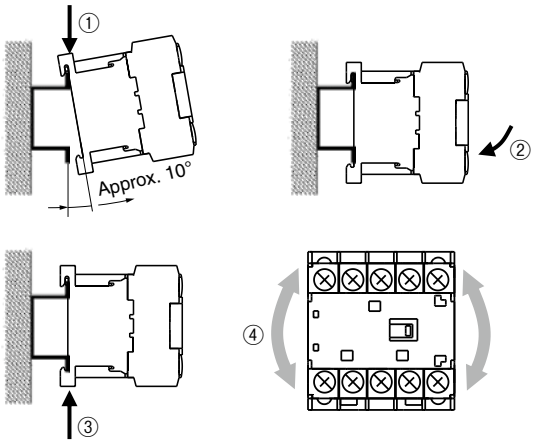
[Mounting]

① Tilt the product at about 10° from mounting surface to the rail, hang the hook at the power supply side on the rail, and softly push the product down.

② Press the product to the rail.

③ Raise the product and hang the hook at the load side on the rail.

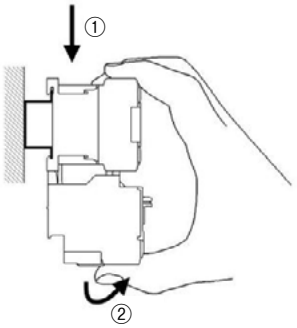
④ Shake the product a little to confirm that the hook at the load side is hung on the rail.



[Removing]

① Hold the product at the top and bottom, press it downward to remove the hook at the bottom of the product.

② Remove the product.

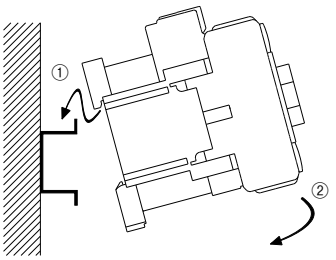


For SK18, SK22, and SK32 models

[Mounting]

① Catch the hook on the power supply side of the product to the rail.

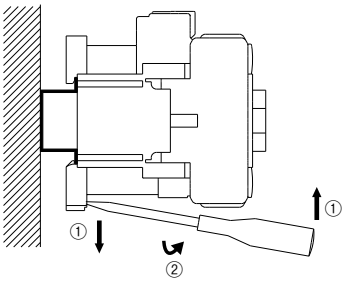
② Press the product to the rail.



[Removing]

① Use a screwdriver or other tool to move the slider downward.

② Remove the product.



● Voltage Fluctuation Range in Control Circuits and Voltage Drop

• SK06A to SK32A (AC Operation)

Drop-out voltage (operating voltage): 85% to 110% of rated voltage

However, there is an official rated inrush voltage, but usage is possible without contact welding even if the voltage drops to 75% of the rating when the main contacts close.

• SK06G to SK32G, SK06L to SK12L (DC Operation)

Drop-out voltage (operating voltage): 85% to 110% of rated voltage at ambient temperature of 55°C and 80% to 110% of rated voltage at ambient temperature of 40°C.

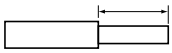
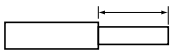
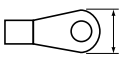
However, there is an official rated inrush voltage, but usage is possible without contact welding even if the voltage drops to 75% of the rating when the main contacts close.

■ Wiring

● Wiring and Terminal Processing
Make all connections correctly according to the connection diagram. For the SK06 to SK32, you can use solid wires, stranded wires, or crimped terminals for the main terminals, auxiliary terminals, and coil terminals.

● Tightening Torque
If the Magnetic Contactor or Switch is not mounted completely, the shock when the Contactor or Switches is turned ON may cause the contacts to jump or may reduce the durability. Also, if wires are not tightened sufficiently, they may become hot or loose, resulting in a fire, short-circuit, electric shock or some other potentially dangerous situation. Be sure to tighten the wires to the torque that is specified in the following table.

● Terminals, Wire Sizes, and Tightening Torque
1) Terminals can be wired with solid wires, stranded wires, or crimped terminals can be used to connect the terminals. To use round crimped terminals, remove the terminal cover before you connect them to the terminals.
2) The connectable wire sizes and tightening torque are given in the following table.

			Main terminals		Control and auxiliary terminals
			SK06 to SK12 types	SK18 to SK32 types	
			TK12 type	TK25, TK26 types	
Direct connection	Solid wire	[mm]	1 wire x (Ø1.2 to 2) 2 wires x (Ø1.2 to 1.6) 2 wires x (Ø1.6 to 2)	1 wire x (Ø1.2 to 2.6) 2 wires x (Ø1.2 to 1.6) 2 wires x (Ø1.6 to 2)	1 wire x (Ø1.2 to 2) 2 wires x (Ø1.2 to 1.6) 2 wires x (Ø1.6 to 2)
		[AWG]	1 wire x (16 to 12) 2 wires x (16 to 14) 2 wires x (14 to 12)	1 wire x (16 to 10) 2 wires x (16 to 14) 2 wires x (14 to 12)	1 wire x (16 to 12) 2 wires x (16 to 14) 2 wires x (14 to 12)
	Stranded wires	[mm²]	1 wire x (0.75 to 2.5) 2 wires x (0.75 to 1.5) 2 wires x (1.5 to 2.5)	1 wire x (0.75 to 5.5) 2 wires x (0.75 to 1) 2 wires x (1 to 1.5) 2 wires x (1.5 to 2.5) 2 wires x (2.5 to 4)	1 wire x (0.75 to 2.5) 2 wires x (0.75 to 1.5) 2 wires x (1.5 to 2.5)
		[AWG]	1 wire x (18 to 14) 2 wires x (18 to 16) 2 wires x (16 to 14)	1 wire x (18 to 10) 2 wires x (16 to 14) 2 wires x (14 to 12)	1 wire x (18 to 14) 2 wires x (18 to 16) 2 wires x (16 to 14)
	Sheath stripping length [mm] 		9 to 10	10 to 11	9 to 10
	Flexible stranded wires with sleeves	[mm²]	1 wire x (0.75 to 2.5) 2 wires x (0.75 to 1.5) 2 wires x (1.5 to 2.5)	1 wire x (0.75 to 2.5) 2 wires x (0.75 to 1) 2 wires x (1 to 1.5) 2 wires x (1.5 to 2.5)	1 wire x (0.75 to 2.5) 2 wires x (0.75 to 1.5) 2 wires x (1.5 to 2.5)
		[AWG]	1 wire x (18 to 14) 2 wires x (18 to 16) 2 wires x (16 to 14)	1 wire x (18 to 12) 2 wires x (16 to 14) 2 wires x (14 to 12)	1 wire x (18 to 14) 2 wires x (18 to 16) 2 wires x (16 to 14)
	Sleeve length [mm] 		10	12	10
Terminal connection	Stranded wires or flexible stranded wires	[mm²]	0.75 to 4	0.75 to 10	0.75 to 2.5
		[AWG]	18 to 10	18 to 8	18 to 14
	Largest crimped terminal [mm] 		7.7	9.7	7.7
Terminal screw size			M3.5	M4	M3.5
Tightening tool			Phillips H2 screwdriver Flat-blade screwdriver, I-1x5.5xL, Type B		
Flat-blade screwdriver, 1×5.5×L, type B		[N·m]	0.8 to 1.0	1.2 to 1.5	0.8 to 1.0

Note 1. Flexible stranded wires without sleeves cannot be used. Attach sleeves before connecting the wires.
・0.75 to 4mm2 (AWG 18 to 12) stranded wire: 7 strands or less
・Flexible stranded wire: More strands that given above.
Note 2. Use DIN 46228-compliant sleeves.
・For 1.5 to 2.5mm2 (AWG 16 to 14) wires, use sleeves without insulating sheaths.
・You will not be able to insert the sleeves for some crimping tools. Use a Phoenix Contact CRIMPFOX 6 crimping tool or the equivalent.
Observe manufacture instructions on the wire sheath stripping lengths.
Note 3. For compliance with UL or CSA standards, you must use AWG 14 or 12 wires. Also, you must use solid wires, or use stranded or flexible stranded wires with crimped terminals or sleeves.
Note 4. Two crimped terminals can be connected.
Note 5. Do not connect anything to terminals that are not wired.
Note 6. After you bend or otherwise arrange the connected wires after wiring, make sure that the tightening torque is still correct.
Note 7. If 18 A or higher will continuously flow through a Magnetic Contactor in an environment that exceeds 40°C, wiring with 4mm2 or AWG 12 wires.

●Connection with peripheral units

(1) AC operated type (SK□A)

A surge suppression device is not embedded in the AC operated type operating coils. Use an optional coil-surge suppression unit, if needed. For information about the choice of coil-surge suppression units, see the catalog.

(2) DC operated type (SK□G, SK□L)

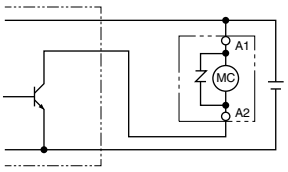
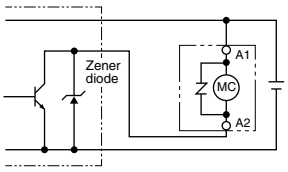
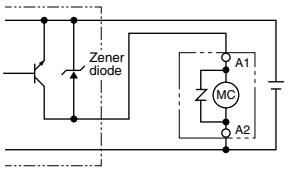
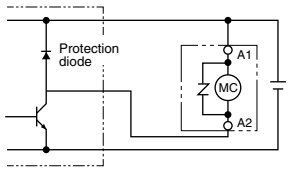
A surge suppression device (varistor) is embedded in DC operated type operating coils. Therefore, there is no need to connect a surge suppression circuit externally to a normal sequential circuit. (Table 1) Connect the operating coil terminal to various pieces of DC output equipment according to Table 2.

Be careful that an operating coil terminal has A1 (plus) or A2 (minus) polarity.

Table 1 : Varistor voltage of DC operated type

Coil voltage code	Coil voltage [V]	Varistor voltage [V]
B	12	39
E	24	
F	48	100
G	60	240
1	100	
H	110	
K	120	
2	200	470
Y	210	
M	220	

Table 2 : Connection between operating coil terminal of DC operated type and a peripheral unit

Output type of equipment	No protection diode	With protection diode		
Connection method				
Equipment example	Various DC output models	NPN output photoelectric sensor, proximity switch, etc.	NPN output photoelectric sensor, proximity switch, etc.	Programmable controller, etc.
Cautions	The dielectric strength of output transistor should be at least the coil surge voltage plus output supply voltage.	–		Prolongs the returning time for the protection diode.

■ Applications for special environments

● Tropical wetland and cold region processing

If magnetic contactors and switches are exported or used in tropical wetlands or cold regions as single units or integrated within boards or the like, even standard products can be used under the following conditions. Special specification products should be used in more severe usage conditions.

Ambient conditions		Standard product	Products for tropical wetlands and cold regions
Temperature	In operation	-10 to +55°C	-25 to +55°C *
	In transport In storage	-40 to +65°C	-45 to +65°C
Relative humidity		85% or less	95% or less

(Note 1) Conditions assume that there's no dew condensation nor freezing due to drastic temterature change.

(Note 2) Temperature and humidity refer to the panel inside temperature.

* Thermal overload relays: Up to -10°C.

■ Handling

● Handling magnetic contactors

[Important points for inspections]

The contacts and operating coils of SK Series magnetic contactors cannot be replaced.

Only the terminal cover, terminal screws, and flexible conductors (electric wires) can be disassembled or removed.

● Handling Thermal Overload Relays

1) Adjusting the Current [Figure 1]
Turn the adjustment dial within the scale so that the total load current of the motor aligns with the triangle mark. Performance may not be dependable if the dial is set outside of the range of the scale.

2) Operation Indication [Figure 1]
When the Thermal Overload Relay operates, the white trip indicator will disappear in the operation indication window. (The white indicator will not be hidden if the Thermal Overload Relay is tripped in auto-reset status.)

3) Sequence Check [Figure 1]
You can perform a sequence check by pressing the white trip indicator in the direction of the arrow.

4) Reset Method [Figure 1]
When the Thermal Overload Relay operates, remove the cause of the error (e.g., an overload) and then press the reset button. (The Thermal Overload Relay will not reset unless it has cooled sufficiently.)

5) Auto-reset Status and Two-wire Circuits
If the Thermal Overload Relay is in auto-reset status for a 2-wire circuit and the Thermal Overload Relay resets automatically, the motor will restart operation automatically. Take adequate precautions for this.

6) Changing between Manual Resetting and Auto Resetting [Figure 2]
Use the following procedure to change between manual resetting and auto resetting. Reverse the procedure to change between auto resetting and manual resetting.

① Open the front cover.
② Use a screwdriver or similar device to press the reset button and turn it 90° clockwise.
③ Make sure that the reset button remains in the pressed state.
④ Close the front cover.

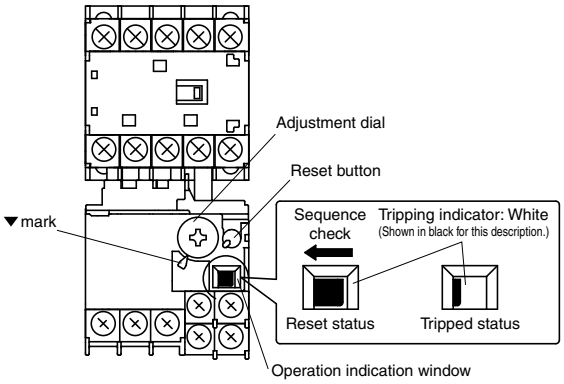


Figure 1

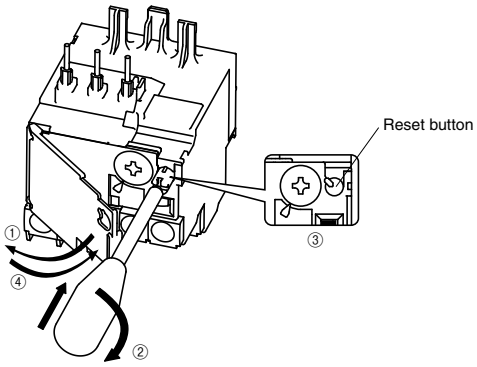
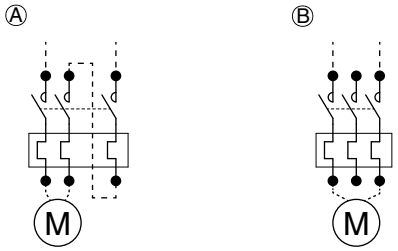


Figure 2

● Application in Single-phase Motor Circuits and DC Motor Circuits
The TK12 Thermal Overload Relays are equipped with open-phase protection. If current does not flow on all phases, the reduced operating current may cause the TK12 to operate unnecessarily. If you use the TK12 in a single-phase motor circuit or DC motor circuit, perform either Ⓐ or Ⓑ.
Ⓐ Connect the wiring so that series current flows to all of the poles.
Ⓑ Set the adjustment dial to a setting that is 5% to 10% higher than normal.



● Ambient Temperature Compensation Characteristics

Changes in the ambient environment will affect the operation of the Thermal Overload Relay. The operational current will be higher at lower temperatures and lower at higher temperatures, i.e., compensation of operating characteristics will not be complete. Adjust the current according to the application environment.

The compensation coefficient for adjusting the current depends on the ambient temperature, as shown in Figure 3. If the ambient temperature in the application changes greatly, e.g., by 20°C, use the following example as a guide to calculate the adjusted current value after compensation.

Example: Calculation Method for Dial Adjustment at an Ambient Temperature of 55°C

$$\frac{\text{Dial current at 20°C}}{\text{Compensation coefficient at ambient temperature of 55°C}} = \text{Dial current at ambient temperature of 55°C}$$

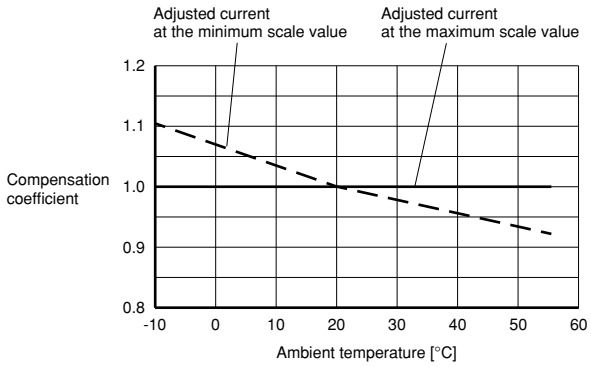


Figure 3

● Mounting the Thermal Overload Relay to and Removing It from the Magnetic Contactor

I. Mounting [Figure 4]

1) Loosen terminals 2, 4, and 6 on the Magnetic Contactor.
2) Insert the posts on the Thermal Overload Relay into the holes on the Magnetic Contactor in the direction shown by the arrows.
3) Insert the main circuit section of the Thermal Overload Relay on the right sides of the terminal screws.
4) Tighten the terminal screws on the Magnetic Contactor to the specified torque.

II. Removing [Figure 4]

1) Loosen the terminals screws on the Magnetic Contactor.
2) Move the Thermal Overload Relay left and right and pull it free from the Magnetic Contactor.

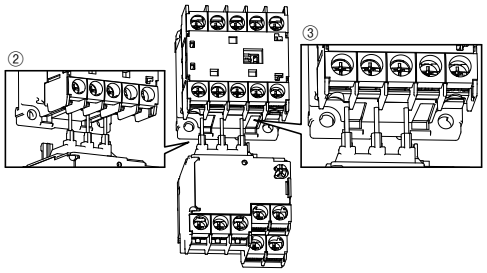


Figure 4

■ Refresh recommendation

The main contacts, mechanical components, and other parts in Fuji magnetic contactors and switches have a wear life expectancy based on the number of times they are switched. Coil electric wires and electronic components in electronic units have a life expectancy based on degradation over time according to the environment and conditions they are used in.

We recommend refreshing Fuji magnetic contactors and switches when they reach the specified number of times switched as noted in the user's manual or catalog, or roughly 10 years from the manufacture date under standard usage conditions as noted in the "Survey Concerning Recommended Refresh Periods for Low Voltage Devices" report published by The Japan Electrical Manufacturers' Association (JEMA).

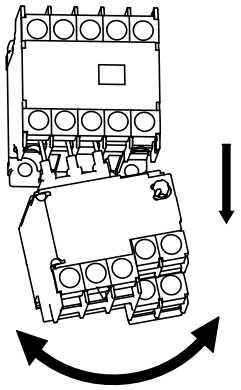


Figure 5

Magnetic Contactors

SK12L

■ Features

- International safety standards for standard models (IEC, GB, JIS, UL, and CSA).
- Models available with AC or DC operating coils (DC: 2.4W and 1.2W models only).
- Many optional units.
  - Auxiliary Contact Blocks (2-pole or 4-pole)
  - Coil Surge Suppression Units
  - Interlock Units
- Easier Thermal Overload Relay wiring.
  The terminal arrangement separates main circuit wires and auxiliary circuit wires for easier wiring.

■ Ordering Information (Types)

- Magnetic Contactors

SK 06 A H - E 10
① ② ③ ④ ⑤ ⑥

①Series
②Frame size
③Operating coil specification
④Auxiliary contact specification
⑤Coil voltage specification
⑥Auxiliary contact arrangement

■ Ratings and Types

- Magnetic Contactors SK06, 09, 12

Frame size ②	Max. motor capacity [kW] 3-phase squirrel-cage motor (AC-3)			Rated operational current [A] 3-phase squirrel-cage motor (AC-3)			Resistive load (AC-1)		Conventional free air thermal current [A] (Rated thermal current)	Operating coil specification ③	Auxiliary contact specification ④	Auxiliary contact arrangement ⑥	Type
	200-240V	380-440V	500-550V	200-240V	380-440V	500-550V	200-240V	380-440V					
6A [06]	1.5	2.2	3	6	6	5	12	12	20	AC-operated [A]	Bifurcated [blank]	1NO [10] 1NC [01]	**SK06A-□▲**
											Single [H]		**SK06AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK06G-□▲**
											Single [H]		**SK06GH-□▲**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK06L-□▲**
											Single [H]		**SK06LH-□▲**
9A [09]	2.2	4	4	9	9	7	16	16		AC-operated [A]	Bifurcated [blank]		**SK09A-□▲**
											Single [H]		**SK09AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK09G-□▲**
											Single [H]		**SK09GH-□▲**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK09L-□▲**
											Single [H]		**SK09LH-□▲**
12A [12]	3	5.5	5.5	12	12	9	20	20		AC-operated [A]	Bifurcated [blank]		**SK12A-□▲**
											Single [H]		**SK12AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK12G-□▲**
											Single [H]		**SK12GH-□▲**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK12L-□▲**
											Single [H]		**SK12LH-□▲**

Note 1. "□" in the type column is replaced with the coil voltage code.
Note 2. "▲" in the type column is replaced with the auxiliary contact arrangemant code.
Note 3. Numbers and letters in brackets [ ] are used in the product code.

● Magnetic Contactors SK18, 22, 32

Frame size ②	Max. motor capacity [kW] 3-phase squirrel-cage motor (AC-3)			Rated operational current [A] 3-phase squirrel-cage motor (AC-3)			Rated operational current [A] Resistive load (AC-1)		Conventional free air thermal current [A] (Rated thermal current)	Operating coil specification ③	Auxiliary contact specification ④	Auxiliary contact arrangement ⑥	Type
	200-240V	380-440V	500-550V	200-240V	380-440V	500-550V	200-240V	380-440V					
18A [18]	4.5	7.5	7.5	18	32	32	32	32	32	AC-operated [A]	Bifurcated [blank]	1NO [10] 1NC [01]	**SK18A-□▲**
											Single [H]		**SK18AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK18G-□▲**
											Single [H]		**SK18GH-□▲**
22A [22]	5.5	11	11	22	32	32	32	32	32	AC-operated [A]	Bifurcated [blank]		**SK22A-□▲**
											Single [H]		**SK22AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK22G-□▲**
											Single [H]		**SK2GH-□▲**
32A [32]	7.5	15	15	32	40	40	40	40	40	AC-operated [A]	Bifurcated [blank]		**SK32A-□▲**
											Single [H]		**SK32AH-□▲**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK32G-□▲**
											Single [H]		**SK32GH-□▲**

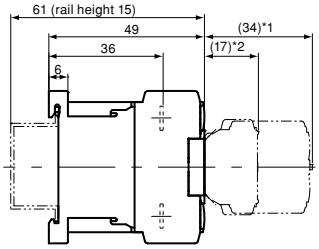
Note 1. "□" in the type column is replaced with the coil voltage code.
Note 2. "▲" in the type column is replaced with the auxiliary contact arrangemant code.
Note 3. Numbers and letters in brackets [ ] are used in the product code.

● Coil voltage ⑤

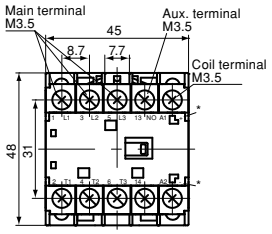
AC-operated	Order Voltage	24	48	100	110	120	200	220	240	380	400	440	500
	Product code	E	F	1	H	K	2	M	P	S	4	T	5
DC-operated (2.4W)	Order Voltage	12	24	48	60	100	110	120	200	210	220		
	Product code	B	E	F	G	1	H	K	2	Y	M		
DC-operated (1.2W)	Order Voltage	12	24	48									
	Product code	B	E	F									

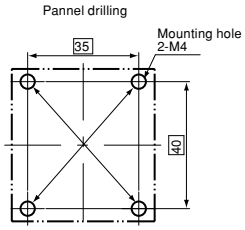
■ Dimensions, mm

● Magnetic Contactors
SK06, SK09, SK12



Note:
*1 With SZ1KA□ auxiliary contact blocks.
*2 With SZ1FA□ auxiliary contact blocks.





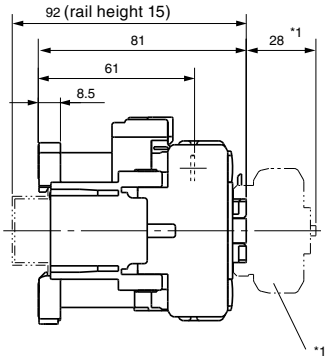
Use the two mounting holes on a diagonal

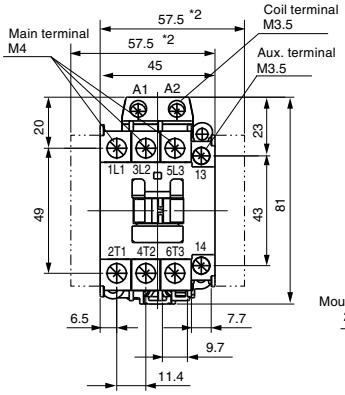
Aux. contact	Contact arrangement
1NO	1/L1 3/L2 5/L3 13 A1 (+) * / 2/T1 4/T2 6/T3 14 A2 (-) *
1NC	1/L1 3/L2 5/L3 21 A1 (+) * / 2/T1 4/T2 6/T3 22 A2 (-) *

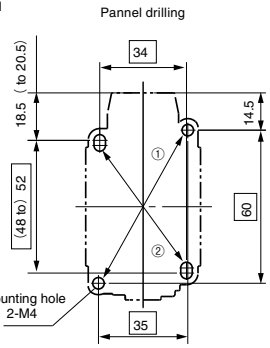
*: For DC-operated

Mass:
0.14kg (For AC-operated)
0.17kg (For DC-operated)

SK18A, SK22A







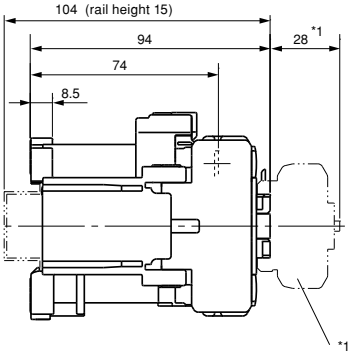
Use the two mounting holes on a diagonal
① 35 x 60
② 34 x (48 to) 52: Convertible with SC-4-0,SC-4-1

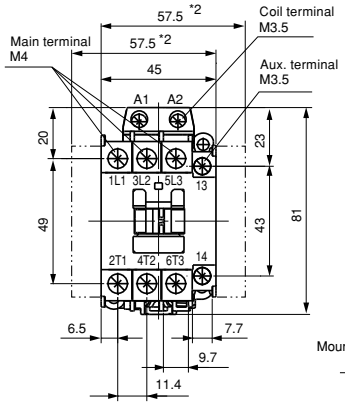
Aux. contact	Contact arrangement
1NO	1/L1 3/L2 5/L3 13 A1 A2 / 2/T1 4/T2 6/T3 14
1NC	1/L1 3/L2 5/L3 21 A1 A2 / 2/T1 4/T2 6/T3 22

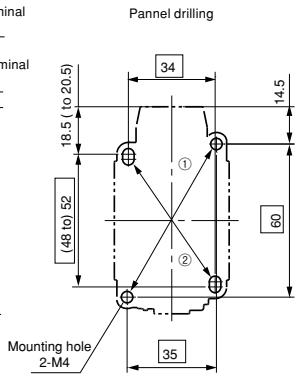
Mass: 0.34kg

Note:
*1 With font mounting auxiliary contact block
*2 With side mounting auxiliary contact block

SK18G, SK22G







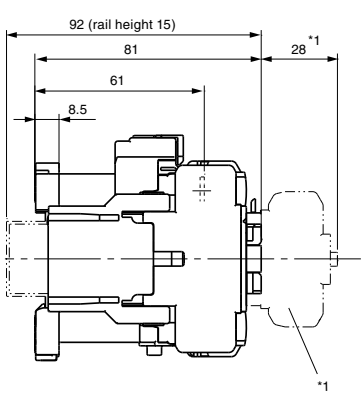
Use the two mounting holes on a diagonal
① 35 x 60
② 34 x (48 to) 52: Convertible with SC-4-0/G,SC-4-1/G

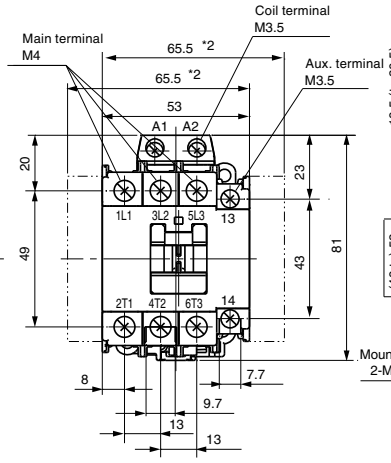
Aux. contact	Contact arrangement
1NO	1/L1 3/L2 5/L3 13 (+) A1 (-) A2 / 2/T1 4/T2 6/T3 14
1NC	1/L1 3/L2 5/L3 21 (+) A1 (-) A2 / 2/T1 4/T2 6/T3 22

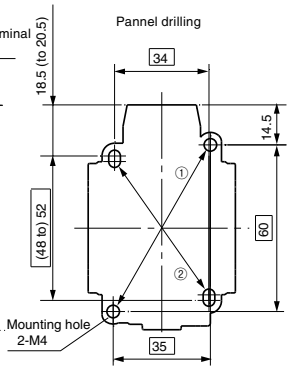
Mass: 0.43kg

Note:
*1 With font mounting auxiliary contact block
*2 With side mounting auxiliary contact block

SK32A







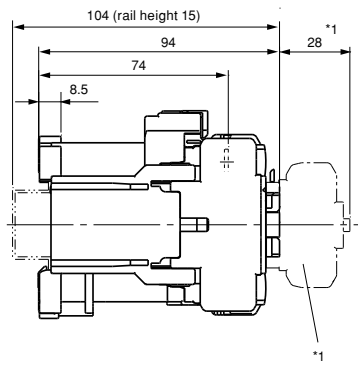
Aux. contact	Contact arrangement
1NO	1/L1 3/L2 5/L3 13 A1 A2 2/T1 4/T2 6/T3 14
1NC	1/L1 3/L2 5/L3 21 A1 A2 2/T1 4/T2 6/T3 22

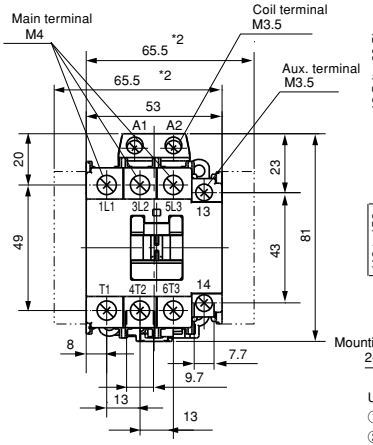
Mass: 0.37kg

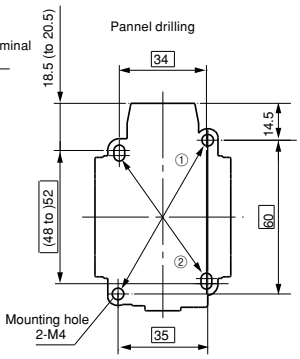
Note:
*1 With font mounting auxiliary contact block
*2 With side mounting auxiliary contact block

Use the two mounting holes on a diagonal
① 35 x 60
② 34 x (48 to) 52: Convertible with SC-4-0,SC-4-1

SK32G







Aux. contact	Contact arrangement
1NO	1/L1 3/L2 5/L3 13 (+) A1 (-) A2 2/T1 4/T2 6/T3 14
1NC	1/L1 3/L2 5/L3 21 (+) A1 (-) A2 2/T1 4/T2 6/T3 22

Mass: 0.48kg

Note:
*1 With font mounting auxiliary contact block
*2 With side mounting auxiliary contact block

Use the two mounting holes on a diagonal
① 35 x 60
② 34 x (48 to) 52: Convertible with SC-4-0,SC-4-1

Reversing Magnetic Contactors

SK12AR

■ Features

- Ideal for forward/reverse motor operation and plugging.
- Mechanical interlock provided as a standard feature.

■ Ordering Information (Types)

- Reversing Magnetic Contactors

SK	06	A	H	R	-	E	10	W
①	②	③	④	⑤		⑥	⑦	⑧

①Series
②Frame size
③Operating coil specification
④Auxiliary contact specification
⑤Reversing
⑥Coil voltage specification
⑦Auxiliary contact arrangement
⑧Reversing connection

■ Ratings and Types

- Reversing Magnetic Contactors SK06, SK09, SK12

Frame size ②	Max. motor capacity [kW]			Rated operational current [A]					Conventional free air thermal current [A] (Rated thermal current)	Operating coil specification ③	Auxiliary contact specification ④	Auxiliary contact arrangement ⑦	Type
	3-phase squirrel-cage motor (AC-3)			3-phase squirrel-cage motor (AC-3)			Resistive load (AC-1)						
	200-240V	380-440V	500-550V	200-240V	380-440V	500-550V	200-240V	380-440V					
6A [06]	1.5	2.2	3	6	6	5	12	12	20	AC-operated [A]	Bifurcated [blank]	1NO x 2 [10] 1NC x 2 [01]	**SK06AR-□▲W**
											Single [H]		**SK06AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK06GR-□▲W**
											Single [H]		**SK06GHR-□▲W**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK06LR-□▲W**
											Single [H]		**SK06LHR-□▲W**
9A [09]	2.2	4	4	9	9	7	16	16		AC-operated [A]	Bifurcated [blank]		**SK09AR-□▲W**
											Single [H]		**SK09AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK09GR-□▲W**
											Single [H]		**SK09GHR-□▲W**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK09LR-□▲W**
											Single [H]		**SK09LHR-□▲W**
12A [12]	3	5.5	5.5	12	12	9	20	20		AC-operated [A]	Bifurcated [blank]		**SK12AR-□▲W**
											Single [H]		**SK12AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK12GR-□▲W**
											Single [H]		**SK12GHR-□▲W**
										DC-operated (1.2W) [L]	Bifurcated [blank]		**SK12LR-□▲W**
											Single [H]		**SK12LHR-□▲W**

Note 1. "□" in the type column is replaced with the coil voltage code.
Note 2. "▲" in the type column is replaced with the auxiliary contact arrangemant code.
Note 3. Numbers and letters in brackets [ ] are used in the product code.
Note 4. An electrical interlock is not implemented on Magnetic Contactors with an auxiliary contact arrangement of 1NOx2. When using these Magnetic Contactors, always implement an electrical interlock in the external control circuits to prevent short-circuit faults when power is turned ON.
Note 5. An electrical interlock is implemented in the auxiliary circuit configurations of the Magnetic Contactor. If you need to use an auxiliary contact, add an option Auxiliary Contact Blocks.

● Reversing Magnetic Contactors SK18, SK22, SK,32

Frame size ②	Max. motor capacity [kW]			Rated operational current [A]					Conventional free air thermal current [A] (Rated thermal current)	Operating coil specification ③	Auxiliary contact specification ④	Auxiliary contact arrangement ⑦	Type
	3-phase squirrel-cage motor (AC-3)			3-phase squirrel-cage motor (AC-3)			Resistive load (AC-1)						
	200-240V	380-440V	500-550V	200-240V	380-440V	500-550V	200-240V	380-440V					
18A [18]	4.5	7.5	7.5	18	18	13	32	32	32	AC-operated [A]	Bifurcated [blank]	1NO x 2 [10] 1NC x 2 [01]	**SK18AR-□▲W**
											Single [H]		**SK18AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK18GR-□▲W**
											Single [H]		**SK18GHR-□▲W**
22A [22]	5.5	11	11	22	22	17	32	32	32	AC-operated [A]	Bifurcated [blank]		**SK22AR-□▲W**
											Single [H]		**SK22AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK22GR-□▲W**
											Single [H]		**SK22GHR-□▲W**
32A [32]	7.5	15	15	32	32	24	40	40	40	AC-operated [A]	Bifurcated [blank]		**SK32AR-□▲W**
											Single [H]		**SK32AHR-□▲W**
										DC-operated (2.4W) [G]	Bifurcated [blank]		**SK32GR-□▲W**
											Single [H]		**SK32GHR-□▲W**

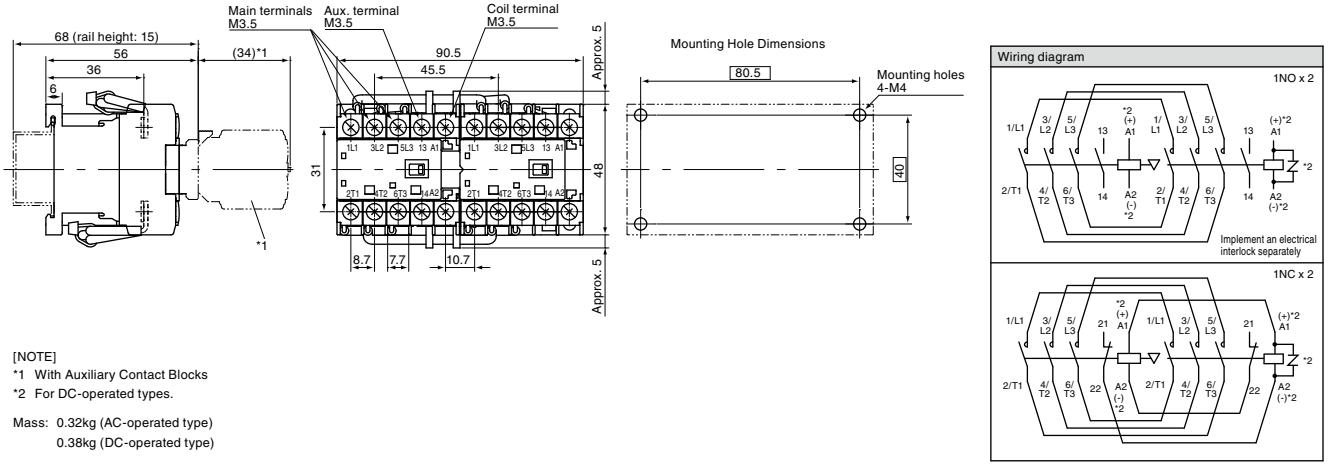
Note 1. "□" in the type column is replaced with the coil voltage code.
Note 2. "▲" in the type column is replaced with the auxiliary contact arrangemant code.
Note 3. Numbers and letters in brackets [ ] are used in the product code.
Note 4. An electrical interlock is not implemented on Magnetic Contactors with an auxiliary contact arrangement of 1NOx2. When using these Magnetic Contactors, always implement an electrical interlock in the external control circuits to prevent short-circuit faults when power is turned ON.
Note 5. An electrical interlock is implemented in the auxiliary circuit configurations of the Magnetic Contactor. If you need to use an auxiliary contact, add an option Auxiliary Contact Blocks.

● Coil voltage ⑥

AC-operated	Order Voltage	24	48	100	110	120	200	220	240	380	400	440	500
	Product code	E	F	1	H	K	2	M	P	S	4	T	5
DC-operated (2.4W)	Order Voltage	12	24	48	60	100	110	120	200	210	220		
	Product code	B	E	F	G	1	H	K	2	Y	M		
DC-operated (1.2W)	Order Voltage	12	24	48									
	Product code	B	E	F									

■ Dimensions, mm

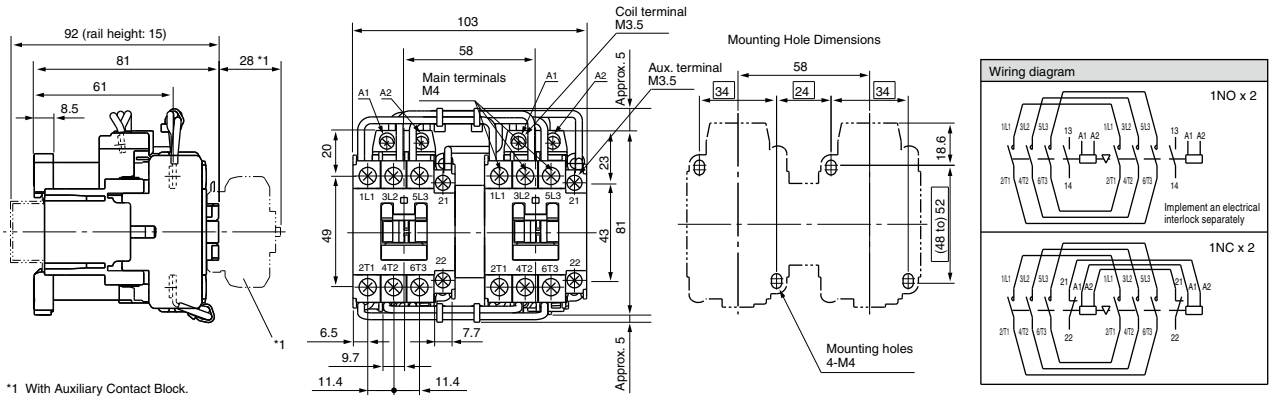
● Magnetic Contactors
SK06□R, SK09□R, SK12□R



[NOTE]
*1 With Auxiliary Contact Blocks
*2 For DC-operated types.

Mass: 0.32kg (AC-operated type)
0.38kg (DC-operated type)

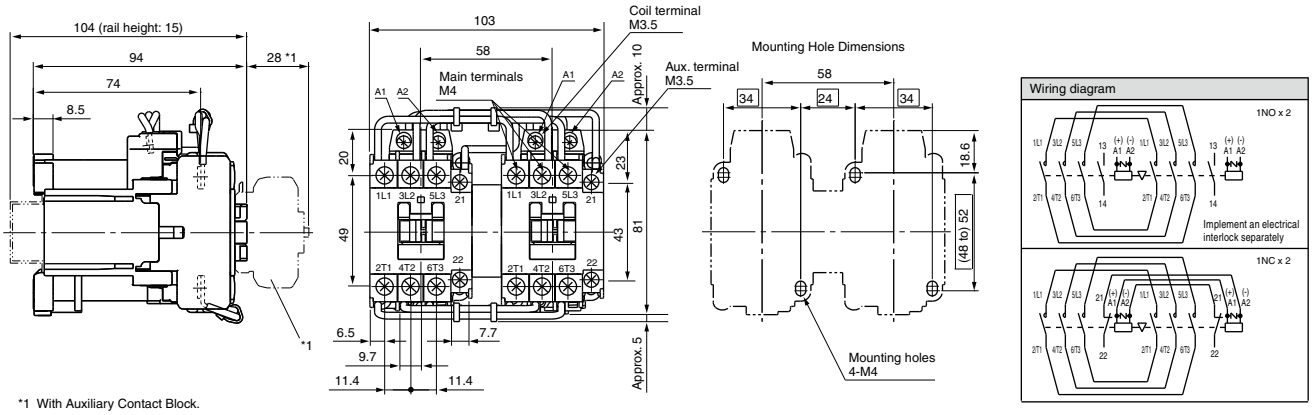
SK18AR, SK22AR



*1 With Auxiliary Contact Block.

Mass: 0.73kg

SK18GR, SK22GR

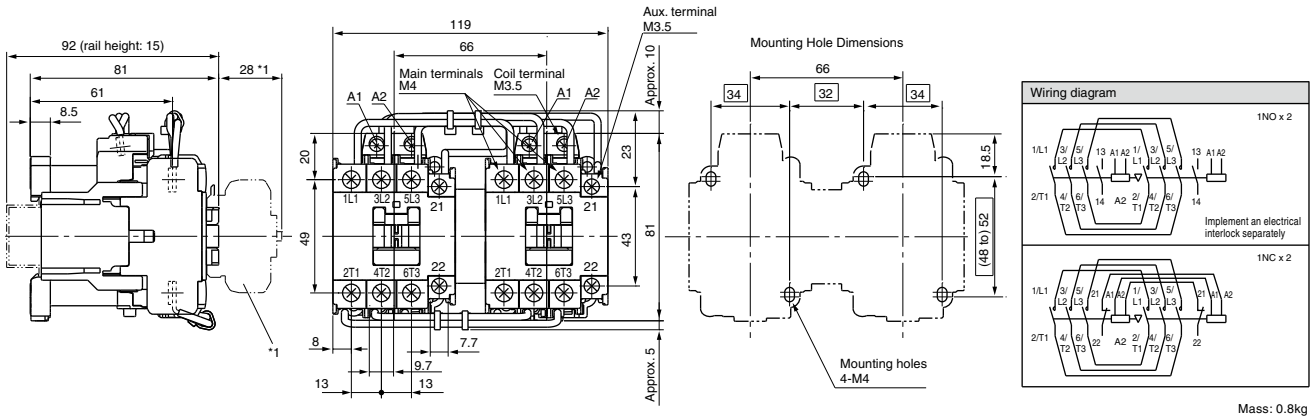


*1 With Auxiliary Contact Block.

Mass: 0.9kg

■ Dimensions, mm

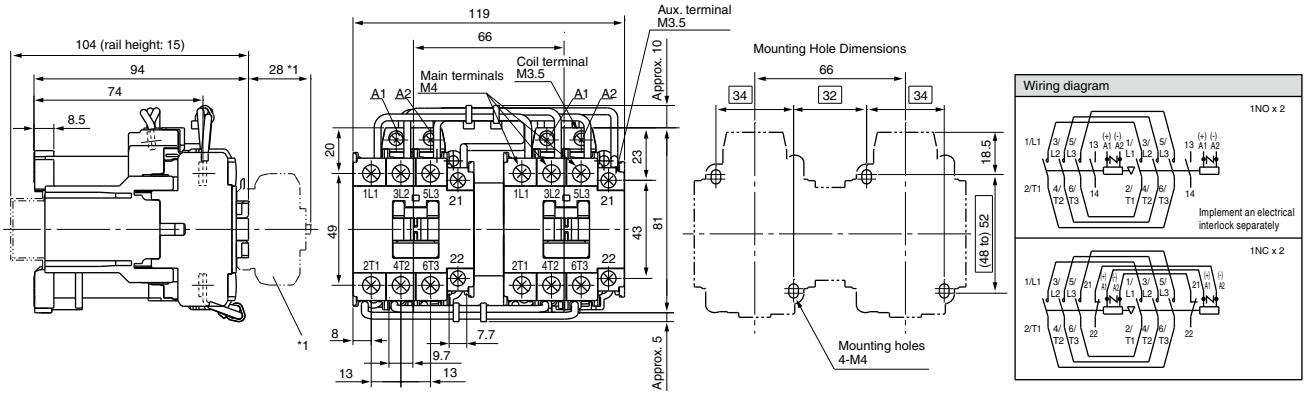
SK32AR



Mass: 0.8kg

*1 With Auxiliary Contact Block.

SK32GR



Mass: 1.01kg

*1 With Auxiliary Contact Block.

Main contact 4-pole magnetic contactor

Main contact 4-pole magnetic contactor

■ Features

- Perfect for applications where four wires are required for the main circuit
- 4NO product and 2NO2NC product main contacts are available
- The operation coil is a low consumption unit with a power consumption of 1.2 W.

SK12FL

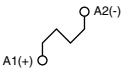
■ Ordering Information (Types)

● Main contact 4-pole magnetic contactor

SK12EL - E
①　②

①Basic types
②Coil voltage specification

● Coil voltage specification code

Coil voltage ②	Code	Coil specification
12V DC 24V DC	B E	

(Note 1) The allowable power fluctuation range is 85 to 110% of the rated voltage.
(Note 2) Be careful, as operating coil terminals have polarity.

■ Ratings and Types

Main contact (NO)								Main contact (NC)			Conventional free air thermal current [A] (Rated thermal current)	Main contact arrangement	Type
Max. motor capacity [kW]			Rated operational current [A]					Rated operational current [A]					
3-phase squirrel-cage motor (AC-3)			3-phase squirrel-cage motor (AC-3)			Resistive load (AC-1)		Resistive load (AC-1)					
200-240V	380-440V	500-550V	200-240V	380-440V	500-550V	200-240V	380-440V	200-240V	380-440V	500-550V			
3	5.5	5.5	12	12	9	20	20	–	–	–	20	4NO	**SK12EL-□**
–	–	–	–	–	–			10	10	5		2NO2NC	**SK12FL-□**

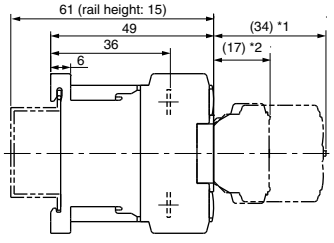
(Note 1) This product is not equipped with auxiliary contacts. If necessary, combine it with a 2-pole auxiliary contact block product.
(Note 2) It cannot be combined with a 4-pole auxiliary contact block product.

■ Performance

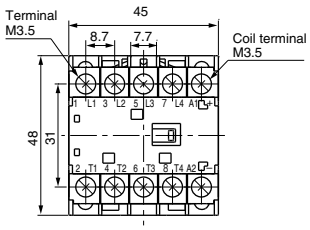
Type	Rated operational voltage [V]	Rated operational current [A]	Making/breaking current [A]		Operating cycles per hour [times hour]	Durability (Operations)		Performance indication
			Making	Breaking		Mechanical	Electrical	
SK12EL-□ **SK12FL-□**	220	12	144	120	1800	1000	100	AC-3·0·0-0
	440	12	144	120				

■ Dimensions, mm

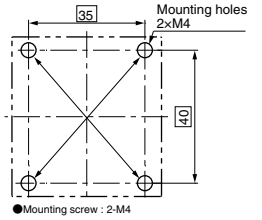
SK12EL
SK12FL



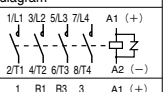
*1 When an auxiliary contact block (SZ1KA20, 11, 02) (front mounting) was installed
*2 When an auxiliary contact block (SZ1FA11) (front mounting) was installed



Mounting Hole Dimensions



●Mounting screw : 2-M4
Install using two mounting holes in opposite corners.

Type (Contact arrangement)	Contact arrangement diagram
SK12EL (4A)	
SK12FL (2A2B)	

Mass: 0.14kg (AC operated)
0.17kg (DC operated)

Magnetic contactor with tab terminal

Magnetic contactor with tab terminal

■ Features

- This magnetic contactor supports tab terminal connections.
- Can be applied to three-phase motors (AC 230 V, 3 kW).
- The operation coil has a low power consumption of 1.2 W.
- High life expectancy type, with an electrical life expectancy of 1,000,000 operations
- Built-in operation coil switch surge suppression function.

SK121L

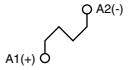
■ Ordering Information (Types)

- Magnetic contactor with tab terminal

SK121L - E 10
① ② ③

①Basic types
②Coil voltage specification
③Auxiliary contact arrangement

- Coil voltage specification code

Coil voltage ②	Code	Coil specification
12V DC 24V DC	B E	

(Note 1) The allowable power fluctuation range is 85 to 110% of the rated voltage.
(Note 2) Be careful, as operating coil terminals have polarity.

■ Ratings and Types

Max. motor capacity [kW]			Rated operational current [A]			Conventional free air thermal current [A] (Rated thermal current)	Auxiliary contact arrangement	Type
3-phase squirrel-cage motor (AC-3)			3-phase squirrel-cage motor (AC-3)					
200-240V	380-440V	500-550V	200-240V	380-440V	500-550V			
3	5.5	5.5	12	12	9	15	1NO	**SK121L**
							1NC	

■ Performance

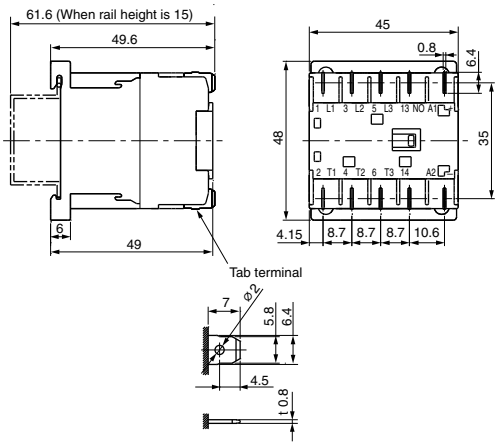
Type	Rated operational voltage [V]	Rated operational current [A]	Making/breaking current [A]		Operating cycles per hour [times hour]	Durability (Operations)		Performance indication
			Making	Breaking		Mechanical	Electrical	
SK121L	220	12	120	96	1800	1000	100	AC-3·0·0-0
	440	12	120	96				

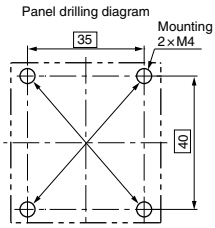
■ Connection terminal

IEC 61210 "Flat quick-connect terminations for electrical copper" Size: 6.3mm
[Recommended terminal]
• Manufacturer : JST
• Product code : FVDHDF1.25-250B (Applicable wire : 1.0 to 1.65mm²)
FVDHDF2-250B (Applicable wire : 1.65 to 2.63mm²)
(250 series)

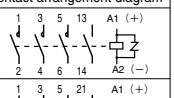
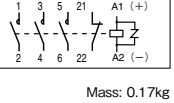
■ Dimensions, mm

SK121L





●Mounting screw: 2-M4
Mount using two mounting holes that are in a diagonal line.

Auxiliary contact	Contact arrangement diagram
1NO	
1NC	

Mass: 0.17kg

PC board mounting magnetic contactor

PC board mounting magnetic contactor

■ Features

- Includes a terminal for installing PC boards.
- Capable of directly driving a 3-phase motor (AC 230 V, 2.2 kW) without an interface relay, using programmable controller or detector transistor output (1.2 W).

SK092L

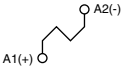
■ Ordering Information (Types)

- PC board mounting magnetic contactor

SK092L - E 10
① ② ③

①Basic types
②Coil voltage specification
③Auxiliary contact arrangement

- Coil voltage specification code

Coil voltage ②	Code	Coil specification
12V DC 24V DC	B E	

(Note 1) The allowable power fluctuation range is 85 to 110% of the rated voltage.
(Note 2) Be careful, as operating coil terminals have polarity.

■ Ratings and Types

Max. motor capacity [kW]		Rated operational current [A]			Conventional free air thermal current [A]	Auxiliary contact arrangement	Type
3-phase squirrel-cage motor (AC-3)		3-phase squirrel-cage motor (AC-3)		Resistive load (AC-1)			
200-240V	380-440V	200-240V	380-440V	200-240V			
2.2	4	9	9	9	9	1NO	**SK092L**
						1NC	

⚠ CAUTION Wiring

- When installing directly to a PC board (SK092L model)

Take enough current-carrying capacity for the PC board conductor.

(Recommended example) PC board
Conductor thickness: 70 [μm]
Conductor width: 6 [mm]
Conductor cross-section area: 0.42 [mm²]

- Precautions for PC board mounting

No measures have been taken to prevent solder, flux, or other materials from entering the magnetic contactor. If solder, flux, or other materials enter the magnetic contactor, it could cause insulation deterioration, contact failures, or other problems.
Follow the precautions below for PC board mounting:

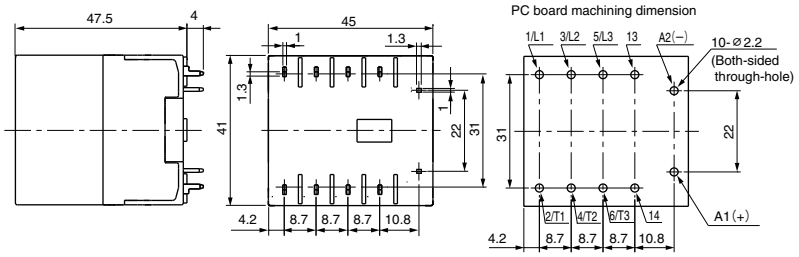
· Solder by hand. Make sure that solder, flux, or other materials do not enter the magnetic contactor.
· Use non-corrosive flux (for example, rosin-based flux).
· Do not wash after soldering. If it must be washed, only wash the solder surface to prevent the wash solution from entering the magnetic contactor. Use an alcohol-based wash solution.
· Do not coat. If the coating agent enters the magnetic contactor, it could cause contact failures.
· After soldering, do not lift the PC board up by the magnetic contactor.

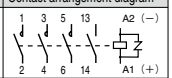
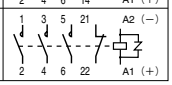
■ Performance

Type	Rated operational voltage [V]	Rated operational current [A]	Making/breaking current [A]		Operating cycles per hour [times hour]	Durability (Operations)		Performance indication
			Making	Breaking		Mechanical	Electrical	
SK092L	220	9	90	72	1800	1000	100	AC-3·0·0-0
	440	9	90	72				

■ Dimensions, mm

SK092L



Auxiliary contact	Contact arrangement diagram
1NO	
1NC	

Mass: 0.17kg

Thermal Overload Relay

■ Features

- International safety standards for standard models (IEC, GB, JIS, UL, and CSA).
- A terminal cover and dial cover are provided as standard features.
- Highly reliable 1NO1NC isolated auxiliary contacts to enable using NC and NO contacts at different potentials.
- Easily switch between manual and automatic reset.
- Parallel arrangement of main terminals and auxiliary terminals for easier wiring.

TK12

TK25

■ Ratings and Types

Type
TK12W□-■■■
TK25□-■■■
TK26□-■■■

Note. "□" in the type column is replaced with the reset method code.
"■■■" is replaced by the specified code for the current setting range.

■ Ordering Information (Types)

- Thermal Overload Relay

TK 12 W A - 009
① ② ③ ④ ⑤

①Type
②Frame size
③Mounting * TK12 only
④Reset method
⑤Ampere setting range *
* Refer to Heat Element Rating Specification Codes.

■ Ampere Setting Range Specification Codes

Type			Ampere setting range (A)	Ordering code	Applicable magnetic contactors					
TK12	TK25	TK26	0.1 - 0.15	**P10**	SK06	SK09	SK12	SK18	SK22	SK32
			0.13 - 0.2	**P13**						
			0.18 - 0.27	**P18**						
			0.24 - 0.36	**P24**						
			0.34 - 0.52	**P34**						
			0.48 - 0.72	**P48**						
			0.64 - 0.96	**P64**						
			0.8 - 1.2	**P80**						
			0.95 - 1.45	**P95**						
			1.1 - 1.65	**1P1**						
			1.4 - 2.1	**1P4**						
			1.7 - 2.6	**1P7**						
			2.2 - 3.4	**2P2**						
			2.8 - 4.2	**2P8**						
			4 - 6	**004**						
			5 - 7.5	**005**	–	–	–	–	–	
			6 - 9	**006**						
			7 - 10.5	**007**						
			9 - 13	**009**						
–			12 - 18	**012**						
			16 - 22	**016**						
	–		20 - 26	**020**						
			26 - 32	**026**						

■ Auxiliary Circuit Ratings

● Ratings for IEC Standard Compliance

Type	Conventional free air thermal current [A] (Rated continuous current)	Rated operational current [A]					Minimum voltage and current
		Rated operational voltage [V]	AC-15 (Ind. load)		DC-13 (Ind. load)		
			NC contacts	NO contacts	NC contacts	NO contacts	
TK12	5	24	3 (0.5)	3 (0.5)	1.1(0.3)	1.1 (0.3)	DC5V, 3mA
		100-120	2.5 (0.5)	2.5 (0.5)	0.28	0.28	
		200-240	2 (0.5)	1.5 (0.5)	0.14	0.14	
		380-440	1 (0.5)	0.75 (0.5)	–		
		500-600	0.6 (0.5)	0.6 (0.5)	–		
TK25 TK26	5	24	3 (0.5)	3 (0.5)	1.1(0.3)	1.1 (0.3)	DC5V, 3mA
		100-120	2.5 (0.5)	2.5 (0.5)	0.28	0.28	
		200-240	2 (0.5)	2 (0.5)	0.14	0.14	
		380-440	1 (0.5)	1 (0.5)	–		
		500-600	0.6 (0.5)	0.6 (0.5)	–		

Numbers in brackets ( ) are for automatic reset.

● Ratings for UL and CSA Standard Compliance

Type	Rated continuous current [A]	Rated operational current [A]						Rating code	
		AC			DC				
		Rated operational voltage [V]	Making	Breaking	Rated operational voltage [V]	Making	Breaking	AC	DC
TK12 TK25 TK26	5	120	30	3	125	0.22	0.22	B600	R300
		240	15	1.5					
		480	7.5	0.75	250	0.11	0.11		
		600	6	0.6					

■ Operating Characteristics (Specifications)

● 3-pole Circuits

Standard	Operating limit		Overload (hot start)	Locked rotor (cold start)	Ambient temperature
	Non-tripping	Tripping			
IEC 60947-4-1	105% Ie (for less than 2h)	120% Ie (for less than 2h)	Tripping class 10A: 150% Ie for less than 2min	Tripping class 10A: 720% Ie for 2 to 10 s max.	20℃

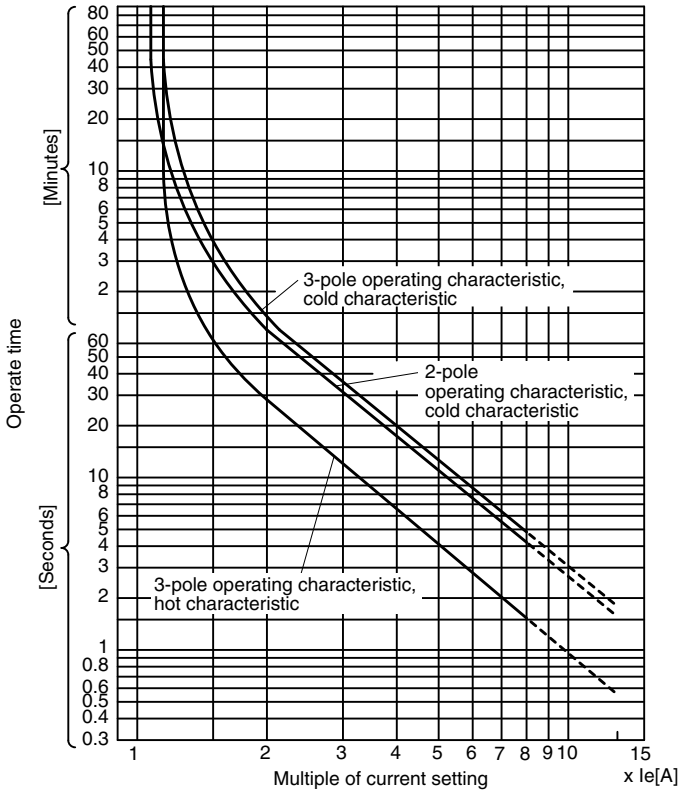
● 2-pole Circuits

Standard	Phase-loss protection	Non-tripping	Operation (hot start)	Ambient temperature
IEC 60947-4-1	Provided.	2-pole: 100% Ie 1-pole: 90% Ie	{ 2-pole: 115% Ie (for less than 2h) 1-pole:0% Ie	20℃

■ Operating Characteristics Curves (Average Values)

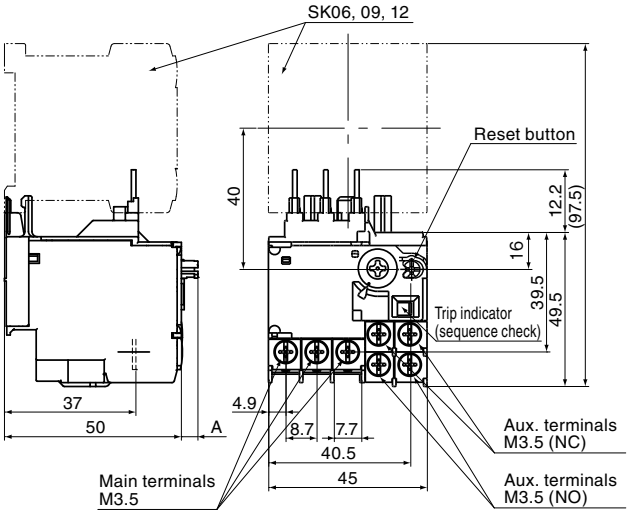
● Tripping Class 10A

TK12, TK25, TK26 series, Ambient temperature: 20°C

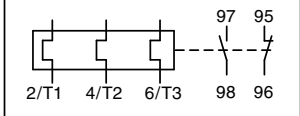


■ Dimensions, mm

● Thermal Overload Relay
TK12



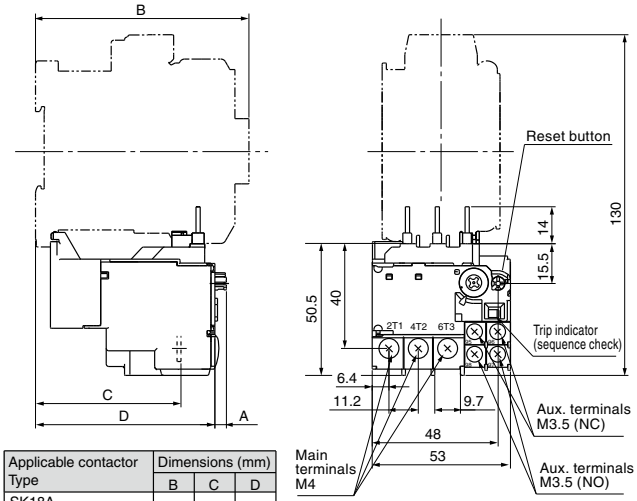
Wiring diagram



Mass : 0.1kg

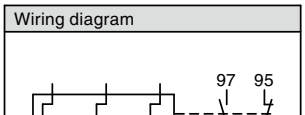
Dimension A
- Manually reset state: 5mm
- Automatically reset state: 2mm

TK25



Applicable contactor Type	Dimensions (mm)		
	B	C	D
SK18A SK22A	81	55.5	68.5
SK18G SK22G	94	68.5	81.5

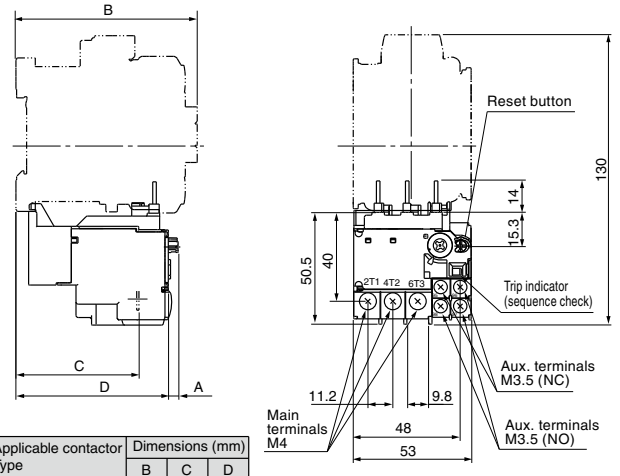
Wiring diagram



Mass: 0.11kg

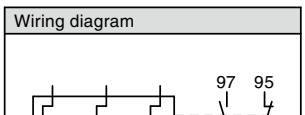
Dimension A
- Manually reset state: 5mm
- Automatically reset state: 2mm

TK26



Applicable contactor Type	Dimensions (mm)		
	B	C	D
SK32A	81	55.5	68.5
SK32G	94	68	81

Wiring diagram



Mass: 0.11kg

Dimension A
- Manually reset state: 5mm
- Automatically reset state: 2mm

Optional unit

■ Type Numbers and Product Codes

Product name	Type	Specification	Used with
Auxiliary Contact Blocks (Front mounting, Bifurcated Contact)	**SZ1KA40**	Contact arrangement: 4NO	SK06 to SK12 *1 SKH4 *1
	SZ1KA31	Contact arrangement: 3NO+1NC	
	SZ1KA22	Contact arrangement: 2NO+2NC	
	SZ1KA13	Contact arrangement: 1NO+3NC	
	SZ1KA04	Contact arrangement: 4NC	
	SZ1-A20	Contact arrangement: 2NO	SK18, SK22, SK32 *3
	SZ1-A11	Contact arrangement: 1NO+1NC	
	SZ1-A02	Contact arrangement: 2NC	
	SZ-A111	Make-before-break contact: 1NO+1NC	
	SZ1KA20	Contact arrangement: 2NO	SK06 to SK12 SKH4
	SZ1KA11	Contact arrangement: 1NO+1NC	
	SZ1KA02	Contact arrangement: 2NC	
Auxiliary Contact Blocks (Front mounting, Single Button Contact)	**SZ1KA40H**	Contact arrangement: 4NO	SK06 to SK12 *1 SKH4 *1
	SZ1KA31H	Contact arrangement: 3NO+1NC	
	SZ1KA22H	Contact arrangement: 2NO+2NC	
	SZ1KA13H	Contact arrangement: 1NO+3NC	
	SZ1KA04H	Contact arrangement: 4NC	
	SZ1KA20H	Contact arrangement: 2NO	SK06 to SK12 SKH4
	SZ1KA11H	Contact arrangement: 1NO+1NC	
	SZ1KA02H	Contact arrangement: 2NC	
	SZ-A20H	Contact arrangement: 2NO	SK18, SK22, SK32 *3
	SZ-A11H	Contact arrangement: 1NO+1NC	
	SZ-A02H	Contact arrangement: 2NC	
Auxiliary Contact Blocks (Small Front mounting, Bifurcated Contact)	**SZ1FA11**	Contact arrangement: 1NO+1NC	SK06 to SK12 SKH4
Auxiliary Contact Blocks (Small Front mounting, Single Button Contact)	**SZ1FA11H**	Contact arrangement: 1NO+1NC	SK06 to SK12 SKH4
Auxiliary Contact Blocks (Side mounting)	**SZ-AS1**	Contact arrangement: 1NO+1NC	SK18, SK22, SK32 *3
	SZ-AS1H	Contact arrangement: 1NO+1NC	
Mechanical Interlock Units	**SZ1KRM**	Reversing assembly and mechanical interlock	SK06 to SK12
	SZ-RM		SK18, SK22, SK32
Reversing Connection Kit (wiring)	**SZ1KRW1W**	Reversing Connection Kit for main circuit	SK06 to SK12
	SZ-RW22		Sk18, SK22
	SZ-RW23		SK32
	SZ1KRW1E	Reversing Connection Kit for control circuit	SK06 to SK12
Main Circuit Surge Suppression Unit *2	**SZ-ZM1**	Front mounting Built-in CR (3-phase motor, 240V, 0.1 to 3.7kw)	SK18
	SZ-ZM2	Side mounting Built-in CR (3-phase motor, 240V, 0.1 to 3.7kw)	SK06 to SK12 *2 SK18
	SZ-ZM3E	Front mounting Built-in CR (3-phase motor, 240V, 0.1 to 15kw)	SK18, SK22, SK32
	SZ-ZM4E	Side mounting Built-in CR (3-phase motor, 240V, 0.1 to 15kw)	SK06 to SK12 *2 SK18, SK22, SK32
Separate Installation Unit (for Main Circuit Surge Suppression Unit)	**SZ-ZMH**	For Main Circuit Surge Suppression Unit SZ-ZM2	SZ-ZM2
Coil Surge Suppression Units (surge suppression only)	**SZ1KZ1**	Built-in varistor: 24 to 48V AC	SK06 to SK12 *4 SKH4
	SZ1KZ2	Built-in varistor: 48 to 125V AC	
	SZ1KZ3	Built-in varistor: 100 to 250V AC	
	SZ1KZ6	Built-in diode: 24 to 125V DC	SK06G to SK12G SK06L to SK12L SKH4G, SKH4L *4
	SZ-Z1	Built-in varistor: 24 to 48V AC	SK18, SK22, SK32 *4
	SZ-Z2	Built-in varistor: 100 to 250V AC	
	SZ-Z3	Built-in varistor: 380 to 440V AC	SK18A, SK22, SK32A
	SZ-Z4	Built-in CR: 24 to 48V AC	SK18, SK22, SK32 *4
	SZ-Z5	Built-in CR: 100 to 250V AC	
Coil Surge Suppression Units (with Operation Indicator Lamps)	**SZ1KZ4**	Built-in varistor and LED: 24 to 48V AC/DC	SK06 to SK12 *4 SKH4
	SZ1KZ5	Built-in varistor and LED: 48 to 125V AC/DC	
	SZ-Z6	Built-in varistor and LED: 24 to 48V AC/DC	SK18, SK22, SK32 *4
	SZ-Z7	Built-in varistor and LED: 100 to 240V AC/DC	
	SZ-Z8	Built-in CR and LED: 24 to 48V AC/DC	
	SZ-Z9	Built-in CR and LED: 100 to 240V AC/DC	
Operation Indicator Units	**SZ1KL1**	Built-in LED: 12 to 24V AC/DC	SK06 to SK12 SKH4
	SZ1KL2	Built-in LED: 24 to 48V AC/DC	
	SZ1KL3	Built-in LED: 48 to 125V AC/DC	
Thermal Overload Relay Separate Installation Unit	**TZ1H12N**	For separate installation type thermal overload relay assembly	TK12
	TZ1H26N		TK26
Thermal Overload Relay Reset Releases	**SZ-R1**	Release length: 300mm	TK12, TK25, TK26
	SZ-R2	Release length: 500mm	
	SZ-R3	Release length: 700mm	
Link Module	**BZ0LRK12AA**	Links to Manual Motor Starter	SK06 to SK12
	BZ0LRK22AA		SK18, SK22
	BZ0LRK32AA		SK32
Spaser	**BZ0LRKACA**		SK18A, SK22A, SK32A
Reversing Connection Unit (Insert)	**SZ1KRW1M**	Reversing Connection Unit (Insert) for main circuit	SK06 to SK12

*1 These options cannot be used with 1.2W DC Magnetic Contactors and Starters from SK06 to SK12L and SKH4L Auxiliary Relays.
*2 Use the SZ-ZM2 Main Circuit Surge Suppression Unit together with the SZ-ZMH Standalone Installation Unit.
*3 You can add another auxiliary contact unit when side mounting it.
*4 DC operated SK□G type and SK□L type have a built-in varistor in the main unit.

Auxiliary Contact Blocks

SZ1KA22 SZ1KA11 SZ1FA11

■ Features

- Easily add on auxiliary contacts.
- You can add auxiliary contacts without increasing the footprint to contribute to control panel downsizing.
- Many different contact variations in two external sizes.
- Models with double contacts are available for high reliability to achieve a minimum operating voltage and current of 5V DC, 3mA.

■ Ordering Information (Types)

- Auxiliary Contact Blocks

SZ1KA22

①Type

■ Ordering Information (Types)

Product name	Number of contacts	Contact arrangement	Mounting	Used with	Type
Auxiliary Contact Blocks with Bifurcated Contacts	4	4NO	Front mounting	SK06 to SK12 *1 SKH4 *1	**SZ1KA40**
		3NO+1NC			**SZ1KA31**
		2NO+2NC			**SZ1KA22**
		1NO+3NC			**SZ1KA13**
		4NC			**SZ1KA04**
	2	2NO	Front mounting	SK06 to SK12 SKH4	**SZ1KA20**
		1NO+1NC			**SZ1KA11**
		2NC			**SZ1KA02**
	2	2NO	Front mounting	SK18, 22, 32	**SZ-A20**
		1NO1NC			**SZ-A11**
		2NC			**SZ-A02**
Auxiliary Contact Blocks with Single Contacts	4	4NO	Front mounting	SK06 to SK12 *1 SKH4 *1	**SZ1KA40H**
		3NO+1NC			**SZ1KA31H**
		2NO+2NC			**SZ1KA22H**
		1NO+3NC			**SZ1KA13H**
		4NC			**SZ1KA04H**
	2	2NO	Front mounting	SK06 to SK12 SKH4	**SZ1KA20H**
		1NO+1NC			**SZ1KA11H**
		2NC			**SZ1KA02H**
	2	2NO	Front mounting	SK18, 22, 32	**SZ-A20H**
		1NO1NC			**SZ-A11H**
		2NC			**SZ-A02H**
Small Auxiliary Contact Block with Bifurcated Contacts	2	1NO+1NC	Front mounting	SK06 to SK12 SKH4	**SZ1FA11**
Small Auxiliary Contact Block with Single Contacts	2	1NO+1NC	Front mounting	SK06 to SK12 SKH4	**SZ1FA11H**
Make-before-break Auxiliary Contact (Bifurcated Contact)	2	1NO1NC	Front mounting	SK18, 22, 32	**SZ-A111**
Auxiliary Contact Block (Bifurcated Contact)	2	1NO1NC	Side Mounting	SK18, 22, 32	**SZ-AS1**
Auxiliary Contact Block (Single Contact)	2	1NO1NC	Side Mounting	SK18, 22, 32	**SZ-AS1H**

*1These options cannot be used with 1.2W DC Magnetic Contactors and Starters from SK06 to SK12L and 1.2W SKH4L Auxiliary Relays.

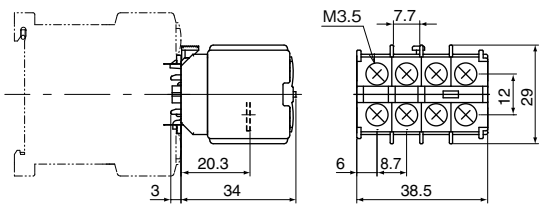
■ Ratings

Type	Conventional free air thermal current (Rated continuous current) [A]	Making and breaking current (AC) [A]	Rated operational current [A]						Minimum voltage and current
			AC			DC			
			Rated operational voltage [V]	Ind. load (AC-15)	Res. load (AC-12)	Rated operational voltage [V]	Ind. load (DC-13)	Res. load (DC-12)	
SZ1KA□ SZ1FA□ (Bifurcated contacts)	10	30	AC100 - 120	3	6	24 DC	2	3	5V DC, 3mA
		30	AC200 - 240	3	6	48 DC	1	2	
		10	AC380 - 440	1	6	110 DC	0.3	1.5	
		5	AC500 - 600	0.5	3	220 DC	0.2	0.5	
SZ1KA□H SZ1FA□H (Single contacts)	10	60	AC100 - 120	6	10	24 DC	4	8	24V DC, 10mA
		60	AC200 - 240	6	10	48 DC	1	3.5	
		60	AC380 - 440	6	10	110 DC	0.5	2.5	
		30	AC500 - 600	3	5	220 DC	0.25	0.8	
SZ-A□ SZ-AS1 (Bifurcated contacts)	10	60	AC100 - 120	6	10	24 DC	3	5	5V DC, 3mA
		30	AC200 - 240	3	8	48 DC	1.5	3	
		15	AC380 - 440	1.5	5	110 DC	0.55	2.5	
		12	AC500 - 600	1.2	5	220 DC	0.27	1	
SZ-A□H SZ-AS1H (Single contacts)	10	60	AC100 - 120	6	10	24 DC	5	10	24V DC, 10mA
			AC200 - 240		10	48 DC	1.5	5	
		40	AC380 - 440	4	10	110 DC	0.7	4	
			AC500 - 600		10	220 DC	0.27	1	

■ Dimensions, mm

- **SZ1KA40**
- **SZ1KA31**
- **SZ1KA22**
- **SZ1KA13**
- **SZ1KA04**
- **SZ1KA40H**
- **SZ1KA31H**
- **SZ1KA22H**
- **SZ1KA13H**
- **SZ1KA04H**

4-pole

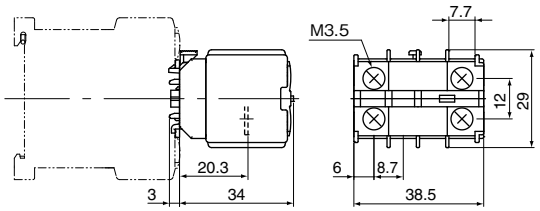


Mass: 34g

Type	Contact arrangement	
SZ1KA40 **SZ1KA40H**	4NO	53 63 73 83 54 64 74 84
SZ1KA31 **SZ1KA31H**	3NO+1NC	53 61 73 83 54 62 74 84
SZ1KA22 **SZ1KA22H**	2NO+2NC	53 61 71 83 54 62 72 84
SZ1KA13 **SZ1KA13H**	1NO+3NC	53 61 71 81 54 62 72 82
SZ1KA04 **SZ1KA04H**	4NC	51 61 71 81 52 62 72 82

- **SZ1KA20**
- **SZ1KA11**
- **SZ1KA02**
- **SZ1KA20H**
- **SZ1KA11H**
- **SZ1KA02H**

2-pole

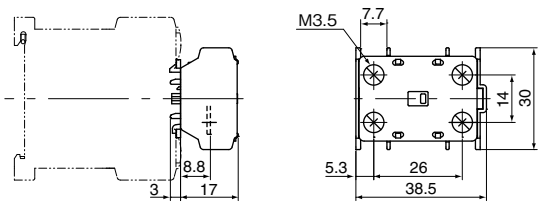


Mass: 29g

Type	Contact arrangement	
SZ1KA20 **SZ1KA20H**	2NO	53 63 54 64
SZ1KA11 **SZ1KA11H**	1NO+1NC	53 61 54 62
SZ1KA02 **SZ1KA02H**	2NC	51 61 52 62

- **SZ1FA11**
- **SZ1FA11H**

Small, 2-pole



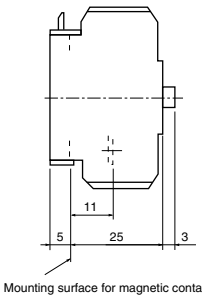
Mass: 17g

Type	Contact arrangement	
SZ1FA11 **SZ1FA11H**	1NO+1NC	53 61 54 62

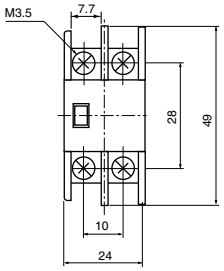
■ Dimensions, mm

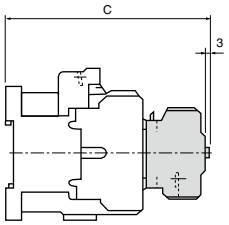
• Front mounting

• SZ-A20
• SZ-A11
• SZ-A02
• SZ-A111

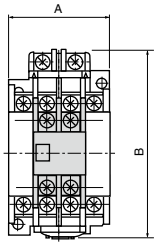


2 poles





2 poles



(Note) Auxiliary contact block (4-pole) mounting cannot be performed. Only 2-pole mounting can be performed. It also cannot be used together with a side mounting auxiliary contact block.

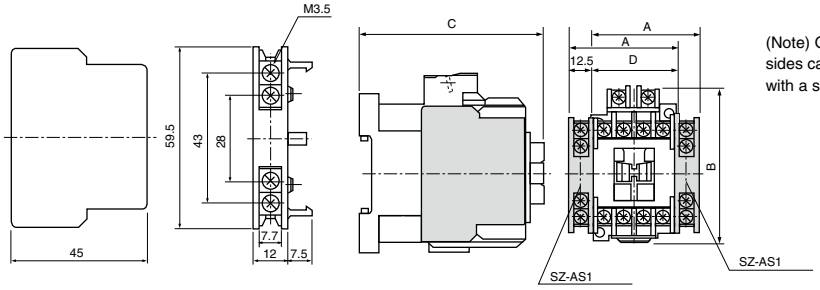
Type	Contact arrangement		Mass [g]
SZ-A20 SZ-A20H	2NO	53 63 54 64	20
SZ-A11 SZ-A11H	1NO1NC	53 61 54 62	20
SZ-A02 SZ-A02H	2NC	51 61 52 62	20
SZ-A111	1NO1NC	57 65 58 66	20

Dimension table

Magnetic contactor coordination type		Dimension [mm]			Mass [kg]
Type	No. of auxiliary contacts (main unit)	A	B	C	
SK18A, 22A	1	45	81	109	0.36
SK18G, 22G	1	45	81	122	0.44
SK32A	1	53	81	109	0.39
SK32G	1	53	81	122	0.5

• Side mounting

• SZ-AS1
• SZ-AS1H



(Note) One can be mounted on one side. Mounting on both sides cannot be performed, and it cannot be used together with a side mounting auxiliary contact block.

Dimension table

Magnetic contactor coordination type		Dimension [mm]				Mass [kg]
Type	No. of auxiliary contacts (main unit)	A	B	C	D	
SK18A, 22A	1	57.5	81	81	45	0.37
SK18G, 22G	1	57.5	81	94	45	0.45
SK32A	1	65.5	81	81	53	0.4
SK32G	1	65.5	81	94	53	0.51

Type	Contact arrangement		Mass [g]
SZ-AS1 SZ-AS1H For left surface mounting	1NO1NC	53 61 54 62	28
SZ-AS1 SZ-AS1H For right surface mounting	1NO1NC	71 83 72 84	28

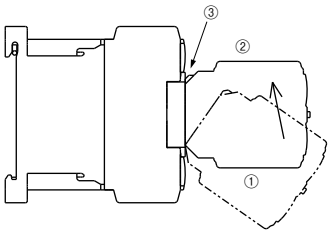
■ Mounting and removing

[SK06/09/12 models]

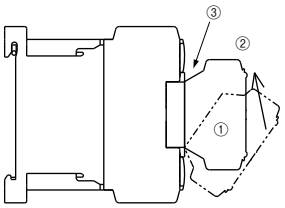
● Front mounting type (SZ1KA□ and SZ1FA□)
Mounting
(1) Insert the hook from ① into the mounting groove on the main unit, then move it in direction ②.
(When the hook has caught, a click sound will be heard.)
(2) After mounting, confirm that the auxiliary contact block is fixed firmly in place.

Removing
(1) Press hook ③ on the unit with your finger, then move it in the opposite direction it was mounted in.

SZ1KA□



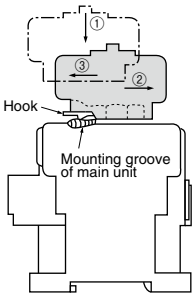
SZ1FA□



[SK18/22/32 models]

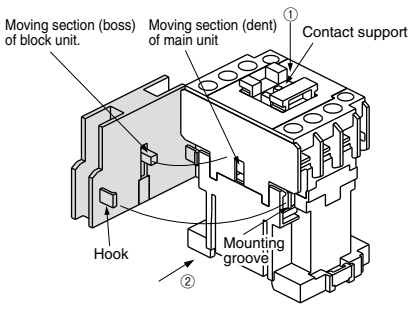
● Front mounting type (SZ-A□)
Mounting
(1) Attach the block unit to the main unit in the direction of ①, and move it in the direction of ② until the hook of the block unit is caught in the mounting groove of the main unit.
(2) After mounting, press the moving section of the block unit to ensure that the block unit moves smoothly.

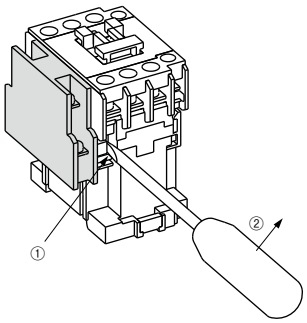
● Removing
(1) Pull up the hook and move it in the direction of ③.



Side mounting type (SZ-AS1)
● Mounting
(1) While pressing the contact support in the direction of ①, insert the moving section (boss) of the block unit into the moving section (dent) of the main unit, and move it in the direction of ②until the hook of the block unit is caught in the mounting groove of the main unit.
(2) After mounting, press the moving section of the main unit to ensure that the block unit moves smoothly.

● Removing
Follow the procedure below to remove the unit from the product.
(1) Insert a tool such as a flathead screwdriver into gap ①, then press the tool in direction ② to release the hook.





Mechanical Interlock Unit and Power Connection Kit for Reversing

■ Features

- Mechanically prevent two Magnetic Contactors from turning ON at the same time.
- Combine a Reversing Connection Kit with an Interlock Unit to easily configure a reversing Magnetic Contactors.
- Mounting two Magnetic Contactors on the front surface reduces the mounting footprint and contributes to downsizing control panels.

SZ1KRM

SZ1KRW1W

■ Types

- Mechanical Interlock Unit: Joins two Magnetic Contactors to mechanically lock them.

Product name	Used with	Type
Mechanical Interlock Unit	SK06, SK09, SK12	**SZ1KRM**
	SK18, SK22, SK32	**SZ-RM**

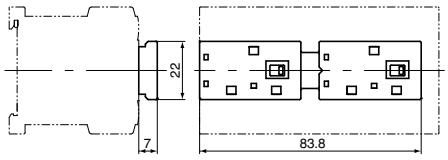
- Power Connection Kit for Reversing: Used to reverse the circuit wiring between the main circuit terminals.

Product name	Wire size	Number of conductors per set	Used with	Type
Power Connection Kit for Reversing	AWG14 (1.6 dia.)	・One set for power supply side ・One set for load side	SK06, SK09, SK12	**SZ1KRW1W**
		・For power supply side control ・For load side control	SK06, SK09, SK12	**SZ1KRW1E**
		・One set for power supply side ・One set for load side	SK18, SK22	**SZ-RW22**
			SK32	**SZ-RW23**

■ Dimensions, mm

- Mechanical Interlock Unit

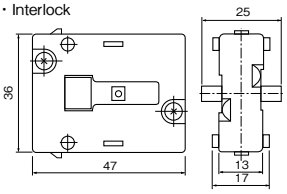
·SZ1KRM



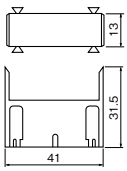
Mass : 11g

·SZ-RM

・Interlock



・Joint block



Mass: 25g

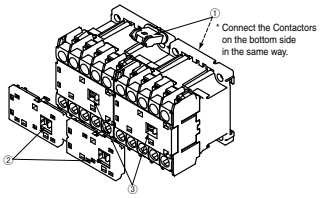
(Note 1) The interlock unit is formed from an interlock and a joint block.
(Note 2) Refer to the sections on reversing type magnetic contactors and switches on pages 33 to 35 for dimensions combined with magnetic contactors.

⚠Caution Precaution for Correct Use

・When the Magnetic Contactors are switched rapidly, use an electrically interlock, such as a delay relay, to ensure a switching time of at least 15ms for the contacts of the two Magnetic Contactors.

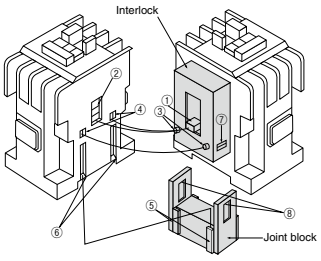
■ Mounting Procedures

- Interlock Unit: SZ1KRM

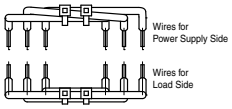


(1) Connect two Magnetic Contactors with the two connection pieces ①.
(2) Move the moveable projections ② on the Interlock Unit to the right side.
(3) Insert the Interlock Unit directly from the top so that it is aligned with the projections ③ on the moveable portion on the Magnetic Contactors.
(4) After you mount the Interlock Unit, slide the projection on the indicator window on the right side and then on the left side to confirm that they move smoothly.

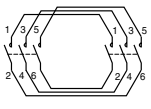
- Interlock Unit: SZ-RM



(1) Match the projecting part ① with the movable part of the mechanical interlock unit with the small square opening part ② of the movable part (contact support) of the contactor, and the round boss ③ of the mechanical interlock unit with the recessed part ④ on the side of the contactor. Secure the interlock mechanical interlock unit from both sides through the contactor.
(2) Insert the ribs ⑤ of the joint block into the guides ⑥ of the contactor and fit the window ⑧ of the joint block into the projecting part ⑦ of the mechanical interlock unit.
(3) After connection, push and release the movable parts (contact supports) of the forwarding and reversing contactors one turn at a time to see that they move smoothly.
(4) To remove, use a screwdriver to remove the window ⑧ of the joint block from the projecting part ⑦ of the mechanical interlock unit and remove the joint block.



- Power Connection Kit for Reversing
Connect the Kit to the main circuit terminals. There are wires for the power supply side and wires for the load side. Be sure to connect them to the correct sides.



Main Circuit Surge Suppression Unit and Separate Installation Unit

■ Features

- Absorbs the surge voltage that is generated from three-phase motors when the Magnetic Contactor is switched to suppress the effects of surge voltage.
- Combination with a Separate Installation Unit enables both screw mounting and DIN rail mounting. (The SZ-ZM2 Main Circuit Surge Suppression Unit must be used with a Separate Installation Unit to secure it.)

SZ-ZM2

SZ-ZMH

■ Ratings and Types

Product name	Mounting	Rated voltage and frequency	CR time constant	Applicable 3-phase motor	Applicable model	Type
Main Circuit Surge Suppression Unit	Front mounting	250V AC, 50/60Hz	C=0.22μF R=100	200 to 240V AC 0.1 to 3.7kW	SK18	**SZ-ZM1**
	Side mounting				SK06 to18	**SZ-ZM2**
	Front mounting	250V AC, 50/60Hz	C=0.33μF R=47	200 to 240V AC 0.1 to 15kW	SK18, 22, 32	**SZ-ZM3E**
	Side mounting				SK06 to 32	**SZ-ZM4E**
Separate Installation Unit	Screw mounting DIN rail mounting	–	–	–	SZ-ZM2 SZ-ZM4E	**SZ-ZMH**

❶ Application of the SK Series (SK06/09/12) is possible through combined usage of SZ-ZM2 or SZ-ZM4E and a separate installation unit.
❷ SZ-ZM3E and SZ-ZM4E are for lead tip sleeve use (Ø1.1 mm).

■ Performances

Item		Performance
Dielectric strength	Between terminals	Rated voltage × 230% for 1 min
	Between terminals and Unit outer case	Rated voltage × 2 + 1,000V for 1 min
Insulation resistance	Between terminals	2,000MΩ min.
	Between terminals and Unit outer case	2,000MΩ min. per terminal
Electrostatic capacity tolerance (at 1kHz)		±10%
Durability		1 million operations

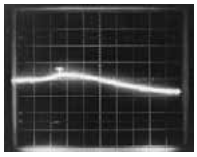
■ Main Circuit Surge Suppression Characteristics

(220V AC, 2.2kW motor)

- Without Main Circuit Surge Suppression Unit

(No.CP-485)

- With Main Circuit Surge Suppression Unit

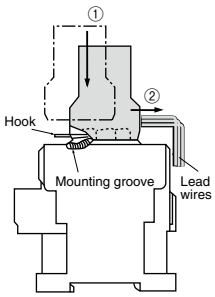


(No.CP-486)

■ Mounting Procedures

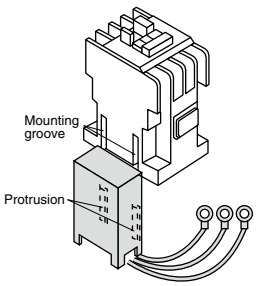
- SZ-ZM1, ZM3E

(1) To install, force the unit onto the contactor form the direction of arrow ① and move it in the direction of arrow ②. Check that the pawl of the unit fits into the groove of the contactor.
(2) To remove, raise the pawl of the unit and move the unit in the direction reverse that of installation.
(3) Connect lead wires to Load-side terminals 2, 4 and 6 of the contactor. Lead wires can be connected to any of these terminals. Tighten with tightening torque described in instruction for magnetic contactor.



- SZ-ZM2, ZM4E

(1) To install, push the projecting part of the unit into the groove from under the contactor until it stops.
(2) To remove, slide the unit downward.
(3) Connect lead wires to Load-side terminals 2, 4 and 6 of the contactor. Lead wires can be connected to any of these terminals. Tighten with tightening torque described in instruction for magnetic contactor.



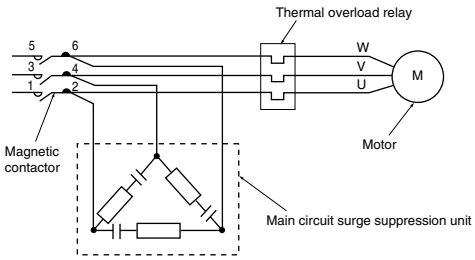
⚠Caution Precaution for Correct Use

・Do not use the Main Circuit Surge Suppression Unit near inverter circuits or in other locations where a large harmonic component is present.

Main Circuit Surge Suppression Unit and Separate Installation Unit

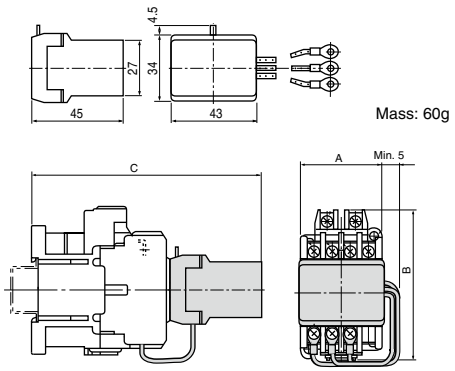
■ Wiring Diagram

・Connection with magnetic starter



■ Dimensions, mm

● Front mounting (SZ-ZM1, ZM3E)

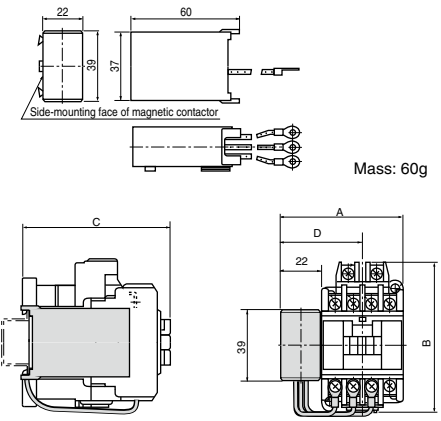


Dimension table

Type	Dimension (mm)		
	A	B	C
SK18A + SZ-ZM1	45	81	121
SK18G + SZ-ZM1	45	81	134
SK22A + SZ-ZM3E	45	81	121
SK22G + SZ-ZM3E	45	81	134
SK32A + SZ-ZM3E	53	81	121
SK32G + SZ-ZM3E	53	81	134

(Note) SZ-ZM3E model is for lead tip sleeve use (Ø1.1 mm).

● Side mounting (SZ-ZM2, ZM4)

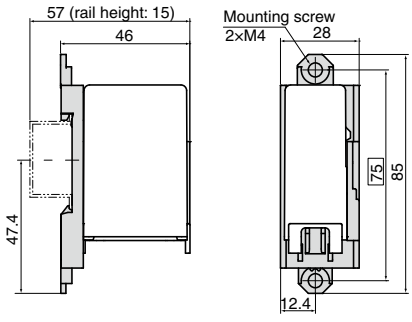


Dimension table

Type	Dimension (mm)			
	A	B	C	D
SK18A + SZ-ZM2	67	81	81	44.5
SK18G + SZ-ZM2	67	81	94	44.5
SK22A + SZ-ZM4E	67	81	81	44.5
SK22G + SZ-ZM4E	67	81	94	44.5
SK32A + SZ-ZM4E	75	81	81	44.5
SK32G + SZ-ZM4E	75	81	94	44.5

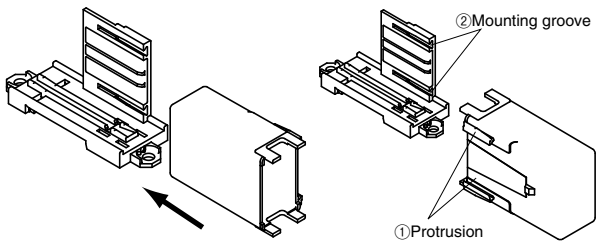
(Note 1) SZ-ZM4E model is for lead tip sleeve use (Ø1.1 mm).
(Note 2) Side mounting-type main circuit surge suppression units can be mounted to either the left or right side of the magnetic contactor.

● Separate installation unit (SZ-ZMH)



● Mounting

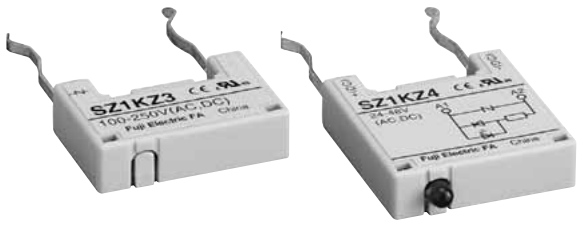
Line up protrusion ① on the side of the main circuit surge suppression unit with the mounting groove on the inner wall of the separate mounting unit, then press hard in the direction of the arrow until a click is heard.



Coil Surge Suppression Units and Operation Indicator Lamps

■ Features

- The Main Circuit Surge Absorber Unit absorbs the surge voltage that is generated when the coil in a Magnetic Contactor turns OFF. This suppresses malfunctioning of electronic circuits.
- The Operation Indicator Unit indicates with an LED when voltage is applied to the coil terminals.



SZ1KZ3 SZ1KZ4

■ Ratings and Types

Product name	Surge suppression element	Specification	Operation indicator lamp	Applicable model		Control circuit voltage		Type
				AC-operated type	DC-operated type	AC	DC	
Coil Surge Suppression Units	Varistor	Varistor voltage: 100V	-	SK06A SK09A SK12A	-	24-48V	Not required. ❶	**SZ1KZ1**
		Varistor voltage: 240V				48-125V		**SZ1KZ2**
		Varistor voltage: 470V				100-250V		**SZ1KZ3**
		Varistor voltage: 100V	LED (red)			24-48V	Not required. ❶	**SZ1KZ4**
		Varistor voltage: 240V				48-125V		**SZ1KZ5**
	Diode	-	-	-	SK06G, L SK09G, L SK12G, L	-	12-125V	**SZ1K26**
Operation Indicator Units	-	-	LED (red)	SK06A SK09A SK12A		12-24V	12-24V	**SZ1KL1**
						24-48V	24-48V	**SZ1KL2**
						48-125V	48-125V	**SZ1KL3**
Coil Surge Suppression Units	Varistor	Varistor voltage: 100V	-	SK18A SK22A SK32A	-	24-48V	Not required ❶	**SZ-Z1**
		Varistor voltage: 470V	-			100-250V		**SZ-Z2**
		Varistor voltage: 910V	-			380-440V	- ❷	**SZ-Z3**
	CR	0.22μF, 22	-		SK18G SK22G SK32G	24-48V	24-48V	**SZ-Z4**
		0.1μF, 220	-			100-250V	100-250V	**SZ-Z5**
	Varistor	Varistor voltage: 100V	LED (red)		-	24-48V	Not required ❶	**SZ-Z6**
		Varistor voltage: 470V	LED (red)			100-250V		**SZ-Z7**
	CR	0.22μF, 22	LED (red)		SK18G SK22G SK32G	24-48V	24-48V	**SZ-Z8**
		0.1μF, 220	LED (red)			100-250V	100-250V	**SZ-Z9**

Note: ❶ A varistor is built into the SK□G and SK□L for DC operation.
Note: ❷ This type of unit is used for AC-operated contactors only.

■ Coil Surge Suppression Characteristics

Product	Application	Characteristics (200V AC coil)
Without Surge Suppression Unit	A sharp surge voltage is generated from the coil due to coil inductance as a result of the rapid change in voltage when the coil turns OFF. This becomes noise to surrounding electronic devices, and can cause malfunctions and circuit destruction.	SK12A  (0.1ms/div, 1kV/div)
Models with varistors built in	When the surge voltage reaches a certain level, current flows to the varistor that is connected in parallel with the coil. This serves to control the peak surge voltage. Varistors can be applied to either AC or DC. The suppressed surge voltage is approximately the varistor voltage.	SK12A + SZ1KZ3  (2ms/div, 200V/div)

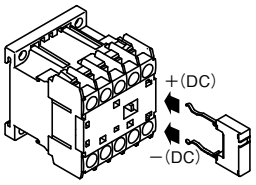
Coil Surge Suppression Units and Operation Indicator Lamps

■ Mounting methods

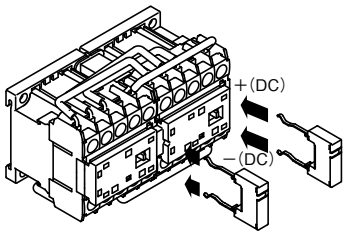
● SZ1KZ1 to 6, SZ1KL1 to 3

(1) Insert the Unit into the mounting holes in the Magnetic Contactor. The Unit must be oriented properly top to bottom. Do not mount the Unit backwards.

· Mounting to Non-reversing Magnetic Contactors

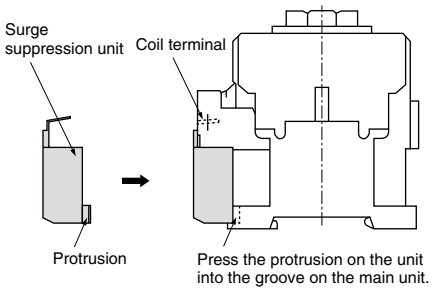


· Mounting to Reversing Magnetic Contactors



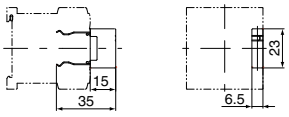
● SZ-Z1 to Z9, SZ-Z31 to Z37, SZ-Z41 to Z45

(1) Insert the terminals on the unit into coil terminals A1 and A2, then press the protrusion for fixing the unit in place into the groove on the magnetic contactor main unit to mount it.
Tighten the unit terminals along with the operating circuit electric wires.



■ Dimensions, mm

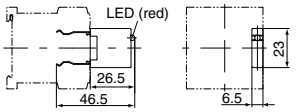
● SZ1KZ1 to SZ1KZ3, SZ1KZ6
(Coil Surge Suppression Units)



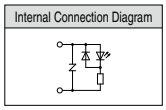
Internal Connection Diagram	
SZ1KZ1 to SZ1KZ3	SZ1KZ6

Mass : 3g

● SZ1KZ4 and SZ1KZ5
(Coil Surge Suppression Units with Operation Indicator Lamps)

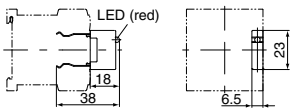


Internal Connection Diagram

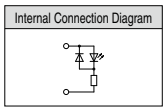


Mass : 4g

● SZ1KL1 to SZ1KL3
(Operation Indicator Units)



Internal Connection Diagram



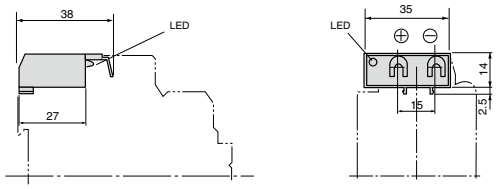
Mass : 2g

● SZ-Z1, Z2, Z3 (Varistor built-in type)
● SZ-Z4, Z5 (CR built-in type)

Internal Connection Diagram	
Varistor built-in type	
CR built-in type	

Mass: 14g

● SZ-Z6, Z7 types (varistor built-in type, with LED indicator)
● SZ-Z8, Z9 types (CR built-in type, with LED indicator)

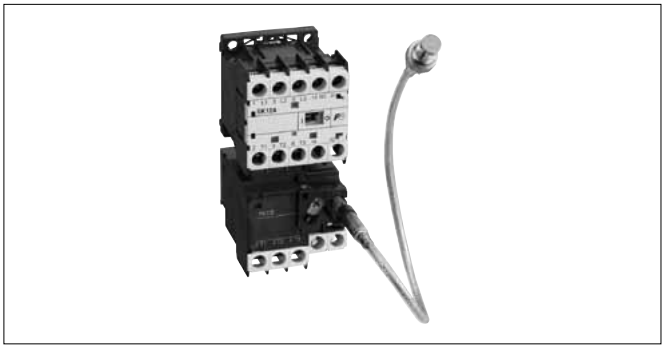


(Note 1) For DC operated units, pay careful attention to the polarity.

Internal Connection Diagram	
Varistor built-in type	
CR built-in type	

Mass: 16g

Thermal Overload Relay Reset Releases



■ Features

- A Reset Release is used to enable resetting a Thermal Relay from the front surface of the panel or from a remote location.

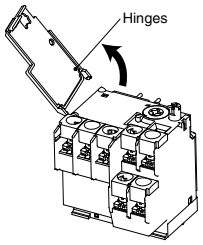
■ Ratings and Types

Product name	Release length [mm]	Mass [g]	Used with	Type
			2E Thermal Overload Relay	
Thermal Overload Relay Reset Releases	300	30	TK12, TK25 and TK26 (Packaged together with Reset Releases for the TR-0N and 5-1N.)	**SZ-R1**
	500	40		**SZ-R2**
	700	50		**SZ-R3**

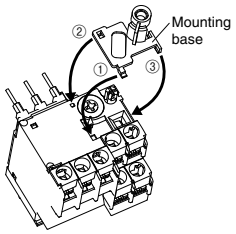
■ Mounting Procedure

- SZ-R1, R2, R3

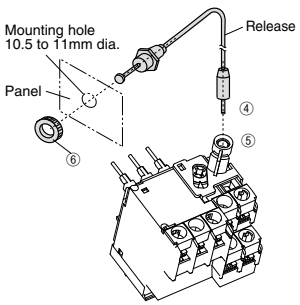
(1) Remove the front cover.
The cover can be easily removed as shown in the figure if you hold the cover near the hinges and pull strongly.



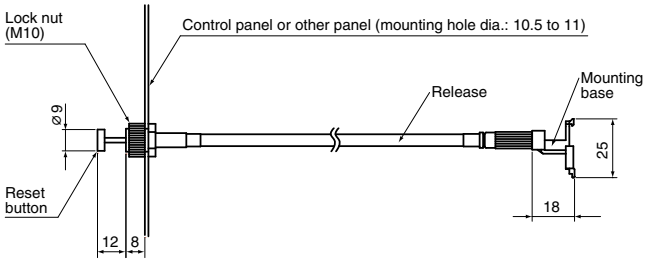
(2) Insert the tab ① on the mounting base into the hole in the Thermal Relay and then latch the tabs ② and ③. To remove the mounting base, use a fine screwdriver to disengage tabs ② and ③.



(3) Tighten the male thread ④ on the Release in the female thread ⑤ on the mounting base. Remove the nut ⑥ from the Release, insert the Release through the panel from the back of the panel, and tighten the nut ⑥ from the front of the panel to secure the Release.

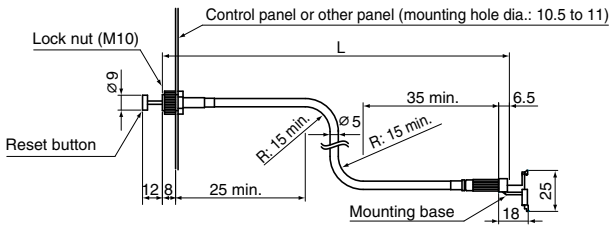


■ Dimensions, mm



⚠Caution Precaution for Correct Use

- When mounting the Release, do not allow the lead to bend within 25mm from the panel and within 35mm of the mounting base.
- Do not bend the lead of the Release to a radius of less than 15mm. (Refer to the figure on the right.)
- Prepare a mounting hole with a diameter of 10.5 to 11mm.



Separate Mounting Unit for Thermal Overload Relay

TZ1H26N

■ Features

- By combining this unit with a thermal overload relay for a magnetic starter, it can be used as a thermal overload relay for separate mounting.
- Screw mounting and rail mounting using an IEC top hat type of rail (35 mm width) are available.

■ Ordering Information (Types)

- Separate Mounting Unit for Thermal Overload Relay

TZ1H26N Note: An order can also be made with the product type code.

① Type

■ Types

Product name	Applicable thermal overload relay	Type
Separate Mounting Unit for Thermal Overload Relay	TK12	**TZ1H12N**
	TK26	**TZ1H26N**

■ Mounting Procedure

(1) Fully loosen the terminal screws of the separate mounting unit.
(2) Insert the connecting wires of the thermal overload relay, along the insertion guide of the separate mounting unit (Figure 1).
(3) Press the thermal overload relay in the direction of the arrow, and confirm that the lower section of the thermal overload relay is securely engaged with the hooks (2 locations) of the separate mounting unit (Figure 2).

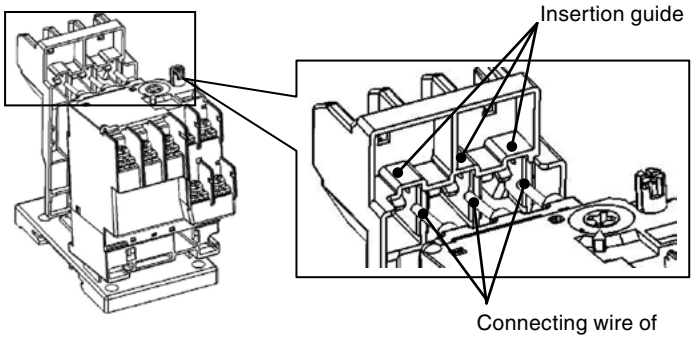


Figure 1

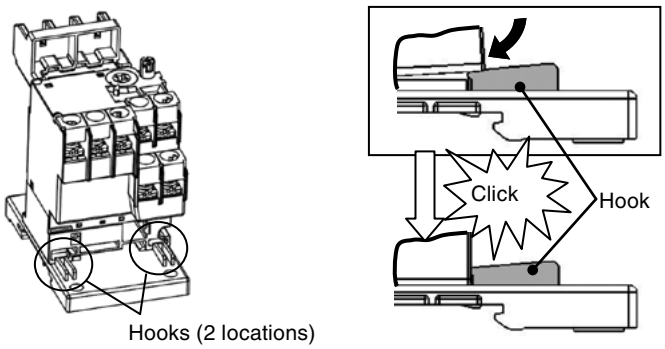
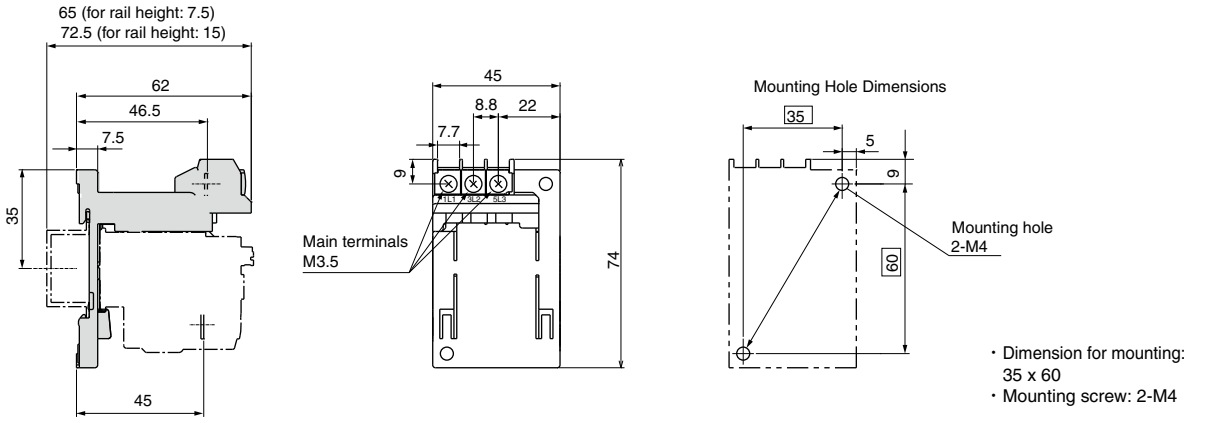


Figure 2

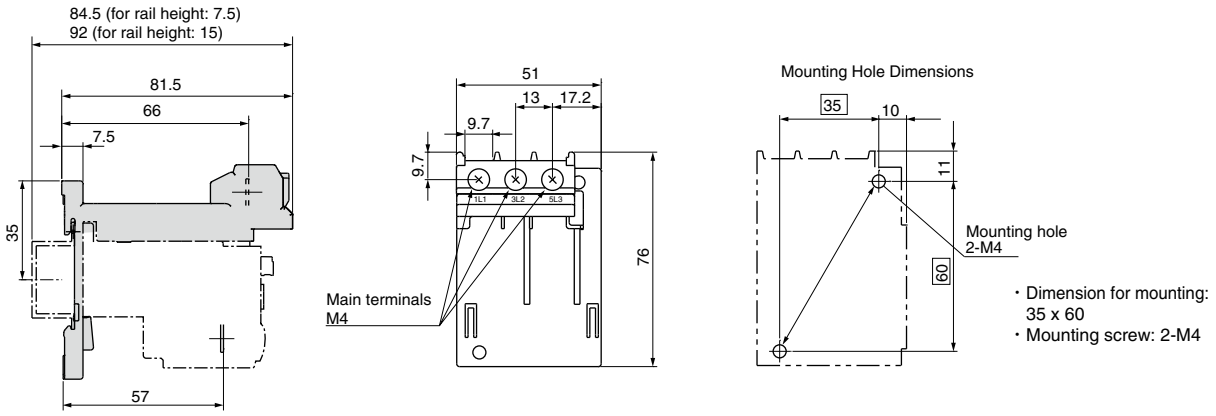
■ Dimensions

●TZ1H12N



Mass: 30g

●TZ1H26N



Mass: 40g

Link Module and Power Connection Kit for Reversing (Insert)

Link Module and Power Connection Kit for Reversing (Insert)

■ Features

- Connect a Manual Motor Starter and a Magnetic Contactor directly through a Link Module.
- A Reversing Connection Kit (Insert) for Combination Starters has joined the lineup.

BZ0LRK12AA

SZ1KRW1M

■ Types

● Link Module/Spacer : Electrically and mechanically connects a Manual Motor Starter and Magnetic Contactor.

Link Module	Applicable MMS	Applicable Magnetic Contactors	Type
(for SK06, SK09, SK12)  Photo No. KKD11-101	BM3RSB BM3RHB	SK06, SK09, and SK12	**BZ0LRK12AA**
(for SK18, SK22) NEW  Photo No. KKD15-219	BM3RSB BM3RHB BM3RSR BM3RHR	SK18A, SK18G SK22A, SK22G	**BZ0LRK22AA**
(for SK32 type) NEW  Photo No. KKD15-221		SK32A, SK32G	**BZ0LRK32AA**
Spacer (for SK18A, SK22A, SK32A) NEW  Photo No. KKD15-223	-	SK18A SK22A SK32A	**BZ0LRKACA**

● Power Connection Kit for Reversing (Insert): Used to reverse the circuit wiring between the main circuit terminals.

	Wire size	Number of conductors per set	Applicable MMS	Applicable types	Type
 Photo No. KKD11-113	1.6 dia.	・One set for power supply side ・One set for load side	BM3RSB BM3RHB	SK06, SK09, and SK12	**SZ1KRW1M**

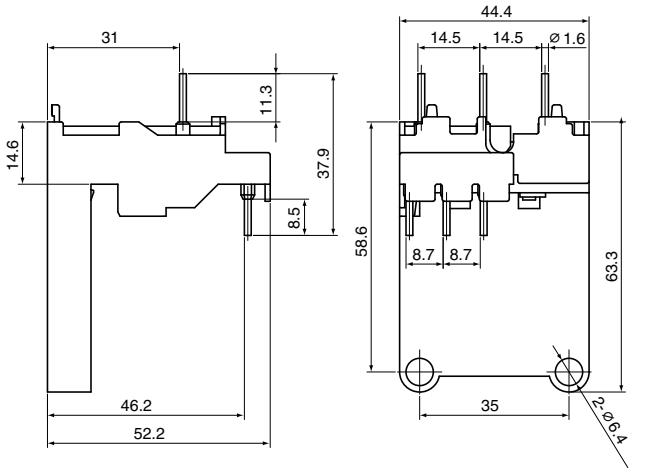
● Combination Starter Configuration Table

Applicable MMS	Applicable magnetic contactor	Operating coil	Link module	Spacer
BM3RSB BM3RHB BM3RSR BM3RHR	SK06A, SK06G, SK06L SK09A, SK09G, SK09L SK12A, SK12G, SK12L	AC DC	BZ0LRK12AA	–
	SK18A SK22A	AC *1	BZ0LRK22AA	BZ0LRKACA
	SK18G SK22G	DC		–
	SK32A	AC *1	BZ0LRK32AA	BZ0LRKACA
	SK32G	DC		

*1 For an AC coil product (AC-operated type), a spacer is necessary besides a link module.
Note: When combining with SK18, SK22 or SK32 types, you can use only an MMS with the changed slider. When ordering an MMS with the changed slider, please order this item with "NEW" appended to the product type code.

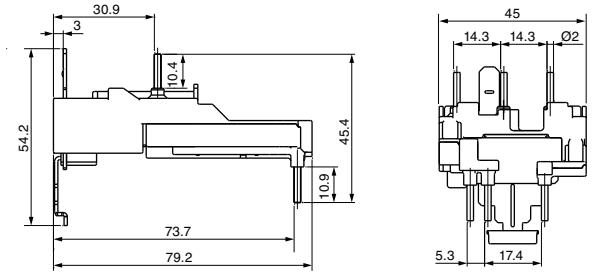
■ Dimensions, mm

● Link Module
BZ0LRK12AA



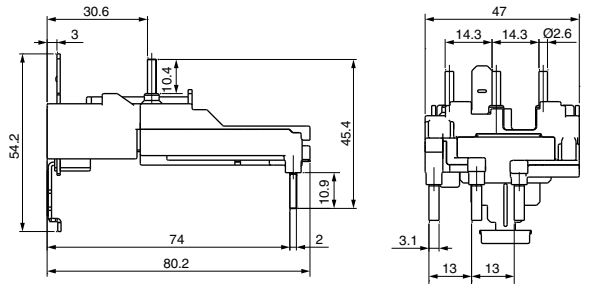
Mass : 25g

● Link Module
BZ0LRK22AA



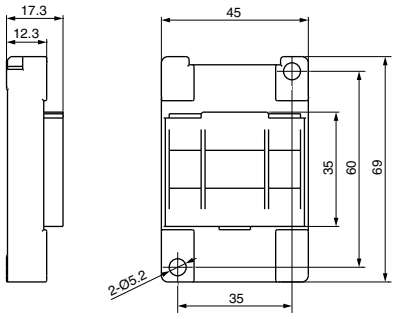
Mass: 35g

● Link Module
BZ0LRK32AA



Mass: 41g

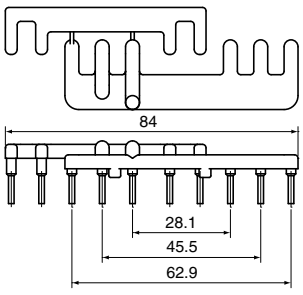
● Spacer
BZ0LRKACA



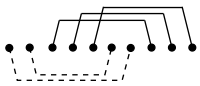
Mass: 20g

● Power Connection Kit for Reversing (Insert)
SZKRW1H

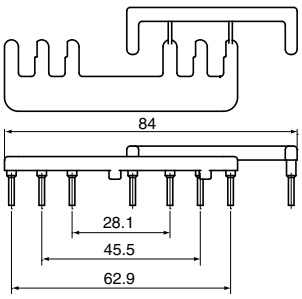
[Insert for Power Supply Side]



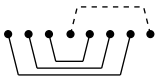
Mass : 17g



[Insert for Load Side]



Mass : 13g



The dotted line indicates wiring for an electrical interlock when the integrated auxiliary contact is 1NC x 2. When the integrated auxiliary contact is 1NO x 2 or when wiring is not necessary, only the main circuit should be used by separating this section.

■ Features

- International safety standards for standard models (IEC, GB, JIS, UL, and CSA).
- Models available with AC, DC, or low-power DC operating coils.
- Bifurcated contact for more reliable contact for micro-loads of 3mA at 5V DC.
- Models with high-capacity contacts (single button contact) are also available.
- Configure a wide range of contacts in combination with Auxiliary Contact Blocks.

SKH4A

■ Ordering Information (Types)

- Auxiliary Relays

SKH4 A H - E 22
① ② ③ ④ ⑤ ①Series ②Operating coil ③Contact specification ④Coil voltage specification ⑤Contact arrengement

■ Ratings

Refer to Auxiliary Contact Ratings on page 11.

■ Types

Operating coil specification ②	Contact specification ③	Coil voltage specification ④	Contact arrengement ⑤	Type
AC-operated types [A]	Bifurcated contact [blank]	24V [E] 120V [K] 380V [S] 48V [F] 200V [2] 400V [4] 100V [1] 220V [M] 440V [T]	4NO	SKH4A-□40
			3NO+1NC	SKH4A-□31
			2NO+2NC	SKH4A-□22
	Single button contact [H]	110V [H] 240V [P] 500V [5]	4NO	SKH4AH-□40
			3NO+1NC	SKH4AH-□31
			2NO+2NC	SKH4AH-□22
DC-operated types (2.4W) [G]	Bifurcated contact [blank]	12V [B] 100V [1] 210V [Y] 24V [E] 110V [H] 220V [M] 48V [F] 120V [K]	4NO	SKH4G-□40
			3NO+1NC	SKH4G-□31
			2NO+2NC	SKH4G-□22
	Single button contact [H]	60V [G] 200V [2]	4NO	SKH4GH-□40
			3NO+1NC	SKH4GH-□31
			2NO+2NC	SKH4GH-□22
DC-operated types (1.2W) [L]	Bifurcated contact [blank]	12V [B] 24V [E] 48V [F]	4NO	SKH4L-□40
			3NO+1NC	SKH4L-□31
			2NO+2NC	SKH4L-□22
	Single button contact [H]		4NO	SKH4LH-□40
			3NO+1NC	SKH4LH-□31
			2NO+2NC	SKH4LH-□22

Note. "□" in the type column is replaced with the coil voltage code.

■ Performances

● Durability (Based on IEC 60947-5-1)

Type	Number of contacts	Operating cycles per hour [times/hour]	Mechanical durability	Electrical durability					
				AC-15		AC-12		DC-13	DC-12
				220V	440V	220V	440V	220V	220V
SKH4	4	1800	10 million	500,000	500,000	250,000	250,000	250,000	500,000

■ Combinations with Auxiliary Contact Blocks

SK-Series Auxiliary Relays and Auxiliary Contacts Blocks can be combined as shown in the following table. Other combinations are not possible.

Auxiliary Contact Block / Auxiliary Relay type	Type	SZ1KA40 SZ1KA40H	SZ1KA31 SZ1KA31H	SZ1KA22 SZ1KA22H	SZ1KA13 SZ1KA13H	SZ1KA04 SZ1KA04H	SZ1KA20 SZ1KA20H	SZ1KA11 SZ1KA11H	SZ1KA02 SZ1KA02H	SZ1FA11 SZ1FA11H
	Auxiliary contact arrangement	4NO	3NO+1NC	2NO+2NC	1NO+3NC	4NC	2NO	1NO+1NC	2NC	1NO+1NC
		Combined auxiliary contact arrangement								
SKH4A SKH4AH SKH4G SKH4GH	4NO	8NO	7NO+1NC	6NC+2NC	5NO+3NC	4NO+4NC	6NO	5NO+1NC	4NO+2NC	5NO+1NC
	3NO+1NC	7NO+1NC	6NO+2NC	5NO+3NC	4NO+4NC	3NO+5NC	5NO+1NC	4NO+2NC	3NO+3NC	4NO+2NC
	2NO+2NC	6NO+2NC	5NO+3NC	4NO+4NC	3NO+5NC	2NO+6NC	4NO+2NC	3NO+3NC	2NO+4NC	3NO+3NC
SKH4L SKH4LH	4NO	–	–	–	–	–	6NO	5NO+1NC	4NO+2NC	5NO+1NC
	3NO+1NC	–	–	–	–	–	5NO+1NC	4NO+2NC	3NO+3NC	4NO+2NC
	2NO+2NC	–	–	–	–	–	4NO+4NC	3NO+3NC	2NO+4NC	3NO+3NC

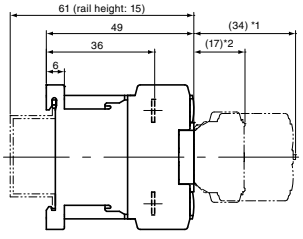
■ Linked Contact Compliance (Compliance with Requirements of IEC60947-5-1 Annex L)

Auxiliary Contact Block / Auxiliary Relay type	No Auxiliary Contact Block	SZ1KA□		SZ1FA11	SZ1KA□H		SZ1FA11H
		4-pole	2-pole		4-pole	2-pole	
SKH4A SKH4AH	○	×	×	×	×	×	×
SKH4G SKH4GH	○	×	×	○	○	○	○
SKH4L SKH4LH	○	–	○	○	–	○	○

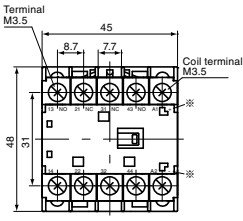
○ : Complies.
× : Does not comply.

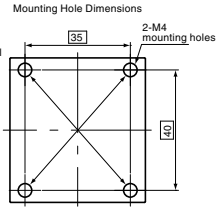
■ Dimensions, mm

SKH4



[NOTE]
*1: With SZ1KA□ Auxiliary Contact Blocks.
*2: With SZ1FA□ Auxiliary Contact Blocks.





Mounting screws: 2-M4 screws
Mount the Auxiliary Relay with two mounting holes in diagonally opposed corners.

Auxiliary contacts	Contact arrangement
4NO	13 23 33 43 A1 (+) ※ / 14 24 34 44 A2 (-) ※
3NO+1NC	13 21 33 43 A1 (+) ※ / 14 22 34 44 A2 (-) ※
2NO+2NC	13 21 31 43 A1 (+) ※ / 14 22 32 44 A2 (-) ※

※For DC-operated types.

Mass : 0.14kg (SKH4A)
0.17kg (SKH4G and SKH4L)

■ MEMO

⚠ Safety Considerations

- Operate (keep) in the environment specified in the operating instructions and manual. High temperature, high humidity, condensation, dust, corrosive gases, oil, organic solvents, excessive vibration or shock might cause electric shock, fire, erratic operation or failure.
- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult with Fuji Electric FA.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.
- Follow the regulations of industrial wastes when the product is to be discarded.
- For further questions, please contact your Fuji sales representative or Fuji Electric FA.

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