



Magnetic motor starters
SW series



Enclosed with pushbuttons



Magnetic contactors
SC series



Solid-state contactors

■ MAGNETIC CONTACTORS AND STARTERS

■ THERMAL OVERLOAD RELAYS

■ SOLID-STATE CONTACTORS



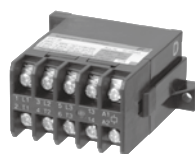
Magnetic motor starters
SW series



Reversing motor starters
SW series



Solid-state contactors



Magnetic contactors
FC series



Thermal overload relays

LOW
VOLTAGE
EQUIPMENT
Up to 600 Volts

INDIVIDUAL CATALOG 01

from D&C CATALOG 20th Edition

01 02 03 04 05 06 07 08 09 10 11 12



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Magnetic Contactors and Starters

SC and SW series

Design features

SC-03, 0, 05, 4-0, 4-1, 5-1 SC-N1, N2, N2S, N3

Description

Small frame contactors with new functions join the SC series.

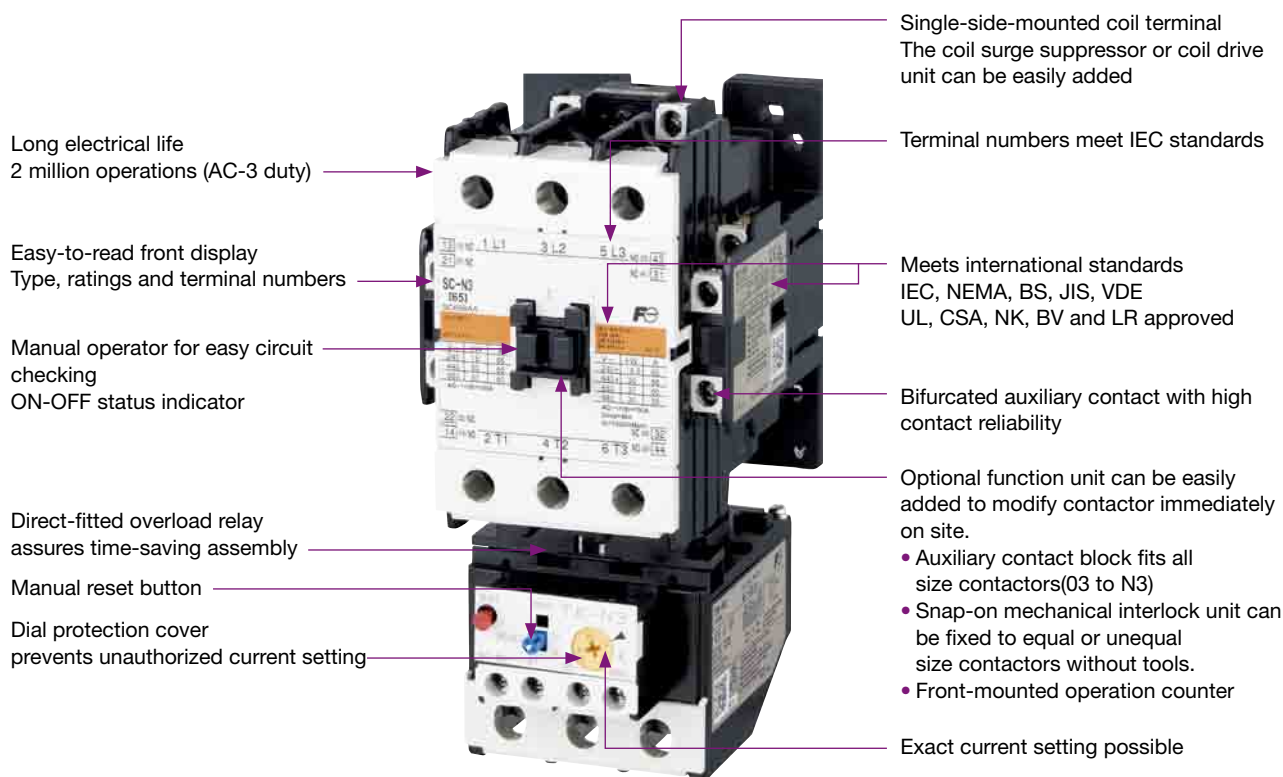
The SC line up, which is based on high level technology, now extends from the SC-03 to the SC-N16.

The SC series contactors have such options as additional auxiliary contact blocks and operation counter unit with snap-on fittings, and coil surge suppressors. Modification can be made quickly and easily on site.

Improved contact materials and structure double the electrical life compared with existing contactors 2 million operations.

Bifurcated type auxiliary contacts have a high degree of contact reliability.

Therefore, they can be used in low-level circuits of 5V, 3mA and directly input to electronic equipment.



Easy modular system

Side mounting

Auxiliary contact block
Single pole (1NO + 1NC)

Mechanical interlock unit

The mechanical interlock unit is used to interlock two contactors for reversing. One size fits all contactors.

Main circuit surge suppression unit

This unit prevents miss-operation of electronic controllers due to motor surge voltages.

Coil drive unit

Coil surge suppression unit

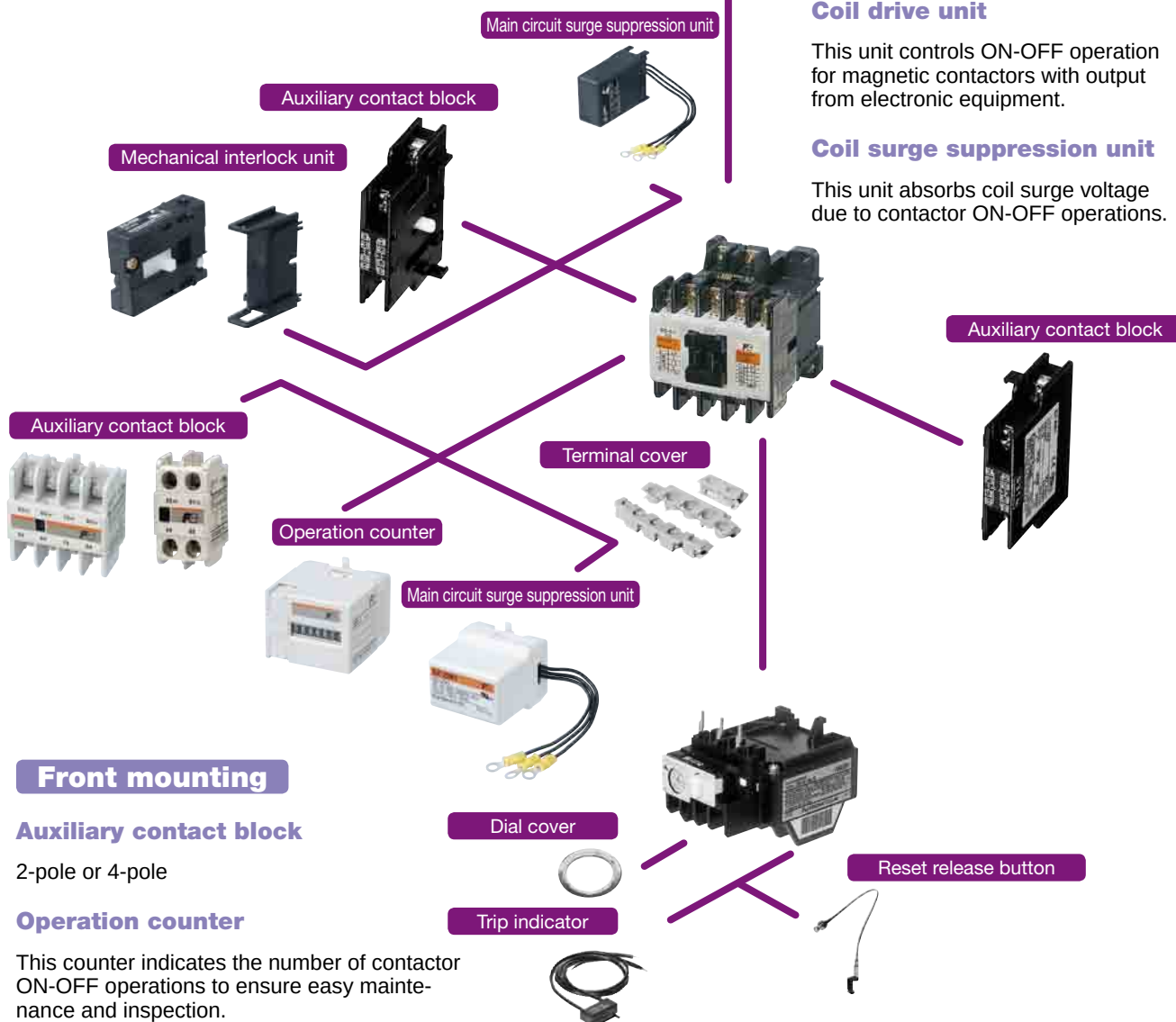
Top mounting

Coil drive unit

This unit controls ON-OFF operation for magnetic contactors with output from electronic equipment.

Coil surge suppression unit

This unit absorbs coil surge voltage due to contactor ON-OFF operations.



Front mounting

Auxiliary contact block

2-pole or 4-pole

Operation counter

This counter indicates the number of contactor ON-OFF operations to ensure easy maintenance and inspection.

Main circuit surge suppression unit

Further information

See page 01/69

Magnetic Contactors and Starters

SC and SW series

Design features

SC-N1 to N16

Description

FUJI SC series (SC-N6 to N16) contactors have been developed and manufactured using FUJI's most advanced electronic technologies. They employ an electronically-controlled SUPER MAGNET which is provided with a built-in IC, thus enhancing their performance and reliability. The SUPER MAGNET is based on an "AC-input, DC-operated concept", thus allowing the coil to be energized by both AC and DC input. Moreover, once closed, sealed current is controlled by switching circuit. This permits a great reduction in power consumption – a cost-effective feature.

The SC-N1 to SC-N5A do not have the SUPER MAGNET. These contactors feature compact size, arc extinguishing mechanisms with a high breaking efficiency, low power consumption, easy operation, and ratings up to 660 volts.



Features of the SUPER MAGNET

- Operates on both AC and DC power supply
- Has a wide operational voltage range
- No tendency to "chatter"
- Eliminates contact welding or coil burning
- Reduces power consumption

In addition the FUJI SC-N series contactors employ bifurcated auxiliary contacts which improve contact performance and permit them to be used in conjunction with programmable logic controllers.

FUJI SC-N series contactors are the most suitable for new FA age applications which require the most advanced electronic technologies and maximum dependability.

The FUJI SC series conforms to and has been approved by various international standards.

Specifications			Contactors		Starters(open)	
			Non-reversing	reversing	Non-reversing	reversing
No.of thermal overload relay heater elements			-	-	3	3
Type			SC-□	SC-□RM	SW-□/3H	SW-□RM/3H
Conformed	New JIS	Japan	●	●	●	●
	IEC	International	●	●	●	●
	BS	UK	●	●	●	●
	EN	Europe	●	●	●	●
Approved	UL	USA	●	●	●	●
	CSA	Canada	●	●	●	●
	CCC	China	● *	● *	-	-
EC Directives	CE Marking	Europe	●	●	●	●
Inspection Institute	TÜV	Germany	●	●	●	●

Notes

- : Conforming to Standard
- UL/CSA : A new certification mark that indicates compliance with both Canadian and U.S.requirements.
- : Frame size N1 to N14 and N16(Contactor only)
- * : When ordering the ccc standard type, add(ccc)suffix to the type number.

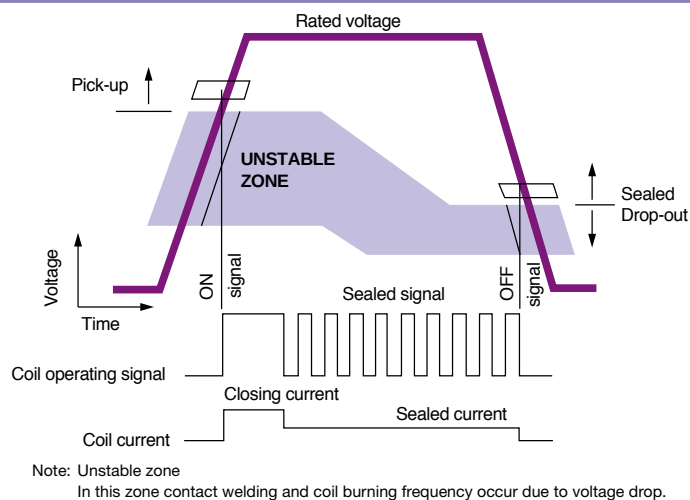
Advantages of SUPER MAGNET

● Positive pick-up and drop-out

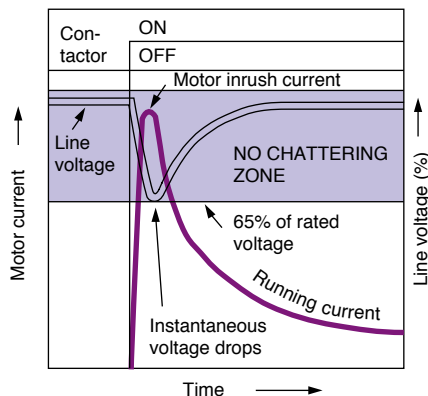
The SUPER MAGNET operation is electronically controlled. There is no unstable zone as will be seen in the diagram—an outstanding feature that other contactors can not provide. Chattering is a phenomenon which occurs when the gravitational force of the starter magnet decreases through the line voltage drop at the time of motor starting. This may cause damage such as contact welding or coil burning.

The SUPER MAGNET holds without chattering even if the line voltage drops to 65% of its rated value, so preventing this type of trouble.

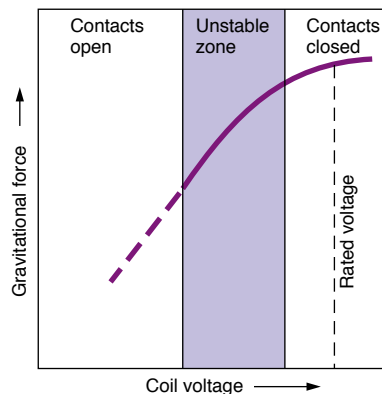
IC-controlled SUPER MAGNET



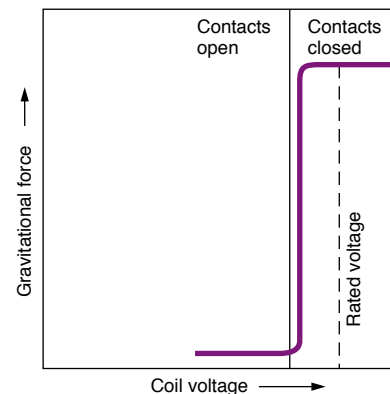
Motor starting



Existing series



SC-N series



● Operation on both AC and DC inputs

The rated operational voltage range of the SC-N series contactors has been greatly expanded. They operate on both AC (50/60Hz) and DC inputs.

Coils (SC-N6 to SC-N16)

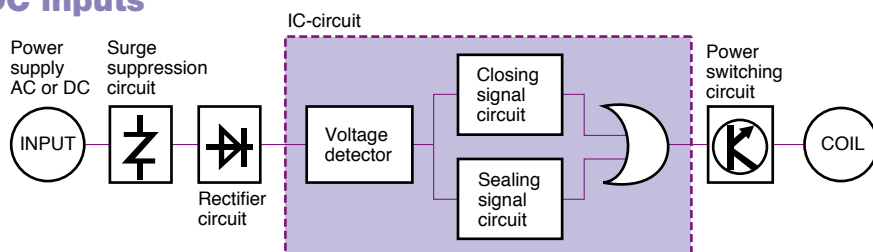
Rated voltage	Rated coil voltage, frequency	
	AC	DC
24V	24–25V 50/60 Hz	24V
48V	48–50V 50/60 Hz	48V
100V	100–127V 50/60 Hz	100–120V ^{*1}
200V	200–250V 50/60 Hz	200–240V ^{*2}
300V	265–347V 50/60 Hz	—
400V	380–450V 50/60 Hz	—
500V	460–575V 50/60 Hz	—

Notes: SC-N6 to N12: 24V–575V

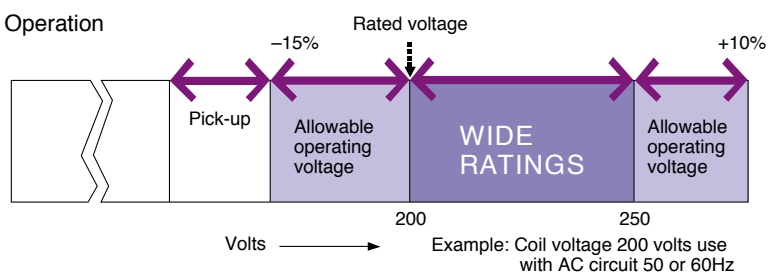
SC-N14 to N16: 100V–575V

^{*1} : The coil voltage from a DC power supply with single phase full-wave rectification will be 100 to 110 V.

^{*2} : The coil voltage from a DC power supply with single phase full-wave rectification will be 200 to 220 V.



Operation



For further information

See page 01/22

Magnetic Contactors and Starters

SC and SW series

Design features

Safety

Terminal cover for finger protection

These optional terminal covers comply with VBG4 (German Rules of Accident Prevention), IEC60529, DIN57106, VDE0106 Teil100, which are recommendations for preventing exposure to live parts. The terminal cover satisfies the requirements of Machinery Directive EN60204-1 "Direct Contact Prevention" concerning mechanical safety.



Insulation Improved tracking resistance

Tracking resistance of the molded parts comprising of the conductive block has been improved.

Comparative Tracking Index (CTI) : 175V or higher

Tracking : It means the route of the leak electric current caused on the surface of the isolation body.

Standard heat-proof material

The molded parts used are made of heat-proof materials specified in UL94 (UL94 : STANDARD FOR SAFETY FOR TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN DEVICES AND APPLIANCES).

Mirror contacts (Positively safety contacts)

The contactor with mirror contacts has been certified by TÜV. Mirror contact conforms to the requirement for auxiliary contact that is intended to be included in the future amendment to IEC 60947-4-1.

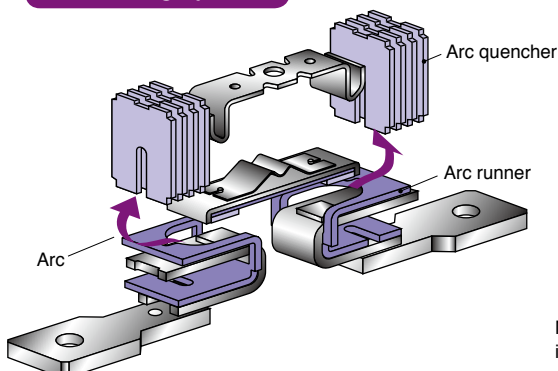
Mirror contact : Normally closed auxiliary contact, which cannot be in closed position simultaneously with the normally open main contact.

Free arc space

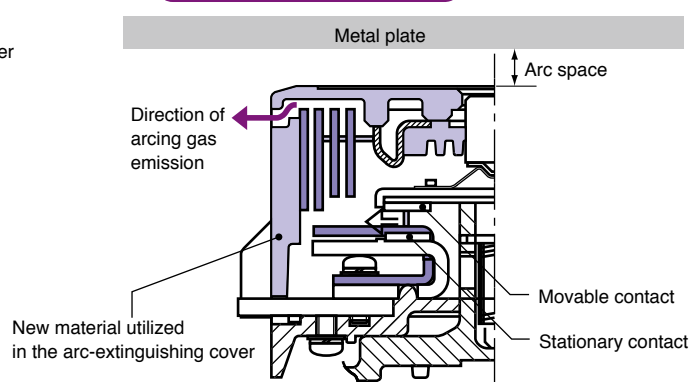
A new arc-extinguishing method, which makes full use of magnetic field analysis technology, and a new material (UL94V-0) that has been incorporated into the design of this new type of arc-extinguishing chamber to provide a free arc space. This new method and design reduces the depth size, not only of the main body, but also that of the board (Types SC-N1 to N12).

Free arc space : It means arc space is not needed on making and breaking condition according to IEC 60947-4-1. (Refer to chart Arcing gas cooling block.)

Arc driving system (explanation only)



Arc gas cooling system (explanation only)



Utility

Special type “/G” for DC operation added to SC-N1 to N5 series

A new type of “/G” has been added to SC-N1 to N5 types for DC operation.

Power input and consumption have been considerably reduced by introducing a full voltage-applying coil.



Bifurcated auxiliary contact system

Bifurcated auxiliary contact system

By employing a bifurcated contact system, higher contact reliability is achieved for service at 5V DC, 3mA (Types SC-N1 to N12).

Ecology

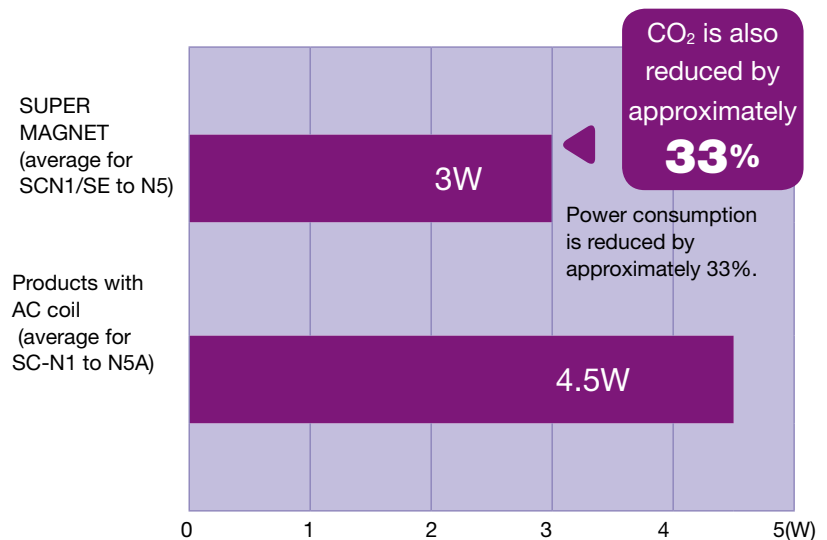
Motor starter manufactured at ISO9001 and ISO14001-certified factory

Fuji Electric has been certified for both ISO9000 series and ISO14000 series compliance. Both standards are established by the International Organization for Standardization (ISO). The former is for quality control and quality assurance, while the latter is for environmental management systems. Certified for ISO9001 and ISO14001, our Fukiage Factory, which manufactures motor starters, puts great effort into establishing a highly reliable quality assurance system and a development and production structure which takes environmental protection into account.

Reducing Power Consumption

The use of a new type of super magnet that applies 3D magnetic field analysis has enabled greatly reducing power consumption.

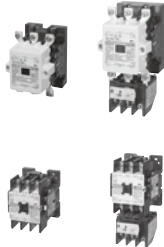
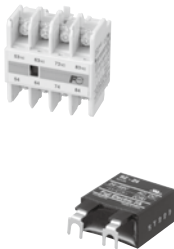
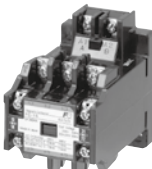
This reduces CO₂ emissions by 33% over products with AC coils (average for SC-N1/SE to N5 (inhouse comparison)).



Magnetic Contactors and Starters

General information

■ Overview of Product Series

Series		Page	Features	Main models and model numbers	
SC Series (Basic Series)	Magnetic Contactors and Starters	01/1 } 01/65	- Electrical life: 2,000,000 operations (SC-N3 or smaller) - Bifurcated auxiliary contacts for greater reliability - Compliance with international standards (UL, CSA, IEC, LR, BV, etc.) - Easier to use (structured to enable easy coil replacement). - High operating reliability due to a super magnet with built-in IC (SC-N6 or larger). (Prevents coil burning due to voltage fluctuations and contact fusing due to floppy operation; enables using the same coils for AC/DC, increases the range, reduces switching noise, etc.) - Mirror contacts are a standard feature. - A wide range of options	Models	Type
	 (No.KK04-090,49 1KK05-053, 056)			- Standard type - Reversible type - DC-operating type - Mechanical-latch type - Heavy starting duty type - With quick operating type thermal relay - With 2E thermal relay - With 3E relay	SC-□, SW-□ SC-□RM, SW-□RM SC-□/G, SW-□/G, SC-□/SE, SW-□/SE SC-□/V, /VG,VS SW-□/3L SW-□/3Q SW-□/2E SW-□/2E + QE-20N
	Optional Units	01/66 } 01/77	- Greatly increase the functionality of Magnetic Switches. - Unit construction for easy installation. - Three-direction Units that switch between front-on, side-on, and top-on operation depending on the mounting direction.	Models	Type
	 (No.KKD06-013, 021)			Auxiliary contact block Operation counter unit Main circuit surge suppression unit Mechanical interlock unit Power connection kit for reversing Coil drive unit for IC output 3-pole parallel plate terminal Coil surge suppression unit Base unit for separate mounting	SZ-A□ SZ-J□ SZ-ZM□ SZ-RM SZ-RW□ SZ-CD□ SZ-SP□ SZ-Z□ SZ-H□
SB Series	DC Magnetic Contactors	01/78 } 01/80	- Ideal for DC motor control and DC circuits of 360 A or less. - Compact and lightweight. - Models available with DPST-NO/SPST-NC main contacts with NC contacts for a dynamic brake. 5N and larger models feature a super magnet with a built-in IC for high operation reliability. - UL/CSA-compliant models are also available.	Models	Type
	 (No.KKD06-013, 021)			Standard type DC-operating type Standard type with DPST-NO/SPST-NC contacts DC-operating type with DPST-NO/SPST-NC contacts	SB-□ SB-2N/SE, SB-□ SB-□B SB-2NB/SE, SB-□B
FC Series	Magnetic Contactors and Starters	01/81 } 01/87	- The best in durability, easy-to-use performance. - Compact: 2/3 or previous models - Electrical durability: 250000 - Mechanical durability: 1 million - Various terminal types available (0 type). - Screw terminals (Standard type) - Tab terminals - P.C. board direct-mounting terminals - Low-voltage-operating type: For the minimum operating voltage, stable operation is possible even if voltage drops to 75% of the rated voltage or 70% of the rated voltage when main contacts are in contact. - UL/TUV-compliant models are also available.	Models	Type
	 (No.KKD05-266)			Standard type Tab terminal type P.C.board direct-mounting type DC-operating type Enclosed type Magnetic switch with pushbutton	FC-□, FW-□ FC-0T FC-0A FC-□/G FW-□C FW-□P

Magnetic Contactors and Starters

General information

	Frame size	03	0	05	4-0	4-1	5-1	N1	N2	N2S	N3	N4	N5	N6	N7	N8	N10	N11	N12	N14	N16		
	Rated current (A)	11	13	13	18	19	19	26	35	50	65	80	93	125	152	180	220	300	400	600	800		
																					*1		
																					*1		
*1 Magnetic Contactors only																							

	Overview	Models	Type	Overview
	Enables easily adding auxiliary contacts.	Trip indicator	SZ-L □	Indicates the tripping status of the thermal relay.
	Displays the number of switching operations of the Magnetic Contactor.	Reset release button	SZ-R □	Used for remote control of thermal relay resetting.
	Protects a three-phase motor from surge voltages.	Dial cover	SZ-DA	Prevents changes to the current setting of thermal relay.
	Used to interlock a reversible Magnetic Switch.	Terminal cover	SZ-T □	Prevents exposure of charged terminal section.
	Used to wire the main circuits of a reversing contactors and starters.	Live-section cover	SZ-JC □, SZ-JW □, SZ-□J	Prevents exposure of charged terminal section.
	Enables driving a coil with a transistor output.	Insulation barrier	SZ-B □	Prevents exposure of charged terminal section and short-circuits between phases.
	Used to assemble a stand-alone, resistive-load Magnetic Contactor.	Contact protector	SZ-RC □	Prevents contact wear cause by material transfer.
	Provides protection against surge voltages with the coil is turned OFF.	Fault detector unit	SZ-F-□/M	Detects errors in the voltage across the load.
	Used to assemble a stand-alone Thermal Relay.	OFF-delay release unit	SZ-□/DE	Holds the closed-circuit status during momentary power interruptions.

[illegible][illegible]

	Frame size	0A	0T	0	0S	1	1S	2S	3	4	—	—	—	—	—	—	—
	Rated current (A)	8	12	12	15	20	26	35	50	65	—	—	—	—	—	—	—

[illegible]

Magnetic Contactors and Starters

General information

■ Overview of Product Series

Series		Page	Features	Main models and types	
TR/TK Series	Thermal overload Relays	01/88 ∩ 01/100	• New models added to the series: Standard (overload protection with 3 elements), 2E (overload + phase loss), long time operation (3 elements), Quick operation. • Independent SPST-NC/SPST-NO auxiliary contacts. • Switchable between manual and automatic resetting. • A wide range of options.	Models	Type
				• Standard type • 2E type • Long time operating type • Quick operating type	TR-□/3, TR-□H/3 TK-□, TK-□H TR-□L/3, TR-□LH/3 TR-□Q, TR-□QH
SS Series	Solid-state Contactors	01/101 ∩ 01/115	• These Solid-state Contactors are non-contact semiconductor contactors that provide the characteristics of magnetic contactors. • Long life and quiet operation. • Cooling fan included in one-piece structure. • AC control is also possible. • Surge absorber included. • Lineup includes models with zero-cross switching function. • A wide range of rated voltages. • Operating indicator (LED) included as standard feature. • Built-in auxiliary output module.	Models	Type
				• Single-pole type (main circuit 240V AC) • Single-pole type (main circuit 480V AC) • 3-pole type (main circuit 240V AC) • 3-pole type (main circuit 480V AC)	SS□1 SS□1H SS□2, SS□3 SS□2H, SS□3H

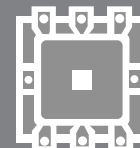
Magnetic Contactors and Starters

General information

	Frame size	0N	5-1N	N2	N3	N5	N6	N7	N8	N10	N12	N14		
	Ampere setting range [A]	0.1-13	0.1-18	4-42	7-105	18-105	45-160	45-160	65-185	85-240	110-450	240-600		
	Frame size	SS03	SS08	SS10	SS20	SS30	SS40	SS50	SS70	SS80	SS100	SS120	SS150	SS200
	Rated themal current [A]	3	8	10	20	30	40	50	70	80	100	120	150	200

01

Magnetic Contactors and Starters Solid-state Contactors



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MINIMUM ORDERS

Orders amounting to **less than ¥10,000** net per order will be charged as ¥10,000 net per order plus freight and other charges.

WEIGHTS AND DIMENSIONS

Weights and dimensions appearing in this catalog are the best information available at the time of going to press.

FUJI ELECTRIC FA has a policy of continuous product improvement, and design changes may make this information out of date.

Please confirm such details before planning actual construction.

INFORMATION IN THIS CATALOG IS SUBJECT TO CHANGE WITHOUT NOTICE.

FUJI low-voltage contactors and starters are available in a broad choice of types, from high-performance to economy, for all consumer and industrial needs. For standard applications, we offer the high-performance SC series. We offer the economical F series for light industrial use, the SB series dedicated to DC circuits, and the SS series with long service-life noise-free solid-state contactors.

SC and SW series

Standard type magnetic contactors and starters

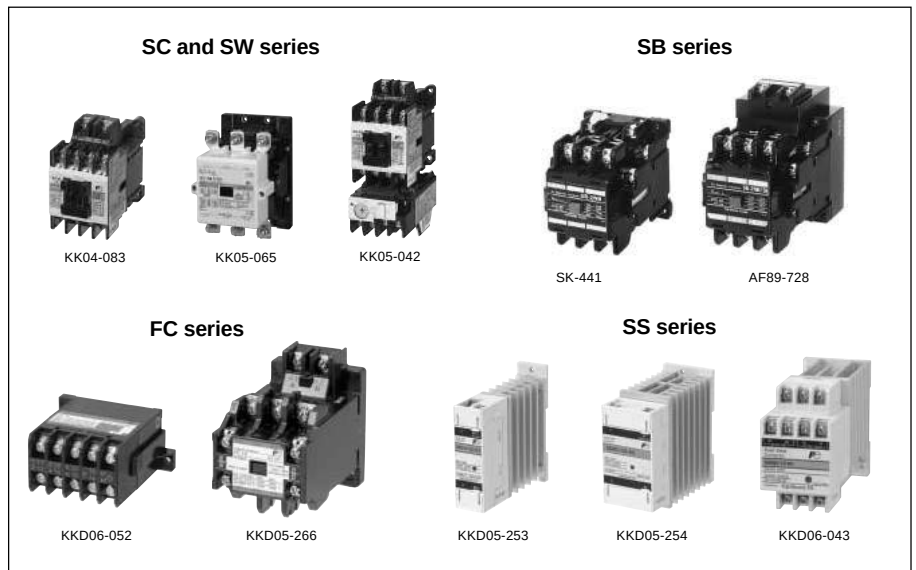
The SC series is a range of long service-life and high-performance contactors. SC-03 to SC-N3 small-frame contactors provide snap-on fitting of numerous optional units, such as auxiliary contact blocks, coil surge suppressors, and operation counters. Field modifications are quick and easy to make.

Type SC-N6 and above contactors come with an IC-controlled SUPER MAGNET coil, which operates from both AC and DC sources, to eliminate burnt coils and contact chattering caused by voltage fluctuation.

SB series

DC magnetic contactors

We developed the SB series DC contactors from our SC series AC contactors. Applications include opening and closing DC circuits and controlling DC motors. They permit switching of DC loads up to 550V DC, 360A. There are two main contact arrangements available: the 2NO type and the 2NO + 1NC type, which has one NC contact for dynamic brake circuits. Type SB-5N and above contactors come with an IC-controlled SUPER MAGNET coil for improved operational stability.



FC and FW series

Definite purpose contactors and starters

The FC series contactors are compact and economical contactors designed for use in consumer appliances with relatively low switching frequencies. Typical applications include air conditioners, industrial washing machines, heaters, compressors, driers, and fans. Contactor pickup voltage is 75% of the rated voltage. FC-0 is available with tab and printed board terminals, as well as with self-lifting screw terminals.

SS series

Solid-state contactors

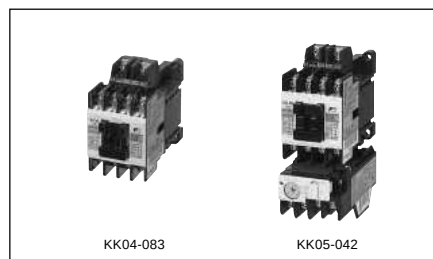
The SS series contactors employ a semiconductor that can withstand both high voltage and large overcurrent when making and breaking load circuits. The completely contactless design gives high performance, including long service life and noise-free operation. Applications include frequent making and breaking for motors, heaters, and similar circuits. A built-in surge absorbing varistor and CR circuit to protect the SSC from surges when switching inductive loads, and surges from external circuits.

DUO series
BM3 series manual motor starters,
SC-M and SC-E series magnetic
contactors
Refer to the Individual Catalog No.02.

Magnetic Contactors and Starters

SC and SW series

Versions



Standard type contactors and starters

Standard type is usually used to start and stop motors, and to open and close resistance loads like heaters or electric furnaces.
See page 01/25.



Contactors and starters with SUPER MAGNET

IC operated SUPER MAGNET prevents coil burning and contact welding due to voltage fluctuations
See page 01/25.



Enclosed type starters

Standard type starter are housed in a protective enclosure.
See page 01/33.



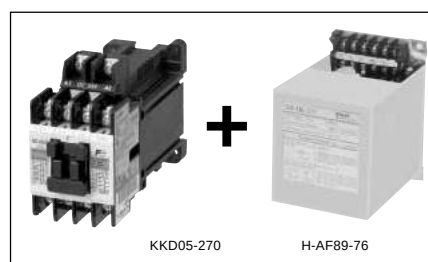
Reversing contactors and starters

This type is most suitable for reversing operation of 3-phase motors or plugging or braking.
See page 01/34.



DC-operated contactors and starters

Main circuit is AC, and operation is carried out by DC operating coil. This type is useful for applications in which control power source is independent.
See page 01/41.



OFF-delay release contactors and starters

This is a combination of DC-operated magnetic contactor and off-delay release unit. This prevents circuit opening due to instantaneous voltage drops.
See page 01/46.



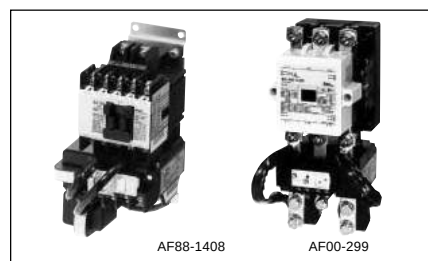
With extra pickup operating coil

These contactors are suitable for use in places with poor power supply conditions. These contactors operate normally even if the coil input voltage falls to 75% of the coil rated voltage.
See page 01/47.



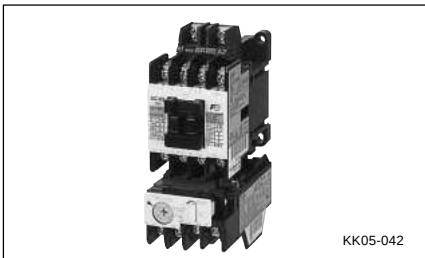
Mechanical latch contactors

Latch mechanism prevents the circuit from opening due to power failure, instantaneous power failure, or voltage drop of power source. This is suitable for change-over circuit and stand-by power supply equipment.
See page 01/48.



Heavy starting duty starters

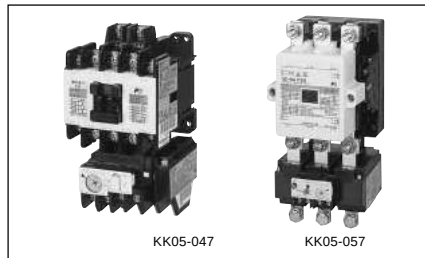
This is suitable for overload protection or stall prevention of motors with longer starting times such as those for blowers and fans having a large inertia.
See page 01/53.



KK05-042

Starters with quick-operating overload relay

With the attached quick operating type O/L relay, this is suitable for protecting submersible pumps or compressor motors with a small heat capacity.
See page 01/55.

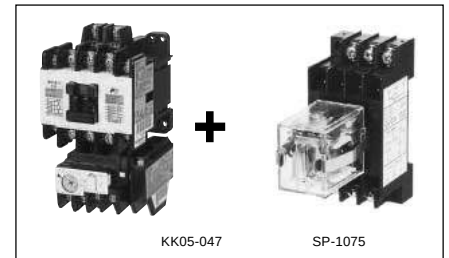


KK05-047

KK05-057

Starters with phase-loss protective device

The attached 2E thermal O/L relay protects against motor overload and as well as phase-loss.
See page 01/56.



KK05-047

SP-1075

Starters with phase-loss and phase-sequence protective device

By combining 2E thermal O/L relay and phase-sequence relay, motor overload, phase-loss and phase-sequence protection is obtained.
See page 01/58.



KKD06-010

Starters with on-off and RESET pushbuttons

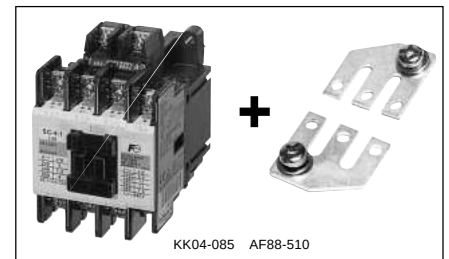
Pushbuttons for close and open are built in the enclosure. Suitable for simple operations.
See page 01/60.



SD-704

Dust-tight/light-corrosion resistant type starters

The enclosure is dust-tight and corrosion-proof, and so is suitable for locations with dusty or corrosive atmospheres.
See page 01/62.



KK04-085

AF88-510

Contactors for single-phase resistance load

This is a standard type magnetic contactor with a 3-phase parallel plate terminal. This is most suitable for on-off operation of electric heaters, water heaters and electric lights.
See page 01/63.



KKD06-036

With single-button auxiliary contacts

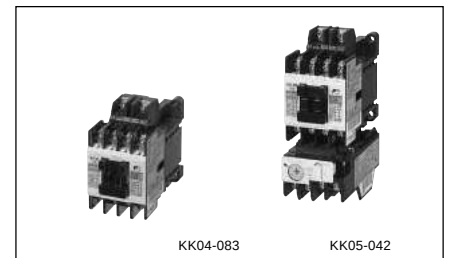
An auxiliary contact of a standard contactor is bifurcated. All SC-03H to SC-N12H contactor, however, feature single-button auxiliary contacts with a higher current rating than the contacts used by the standard contactor.
See page 01/64.



AF95-240

With quick connection terminals

No removing terminal screw is required. When contactor and starters with the quick connection terminals are shipped, these screws are inserted in the terminals section but make no contact. It reduces the number of wiring steps. Terminals with finger protection enable a high level of safety.
See page 01/65.



KK04-083

KK05-042

UL, CSA, TÜV and CCC approved motor starters and contactors

Many models of SC series conform to UL, CSA, TÜV and CCC requirements.
See page 01/120.

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Open type

■ Types and ratings/Non-reversing, Open

Frame size		03	0	05	4-0	Further information
Max. motor capacity (kW)	200–240V	2.5	3.5	3.5	4.5	
	380–440V	4	5.5	5.5	7.5	
AC-3, IEC 60947-4-1	500–550V	4	5.5	5.5	7.5	
	600–660V	4	5.5	5.5	7.5	
Operational current (A)	200–240V	11	13	13	18	
	380–440V	9	12	12	16	
	500–550V	7	9	9	13	
	600–660V	5	7	7	9	
Operational current (A)	AC-1	20	20	20	25	
Conventional free air thermal current (A)		20	20	20	25	
Auxiliary contact arrangement		1NO 1NC	1NO 1NC	1NO+1NC 2NO, 2NC	1NO 1NC	
Standard	Contact Starter	SC-03 SW-03/3H	SC-0 SW-0/3H	SC-05 SW-05/3H	SC-4-0 SW-4-0/3H	Page 01/25
DC operated	Contact Starter	SC-03/G SW-03/G3H	SC-0/G SW-0/G3H	SC-05/G SW-05/G3H	SC-4-0/G SW-4-0/G3H	Page 01/41
OFF-delay release *1	Contact Starter	SC-03/G+SZ-DE□ SW-03/G3H+ SZ-DE□	SC-0/G+SZ-DE□ SW-0/G3H+ SZ-DE□	SC-05/G+SZ-DE□ SW-05/G3H+ SZ-DE□	SC-4-0/G+SZ-DE□ SW-4-0/G3H+ SZ-DE□	Page 01/46
With extra pick-up operating coil	Contact Starter	SC-03/U SW-03/U3H	SC-0/U SW-0/U3H	SC-05/U SW-05/U3H	SC-4-0/U SW-4-0/U3H	Page 01/47
Mechanical latch AC operated	Contact Starter	SC-03/V –	SC-0/V –	SC-05/V –	SC-4-0/V –	Page 01/48
Mechanical latch DC operated	Contact Starter	SC-03/VG –	SC-0/VG –	SC-05/VG –	SC-4-0/VG –	Page 01/46
Heavy starting duty	Contact Starter	– SW-03/3L	– SW-0/3L	– SW-05/3L	– SW-4-0/3L	Page 01/53
With quick operating overload relay	Contact Starter	– SW-03/3Q	– SW-0/3Q	– SW-05/3Q	– SW-4-0/3Q	Page 01/55
With phase-loss protective device	Contact Starter	– SW-03/2E	– SW-0/2E	– SW-05/2E	– SW-4-0/2E	Page 01/56
With phase-loss and phase sequence protective device *2	Contact Starter	– SW-03/2E+QE-□0N	– SW-0/2E+QE-□0N	– SW-05/2E+QE-□0N	– SW-4-0/2E+QE-□0N	Page 01/58
For single-phase resistance load	Contact Starter	SC-03+SZ-SP1 –	SC-0+SZ-SP1 –	SC-05+SZ-SP1 –	SC-4-0+SZ-SP2 –	Page 01/63
With quick connection terminals	Contact starter	SC-03Y SW-03Y	SC-0Y SW-0Y	SC-05Y SW-05Y	– –	Page 01/65
Thermal overload relay On-contactor mounting						Page 01/88
Standard Long time operation Quick operation		TR-0N/3 TR-0NL/3 TR-0NQ	TR-0N/3 TR-0NL/3 TR-0NQ	TR-0N/3 TR-0NL/3 TR-0NQ	TR-5-1N/3 TR-5-1NL/3 TR-5-1NQ	
Phase-loss protection		TK-0N	TK-0N	TK-0N	TK-5-1N	

Note: *1 Replace the □ mark in the type number by the operating voltage code.

100V AC: 100, 110V AC: 110, 200V AC: 200, 220V AC: 220

*2 Replace the □ mark in the type number by the operating voltage code.

200-220V AC: 2, 380-415V AC: 4

■ Types and ratings/Non-reversing, Open

Frame size		4-1	5-1	N1	N2	Further information
Max. motor capacity (kW)	200–240V	5.5	5.5	7.5	11	
	380–440V	11	11	15	18.5	
AC-3, IEC 60947-4-1	500–550V	11	11	15	18.5	
	600–660V	7.5	7.5	11	15	
Operational current (A)	200–240V	22	22	32	40	
	380–440V	22	22	32	40	
	500–550V	17	17	24	29	
	600–660V	9	9	15	19	
Operational current (A)	AC-1	32	32	50	60	
Conventional free air thermal current (A)		32	32	50	60	
Auxiliary contact arrangement		1NO 1NC	1NO+1NC, 2NO 2NO+2NC, 2NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-4-1 SW-4-1/3H	SC-5-1 SW-5-1/3H	SC-N1 SW-N1/3H	SC-N2 SW-N2/3H	Page 01/25
DC operated	Contact Starter	SC-4-1/G SW-4-1/G3H	SC-5-1/G SW-5-1/G3H	SC-N1/G SW-N1/G3H	SC-N2/G SW-N2/G3H	Page 01/41
OFF-delay release	*1 Contact Starter	SC-4-1/G+SZ-DE□ SW-4-1/G3H+ SZ-DE□	SC-5-1/G+SZ-DE□ SW-5-1/G3H+ SZ-DE□	SC-N1/G+ SZ-N1/GDE SW-N1/G3H+ SZ-N1/GDE	SC-N2/G+ SZ-N1/GDE SW-N2/G3H+ SZ-N1/GDE	Page 01/46
With extra pick-up operating coil	Contact Starter	SC-4-1/U SW-4-1/U3H	SC-5-1/U SW-5-1/U3H	SC-N1/U SW-N1/U3H	SC-N2/U SW-N2/U3H	Page 01/47
Mechanical latch AC operated	Contact Starter	SC-4-1/V –	SC-5-1/V –	SC-N1/VS –	SC-N2/VS –	Page 01/48
Mechanical latch DC operated	Contact Starter	SC-4-1/VG –	SC-5-1/VG –	SC-N1/VS –	SC-N2/VS –	Page 01/48
Heavy starting duty	Contact Starter	– SW-4-1/3L	– SW-5-1/3L	– SW-N1/3L	– SW-N2/3L	Page 01/53
With quick operating overload relay	Contact Starter	– SW-4-1/3Q	– SW-5-1/3Q	– SW-N1/3Q	– SW-N2/3Q	Page 01/55
With phase-loss protective device	Contact Starter	– SW-4-1/2E	– SW-5-1/2E	– SW-N1/2E	– SW-N2/2E	Page 01/56
With phase-loss and phase sequence protective device	*2 Contact Starter	– SW-4-1/2E+QE-□0N	– SW-5-1/2E+QE-□0N	– SW-N1/2E+QE-□0N	– SW-N2/2E+QE-□0N	Page 01/58
For single-phase resistance load	Contact Starter	SC-4-1+SZ-SP2 –	SC-5-1+SZ-SP2 –	SC-N1+SZ-SP3 –	SC-N2+SZ-SP3 –	Page 01/63
With quick connection terminals	Contact starter	– –	SC-5-1Y SW-5-1Y	– –	– –	Page 01/65
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-5-1N/3	TR-5-1N/3	TR-N2/3	TR-N2/3	
Long time operation		TR-5-1NL/3	TR-5-1NL/3	TR-N2L/3	TR-N2L/3	
Quick operation		TR-5-1NQ	TR-5-1NQ	TR-N2Q	TR-N2Q	
Phase-loss protection		TK-5-1N	TK-5-1N	TK-N2	TK-N2	

Note: *1 Replace the □ mark in the type number by the operating voltage code.

100V AC: 100, 110V AC: 110, 200V AC: 200, 220V AC: 220

*2 Replace the □ mark in the type number by the operating voltage code.

200-220V AC: 2, 380-415V AC: 4

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Open type

■ Types and ratings/Non-reversing, Open

Frame size		N2S	N3	N4	N5A	Further information
Max. motor capacity (kW)	200–240V	15	18.5	22	30	
	380–440V	22	30	40	55	
AC-3, IEC 60947-4-1	500–550V	25	37	37	55	
	600–660V	22	30	37	55	
Operational current (A)	200–240V	50	65	80	105	
	380–440V	50	65	80	105	
	500–550V	38	60	60	85	
	600–660V	26	38	44	64	
Operational current (A)	AC-1	80	100	135	150	
Conventional free air thermal current (A)		80	100	135	150	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contactor Starter	SC-N2S SW-N2S/3H	SC-N3 SW-N3/3H	SC-N4 SW-N4/3H	SC-N5A SW-N5A/3H	Page 01/25
DC operated	Contactor Starter	SC-N2S/G SW-N2S/G3H	SC-N3/G SW-N3/G3H	SC-N4/G SW-N4/G3H	SC-N5/G SW-N5/G3H	Page 01/41
OFF-delay release	Contactor Starter	SC-N2S/G+ SZ-N2S/GDE SW-N2S/G3H+ SZ-N2S/GDE	SC-N3/G+ SZ-N2S/GDE SW-N3/G3H+ SZ-N2S/GDE	SC-N4/SE+ SZ-N5/DE SW-N4/SE3H+ SZ-N5/SEDE	SC-N5+ SZ-N5/DE SW-N5/3H+ SZ-N5/DE	Page 01/46
With extra pick-up operating coil ^{*1}	Contactor Starter	SC-N2S/U SW-N2S/U3H	SC-N3/U SW-N3/U3H	SC-N4/U SW-N4/U3H	– –	Page 01/47
Mechanical latch AC operated	Contactor Starter	SC-N2S/VS –	SC-N3/VS –	SC-N4/VS –	SC-N5/VS –	Page 01/48
Mechanical latch DC operated	Contactor Starter	SC-N2S/VS –	SC-N3/VS –	SC-N4/VS –	SC-N5/VS –	Page 01/48
Heavy starting duty	Contactor Starter	– SW-N2S/3L	– SW-N3/3L	– SW-N4/3L	– SW-N5A/3L	Page 01/53
With quick operating overload relay	Contactor Starter	– SW-N2S/3Q	– SW-N3/3Q	– SW-N4/3Q	– SW-N5A/3Q	Page 01/55
With phase-loss protective device	Contactor Starter	– SW-N2S/2E	– SW-N3/2E	– SW-N4/2E	– SW-N5A/2E	Page 01/56
With phase-loss and phase sequence protective device ^{*2}	Contactor Starter	– SW-N2S/2E+QE-□0N	– SW-N3/2E+QE-□0N	– SW-N4/2E+QE-□0N	– SW-N5A/2E+QE-□0N	Page 01/58
For single-phase resistance load	Contactor Starter	SC-N2S+SZ-SP4 –	SC-N3+SZ-SP4 –	SC-N4+SZ-SP5 –	SC-N5A+SZ-SP5 –	Page 01/63
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N3/3	TR-N3/3	TR-N5/3	TR-N5/3	
Long time operation		TR-N3L/3	TR-N3L/3	TR-N5L/3	TR-N5L/3	
Quick operation		TR-N3Q	TR-N3Q	TR-N5Q	TR-N5Q	
Phase-loss protection		TK-N3	TK-N3	TK-N5	TK-N5	

Note: ^{*1} The standard types for frame sizes N6 and above (with SUPER MAGNET) hold without chattering even if the line voltage drops to 65% of its rated value.

^{*2} Replace the □ mark in the type number by the operating voltage code.

200-220V AC: 2, 380-415V AC: 4

■ Types and ratings/Non-reversing, Open

Frame size		N6	N7	N8	N10	Further information
Max. motor capacity (kW)	200–240V	37	45	55	65	
	380–440V	60	75	90	110	
AC-3, CEC 60947-4-1	500–550V	60	75	130	132	
	600–660V	60	90	132	132	
Operational current (A)	200–240V	125	150	180	220	
	380–440V	125	150	180	220	
	500–550V	90	120	180	200	
	600–660V	72	103	150	150	
Operational current (A)	AC-1	150	200	260	260	
Conventional free air thermal current (A)		150	200	260	260	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-N6 SW-N6/3H	SC-N7 SW-N7/3H	SC-N8 SW-N8/3H	SC-N10 SW-N10/3H	Page 01/25
DC operated	Contact Starter	SC-N6 SW-N6/3H	SC-N7 SW-N7/3H	SC-N8 SW-N8/3H	SC-N10 SW-N10/3H	Page 01/41
OFF-delay release	Contact Starter	SC-N6+SZ-N6/DE SW-N6/3H+ SZ-N6/DE	SC-N7+SZ-N6/DE SW-N7/3H+ SZ-N6/DE	SC-N8+SZ-N8/DE SW-N8/3H+ SZ-N8/DE	SC-N10+SZ-N8/DE SW-N10/3H+ SZ-N8/DE	Page 01/46
With extra pick-up operating coil ^{*1}	Contact Starter	– –	– –	– –	– –	– –
Mechanical latch/ AC operated	Contact Starter	SC-N6/VS –	SC-N7/VS –	SC-N8/VS –	SC-N10/VS –	Page 01/48
Mechanical latch/ DC operated	Contact Starter	SC-N6/VS –	SC-N7/VS –	SC-N8/VS –	SC-N10/VS –	Page 01/48
Heavy starting duty	Contact Starter	– SW-N6/3L	– SW-N7/3L	– SW-N8/3L	– SW-N10/3L	Page 01/53
With quick operating overload relay	Contact Starter	– –	– –	– –	– –	Page 01/55
With phase-loss protective device	Contact Starter	– SW-N6/2E	– SW-N7/2E	– SW-N8/2E	– SW-N10/2E	Page 01/56
With phase-loss and phase sequence protective device ^{*2}	Contact Starter	– SW-N6/2E+QE-□0N	– SW-N7/2E+QE-□0N	– SW-N8/2E+QE-□0N	– SW-N10/2E+QE-□0N	Page 01/58
For single-phase resistance load	Contact Starter	SC-N6+SZ-SP7 –	SC-N7+SZ-SP7 –	SC-N8+SZ-SP8 –	SC-N10+SZ-SP8 –	Page 01/63
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N6/3	TR-N7/3	TR-N8/3	TR-N10/3	
Long time operation		TR-N6L/3	TR-N7L/3	TR-N10L/3	TR-N10L/3	
Quick operation		–	–	–	–	
Phase-loss protection		TK-N6	TK-N7	TK-N8	TK-N10	

Note: ^{*1} The standard types for frame sizes N6 and above (with SUPER MAGNET) hold without chattering even if the line voltage drops to 65% of its rated value.

^{*2} Replace the □ mark in the type number by the operating voltage code.

200-220V AC: 2, 380-415V AC: 4

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Open type

■ Types and ratings/Non-reversing, Open

Frame size		N11	N12	N14	N16	Further information
Max. motor capacity (kW)	200–240V	90	120	180	220	
	380–440V	160	220	315	440	
AC-3, IEC 60947-4-1	500–550V	160	250	400	500	
	600–660V	200	300	480	500	
Operational current (A)	200–240V	300	400	600	800	
	380–440V	300	400	600	800	
	500–550V	230	360	600	720	
	600–660V	230	360	600	630	
Operational current (A)	AC-1	350	450	660	800	
Conventional free air thermal current (A)		350	450	660	800	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-N11 SW-N11/3H	SC-N12 SW-N12/3H	SC-N14 SW-N14/3H	SC-N16 –	Page 01/25
DC operated	Contact Starter	SC-N11 SW-N11/3H	SC-N12 SW-N12/3H	SC-N14 SW-N14/3H	SC-N16 –	Page 01/41
OFF-delay release	Contact Starter	SC-N11+SZ-N11/DE SW-N11/3H+ SZ-N11/DE	SC-N12+SZ-N11/DE SW-N12/3H+ SZ-N11/DE	SC-N14+SZ-N14/DE SW-N14/3H+ SZ-N14/DE	– – –	Page 01/46
With extra pick-up operating coil ^{*1}	Contact Starter	– –	– –	– –	– –	– –
Mechanical latch AC operated	Contact Starter	SC-N11/VS –	SC-N12/VS –	SC-N14/VS –	– –	Page 01/48
Mechanical latch DC operated	Contact Starter	SC-N11/VS –	SC-N12/VS –	SC-N14/VS –	– –	Page 01/48
Heavy starting duty	Contact Starter	– SW-N11/3L	– SW-N12/3L	– SW-N14/3L	– –	Page 01/53
With quick operating overload relay	Contact Starter	– –	– –	– –	– –	– –
With phase-loss protective device	Contact Starter	– SW-N11/2E	– SW-N12/2E	– SW-N14/2E	– –	Page 01/56
With phase-loss and phase sequence protective device ^{*2}	Contact Starter	– SW-N11/2E+QE-□0N	– SW-N12/2E+QE-□0N	– SW-N14/2E+QE-□0N	– –	Page 01/58
For single-phase resistance load	Contact Starter	SC-N11+SZ-SP9 –	SC-N12+SZ-SP9 –	SC-N14+SZ-SP10 –	SC-N16+SZ-SP10 –	Page 01/63
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N12/3	TR-N12/3	TR-N14/3	–	
Long time operation		TR-N12L/3	TR-N12L/3	TR-N14L/3	–	
Quick operation		–	–	–	–	
Phase-loss protection		TK-N12	TK-N12	TK-N14	–	

Note: ^{*1} The standard types for frame sizes N6 and above (with SUPER MAGNET) hold without chattering even if the line voltage drops to 65% of its rated value.

^{*2} Replace the □ mark in the type number by the operating voltage code.

200-220V AC: 2, 380-415V AC: 4

■ Types and ratings/Non-reversing, Enclosed

Frame size		03	0	05	4-0	Further information
Max. motor capacity (kW)	200–240V	2.5	3.5	3.5	4.5	
	380–440V	4	5.5	5.5	7.5	
AC-3, IEC 60947-4-1	500–550V	4	5.5	5.5	7.5	
	600–660V	4	5.5	5.5	7.5	
Operational current (A)	200–240V	11	13	13	18	
	380–440V	9	12	12	16	
	500–550V	7	9	9	13	
	600–660V	5	7	7	9	
Operational current (A)	AC-1	20	20	20	25	
Conventional free air thermal current (A)		20	20	20	25	
Auxiliary contact arrangement		1NO 1NC	1NO 1NC	1NO+1NC 2NO, 2NC	1NO 1NC	
Standard	Contact Starter	SC-03C SW-03C/3H	SC-0C SW-0C/3H	SC-05C SW-05C/3H	SC-4-0C SW-4-0C/3H	Page 01/25
With extra pick-up operating coil	Contact Starter	– SW-03C/U3H	– SW-0C/U3H	– SW-05C/U3H	– SW-4-0C/U3H	Page 01/47
With phase-loss protective device	Contact Starter	– SW-03C/2E	– SW-0C/2E	– SW-05C/2E	– SW-4-0C/2E	Page 01/56
With ON-OFF/reset pushbuttons	Contact Starter	– SW-03P/3H	– SW-0P/3H	– SW-05P/3H	– SW-4-0P/3H	Page 01/60
Dust tight/light corrosion resistant	Contact Starter	– SW-03LG/3H	– SW-0LG/3H	– SW-05LG/3H	– SW-4-0LG/3H	Page 01/62
Thermal overload relay		See page 01/12. Same as the open types				Page 01/88

Frame size		4-1	5-1	N1	N2	Further information
Max. motor capacity (kW)	200–240V	5.5	5.5	7.5	11	
	380–440V	11	11	15	18.5	
AC-3, IEC 60947-4-1	500–550V	11	11	15	18.5	
	600–660V	7.5	7.5	11	15	
Operational current (A)	200–240V	22	22	32	40	
	380–440V	22	22	32	40	
	500–550V	17	17	24	29	
	600–660V	9	9	15	19	
Operational current (A)	AC-1	32	32	50	60	
Conventional free air thermal current (A)		32	32	50	60	
Auxiliary contact arrangement		1NO 1NC	1NO+1NC 2NO, 2NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-4-1C SW-4-1C/3H	SC-5-1C SW-5-1C/3H	SC-N1C SW-N1C/3H	SC-N2C SW-N2C/3H	Page 01/25
With extra pick-up operating coil	Contact Starter	– SW-4-1C/U3H	– SW-5-1C/U3H	– SW-N1C/U3H	– SW-N2C/U3H	Page 01/47
With phase-loss protective device	Contact Starter	– SW-4-1C/2E	– SW-5-1C/2E	– SW-N1C/2E	– SW-N2C/2E	Page 01/56
With ON-OFF pushbuttons	Contact Starter	– –	– –	– SW-N1P/3H	– SW-N2P/3H	Page 01/60
With ON-OFF/reset pushbuttons	Contact Starter	– SW-4-1P/3H	– SW-5-1P/3H	– SW-N1PB/3H	– SW-N2PB/3H	Page 01/60
Dust tight/light corrosion resistant	Contact Starter	– SW-4-1LG/3H	– SW-5-1LG/3H	– SW-N1LG/3H	– SW-N2LG/3H	Page 01/62
Thermal overload relay		See page 01/12. Same as the open types				Page 01/88

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Enclosed type

■ Types and ratings/Non-reversing, Enclosed

Frame size		N2S	N3	N4	N5A	Further information
Max. motor capacity (kW)	200–240V	15	18.5	22	30	
	380–440V	22	30	40	55	
AC-3, IEC 60947-4-1	500–550V	25	37	37	55	
	600–660V	22	30	37	55	
Operational current (A)	200–240V	50	65	80	105	
	380–440V	50	65	80	105	
	500–550V	38	60	60	85	
	600–660V	26	38	44	64	
Operational current (A)	AC-1	80	100	135	150	
Conventional free air thermal current (A)		80	100	135	150	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-N2SC SW-N2SC/3H	SC-N3C SW-N3C/3H	SC-N4C SW-N4C/3H	SC-N5AC SW-N5AC/3H	Page 01/25
With extra pick-up operating coil *	Contact Starter	– SW-N2SC/U3H	– SW-N3C/U3H	– SW-N4C/SE3H	– –	Page 01/47
With phase-loss protective device	Contact Starter	– SW-N2SC/2E	– SW-N3C/2E	– SW-N4C/2E	– SW-N5AC/2E	Page 01/56
With ON-OFF pushbuttons	Contact Starter	– SW-N2SP/3H	– SW-N3P/3H	– –	– –	Page 01/60
With ON-OFF and reset pushbuttons	Contact Starter	– SW-N2SPB/3H	– SW-N3PB/3H	– SW-N4PB/3H	– SW-N5PB/3H	Page 01/60
Dust tight/light corrosion resistant	Contact Starter	– SW-N2SLG/3H	– SW-N3LG/3H	– SW-N4LG/3H	– SW-N5ALG/3H	Page 01/62
Thermal overload relay		See page 01/13. Same as the open types				Page 01/88

Frame size		N6	N7	N8	N10	Further information
Max. motor capacity (kW)	200–240V	37	45	55	65	
	380–440V	60	75	90	110	
AC-3, IEC 60947-4-1	500–550V	60	75	130	132	
	600–660V	60	90	132	132	
Operational current (A)	200–240V	125	150	180	220	
	380–440V	125	150	180	220	
	500–550V	90	120	180	200	
	600–660V	72	103	150	150	
Operational current (A)	AC-1	150	200	260	260	
Conventional free air thermal current (A)		150	200	260	260	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	
Standard	Contact Starter	SC-N6C SW-N6C/3H	SC-N7C SW-N7C/3H	SC-N8C SW-N8C/3H	SC-N10C SW-N10C/3H	Page 01/25
With extra pick-up operating coil *	Contact Starter	– –	– –	– –	– –	– –
With phase-loss protective device	Contact Starter	– SW-N6C/2E	– SW-N7C/2E	– SW-N8C/2E	– SW-N10C/2E	Page 01/56
With ON-OFF pushbuttons	Contact Starter	– –	– –	– –	– –	– –
With ON-OFF and reset pushbuttons	Contact Starter	– SW-N6PB/3H	– –	– SW-N8PB/3H	– SW-N10PB/3H	Page 01/60
Dust tight/light corrosion resistant	Contact Starter	– SW-N6LG/3H	– SW-N7LG/3H	– SW-N8LG/3H	– SW-N10LG/3H	Page 01/62
Thermal overload relay		See page 01/13. Same as the open types				Page 01/88

Note: * The standard types for frame sizes N6 and above (with SUPER MAGNET) hold without chattering even if the line voltage drops to 65% of its rated value.

■ Types and ratings/Non-reversing, Enclosed

Frame size		N11	N12	N14	N16	Further information
Max. motor capacity (kW)	200–240V	90	120	180	–	
	380–440V	160	220	315	–	
AC-3, IEC 60947-4-1	500–550V	160	250	400	–	
	600–660V	200	300	480	–	
Operational current (A)	200–240V	300	400	600	–	
	380–440V	300	400	600	–	
	500–550V	230	360	600	–	
	600–660V	230	360	600	–	
Operational current (A)	AC-1	350	450	660	–	
Conventional free air thermal current (A)		350	450	660	–	
Auxiliary contact arrangement		2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	2NO+2NC 4NO+4NC	– –	
Standard	Contact Starter	SC-N11C SW-N11C/3H	SC-N12C SW-N12C/3H	SC-N14C SW-N14C/3H	– –	Page 01/25
With extra pick-up operating coil *	Contact Starter	– –	– –	– –	– –	– –
With phase-loss protective device	Contact Starter	– SW-N11C/2E	– SW-N12C/2E	– SW-N14C/2E	– –	Page 01/56
With ON-OFF pushbuttons	Contact Starter	– –	– –	– –	– –	– –
With ON-OFF and reset pushbuttons	Contact Starter	– –	– –	– –	– –	– –
Dust tight/light corrosion resistant	Contact Starter	– –	– –	– –	– –	– –
Thermal overload relay		See page 01/14. Same as the open types				Page 01/88

Note: * The standard types for frame sizes N6 and above (with SUPER MAGNET) hold without chattering even if the line voltage drops to 65% of its rated value.

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Reversing, Open type

■ Types and ratings/Reversing, Open

Frame size		03	0	05	4-0	Further information
Max. motor capacity (kW)	200–240V	2.5	3.5	3.5	4.5	
	380–440V	4	5.5	5.5	7.5	
AC-3, IEC 60947-4-1	500–550V	4	5.5	5.5	7.5	
	600–660V	4	5.5	5.5	7.5	
Operational current (A)	200–240V	11	13	13	18	
	380–440V	9	12	12	16	
	500–550V	7	9	9	13	
	600–660V	5	7	7	9	
Conventional free air thermal current (A)		20	20	20	25	
Auxiliary contact arrangement		1NC×2 1NO×2	1NC×2 1NO×2	(1NO+1NC)×2 2NC×2	1NC×2 1NO×2	
Standard	Contactor Starter	SC-03RM SW-03RM/3H	SC-0RM SW-0RM/3H	SC-05RM SW-05RM/3H	SC-4-0RM SW-4-0RM/3H	Page 01/34
DC operated	Contactor Starter	SC-03RM/G SW-03RM/G3H	SC-0RM/G SW-0RM/G3H	SC-05RM/G SW-05RM/G3H	SC-4-0RM/G SW-4-0RM/G3H	Contact FUJI
Mechanical latch	Contactor	SC-03RM/V	SC-0RM/V	SC-05RM/V	SC-4-0RM/V	Page 01/48
AC operated	Starter	–	–	–	–	
Mechanical latch	Contactor	SC-03RM/VG	SC-0RM/VG	SC-05RM/VG	SC-4-0RM/VG	Page 01/48
DC operated	Starter	–	–	–	–	
With phase-loss protective device	Contactor Starter	– SW-03RM/2E	– SW-0RM/2E	– SW-05RM/2E	– SW-4-0RM/2E	Page 01/56
Thermal overload relay On-contactor mounting						Page 01/88
Standard Phase-loss protection		TR-0N/3 TK-0N	TR-0N/3 TK-0N	TR-0N/3 TK-0N	TR-5-1N/3 TK-5-1N	

Frame size		4-1	5-1	N1	N2	Further information
Max. motor capacity (kW)	200–240V	5.5	5.5	7.5	11	
	380–440V	11	11	15	18.5	
AC-3, IEC 60947-4-1	500–550V	11	11	15	18.5	
	600–660V	7.5	7.5	11	15	
Operational current (A)	200–240V	22	22	32	40	
	380–440V	22	22	32	40	
	500–550V	17	17	24	29	
	600–660V	9	9	15	19	
Conventional free air thermal current (A)		32	32	50	60	
Auxiliary contact arrangement		1NC×2 1NO×2	(1NO+1NC)×2, 2NC×2 (2NO+2NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactor Starter	SC-4-1RM SW-4-1RM/3H	SC-5-1RM SW-5-1RM/3H	SC-N1RM SW-N1RM/3H	SC-N2RM SW-N2RM/3H	Page 01/34
DC operated	Contactor Starter	SC-4-1RM/G SW-4-1RM/G3H	SC-5-1RM/G SW-5-1RM/G3H	SC-N1RM/G SW-N1RM/G3H	SC-N2RM/G SW-N2RM/G3H	Contact FUJI
Mechanical latch	Contactor	SC-4-1RM/V	SC-5-1RM/V	SC-N1RM/VS	SC-N2RM/VS	Page 01/48
AC operated	Starter	–	–	–	–	
Mechanical latch	Contactor	SC-4-1RM/VG	SC-5-1RM/VG	SC-N1RM/VS	SC-N2RM/VS	Page 01/48
DC operated	Starter	–	–	–	–	
With phase-loss protective device	Contactor Starter	– SW-4-1RM/2E	– SW-5-1RM/2E	– SW-N1RM/2E	– SW-N2RM/2E	Page 01/56
Thermal overload relay On-contactor mounting						Page 01/88
Standard Phase-loss protection		TR-5-1N/3 TK-5-1N	TR-5-1N/3 TK-5-1N	TR-N2/3 TK-N2	TR-N2/3 TK-N2	

Note: Auxiliary contact arrangements indicate the ones for types except mechanical latch types.

Magnetic Contactors and Starters
SC and SW series
Quick selection guide/Reversing, Open type

01

■ Types and ratings/Reversing, Open

Frame size		N2S	N3	N4	N5A	Further information
Max. motor capacity (kW)	200–240V	15	18.5	22	30	
	380–440V	22	30	40	55	
AC-3, IEC 60947-4-1	500–550V	25	37	37	55	
	600–660V	22	30	37	55	
Operational current (A)	200–240V	50	65	80	105	
	380–440V	50	65	80	105	
	500–550V	38	60	60	85	
	600–660V	26	38	44	64	
Conventional free air thermal current (A)		80	100	135	150	
Auxiliary contact arrangement		(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactor Starter	SC-N2SRM SW-N2SRM/3H	SC-N3RM SW-N3RM/3H	SC-N4RM SW-N4RM/3H	SC-N5ARM SW-N5ARM/3H	Page 01/34
DC operated	Contactor Starter	SC-N2SRM/G SW-N2SRM/G3H	SC-N3RM/G SW-N3RM/G3H	SC-N4RM/G SW-N4RM/G3H	SC-N5RM/G SW-N5RM/G3H	Contact FUJI
Mechanical latch	Contactor	SC-N2SRM/VS	SC-N3RM/VS	SC-N4RM/VS	SC-N5RM/VS	Page 01/48
AC operated	Starter	–	–	–	–	
Mechanical latch	Contactor	SC-N2SRM/VS	SC-N3RM/VS	SC-N4RM/VS	SC-N5RM/VS	Page 01/48
DC operated	Starter	–	–	–	–	
With phase-loss protective device	Contactor Starter	– SW-N2SRM/2E	– SW-N3RM/2E	– SW-N4RM/2E	– SW-N5ARM/2E	Page 01/56
Thermal overload relay On-contactor mounting						Page 01/88
Standard Phase-loss protection		TR-N3/3 TK-N3	TR-N3/3 TK-N3	TR-N5/3 TK-N5	TR-N5/3 TK-N5	

Frame size		N6	N7	N8	N10	Further information
Max. motor capacity (kW)	200–240V	37	45	55	65	
	380–440V	60	75	90	110	
AC-3, IEC 60947-4-1	500–550V	60	75	130	132	
	600–660V	60	90	132	132	
Operational current (A)	200–240V	125	150	180	220	
	380–440V	125	150	180	220	
	500–550V	90	120	180	200	
	600–660V	72	103	150	150	
Conventional free air thermal current (A)		150	200	260	260	
Auxiliary contact arrangement		(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactor Starter	SC-N6RM SW-N6RM/3H	SC-N7RM SW-N7RM/3H	SC-N8RM SW-N8RM/3H	SC-N10RM SW-N10RM/3H	Page 01/34
DC operated	Contactor Starter	SC-N6RM SW-N6RM/3H	SC-N7RM SW-N7RM/3H	SC-N8RM SW-N8RM/3H	SC-N10RM SW-N10RM/3H	Contact FUJI
Mechanical latch	Contactor	SC-N6RM/VS	SC-N7RM/VS	SC-N8RM/VS	SC-N10RM/VS	Page 01/48
AC operated	Starter	–	–	–	–	
Mechanical latch	Contactor	SC-N6RM/VS	SC-N7RM/VS	SC-N8RM/VS	SC-N10RM/VS	Page 01/48
DC operated	Starter	–	–	–	–	
With phase-loss protective device	Contactor Starter	– SW-N6RM/2E	– SW-N7RM/2E	– SW-N8RM/2E	– SW-N10RM/2E	Page 01/56
Thermal overload relay On-contactor mounting						Page 01/88
Standard Phase-loss protection		TR-N6/3 TK-N6	TR-N7/3 TK-N7	TR-N8/3 TK-N8	TR-N10/3 TK-N10	

Note: Auxiliary contact arrangements indicate the ones for types except mechanical latch types.

Magnetic Contactors and Starters

SC and SW series

Quick selection guide/Reversing, Open type

■ Types and ratings/Reversing, Open

Frame size		N11	N12	N14	N16	Further information
Max. motor capacity (kW)	200–240V	90	120	180	–	
	380–440V	160	220	315	–	
AC-3, IEC 60947-4-1	500–550V	160	250	400	–	
	600–660V	200	300	480	–	
Operational current (A)	200–240V	300	400	600	–	
	380–440V	300	400	600	–	
	500–550V	230	360	600	–	
	600–660V	230	360	600	–	
Conventional free air thermal current (A)		350	450	660	–	
Auxiliary contact arrangement		(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	– –	
Standard	Contactors Starters	SC-N11RM SW-N11RM/3H	SC-N12RM SW-N12RM/3H	SC-N14RM SW-N14RM/3H	– –	Page 01/34
DC operated	Contactors Starters	SC-N11RM SW-N11RM/3H	SC-N12RM SW-N12RM/3H	SC-N14RM SW-N14RM/3H	– –	Contact FUJI
Mechanical latch	Contactors	SC-N11RM/VS	SC-N12RM/VS	SC-N14RM/VS	–	Page 01/48
AC operated	Starters	–	–	–	–	
Mechanical latch	Contactors	SC-N11RM/VS	SC-N12RM/VS	SC-N14RM/VS	–	Page 01/48
DC operated	Starters	–	–	–	–	
With phase-loss protective device	Contactors Starters	– SW-N11RM/2E	– SW-N12RM/2E	– SW-N14RM/2E	– –	Page 01/56
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N11/3	TR-N12/3	TR-N14/3	–	
Phase-loss protection		TK-N11	TK-N12	TK-N14	–	

Note: Auxiliary contact arrangements indicate the ones for types except mechanical latch types.

Magnetic Contactors and Starters
SC and SW series
Quick selection guide/Reversing, Enclosed type

01

■ Types and ratings/Reversing, Enclosed

Frame size		03	0	05	4-0	Further information
Max. motor capacity (kW)	200–240V	2.5	3.5	3.5	4.5	
	380–440V	4	5.5	5.5	7.5	
AC-3, IEC 60947-4-1	500–550V	4	5.5	5.5	7.5	
	600–660V	4	5.5	5.5	7.5	
Operational current (A)	200–240V	11	13	13	18	
	380–440V	9	12	12	16	
	500–550V	7	9	9	13	
	600–660V	5	7	7	9	
Conventional free air thermal current (A)		20	20	20	25	
Auxiliary contact arrangement		1NC×2 1NO×2	1NC×2 1NO×2	(1NO+1NC)×2 2NC×2	1NC×2 1NO×2	
Standard	Contactor Starter	SC-03RMC SW-03RMC/3H	SC-0RMC SW-0RMC/3H	SC-05RMC SW-05RMC/3H	SC-4-0RMC SW-4-0RMC/3H	Page 01/34
With phase-loss protective device	Contactor Starter	– SW-03RMC/2E	– SW-0RMC/2E	– SW-05RMC/2E	– SW-4-0RMC/2E	Page 01/56
With ON-OFF pushbuttons	Contactor Starter	– –	– –	– –	– –	– –
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-0N/3	TR-0N/3	TR-0N/3	TR-5-1N/3	
Phase-loss protection		TK-0N	TK-0N	TK-0N	TK-5-1N	

Frame size		4-1	5-1	N1	N2	Further information
Max. motor capacity (kW)	200–240V	5.5	5.5	7.5	11	
	380–440V	11	11	15	18.5	
AC-3, IEC 60947-4-1	500–550V	11	11	15	18.5	
	600–660V	7.5	7.5	11	15	
Operational current (A)	200–240V	22	22	32	40	
	380–440V	22	22	32	40	
	500–550V	17	17	24	29	
	600–660V	9	9	15	19	
Conventional free air thermal current (A)		32	32	50	60	
Auxiliary contact arrangement		1NC×2 1NO×2	(1NO+1NC)×2 2NC×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactor Starter	SC-4-1RMC SW-4-1RMC/3H	SC-5-1RMC SW-5-1RMC/3H	SC-N1RMC SW-N1RMC/3H	SC-N2RMC SW-N2RMC/3H	Page 01/34
With phase-loss protective device	Contactor Starter	– SW-4-1RMC/2E	– SW-5-1RMC/2E	– SW-N1RMC/2E	– SW-N2RMC/2E	Page 01/56
With ON-OFF pushbuttons	Contactor Starter	– –	– –	– –	– –	– –
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-5-1N/3	TR-5-1N/3	TR-N2/3	TR-N2/3	
Phase-loss protection		TK-5-1N	TK-5-1N	TK-N2	TK-N2	

Magnetic Contactors and Starters

SC and SW series

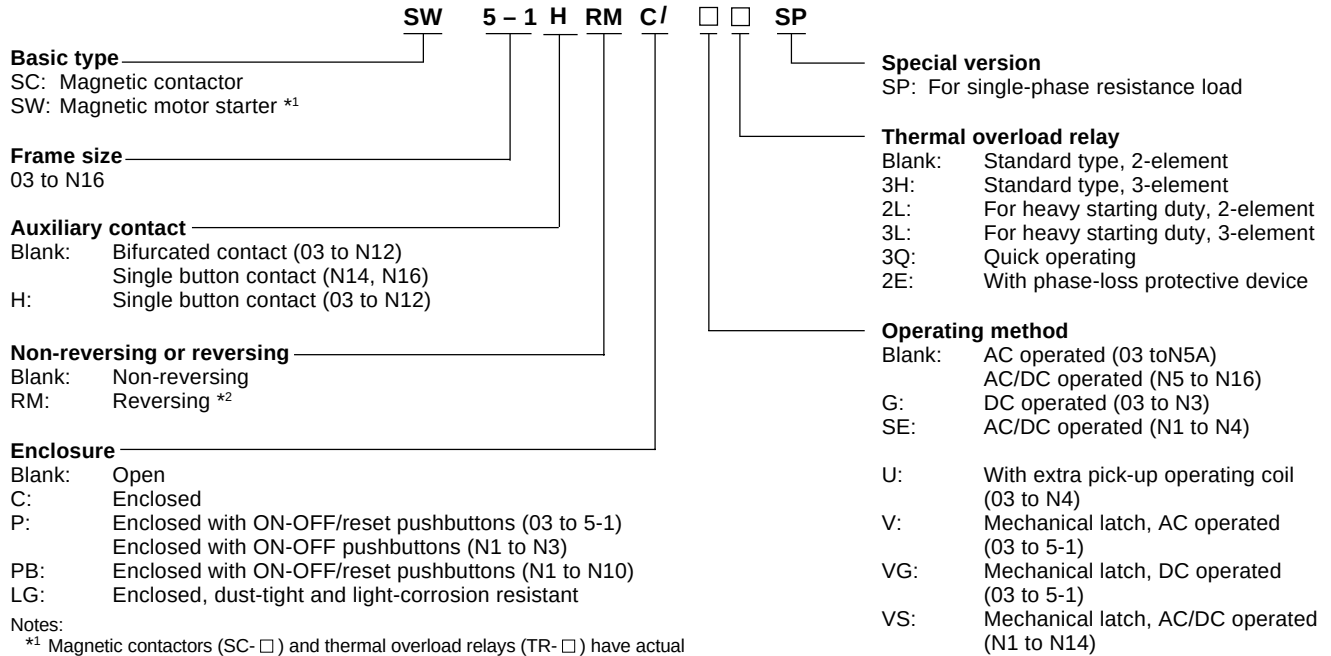
Quick selection guide/Reversing, Enclosed type

■ Types and ratings/Reversing, Enclosed

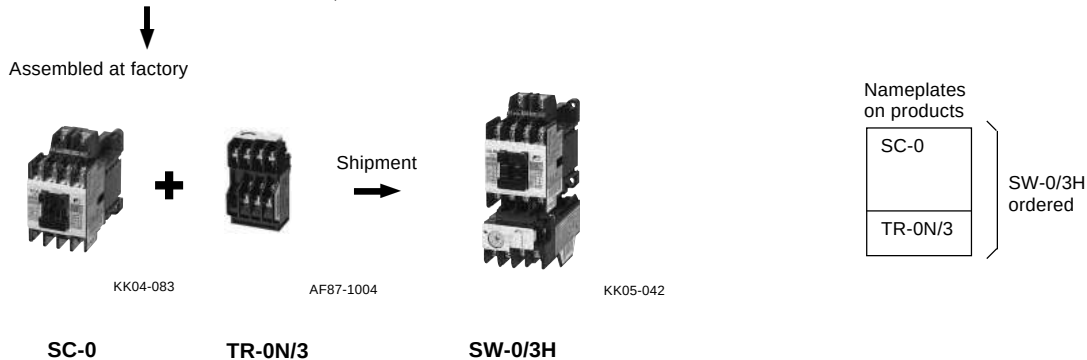
Frame size		N2S	N3	N4	N5A	Further information
Max. motor capacity (kW)	200–240V	15	18.5	22	30	
	380–440V	22	30	40	55	
AC-3, IEC 60947-4-1	500–550V	25	37	37	55	
	600–660V	22	30	37	55	
Operational current (A)	200–240V	50	65	80	105	
	380–440V	50	65	80	105	
	500–550V	38	60	60	85	
	600–660V	26	38	44	64	
Conventional free air thermal current (A)		80	100	135	150	
Auxiliary contact arrangement		(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactors	SC-N2SRMC	SC-N3RMC	SC-N4RMC	SC-N5ARMC	Page 01/34
	Starters	SW-N2SRMC/3H	SW-N3RMC/3H	SW-N4RMC/3H	SW-N5ARMC/3H	
With phase-loss protective device	Contactors	–	–	–	–	Page 01/56
	Starters	SW-N2SRMC/2E	SW-N3RMC/2E	SW-N4RMC/2E	SW-N5ARMC/2E	
With ON-OFF pushbuttons	Contactors	–	–	–	–	–
	Starters	–	–	–	–	–
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N3/3	TR-N3/3	TR-N5/3	TR-N5/3	
Phase-loss protection		TK-N3	TK-N3	TK-N5	TK-N5	

Frame size		N6	N7	N8	N10	Further information
Max. motor capacity (kW)	200–240V	37	45	55	65	
	380–440V	60	75	90	110	
AC-3, IEC 60947-4-1	500–550V	60	75	130	132	
	600–660V	60	90	132	132	
Operational current (A)	200–240V	125	150	180	220	
	380–440V	125	150	180	220	
	500–550V	90	120	180	200	
	600–660V	72	103	150	150	
Conventional free air thermal current (A)		150	200	260	260	
Auxiliary contact arrangement		(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	(2NO+2NC)×2 (3NO+3NC)×2	
Standard	Contactors	SC-N6RMC	SC-N7RMC	SC-N8RMC	SC-N10RMC	Page 01/34
	Starters	SW-N6RMC/3H	SW-N7RMC/3H	SW-N8RMC/3H	SW-N10RMC/3H	
With phase-loss protective device	Contactors	–	–	–	–	Page 01/56
	Starters	SW-N6RMC/2E	SW-N7RMC/2E	SW-N8RMC/2E	SW-N10RMC/2E	
With ON-OFF pushbuttons	Contactors	–	–	–	–	–
	Starters	–	–	–	–	–
Thermal overload relay On-contactor mounting						Page 01/88
Standard		TR-N6/3	TR-N7/3	TR-N8/3	TR-N10/3	
Phase-loss protection		TK-N6	TK-N7	TK-N8	TK-N10	

■ Types number nomenclature



- Example
When a motor starter SW-0 is ordered;



- *2 Open type reversing magnetic contactors (SC-□RM) and motor starters (SW-□RM) have no type name on their nameplates describing them as reversing types.

- Example
When a reversing contactor SC-0RM is ordered;



■ Ordering information

Specify the following:

1. Ordering code (see next page)
2. Overload relay setting range code
3. Operating coil voltage code
4. Auxiliary contact arrangement code

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Magnetic Contactors and Starters

SC and SW series

Ordering code system

■ Ordering code system

SC series magnetic contactors

SC 25 B A A-M 22
①② ③④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩⑪

SW series magnetic motor starter

SC 25 B A A N-M 22 TB D
①② ③④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩⑪ ⑫ ⑬

① Product category

Description	Code
Contactor and starter	S

② Series category

Description	Code
SC and SW series	C

③④ Frame size

Frame size	Code	
	③	④
03	1	1
0	1	3
05	1	4
4-0	1	8
4-1	1	9
5-1	2	0
N1	2	5
N2	3	5
N2S	5	0
N3	6	5
N4	8	0
N5	9	3
N6	1	C
N7	1	F
N8	1	J
N10	2	C
N11	3	A
N12	4	A
N14	6	A
N16*	8	A

*Contactor only

⑤ Index

Index	Code
03 to 5-1	Blank
N1 to N16	B
N5A	C

⑨ Coil voltage

● Frame size 03 to N5A
AC coil

Operating coil voltage		Code
50Hz	60Hz	
24V	24-26V	E
48V	48-52V	F
100V	100-110V	1
100-110V	110-120V	H
110-120V	120-130V	K
200V	200-220V	2
200-220V	220-240V	M
220-240V	240-260V	P
346-380V	380-420V	S
380-400V	400-440V	4
415-440V	440-480V	T
480-500V	500-550V	5

⑥ Version

Description	Code	
	Contactor	Starter
Non-reversing, open Standard	A	A
Non-reversing, enclosed Standard	C	C
Dust-tight/light-corrosion resistant	—	L
With on – off pushbutton	—	P
With on – off/reset pushbutton	—	J
Reversing, open Standard	R	R
Reversing, enclosed Standard	M	M
Dust-tight/light-corrosion resistant	—	G

⑦ Coil and contact specifications

Description		Code
Standard	AC operating coil	A (Up to N5A)
	DC operating coil	G (Up to N5)
	Both AC and DC operating coil	A (N5 and above)
	With extra pick-up operating coil	U (Up to N4)
With super magnet	Both AC and DC operating coil	S (N1 to N4)
Mechanical latch (Contactor only)	AC operating coil	V (Up to 5-1)
	DC operating coil	D (Up to 5-1)
	Both AC and DC operating coil	E (N1 and above)
With single-button auxiliary contact	AC operating coil	H (Up to N12)
	DC operating coil	Q (Up to N12)
	With extra pick-up operating coil	L (Up to N12)

⑧ Type of thermal overload relay

Description			Code
Standard	TR-□	2-element	N
	TR-□/3	3-element	N
Long time operating	TR-□L	2-element	L
	TR-□L3	3-element	F
Quick operating	TR-□Q	3-element	S
Open-phase protection	TK-□	3-element	E

● Frame size 03 to N5
DC coil

Operating coil voltage	Code
12V DC	B
24V DC	E
48V DC	F
60V DC	G
100V DC	1
110V DC	H
120V DC	K
200V DC	2
210V DC	Y
220V DC	M

● Frame size N1/SE to N4/SE, N5 to N16
AC and DC coil (common)

Operating coil voltage		Code
AC 50/60Hz	DC	
24-25V	24V	E
48-50V	48V	F
100-127V	100-120V	1
200-250V	200-240V	2
265-347V	—	3
380-450V	—	4
460-575V	—	5

⑩⑪ Auxiliary contact

● SC-03 to 5-1

Contact arrangement	Code	
	⑩	⑪
1NO	1	0
1NC	0	1
1NO+1NC	1	1
2NO	2	0
2NC	0	2
2NO+2NC	2	2

● SC-N1 to N16

Contact arrangement	Code	
	⑩	⑪
2NO+2NC	2	2
3NO+3NC	3	3
4NO+4NC	4	4

⑬ No. of heater element and reset method

Description	Code
Manual reset	Blank
2-element	
3-element	D
Auto reset	A
2-element	
3-element	

■ Correct mounting

- (1) The standard mounting shown in Figure 1 is the proper mounting method. Following slanting mounting with front, behind, left and right direction is possible. (Figure 2) Allowable slant angle of SC (SW) - 03 to N16 : 30°
- (2) Side mounting can be necessary due to wiring or installation restriction. Side mounting is possible if you consider the followings, except for the types of SC-N14, 16 and mechanically latched type.
 - The performance of magnetic contactors is almost the same. Only mechanical durability and switching frequency may decrease.
 - The ultimate operational current of thermal overload relay may slightly changes.
- (3) Other mountings
 - Standard magnetic contactors and starters cannot be mounted on the ceiling. If they were mounted on the ceiling, they could not satisfy the operating performance value specified by Standards due to effect of moving section mass.
 - Standard magnetic contactors and starters cannot be mounted horizontally. External vibration or shock may result in malfunction due to effect of moving section mass. Dedicated horizontal mounting models are available on request. Add suffix "Z109" to the type number when

⑫ Thermal overload relay ampere setting range

Ampere setting range (A)	Code	Ampere setting range (A)	Code	Ampere setting range (A)	Code
0.1 - 0.15	TA	4 - 6	TS	65 - 95	TM
0.13 - 0.2	TB	5 - 8	TT	85 - 105	TI
0.15 - 0.24	TC	6 - 9	TU	85 - 125	TN
0.2 - 0.3	TD	7 - 11	TV	110 - 160	TP
0.24 - 0.36	TE	9 - 13	TW	125 - 185	TR
0.3 - 0.45	TF	12 - 18	TX	160 - 240	TS
0.36 - 0.54	TG	16 - 22	TQ	200 - 300	TT
0.48 - 0.72	TH	18 - 26	TB	240 - 360	TU
0.64 - 0.96	TJ	24 - 36	TE	300 - 450	TV
0.8 - 1.2	TK	28 - 40	TF	400 - 600	TW
0.95 - 1.45	TL	32 - 42	TI		
1.4 - 2.2	TM	34 - 50	TG		
1.7 - 2.6	TN	45 - 65	TJ		
2.2 - 3.4	TP	48 - 68	TO		
2.8 - 4.2	TR	53 - 80	TL		

Ordering example

● Magnetic motor starter

①	Magnetic starter	S
②	SW series	C
③④	Frame size: 5-1	20
⑤	Index	Blank
⑥	Non-reversing, open: Standard	A
⑦	Operating coil: AC operating	A
⑧	Thermal overload relay: Standard	N
⑨	Operating coil voltage: 220V-240V AC, 50Hz	P
⑩⑪	Auxiliary contact: 1NO+1NC	11
⑫	Thermal overload relay heater range : 9-13	TW
⑬	No. of heater element: 3	D

Ordering code: SC20AAN-P11TWD

● Magnetic contactor

①	Magnetic contactor	S
②	SC series	C
③④	Frame size: N6	1C
⑤	Index	B
⑥	Non-reversing, open: Standard	A
⑦	Operating coil: DC operating	A
⑨	Operating coil voltage: 110V DC	1
⑩⑪	Auxiliary contact: 2NO+2NC	22

Ordering code: SC1CBAA-122

ordering. However, the models of "Z109" specification cannot be applied to standard mounting (vertical mounting).

- (i) Dedicated horizontal mounting models have 80% of mechanical durability, electrical durability and switching frequency, compared with standard mounting models.
- (ii) For magnetic starters, the ultimate operational current of thermal overload relay slightly changes.
- (iii) The following models are available; type SC-03 to SC-5-1, type SW-03 to 5-1, type SH-4, 5, type SC-N1 to N10, type SW-N1 to N10, type SC-N1/G to N3/G, type SC-N1/SE to N4/SE, type SB-□N.
- (iv) Dedicated horizontal mounting models of type SC-03/G to SC-5-1/G, type SC-N11 to SC-N16, type SB-□NB are not available.



Figure 1 Standard mounting

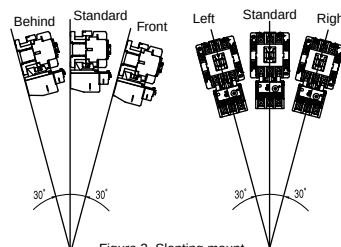


Figure 2 Slanting mount

Magnetic Contactors and Starters

SC and SW series

Specifications

■ Ratings

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

Contactor Type	Starter Type	Max. motor capacity (kW)				Rated operational current (A)				Thermal current (A) *1
		200V	380V	500V	600V	200V	380V	500V	600V	
		240V	440V	550V	660V	240V	440V	550V	660V	
SC-03	SW-03/3H	2.5	4	4	4	11	9	7	5	20
SC-0	SW-0/3H	3.5	5.5	5.5	5.5	13	12	9	7	20
SC-05	SW-05/3H	3.5	5.5	5.5	5.5	13	12	9	7	20
SC-4-0	SW-4-0/3H	4.5	7.5	7.5	7.5	18	16	13	9	25
SC-4-1	SW-4-1/3H	5.5	11	11	7.5	22	22	17	9	32
SC-5-1	SW-5-1/3H	5.5	11	11	7.5	22	22	17	9	32
SC-N1	SW-N1/3H	7.5	15	15	11	32	32	24	15	50
SC-N2	SW-N2/3H	11	18.5	18.5	15	40	40	29	19	60
SC-N2S	SW-N2S/3H	15	22	25	22	50	50	38	26	80
SC-N3	SW-N3/3H	18.5	30	37	30	65	65	60	38	100
SC-N4	SW-N4/3H	22	40	37	37	80	80	60	44	135
SC-N5A	SW-N5A/3H	30	55	55	55	105	105	85	64	150
SC-N6	SW-N6/3H	37	60	60	60	125	125	90	72	150
SC-N7	SW-N7/3H	45	75	75	90	150	150	120	103	200
SC-N8	SW-N8/3H	55	90	130	132	180	180	180	150	260
SC-N10	SW-N10/3H	65	110	132	132	220	220	200	150	260
SC-N11	SW-N11/3H	90	160	160	200	300	300	230	230	350
SC-N12	SW-N12/3H	120	220	250	300	400	400	360	360	450
SC-N14	SW-N14/3H	180	315	400	480	600	600	600	600	660
SC-N16	—	220	440	500	500	800	800	720	630	800

Note: *1 The values are applied to contactors.

■ Making and breaking capacities

Utilization category	Typical applications	IEC 60947-4-1, EN 60947-4-1, VDE 0660, JIS C 8201-4-1					
		Making and breaking			Making		
		Ic/Ie	Ur/Ue	cosø or L/R	I/Ie	U/Ue	cosø or L/R
AC-1	Non-inductive or slightly inductive loads, resistance furnaces	1.5	1.05	0.8	1.5	1.05	0.8
AC-2	Slip-ring motors: Starting, switching off	4.0	1.05	0.65	4.0	1.05	0.65
AC-3	Squirrel-cage motors: Ie 100A	8.0	1.05	0.45	10	1.05	0.45
	Starting, switching off duling running Ie > 100A	8.0	1.05	0.35	10	1.05	0.35
AC-4	Squirrel-cage motors: Ie 100A	10	1.05	0.45	12	1.05	0.45
	Starting, plugging, inching Ie > 100A	10	1.05	0.35	12	1.05	0.35
AC-5a	Switching of electric discharge lamp controls	3.0	1.05	0.45	3.0	1.05	0.45
AC-5b	Switching of incandescent lamps	1.5	1.05	*	1.5	1.05	*

Note: *Test to be carried out with an incandescent lamp load.

Ie: Rated operational current

Ue: Rated operational voltage

I: Current made

U: Voltage before make

Ur: Recovery voltage

Ic: Current broken

■ Auxiliary contact ratings

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

Type	Continuous currnet (A)	Make and break capacity at AC (A)	Rated operational current (A)			DC			Minimum voltage and current
			AC Voltage (V)	AC-15 (Ind.load)	AC-12 (Res.load)	Voltage (V)	DC-13 (Ind.load)	DC-12 (Res.load)	
SC-03 to SC-N12	10	60	100–120	6	10	24	3	5	5V 3mA
		30	200–240	3	8	48	1.5	3	
		15	380–440	1.5	5	110	0.55	2.5	
		12	500–600	1.2	5	220	0.27	1	
SC-N14 to SC-16N	10	60	100–120	6	10	24	5	10	24V 10mA
		60	200–240	6	10	48	1.5	5	
		40	380–440	4	10	110	0.55	2.5	
		25	500–600	2.5	10	220	0.27	1	

■ Inching and plugging operations (Conforming to IEC 60947-4-1)

In applications where inching and plugging operations are included the contact wear will be increased. Therefore, it is necessary to select ones having larger frame sizes than in standard applications so as to minimize the needs of maintenance and replacement.

Voltage	Motor ratings		50% inching operation	
	Capacity (kW)	Full load current (A)	Electrical durability 100,000 operations	Electrical durability 500,000 operations
200V 240V	0.2	1.8	SC-03	SC-03
	0.4	3.2	SC-03	SC-03
	0.75	4.8	SC-03	SC-0, 05
	1.5	8.0	SC-03	SC-4-1, 5-1
	2.2	11.1	SC-4-0	SC-N1
	3.7	17.4	SC-4-1, 5-1	SC-N2
	5.5	26	SC-N1	SC-N3
	7.5	34	SC-N2	SC-N5A
	11	48	SC-N2S	SC-N7
	15	65	SC-N4	SC-N8
380V 440V	18.5	79	SC-N5A	SC-N10
	22	93	SC-N6	SC-N11
	30	124	SC-N7	SC-N14
	37	152	SC-N8	SC-N14
	45	180	SC-N10	—
	55	220	SC-N11	—
	75	300	SC-N14	—
	0.75	2.4	SC-03	SC-03
	1.5	4.0	SC-03	SC-03
	2.2	5.6	SC-03	SC-4-0
	3.7	8.7	SC-03	SC-4-1, 5-1
	5.5	13	SC-4-0	SC-N1
	7.5	17	SC-4-1, 5-1	SC-N2S
	11	24	SC-N1	SC-N3
	15	32.5	SC-N2	SC-N5A
	18.5	39.5	SC-N2S	SC-N6
	22	46.5	SC-N3	SC-N7
	30	62	SC-N4	SC-N8
	37	76	SC-N5A	SC-N10
	45	90	SC-N6	SC-N11
	55	110	SC-N8	SC-N12
	75	150	SC-N10	SC-N14
	90	180	SC-N11	—
	110	220	SC-N12	—
	132	264	SC-N14	—
	150	300	SC-N14	—
	160	320	SC-N14	—

Notes: 1. Inching % = $\frac{\text{No. of inching operations}}{\text{Total No. of switching operations}} \times 100\%$

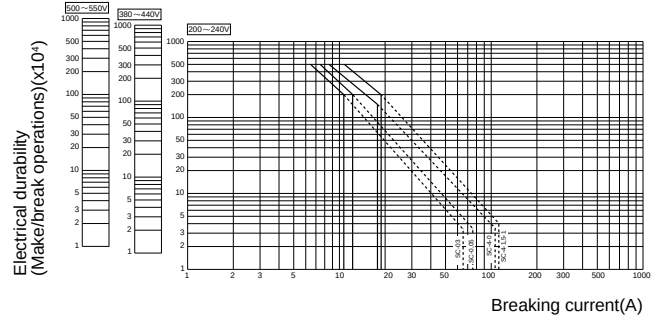
2. Light inching: 50%
 Printing machine and similar equipment
 Heavy inching: 75 – 100%
 Machine tool, hoist and similar equipment (In cases when there are frequent on/off operations involving starting rush current).

■ Standard conditions for operation in service

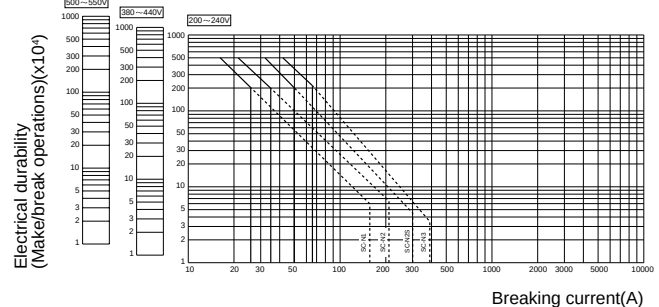
- Temperature range:
 Operating: –5°C to +40°C
 (–5°C to +55°C inside panel box)
 Storage: –40°C to +65°C
- Humidity: 45 to 85% RH
- Vibration: 10 to 55Hz, 15m/s²
- Shock: 50m/s²
- Altitude: 2000m (6600ft) or lower
- IP40

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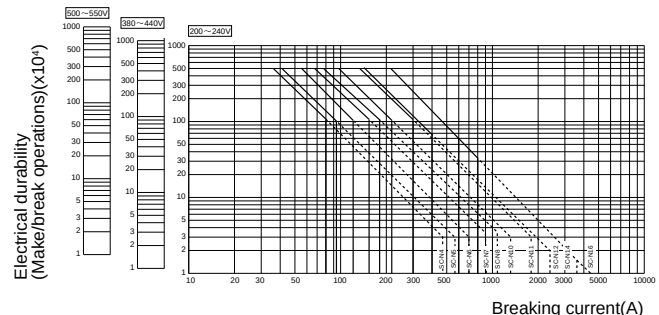
■ Breaking current and electrical durability SC-03 to 5-1



SC-N1 to N3

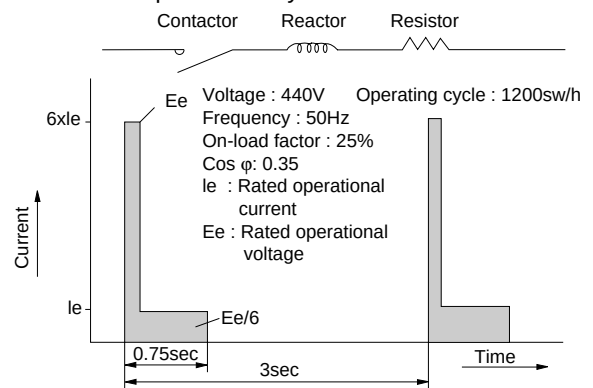


SC-N4 to N16



■ Testing method—Category AC-3

The method of determining the life expectancy and performance is prescribed by IEC as below.



A current equal to six times that of the rated operational current of the starter is applied to the terminals the switch is closed and the current immediately reduced to the rated operational current and then interrupted.

Magnetic Contactors and Starters

SC and SW series

Specifications

■ Performance data

Frame size	Making capacity I/le	Breaking capacity I/le	Operating cycles per hour	Voltage	Durability (operations)	
					Electrical *	Mechanical
03, 0, 05	12	10	1,800	200/240V AC 380/440V AC	2 million	10 million
4-0	12	10	1,800	200/240V AC 380/440V AC	1.5 million	10 million
4-1, 5-1	12	10	1,800	200/240V AC 380/440V AC	2 million	10 million
N1 to N3	12	10	1,200	200/240V AC 380/440V AC	2 million	10 million (N1, N2) 5 million (N2S, N3)
N4 to N11	12	10	1,200	200/240V AC 380/440V AC	1 million	5 million
N12, N14	12	10	1,200	200/240V AC 380/440V AC	500,000	5 million
N16	12	10	1,200	200/240V AC 380/440V AC	250,000	2.5 million

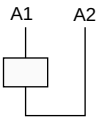
le: Rated operational current.

I: Making or breaking current

* For details, refer to page 01/21

■ Coil voltage

● Frame size 03 to N5A

Frame size	Coil operating voltage and frequency (AC)			Order voltage	Coil voltage code	Identification by coil color	Wiring
03	24V	50Hz/24–26V	60Hz	AC24V	E	White	
0	48V	50Hz/48–52V	60Hz	AC48V	F	White	
05	100V	50Hz/100–110V	60Hz	AC100V	1	Green (Standard voltage)	
4-0	100–110V	50Hz/110–120V	60Hz	AC110V	H	White	
4-1	110–120V	50Hz/120–130V	60Hz	AC120V	K	White	
5-1	200V	50Hz/200–220V	60Hz	AC200V	2	Yellow (Standard voltage)	
N1	200–220V	50Hz/220–240V	60Hz	AC220V	M	White	
N2	220–240V	50Hz/240–260V	60Hz	AC240V	P	White	
N2S	346–380V	50Hz/380–420V	60Hz	AC380V	S	White	
N3	380–400V	50Hz/400–440V	60Hz	AC400V	4	Purple (Standard voltage)	
N4	415–440V	50Hz/440–480V	60Hz	AC440V	T	White	
N5A	480–500V	50Hz/500–550V	60Hz	AC500V	5	White	

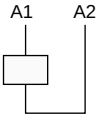
Notes: • Other voltages are available in 24 to 600V ranges on request.

• For frame size N1/SE to N4/SE, 24V to 250V AC (24V to 240V DC) is available.

• Use the coil voltage code, not specifying your actual voltage when ordering. Contactors with coil voltage range which corresponds to the voltage code you specified will be shipped from factory.

The above coil operating voltage and frequency (not voltage code) are shown on the products.

● Frame size N5 to N16

Frame size	Coil operating voltage and frequency		Order voltage	Coil voltage code	Identification by coil color	Wiring
	AC	DC				
N5	24–25V 50/60Hz	24V	AC24V ^{*3}	E	White	
N6	48–50V 50/60Hz	48V	AC48V ^{*3}	F	White	
N7	100–127V 50/60Hz	100–120V ^{*1}	AC100V	1	Green (Standard voltage)	
N8						
N10	200–250V 50/60Hz	200–240V ^{*2}	AC200V	2	Yellow (Standard voltage)	
N11	265–347V 50/60Hz	–	AC300V	3	White	
N12	380–450V 50/60Hz	–	AC400V	4	Purple (Standard voltage)	
N14	460–575V 50/60Hz	–	AC500V	5	White	
N16						

Notes: • The coils are AC/DC common use (rated voltage 200V or less)

• Standard rated voltages are 100V, 200V and 400V.

Other voltages are available in 24V to 575V AC (24V to 240V DC) in frame size N5 to N12, also available in 100V to 575V AC (100V to 240V DC) in frame size N14 to N16.

• Use the coil voltage code, not specifying your actual voltage when ordering. Contactors with coil voltage range which corresponds to the voltage code you specified will be shipped from factory.

The above coil operating voltage and frequency (not voltage code) are shown on the products.

^{*1} The coil voltage from a DC power supply with single phase full-wave rectification will be 100 to 110 V.

^{*2} The coil voltage from a DC power supply with single phase full-wave rectification will be 200 to 220 V.

^{*3} The coil voltage 24V and 48V are not available in frame size N14 to N16.

■ Coil characteristics
● Frame size 03 to N5A

Frame size	Power consumption		Watt loss (W)		Pick-up voltage (V)		Drop-out voltage (V)		Operating time (ms)	
	Inrush (VA)	Sealed (VA)	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz	Coil ON→ Contact ON	Coil OFF→ Contact OFF
03	95	9	2.7	2.8	105–125	116–136	70–98	80–110	9–20	5–16
0	95	9	2.7	2.8	105–125	116–136	70–98	80–110	9–20	5–16
05	95	9	2.7	2.8	105–125	116–136	70–98	80–110	9–20	5–16
4–0	95	9	2.7	2.8	118–136	130–146	75–106	88–120	9–20	5–16
4–1	95	9	2.7	2.8	118–136	130–146	75–106	88–120	9–20	5–16
5–1	95	9	2.7	2.8	118–136	130–146	75–106	88–120	9–20	5–16
N1	135	12.7	3.6	3.8	110–130	120–140	75–105	85–115	10–17	6–17
N2	135	12.7	3.6	3.8	110–130	120–140	75–105	85–115	10–17	6–17
N2S	190	13.4	4.5	5	115–135	130–150	85–110	100–125	10–18	8–18
N3	190	13.4	4.5	5	115–135	130–150	85–110	100–125	10–18	8–18
N4	210	14.4	4.8	5.3	120–140	135–155	70–95	95–120	16–23	7–17
N5A	260	18.1	6.2	6.7	115–145	135–150	80–90	90–110	13–21	6–12

Note: Coil ratings 200V 50Hz, 200 to 220V 60Hz. Operating time is based on 200V 50Hz.

● Frame size N5 to N16, N1/SE to N4/SE (contactor only)

AC operating

Frame size	Power consumption		Watt loss (W)		Pick-up voltage (V) 200V 50/60Hz	Drop-out voltage (V) 200V 50/60Hz	Operating time (ms)	
	Inrush (VA)	Sealed (VA)	200V 50Hz	220V 60Hz			Coil ON→ Contact ON	Coil OFF→ Contact OFF
N5	95	4.6	3.2	3.6	140–150	60–100	39–45	27–33
N6	230	5.8	3.4	3.7	140–150	60–100	31–37	30–36
N7	230	5.8	3.4	3.7	140–150	60–100	31–37	30–36
N8	255	6.2	4.7	5.2	140–150	60–100	38–44	31–37
N10	255	6.2	4.7	5.2	140–150	60–100	38–44	31–37
N11	320	6.5	5.6	6	140–150	60–100	43–49	41–47
N12	320	6.5	5.6	6	140–150	60–100	43–49	41–47
N14	460	11	7.8	8.6	140–160	60–100	69–75	56–62
N16	460	11	7.8	8.6	140–160	60–100	69–75	56–62
N1/SE	130	4.2	2.8	3.2	140–150	60–100	21–27	18–24
N2/SE	130	4.2	2.8	3.2	140–150	60–100	21–27	18–24
N2S/SE	160	4.3	2.9	3.3	140–150	60–100	24–30	24–32
N3/SE	160	4.3	2.9	3.3	140–150	60–100	24–30	24–32
N4/SE	95	4.6	3.2	3.6	140–150	60–100	39–45	26–33

Note: Coil ratings 200 to 250V 50/60Hz, 200 to 220V DC. Operating time is based on 200V 50/60Hz.

DC operating

Frame size	Power consumption		Time constant (ms) Sealed	Pick-up voltage (V) 200V DC	Drop-out voltage (V) 200V DC	Operating time (ms)	
	Inrush (W)	Sealed (W)				Coil ON→ Contact ON	Coil OFF→ Contact OFF
N5	110	3	1	140–160	40–100	35–41	26–32
N6	275	4	1	140–160	40–100	28–34	27–33
N7	275	4	1	140–160	40–100	28–34	27–33
N8	300	4.5	1	140–160	40–100	33–39	31–37
N10	300	4.5	1	140–160	40–100	33–39	31–37
N11	410	4.6	1	140–160	40–100	38–44	41–47
N12	410	4.6	1	140–160	40–100	38–44	41–47
N14	500	8.8	1	140–160	40–100	64–70	52–57
N16	500	8.8	1	140–160	40–100	64–70	52–57

Note: Coil ratings 200 to 250V 50/60Hz, 200 to 220V DC. Operating time is based on 200V DC.

Magnetic Contactors and Starters

SC and SW series

Specifications

DC applications of magnetic contactors

■ Description

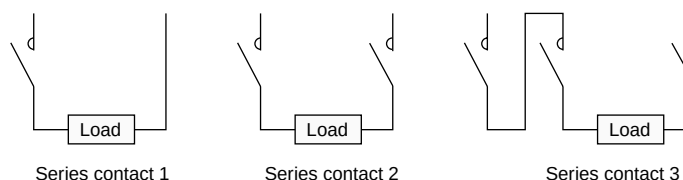
FUJI magnetic contactors in the SC series are normally used in AC circuit applications. However, they may also be used in DC circuits, and in this case their contacts must be connected in series as shown in the diagram.

When used in this manner they will be found to be more economical than using contactors exclusively designed for DC applications. Coils are available for both AC and DC.

If the following ratings are observed the equipment will have an electrical durability of approx. 500,000 operations.

■ Wiring connection

Contacts must be connected in series when the contactors are used in DC applications.



■ Ratings

Type	No. of contacts connected in series	Rated operational current (A)							
		Class DC-1(JEM1038) (Resistive, L/R ≤ 1ms.)				Class DC2, 4,(JEM1038) (DC motor, L/R ≤ 15ms.)			
		24V	48V	110V	220V	24V	48V	110V	220V
SC-03	1	13	13	10	1.2	6	3	2	0.35
	2	13	13	10	6	12	6	4	1.2
	3	15	15	15	15	15	10	8	4
SC-0	1	13	13	10	1.2	6	3	2	0.35
	2	13	13	10	6	12	6	4	1.2
	3	15	15	15	15	15	10	8	4
SC-05	1	13	13	10	1.2	6	3	2	0.35
	2	13	13	10	6	12	6	4	1.2
	3	15	15	15	15	15	10	8	4
SC-4-0	1	16	13	10	1.5	8	6	2	0.35
	2	16	16	12	8	16	12	6	1.5
	3	18	18	18	15	18	18	12	6
SC-4-1	1	20	15	12	2	10	8	3	0.35
	2	20	20	15	10	20	15	8	2
	3	22	22	20	15	22	22	15	8
SC-5-1	1	20	15	12	2	10	8	3	0.35
	2	20	20	15	10	20	15	8	2
	3	22	22	20	15	22	22	15	8
SC-N1	1	25	25	15	2	15	8	3	0.35
	2	25	25	25	20	25	15	8	2
	3	35	35	30	25	35	25	20	8
SC-N2	1	30	30	20	2	20	15	4	0.35
	2	30	30	30	20	30	20	15	3
	3	45	45	40	35	35	30	30	8
SC-N2S	2	60	60	40	20	60	30	20	3.5
	3	60	60	60	40	60	60	60	13
SC-N3	2	80	80	50	20	80	40	20	4
	3	80	80	80	60	80	80	80	20
SC-N4	2	80	80	50	20	80	40	20	4
	3	80	80	80	60	80	80	80	20
SC-N5A	2	120	120	80	40	120	80	40	15
	3	120	120	120	120	120	120	120	80
SC-N6	2	120	120	80	40	120	80	40	15
	3	120	120	120	120	120	120	120	80
SC-N7	2	160	160	100	80	160	120	80	40
	3	160	160	160	160	160	160	160	160
SC-N8	2	200	200	160	160	200	160	120	60
	3	200	200	200	200	200	200	200	200
SC-N10	2	200	200	160	160	200	160	120	60
	3	200	200	200	200	200	200	200	200
SC-N11	2	300	300	200	200	300	200	160	80
	3	300	300	300	300	300	300	300	300
SC-N12	2	400	400	330	300	400	300	200	100
	3	400	400	400	400	400	400	400	400
SC-N14	2	600	500	420	300	—	—	—	—
	3	600	600	600	420	—	—	—	—

Standard type non-reversing contactors and starters

Up to 315kW 440 Volts 3-phase
(440kW for contactor only)

Description

The starter consists of a magnetic contactor and a thermal overload relay and is designed for the full voltage starting of 3-phase induction motor.

Standards

- Meet the requirements of BS, NEMA, IEC, VDE and JIS.
- The SC series contactors have already been approved by NK, LR, BV for marine use, UL, CSA and TÜV. These contactors can be used universally because of their high efficiency and reliability and are completely safe. Their maximum rated voltage is 660V AC.

Features

SC-03 to SC-5-1

- Small frame contactors have such options as additional auxiliary blocks, operation counter unit with snap-on fittings, and coil surge suppressors. Modification can be made quickly and easily on site.
- Bifurcated type auxiliary contacts have a high degree of contact reliability. They can be used in low level circuit of 5V, 3mA.
- Type and rating are indicated on the front of contactor.

Contactors with single button auxiliary contacts (SC-03H to N12H)

See page 01/64

Types and ratings

Max. motor capacity (kW)		Rated operation current (A)		Rated thermal current (A)	Auxiliary contact		Contactor		Starter (3-element)	
200V	380V	200V	380V		NO	NC	Open Type	Ordering code	Open Type	Ordering code
240V	440V	240V	440V						Enclosed Type	Ordering code
2.5	4	11	9	20	1	— ^{*1}	SC-03	SC11AA-■10	SW-03/3H	SC11AAN-■10T□□
3.5	5.5	13	12	20	1	— ^{*1}	SC-0	SC13AA-■10	SW-0/3H	SC13AAN-■10T□□
3.5	5.5	13	12	20	1	1 ^{*2}	SC-05	SC14AA-■11	SW-05/3H	SC14AAN-■11T□□
4.5	7.5	18	16	25	1	— ^{*1}	SC-4-0	SC18AA-■10	SW-4-0/3H	SC18AAN-■10T□□
5.5	11	22	22	32	1	— ^{*1}	SC-4-1	SC19AA-■10	SW-4-1/3H	SC19AAN-■10T□□
5.5	11	22	22	32	1	1 ^{*3}	SC-5-1	SC20AA-■11	SW-5-1/3H	SC20AAN-■11T□□
7.5	15	32	32	50	2	2	SC-N1	SC25BAA-■22	SW-N1/3H	SC25BAAN-■22T□□
11	18.5	40	40	60	2	2	SC-N2	SC35BAA-■22	SW-N2/3H	SC35BAAN-■22T□□
15	22	50	50	80	2	2	SC-N2S	SC50BAA-■22	SW-N2S/3H	SC50BAAN-■22T□□
18.5	30	65	65	100	2	2	SC-N3	SC65BAA-■22	SW-N3/3H	SC65BAAN-■22T□□
22	40	80	80	135	2	2	SC-N4	SC80BAA-■22	SW-N4/3H	SC80BAAN-■22T□□
30	55	105	105	150	2	2	SC-N5A	SC93CAA-■22	SW-N5A/3H	SC93CAAN-■22T□□
37	60	125	125	150	2	2	SC-N6	SC1CBAA-■22	SW-N6/3H	SC1CBAAN-■22T□□
45	75	150	150	200	2	2	SC-N7	SC1FBAAN-■22	SW-N7/3H	SC1FBAAN-■22T□□
55	90	180	180	260	2	2	SC-N8	SC1JBAA-■22	SW-N8/3H	SC1JBAAN-■22T□□
65	110	220	220	260	2	2	SC-N10	SC2CBAA-■22	SW-N10/3H	SC2CBAAN-■22T□□
90	160	300	300	350	2	2	SC-N11	SC3ABAA-■22	SW-N11/3H	SC3ABAA-■22T□□
120	220	400	400	450	2	2	SC-N12	SC4ABAA-■22	SW-N12/3H	SC4ABAA-■22T□□
180	315	600	600	660	2	2	SC-N14	SC6ABAA-■22	SW-N14/3H	SC6ABAA-■22T□□
220	440	800	800	800	2	2	SC-N16	SC8ABAA-■22		

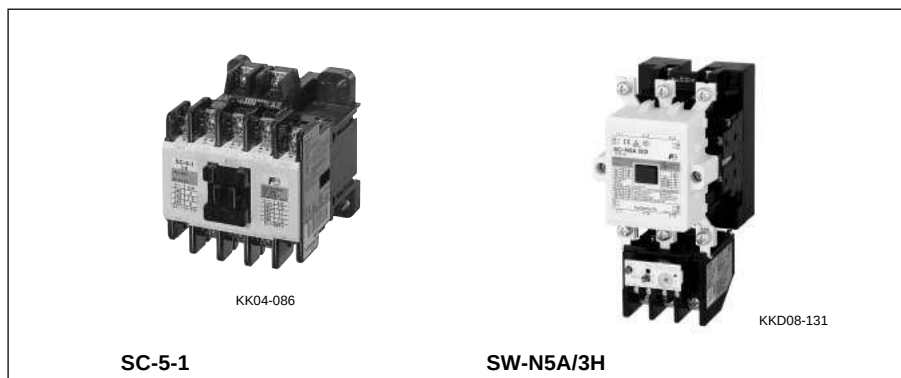
Notes : 1. ■ : Coil voltage code, □ : Thermal overload relay ampere setting range code, see page 01/19.

2. ^{*1} Auxiliary contact 1NC is available. ^{*2} Auxiliary contact 2NC or 2NC is available.

^{*3} Auxiliary contact 2NO, 2NC, or 2NO+2NC is available. For enclosed type, 2NO+2NC is not available.

3. Auxiliary contact 4NO+4NC is available on request for frame size N1 and above.

4. Contactor with enclosure is also available.



SC-N1 to SC-N16

- Adoption of improved contact material and arc-extinguishing grid permits further improvement in breaking efficiency.
- Type and rating are indicated on the front of contactor.
- Auxiliary contact arrangements are available up to 4NO+4NC.
- Can be mounted on 35mm rails to meet the requirements of IEC Standards. (SC-N1 to N3)
- Bifurcated type auxiliary contacts have a high degree of contact reliability. They can be used in low level circuit of 5V, 3mA.(SC-N1 to N12)

SUPER MAGNET(SC-N6 to SC-N16)

- The electronically-controlled SUPER MAGNET has an IC built into the coil circuit. Its operation is based on the "AC input, DC operated" concept.
- Operate on both AC and DC power supply. The operating voltage range has been greatly expanded.

- Coil burning and contact chattering due to voltage fluctuation have been eliminated.
- A built-in surge suppression device prevents surges from occurring on ON-OFF operations.

Thermal overload relays

- Superior protection
- The starter is fitted with a TR type thermal overload relay which features ambient temperature compensation, auto-manual resetting, and trip indicator.
- Alarm contacts are available in 1NO+1NC arrangements.
- Optional operation indicating lamp can be fitted on request.

Thermal overload relays :

See page 01/88.

Auxiliary contact ratings :

See page 01/20.

Performance data :

See page 01/22.

■ Coil ratings : See page 01/22.

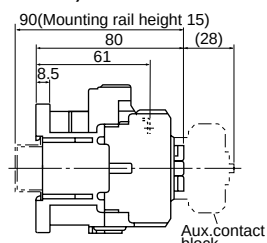
Magnetic Contactors and Starters

SC and SW series

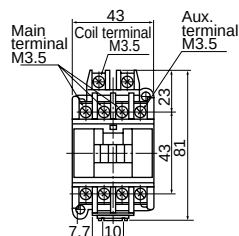
Standard type

■ Dimensions, mm Contactors/Open type

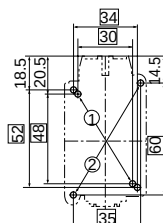
SC-03, SC-0



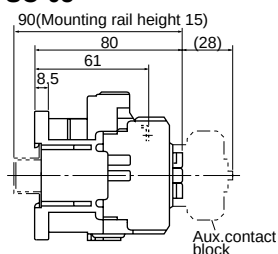
Mass: 0.32kg



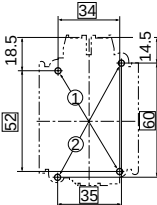
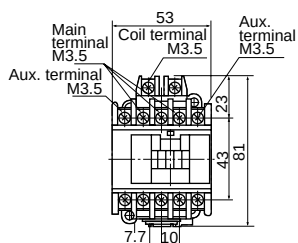
Panel drilling



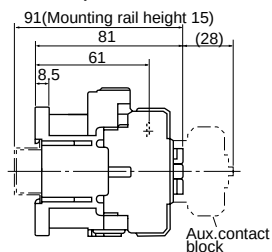
SC-05



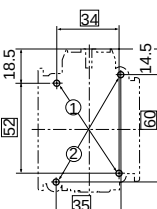
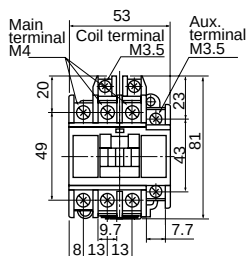
Mass: 0.34kg



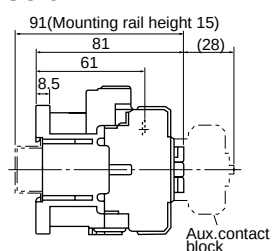
SC-4-0, SC-4-1



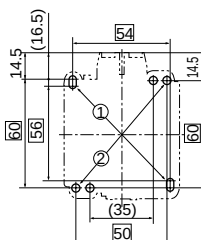
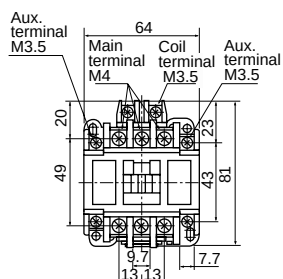
Mass: 0.36kg



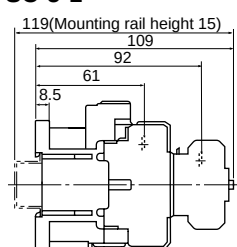
SC-5-1



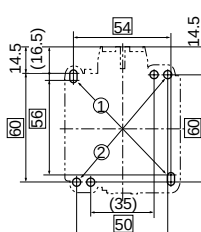
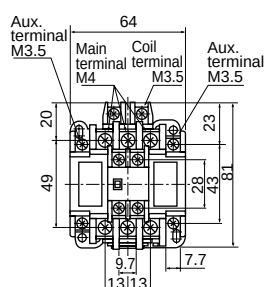
Mass: 0.38kg



SC-5-1



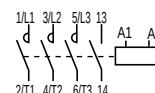
Mass: 0.4kg



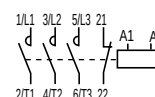
■ Wiring diagrams

Auxiliary contact

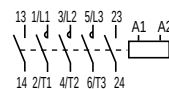
1NO



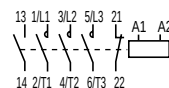
1NC



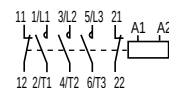
2NO



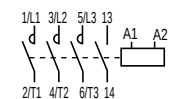
1NO+1NC



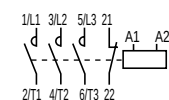
2NC



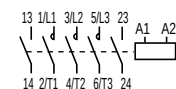
1NO



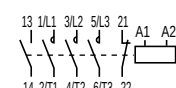
1NC



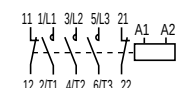
2NO



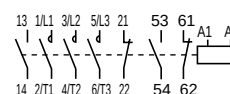
1NO+1NC



2NC



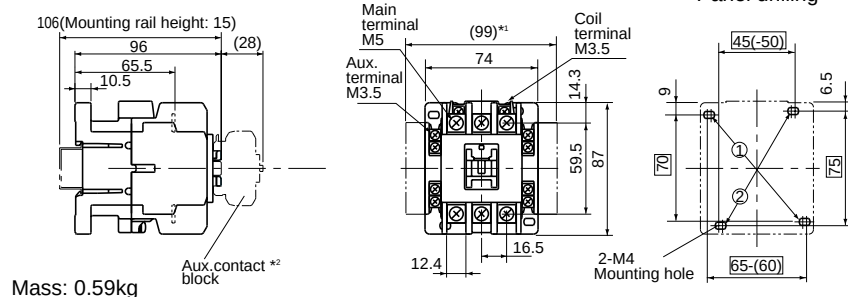
2NO+2NC



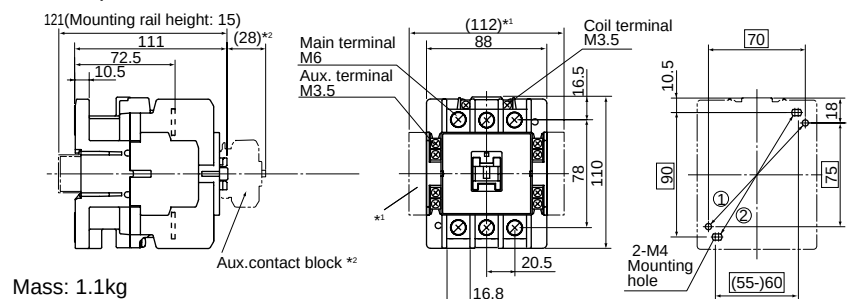
Note: Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

■ Dimensions, mm
Contactors/Open type

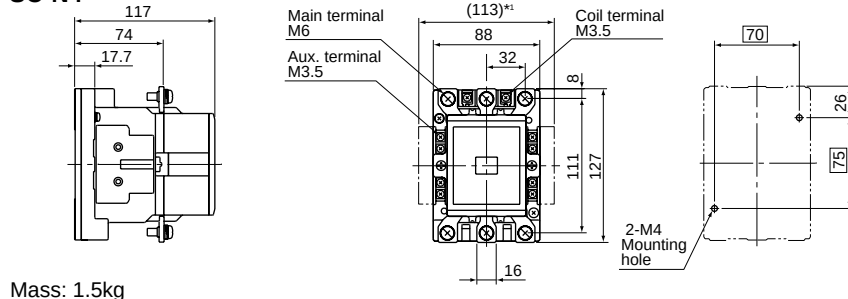
SC-N1, SC-N2



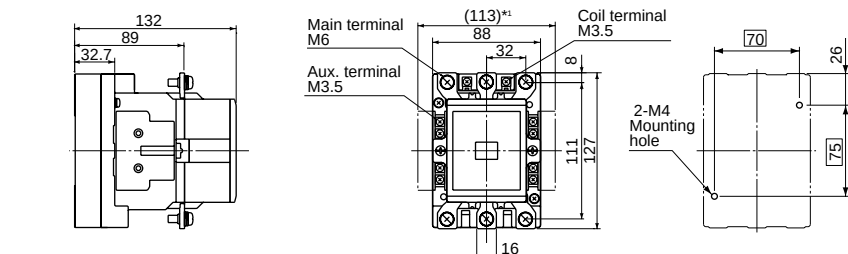
SC-N2S, SC-N3



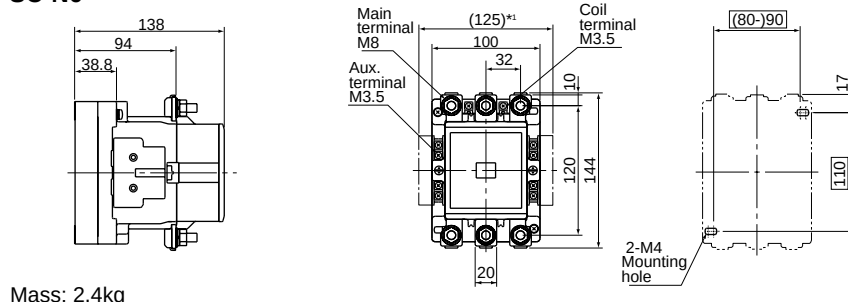
SC-N4



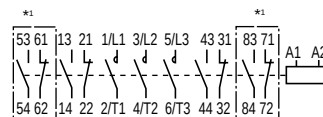
SC-N5A



SC-N6



■ Wiring diagrams
SC-N1 to SC-N16



*1 In case of auxiliary contact 4NO+4NC

Note: • Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

*1 For two side mounting aux. contact blocks mounted

*2 For front mounting aux. contact blocks mounted

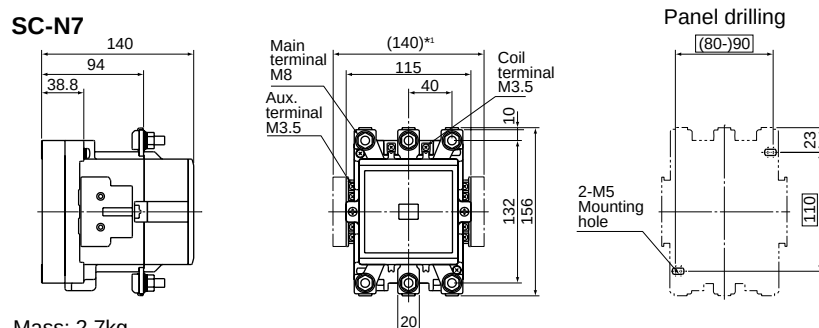
Magnetic Contactors and Starters

SC and SW series

Standard type

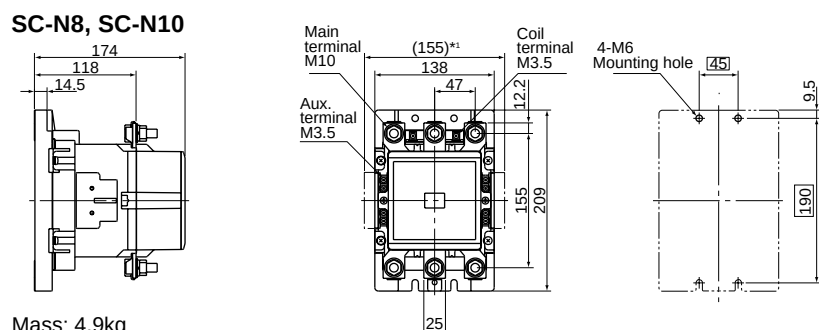
■ Dimensions, mm Contactors/Open type

SC-N7



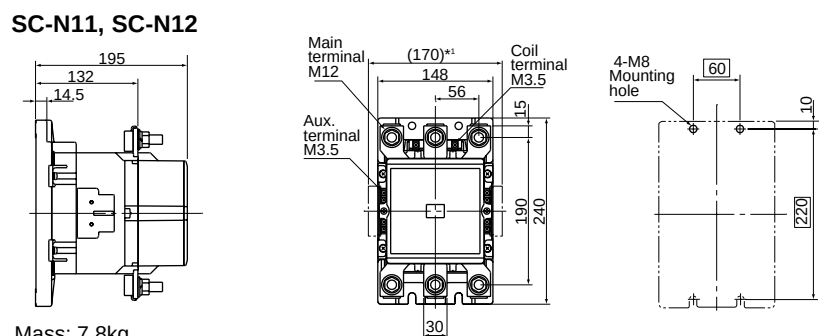
Mass: 2.7kg

SC-N8, SC-N10



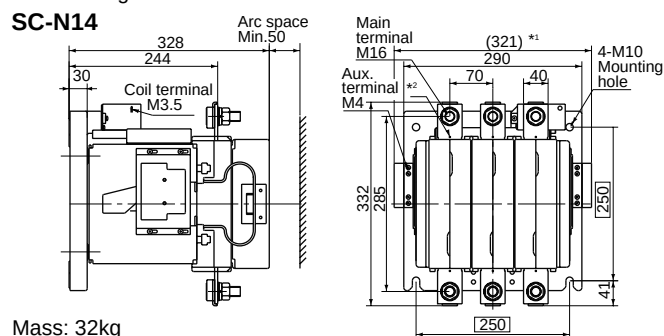
Mass: 4.9kg

SC-N11, SC-N12



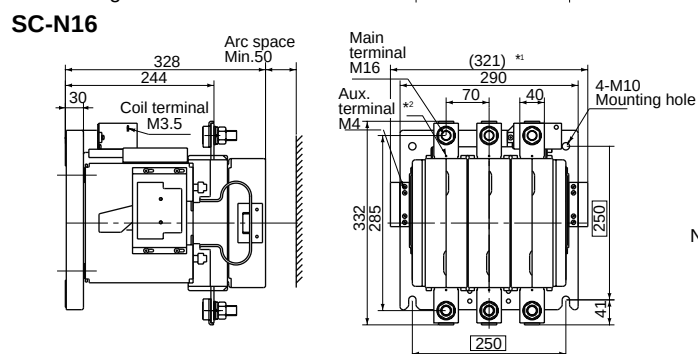
Mass: 7.8kg

SC-N14



Mass: 32kg

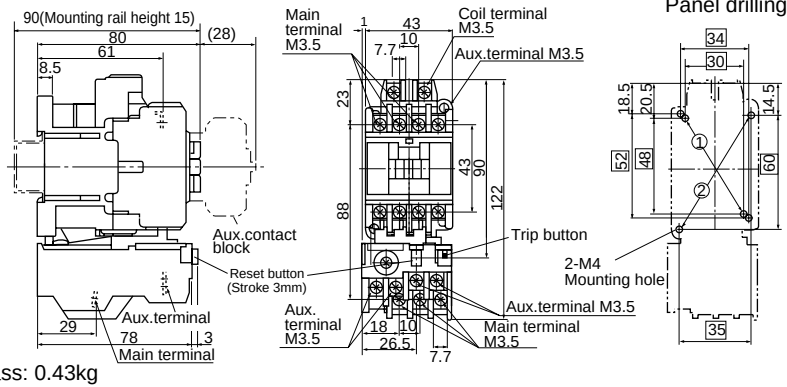
SC-N16



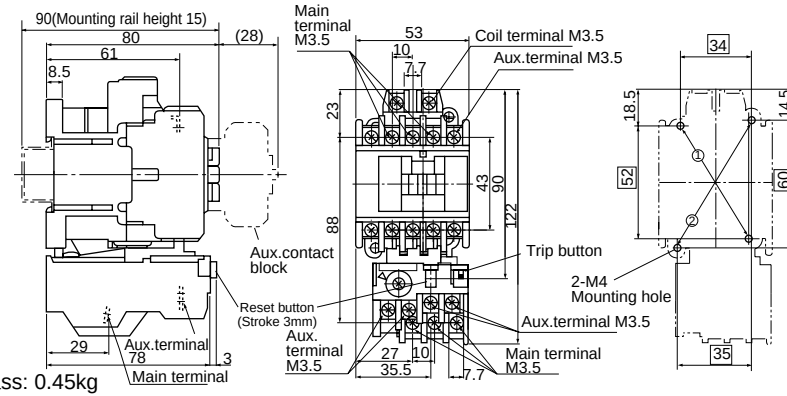
Mass: 34kg

Note: *1 For two side mounting aux.contact blocks mounted
*2 M4 tap for control circuit

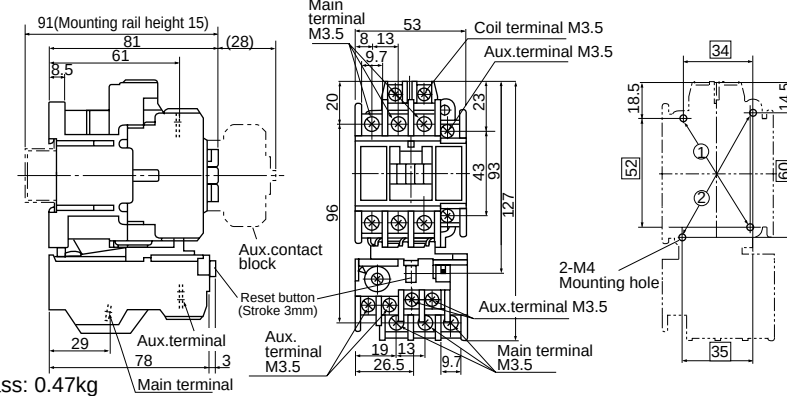
■ Dimensions, mm
Starters/Open type
SW-03/3H, SW-0/3H



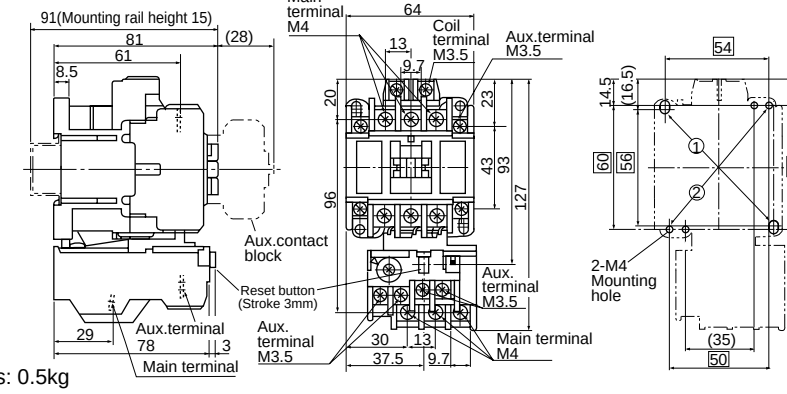
SW-05/3H



SW-4-0/3H, SW-4-1/3H



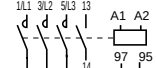
SW-5-1/3H



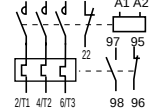
■ Wiring diagrams

Auxiliary contact

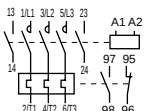
1NO



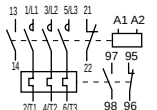
1NC



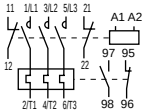
2NO



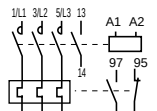
1NO+1NC



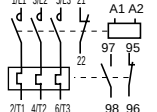
2NC



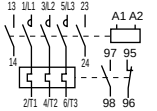
1NO



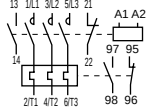
1NC



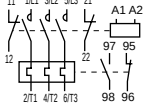
2NO



1NO+1NC



2NC



Note: Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

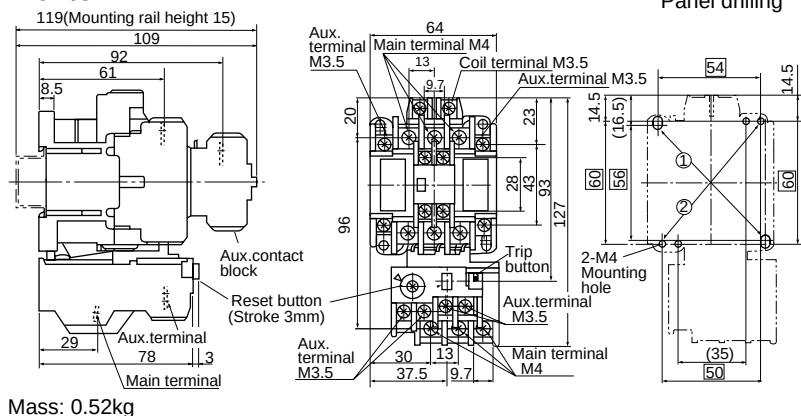
Magnetic Contactors and Starters

SC and SW series

Standard type

■ Dimensions, mm Starters/Open type

SW-5-1/3H

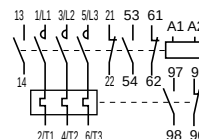


Mass: 0.52kg

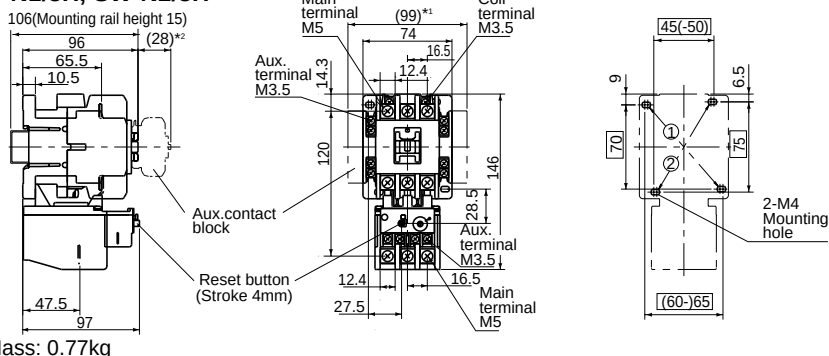
■ Wiring diagrams SW-5-1/3H

Auxiliary contact

2NC+2NO

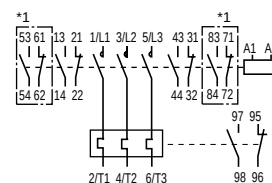


SW-N1/3H, SW-N2/3H



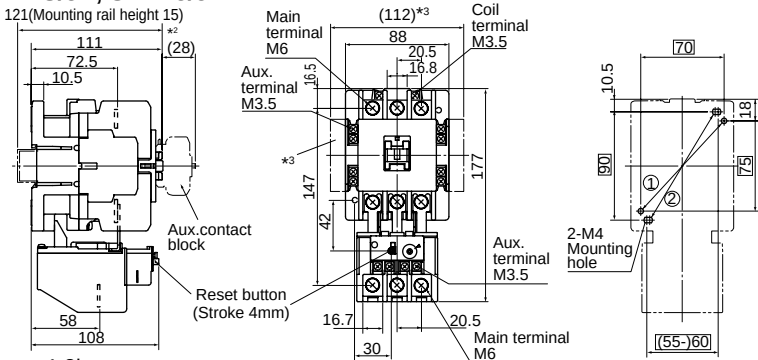
Mass: 0.77kg

■ Wiring diagrams SW-N1/3H to SW-N8/3H



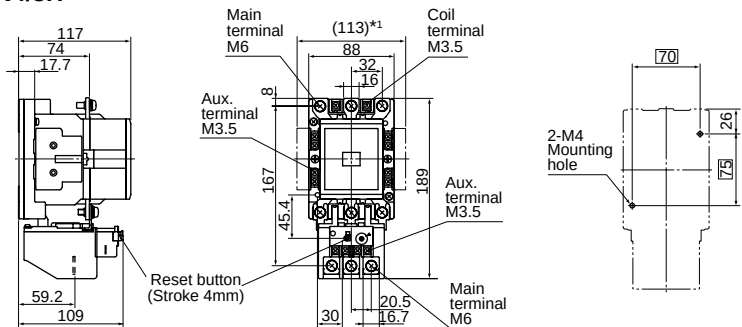
*1 In case of auxiliary contact 4NO+4NC

SW-N2S/3H, SW-N3/3H



Mass: 1.3kg

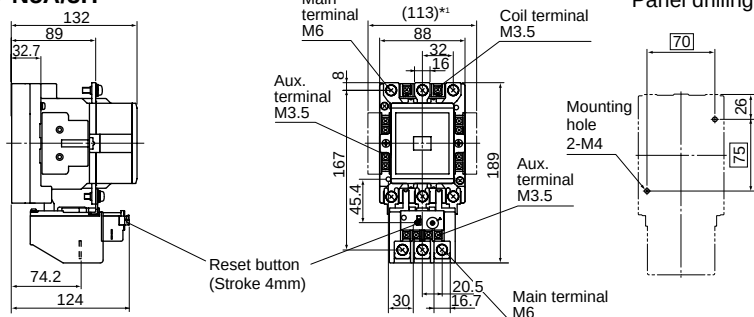
SW-N4/3H



Mass: 1.7kg

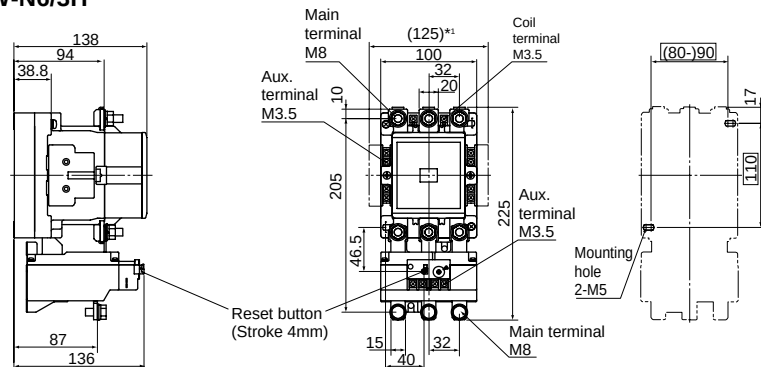
Note: • Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard
*1 For two side mounting aux. contact blocks mounted
*2 For front mounting aux. contact blocks mounted

■ Dimensions, mm
Starters/Open type
SW-N5A/3H



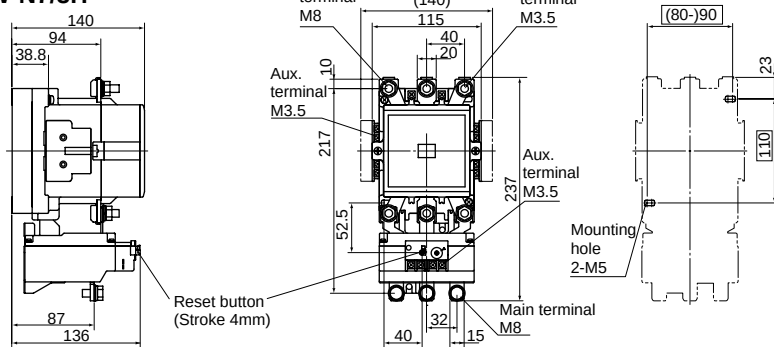
Mass: 1.7kg

SW-N6/3H



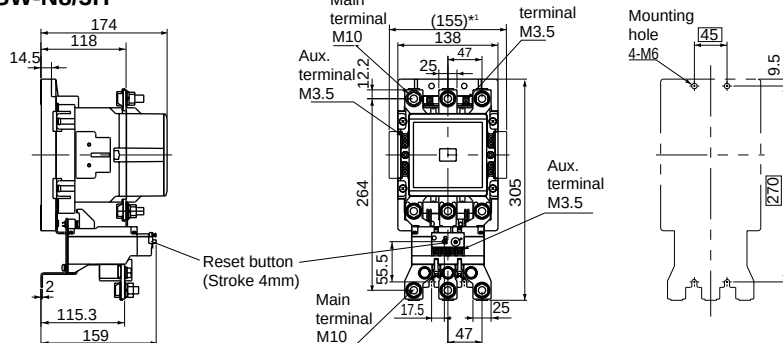
Mass: 3kg

SW-N7/3H



Mass: 3.3kg

SW-N8/3H



Mass: 6.1kg

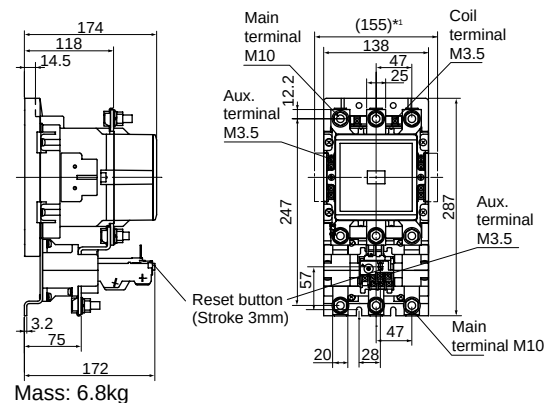
Note: *1 For two side mounting aux. contact blocks mounted

Magnetic Contactors and Starters

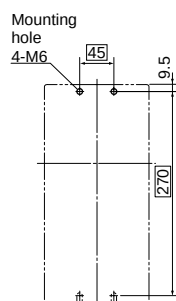
SC and SW series

Standard type

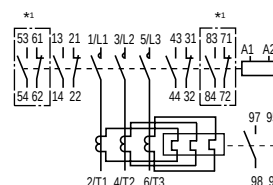
■ Dimensions, mm Starters/Open type SW-N10/3H



Panel drilling

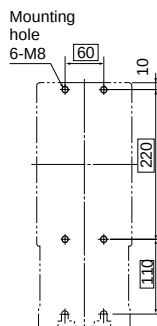
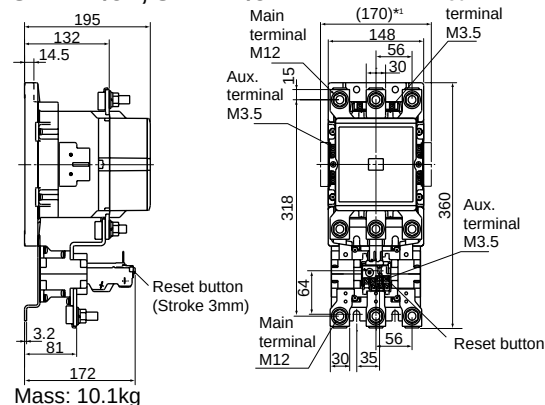


■ Wiring diagrams SW-N10/3H to SW-N14/3H

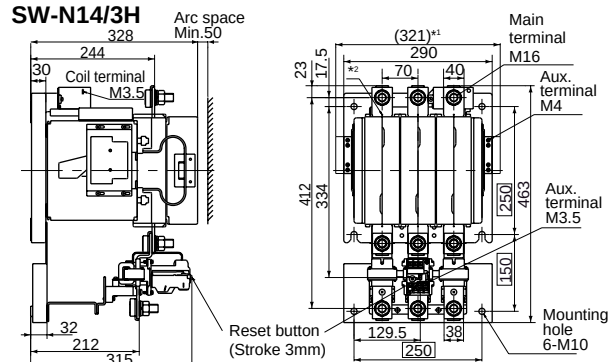


*1 In case of auxiliary contact 4NO+4NC

SW-N11/3H, SW-N12/3H



SW-N14/3H



Mass: 37kg

Note: *1 For two side mounting aux. contact blocks mounted

*2 For front mounting aux. contact blocks mounted

Starters/Enclosed type



AF88-1347

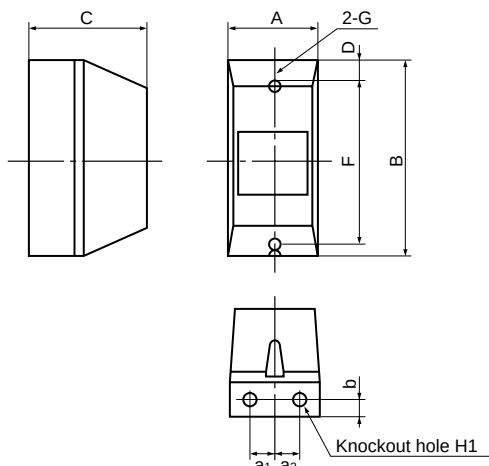


Fig. 1 Plastic enclosure

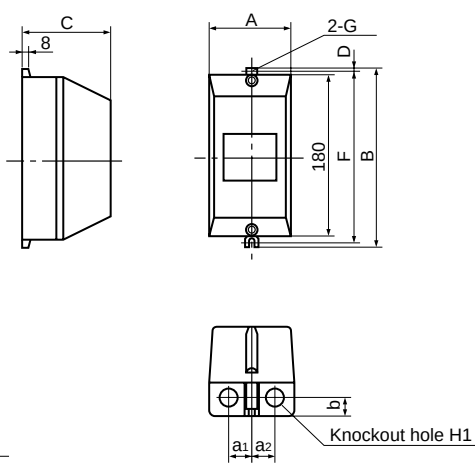


Fig. 2 Plastic enclosure

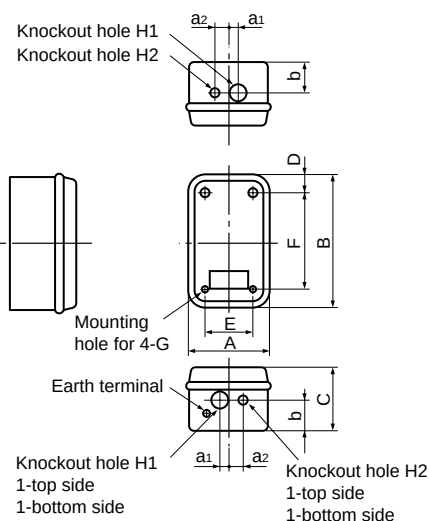


Fig. 3 Steel enclosure

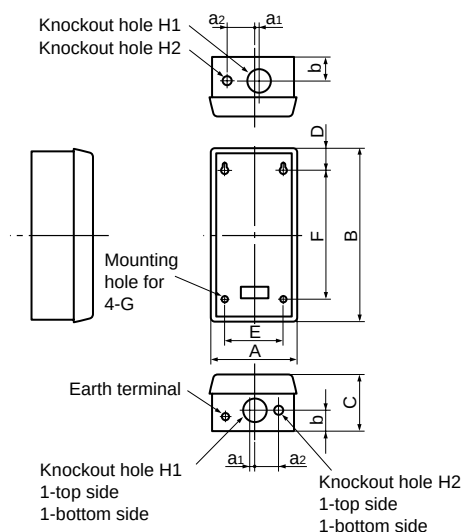


Fig. 4 Steel enclosure

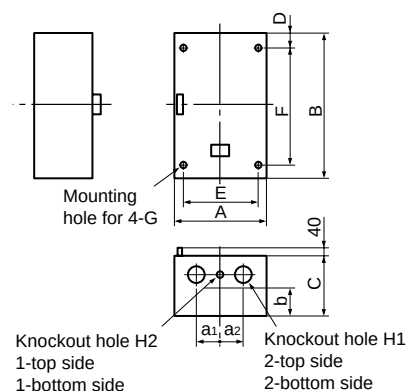


Fig. 5 Steel enclosure

Type	A	B	C	D	E	F	G	Lead hole H1	Lead hole H2	Lead hole a1	Lead hole a2	b	Mass (kg)	Fig. No.
SW-03C/3H	76	165	94	14.5	—	135	M4	φ17	φ17	19	19	18.5	0.7	1
SW-0C/3H	76	165	94	14.5	—	135	M4	φ17	φ17	19	19	18.5	0.7	
SW-05C/3H	76	165	94	14.5	—	135	M4	φ17	φ17	19	19	18.5	0.72	
SW-4-0C/3H	90	200	94	5	—	190	M4	φ21	φ21	24	24	22.5	0.80	2
SW-4-1C/3H	90	200	94	5	—	190	M4	φ21	φ21	24	24	22.5	0.80	
SW-5-1C/3H	90	200	94	5	—	190	M4	φ21	φ21	24	24	22.5	0.83	
SW-N1C/3H	145	246	132	18	80	210	M6	φ28	φ28	Top: 20	60	2.0	2.0	3
SW-N2C/3H	145	246	132	18	80	210	M6	φ28	φ28	Bottom: 27	60	2.0	2.0	
SW-N2SC/3H	175	320	145	35	110	250	M6	φ35	φ28	15	35	70	3	
SW-N3C/3H	175	320	145	35	110	250	M6	φ35	φ28	15	35	70	3	
SW-N4C/3H	200	400	160	37	125	325	M8	φ43	φ28	20	40	80	4.4	
SW-N5AC/3H	200	400	160	37	125	325	M8	φ43	φ28	20	40	80	4.4	
SW-N6C/3H	225	450	180	50	150	350	M8	φ52	φ28	10	70	80	8.4	4
SW-N7C/3H	280	560	210	55	175	450	M10	φ65	φ28	10	80	95	12.3	
SW-N8C/3H	335	670	225	85	200	500	M10	φ78	φ28	0	100	95	18.1	
SW-N10C/3H	335	670	225	85	200	500	M10	φ78	φ28	0	100	95	18.8	
SW-N11C/3H	400	800	250	100	250	600	M10	φ105	φ28	0	150	100	24.6	
SW-N12C/3H	400	800	250	100	250	600	M10	φ105	φ28	0	150	100	24.6	
SW-N14C/3H	600	950	400	75	500	800	M12	φ105	φ28	150	150	280	97.0	5

Note: Dimensions of enclosed type contactor SC-03C to SC-N14C are same as those of starters. Contact FUJI for mass.

Magnetic Contactors and Starters

SC and SW series

Reversing standard type

Reversing standard type contactors and starters

Description

The reversing starter consists of two magnetic contactors and a thermal overload relay. They are suitable for across-the-line starting and reversing of 3-phase squirrel-cage rotor and slip-ring motors.

This starter is provided with a built-in "perfect interlock safety mechanism" which prevents the engagement of forward-reverse contactors simultaneously, as well as electrical interlock. Where there is a danger of forward-reverse being engaged at the same time, i.e., in the case of power source switching, hoist or machine tool controls, etc. then this type is recommended. The action is simple and positive, and free from trouble in operation.

Operating mechanism

When one contactor begins to move the other contactor is locked in position. An arm is used to actuate each contactor so that there is no possibility of double engagement.



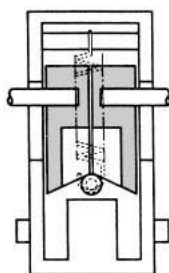
Ratings of auxiliary contact and coil:

See pages 01/20 and 01/22.

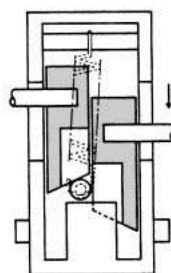
Performance data:

Same as standard open type. See page 01/22.

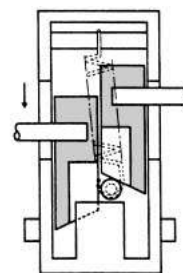
Mechanism principle (Explanation only)



Both contactors open position



Forward contactor closed position



Reverse contactor closed position

Ordering information

Specify the following:

1. Ordering code
2. Overload relay setting range code
3. Operating coil voltage code
4. Auxiliary contact arrangement as shown in the table below.

Example: (2NO + 2NC) × 2

Types and ratings

Max. motor capacity (kw)		Rated operation current (A)		Auxiliary contact	Contactor		Starter (3-element)				
					Open Type	Ordering code	Open Type	Ordering code	Enclosed Type	Ordering code	
200V	380V	200V	380V								
240V	440V	240V	440V								
2.5	4	11	9	1NC×2 ^{*1}	SC-03RM	SC11RA-■01	SW-03RM/3H	SC11RAN-■01T□D	SW-03RMC/3H	SC11MAN-■01T□D	
3.5	5.5	13	12	1NC×2 ^{*1}	SC-0RM	SC13RA-■01	SW-0RM/3H	SC13RAN-■01T□D	SW-0RMC/3H	SC13MAN-■01T□D	
3.5	5.5	13	12	(1NO+1NC)×2 ^{*2}	SC-05RM	SC14RA-■11	SW-05RM/3H	SC14RAN-■11T□D	SW-05RMC/3H	SC14MAN-■11T□D	
4.5	7.5	18	16	1NC×2 ^{*1}	SC-4-0RM	SC18RA-■01	SW-4-0RM/3H	SC18RAN-■01T□D	SW-4-0RMC/3H	SC18MAN-■01T□D	
5.5	11	22	22	1NC×2 ^{*1}	SC-4-1RM	SC19RA-■01	SW-4-1RM/3H	SC19RAN-■01T□D	SW-4-1RMC/3H	SC19MAN-■01T□D	
5.5	11	22	22	(1NO+1NC)×2 ^{*3}	SC-5-1RM	SC20RA-■11	SW-5-1RM/3H	SC20RAN-■11T□D	SW-5-1RMC/3H	SC20MAN-■11T□D	
7.5	15	32	32	(2NO+2NC)×2 ^{*3}	SC-N1RM	SC25BRA-■22	SW-N1RM/3H	SC25BRAN-■22T□D	SW-N1RMC/3H	SC25BMAN-■22T□D	
11	18.5	40	40	(2NO+2NC)×2 ^{*3}	SC-N2RM	SC35BRA-■22	SW-N2RM/3H	SC35BRAN-■22T□D	SW-N2RMC/3H	SC35BMAN-■22T□D	
15	22	50	50	(2NO+2NC)×2 ^{*3}	SC-N2SRM	SC50BRA-■22	SW-N2SRM/3H	SC50BRAN-■22T□D	SW-N2SRMC/3H	SC50BMAN-■22T□D	
18.5	30	65	65	(2NO+2NC)×2 ^{*3}	SC-N3RM	SC65BRA-■22	SW-N3RM/3H	SC65BRAN-■22T□D	SW-N3RMC/3H	SC65BMAN-■22T□D	
22	40	80	80	(2NO+2NC)×2 ^{*3}	SC-N4RM	SC80BRA-■22	SW-N4RM/3H	SC80BRAN-■22T□D	SW-N4RMC/3H	SC80BMAN-■22T□D	
30	55	105	105	(2NO+2NC)×2 ^{*3}	SC-N5ARM	SC93CRA-■22	SW-N5ARM/3H	SC93CRAN-■22T□D	SW-N5ARMC/3H	SC93CMAN-■22T□D	
37	60	125	125	(2NO+2NC)×2 ^{*3}	SC-N6RM	SC1CBRA-■22	SW-N6RM/3H	SC1CBRAN-■22T□D	SW-N6RMC/3H	SC1CBMAN-■22T□D	
45	75	150	150	(2NO+2NC)×2 ^{*3}	SC-N7RM	SC1FBRA-■22	SW-N7RM/3H	SC1FBRAN-■22T□D	SW-N7RMC/3H	SC1FBMAN-■22T□D	
55	90	180	180	(2NO+2NC)×2 ^{*3}	SC-N8RM	SC1JBRA-■22	SW-N8RM/3H	SC1JBRAN-■22T□D	SW-N8RMC/3H	SC1JBMAN-■22T□D	
65	110	220	220	(2NO+2NC)×2 ^{*3}	SC-N10RM	SC2CBRA-■22	SW-N10RM/3H	SC2CBRAN-■22T□D	SW-N10RMC/3H	SC2CBMAN-■22T□D	
90	160	300	300	(2NO+2NC)×2 ^{*3}	SC-N11RM	SC3ABRA-■22	SW-N11RM/3H	SC3ABRAN-■22T□D			
120	220	400	400	(2NO+2NC)×2 ^{*3}	SC-N12RM	SC4ABRA-■22	SW-N12RM/3H	SC4ABRAN-■22T□D			
180	315	600	600	(2NO+2NC)×2 ^{*3}	SC-N14RM	SC6ABRA-■22	SW-N14RM/3H	SC6ABRAN-■22T□D			

Notes: 1. ■ : Coil voltage code. □ : Thermal overload relay ampere setting range code. See page 01/19.
2. ^{*1}: Auxiliary contact 1NO×2 is available on request. However, these contactors are not electrically interlocked. Be sure to arrange electrical interlock circuit externally to avoid short-circuit accidents.

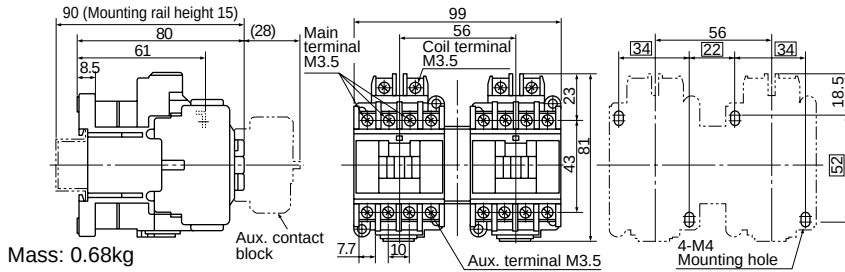
^{*2}: Auxiliary contact 2NC×2 is available on request.

^{*3}: Auxiliary contact (3NO+3NC)×2 is available on request for frame size N1 and above. Auxiliary contact (4NO+4NC)×2 is available on request for frame size N1 to N3.

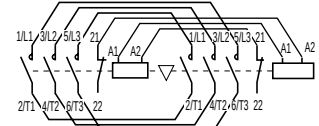
3. Contactor with enclosure is available on request.

■ Dimensions, mm
Reversing contactors/Open type

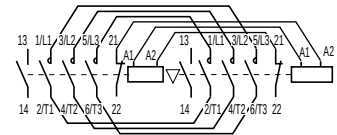
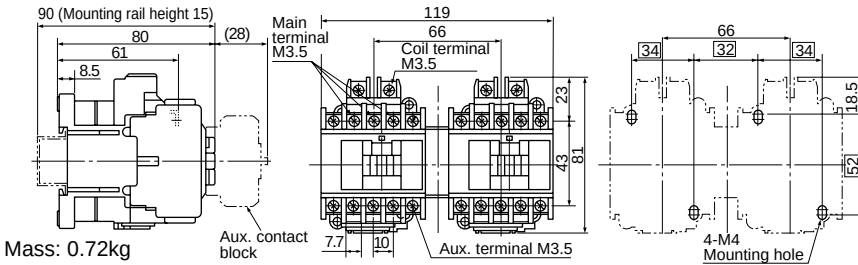
SC-03RM, SC-0RM



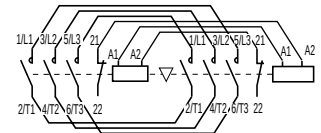
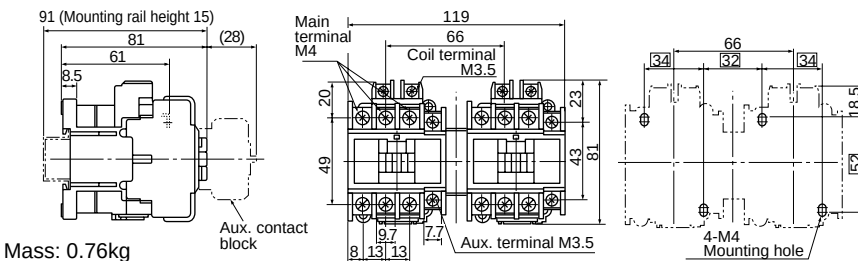
■ Wiring diagrams



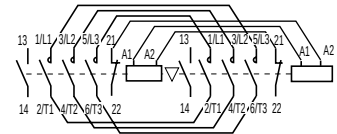
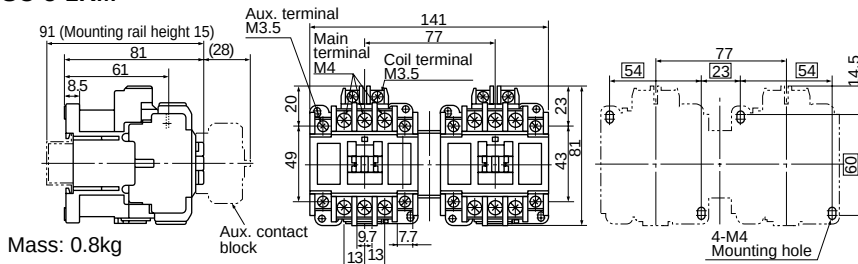
SC-05RM



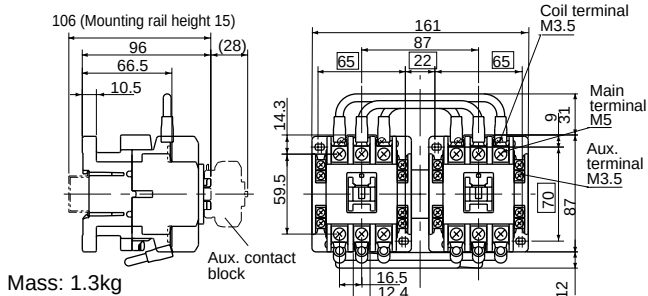
SC-4-0RM, SC-4-1RM



SC-5-1RM

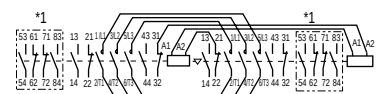


SC-N1RM, SC-N2RM

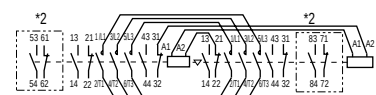


■ Wiring diagrams

SC-N1RM to SC-N3RM



SC-N4RM to SC-N14RM



Magnetic Contactors and Starters

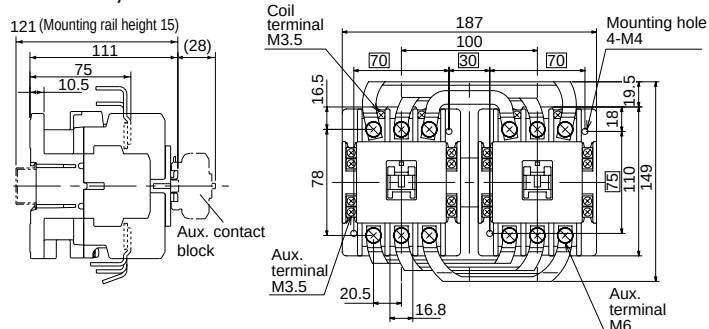
SC and SW series

Reversing standard type

■ Dimensions, mm

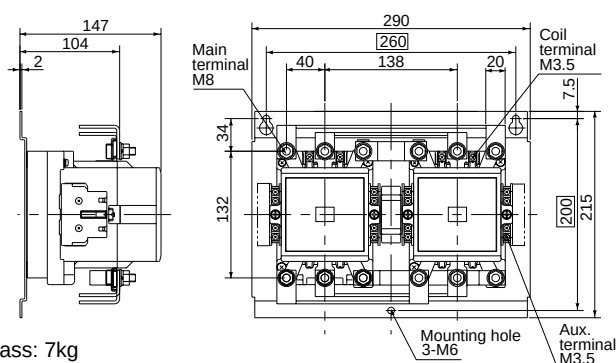
Reversing contactors/Open type

SC-N2SRM, SC-N3RM



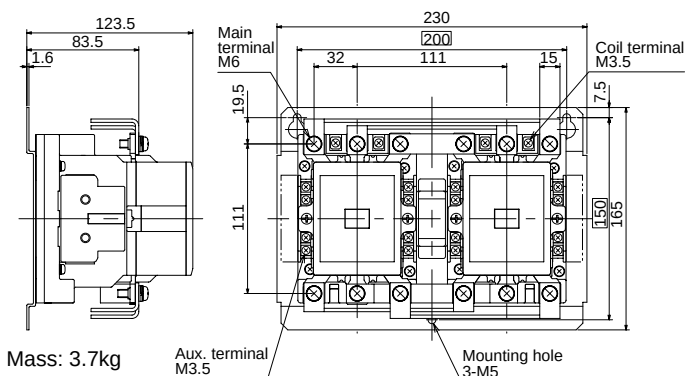
Mass: 2.3kg

SC-N7RM



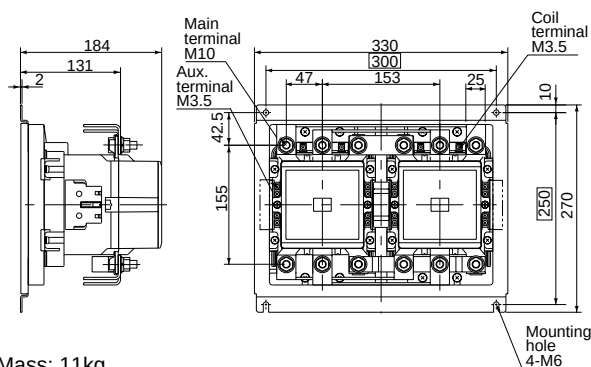
Mass: 7kg

SC-N4RM



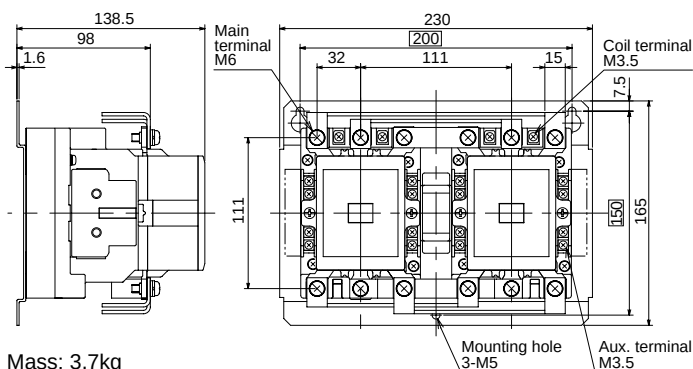
Mass: 3.7kg

SC-N8RM, SC-N10RM



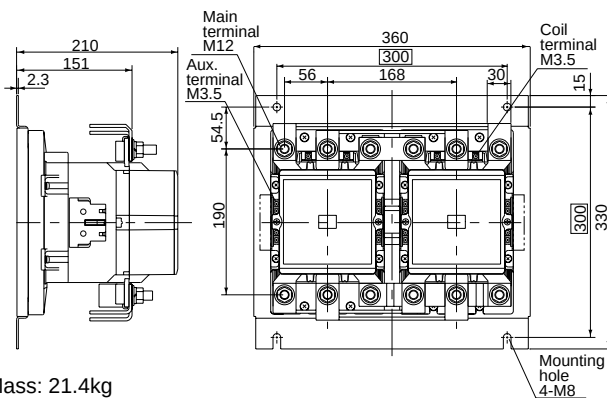
Mass: 11kg

SC-N5ARM



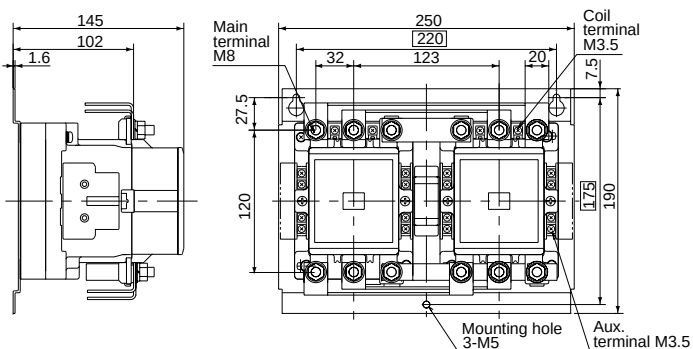
Mass: 3.7kg

SC-N11RM, SC-N12RM



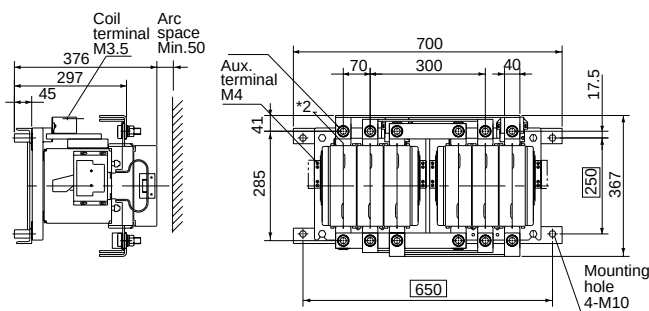
Mass: 21.4kg

SC-N6RM



Mass: 5.9kg

SC-N14RM



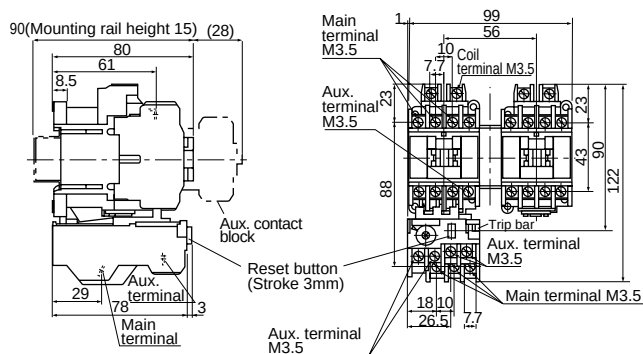
Mass: 80kg

*2 M4 tap for control circuit

■ Dimensions, mm

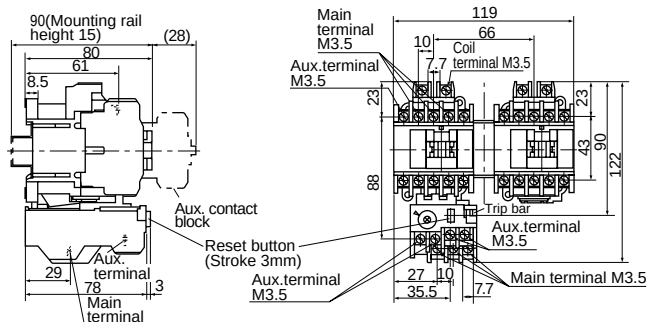
Reversing motor starters/Open type

SW-03RM/3H, SW-0RM/3H



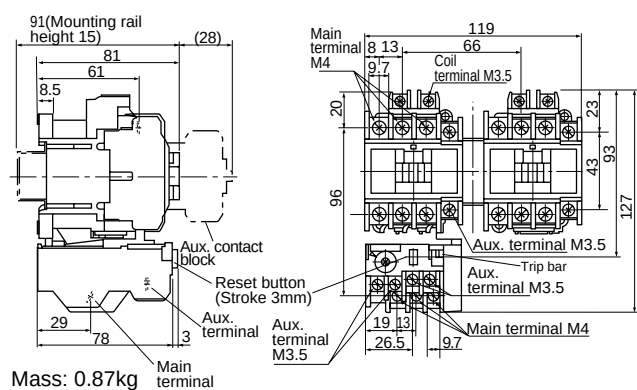
Mass: 0.79kg

SW-05RM/3H



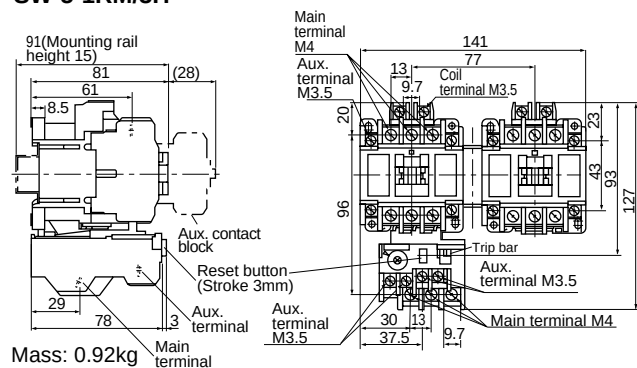
Mass: 0.83kg

SW-4-0RM/3H, SW-4-1RM/3H



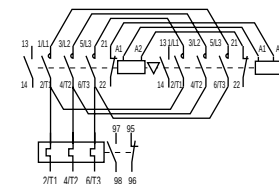
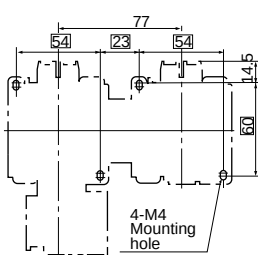
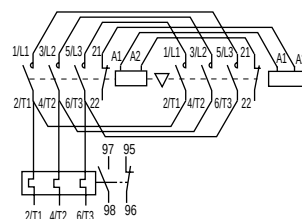
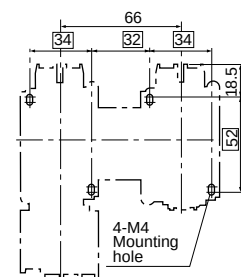
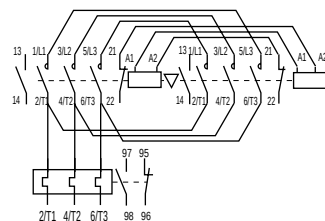
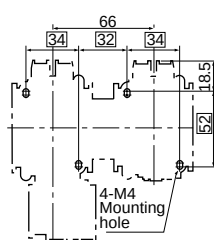
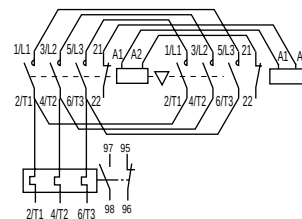
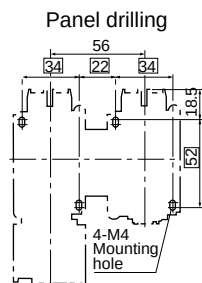
Mass: 0.87kg

SW-5-1RM/3H



Mass: 0.92kg

■ Wiring diagrams



Magnetic Contactors and Starters

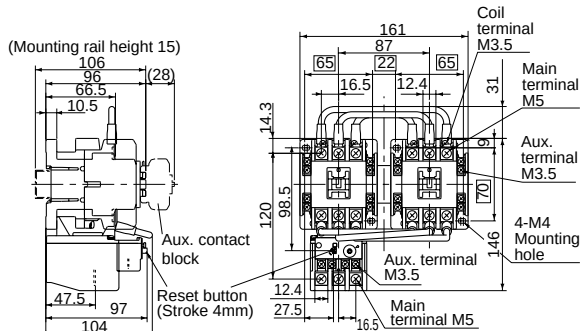
SC and SW series

Reversing standard type

■ Dimensions, mm

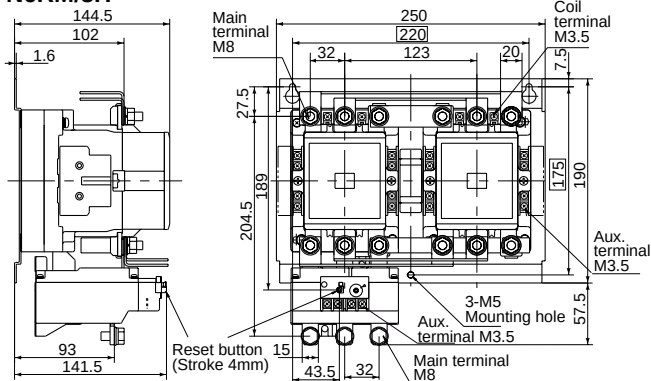
Reversing motor starters/Open type

SW-N1RM/3H, SW-N2RM/3H



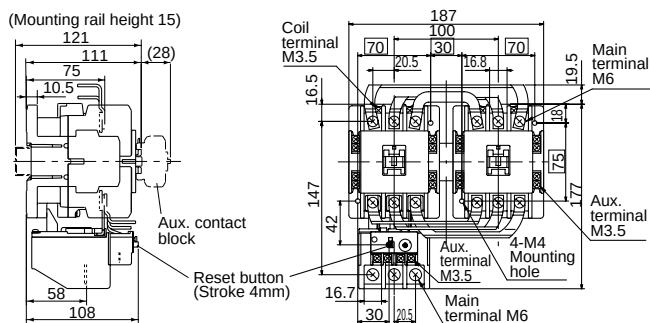
Mass: 1.5kg

SW-N6RM/3H



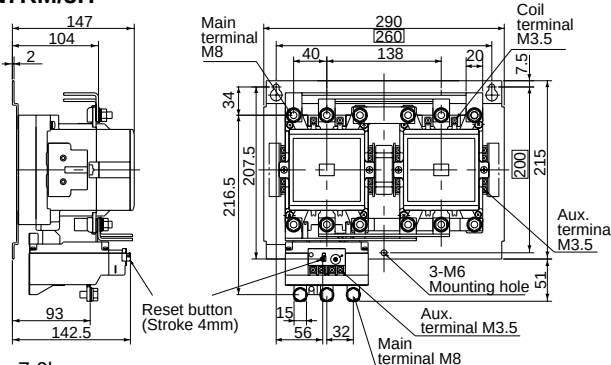
Mass: 6.5kg

SW-N2SRM/3H, SW-N3RM/3H



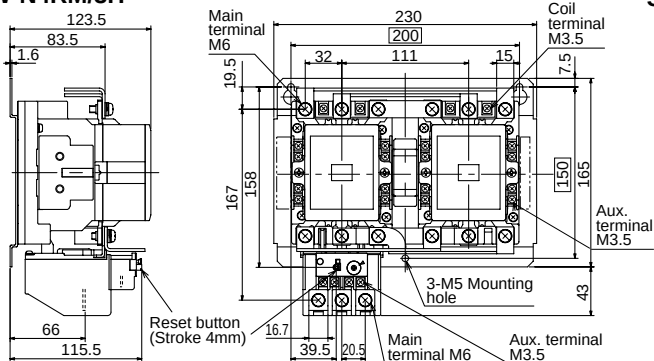
Mass: 2.6kg

SW-N7RM/3H



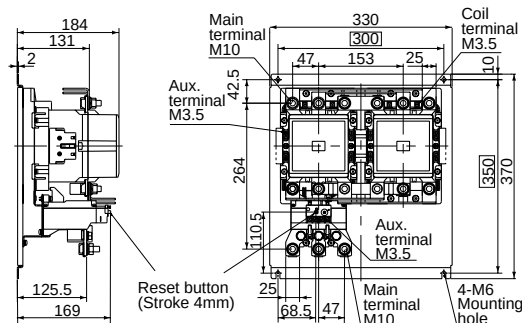
Mass: 7.6kg

SW-N4RM/3H



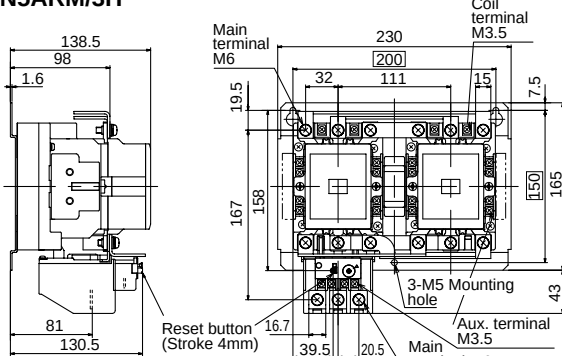
Mass: 4kg

SW-N8RM/3H



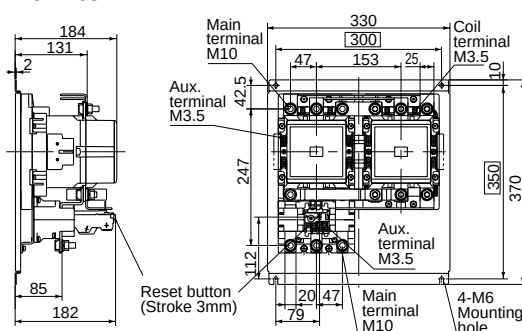
Mass: 12.2kg

SW-N5ARM/3H



Mass: 4kg

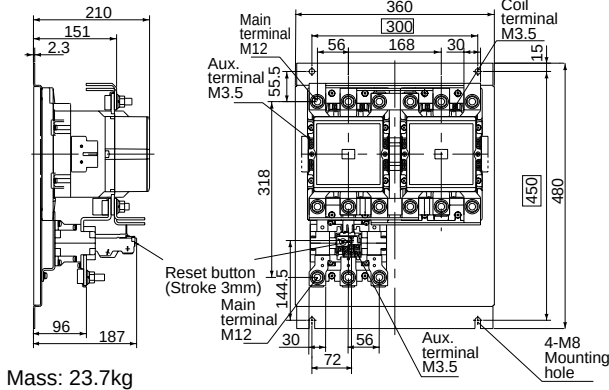
SW-N10RM/3H



Mass: 12.9kg

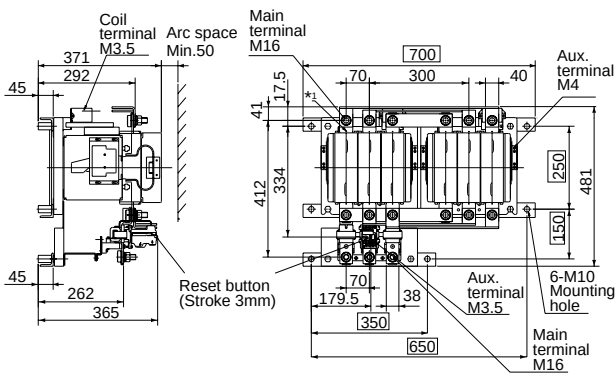
■ Dimensions, mm
Reversing motor starters/Open type

SW-N11RM/3H, SW-N12RM/3H



Mass: 23.7kg

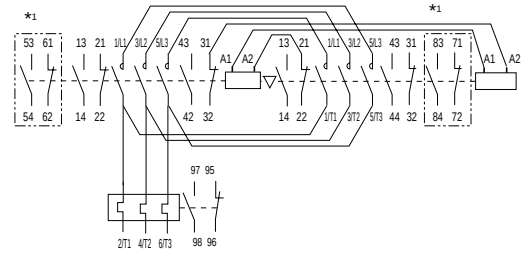
SW-N14RM/3H



Mass: 85kg

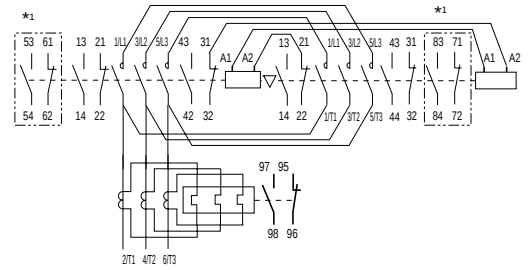
*1 M4 tap for control circuit

■ Wiring diagrams
SW-N1RM/3H to SW-N8RM/3H



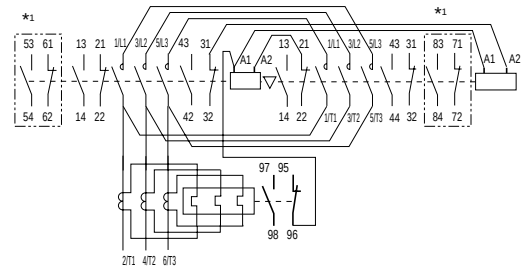
*1 In case of auxiliary contact 3NO+3NC

SW-N10RM/3H to SW-N12RM/3H



*1 In case of auxiliary contact 3NO+3NC

SW-N14RM/3H



*1 In case of auxiliary contact 3NO+3NC

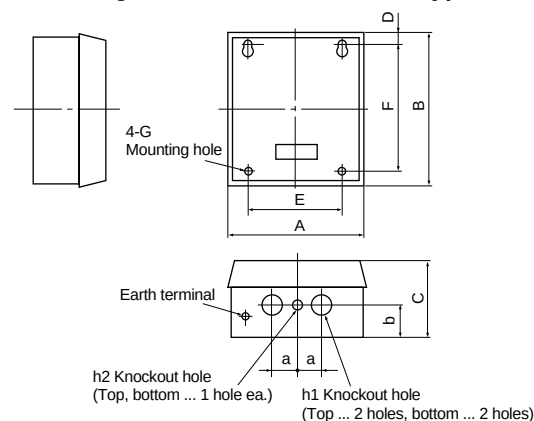
Magnetic Contactors and Starters

SC and SW series

Reversing standard type

■ Dimensions, mm

Reversing motor starters/Enclosed type



Type	A	B	C	D	E	F	G	h1	h2	a	b	Mass (kg) 3-element
SW-03RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	1.9
SW-0RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	1.9
SW-05RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	1.9
SW-4-0RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	1.95
SW-4-1RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	1.95
SW-5-1RMC/3H	192	192	100	16	130	160	4-M6	φ22	—	65	65	2.0
SW-N1RMC/3H	254	250	131	20	185	210	4-M6	φ28	—	80	70	3.8
SW-N2RMC/3H	254	250	131	20	185	210	4-M6	φ28	—	80	70	3.8
SW-N2SRMC/3H	280	320	145	35	200	250	4-M6	φ35	φ28	55	70	6.6
SW-N3RMC/3H	280	320	145	35	200	250	4-M6	φ35	φ28	55	70	6.6
SW-N4RMC/3H	355	400	160	37.5	250	325	4-M8	φ43	φ28	65	80	10.7
SW-N5ARMC/3H	355	400	160	37.5	250	325	4-M8	φ43	φ28	65	80	11.4
SW-N6RMC/3H	400	450	180	50	300	350	4-M8	φ52	φ28	85	80	14.3
SW-N7RMC/3H	450	560	210	55	350	450	4-M10	φ65	φ28	90	95	21.5
SW-N8RMC/3H	500	670	225	85	400	500	4-M10	φ78	φ28	90	105	29.4
SW-N10RMC/3H	500	670	225	85	400	500	4-M10	φ78	φ28	90	105	32.4

Notes: • SW-5-1RMC/3H with aux. contact 2×2NO·2NC is not available.
• Dimensions of enclosed type contactor SC-03RMC to SC-N10RMC/3H are same as those of starters. Contact FUJI for mass.

DC operated contactors and starters

Up to 37kW 440 Volts

Description

In most cases general purpose AC magnetic motor starters employ AC coils, and although "AC motor with AC controls" is the normal practice, in complicated controls troubles can be expected due to the instantaneous voltage drop or power failure in the AC power source. Thus, in some applications "AC motor with DC control" offers a better system.

FUJI manufactures two types of DC operated contactors. In one type the ON/OFF operation is carried out by a DC operating coil. The other type is operated by the SUPER MAGNET. The SC-03/G to N3/G types use the single coil system. They can be operated at full voltage. When requiring the DC operation for SC-N1 to N4 contactor, the contactor with SUPER MAGNET is substituted (SC-N1/SE to N4/SE). AC/DC operated types with SUPER MAGNET

- SC-N1/SE to N4/SE, SW-N1/SE to N4/SE

- SC-N5 to N16, SW-N5/3H to 14/3H

These standard types employ the SUPER MAGNET.

Ordering information

Specify the following:

1. Ordering code
2. Operating coil voltage code
3. Contact arrangement:

In the case of the frame size 0/G to 5-1/G, specify the contact arrangement.

4. Overload relay setting range code.

Ratings

Max. motor capacity (kW)		Operational current (A)		Thermal current (A)	Auxiliary contact		Contactor Type	Ordering code	Starter (3-element)	
200V	380V	200V	380V		NO	NC			Type	Ordering code
240V	440V	240V	440V							
2.5	4	11	9	20	1	— ^{*1}	SC-03/G	SC11AG-■10	SW-03/G3H	SC11AGN-■10T□D
3.5	5.5	13	12	20	1	— ^{*1}	SC-0/G	SC13AG-■10	SW-0/G3H	SC13AGN-■10T□D
3.5	5.5	13	12	20	1	1 ^{*2}	SC-05/G	SC14AG-■11	SW-05/G3H	SC14AGN-■11T□D
4.5	7.5	18	16	25	1	— ^{*1}	SC-4-0/G	SC18AG-■10	SW-4-0/G3H	SC18AGN-■10T□D
5.5	11	22	22	32	1	— ^{*1}	SC-4-1/G	SC19AG-■10	SW-4-1/G3H	SC19AGN-■10T□D
5.5	11	22	22	32	1	1 ^{*3}	SC-5-1/G	SC20AG-■11	SW-5-1/G3H	SC20AGN-■11T□D
7.5	15	32	32	50	2	2	SC-N1/G	SC25BAG-■22	SW-N1/G3H	SC25BAGN-■22T□D
11	18.5	40	40	60	2	2	SC-N2/G	SC35BAG-■22	SW-N2/G3H	SC35BAGN-■22T□D
15	22	50	50	80	2	2	SC-N2S/G	SC50BAG-■22	SW-N2S/G3H	SC50BAGN-■22T□D
18.5	30	65	65	100	2	2	SC-N3/G	SC65BAG-■22	SW-N3/G3H	SC65BAGN-■22T□D
22	40	80	80	135	2	2	SC-N4/G	SC80BAG-■22	SW-N4/G3H	SC80BAGN-■22T□D
30	55	105	105	150	2	2	SC-N5/G	SC93BAG-■22	SW-N5/G3H	SC93BAGN-■22T□D
7.5	15	32	32	50	2	2	SC-N1/SE	SC25BAS-■22	SW-N1/SE3H	SC25BASN-■22T□D
11	18.5	40	40	60	2	2	SC-N2/SE	SC35BAS-■22	SW-N2/SE3H	SC35BASN-■22T□D
15	22	50	50	80	2	2	SC-N2S/SE	SC50BAS-■22	SW-N2S/SE3H	SC50BASN-■22T□D
18.5	30	65	65	100	2	2	SC-N3/SE	SC65BAS-■22	SW-N3/SE3H	SC65BASN-■22T□D
22	40	80	80	135	2	2	SC-N4/SE	SC80BAS-■22	SW-N4/SE3H	SC80BASN-■22T□D
30	55	105	105	150	2	2	SC-N5	SC90BAA-■22	SW-N5/3H	SC90BAAN-■22T□D

Notes: 1. ■ : Coil voltage code, □ : Thermal overload relay ampere setting range code, see page 01/19

2. ^{*1} Auxiliary contact 1NC is available. ^{*2} Auxiliary contact 2NO or 2NC is available. ^{*3} Auxiliary contact 2NO, 2NC, or 2NO+2NC is available. For enclosed type, 2NO+2NC is not available

3. Auxiliary contact 4NO+4NC is available on request for frame size N1 and above.

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Information subject to change without notice



Coil ratings

Type	Coil voltage (V DC)	Power consumption		Operating characteristic	
		Inrush (W)	Sealed (W)	Pick-up voltage (V)	Drop-out voltage (V)
SC-03/G	12, 24, 48, 60,	7	7	10-15	3-7
SC-0/G	100, 110, 120	7	7	10-15	3-7
SC-05/G	200, 210, 220	7	7	10-15	3-7
SC-4-0/G		7	7	11-16	3-7
SC-4-1/G		7	7	11-16	3-7
SC-5-1/G		7	7	11-16	3-8
SC-N1/G		9	9	9-15	3-9
SC-N2/G		9	9	9-15	3-9
SC-N2S/G		12	12	9-15	3-8
SC-N3/G		12	12	9-15	3-8
SC-N4/G		20	20	10-15	3-8
SC-N5/G		20	20	10-15	3-8
SC-N1/SE	24, 48	145	2.4	16-19	4-12
SC-N2/SE	100-120 ^{*1}	145	2.4	16-19	4-12
SC-N2S/SE	200-240 ^{*2}	175	2.0	16-19	4-12
SC-N3/SE		175	2.0	16-19	4-12
SC-N4/SE		100	2.8	16-19	4-12
SC-N5		100	2.8	16-19	4-12

Notes: Operating coil voltage 24V DC for 03/G to N5/G

24V DC for N1/SE to N4/SE, N5

^{*1} The coil voltage from a DC power supply with single phase full-wave rectification will be 100 to 110 V.

^{*2} The coil voltage from a DC power supply with single phase full-wave rectification will be 200 to 220 V.

■ UL, CSA, TÜV and CCC approved:

See page 01/116, 123, 127.

■ Auxiliary contact

Same as standard type, See page 01/20.

Magnetic Contactors and Starters

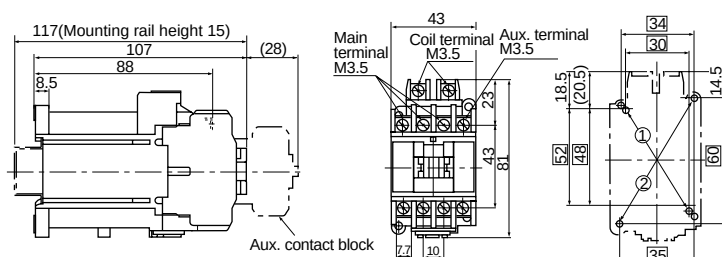
SC and SW series

DC operated

■ Dimensions

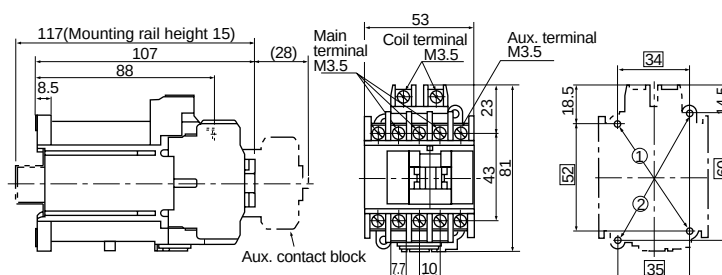
DC operated contactors

SC-03/G, SC-0/G



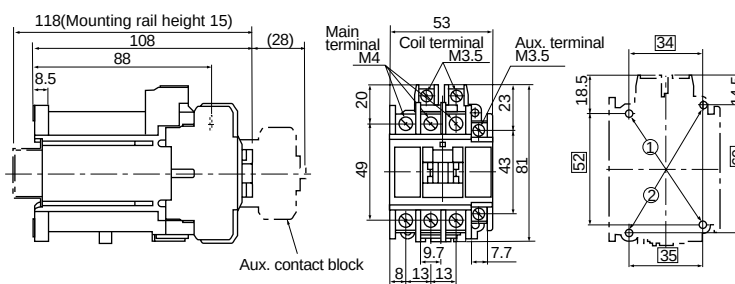
Mass:0.55kg

SC-05/G



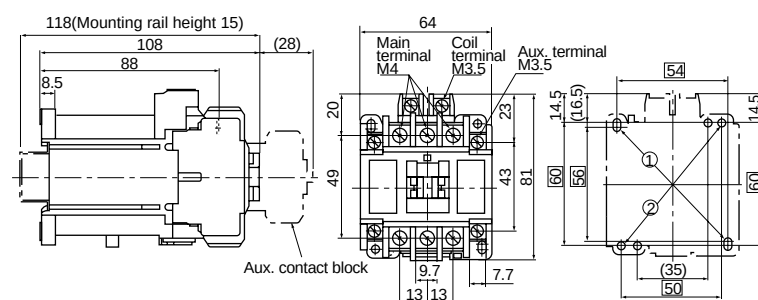
Mass:0.58kg

SC-4-0/G, SC-4-1/G



Mass:0.6kg

SC-5-1/G

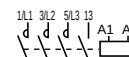


Mass:0.62kg

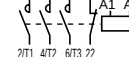
■ Wiring diagrams

Auxiliary contact

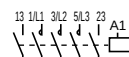
1NO



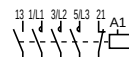
1NC



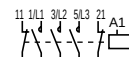
2NO



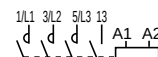
1NO+1NC



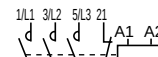
2NC



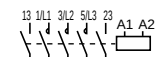
1NO



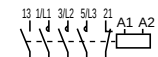
1NC



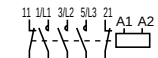
2NO



1NO+1NC

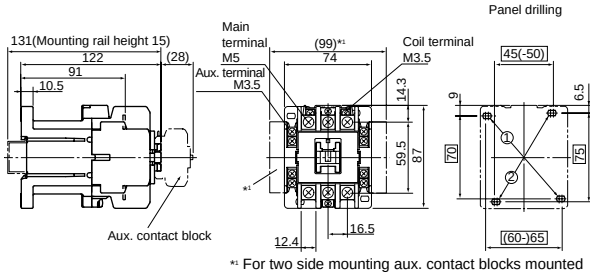


2NC



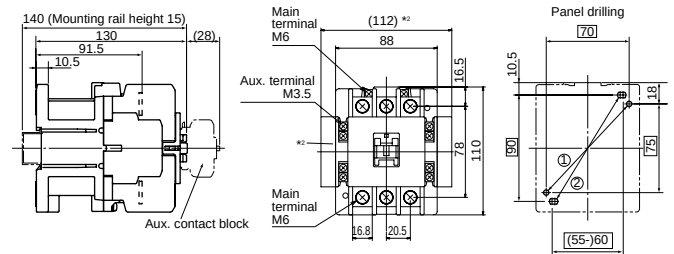
Note: Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

■ Dimensions
DC operated contactors
SC-N1/G, SC-N2/G



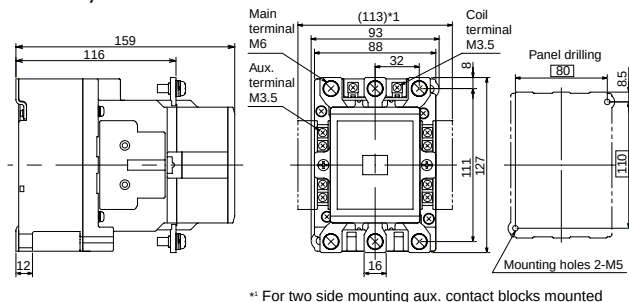
Mass: 0.82kg

SC-N2S/G, SC-N3/G



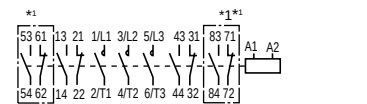
Mass: 1.4kg

SC-N4/G, SC-N5/G



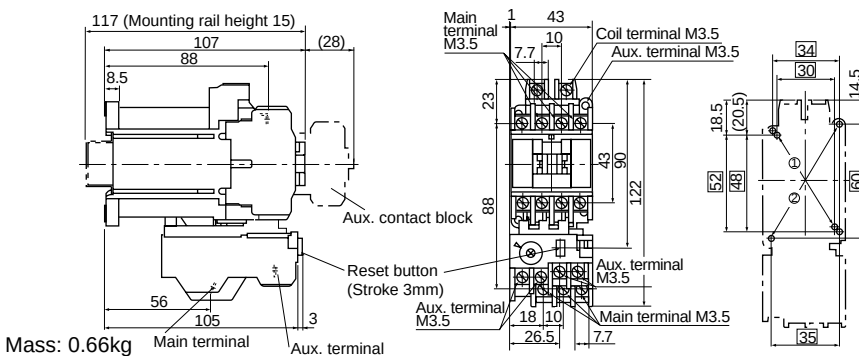
Mass: 2.3kg

■ Wiring diagrams
SC-N1/G to SC-N5/G



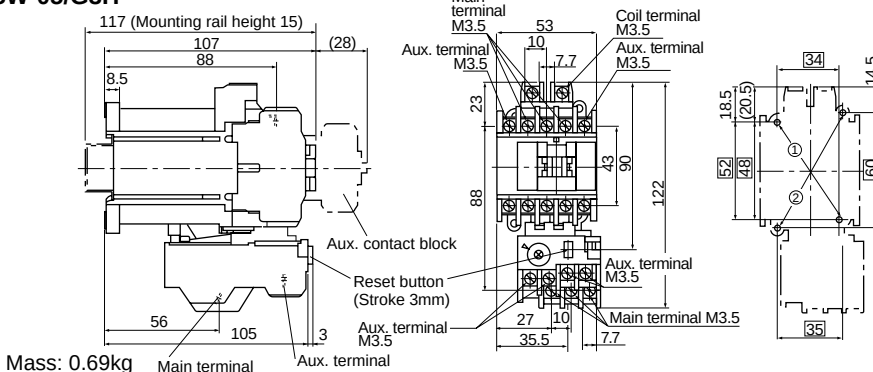
*1 In case of auxiliary contact 4NO+4NC

DC operated starters
SW-03/G3H, SW-0/G3H



Mass: 0.66kg

SW-05/G3H



Mass: 0.69kg

■ Wiring diagrams

Auxiliary contact

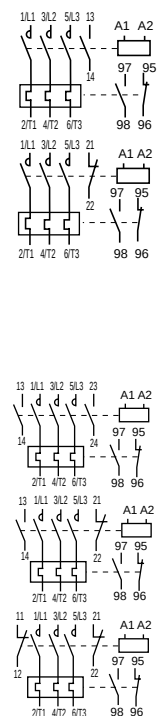
1NO

1NC

2NO

1NO+1NC

2NC



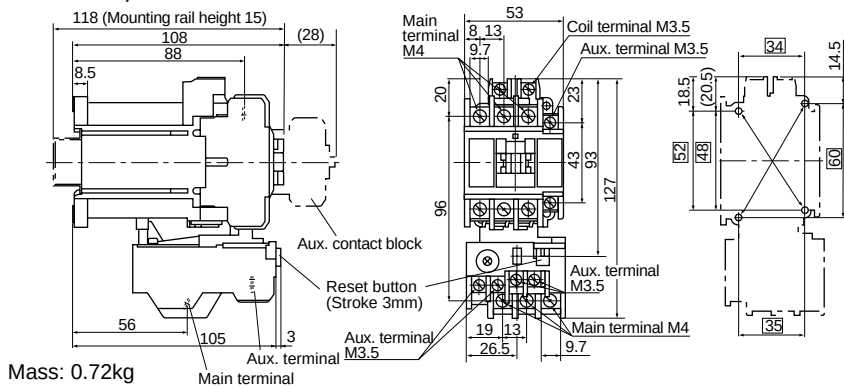
Note: Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

Magnetic Contactors and Starters SC and SW series DC operated

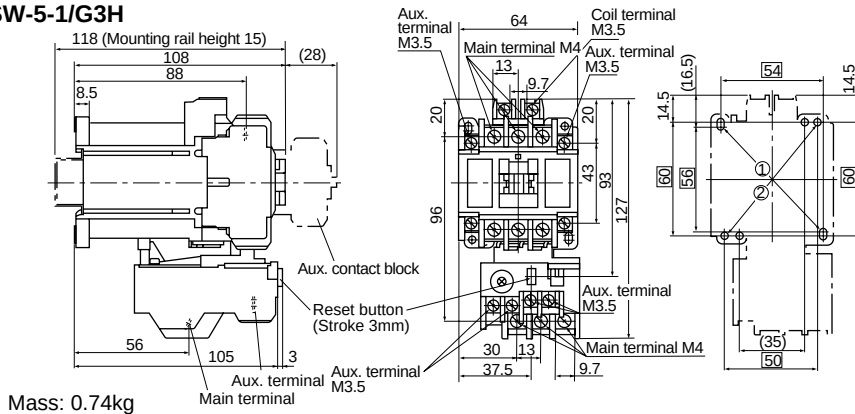
■ Dimensions

DC operated starters

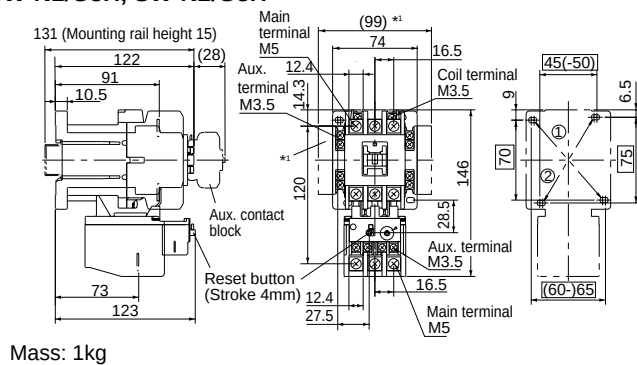
SW-4-0/G3H, SW-4-1/G3H



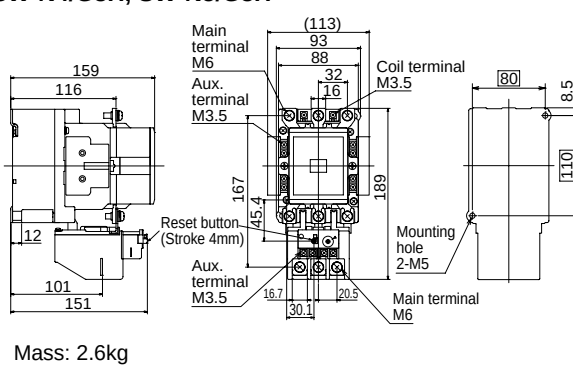
SW-5-1/G3H



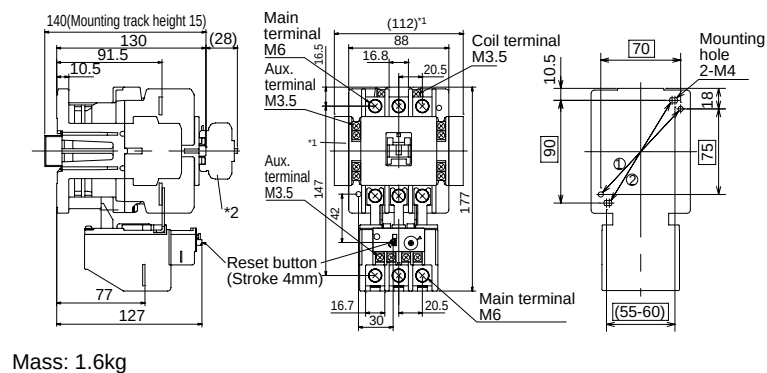
SW-N1/G3H, SW-N2/G3H



SW-N4/G3H, SW-N5/G3H

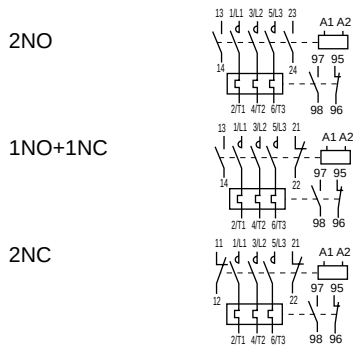
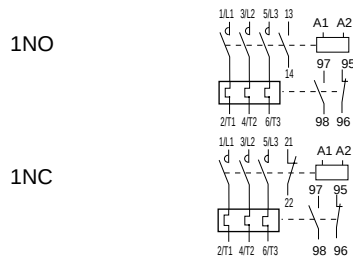


SW-N2S/G3H, SW-N3/G3H



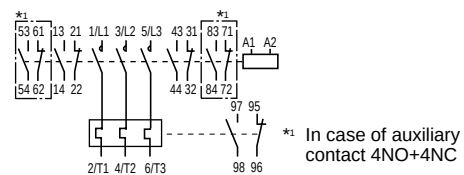
■ Wiring diagrams

Auxiliary
contact



■ Wiring diagrams

SW-N1/G3H to SW-N5/G3H



Note: • Use the two mounting holes on a diagonal line to mount a contactor.
Mounting holes indicated by ① are compatible with those of SRC type.
Mounting holes indicated by ② are compatible with IEC standard

*1 For two side mounting aux. contact blocks mounted
*2 For front mounting aux. contact blocks mounted

Magnetic Contactors and Starters

SC and SW series

OFF-delay release

OFF-delay release type

■ Description

This type contactor consists of DC-operated contactor and off-delay release unit, and the contacts are released with a delay of 1-4 or 1-5 seconds after the coil has been de-energized.

When the standard type contactor suffers an instantaneous voltage drop

in the AC power supply or a power failure takes place the operating coils are de-energized and the reclosing of the contacts must be carried out every time. The off-delay release contactor is so designed that in the event of a brief power outage the coil will not release the contacts and the power is maintained making reclosing action unnecessary.

■ Combination of OFF-delay release units and contactors

Contactor Type	Ordering code	Starter (3-element) Type	Ordering code	OFF-delay release unit Type	Ordering code
SC-03/G	SC11AG-■10	SW-03/G3H	SC11AGN-■10T□D	SZ-DE □	SZ1DE□
SC-0/G	SC13AG-■10	SW-0/G3H	SC13AGN-■10T□D		
SC-05/G	SC14AG-■11	SW-05/G3H	SC14AGN-■11T□D		
SC-4-0/G	SC18AG-■10	SW-4-0/G3H	SC18AGN-■10T□D		
SC-4-1/G	SC19AG-■10	SW-4-1/G3H	SC19AGN-■10T□D		
SC-5-1/G	SC20AG-■11	SW-5-1/G3H	SC20AGN-■11T□D		
SC-N1/G	SC25BAG-■22	SW-N1/G3H	SC25BAGN-■22T□D	SZ-N1/GDE	SZ2N1GDE-□
SC-N2/G	SC35BAG-■22	SW-N2/G3H	SC35BAGN-■22T□D	SZ-N1/GDE	SZ2N1GDE-□
SC-N2S/G	SC50BAG-■22	SW-N2S/G3H	SC50BAGN-■22T□D	SZ-N2S/GDE	SZ2N2SGDE-□
SC-N3/G	SC65BAG-■22	SW-N3/G3H	SC65BAGN-■22T□D	SZ-N2S/GDE	SZ2N2SGDE-□
SC-N4/SE	SC80BAS-■22	SW-N4/SE3H	SC80BASN-■22T□D	SZ-N5/DE	SZ2N5DE-□
SC-N5	SC93BAA-■22	SW-N5/3H	SC93BAAN-■22T□D	SZ-N5/DE	SZ2N5DE-□
SC-N6	SC1CBAA-■22	SW-N6/3H	SC1CBAAN-■22T□D	SZ-N6/DE	SZ2N6DE-□
SC-N7	SC1FBAA-■22	SW-N7/3H	SC1FBAAN-■22T□D	SZ-N6/DE	SZ2N6DE-□
SC-N8	SC1JBAA-■22	SW-N8/3H	SC1JBAAAN-■22T□D	SZ-N8/DE	SZ2N8DE-□
SC-N10	SC2CBAA-■22	SW-N10/3H	SC2CBAAN-■22T□D	SZ-N8/DE	SZ2N8DE-□
SC-N11	SC3ABAA-■22	SW-N11/3H	SC3ABAAAN-■22T□D	SZ-N11/DE	SZ2N11DE-□
SC-N12	SC4ABAA-■22	SW-N12/3H	SC4ABAAAN-■22T□D	SZ-N11/DE	SZ2N11DE-□
SC-N14	SC6ABAA-■22	SW-N14/3H	SC6ABAAAN-■22T□D	SZ-N14/DE	SZ2N14DE-□

Notes: 1. For contactor and starter.

Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

2. For off-delay release unit.

Enter the control voltage code in the □ mark.

● OFF-delay release unit ordering code

SZ 2N1 ■ DE - □	
Basic type	Control voltage
Frame size	For SZ-DE
	100: 100V AC, 50/60Hz
	110: 110V AC, 50/60Hz
	200: 200V AC, 50/60Hz
	220: 220V AC, 50/60Hz
OFF-delay release unit	For SZ-N1/GDE to N14/DE
■ 2N1 to 2N2S: G	1: 100-110V AC, 50/60Hz
2N5 to 2N14: Blank	2: 200-220V AC, 50/60Hz

Note: If OFF-delay release contactors (starters) having capacities of frame size 03 to N3 are required the DC operated contactors (starters) will be combined with the OFF-delay release unit.

When ordering make sure that the input voltage (AC) of the OFF-delay release unit is equal to the operating voltage (DC) of the contactors (starters).

Example:
SZ-N5/DE 100V AC 50Hz+SC-N5 100V DC
(OFF-delay release unit) + (Contactor)

■ Performance data

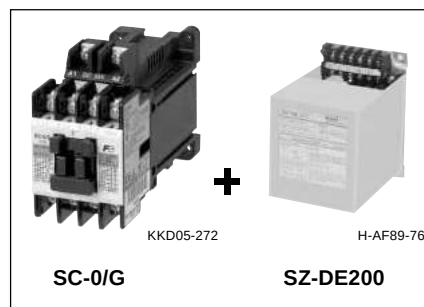
Frame	Hold time	Making/breaking capacity	Operating cycles per hour	Life expectancy (operations)	
				Electrical	Mechanical
03/G to 5-1/G	1-5 sec.	10×le / 8×le	600	2 million*1	10 million
N1/G, N2/G	1-5 sec.	10×le / 8×le	600	2 million	10 million
N2S/G, N3/G	1-5 sec.	10×le / 8×le	600	2 million	5 million
N4/SE	1-4 sec.	10×le / 8×le	600	1 million	5 million
N5 to N11	1-4 sec.	10×le / 8×le	600	1 million	5 million
N12	1-4 sec.	10×le / 8×le	600	500,000	5 million
N14	1-4 sec.	10×le / 8×le	600	500,000	5 million

le: Rated operational current

Capacitor life: 100,000 operations

*1 Frame size 4-0: 1.5 million

Conforming to Class AC-3, IEC 60947-4-1

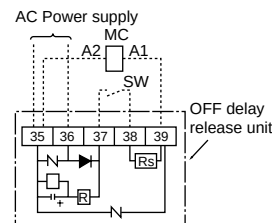


OFF-delay release unit

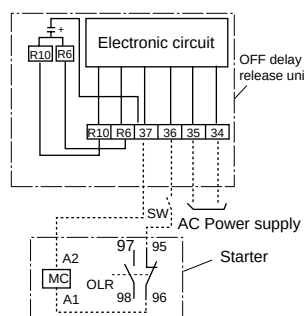
■ Wiring diagrams

SZ-DE100, 110, 200, 220

SZ-N1/GDE, N2S/GDE



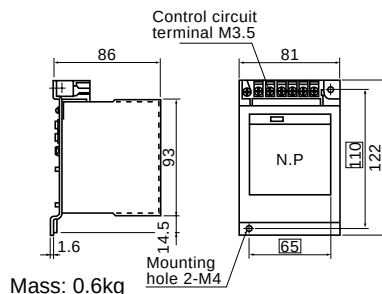
SZ-N5/DE to N14/DE



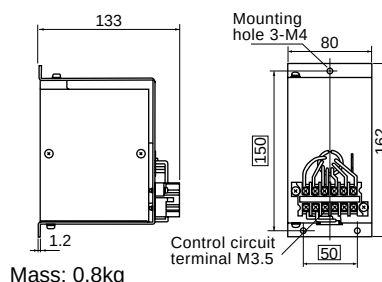
■ Dimensions, mm

SZ-DE100, 110, 200, 220

SZ-N1/GDE, N2S/GDE



SZ-N5/DE to N14/DE



Contactors and starters with extra pick-up operating coil

■ Description

Generally, if the operating coil voltage of the contactor is within 85%–110% of its rated value normal operation can be expected. However, should the power source have a low capacity or if the supply point is some distance away from the power source a voltage drop can be expected and voltage may fall below 85% of its rated value under motor starting or similar conditions. Direct-on-line starting under these circumstances may result in poor starter performance, contacts welding together and coils overheating. The FUJI U-type contactors are provided with an extra operating coil which performs correctly even if the voltage is only 75% of its rated value. This starter is recommended for use in locations

where reduced voltage conditions are met.

Standard types for frame sizes N5 and above can be used as the contactor or starter with extra pick-up operating coil. Enclosed type starters (03 to N4) are also available.

■ **Ratings:** See page 01/20.

■ **Coil voltage:** See page 01/22.

■ **Dimensions:**

Same as standard type.

See page 01/26, 01/27.

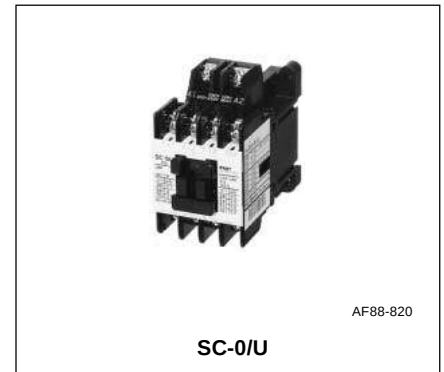
■ **Thermal overload relay:**

See page 01/88.

■ Ordering information

Specify the following:

1. Ordering code
2. Motor ratings: Voltage, frequency, capacity (kW) and full load current.
3. Operating coil voltage code



■ Coil characteristics

Contactor Type	Ordering code	Starter (3-element) Type	Ordering code	Aux. contact		Power consumption		Pick-up voltage (V)		Drop-out voltage (V)	
				NO	NC	Inrush (VA)	Sealed (VA)	200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz
SC-03/U	SC11AU-■10	SW-03/U3H	SC11AUN-■10T□D	1	— *1	120	15	93–115	102–124	58–88	66–96
SC-0/U	SC13AU-■10	SW-0/U3H	SC13AUN-■10T□D	1	— *1	120	15	93–115	102–124	58–88	66–96
SC-05/U	SC14AU-■11	SW-05/U3H	SC14AUN-■11T□D	1	1 *2	120	15	93–116	103–126	60–90	70–99
SC-4-0/U	SC18AU-■10	SW-4-0/U3H	SC18AUN-■10T□D	1	— *1	120	15	100–120	110–130	63–90	73–100
SC-4-1/U	SC19AU-■10	SW-4-1/U3H	SC19AUN-■10T□D	1	— *1	120	15	100–120	110–130	63–90	73–100
SC-5-1/U	SC20AU-■11	SW-5-1/U3H	SC20AUN-■11T□D	1	1 *2	120	15	99–121	110–130	64–96	74–102
SC-5-1/U	SC20AU-■22	SW-5-1/U3H	SC20AUN-■22T□D	2	2	120	15	99–121	110–130	64–96	74–102
SC-N1/U	SC25BAU-■22	SW-N1/U3H	SC25BAUN-■22T□D	2	2 *3	130	13	104–122	114–132	68–88	80–98
SC-N2/U	SC35BAU-■22	SW-N2/U3H	SC35BAUN-■22T□D	2	2 *3	130	13	104–122	114–132	68–88	80–98
SC-N2S/U	SC50BAU-■22	SW-N2S/U3H	SC50BAUN-■22T□D	2	2 *3	195	14.3	104–120	118–134	72–90	84–102
SC-N3/U	SC65BAU-■22	SW-N3/U3H	SC65BAUN-■22T□D	2	2 *3	195	14.3	104–120	118–134	72–90	84–102
SC-N4/U	SC80BAU-■22	SW-N4/U3H	SC80BAUN-■22T□D	2	2 *3	235	20	104–120	118–134	72–90	84–102

Notes: 1 The standard SC-N5 to SC-N16 types are provided with the SUPER MAGNET which holds without chattering even if the line voltage drops to 65% of its rated value, so preventing the troubles such as contact welding or coil burning.

2. *1 Auxiliary contact 1NC is available on request.

*2 Auxiliary contact 2NO or 2NC is available on request.

*3 Auxiliary contact 4NO+4NC is available on request

3. Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

■ Performance data

Type		Make and break capacity	Operating cycles per hour	Life expectancy (operations)	
Contactor	Starter			Electrical	Mechanical
SC-03/U	SW-03/U3H	IEC60947-4-1 class AC-3 Make: 10×Ie Break: 8×Ie (Ie : Operational current)	1800	2 million	2.5 million
SC-0/U	SW-0/U3H		1800	2 million	2.5 million
SC-05/U	SW-05/U3H		1800	2 million	2.5 million
SC-4-0/U	SW-4-0/U3H		1800	2 million	2.5 million
SC-4-1/U	SW-4-1/U3H		1800	2 million	2.5 million
SC-5-1/U	SW-5-1/U3H		1800	2 million	2.5 million
SC-N1/U	SW-N1/U3H		1200	2 million	2.5 million
SC-N2/U	SW-N2/U3H		1200	1 million	1 million
SC-N2S/U	SW-N2S/U3H		1200	1 million	1 million
SC-N3/U	SW-N3/U3H		1200	1 million	1 million
SC-N4/U	SW-N4/U3H	1200	1 million	1 million	

Magnetic Contactors

SC series

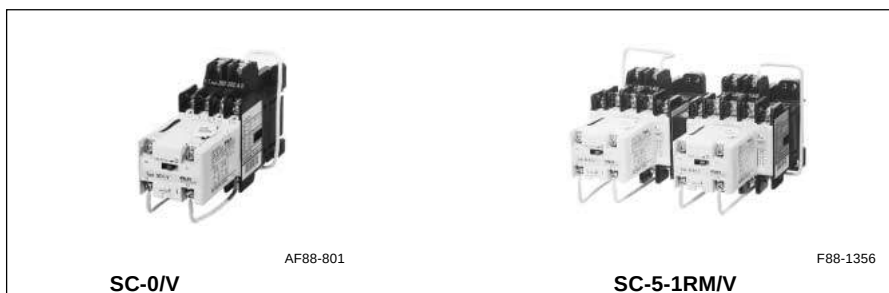
Mechanical latch

Mechanical latch contactors

Up to 315kW 440 Volts AC 3-phase

■ Description

Mechanical latch contactors are used where operating sequence continuity must be maintained regardless of any outside interruptions, such as voltage failure or instantaneous voltage drop. Typical applications are for electric furnaces, machine tool circuits, standby power supply and normal power changeover circuits in hospitals, schools and office buildings. These contactors are provided with two coils. One is CC (Closing Coil) and the other is TC (Tripping Coil). An interlocking circuit is provided between the CC coil and the TC coil. Since a coil voltage is not applied during operation it is extremely quiet. Power consumption can also be saved.



■ Performance data

Frame size	Making capacity	Breaking capacity	Operating cycles per hour	Life expectancy (operations)	
				Electrical	Mechanical
03/V to 5-1/V, 03/VG to 5-1/VG	10×Ie	8×Ie	1200	500,000	1 million
N1/VS to N3/VS	10×Ie	8×Ie	600	500,000	500,000
N4/VS to N12/VS	10×Ie	8×Ie	600	250,000	250,000
N14/VS	10×Ie	8×Ie	600	100,000	100,000

Notes: Ie: Rated operational current.

- Mechanical latch units cannot be sold separately. Such units are only sold attached to contactors.
- Do not detach mechanical latch units from contactors and do not make modifications such as attaching mechanical latch units to other contactors.

■ Types and ratings

• AC, AC/DC operated

Max. motor capacity (kW)		Rated operational current (A)		Rated thermal current lth (A)	Non-reversing				Reversing			
200V 240V	380V 440V	200V 240V	380V 440V		Type	Aux. contact NO	NC	Ordering code	Type	Aux. contact NO	NC	Ordering code
2.5	4	11	9	20	SC-03/V	—	—	SC11AV-■00	SC03RM/V	—	—	SC11RV-■00
3.5	5.5	13	12	20	SC-0/V	—	—	SC13AV-■00	SC0RM/V	—	—	SC13RV-■00
3.5	5.5	13	12	20	SC-05/V	1	—	SC14AV-■10	SC05RM/V	2	—	SC14RV-■10
3.5	5.5	13	12	20		—	1	SC14AV-■01		—	2	SC14RV-■01
4.5	7.5	18	16	25	SC-4-0/V	—	—	SC18AV-■00	SC-4-0RM/V	—	—	SC18RV-■00
5.5	11	22	22	32	SC-4-1/V	—	—	SC19AV-■00	SC-4-1RM/V	—	—	SC19RV-■00
5.5	11	22	22	32	SC-5-1/V	1	—	SC20AV-■10	SC-5-1RM/V	2	—	SC20RV-■10
5.5	11	22	22	32		—	1	SC20AV-■01		—	2	SC20RV-■01
5.5	11	22	22	32		1	2	SC20AV-■12		2	4	SC20RV-■12
7.5	15	32	32	50	SC-N1/VS	2	2	SC25BAE-■22	SC-N1RM/VS	4	4	SC25BRE-■22
11	18.5	40	40	60	SC-N2/VS	2	2	SC35BAE-■22	SC-N2RM/VS	4	4	SC35BRE-■22
15	22	50	50	80	SC-N2S/VS	2	2	SC50BAE-■22	SC-N2SRM/VS	4	4	SC50BRE-■22
18.5	30	65	65	100	SC-N3/VS	2	2	SC65BAE-■22	SC-N3RM/VS	4	4	SC65BRE-■22
22	40	80	80	135	SC-N4/VS	1	2	SC80BAE-■12	SC-N4RM/VS	2	4	SC80BRE-■12
30	55	105	105	150	SC-N5/VS	1	2	SC93BAE-■12	SC-N5RM/VS	2	4	SC93BRE-■12
37	60	125	125	150	SC-N6/VS	1	2	SC1CBAE-■12	SC-N6RM/VS	2	4	SC1CBRE-■12
45	75	150	150	200	SC-N7/VS	1	2	SC1FBAE-■12	SC-N7RM/VS	2	4	SC1FBRE-■12
55	90	180	180	260	SC-N8/VS	1	2	SC1JBAE-■12	SC-N8RM/VS	2	4	SC1JBRE-■12
65	110	220	220	260	SC-N10/VS	1	2	SC2CBAE-■12	SC-N10RM/VS	2	4	SC2CBRE-■12
90	160	300	300	350	SC-N11/VS	1	2	SC3ABAE-■12	SC-N11RM/VS	2	4	SC3ABRE-■12
120	220	400	400	450	SC-N12/VS	1	2	SC4ABAE-■12	SC-N12RM/VS	2	4	SC4ABRE-■12
180	315	600	600	660	SC-N14/VS	1	2	SC6ABAE-■12	SC-N14RM/VS	2	4	SC6ABRE-■12

Notes: Since SC-N1/VS to SC-N14/VS are provided with the SUPER MAGNET they operate on both AC or DC.

Enter the coil rated voltage code in the ■ mark, see page 01/19

• DC operated

Max. motor capacity (kW)		Rated operational current (A)		Rated thermal current lth (A)	Non-reversing				Reversing			
200V 240V	380V 440V	200V 240V	380V 440V		Type	Aux. contact NO NC		Ordering code	Type	Aux. contact NO NC		Ordering code
2.5	4	11	9	20	SC-03/VG	—	—	SC11AD-■00	SC03RM/VG	—	—	SC11RD-■00
3.5	5.5	13	12	20	SC-0/VG	—	—	SC13AD-■00	SC0RM/VG	—	—	SC13RD-■00
3.5	5.5	13	12	20	SC-05/VG	1	—	SC14AD-■10	SC05RM/VG	2	—	SC14RD-■10
3.5	5.5	13	12	20		—	1	SC14AD-■01		—	2	SC14RD-■01
4.5	7.5	18	16	25	SC-4-0/VG	—	—	SC18AD-■00	SC-4-0RM/VG	—	—	SC18RD-■00
5.5	11	22	22	32	SC-4-1/VG	—	—	SC19AD-■00	SC-4-1RM/VG	—	—	SC19RD-■00
5.5	11	22	22	32	SC-5-1/VG	1	—	SC20AD-■10	SC-5-1RM/VG	2	—	SC20RD-■10
5.5	11	22	22	32		—	1	SC20AD-■01		—	2	SC20RD-■01
5.5	11	22	22	32		1	2	SC20AD-■12		2	4	SC20RD-■12

Note: Enter the coil rated voltage code in the ■ mark, see page 01/19

■ Operating method

Closing

When the closing coil is energized the latch mechanism interlocks to latch and the NC contact connected in series with the closing coil opens and the coil is de-energized.

Tripping

When the tripping coil is energized the latch is released and tripping is carried out by means of the back spring. At this time the NO contact connected in series with the tripping coil opens.

■ Operating notes

- When carrying out a sequence operating check make sure that the load circuit is open.
- The electrical signal time for closing and tripping should be 0.3 sec. or more.
- Tripping coil is short time rated. Tripping coil: Max. 15 seconds
- In the cases of 03/V to N3/VS versions the contacts cannot be replaced. In the cases of those versions above N4/VS the contacts can be replaced.
- Both closing and tripping circuits should be electrically interlocked with each other.

■ Ordering information

Specify the following:

- Ordering code
- Auxiliary contact arrangement:
In the case of the frame size 05/V, 05/VG, 5-1/V or 5-1/VG, specify the contact arrangement.
- Closing and tripping coil
For AC operated: Voltage and frequency
For DC operated: Voltage

■ Coil characteristics

AC operated

Type	Power consumption Closing (VA)	Power consumption Tripping (VA)	Coil voltage *
SC-03/V	95	150	100/100–110V AC 50/60Hz
SC-0/V	95	150	
SC-05/V	95	150	
SC-4-0/V	95	150	
SC-4-1/V	95	150	
SC-5-1/V	95	150	200/200–220V AC 50/60Hz
SC-N1/VS	100	140	
SC-N2/VS	100	140	
SC-N2S/VS	115	140	
SC-N3/VS	115	140	
SC-N4/VS	161	266	100–110V AC 50/60Hz
SC-N5/VS	161	266	
SC-N6/VS	229	266	
SC-N7/VS	229	266	
SC-N8/VS	273	385	
SC-N10/VS	273	385	200/220V AC 50/60Hz
SC-N11/VS	490	385	
SC-N12/VS	490	385	
SC-N14/VS	500	660	

Notes: *Other coil voltage can be supplied.
SC-03/V to 5-1/V: 24 to 220V AC 50/60Hz
SC-N1/VS to N12/VS: 24 to 220V AC 50/60Hz
SC-N14/VS: 100 to 220V AC 50/60Hz

DC operated

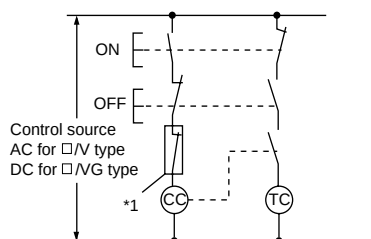
Type	Power consumption Closing (W)	Power consumption Tripping (W)	Coil voltage *
SC-03/VG	7	150	100, 110V DC
SC-0/VG	7	150	
SC-05/VG	7	150	
SC-4-0/VG	7	150	200, 220V DC
SC-4-1/VG	7	150	
SC-5-1/VG	7	150	
SC-N1/VS	95	150	100–110V DC
SC-N2/VS	95	150	
SC-N2S/VS	110	150	
SC-N3/VS	110	150	
SC-N4/VS	153	198	
SC-N5/VS	153	198	200–220V DC
SC-N6/VS	216	198	
SC-N7/VS	216	198	
SC-N8/VS	260	294	
SC-N10/VS	260	294	
SC-N11/VS	515	294	
SC-N12/VS	515	294	
SC-N14/VS	500	660	

Notes: *Other coil voltage can be supplied.
SC-03/VG to 5-1/VG: 24 to 220V DC
SC-N1/VS to N12/VS: 24 to 220V DC
SC-N14/VS: 100 to 220V DC

■ Operating circuit

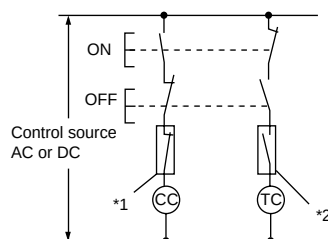
SC-03/V to 5-1/V

SC-03/VG to 5-1/VG



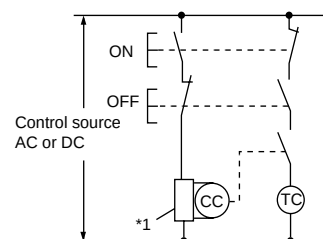
*1 NC contact for closing coil to be de-energized

SC-N1/VS to N3/VS



*1 NC contact for closing coil to be de-energized.
*2 NO contact for tripping coil to be de-energized.

SC-N4/VS to N14/VS



*1 Solid-state circuit for closing coil to be controlled.
(NC solid-state contact)

Magnetic Contactors

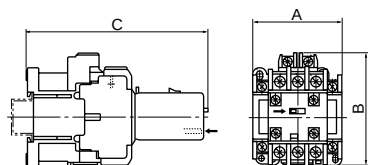
SC series

Mechanical latch

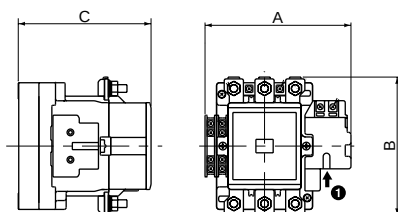
Mechanical latch type contactors

■ Dimensions, mm

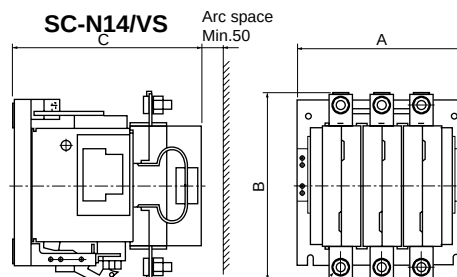
SC-03/V to 5-1/V
SC-03/VG to 5-1/VG



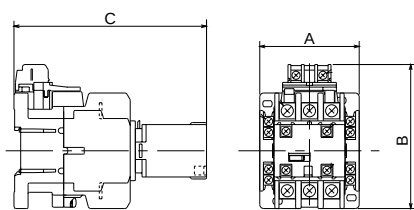
SC-N4/VS to N7/VS



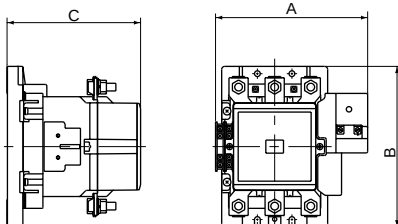
SC-N14/VS



SC-N1/VS to N3/VS



SC-N8/VS to N12/VS



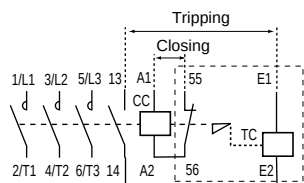
Dimensions for reference only.
Confirm before construction begins.

Type	A	B	C	Mass (kg)
SC-03/V, 0/V	43	81	128	0.43
SC-05/V	53	81	128	0.45
SC-4-0/V, 4-1/V	53	81	129	0.47
SC-5-1/V	64	81	129	0.49
SC-03/VG, 0/VG	43	81	155	0.66
SC-05/VG	53	81	155	0.69
SC-4-0/VG, 4-1/VG	53	81	156	0.71
SC-5-1/VG	64	81	156	0.73

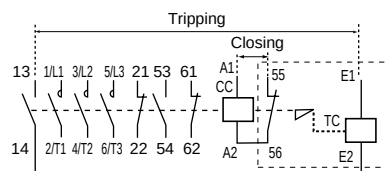
Type	A	B	C	Mass (kg)
SC-N1/VS, N2/VS	74	108	143.5	0.75
SC-N2S/VS, N3/VS	88	130	158	1.25
SC-N4/VS, N5/VS	140	127	132	2.3
SC-N6/VS	152	144	138	2.9
SC-N7/VS	167.5	156	140	3.2
SC-N8/VS, N10/VS	199	209	174	5.7
SC-N11/VS, N12/VS	215.5	240	195	8.6
SC-N14/VS	290	332	331	37

■ Wiring diagrams

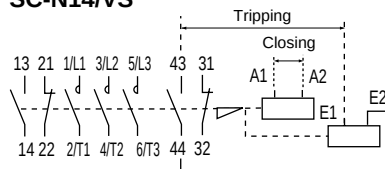
SC-03/V, 0/V, 4-0/V, 4-1/V
SC-03/VG, 0/VG, 4-0/VG, 4-1/VG



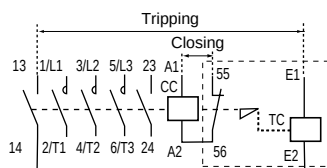
SC-5-1/V, /VG (Aux. contact 1NO+2NC)



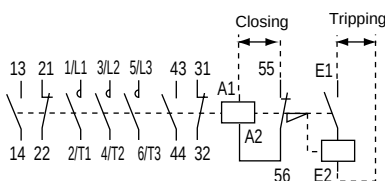
SC-N14/VS



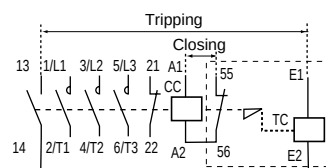
SC-05/V, 5-1/V SC-05/VG, 5-1/VG
(Aux. contact 1NO)



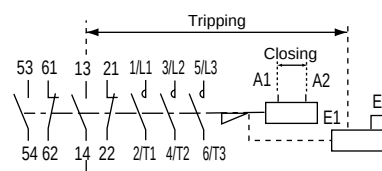
SC-N1/VS to N3/VS



(Aux. contact 1NC)



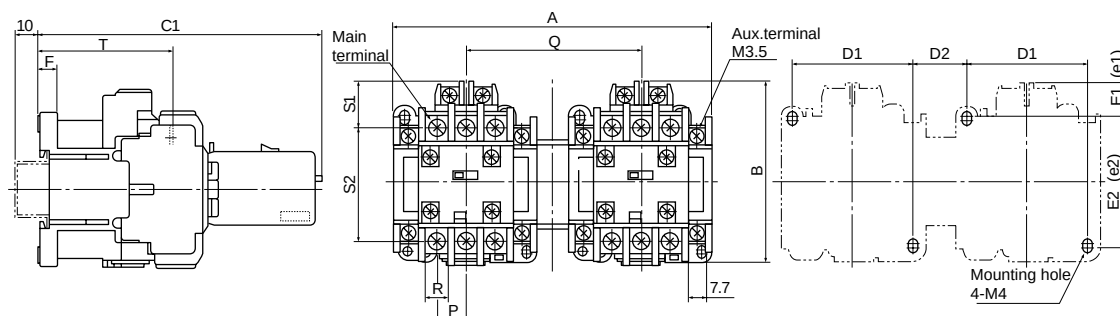
SC-N4/VS to N12/VS



CC: Closing coil
TC: Tripping coil

Reversing mechanical latch contactors

■ Dimensions, mm
SC-03RM/V to 5-1RM/V
SC-03RM/VG to 5-1RM/VG



Type	Auxiliary contact	A	B	C1	D1	D2	E1(e1)	E2(e2)	F	P	Q	R	S1	S2	T	Main terminal	Mass (kg)
SC-03RM/V	—	99	81	128	34	22	18.5 (20.5)	52 (48)	8.5	10	56	7.7	23	43	61	M3.5	0.9
SC-0RM/V	—	99	81	128	34	22	18.5 (20.5)	52 (48)	8.5	10	56	7.7	23	43	61	M3.5	0.9
SC-05RM/V	2NO or 2NC	119	81	128	34	32	18.5 (20.5)	52 (48)	8.5	10	66	7.7	23	43	61	M3.5	0.94
SC-4-0RM/V	—	119	81	129	34	32	18.5 (20.5)	52 (48)	8.5	13	66	9.7	20	49	61	M4	0.98
SC-4-1RM/V	—	119	81	129	34	32	18.5 (20.5)	52 (48)	8.5	13	66	9.7	20	49	61	M4	0.98
SC-5-1RM/V	2NO or 2NC	141	81	129	54	23	14.5 (16.5)	60 (56)	8.5	13	77	9.7	20	49	61	M4	1.02
	2NO+4NC	165	81	129	54	23	14.5 (16.5)	60 (56)	8.5	13	77	9.7	20	49	61	M4	1.08
SC-03RM/VG	—	99	81	155	34	22	18.5 (20.5)	52 (48)	8.5	10	56	7.7	23	43	88	M3.5	1.36
SC-0RM/VG	—	99	81	155	34	22	18.5 (20.5)	52 (48)	8.5	10	56	7.7	23	43	88	M3.5	1.36
SC-05RM/VG	2NO or 2NC	119	81	155	34	32	18.5 (20.5)	52 (48)	8.5	10	66	7.7	23	43	88	M3.5	1.42
SC-4-0RM/VG	—	119	81	156	34	32	18.5 (20.5)	52 (48)	8.5	13	66	9.7	20	49	88	M4	1.46
SC-4-1RM/VG	—	119	81	156	34	32	18.5 (20.5)	52 (48)	8.5	13	66	9.7	20	49	88	M4	1.46
SC-5-1RM/VG	2NO or 2NC	141	81	156	54	23	14.5 (16.5)	60 (56)	8.5	13	77	9.7	20	49	88	M4	1.5
	2NO+4NC	165	81	156	54	23	14.5 (16.5)	60 (56)	8.5	13	77	9.7	20	49	88	M4	1.56

Fig. 1 SC-N1RM/VS to N3RM/VS

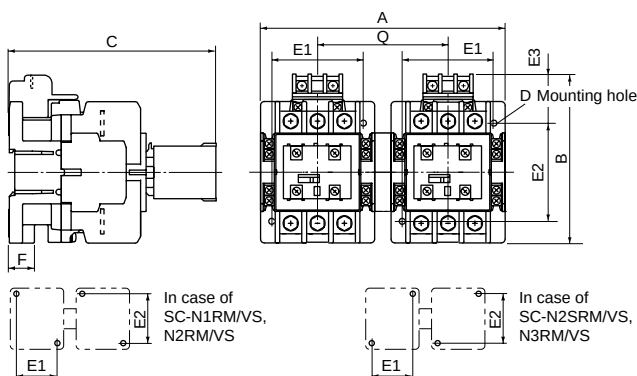


Fig. 2 SC-N4RM/VS to N12RM/VS

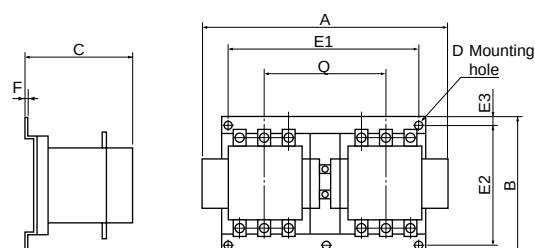
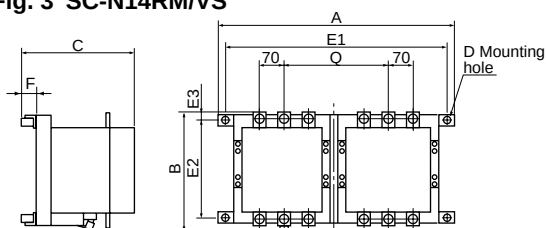


Fig. 3 SC-N14RM/VS



Dimensions for reference only.
Confirm before construction begins.

Type	A	B	C	D	E1	E2	E3	F	Q	Mass (kg)	Fig. No.
SC-N1RM/VS	161	108	143.5	4-M4	65	70	30	10.5	87	1.6	1
SC-N2RM/VS	161	108	143.5	4-M4	65	70	30	10.5	87	1.6	1
SC-N2SRM/VS	187	130	158	4-M4	70	75	38	10.5	100	2.6	1
SC-N3RM/VS	187	130	158	4-M4	70	75	38	10.5	100	2.6	1
SC-N4RM/VS	303	165	122	3-M5	200	150	7.5	1.6	135	5.0	2
SC-N5RM/VS	303	165	122	3-M5	200	150	7.5	1.6	135	5.0	2
SC-N6RM/VS	327	190	145	3-M5	220	175	7.5	1.6	147	6.7	2
SC-N7RM/VS	358	215	147	3-M6	260	200	7.5	2	162	8.1	2
SC-N8RM/VS	421	270	184	4-M6	300	250	10	2	177	13.0	2
SC-N10RM/VS	421	270	184	4-M6	300	250	10	2	177	13.0	2
SC-N11RM/VS	454	330	210	4-M8	300	300	15	2.3	192	21.4	2
SC-N12RM/VS	454	330	210	4-M8	300	300	15	2.3	192	21.4	2
SC-N14RM/VS	700	349	376	4-M10	650	250	41	45	324	80	3

Magnetic Contactors

SC series

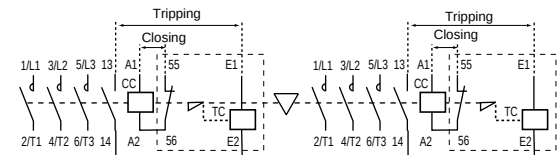
Mechanical latch

Reversing mechanical latch contactors

■ Wiring diagrams

SC-03RM/V, 0RM/V, 4-0RM/V, 4-1RM/V

SC-03RM/VG, 0RM/VG, 4-0RM/VG, 4-1RM/VG



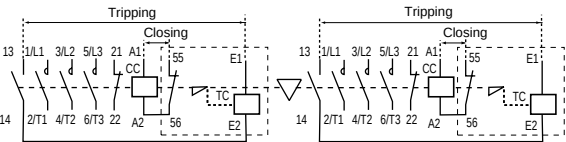
CC: Closing coil

TC: Tripping coil

SC-05RM/V, 5-1RM/V

SC-05RM/VG, 5-1RM/VG

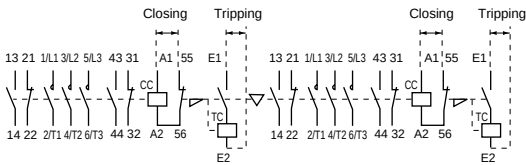
Auxiliary contact: 1NC×2



CC: Closing coil

TC: Tripping coil

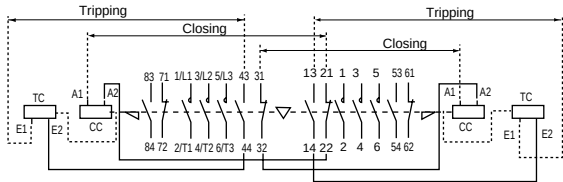
SC-N1RM/VS to N3RM/VS



CC: Closing coil

TC: Tripping coil

SC-N14RM/VS



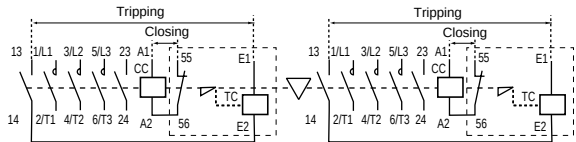
CC: Closing coil

TC: Tripping coil

SC-05RM/V, 5-1RM/V

SC-05RM/VG, 5-1RM/VG

Auxiliary contact: 1NO×2



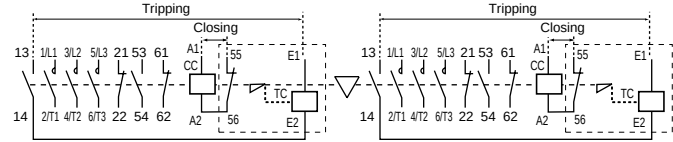
CC: Closing coil

TC: Tripping coil

SC-5-1RM/V

SC-5-1RM/VG

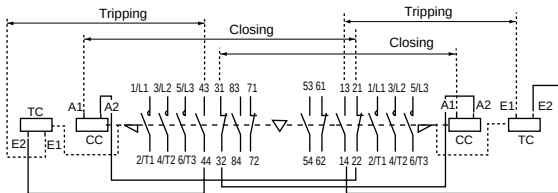
Auxiliary contact: 2×(1NO+2NC)



CC: Closing coil

TC: Tripping coil

SC-N4RM/VS to N12RM/VS



CC: Closing coil

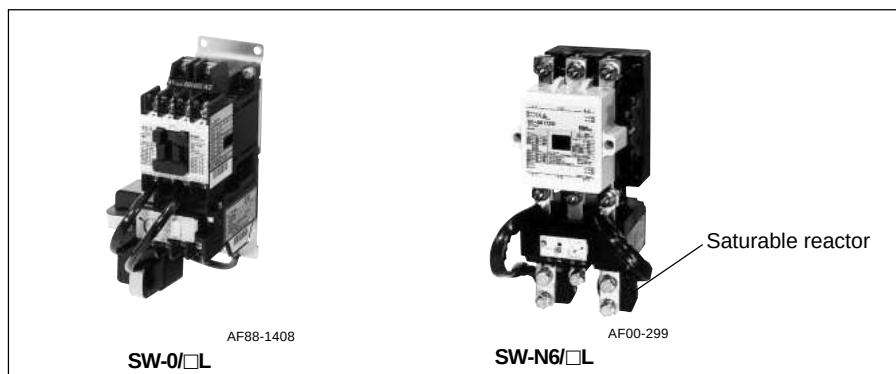
TC: Tripping coil

Motor starters for heavy starting duty conditions

Up to 315kW 440 Volts 3-phase

Description

This starter is designed for applications to those loads where the inrush current at the moment of starting persists for a long period, such as with blowers, winders, fans and centrifugal separators whose inertia force is large. In these cases the inrush current could last up to 7-8 sec., and would cause a standard type starter to misstrip. FUJI heavy load starters are highly suitable for such conditions and are provided with long time operating type thermal overload relays. In this type of



overload relay the small-sized saturable core reactors are connected in parallel with the heater elements. These divert the inrush current at the time of starting.

Ordering information

Specify the following:

1. Ordering code
2. Overload relay setting range code
3. Operating coil voltage code
4. Auxiliary contact arrangement

Types and ratings

Type	Ordering code	Aux. contact		Max. motor capacity (kW)		Operational current (A)		Combined thermal overload relay (3-element) Type
		NO	NC	200V 240V	380V 440V	200V 240V	380V 440V	
SW-03/3L	SC11AAF-■10T□	1	—	2.5	4	11	9	TR-0NL/3
SW-03/3L	SC11AAF-■01T□	—	1	2.5	4	11	9	TR-0NL/3
SW-0/3L	SC13AAF-■10T□	1	—	3.5	5.5	13	12	TR-0NL/3
SW-0/3L	SC13AAF-■01T□	—	1	3.5	5.5	13	12	TR-0NL/3
SW-05/3L	SC14AAF-■20T□	2	—	3.5	5.5	13	12	TR-0NL/3
SW-05/3L	SC14AAF-■11T□	1	1	3.5	5.5	13	12	TR-0NL/3
SW-05/3L	SC14AAF-■02T□	—	2	3.5	5.5	13	12	TR-0NL/3
SW-4-0/3L	SC18AAF-■10T□	1	—	4.5	7.5	18	16	TR-5-1NL/3
SW-4-0/3L	SC18AAF-■01T□	—	1	4.5	7.5	18	16	TR-5-1NL/3
SW-4-1/3L	SC19AAF-■10T□	1	—	5.5	11	22	22	TR-5-1NL/3
SW-4-1/3L	SC19AAF-■01T□	—	1	5.5	11	22	22	TR-5-1NL/3
SW-5-1/3L	SC20AAF-■20T□	2	—	5.5	11	22	22	TR-5-1NL/3
SW-5-1/3L	SC20AAF-■11T□	1	1	5.5	11	22	22	TR-5-1NL/3
SW-5-1/3L	SC20AAF-■02T□	—	2	5.5	11	22	22	TR-5-1NL/3
SW-5-1/3L	SC20AAF-■22T□	2	2	5.5	11	22	22	TR-5-1NL/3
SW-N1/3L	SC25BAAF-■22T□	2	2	7.5	15	32	32	TR-N2L/3
SW-N2/3L	SC35BAAF-■22T□	2	2	11	18.5	40	40	TR-N2L/3
SW-N2S/3L	SC50BAAF-■22T□	2	2	15	22	50	50	TR-N3L/3
SW-N3/3L	SC65BAAF-■22T□	2	2	18.5	30	65	65	TR-N3L/3
SW-N4/3L	SC80BAAF-■22T□	2	2	22	40	80	80	TR-N5L/3
SW-N5A/3L	SC93CAAF-■22T□	2	2	30	55	105	105	TR-N5L/3
SW-N6/3L	SC1CBAAF-■22T□	2	2	37	60	125	125	TR-N6L/3
SW-N7/3L	SC1FBAAF-■22T□	2	2	45	75	150	150	TR-N7L/3
SW-N8/3L	SC1JBAAF-■22T□	2	2	55	90	180	180	TR-N10L/3
SW-N10/3L	SC2CBAAF-■22T□	2	2	65	110	220	220	TR-N10L/3
SW-N11/3L	SC3ABAAF-■22T□	2	2	90	160	300	300	TR-N11L/3
SW-N12/3L	SC4ABAAF-■22T□	2	2	120	220	400	400	TR-N12L/3
SW-N14/3L	SC6ABAAF-■22T□	2	2	180	315	600	600	TR-N14L/3

Notes: 1. ■ Enter the operating coil voltage code.
2. □ Enter the thermal overload relay ampere setting range code.
3. Starters with 2-element overload relay are also available SW-□/2L.

Thermal overload relay:

See page 01/88.

Performance data:

Same as standard type
See page 01/22.

Ratings of coil and auxiliary contacts:

See pages 01/20, 22 and 23.

Wiring diagrams:

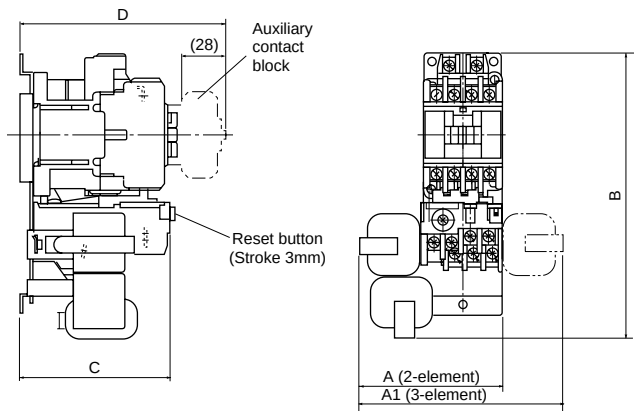
See page 01/29, 30 and 32.
Same as the standard types except thermal overload relays.

Magnetic Motor Starters

SW series

Heavy starting duty

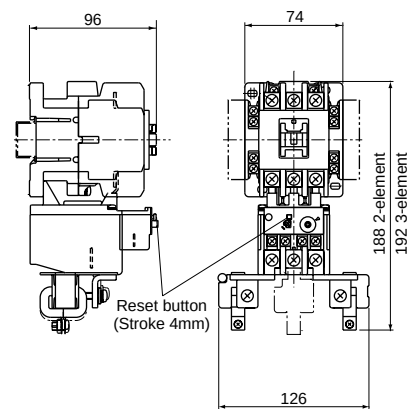
■ Dimensions, mm
SW-03/2L to 5-1/2L
SW-03/3L to 5-1/3L



Type							*	Mass (kg)	
2-element	3-element	A	A1	B	C	D		2- element	3- element
SW-03/2L	SW-03/3L	79	115	157	83	113		0.62	0.72
SW-0/2L	SW-0/3L	79	115	157	83	113		0.62	0.72
SW-05/2L	SW-05/3L	84	120	157	84	114		0.64	0.74
SW-4-0/2L	SW-4-0/3L	88	124	157	83	114		0.66	0.76
SW-4-1/2L	SW-4-1/3L	88	124	157	83	114		0.66	0.76
SW-5-1/2L	SW-5-1/3L	89	124	157	83	114		0.69	0.79
SW-5-1/2L	SW-5-1/3L	89	124	157	83	114		0.71	0.81

C: Without front mounting auxiliary contact block
D: With front mounting auxiliary contact block
* Mounted auxiliary contacts 2NO+2NC

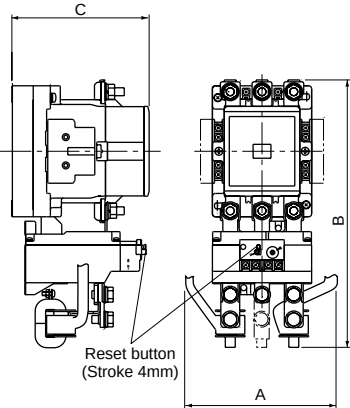
SW-N1/2L, N2/2L
SW-N1/3L, N2/3L



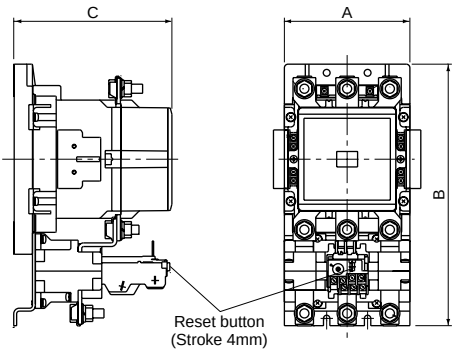
Mass: SW-N1/2L, N2/2L: 1.01kg
SW-N1/3L, N2/3L: 1.13kg

Note: SW-N10/2L, N11/2L, N12/2L and N14/2L, SW-N10/3L, N11/3L, N12/3L and N14/3L, have the same dimensions as SW-N10/3H, N11/3H, N12/3H and N14/3H, respectively.

SW-N2S/2L to SW-N7/2L
SW-N2S/3L to SW-N7/3L



SW-N8/2L
SW-N8/3L



Type		A	B	C	Mass (kg)	
2-element	3-element		2- element	3- element	2- element	3- element
SW-N2S/2L	SW-N2S/3L	138	219	219	111	1.54 1.66
SW-N3/2L	SW-N3/3L	138(149)*	219(202)*	219(224)*	111	1.54 1.64
SW-N4/2L	SW-N4/3L	138(149)*	230(214)*	230(236)*	117	2.26 2.54
SW-N5A/2L	SW-N5A/3L	149	214	236	132	2.66 2.94
SW-N6/2L	SW-N6/3L	165	270	270	138	3.62 3.93
SW-N7/2L	SW-N7/3L	165	281	281	140	3.92 4.23
SW-N8/2L	SW-N8/3L	138	287	287	174	6.8 6.8

*() = In case of ampere setting range 45 to 65A

Dimensions for reference only. Confirm before construction begins.

Motor starters with quick operating thermal overload relay

Up to 55kW 440 Volts 3-phase

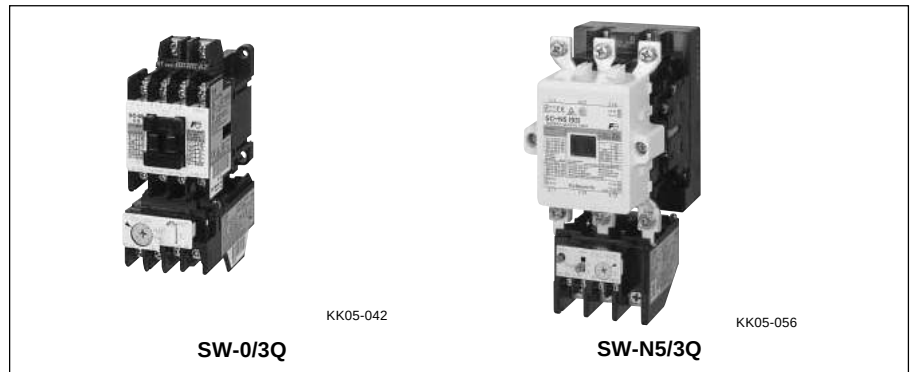
■ Description

This motor starter is fitted with a quick operating type thermal overload relay which makes suitable for controlling submersible motor pumps and compressors. These motor windings are cooled by using liquid or other media.

Thus their overload capacity will be less than standard type motor. This also means that these motors cannot be protected by standard type overload relays since their operation would be rather slow. The starters are available in types ranging from SW-03/3Q to SW-N5/3Q. All thermal overload relays have 3-heater elements.

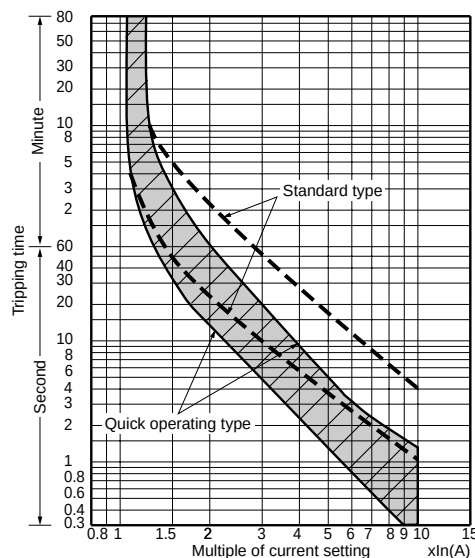
■ Features

- Thermal overload relays are designed to have similar starting characteristics to those of the motors. These relays will operate quicker than the standard type in the face of a locked rotor current. (Refer to the graph.)
- Compact with external dimensions similar to the standard type.
- The ampere setting dial of the overload relays is calibrated to an RC scale (Rated current). All that is necessary is to set a value equal to the full load current of the motor.



■ Operating characteristics

For explanation only



■ Ordering information

Specify the following:

1. Ordering code
2. Overload relay setting range code
3. Operating coil voltage code
4. Auxiliary contact arrangement

■ Performance data:

Same as standard types

See page 01/22.

Conforming to Class AC-3, IEC60947-4-1.

■ Ratings of coil and auxiliary contact:

See pages 01/20, 22 and 23.

■ Dimensions and wiring diagrams:

Same as standard types

See page 01/29, 30 and 31.

■ Thermal overload relay:

See page 01/88.

■ Ratings

Type	Ordering code	Max. motor capacity (kW)		Rated operational current (A)		Auxiliary contact		Combined thermal overload relay	
		200V 240V	380V 440V	200V 240V	380V 440V	NO	NC	Type	Ordering code
SW-03/3Q	SC11AAS-■10T□	2.5	4	11	9	1	— *1	TR-0NQ	TR13SW-□
SW-0/3Q	SC13AAS-■10T□	3.5	5.5	13	12	1	— *1	TR-0NQ	TR13SW-□
SW-05/3Q	SC14AAS-■11T□	3.5	5.5	13	12	1	1 *2	TR-0NQ	TR13SW-□
SW-4-0/3Q	SC18AAS-■10T□	4.5	7.5	18	16	1	— *1	TR-5-1NQ	TR20SW-□
SW-4-1/3Q	SC19AAS-■10T□	4.5	7.5	18	16	1	— *1	TR-5-1NQ	TR20SW-□
SW-5-1/3Q	SC20AAS-■11T□	4.5	7.5	18	16	1	1 *3	TR-5-1NQ	TR20SW-□
SW-5-1/3Q	SC20AAS-■22T□	4.5	7.5	18	16	2	2	TR-5-1NQ	TR20SW-□
SW-N1/3Q	SC25BAAS-■22T□	7.5	15	32	32	2	2	TR-N2Q	TR35BSW-□
SW-N2/3Q	SC35BAAS-■22T□	11	18.5	40	40	2	2	TR-N2Q	TR35BSW-□
SW-N2S/3Q	SC50BAAS-■22T□	15	22	50	50	2	2	TR-N3Q	TR65BSW-□
SW-N3/3Q	SC65BAAS-■22T□	18.5	30	65	65	2	2	TR-N3Q	TR65BSW-□
SW-N4/3Q	SC80BAAS-■22T□	22	40	80	80	2	2	TR-N5Q	TR93BSW-□
SW-N5A/3Q	SC93CAAS-■22T□	30	55	105	105	2	2	TR-N5Q	TR93BSW-□

Notes: *1 Auxiliary contact 1NC is also available on request.

*2 Auxiliary contact 2NO or 2NC is also available on request.

*3 Auxiliary contact 2NO, 2NC or 2NO+2NC is also available on request.

Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

Magnetic Motor Starters

SW series

With phase-loss protective device

Motor starters with phase-loss protective device

Up to 315 kW 440 Volts 3-phase

■ Description

These starters are provided with a FUJI TK type thermal overload relay. This has an phase-loss protection function as well as the ordinary overload protection.

These devices prevent damage due to single-phasing such as fuse melting, cable troubles or loosening through excessive vibration.

They are highly suitable for such applications as cooling fans or circulating pumps for power transformers.

The switches use FUJI SC series contactors which have a life expectancy of over 1 million operations and which makes them suitable for motor controls for industrial use.

Size range from 03 to N14 with capacities from 2.5kW to 180kW 220 Volts AC. Starters are available in both open- and enclosed-type versions.

Reversing motor starters with TK relays are also available.

■ Ordering information

Specify the following:

1. Ordering code
2. Overload relay setting range code
3. Operating coil voltage code
4. Auxiliary contact arrangement

■ Performance data:

Same as standard types.

See page 01/22.

■ Ratings of coil and auxiliary contacts:

See pages 01/20, 22 and 23.

■ Dimensions and wiring diagrams:

See pages 01/29, 30, 31 and 32.

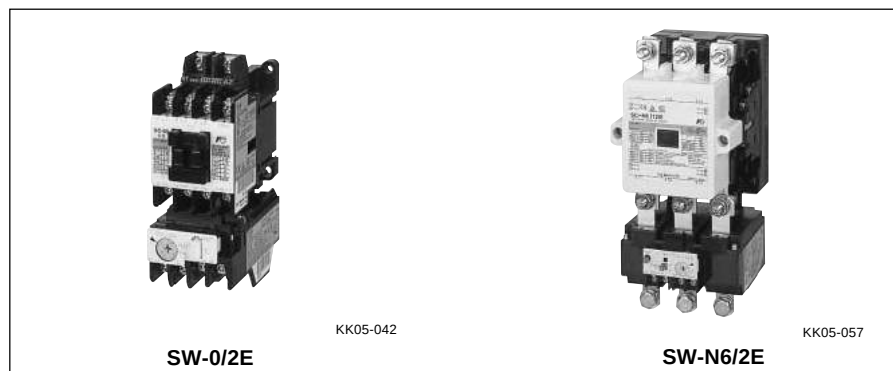
■ Characteristics of TK relay:

See page 01/100.

■ Thermal overload relays with phase-loss protection

The TK thermal overload relay perfectly matches the heat characteristics of 3-phase squirrel-cage induction motors. The heater element and phase-loss protective mechanism are built inside the enclosure.

The characteristics of the phase-loss



mechanism co-ordinate with the temperature rise curve of the stator winding at the time of phase-loss. When an phase-loss is produced during the full load operation of a 3-phase motor a current larger than the full load current will flow and operate the thermal overload relay.

Under this load condition the standard type OL relay can provide adequate protection. If the load is approx. 60% of the full load current the motor will continue a single phase running and the line current will become almost equal to the full load current.

However, since it will not reach the minimum operating point of OL relay the starter will not be tripped.

In the case of a delta winding motor a phase current of approx. 115% of the line full load current will flow in windings. This overcurrent results in a temperature rise in the motor windings and damage due to overheating can be expected.

FUJI TK thermal overload relays are provided with ADL mechanism which can correctly detect phase-loss under such medium load conditions. This sophisticated detecting mechanism can take corrective action quicker in the case of overload running.

The ADL mechanism operates on a dependable and simple level design. It works as follows:—

The heater, in phase-loss, will be cool since no load current flows, while heater of other phases will heat up since a large current flows.

The difference in temperature between the cold and hot heater elements causes the shift lever to operate the Trip/Alarm contact.

The operating current range is 105%–120% of the rated current set on the dial.

Reversing motor starter with phase-loss protective device

■ Description

This reversing motor starter uses two contactors and TK type thermal overload relay. The TK relay is provided with a heater element and a built-in mechanism for phase-loss protection use, which match with the thermal characteristics of 3-phase squirrel-cage rotor motor. This eliminates the possibility of damage in the case of the motor overheating.

The TK relay also features manual tripping, a trip-free mechanism, MANUAL/AUTO selector lever, wide range dial ampere adjustment, ambient temperature compensator and 1NO•1NC trip/alarm contact, etc. Starters can be supplied with either open type or provided with enclosures. The general purpose enclosure is made of pressed steel and is not provided with a pushbutton.

■ Types and ratings/Non-reversing

Max. motor capacity (kW)		Operational current (A)		Auxiliary contact	Open Type	Ordering code	Enclosed Type	Ordering code	Combined thermal overload relay
200V	380V	200V	380V	Standard					
240V	440V	240V	440V						
2.5	4	11	9	1NO *1	SW-03/2E	SC11AAE-■10T□	SW-03C/2E	SC11CAE-■10T□	TK-0N
3.5	5.5	13	12	1NO *1	SW-0/2E	SC13AAE-■10T□	SW-0C/2E	SC13CAE-■10T□	TK-0N
3.5	5.5	13	12	1NO+1NC *2	SW-05/2E	SC14AAE-■11T□	SW-05C/2E	SC14CAE-■11T□	TK-0N
4.5	7.5	18	16	1NO *1	SW-4-0/2E	SC18AAE-■10T□	SW-4-0C/2E	SC18CAE-■10T□	TK-5-1N
5.5	11	22	22	1NO *1	SW-4-1/2E	SC19AAE-■10T□	SW-4-1C/2E	SC19CAE-■10T□	TK-5-1N
5.5	11	22	22	1NO+1NC *3	SW-5-1/2E	SC20AAE-■11T□	SW-5-1C/2E	SC20CAE-■11T□	TK-5-1N
7.5	15	32	32	2NO+2NC *4	SW-N1/2E	SC25BAAE-■22T□	SW-N1C/2E	SC25BCAE-■22T□	TK-N2
11	18.5	40	40	2NO+2NC *4	SW-N2/2E	SC35BAAE-■22T□	SW-N2C/2E	SC35BCAE-■22T□	TK-N2
15	22	50	50	2NO+2NC *4	SW-N2S/2E	SC50BAAE-■22T□	SW-N2SC/2E	SC50BCAE-■22T□	TK-N3
18.5	30	65	65	2NO+2NC *4	SW-N3/2E	SC65BAAE-■22T□	SW-N3C/2E	SC65BCAE-■22T□	TK-N3
22	40	80	80	2NO+2NC *4	SW-N4/2E	SC80BAAE-■22T□	SW-N4C/2E	SC80BCAE-■22T□	TK-N5
30	55	105	105	2NO+2NC *4	SW-N5A/2E	SC93CAAE-■22T□	SW-N5AC/2E	SC93CCAE-■22T□	TK-N5
37	60	125	125	2NO+2NC *4	SW-N6/2E	SC1CBAAE-■22T□	SW-N6C/2E	SC1CBCAE-■22T□	TK-N6
45	75	150	150	2NO+2NC *4	SW-N7/2E	SC1FBAAE-■22T□	SW-N7C/2E	SC1FBCAE-■22T□	TK-N7
55	90	180	180	2NO+2NC *4	SW-N8/2E	SC1JBAAE-■22T□	SW-N8C/2E	SC1JBCAE-■22T□	TK-N8
65	110	220	220	2NO+2NC *4	SW-N10/2E	SC2CBAAE-■22T□	SW-N10C/2E	SC2CBCAE-■22T□	TK-N10
90	160	300	300	2NO+2NC *4	SW-N11/2E	SC3ABAAE-■22T□	SW-N11C/2E	SC3ABCAE-■22T□	TK-N11
120	220	400	400	2NO+2NC *4	SW-N12/2E	SC4ABAAE-■22T□	SW-N12C/2E	SC4ABCAE-■22T□	TK-N12
180	315	600	600	2NO+2NC *4	SW-N14/2E	SC6ABAAE-■22T□	SW-N14C/2E	SC6ABCAE-■22T□	TK-N14

Notes: Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

*1 Auxiliary contact 1NC is available on request.

*2 Auxiliary contact 2NO or 2NC is available on request.

*3 Auxiliary contact 2NO, 2NC or 2NO+2NC is available on request. However, 2NO+2NC is not available for enclosed types.

*4 Auxiliary contact 4NO+4NC is available on request for frame sizes N1 and above.

■ Types and ratings/Reversing

Max. motor capacity (kW)		Operational current (A)		Auxiliary contact	Open Type	Ordering code	Enclosed Type	Ordering code	Combined thermal overload relay
200V	380V	200V	380V	Standard					
240V	440V	240V	440V						
2.5	4	11	9	1NC × 2 *1	SW-03RM/2E	SC11RAE-■01T□	SW-03RMC/2E	SC11MAE-■01T□	TK-0N
3.5	5.5	13	12	1NC × 2 *1	SW-0RM/2E	SC13RAE-■01T□	SW-0RMC/2E	SC13MAE-■01T□	TK-0N
3.5	5.5	13	12	(1NO+1NC) × 2 *2	SW-05RM/2E	SC14RAE-■11T□	SW-05RMC/2E	SC14MAE-■11T□	TK-0N
4.5	7.5	18	16	1NC × 2 *1	SW-4-0RM/2E	SC18RAE-■01T□	SW-4-0RMC/2E	SC18MAE-■01T□	TK-5-1N
5.5	11	22	22	1NC × 2 *1	SW-4-1RM/2E	SC19RAE-■01T□	SW-4-1RMC/2E	SC19MAE-■01T□	TK-5-1N
5.5	11	22	22	(1NO+1NC) × 2 *3	SW-5-1RM/2E	SC20RAE-■11T□	SW-5-1RMC/2E	SC20MAE-■11T□	TK-5-1N
7.5	15	32	32	(2NO+2NC) × 2 *4	SW-N1RM/2E	SC25BRAE-■22T□	SW-N1RMC/2E	SC25BMAE-■22T□	TK-N2
11	18.5	40	40	(2NO+2NC) × 2 *4	SW-N2RM/2E	SC35BRAE-■22T□	SW-N2RMC/2E	SC35BMAE-■22T□	TK-N2
15	22	50	50	(2NO+2NC) × 2 *4	SW-N2SRM/2E	SC50BRAE-■22T□	SW-N2SRMC/2E	SC50BMAE-■22T□	TK-N3
18.5	30	65	65	(2NO+2NC) × 2 *4	SW-N3M/2E	SC65BRAE-■22T□	SW-N3RMC/2E	SC65BMAE-■22T□	TK-N3
22	40	80	80	(2NO+2NC) × 2 *4	SW-N4RM/2E	SC80BRAE-■22T□	SW-N4RMC/2E	SC80BMAE-■22T□	TK-N5
30	55	105	105	(2NO+2NC) × 2 *4	SW-N5ARM/2E	SC93CRAE-■22T□	SW-N5ARMC/2E	SC93CMAE-■22T□	TK-N5
37	60	125	125	(2NO+2NC) × 2 *4	SW-N6RM/2E	SC1CBRAE-■22T□	SW-N6RMC/2E	SC1CBMAE-■22T□	TK-N6
45	75	150	150	(2NO+2NC) × 2 *4	SW-N7RM/2E	SC1FBRAE-■22T□	SW-N7RMC/2E	SC1FBMAE-■22T□	TK-N7
55	90	180	180	(2NO+2NC) × 2 *4	SW-N8RM/2E	SC1JBRAE-■22T□	SW-N8RMC/2E	SC1JBMAE-■22T□	TK-N8
65	110	220	220	(2NO+2NC) × 2 *4	SW-N10RM/2E	SC2CBRAE-■22T□	SW-N10RMC/2E	SC2CBMAE-■22T□	TK-N10
90	160	300	300	(2NO+2NC) × 2 *4	SW-N11RM/2E	SC3ABRAE-■22T□	SW-N11RMC/2E	SC3ABMAE-■22T□	TK-N11
120	220	400	400	(2NO+2NC) × 2 *4	SW-N12RM/2E	SC4ABRAE-■22T□	SW-N12RMC/2E	SC4ABMAE-■22T□	TK-N12
180	315	600	600	(2NO+2NC) × 2 *4	SW-N14RM/2E	SC6ABRAE-■22T□	SW-N14RMC/2E	SC6ABMAE-■22T□	TK-N14

Notes: Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

*1 Auxiliary contact 1NO×2 is available on request. However, these contactors are not electrically interlocked. Be sure to arrange electrical interlock circuit externally to avoid short-circuit accidents.

*2 Auxiliary contact 2NC×2 is available on request.

*3 Auxiliary contact 2NC×2 or (2NO+2NC)×2 is available on request.

However, (2NO+2NC)×2 is not available for enclosed types.

*4 Auxiliary contact (3NO+3NC)×2 is available on request.

Magnetic Motor Starters

SW series

With phase-loss and phase-sequence protective device

Motor starters with phase-loss and phase-sequence relays

Up to 315kW 440 Volts 3-phase

Description

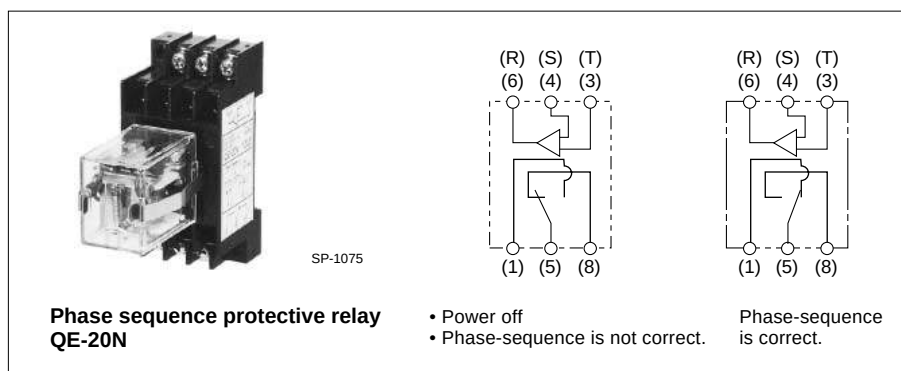
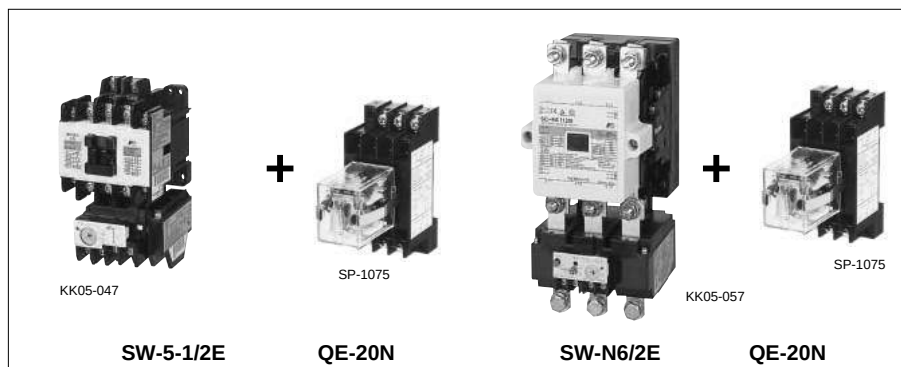
These starters are fitted with TK type thermal overload relay and phase-sequence relay. The phase-sequence relay only permits engagement of the starter when the phase rotation is confirmed to be correct.

These switches are mainly used for construction site machinery, window shutters, machine tools, compressors, freezers, conveyors, underwater pumps, car washing machines, blowers and similar applications. They give excellent protection against damage and overheating resulting from phase-loss operation.

Ordering information

Specify the following:

- Ordering code
2E type motor starter and phase sequence relay QE-20N.
- Overload relay setting range code
- Operating coil voltage code



Types and ratings

Max. motor capacity (kW)		Operational current (A)		Auxiliary contact	Starter with 2E type thermal overload relay		Phase-sequence protective relay	
200V	380V	200V	380V		Type	Ordering code	Type	Ordering code
240V	440V	240V	440V	Standard				
2.5	4	11	9	1NO *1	SW-03/2E	SC11AAE-■10T□	200-220V:	
3.5	5.5	13	12	1NO *1	SW-0/2E	SC13AAE-■10T□	QE-20N	TQ1CPN
3.5	5.5	13	12	1NO + 1NC *2	SW-05/2E	SC14AAE-■11T□		
4.5	7.5	18	16	1NO *1	SW-4-0/2E	SC18AAE-■10T□		
5.5	11	22	22	1NO *1	SW-4-1/2E	SC19AAE-■10T□	380-415V:	
5.5	11	22	22	1NO + 1NC *3	SW-5-1/2E	SC20AAE-■11T□	QE-40N	TQ2CPN
5.5	11	22	22	2NO + 2NC	SW-5-1/2E	SC20AAE-■22T□		
7.5	15	32	32	2NO + 2NC *4	SW-N1/2E	SC25BAAE-■22T□		
11	18.5	40	40	2NO + 2NC *4	SW-N2/2E	SC35BAAE-■22T□		
15	22	50	50	2NO + 2NC *4	SW-N2S/2E	SC50BAAE-■22T□		
18.5	30	65	65	2NO + 2NC *4	SW-N3/2E	SC65BAAE-■22T□		
22	40	80	80	2NO + 2NC *4	SW-N4/2E	SC80BAAE-■22T□		
30	55	105	105	2NO + 2NC *4	SW-N5A/2E	SC93CAAE-■22T□		
37	60	125	125	2NO + 2NC *4	SW-N6/2E	SC1CBAAE-■22T□		
45	75	150	150	2NO + 2NC *4	SW-N7/2E	SC1FBAAE-■22T□		
55	90	180	180	2NO + 2NC *4	SW-N8/2E	SC1JBAAE-■22T□		
65	110	220	220	2NO + 2NC *4	SW-N10/2E	SC2CBAAE-■22T□		
90	160	300	300	2NO + 2NC *4	SW-N11/2E	SC3ABAAE-■22T□		
120	220	400	400	2NO + 2NC *4	SW-N12/2E	SC4ABAAE-■22T□		
180	315	600	600	2NO + 2NC *4	SW-N14/2E	SC6ABAAE-■22T□		

Notes: Enter the coil voltage code in the ■ mark.

Enter the thermal overload relay ampere setting range code in the □ mark.

*1 Auxiliary contact 1NC is available on request.

*2 Auxiliary contact 2NO or 2NC is available on request.

*3 Auxiliary contact 2NO or 2NC is available on request.

*4 Auxiliary contact 4NO+4NC is available on request for frame sizes N1 and above.

Performance data:

Same as standard types.

See page 01/22.

Ratings of coil and auxiliary contacts:

See pages 01/20, 22 and 23.

TK type thermal overload relays:

See page 01/100.

Thermal overload relays with phase-loss and phase-sequence protective relays

Motor starters with 3E relay are fitted with both TK type thermal overload and QE-20N type phase-sequence protective relays.

If the phase rotation of the power supply is not correct the relay will not permit the starter to be switched ON.

These starters provide motors with accurate and consistent protection under overcurrent, phase-loss and reverse-phase conditions.

■ Method of operation

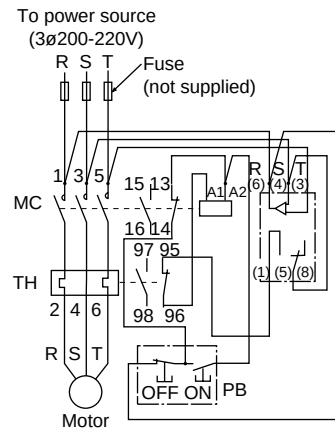
The FUJI phase-sequence relay contacts 1–5 will close if the phase rotation of the power source is correct. In case the rotation is incorrect the contacts 1–5 will remain open and the magnetic coil A1–A2 will not be energized.

■ Dimensions, mm

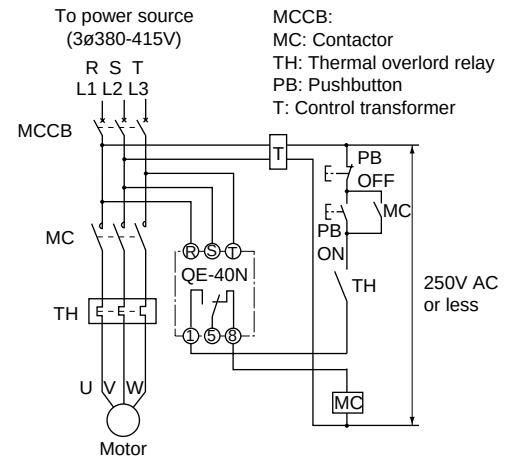
● **Starter with phase-loss protection**
SW-03/2E to 14N/2E (Open)
Same as standard types.
See pages 01/29 to 01/32.

■ Wiring diagrams (example)

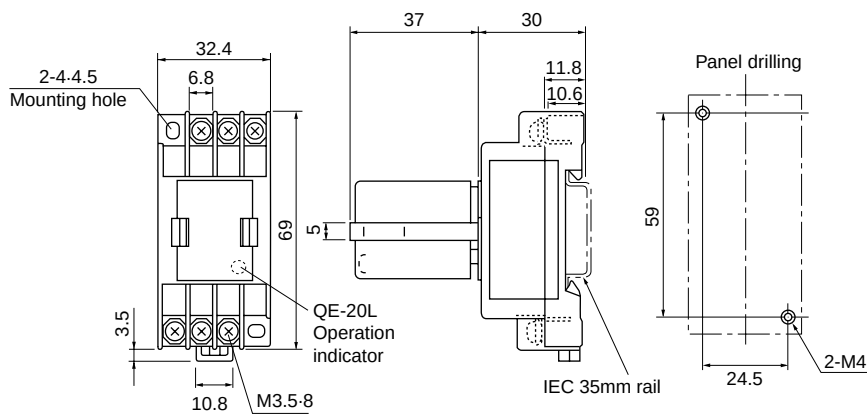
● QE-20N, 20NL 200–220V



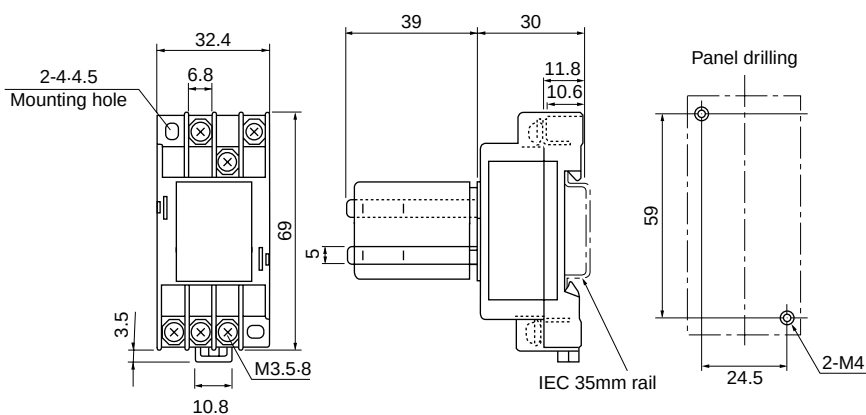
● QE-40N 380–415V



● Phase-sequence protective relay QE-20N, 20NL



QE-40N



Dimensions for reference only. Confirm before construction begins.

Magnetic Motor Starters

SW series

Enclosed with pushbuttons

Motor starters with on-off/reset pushbuttons

Up to 110kW 440 Volts

■ Description

It is provided with on-off push-buttons. Its small size makes little demand on space. The enclosure is a general purpose type and is made of pressed steel sheet. (Plastic enclosure for SW-03P to SW-5-1P)
Compact, space-saving and easily mounted FUJI integral motor starters are highly reliable and efficient products to satisfy your application requirements. They are used with single and 3-phase squirrel-cage induction motors. Essentially consisting of a magnetic contactor and a thermal overload relay these units provide complete motor overload protection with the convenience of an outside reset button mounted on the front of the starter box.

● Contactors

FUJI integral motor starters use the SC series of contactors. All starters incorporate the usual FUJI features. These include free-floating magnetic mechanisms, bounce damping devices, long-life low-maintenance silver alloy contacts and rapid heat-dispersing arc-quenchers. Starter exceed IEC specifications as far as service life is concerned.

Choice of FUJI equipment will ensure you reduced maintenance, inspection and labor costs and uninterrupted dependable service. Available motor capacities are from 4kW to 110kW at 380 Volts.

● Thermal overload relays

Highly efficient heater elements and ambient temperature compensators give motors added protection and more uniform performance. They are fitted with 3-pole heater elements, and resetting is carried out manually with the reset button.

■ Coil ratings:

See page 01/22.

Same as standard type starters.



SW-0P/3H

KKD06-010

■ Performance data:

- Operating cycle: 1,200 cycles per hours
- Life expectancy (operations)
 - Mechanical: 250,000
 - Electrical: 250,000

■ Thermal overload relay:

See page 01/98.

Same as standard type starters.

■ Ordering information

Specify the following:

- Ordering code
- Overload relay setting range code
- Operating coil voltage code

■ Ratings

Max. motor capacity (kW)			Auxiliary contact	With on-off/reset pushbutton		With on-off pushbutton		Combined thermal overload relay
Single-phase 110V	3-phase 200V 240V	380V 440V		Type	Ordering code	Type	Ordering code	
0.4	2.5	4	1NO	SW-03P/3H	SC11PAN-■10T□D	—	—	TR-0N/3
0.5	3.5	5.5	1NO	SW-0P/3H	SC13PAN-■10T□D	—	—	TR-0N/3
0.5	3.5	5.5	1NO+1NC	SW-05P/3H	SC14PAN-■11T□D	—	—	TR-0N/3
0.6	4.5	7.5	1NO	SW-4-0P/3H	SC18PAN-■10T□D	—	—	TR-5-1N/3
0.8	5.5	11	1NO	SW-4-1P/3H	SC20PAN-■10T□D	—	—	TR-5-1N/3
0.8	5.5	11	1NO+1NC	SW-5-1P/3H	SC20PAN-■11T□D	—	—	TR-5-1N/3
1.2	7.5	15	2NO+2NC	SW-N1PB/3H	SC25BSAN-■22T□D	SW-N1P/3H	SC25BPAN-■22T□D	TR-N2/3
1.7	11	18.5	2NO+2NC	SW-N2PB/3H	SC35BSAN-■22T□D	SW-N2P/3H	SC35BPAN-■22T□D	TR-N2/3
—	15	22	2NO+2NC	SW-N2SPB/3H	SC50BSAN-■22T□D	SW-N2SP/3H	SC50BPAN-■22T□D	TR-N3/3
—	18.5	30	2NO+2NC	SW-N3PB/3H	SC65BSAN-■22T□D	SW-N3P/3H	SC65BPAN-■22T□D	TR-N3/3
—	22	40	2NO+2NC	SW-N4PB/3H	SC80BSAN-■22T□D	—	—	TR-N5/3
—	30	55	2NO+2NC	SW-N5PB/3H	SC93BSAN-■22T□D	—	—	TR-N5/3
—	37	60	2NO+2NC	SW-N6PB/3H	SC1CBSAN-■22T□D	—	—	TR-N6/3
—	55	90	2NO+2NC	SW-N8PB/3H	SC1JBSAN-■22T□D	—	—	TR-N8/3
—	65	110	2NO+2NC	SW-N10PB/3H	SC2CBSAN-■22T□D	—	—	TR-N10/3

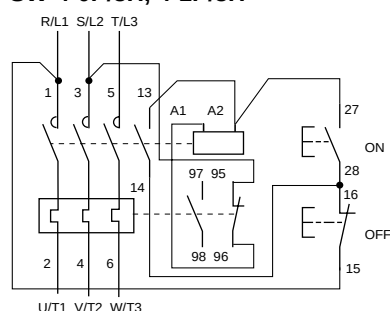
Notes: 2-element is available on request.

Enter the coil voltage code in the ■ mark.

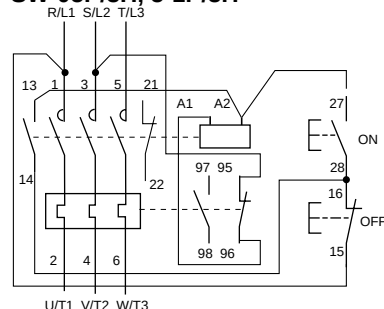
Enter the thermal overload relay ampere setting range code in the □ mark.

■ Wiring diagrams

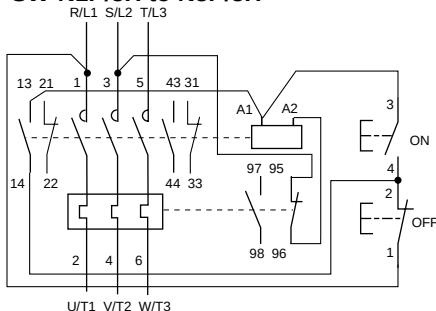
SW-03P/3H, 0P/3H
SW-4-0P/3H, 4-1P/3H



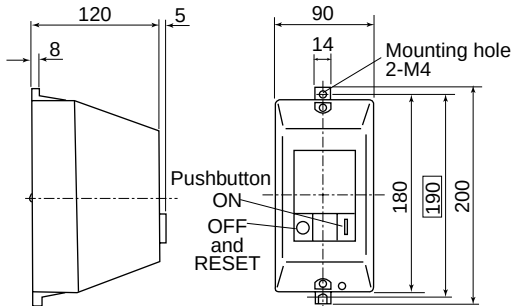
SW-05P/3H, 5-1P/3H



SW-N1PB/3H to N10PB/3H
SW-N1P/3H to N3P/3H

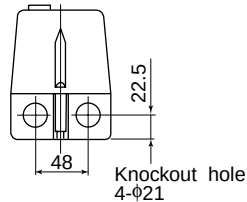


■ Dimensions, mm
 SW-03P to SW-5-1P

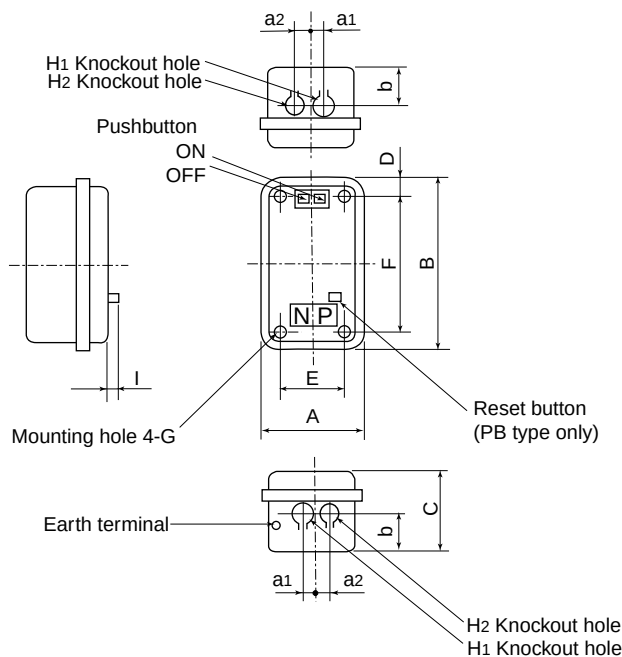


Type	Mass (kg)
SW-03P/3H	0.82
SW-0P/3H	0.82
SW-05P/3H	0.84
SW-4-0P/3H	0.86
SW-4-1P/3H	0.86
SW-5-1P/3H	0.89

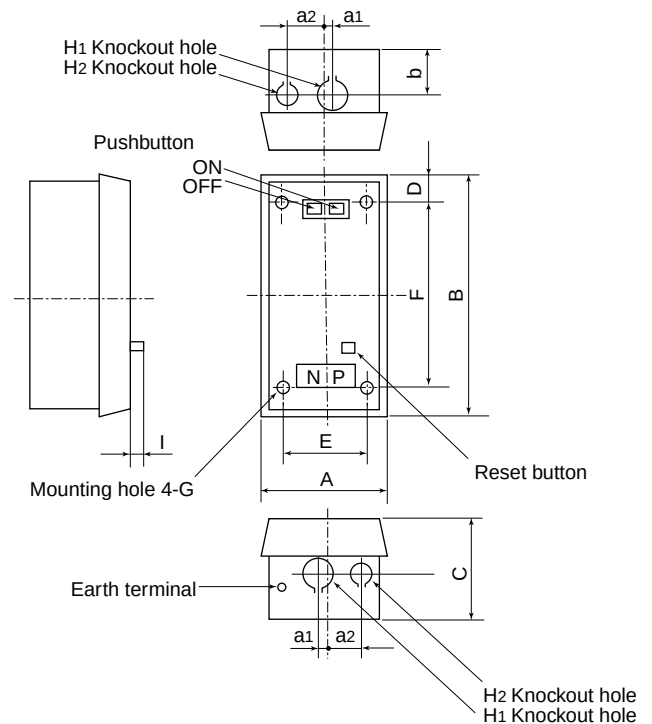
Plastic enclosure



SW-N1PB to SW-N5PB
 SW-N1P to SW-N3P



SW-N6PB to SW-N10PB



Type	A	B	C	D	E	F	G	H ₁	H ₂	I	a ₁	a ₂	b	Mass (kg)	
														PB type	P type
SW-N1PB/3H N1P/3H	175	320	145	35	110	250	M6	φ35	φ28	12	15	35	70	2.6	2.5
SW-N2PB/3H N2P/3H	175	320	145	35	110	250	M6	φ35	φ28	12	15	35	70	2.6	2.5
SW-N2SPB/3H N2SP/3H	175	320	145	35	110	250	M6	φ35	φ28	12	15	35	70	3.2	3.1
SW-N3PB/3H N3P/3H	175	320	145	35	110	250	M6	φ35	φ28	12	15	35	70	3.2	3.1
SW-N4PB/3H	200	400	160	37	125	325	M8	φ43	φ28	12	20	40	80	4.6	—
SW-N5PB/3H	200	400	160	37	125	325	M8	φ43	φ28	12	20	40	80	5.0	—
SW-N6PB/3H	225	450	180	50	150	350	M8	φ52	φ28	12	10	70	80	8.6	—
SW-N8PB/3H	335	670	225	85	200	500	M10	φ78	φ28	11	—	100	95	18.2	—
SW-N10PB/3H	335	670	225	85	200	500	M10	φ78	φ28	11	—	100	95	19.3	—

Mass: with 3-thermal element

Magnetic Motor Starters

SW series

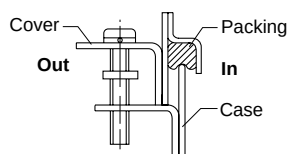
Dust-tight/light-corrosion resistance

Dust-tight/light-corrosion resistance starters

■ Description

When selecting a motor starter the operating conditions must be carefully considered. Attention must be given to such problems as dust, chemically aggressive atmosphere, water, oil and hazardous materials. We can supply enclosures that meet the special needs of such industries as the cement and textile industries, where dust and lint can be expected, and the fertilizer, synthetic fiber, oil refining and electrochemical and metal-plating industries where corrosive gases and materials can affect the performance of electrical equipment. A pressed metal enclosure designed for use in locations where dust, lint, fibers and similar airborne materials are present. The hingeless-type cover is provided with a corrosion-resistant rubber gasket and it is secured by screws. Knockout holes are situated at the top and bottom of the enclosure to accept conduit hubs or glands. This type is for indoor use. The outside surface of the enclosure is treated with a special anti-corrosion coating. This type of case is

recommended for cement and fertilizer plants and similar dusty locations. It is also suitable for oil refineries, breweries and metal-plating workshops and coastal areas where aggressive chemical conditions can be expected. This type of enclosure is not suitable for hazardous gas or hazardous dust locations.



■ Ordering information

Specify the following:

1. Ordering code
2. Overload relay setting range code
3. Operating coil voltage code
4. Method of wiring works and size of conduit pipe
5. Type and density of gas



■ **Types and ratings:** See page 01/25. Same as standard enclosed type.

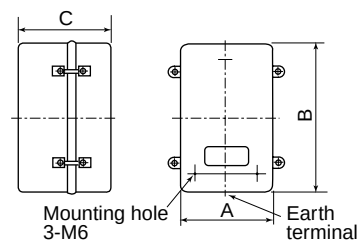
■ **Performance data:** Same as standard type. See page 01/22.

■ **Ratings of coil and auxiliary contact:** See pages 01/20, 22 and 23.

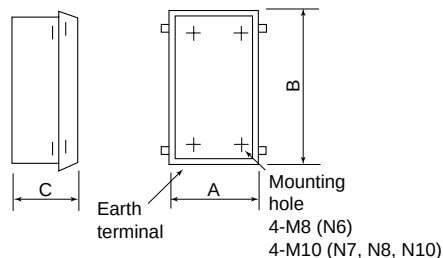
■ **Thermal overload relay:** See page 01/88.

■ Dimensions, mm

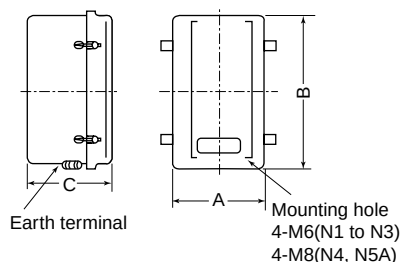
SW-03LG to SW-5-1LG



SW-N6LG to N10LG



SW-N1LG to SW-N5ALG



Dimensions for reference only. Confirm before construction begins.

■ Application for special atmosphere

Description	Standard type	Dust-tight/light corrosion res. (lg)
Dust-tight	—	○
Moisture-proof	○	○
Drip-proof	—	—
Splashing-proof	—	○
Rain-proof	—	—
Corrosion-resistant		
Light	○	○
Medium	—	○
Hazardous locations	—	—
Gas-tight	—	—

Note: ○ : Available
— : Not available

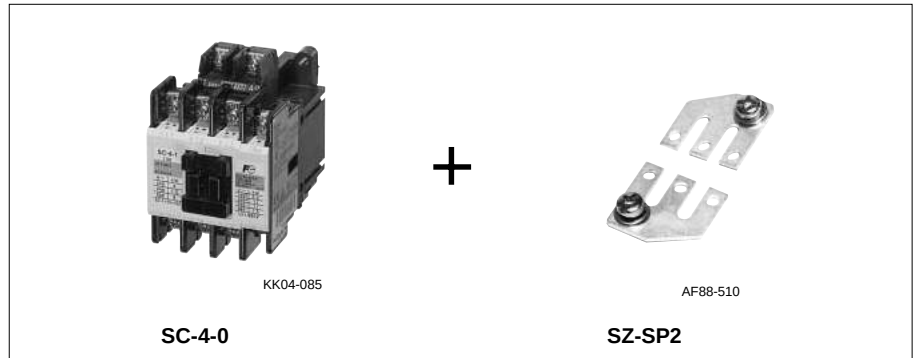
Type	Ordering code	Aux. contact	A	B	C	Mass (kg)
SW-03LG/3H	SC11LAN-■10T□D	1NO	120	195	117	1.4
SW-0LG/3H	SC13LAN-■10T□D	1NO	120	195	117	1.4
SW-05LG/3H	SC14LAN-■11T□D	1NO + 1NC	120	195	117	1.4
SW-4-0LG/3H	SC18LAN-■10T□D	1NO	120	195	117	1.5
SW-4-1LG/3H	SC19LAN-■10T□D	1NO	120	195	117	1.5
SW-5-1LG/3H	SC20LAN-■11T□D	1NO + 1NC	120	195	117	1.5
SW-N1LG/3H	SC25BLAN-■22T□D	2NO + 2NC	145	246	135	2.0
SW-N2LG/3H	SC35BLAN-■22T□D	2NO + 2NC	145	246	135	2.0
SW-N2SLG/3H	SC50BLAN-■22T□D	2NO + 2NC	175	320	145	3.1
SW-N3LG/3H	SC65BLAN-■22T□D	2NO + 2NC	175	320	145	3.1
SW-N4LG/3H	SC80BLAN-■22T□D	2NO + 2NC	200	400	160	4.5
SW-N5ALG/3H	SC93CLAN-■22T□D	2NO + 2NC	200	400	160	4.5
SW-N6LG/3H	SC1CBLAN-■22T□D	2NO + 2NC	225	450	180	8.5
SW-N7LG/3H	SC1FBLAN-■22T□D	2NO + 2NC	280	588	210	12.3
SW-N8LG/3H	SC1JBLAN-■22T□D	2NO + 2NC	335	698	225	18.1
SW-N10LG/3H	SC2CBLAN-■22T□D	2NO + 2NC	335	698	225	18.8

■ : Coil voltage code □ : Thermal overload relay ampere setting range code

Resistance load magnetic contactors

Description

These single pole contactors are for exclusively resistive load use. They are provided with large and sturdy parallel plate terminals attached to the 3-pole standard contactors to make them suitable for large current ratings. Typical applications are for industrial heating controls, PVA processing, solution vats, electric resistance furnaces, heat treatment facilities, drying kilns, farming, marine farming, lighting and similar purposes.



Ordering information

Specify the following:

1. Ordering code
2. Operating coil voltage code

3. State clearly "with parallel plate terminals for attaching to contactor".
4. Application and rated load current

Types and ratings

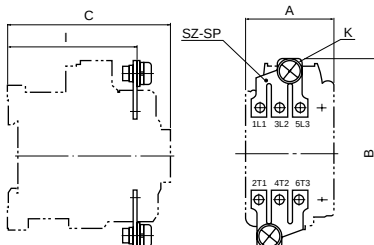
Operational current (A) 110V/220V	Auxiliary contact NO NC	Making and breaking current	Operating cycles per hour	Life expectancy (operations) Electrical Mechanical	Contactor Type	Ordering code	3-pole parallel terminal plate Type	Ordering code
25	1 —	1.5 × Ie	150	500,000 10 millions	SC-03	SC11AA-■10	SZ-SP1	SZ1SP1
30	1 —	1.5 × Ie	150	500,000 10 millions	SC-0	SC13AA-■10	SZ-SP1	SZ1SP1
30	1 1	1.5 × Ie	150	500,000 10 millions	SC-05	SC14AA-■11	SZ-SP1	SZ1SP1
40	1 —	1.5 × Ie	150	500,000 10 millions	SC-4-0	SC18AA-■10	SZ-SP2	SZ1SP2
50	1 —	1.5 × Ie	150	500,000 10 millions	SC-4-1	SC19AA-■10	SZ-SP2	SZ1SP2
50	1 1	1.5 × Ie	150	500,000 10 millions	SC-5-1	SC20AA-■11	SZ-SP2	SZ1SP2
50	2 2	1.5 × Ie	150	500,000 10 millions	SC-5-1	SC20AA-■22	SZ-SP2	SZ1SP2
100	2 2	1.5 × Ie	150	500,000 5 millions	SC-N1	SC25BAA-■22	SZ-SP3	SZ2SP3
125	2 2	1.5 × Ie	150	500,000 5 millions	SC-N2	SC35BAA-■22	SZ-SP3	SZ2SP3
200	2 2	1.5 × Ie	150	250,000 5 millions	SC-N2S	SC50BAA-■22	SZ-SP4	SZ2SP4
250	2 2	1.5 × Ie	150	250,000 5 millions	SC-N3	SC65BAA-■22	SZ-SP4	SZ2SP4
315	2 2	1.5 × Ie	150	250,000 5 millions	SC-N4	SC80BAA-■22	SZ-SP5	SZ2SP5
400	2 2	1.5 × Ie	150	250,000 5 millions	SC-N5A	SC93CAA-■22	SZ-SP5	SZ2SP5
400	2 2	1.5 × Ie	150	250,000 5 millions	SC-N6	SC1CBAA-■22	SZ-SP6	SZ2SP6
500	2 2	1.5 × Ie	150	250,000 5 millions	SC-N7	SC1FBAA-■22	SZ-SP7	SZ2SP7
630	2 2	1.5 × Ie	150	250,000 5 millions	SC-N8	SC1JBAA-■22	SZ-SP8	SZ2SP8
710	2 2	1.5 × Ie	150	250,000 5 millions	SC-N10	SC2ABAA-■22	SZ-SP8	SZ2SP8
900	2 2	1.5 × Ie	150	250,000 5 millions	SC-N11	SC3ABAA-■22	SZ-SP9	SZ2SP9
1000	2 2	1.5 × Ie	150	250,000 5 millions	SC-N12	SC4ABAA-■22	SZ-SP9	SZ2SP9
1600	2 2	1.5 × Ie	150	250,000 5 millions	SC-N14	SC6ABAA-■22	SZ-SP10	SZ2SP10
2100	2 2	1.5 × Ie	150	100,000 2,500,000	SC-N16	SC8ABAA-■22	SZ-SP11	SZ2SP11

Notes: 1. ■: Coil voltage code, see page 01/27

2. Ie: Rated operational current. Conforming to Class AC-1, IEC60947-4-1.

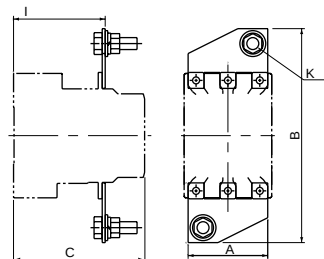
Dimensions, mm

SC-03 + SZ-SP1 to SC-5-1 + SZ-SP2



Type	A	B	C	I	K	Mass (g) *
SC-03+SZ-SP1	43	90	80	63	M6	25
SC-0+SZ-SP1	43	90	80	63	M6	25
SC-05+SZ-SP1	53	90	80	63	M6	25
SC-4-0+SZ-SP2	53	100	81	63	M6	35
SC-4-1+SZ-SP2	53	100	81	63	M6	35
SC-5-1+SZ-SP2	64	100	81	63	M6	35
1NO•1NC	64	100	109	63	M6	35
2NO•2NC	64	100	109	63	M6	35
SC-N1, N2+SZ-SP3	74	132	96	64	M8	110
SC-N2S, N3+SZ-SP4	88	174	111	75.5	M10	200
SC-N4+SZ-SP4	88	215	117	77	M12	320

SC-N1+SZ-SP3 to SC-N16+SZ-SP11



Type	A	B	C	I	K	Mass (g) *
SC-N5A+SZ-SP4	88	215	132	92	M12	320
SC-N6+SZ-SP6	100	300	138	98	M12×2	760
SC-N7+SZ-SP7	115	312	140	98	M12×2	800
SC-N8, N10+SZ-SP8	138	371	174	120	M12×2	1300
SC-N11, N12+SZ-SP9	153	420	195	135	M12×4	3000
SC-N14+SZ-SP10	290	525	328	246	M12×4	4400
SC-N16+SZ-SP11	290	525	328	246	M12×4	5900

*Mass: 3-pole parallel terminal plate only

Magnetic Contuctors

SC series

With single button auxiliary contact

Magnetic contactors with single button auxiliary contact

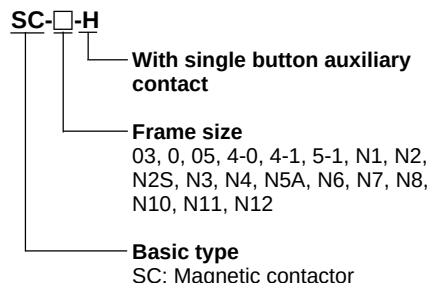
■ Description

The SC-03H to N12H contactors are improved versions of the standard SC-03 to SC-N12 contactors. The improvement consists of changing the auxiliary contact from a bifurcated to a single button type contact. This change increases the auxiliary contact rating.

The specifications, including the main contact rating and the expected electrical service life, are similar to that of the SC-03 to N12 types.

The options for the SC series, such as the coil surge suppressor and mechanical interlock can also be used.

■ Type number nomenclature



■ Performance data

Same as standard types

■ Ordering information

Specify the following:

1. Ordering code
2. Operating coil voltage code
3. Auxiliary contact arrangement code.



■ Coil voltage

Same as standard type, See page 01/22

■ Ratings (Conforming to AC-3, IEC 60947-4-1)

Type	Ordering code	Max. motor capacity (kW)				Rated operational current (A)				Rated thermal current (A)	Auxiliary contact
		3-phase 200V 240V	380V 440V	500V 550V	600V 660V	3-phase 200V 240V	380V 440V	500V 550V	600V 660V		
SC-03H	SC11AH-■10	2.5	4	4	4	11	9	7	5	20	1NO
SC-0H	SC13AH-■10	3.5	5.5	5.5	5.5	13	12	9	7	20	1NO
SC-05H	SC14AH-■11	3.5	5.5	5.5	5.5	13	12	9	7	20	1NO+1NC
SC-4-0H	SC18AH-■10	4.5	7.5	7.5	7.5	18	16	13	9	25	1NO
SC-4-1H	SC19AH-■10	5.5	11	11	7.5	22	22	17	9	32	1NO
SC-5-1H	SC20AH-■11	5.5	11	11	7.5	22	22	17	9	32	1NO+1NC
SC-5-1H	SC20AH-■22	5.5	11	11	7.5	22	22	17	9	32	2NO+2NC *
SC-N1H	SC25BAH-■11	7.5	15	15	11	32	32	24	15	50	2NO+2NC
SC-N2H	SC35BAH-■11	11	18.5	18.5	15	40	40	29	19	60	2NO+2NC
SC-N2SH	SC50BAH-■11	15	22	25	22	50	50	38	26	80	2NO+2NC
SC-N3H	SC65BAH-■11	18.5	30	37	30	65	65	60	38	100	2NO+2NC
SC-N4H	SC80BAH-■11	22	40	37	37	80	80	60	44	135	2NO+2NC
SC-N5AH	SC93CAH-■11	30	55	55	55	105	105	85	64	150	2NO+2NC
SC-N6H	SC1CBAH-■11	37	60	60	60	125	125	90	72	150	2NO+2NC
SC-N7H	SC1FBAH-■11	45	75	75	90	150	150	120	103	200	2NO+2NC
SC-N8H	SC1JBAH-■11	55	90	130	132	180	180	180	150	260	2NO+2NC
SC-N10H	SC2CBAH-■11	65	110	132	132	220	220	200	150	260	2NO+2NC
SC-N11H	SC3ABAH-■11	90	160	160	200	300	300	230	230	350	2NO+2NC
SC-N12H	SC4ABAH-■22	120	220	250	300	400	400	360	360	360	2NO+2NC

Notes: Enter the coil voltage code in the ■ mark

* With auxiliary contact block SZ-A11 (1NO+1NC)

■ Auxiliary contact ratings (Conforming to IEC 60947-5-1)

Type	Continuous current (A)	Make/break current (AC, A)	Rated operational current (A)			DC Voltage (V)	DC-13 (Ind. load)	DC-12 (Res. load)
			AC Voltage (V)	AC-15 (Ind. load)	AC-12 (Res. load)			
SC-03H to SC5-1H	10	60	100–120 200–240	6	10	24 48	5 1.5	10 5
		40	380–440 500–550	4	10	110 220	0.7 0.27	4 1
SC-N1H to SC-N12H	10	60	100–120 200–240	6	10	24 48	10 3	10 5
		40	380–440	4	10	110	1.5	2.5
		25	500–600	2.5	10	220	0.5	1

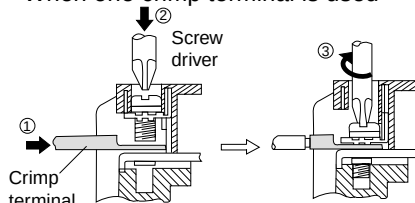
Contactors and starters with quick connection terminals

■ Feature

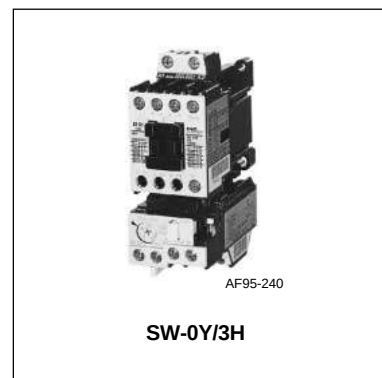
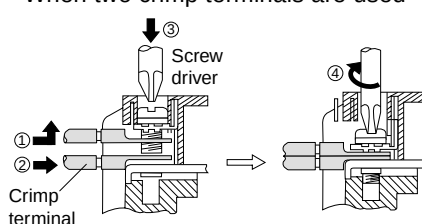
- Easy wiring
Wiring time is at least 50% shorter than previous type.
- Safety
The finger protection feature protects the charging current part during maintenance and check (complying with EN60947-4-1, and IEC60947-4-1)
- International use
The product and terminal structure comply with international safety standards.
It complies with VGB4, DIN57106, VDE0106, and VDE Teil 100 which are recommendation for preventing the exposure of charging current part.

Quick connection terminal

- When one crimp terminal is used



- When two crimp terminals are used



■ Types and rating

Max. motor capacity (kW)		Rated operational current (A)				Rated thermal current (A)	Auxiliary contact arrangement	Contactor	Starter
3-phase AC-3		3-phase motor AC-3		Resistive load AC-1				Type	3-element Type
200V	380V	200V	380V	200V	380V				
240V	440V	240V	440V	240V	440V				
2.5	4	11	9	20	20	20	1NO 1NC	SC-03Y10 SC-03Y01	SW-03Y/3H10 SW-03Y/3H01
3.5	5.5	13	12	20	20	20	1NO 1NC	SC-0Y10 SC-0Y01	SW-0Y/3H10 SW-0Y/3H01
3.5	5.5	13	12	20	20	20	2NO 1NO,1NC 2NC	SC-05Y20 SC-05Y11 SC-05Y02	SW-05Y/3H20 SW-05Y/3H11 SW-05Y/3H02
5.5	11	22	22	32	32	32	2NO 1NO,1NC 2NC	SC-5-1Y20 SC-5-1Y11 SC-5-1Y02	SW-5-1Y/3H20 SW-5-1Y/3H11 SW-5-1Y/3H02

■ Ordering information

Specify the following:

1. Type number
2. Coil voltage (Contactor only)
3. Main circuit voltage (Starter only)
4. Thermal overload setting range code (Starter only)

See page 01/19.

■ Dimensions and panel drilling

Same as the standard types

■ Mass

Same as the standard types

■ Optional unit

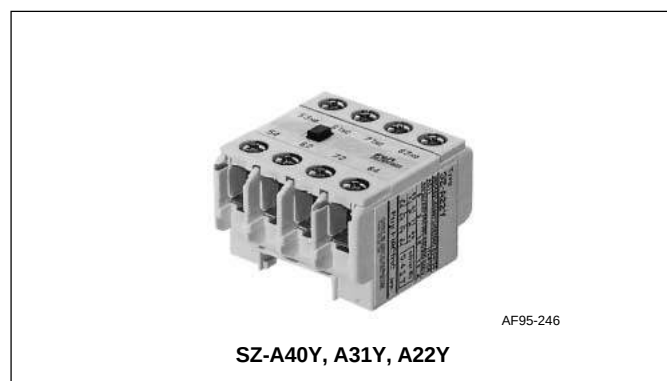
Auxiliary contact blocks with quick connection terminals

Mounting	Thermal current (A)	Contact arrangement	Type
Front mounting	10	4NO 3NO+1NC 2NO+2NC	SZ-A40Y SZ-A31Y SZ-A22Y
		2NO 1NO+1NC 2NO	SZ-A20Y SZ-A11Y SZ-A02Y

● Dimensions and contact arrangement diagrams

Same as the standard type auxiliary contact blocks.

See page 01/69.



Magnetic Contactors and Starters

SC and SW series

Optional unit

■ Optional unit

Optional unit	Description	Type	Used with	Further information
Auxiliary contact block	Front mounting (Bifurcated) 4NO 3NO+1NC 2NO+2NC 2NO 1NO+1NC 2NC 2NO+2NC (Overlapping) 1NO+1NC (Overlapping)	SZ-A40 SZ-A31 SZ-A22 SZ-A20 SZ-A11 SZ-A02 SZ-A222 SZ-A111	SC-03 to N3	Page 01/69
	Front mounting (Single button) 4NO 3NO+1NC 2NO+2NC	SZ-A40H SZ-A31H SZ-A22H	SC-03 to N3	
	Side mounting (Bifurcated) 1NO+1NC Side mounting (Single button) 1NO+1NC 1NO+1NC 1NO+1NC 1NO+1NC	SZ-AS1 SZ-AS2 SZ-AS1H SZ-AS2H SZ-AS3H	SC-03 to N3 SC-N4 to N12 SC-03 to N3 SC-N4 to N12 SC-N14, N16	
Auxiliary contact block with quick connection terminals	4NO 3NO+1NC 2NO+2NC	SZ-A40Y SZ-A31Y SZ-A22Y	SC-03Y, 0Y, 05Y, 5-1Y	Page 01/65
	2NO 1NO+1NC 2NC	SZ-A20Y SZ-A11Y SZ-A02Y		
Operation counter unit	Without alarm contact	SZ-J	SC-03 to N3	Page 01/74
	With alarm contact At 1 million operations At 2 million operations At 3 million operations At 4 million operations At 5 million operations At 6 million operations At 7 million operations At 8 million operations	SZ-J1 SZ-J2 SZ-J3 SZ-J4 SZ-J5 SZ-J6 SZ-J7 SZ-J8	SC-03 to 5-1	
Main circuit surge suppression unit	Front mounting	SZ-ZM1 SZ-ZM3	SC-03 to 5-1 SC-N1 to N3	Page 01/72
	Side mounting	SZ-ZM2 SZ-ZM4	SC-03 to 5-1 SC-N1 to N3	
Mechanical interlock unit		SZ-RM	SC-03 to N3	Page 01/73
Power connection kit for reversing		SZ-RW1 SZ-RW2 SZ-RW3 SZ-RW4 SZ-RW5 SZ-RW6	SC-03, 0 SC-05 SC-4-0, 4-1 SC-5-1 SC-N1, N2 SC-N2S, N3	Page 01/73
Coil drive unit for IC output	Relay type Top mounting	SZ-CD1 SZ-CD3	SC-03 to 5-1 SC-N1 to N3	Page 01/70
	Left-side mounting	SZ-CD5	SC-N4 to N12	
	SSR type Top mounting	SZ-03/CD2-24 SZ-CD4	SC-03 to 5-1 SC-N1 to N3	
	Left-side mounting	SZ-CD6A	SC-N4 to N12	
3-pole parallel plate terminal	(2 pcs/set)	SZ-SP1 SZ-SP2 SZ-SP3 SZ-SP4 SZ-SP5	SC-03, 0, 05 SC-4-0, 4-1, 5-1 SC-N1, N2 SC-N2S, N3 SC-N4, N5A	Page 01/63

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Magnetic Contactors and Starters

SC and SW series

Optional unit

Optional unit	Description	Type	Used with	Further information
Terminal cover	For thermal overload relay	SZ-T10 SZ-T11 SZ-T12 SZ-T13 SZ-T14 SZ-T15 SZ-RN6T SZ-T16 SZ-T17	SZ-HB SZ-HC TR-0N/3, TK-0N TR-5-1N/3, TK-5-1N TR-N2H/3, TK-N2H TR-N3H/3, TK-N3H TR-N6H/3, TKN6H TR-N2/3, TK-N2 TR-N3/3, TK-N3	Page 01/75
	For auxiliary contact block For 4-pole front mount For 2-pole front mount For 1-pole front mount	SZ-T5 SZ-T6 SZ-T7	SZ-A40, A31, A22, A222 SZ-A20, A11, A02, A111 SZ-AS1, AS2	
Insulation barrier	For contactor	SZ-B1	SC(SW)-N4 to N7, TR(TK)-N6H	Page 01/76
		SZ-B2	SC(SW)-N8 to N12, TR(TK)N10H/3 to N12H/3	
Off-delay release unit	100V AC 50/60Hz 110V AC 50/60Hz 200V AC 50/60Hz 220V AC 50/60Hz	SZ-DE100 SZ-DE110 SZ-DE200 SZ-DE220	SC-03/G to 5-1/G	Page 01/46
	100-110V AC, 50/60Hz	SZ-N1/GDE SZ-N2S/GDE SZ-N5/DE SZ-N6/DE SZ-N8/DE SZ-N11/DE SZ-N14/DE	SC-N1/G, N2/G SC-N2S/G, N3/G SC-N4/SE, N5 SC-N6, N7 SC-N8, N10 SC-N11, N12 SC-N14	
	200-220V AC, 50/60Hz	SZ-N1/GDE SZ-N2S/GDE SZ-N5/DE SZ-N6/DE SZ-N8/DE SZ-N11/DE	SC-N1/G, N2/G SC-N2S/G, N3/G SC-N4/SE, N5 SC-N6, N7 SC-N8, N10 SC-N11, N12	
Live-section cover	For contactor	SZ-JC1 SZ-JC2 SZ-JC3 SZ-JC4 SZ-N1J SZ-N2SJ	SC-03, 0 SC-05 SC-4-0, 4-1 SC-5-1 SC-N1, N2 SC-N2S, N3	Page 01/77
		SZ-N4J SZ-N6J SZ-N7J SZ-N8J SZ-N11J	SC-N4, N5A SC-N6 SC-N7 SC-N8, N10 SC-N11, N12	
	For starter	SZ-JW1 SZ-JW2 SZ-JW3 SZ-JW4 SZ-WN1J SZ-WN2SJ	SW-03/3H, 0/3H SW-05/3H SW-4-0/3H, 4-1/3H SW-5-1/3H SW-N1/3H, N2/3H SW-N2S/3H, N3/3H	
		SZ-WN4J SZ-WN6J SZ-WN7J SZ-WN8J SZ-WN10J SZ-WN11J	SW-N4/3H, N5A/3H SW-N6/3H SW-N7/3H SW-N8/3H SW-N10/3H SW-N11/3H, N12/3H	
	For reversing starter	SZ-WN4RJ SZ-WN6RJ SZ-WN7RJ SZ-WN8RJ SZ-WN10RJ SZ-WN11RJ	SW-N4RM, N5ARM SW-N6RM SW-N7RM SW-N8RM SW-N10RM SW-N11RM, N12RM	

Auxiliary contact blocks SZ-A

■ Features

- Easy attaching of auxiliary contact block
This contact block can be attached to magnetic motor starter and contactor with a snap-on fitting. Auxiliary contacts can be added easily at site. When a front mounting block is used, there is no need to enlarge contactor installation space. This helps to make the control panel smaller.
- Bifurcated contact is standard
High reliable bifurcated contact makes it possible to input directly to electronic control circuits like programmable logic controllers.
- Auxiliary contact block with single button contacts is also available.
- Terminal number conforms to IEC standard

■ Standards

Except overlap and single button contact type



■ Performance

Operating frequency: 1800 times/hour
Mechanical durability: 10 million operations
Electrical durability:
500,000 operations (at 220V AC-15)

Type	Contact arrangement
Front mounting	
SZ-A40, A40H	4NO
SZ-A31, A31H	3NO+1NC
SZ-A22, A22H	2NO+2NC
SZ-A20	2NO
SZ-A11	1NO+1NC
SZ-A02	2NC
SZ-A111	1NO+1NC (Overlapping)
SZ-A222	2NO+2NC (Overlapping)
Side mounting	
SZ-AS1, AS1H	1NO+1NC
SZ-AS2, AS2H	1NO+1NC
SZ-AS3H	1NO+1NC

■ Caution on use

1. Front mounting auxiliary contact block and side mounting block cannot be attached to one contactor at the same time.
2. Only one front mounting block can be attached to one contactor.
3. Where mechanical latch unit is already attached, only side mounting auxiliary contact block can be attached.
4. Where interlock unit is already attached, side mounting auxiliary contact block can be attached on one side only.



■ Ratings

Type	Thermal current (A)	Make/break current (A)	Rated operational current (A)*2			Minimum voltage/current
			AC Voltage	Ind. load (AC-15)	Res. load (AC-12)	
SZ-A□	10	60 (60)	110V	6 (6)	10 (10)	5V DC
SZ-AS1		30 (60)	220V	3 (6)	8 (10)	3 mA
SZ-AS2		15 (40)	440V	1.5 (4)	5 (10)	(24 V DC 10mA)
SZ-A□H		12 (25)	550V	1.2 (2.5)	5 (10)	
SZ-AS1H						
SZ-AS2H						
SZ-AS3H						

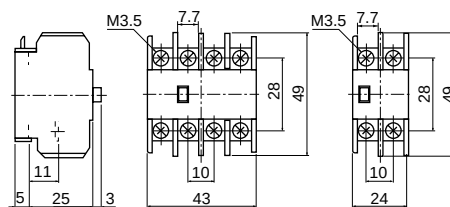
Note: *1 Enter the contact arrangement code in the □ mark.

*2 DC ratings: Same as the auxiliary contact ratings of standard type contactors or contactors with single button contacts.

• () : In case of SZ-A□H (single button contact)

■ Dimensions, mm

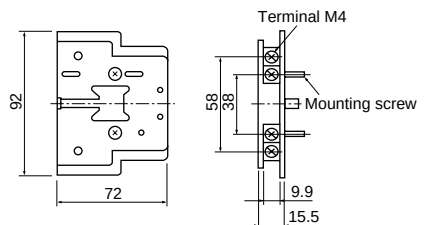
SZ-A40, A40H, A31, A31H, A22, A22H, A222
SZ-A20, A11, A02, A111



Mass: 36g

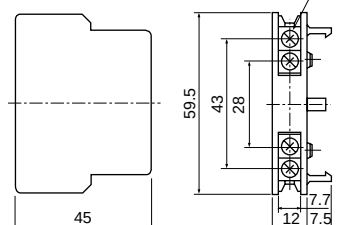
Mass: 20g

SZ-AS3H



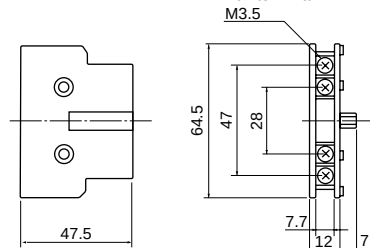
Mass: 75g

SZ-AS1, AS1H



Mass: 28kg

SZ-AS2, AS2H



Mass: 33kg

■ Contact arrangement

SZ-A40, A40H	SZ-A20	SZ-AS1, AS2, AS1H, AS2H, AS3H
4NO	2NO	1NO+1NC
53 63 73 83 54 64 74 84	53 63 54 64	53 61 54 62 In case of left side mounting
SZ-A31, A31H	SZ-A11	
3NO+1NC	1NO+1NC	
53 61 73 83 54 62 74 84	53 61 54 62	
SZ-A22, A22H	SZ-A02	SZ-AS1, AS2, AS1H, AS2H, AS3H
2NO+2NC	2NC	1NO+1NC
53 61 71 83 54 62 72 84	51 61 52 62	71 83 72 84
SZ-A222	SZ-A111	
2NO+2NC	1NO+1NC	In case of right side mounting
57 65 75 87 58 66 76 88	57 65 58 66	

Magnetic Contactors and Starters
SC and SW series
Optional unit

Coil drive units for IC output SZ-CD

This unit is designed to carry out ON-OFF control for contactors with output (24V DC) from the electronic controller. It can be attached to a side or top of a contactor, thus saving on installation space.

■ Features

- This unit operates at, 24V DC.
- Module type allows easy attachment and removal.
- SZ-CD5 and -CD6 can be installed individually and rail mounted.
- Surge suppression function (except SZ-CD5)
- This unit has a built-in surge suppression device (varistor) to protect electronic equipment from surges which occur when the coil is de-energized.

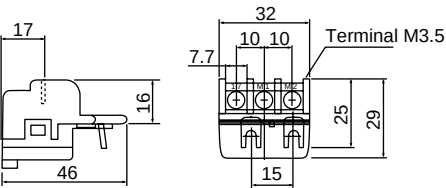
Type		Used with
SZ-CD1 SZ-CD3 SZ-CD5	With relay output	SC-03 to 5-1 SC-N1 to N3 SC-N4 to N12
SZ-03/CD2-24 SZ-CD4 SZ-CD6	With SSR output	SC-03 to 5-1 SC-N1 to N3 SC-N4to N12

■ Specifications

Description		SZ-CD1	SZ-CD3, CD5	SZ-03/CD2-24,CD4,CD6
Coil	Rated voltage	24V DC	24V DC	24V DC
	Pick-up voltage (at 20°C)	85% or less of rated voltage	85% or less of rated voltage	70% or less of rated voltage
	Drop-out voltage (at 20°C)	Over 5% of rated voltage	Over 5% of rated voltage	Over 5% of rated voltage
	Max. allowable voltage	130% or less of rated voltage	130% or less of rated voltage	110% or less of rated voltage
	Power consumption	0.2W(8.3mA)	0.2W(8.3mA)	0.36W(15mA)
Contact	Output device	Relay output	Relay output	SSR output
	Max. make/break voltage	250V AC, 110V DC	250V AC	100-240V AC
	Operating time(ms)	2-5	2-5(SZ-CD5: 3-6)	1 or less

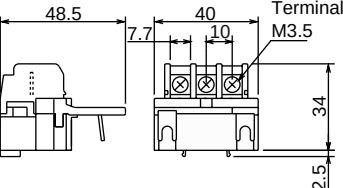
■ Dimensions, mm

SZ-CD1,03/CD2-24 (Top mount)



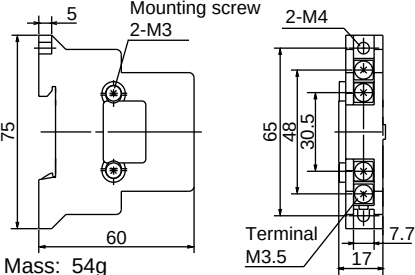
Mass: 26g

SZ-CD3,CD4 (Top mount)



Mass: 28g

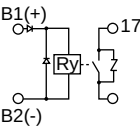
SZ-CD5,CD6 (Side mount)



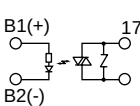
Mass: 54g

■ Wiring diagrams

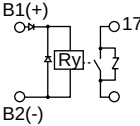
SZ-CD1



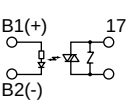
SZ-03/CD2-24



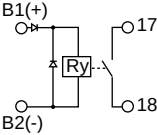
SZ-CD3



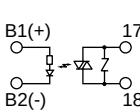
SZ-CD4



SZ-CD5



SZ-CD6



Coil surge suppression units SZ-Z

■ Description

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

Varistor types cut the peak value of surge voltages and CR types suppress rapid increases of surge voltage.

Standard type contactors SC-N6 to N16 are provided with surge suppression devices.

Coil surge suppression unit (for SC-03 to 5-1, SC-N1 to N5A)

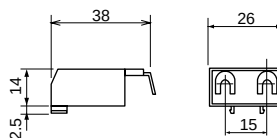
Type	Device	Coil voltage	Used with
SZ-Z1	Varistor	24–48V AC/DC	SC-03 to 5-1 SC-03/G to 5-1/G
SZ-Z2	Varistor	100–250V AC/DC	
SZ-Z3	Varistor	380–440V AC	
SZ-Z4	CR	24–48V AC/DC	
SZ-Z5	CR	100–250V AC/DC	
SZ-Z6 *	Varistor	24–48V AC/DC	
SZ-Z7 *	Varistor	100–250V AC/DC	SC-N1 to N3 SC-N1/G to N3/G
SZ-Z8 *	CR	24–48V AC/DC	
SZ-Z9 *	CR	100–250V AC/DC	
SZ-Z31	Varistor	24–48V AC/DC	
SZ-Z32	Varistor	100–250V AC/DC	
SZ-Z33	Varistor	380–440V AC	
SZ-Z34	CR	24–48V AC	SC-N1 to N3
SZ-Z35	CR	100–250V AC	
SZ-Z36	CR	24–48V DC	SC-N1/G to N3/G
SZ-Z37	CR	100–250V DC	
SZ-Z41	Varistor	24–48V AC/DC	SC-N4, N5A SC-N4/G, N5/G
SZ-Z42	Varistor	100–250V AC/DC	
SZ-Z43	Varistor	380–440V AC	SC-N4, N5A
SZ-Z44	CR	24–48V AC	
SZ-Z45	CR	100–250V AC	
SZ-Z46	CR	24–48V DC	SC-N4/G, N5/G

Note: * With LED operating indicator



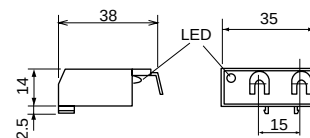
■ Dimensions, mm

SZ-Z1 to Z5 SZ-Z24, Z25



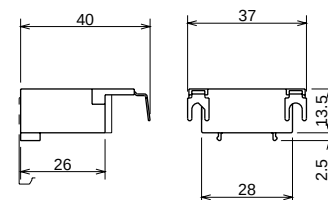
Mass: 14g

SZ-Z6 to Z9



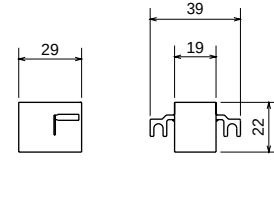
Mass: 16g

SZ-Z31 to Z37



Mass: 15g

SZ-Z41 to Z46



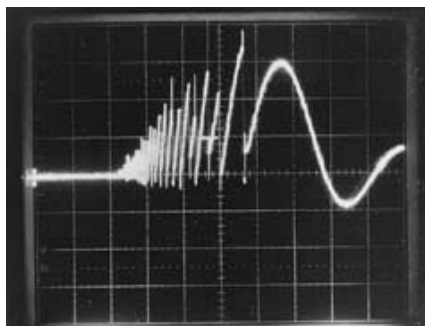
Mass: 15g

■ Characteristics(coil rated 200V AC)

● Without coil surge suppression unit

When current through a coil is interrupted, the sudden change of coil current, induces an abrupt surge voltage due to the coil inductance. The surge voltage sometimes produces noise which can damage or cause adjacent electronic devices to malfunction.

SC-0 (0.1msec/div, 1000V/div)
200V AC coil

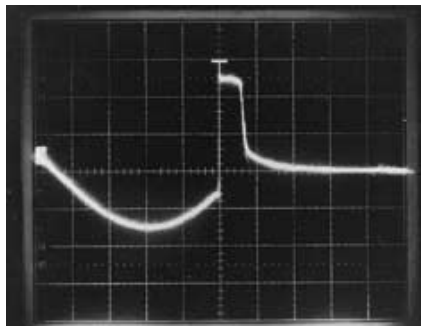


CP-487

● With coil surge suppression unit Varistor type

A surge voltage that exceeds a certain value causes a current to flow through the varistor connected in parallel with the coil, thereby suppressing peaks of the surge voltage. This surge suppression unit can be used in both AC and DC circuits.

SC-0+SZ-Z2 (2msec/div, 200V/div)
200V AC coil



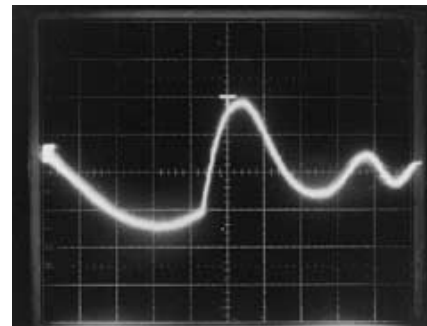
CP-489

● With coil surge suppression unit CR type

A CR (Capacitor-resistor) circuit connected in parallel with the coil suppresses the abrupt increase of surge voltage (dv/dt characteristics) by lowering the surge voltage oscillation frequency.

This surge suppression unit can be used in both AC and DC circuits.

SC-0+SZ-Z5 (2msec/div, 200V/div)
200V AC coil



CP-488

Magnetic Contactors and Starters
SC and SW series
Optional unit

Main circuit surge suppression units SZ-ZM

■ Description

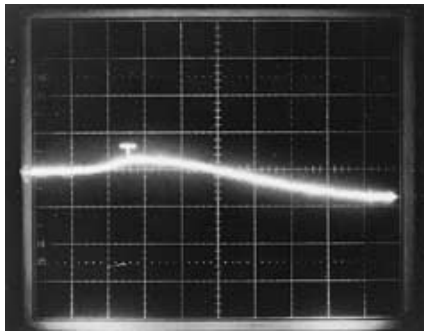
This unit consists of delta connected capacitor (C) and resistor (R).
When contactor is energized or de-energized, a surge voltage is generated from motor circuit. This unit suppresses this surge voltage and protects electronic equipment from malfunction or damage.
Space saving, front mounting type (SZ-ZM1) and side mounting type (SZ-ZM2), which allows simultaneous use of other front mounting optional unit.

Type	Mounting	Voltage	CR constant	Used with
SZ-ZM1	Front	250V AC	C=0.22μF	SC-03 to
SZ-ZM2	Side	50/60Hz	R=100Ω	SC-5-1
SZ-ZM3	Front	250V AC	C=0.33μF	SC-N1 to
SZ-ZM4	Side	50/60Hz	R=47Ω	SC-N3

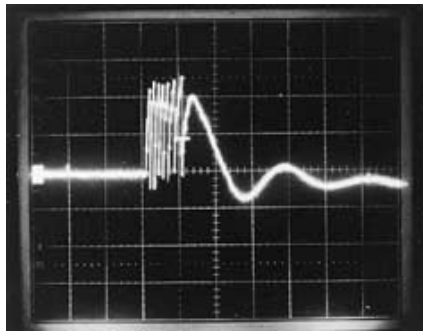
Note: SZ-ZM1 is not applicable to SC-5-1 with auxiliary contact 2NO+2NC.

■ Characteristics

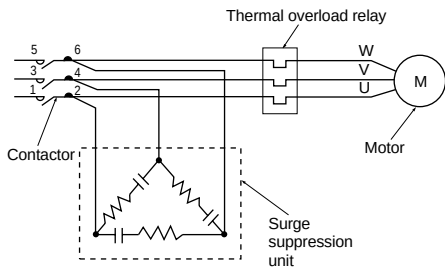
- (200V AC 2.2kW motor)
- With surge suppression unit (5μsec/div 200V/div)



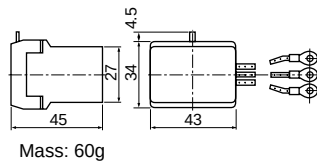
- Without surge suppression unit (5μsec/div 200V/div)



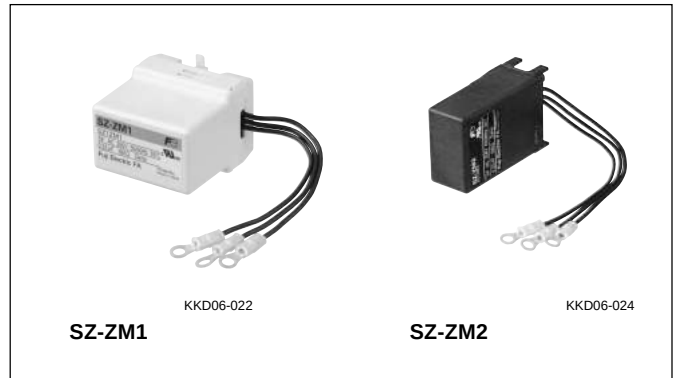
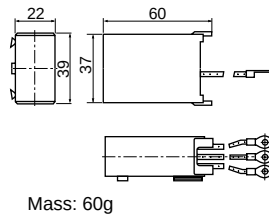
■ Wiring example



■ Dimensions, mm
SZ-ZM1, ZM3



SZ-ZM2, ZM4



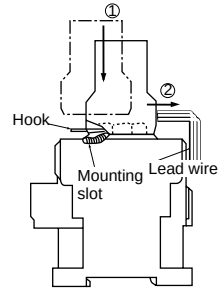
■ Performance

- Dielectric strength: 230% × Rated voltage, 1min. between terminals
2 × Rated voltage + 1,000V, between terminals and case
- Insulation resistance: 2,000MΩ or more
- Capacitance tolerance: ±10% or less at 1kHz

■ Mounting methods

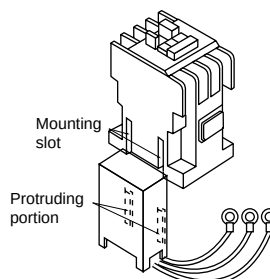
● Front mounting/SZ-ZM1, ZM3

Set the unit on the contactor and slide it in direction ②.
Make sure that the unit's hook is in the mounting slot.
To detach the unit, push up on the units's hook and move the unit in the reverse of direction ②.
Connect the 3 lead wires of the unit to the contactor's load side terminals 2, 4 and 6. Wires can be connected to any of the terminals 2, 4 or 6.



● Side mounting /SZ-ZM2, ZM4

Push the protruding portions of the unit into the mounting slots of the contactor. Connect the 3 lead wires of the unit to the contactor's load side terminals 2, 4 and 6. Wires can be connected to any of the terminals 2,4 or 6.



Mechanical interlock units and power connection kit for reversing

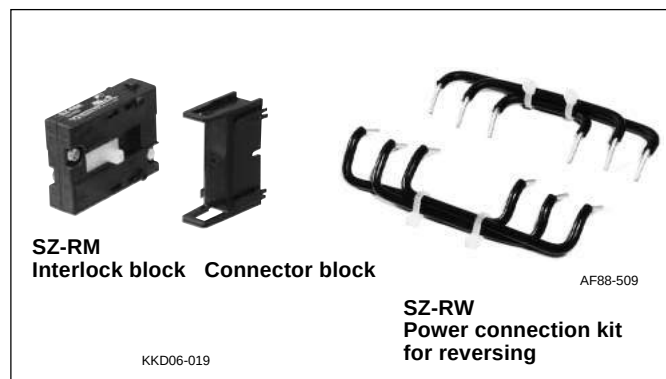
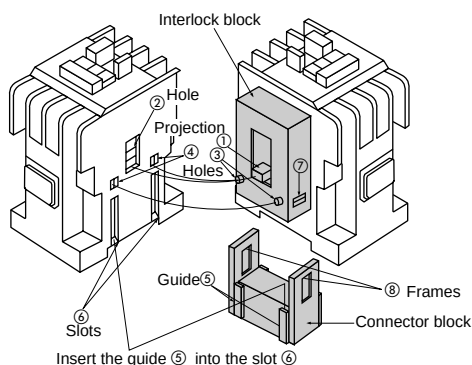
This SZ-RM unit consists of an interlock block, which mechanically prevents the simultaneous engagement of forward and reverse contactors, and a connector block. A reversing contactor can be easily assembled with this unit at site.

An interlock mechanism prevents the engagement of 2 contactors at the same time.

Interlock unit		Power connection kit for reversing		
Type	Used with	Type	Color	Used with
SZ-RM	SC-03 to N3	SZ-RW1	Blue	SC-03, SC-0
		SZ-RW2	Black	SC-05
		SZ-RW3	Yellow	SC-4-0, SC-4-1
		SZ-RW4	White	SC-5-1
		SZ-RW5	White	SC-N1, SC-N2
		SZ-RW6	White	SC-N2S, SC-N3

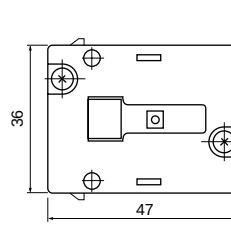
■ Mounting methods

1. Position an interlock block between two contactors so that the tall, square projections ① on the movable portions on either side of the interlock block fit into the square holes ② on the sides of the contactors. The short, round projections ③ on the sides of the interlock block should fit into the round holes ④ on the sides of the contactors.
2. Insert the guides ⑤ on the ends of the connector block into the slots ⑥ in the sides of the contactors and push the connector block in between the contactors until the frames ⑦ of the projecting windows on the ends of the connector block catch firmly on the hook-like projections ⑧ on the interlock block.
3. After connecting the contactors to each other, make sure that they operate smoothly by pressing down the movable manual operator one at a time.
4. To separate the contactors, insert the end of a flat-bladed screwdriver under the frame ⑦ of one of the projecting windows on the connector block and lift it up and over the hook-like projection ⑧ on the interlock block. While lifting up on the frame ⑦, push against the connector block to eject it from between the contactors.



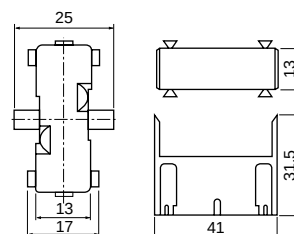
■ Dimensions, mm

Interlock block



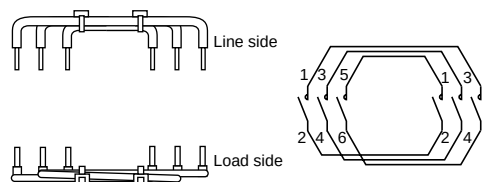
Mass: 18g

Connector block



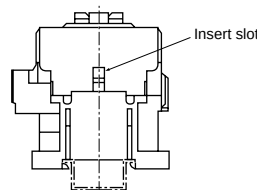
Mass: 4.2g

Power connection kit for reversing



Cautions on attaching interlock unit to SC-03 and SC-0

Insert the protruded portion of the interlock unit into the upper (not lower) part of two slots on the side of the contactor by pressing the manual operator of the contactor.



Magnetic Contactors and Starters

SC and SW series

Optional unit

Operation counter units for SC-03 to N3

■ Features

This unit counts the ON-OFF operation times of a contactor. The contact lifetime can be estimated at a glance. This operation counter unit is a mechanical type counter which can be easily attached to the SC series contactors (Frame size 03 to N3) with snap-on fittings. Before, the operation times of contactors were estimated from the operation status of other equipment. However, the operation times of contactors can be precisely counted and easily checked with this unit.

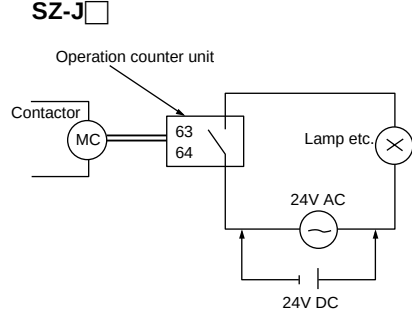
■ Specifications

Type	SZ-J	SZ-J□
Alarm output contact	Not provided	Provided
Number of digits	7 digits	
Counting method	The counter increments by one each time the contactor completes one ON-OFF operation	
Counting speed	Max. 10Hz	
Reset function (to 0)	Not provided	
Output contact		
Arrangement	—	1NO
Rating	—	24V AC/DC 100mA
Making current	—	Max. 0.4A
Mechanical durability	10 million operations	
Used with	SC-03 to SC-N3	SC-03 to SC-5-1

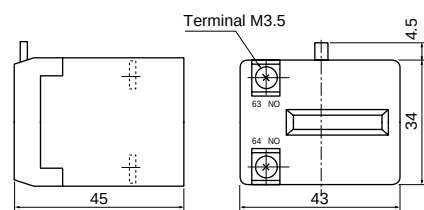
■ Types and output contact operation

Type	Preset operation value	
	ON	OFF
SZ-J	—	—
SZ-J1	1 million	3 million
SZ-J2	2 million	4 million
SZ-J3	3 million	5 million
SZ-J4	4 million	6 million
SZ-J5	5 million	7 million
SZ-J6	6 million	8 million
SZ-J7	7 million	9 million
SZ-J8	8 million	0

■ Wiring diagram (Example)

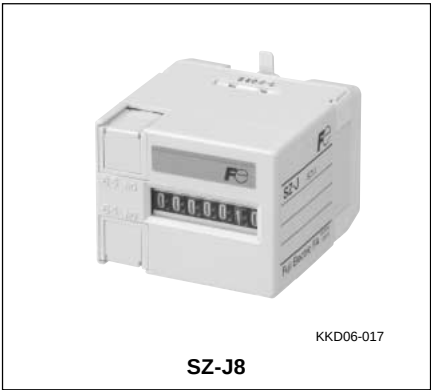


■ Dimensions, mm



Mass: SZ-J 35g
 SZ-J1 to J8 39g

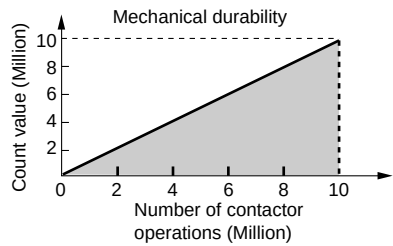
The date for periodical maintenance and contact lifetime can be estimated directly counting the operation times of contactors. So preventive maintenance of important facilities or plant become more effective. 2 types (without and with output contact type) are available. The first one only counts and display the operation times up to 9,999,999. The another type is an output contact type which outputs the alarm output with a built-in reed switch after counting and displaying specified operation times (fixed).



■ Operation

SZ-J

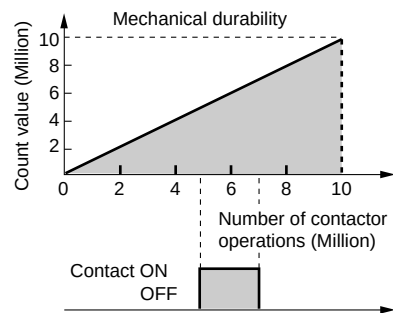
Without output contact



SZ-J□

With output contact

Example SZ-J5

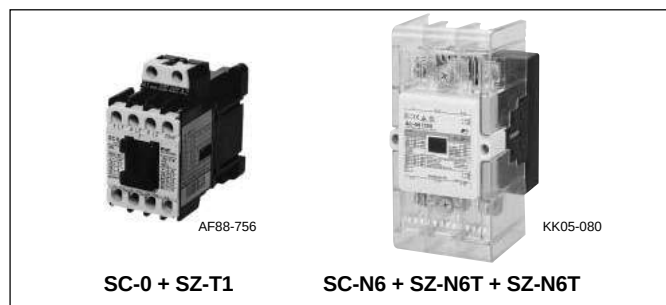


Note: The SZ-J□ operation counters (with alarm output contact) continue counting after an alarm is output. The alarm output is maintained for about 2 million operations.

Terminal covers

The SZ-T type terminal cover conforms to DIN 57106 and VDE 0106 Teil 100 requirements regarding worker safety. The cover increases safety during maintenance and inspection.

Description	Type	Used with
For contactor	SZ-T1	SC-03, 0, SH-4
	SZ-T2	SC-05, SH5
	SZ-T3	SC-4-0, 4-1
	SZ-T4	SC-5-1, SJ-1SG
	SZ-T22	SC-N1, N2
	SZ-T23	SC-N2S, N3
	SZ-N4T	SC-N4, N5A
	SZ-N6T	SC-N6
	SZ-N7T	SC-N7
	SZ-N8T	SC-N8, N10
	SZ-N11T	SC-N11, N12
For starter	SZ-T1 SZ-T12	SW-03/3H, 0/3H
	SZ-T2 SZ-T12	SW-05/3H
	SZ-T3 SZ-T13	SW-4-0/3H, 4-1/3H SJ-1SWG
	SZ-T4 SZ-T13	SW-5-1/3H
	SZ-T22 SZ-T16	SW-N1/3H, N2/3H
	SZ-T23 SZ-T17	SW-N2S/3H, N3/3H
	SZ-N4T SZ-WN4T	SW-N4/3H, N5A/3H
	SZ-N6T SZ-WN6T	SW-N6/3H
	SZ-N7T SZ-WN7T	SW-N7/3H
	SZ-N8T SZ-WN8T	SW-N8/3H
	SZ-N8T SZ-WN10T	SW-N10/3H
	SZ-N11T SZ-WN11T	SW-N11/3H, N12/3H
For auxiliary contact block	SZ-T5	SZ-A40, A31, A22, A222 SZ-A40H, A31H, A22H
	SZ-T6 SZ-T7	SZ-A20, A11, A02, A111 SZ-AS1, AS2 SZ-AS1H, AS2H, AS3H
For thermal overload relay on-contactor mounting	SZ-T12 SZ-T13 SZ-T16 SZ-T17	TR-0N, TK-0N TR-5-1N, TK-5-1N TR-N2, TK-N2 TR-N3, TK-N3
For thermal overload relay separate mounting	SZ-T14 SZ-T15 SZ-RN6T	TR-N2H, TK-N2H TR-N3H, TK-N3H TR-N6H, TK-N6H
Thermal overload relay base unit for separate mounting	SZ-T10 SZ-T11	SZ-HB SZ-HC
For coil drive unit	SZ-T7	SZ-CD5, SZ-CD6



Description	Type	Used with
For reversing contactor	SZ-T1 SZ-T2 SZ-T3 SZ-T4 SZ-T22 SZ-T23	SC-03RM, 0RM SC-05RM SC-4-0RM, 4-1RM SC-5-1RM SC-N1RM, N2RM SC-N2SRM, N3RM
	SZ-N4RT1 SZ-N4RT2	SC-N4RM, N5ARM
	SZ-N6RT1 SZ-N6RT2	SC-N6RM
	SZ-N7RT1 SZ-N7RT2	SC-N7RM
	SZ-N8RT1 SZ-N8RT2	SC-N8RM, N10RM
	SZ-N11RT1 SZ-N11RT2	SC-N11RM, N12RM
For reversing starter	SZ-T1 SZ-T12	SW-03RM, 0RM
	SZ-T2 SZ-T12	SW-05RM
	SZ-T3 SZ-T13	SW-4-0RM, 4-1RM
	SZ-T4 SZ-T13	SW-5-1RM
	SZ-T22 SZ-T16	SW-N1RM, N2RM
	SZ-T23 SZ-T17	SW-N2SRM, N3RM

■ Contactors and starters with terminal cover

Contactors, starters, industrial relays, and thermal overload relays with a terminal cover are also available as the finger-protected type for the European market. Suffix the code /T at the end of the type number, when ordering, for this type.

Example

SC-03/T type: Contactor **SC-03**+Terminal cover **SZ-T1**
SW-03/3HT type: Starter **SW-03/3H**+Terminal cover **SZ-T1+SZ-T12**

Magnetic Contactors and Starters

SC and SW series

Optional unit

Terminal covers (Continued)

■ Dimensions, mm

Contactors

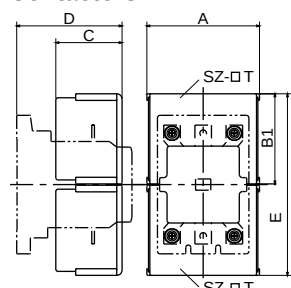


Fig.1

Starters

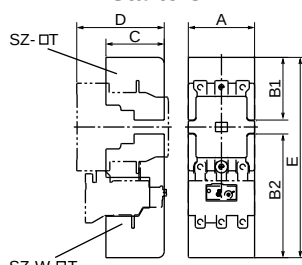


Fig.2

Reversing contactors

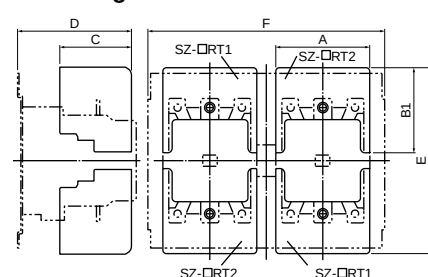


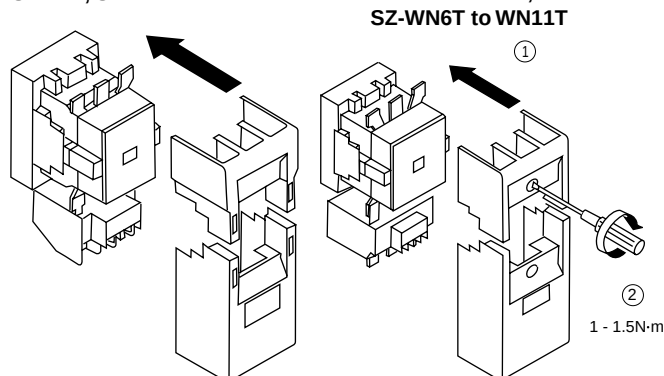
Fig.3

Type	Line side	Load side	A	B1	B2	C	D	E	F	Fig. No.
SZ-N4T	SZ-N4T	SZ-N4T	97.5	90	—	91.5	119*1	199	—	1
SZ-N6T	SZ-N6T	SZ-N6T	100	94.5	—	88	132	210	—	1
SZ-N7T	SZ-N7T	SZ-N7T	115	104	—	89	134	228	—	1
SZ-N8T	SZ-N8T	SZ-N8T	170	136	—	100	159	274	—	1
SZ-N11T	SZ-N11T	SZ-N11T	185	175	—	116	175	352	—	1
SZ-N4T	SZ-WN4T	SZ-WN4T	97.5	90	143.5	91.5	119*1	252.5	—	2
SZ-N6T	SZ-WN6T	SZ-WN6T	100	94.5	186.5	88	132	302	—	2
SZ-N7T	SZ-WN7T	SZ-WN7T	115	104	193	89	134	317	—	2
SZ-N8T	SZ-WN8T	SZ-WN8T	170	136	237	100	159	375	—	2
SZ-N8T	SZ-WN10T	SZ-WN10T	170	136	228	100	159	366	—	2
SZ-N11T	SZ-WN11T	SZ-WN11T	185	175	304	116	175	481	—	2
SZ-N4RT1	SZ-N4RT2	SZ-N4RT2	97.5	90	—	91.5	124*2	199	230	3
SZ-N6RT1	SZ-N6RT2	SZ-N6RT2	100	94.5	—	88	140	210	250	3
SZ-N7RT1	SZ-N7RT2	SZ-N7RT2	115	104	—	89	144	228	290	3
SZ-N8RT1	SZ-N8RT2	SZ-N8RT2	160	136	—	100	172	277	330	3
SZ-N11RT1	SZ-N11RT2	SZ-N11RT2	175	175	—	116	194	352	360	3

Note: *1 134 for SC-N5A, SW-N5A *2 139 for SC-N5ARM

■ Mounting methods

SZ-N4T, SZ-WN4T



Insulation barriers for SC-N4 to N12

■ Features

These optional insulation barriers, prevent accidental short-circuits caused by metallic objects falling onto the terminals

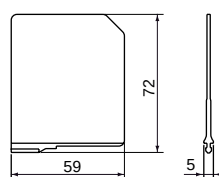


SW-N6+SZ-B1

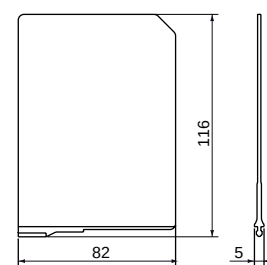
Description	Type	Used with
For contactor	SZ-B1	SC-N4, N5A, N6, N7
	SZ-B2	SC-N8, N10, N11, N12
For starter	SZ-B1	SW-N4/3H, N5A/3H, N6/3H, N7/3H
	SZ-B2	SW-N8/3H, N10/3H, N11/3H, N12/3H
For thermal overload relay	SZ-B1	TR-N6H, TK-N6H
	SZ-B2	TR-N10H, N12H, TK-N10H, N12H

■ Dimensions, mm

SZ-B1

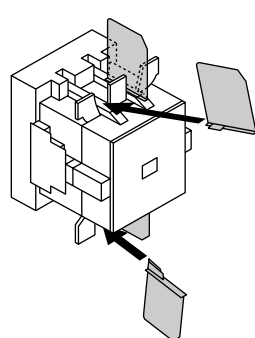


SZ-B2

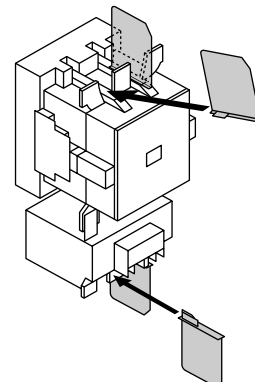


■ Mounting methods

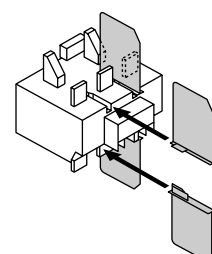
Contactors



Starters

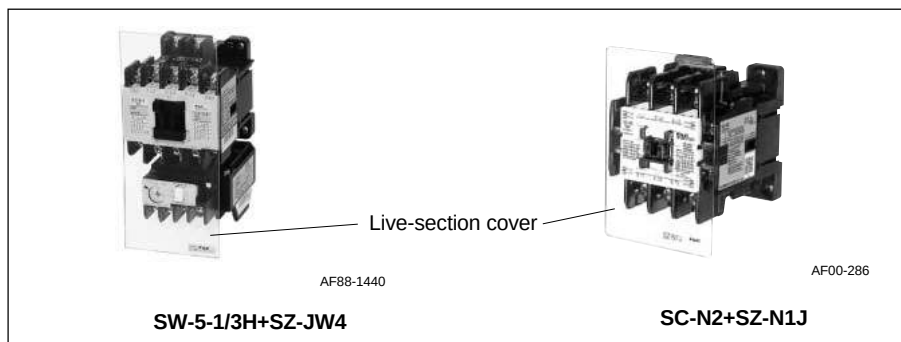


Thermal overload relays



Live-section cover

The live-section cover completely encloses the front of a contactor or starter for increased worker safety during maintenance and inspection.



■ Dimensions, mm

● Contactors ● Starters

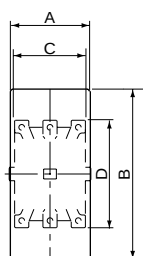


Fig. 1

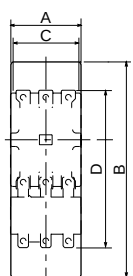


Fig. 2

● Starters (reversing)

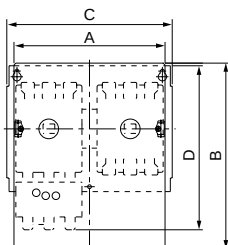
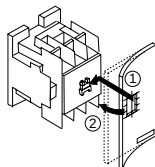


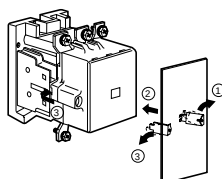
Fig. 3

■ Mounting methods

SZ-JC1 to JC4, SZ-N1J, N2SJ,
SZ-JW1 to JW4, SZ-WN1J, WN2SJ



SZ-N4J to N11J, SZ-WN4J to WN11J



For contactor (Non-reversing)

Cover type	Contactor Type	Fig. No.	Live-section cover		Contactor	
			A	B	C	D
SZ-JC1	SC-03, 0	1	43	97	43	81
SZ-JC2	SC-05	1	53	97	53	81
SZ-JC3	SC-4-0, 4-1	1	53	100	53	81
SZ-JC4	SC-5-1	1	64	100	64	81
SZ-N1J	SC-N1, N2	1	74	120	74	87
SZ-N2SJ	SC-N2S, N3	1	88	140	88	110
SZ-N4J	SC-N4, N5A	1	93	192	88	127
SZ-N6J	SC-N6	1	106	214	100	144
SZ-N7J	SC-N7	1	120	233	115	156
SZ-N8J	SC-N8, N10	1	138	265	138	209
SZ-N11J	SC-N11, N12	1	160	336	148	240

For starter (Non-reversing)

Cover type	Starter Type	Fig. No.	Live-section cover		Starter	
			A	B	C	D
SZ-JW1	SW-03/3H, 0/3H	2	44	140	44	122
SZ-JW2	SW-05/3H	2	53	140	53	122
SZ-JW3	SW-4-0/3H, 4-1/3H	2	53	145	53	127
SZ-JW4	SW-5-1/3H	2	64	145	64	127
SZ-WN1J	SW-N1/3H, N2/3H	2	74	175	74	146
SZ-WN2SJ	SW-N2S/3H, 3/3H	2	88	205	88	177
SZ-WN4J	SW-N4/3H, N5A/3H	2	93	254	88	189
SZ-WN6J	SW-N6/3H	2	106	281	100	225
SZ-WN7J	SW-N7/3H	2	120	300	115	237
SZ-WN8J	SW-N8/3H	2	138	347	138	305
SZ-WN10J	SW-N10/3H	2	138	347	138	287
SZ-WN11J	SW-N11/3H, N12/3H	2	160	423	148	360

For starter (reversing)

Cover type	Starter Type	Fig. No.	Live-section cover		Starter	
			A	B	C	D
SZ-WN4RJ	SW-N4RM/3H, N5ARM/3H	3	204	254	230	208
SZ-WN6RJ	SW-N6RM/3H	3	229	281	250	247.5
SZ-WN7RJ	SW-N7RM/3H	3	258	300	290	266
SZ-WN8RJ	SW-N8RM/3H	3	291	347	330	370
SZ-WN10RJ	SW-N10RM/3H	3	291	347	330	370
SZ-WN11RJ	SW-N11RM/3H, N12RM/3H	3	328	423	360	480

Note: Side mounting types with 4NO + 4NC auxiliary contacts are available. Add the suffix "4" to the type number when ordering.

DC Magnetic Contactors

SB series

2-pole DC magnetic contactors

Up to 55kW 220 Volts DC
Operational current up to 290 Amps
220 Volts DC

■ Description

These highly efficient SB series DC magnetic contactors are improved versions of the SC-N series contactors. The magnetic assembly in these improved units is now the SUPER MAGNET so that these contactors will operate on both AC and DC power supplies and power consumption is minimized.

■ Features

- DC motor control
5.5kW to 55kW (at 220V DC)
- Circuit voltage: Max. 550V DC
Rated thermal current: Max. 360A
- A special magnetic blow-out device ensures improved interrupting performance.
- The main contact arrangement is 2NO. 2NO+1NC types are also available. The 1NC is used for Dynamic Brake circuits.

■ Ordering code system

S B 3 5 B A A — 02 E 2 2
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Product category

Description	Code
Contactor and starter	S

② Series category

Description	Code
SB series	B

③④ Frame size

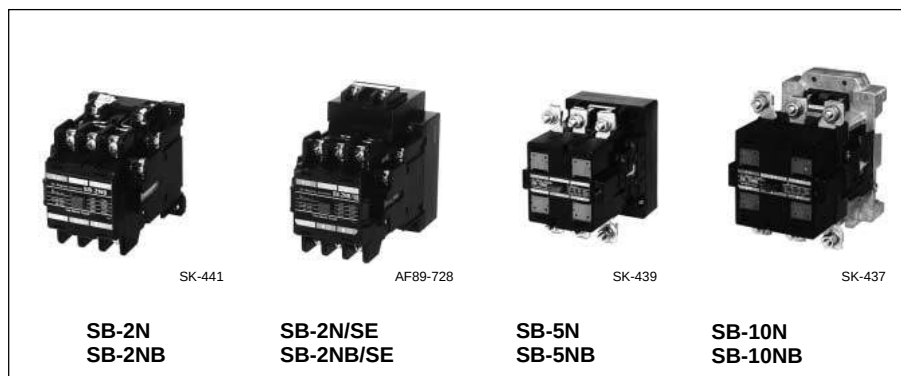
Frame size	Code	
	③	④
2N	3	5
5N	8	5
6N	1	C
10N	2	A
11N	2	K

⑤ Version

Description	Code
<u>Non-reversing, open</u>	
Standard	B
UL approved	1

⑥ Coil specification

Description	Code	
Standard	AC operating coil	A
	Both AC and DC operating coil	B
With SUPER MAGNET	Both AC and DC operating coil	S



- The SUPER MAGNET system permits these contactors to operate on both AC and DC power supplies*.
- Auxiliary contacts can be supplied up to 4NO+4NC arrangement (2NO+2NC for standard products).

Note: * The SB-2N (2NB) operates only on AC. The SB-2N/SE (2NB/SE) is provided with a SUPER MAGNET and operates on both AC and DC power supplies.

JEM 1038

DC2: For shunt-wound motors:

Starting, switching off during running.

The starting current is less than 2.5 times the rated current.

DC4: For series-wound motors:

Starting, switching off during running.

The starting current is less than 2.5 times the rated current.

⑦ Main contact

Contact arrangement	Code
2NO	A
2NO + 1NC	B

⑧ Special main contact (for SB35□□B-)

Main contact	Code
2NC	02
1NO + 2NC	12

⑩⑪ Auxiliary contact

Contact arrangement	Code	
	⑩	⑪
2NO + 2NC	2	2
3NO + 3NC	3	3
4NO + 4NC	4	4

⑨ Coil voltage

● AC coil/SB-2N

Operating coil voltage		Code
50Hz	60Hz	
24V	24 — 26V	E
48V	48 — 52V	C
100V	100 — 110V	1
100 — 110V	110 — 120V	H
110 — 120V	120 — 130V	K
200V	200 — 220V	2
200 — 220V	220 — 240V	M
220 — 240V	240 — 260V	P
346 — 380V	380 — 420V	S
380 — 400V	400 — 440V	4
415 — 440V	440 — 480V	T
480 — 500V	500 — 550V	5

● AC and DC coil/SB-2N/SE, 5N to 11N

Operating coil voltage		Code
AC 50/60Hz	DC	
24 — 25V	24V	E
48 — 50V	48V	F
100 — 127V	110 — 110V	1
200 — 250V	200 — 220V	2
265 — 347V	—	3
380 — 450V	—	4
460 — 575V	—	5

■ Types and ratings

Max. motor capacity (kW)			Rated operational current (A)			Rated thermal current (A)	Auxiliary contact		With 2NO main contacts		With 2NO+1NC* main contacts	
110V	220V	440V	110V	220V	440V		NO	NC	Type	Ordering code	Type	Ordering code
3.7	5.5	7.5	40	35	25	60	2	2	SB-2N	SB35BAA-■22	SB-2NB	SB35BAB-21■22
3.7	5.5	7.5	40	35	25	60	2	2	SB-2N/SE	SB35BSA-■22	SB-2NB/SE	SB35BSB-21■22
7.5	15	22	85	85	60	120	2	2	SB-5N	SB85BBA-■22	SB-5NB	SB85BBB-■22
11	22	30	125	120	80	160	2	2	SB-6N	SB1CBBA-■22	SB-6NB	SB1CBBB-■22
22	37	45	240	200	120	270	2	2	SB-10N	SB2ABBA-■22	SB-10NB	SB2ABBB-■22
30	55	75	320	290	200	360	2	2	SB-11N	SB2KBBA-■22	SB-11NB	SB2KBBB-■22

Notes: • Conforming to class DC2 and DC4, JEM 1038
• Auxiliary contact 4NO+4NC is available on request.
* For SB-2NB and SB-2NB/SE, 2NC or 1NO+2NC main contacts are also available.
■: Coil voltage code

■ Auxiliary contact

Type	Rated thermal current (A)	Making and breaking current (AC, A)	Rated operational current (A)					
			AC circuit			DC circuit		
			Volts	AC-15 (ind.)	AC-12 (res.)	Volts	DC-13 (ind.)	DC-12 (res.)
SB-2N to 11N SB-2NB to 11NB	10	60	110V	6	10	24V	10	10
			220V	6	10	48V	3	5
			440V	4	10	110V	1.5	2.5
			550V	2.5	10	220V	0.5	1

Note: For DC-13 (inductive load) time constant is 100ms or less.

■ NC contact ratings

Type	Rated thermal current (A)	Dynamic brake*		
		Making current (A)	Operating cycles per hour	Time rating (sec)
SB-2NB	50	60	600	3
SB-2NB/SE	50	60		
SB-5NB	100	130		
SB-6NB	100	190		
SB-10NB	160	360		
SB-11NB	200	480		

Note: * Braking condition: No voltage

■ Performance data NO contacts (2-pole in series)

Frame size	Making and braking capacity	Operating cycles per hour	Life expectancy (operations)	
			Electrical	Mechanical
SB-2N to 11N SB-2N/SE SB-2NB to 11NB SB-2NB/SE	4 × Ie	1200	500,000	2.5 million

Ie: Rated operational current

■ Coil ratings

Type	Coil voltage and frequency	Code
2N	100V 50Hz/100 to 110V 60Hz	1
	200V 50Hz/200 to 220V 60Hz	2
	380 to 400V 50Hz/400 to 440V 60Hz	4

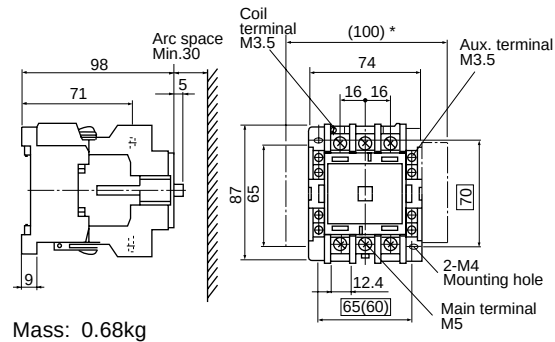
Notes: • The standard voltages are 100V, 200V, and 400V.
• Voltage ranging from 24V to 550V are also available on request.

Type	Coil voltage and frequency		Code
	AC	DC	
2N/SE	24 to 25V 50/60Hz	24V	E
5N	48 to 50V 50/60Hz	48V	F
6N	100 to 127V 50/60Hz	100 to 110V	1
10N	200 to 250V 50/60Hz	200 to 220V	2
11N	265 to 347V 50/60Hz	—	3
	380 to 450V 50/60Hz	—	4
	460 to 575V 50/60Hz	—	5

Notes: • The coils can be used for both AC and DC input.
• The standard voltages are 100V, 200V, and 400V.
Other voltages are available on request in following range.
Frame size 2N/SE: 24 to 250V 5N to 10N: 24V to 575V
11N: 100 to 575V

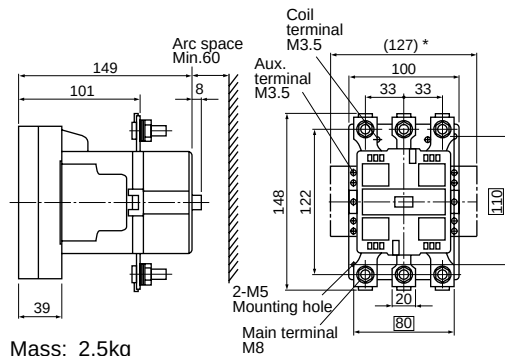
DC Magnetic Contactors SB series

■ Dimensions, mm SB-2N, SB-2NB



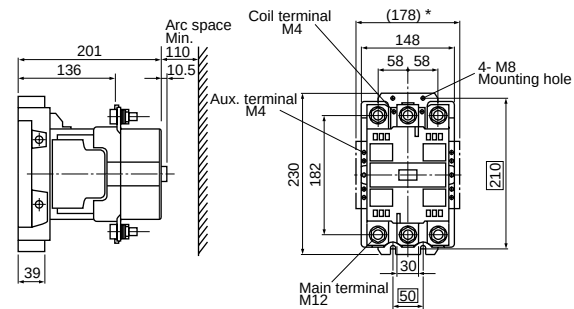
Mass: 0.68kg

SB-5N, SB-5NB, SB-8N, SB-6NB



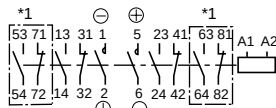
Mass: 2.5kg

SB-11N, SB-11NB

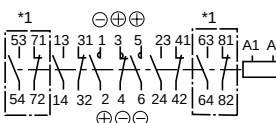


Mass: 6.7kg

■ Wiring diagrams Main contact 2NO



Main contact 2NO+1NC



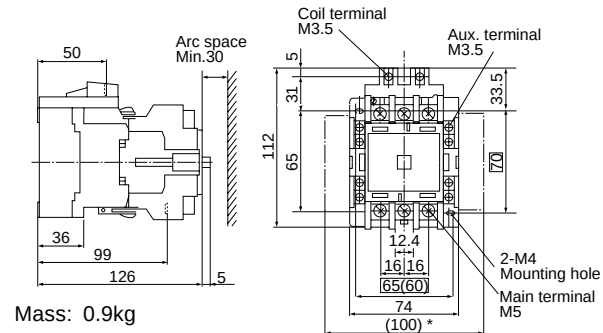
*1 In case of auxiliary contact 4NO+4NC

■ Ordering information

Specify the following:

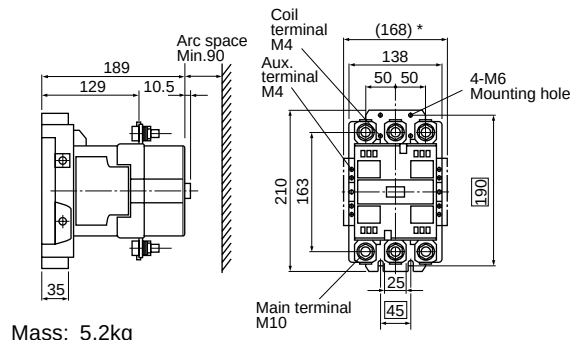
1. Type number or ordering code

SB-2N/SE, SB-2NB/SE



Mass: 0.9kg

SB-10N, SB-10NB

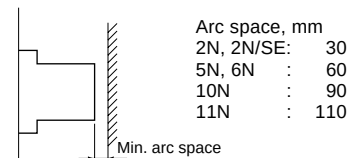
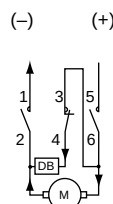


Mass: 5.2kg

Note: * For two side-mounted aux.contact blocks

■ Handling notes

1. The main contacts are marked for positive and negative polarities. Do not confuse the polarities when connecting.
2. Be sure to install the contactors upright.
3. Allow adequate arcing space.



Magnetic contactors FC series

■ Description

FUJI FC series contactors are designed for use in consumer products and light industrial machinery and equipment. They are recommended for applications which call for economy, easy handling and reliability. Typical applications include air conditioners, show cases, industrial washing machines, heaters, pumps, fans, compressors, dryers and vending machines. They are available in sizes ranging from FC-0UL to 4UL and up to 30kW at 440 Volts AC.

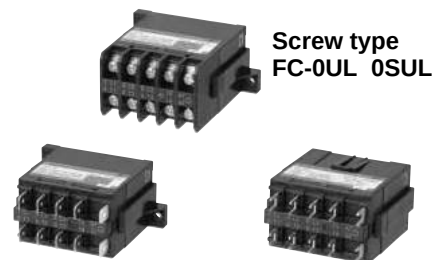
■ Features

- Small size, light weight
- Budget priced
- Long service life
Electrical life expectancy: 250,000 operations. Good for 7 years service if they are operated 100 times a day.
- Scrubbing action
The contacts are self-cleaning by a scrubbing action during operation and are made of a silver alloy.
- Highly reliable operating coil
Pick-up voltage
75% of rated voltage
- Self-lifting terminals
Easy to wire

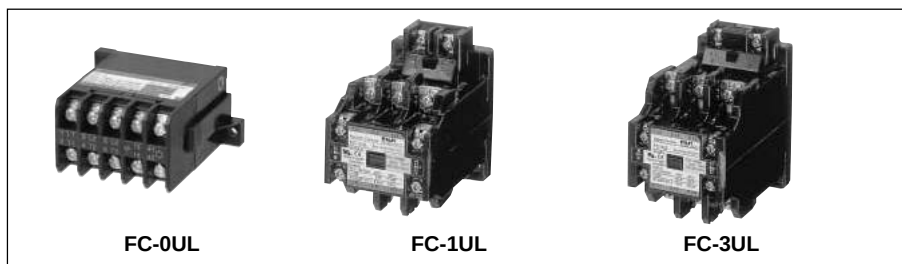
■ Construction

FC-0UL, 0SUL

- Their small size permits them to be mounted in positions where space is limited and they can be mounted in a variety of directions.
- The standard terminals are screw-type. Printed board type and tab terminals are also available.



Tab terminal type FC-0TUL Printed board type FC-0A



- The contact section is housed inside the molded frame and is totally enclosed. The dust-tight construction keeps contact performance at a high level and results in a long trouble-free service life.

FC-1UL to 4UL

- FUJI self-lifting terminals make connection work simple.
- Their free floating design results in quiet operation and eliminates chattering and bouncing.
- The magnetic yokes have been given a rust preventing treatment.
- Coil power consumption is low.

■ Ordering information

Specify the following:

1. Ordering code
2. Operating coil voltage code
3. Auxiliary contact arrangement:
In the case of type FC-0UL, 0A and 0TUL, specify the contact arrangement.

■ Types and ratings (IEC60947-4-1)

Motor capacity (kW) AC-3 3-phase		Operational current (A) AC-3 3-phase		Operational current (A) AC-1 *2	Auxiliary contact		Non-reversing Open	
200V 240V	380V 440V	200V 240V	380V 440V		NO	NC	Type	Ordering code
3	2.5	12	6	20	1	—	FC-0UL	SF12B1A-■10
3	2.5	12	6	20	—	1	FC-0UL	SF12B1A-■01
3.5	4.5	15	10	20	1	—	FC-0SUL	SF15B1A-■10
3.5	4.5	15	10	20	—	1	FC-0SUL	SF15B1A-■01
5.5	5.5	20	13	30	1	1*1	FC-1UL	SF20B1A-■11
7.5	7.5	27	18	30	1	1*1	FC-1SUL	SF26B1A-■11
11	11	40	26	45	1	1*1	FC-2SUL	SF38B1A-■11
15	18.5	52	40	60	1	1*1	FC-3UL	SF50B1A-■11
18.5	30	65	65	80	1	1*1	FC-4UL	SF65B1A-■11
1.5	—	8	—	8	1	—	FC-0A	SF08BBA-■10
1.5	—	8	—	8	—	1	FC-0A	SF08BBA-■01
3	2.5	12	6	20	1	—	FC-0TUL	SF12B3A-■10
3	2.5	12	6	20	—	1	FC-0TUL	SF12B3A-■01
3.5	4.5	15	10	20	1	—	FC-0STUL	SF15B3A-■10
3.5	4.5	15	10	20	—	1	FC-0STUL	SF15B3A-■01
3	2.5	12	6	20	1	—	FC-0/GUL	SF12B1G-■10
3	2.5	12	6	20	—	1	FC-0/GUL	SF12B1G-■01
3.5	4.5	15	10	20	1	—	FC-0S/GUL	SF15B1G-■10
3.5	4.5	15	10	20	—	1	FC-0S/GUL	SF15B1G-■01
3	2.5	12	6	20	1	—	FC-0T/GUL	SF12B3G-■10
3	2.5	12	6	20	—	1	FC-0T/GUL	SF12B3G-■01
3.5	4.5	15	10	20	1	—	FC-0ST/GUL	SF15B3G-■10
3.5	4.5	15	10	20	—	1	FC-0ST/GUL	SF15B3G-■01
1.5	—	8	—	8	1	—	FC-0A/G	SF08BBG-■10
1.5	—	8	—	8	—	1	FC-0A/G	SF08BBG-■01

Notes: *1 Auxiliary contact arrangement 2NO or 2NC is available.

Cable connection: FC-0A: P. C. board
FC-0TUL, 0STUL: With flat connection tabs
Other types: With screw-type terminals

*2 Thermal current (A)

■: Coil voltage code, see page 01/82.

Magnetic Contactors and Starters

FC and FW series

■ Ordering code system

● Contactor

S	F	3	5	B	1	A	—	E	2	2
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

① Product category

Description	Code
Contactors and starters	S

② Series category

Description	Code
F series	F

③④ Frame size

Frame size	Code	
	③	④
0, 0T	1	2
0A	0	8
0S, 0ST	1	5
1	2	0
1S	2	6
2S	3	5
3	5	0
4	6	5

⑤ Version

Description	Code
<u>Non-reversing, open</u>	
Contactors	1
Standard	T
With tab terminal	
Starters	A
Standard	
<u>Non-reversing, enclosed</u>	
Standard	C
With ON-OFF pushbutton	P
(plastic enclosure)	
With ON-OFF pushbutton	S
(steel enclosure)	
With ON-OFF pushbutton and lamp (plastic enclosure)	K

⑥ Coil specification

Description	Code
AC operating coil	A
DC operating coil	G

⑦ Type of thermal overload relay

Description	No. of element	Code
Standard	2, 3	N
Quick operating	3	S
Open-phase protection	3	E

● Starter

S	F	3	5	B	A	A	N	—	E	2	2	T	B	D
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮

⑧ Coil voltage

● AC coil

Operating coil voltage		Code
50Hz	60Hz	
24V	24 — 26V	E
48V	48 — 52V	F
100V	100 — 110V	1
100 — 110V	110 — 120V	H
110 — 120V	120 — 130V	K
200V	200 — 220V	2
200 — 220V	220 — 240V	M
220 — 240V	240 — 260V	P
346 — 380V	380 — 420V	S
380 — 400V	400 — 440V	4
415 — 440V	440 — 480V	T

● DC coil

Operating coil voltage	Code
24V DC	E
48V DC	F
60V DC	G
100V DC	1
110V DC	H
200V DC	2
220V DC	M

⑩ Thermal overload relay ampere setting range

Ampere setting range (A)	Code	Ampere setting range (A)	Code	Ampere setting range (A)	Code
0.1 — 0.15	TA	1.4 — 2.2	TM	7 — 11	TV
0.15 — 0.24	TC	1.7 — 2.6	TN	8 — 16	TV
0.24 — 0.36	TE	2.2 — 3.4	TP	9 — 13	TW
0.36 — 0.54	TG			12 — 18	TX
				13 — 20	TA*1
				18 — 26	TB
				20 — 26	TC*2
0.48 — 0.72	TH	2.8 — 4.2	TR	24 — 36	TE
0.64 — 0.96	TJ	4 — 6	TS	28 — 40	TF
0.8 — 1.2	TK	5 — 8	TT	34 — 50	TG
0.95 — 1.45	TL	6 — 9	TU	45 — 67	TJ

Note: *1 For FW-1S: X

*2 For FW-1S: Y

⑫ No. of heater element

Description	Code
2-element	Blank
3-element	D

■ Auxiliary contact ratings (IEC 60947-4-1)

Frame size	Rated thermal current (A)	Voltage (V AC)	Making & breaking capacity (A)	Rated operational current (A)	
				Inductive	Resistive
0, 0A, 0T, 0S	8	110	40	4	8
		220	40	4	8
		440	20	2	8
1, 1S, 2S, 3, 4	10	110	100	10	10
		220	60	6	10
		440	60	6	10

■ Performance data

Frame size	Making capacity (A)	Breaking capacity (A)	Operating cycles per hour	Life expectancy (operations)	
				Electrical	Mechanical
0 to 1S	$10 \times I_e$	$10 \times I_e$	600	250,000	1 million
2S to 4	$10 \times I_e$	$10 \times I_e$	600	250,000	1 million

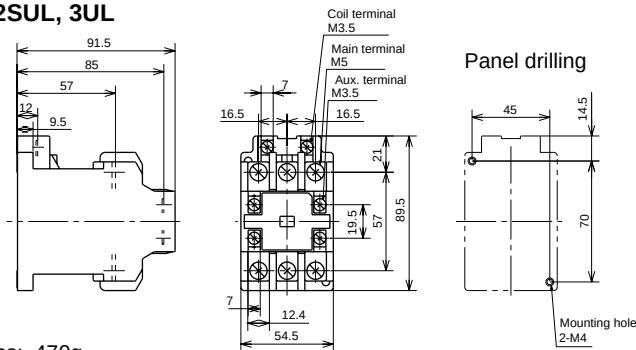
I_e : Rated operational current

■ Coil ratings

Frame size	Power consumption		Voltage and frequency *	Wiring	Operating voltage range
	Inrush (VA)	Sealed (VA)			
0, 0A, 0T, 0S	23	6	200V	A	0.75 to
1, 1S	75	11	50Hz		1.1 times
2S	125	14			rated coil voltage
3	125	14			
4	200	14.3			

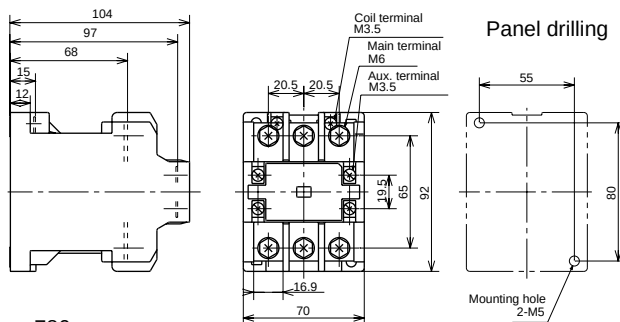
Notes: * Other voltages between 24V and 440V AC are available.
DC operated type FC-0/G and FC-0T/G are also available.
Coil voltage: 24, 48, 60, 100, 120, 200, 210 and 220V DC

FC-2SUL, 3UL



Mass: 470g

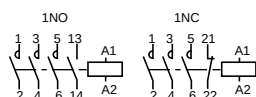
FC-4UL



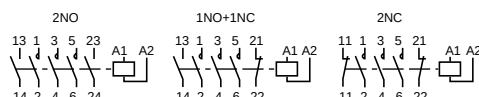
Mass: 780g

■ Wiring diagrams

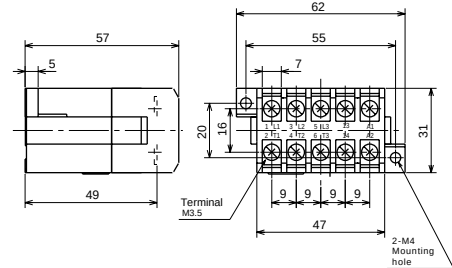
FC-0UL, 0A, 0TUL, 0SUL, 0STUL



FC-1UL, 1SUL, 2SUL, 3UL, 4UL

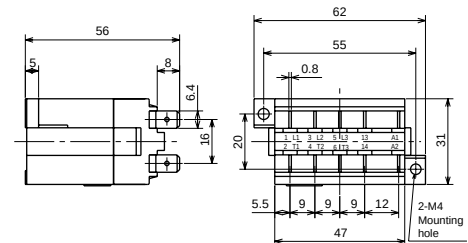


■ Dimensions, mm FC-0UL, 0SUL



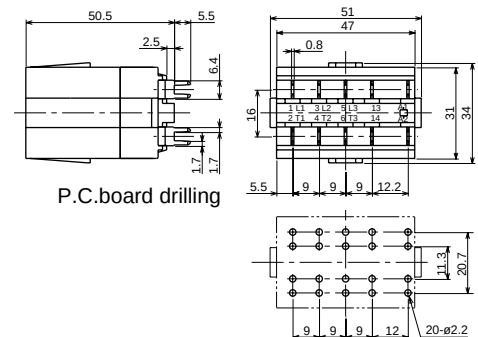
Mass: 160g

FC-0TUL, 0ST/UL



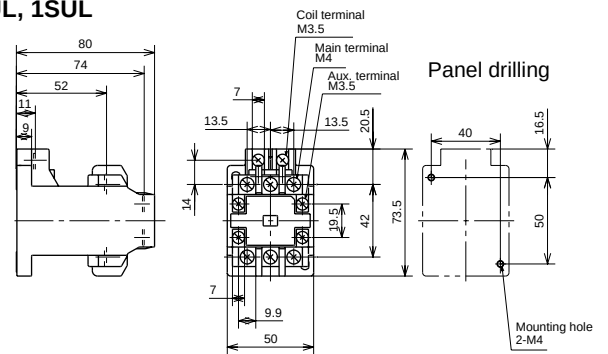
Mass: 160g

FC-0A



Mass: 140g

FC-1UL, 1SUL



Mass: 320g

Magnetic Contactors and Starters

FC and FW series

Non-reversing motor starters FW series

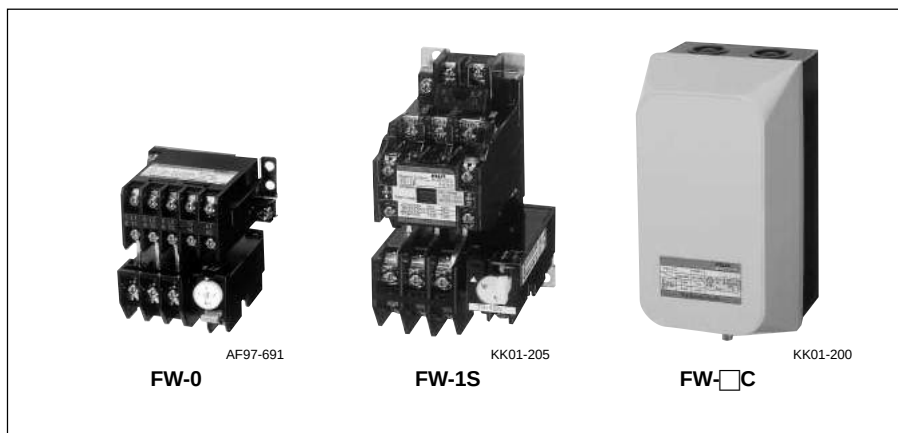
Up to 30kW 440 Volts 3-phase

■ Description

The FUJI FW-series starters are primarily designed for domestic and light industrial use, and can be expected to have a service life of over seven years under conditions where they are operated over 100 times a day. Typical applications are air conditioners, industrial washing machines, boiler and other pumps, fans, compressors, dryers.

The FC contactor can be supplied separately. They are simple, compact and reasonably priced, yet highly efficient and dependable. The thermal overload relay is fitted with elements that compensate for changes in ambient temperature, so stabilizing operations in spite of the season.

Note: In case of F series, contacts and operating coil cannot be replaced at site.



■ Ordering information

Specify the following:

1. Ordering code
2. Operating coil voltage code
3. Overload relay setting range code

■ Thermal overload relay:

See page 01/86.

■ Types and ratings

Motor capacity (kW)		Operational current (A)		Aux. contact		Open		Enclosed		Combined thermal overload relay
3-phase		3-phase				3-element		3-element		
200V	380V	200V	380V	NO	NC	Type	Ordering code	Type	Ordering code	Type
240V	440V	240V	440V							
3	2.5	12	6	1	—*1	FW-0/3H	SF12BAAN-■10T□□	FW-0C/3H	SF12BCAN-■10T□□	TR-0/3
3.5	4.5	15	10	1	—*1	FW-0S/3H	SF15BAAN-■10T□□	FW-0SC/3H	SF15BCAN-■10T□□	TR-0/3
5.5	5.5	20	13	1	1*2	FW-1/3H	SF20BAAN-■11T□□	FW-1C/3H	SF20BCAN-■11T□□	RCa3737-1CNF/3
7.5	7.5	27	18	1	1*2	FW-1S/3H	SF26BAAN-■11T□□	FW-1SC/3H	SF26BCAN-■11T□□	TR-1SN/3
11	11	40	26	1	1*2	FW-2S/3H	SF35BAAN-■11T□□	FW-2SC/3H	SF35BCAN-■11T□□	TR-2NF/3
15	18.5	52	40	1	1*2	FW-3/3H	SF50BAAN-■11T□□	FW-3C/3H	SF50BCAN-■11T□□	TR-2NF/3
18.5	30	65	65	1	1*2	FW-4/3H	SF65BAAN-■11T□□	FW-4C/3H	SF65BCAN-■11T□□	TR-3N/3

Notes: *1 Auxiliary contact arrangement 1NC is available.

*2 Auxiliary contact arrangement 2NO or 2NC is available.
Conforming to IEC 60947-4-1 AC-3.

■: Coil voltage code, see page 01/82.

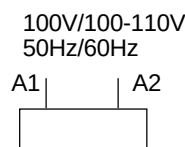
□: Thermal overload relay ampere setting range code, see page 01/82.

■ Coil ratings

Frame size	Power consumption (max.)		Voltage and frequency *
	Inrush (VA)	Sealed (VA)	
0, 0S	23	6	200V AC 50Hz
1, 1S	75	11	
2S	125	14	
3	125	14	
4	200	14.3	

Notes: * Other voltages between 24V and 440V AC are available.
DC operated type FC-0/G and FC-0T/G are also available.
Coil voltage: 24, 48, 60, 100, 120, 200, 210 and 220V DC

Wiring example



■ Performance data

Frame size	Making & breaking capacity	Operating cycles per hour	Durability (operations)	
			Electrical	Mechanical
0, 0S, 1, 1S	10 × I _e	600	250,000	1,000,000
2S, 3, 4	10 × I _e	600	250,000	1,000,000

I_e: Rated operational current (Amps).

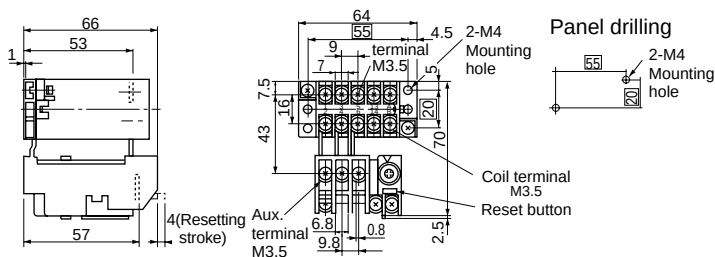
■ Auxiliary contact ratings

Frame size	Rated thermal current (A)	Voltage (V AC)	Making & breaking capacity (A)	Rated operational current A)	
				Inductive (cosφ=0.65)	Resistive (cosφ=0.95)
0, 0S	8	200-240 380-440	40 20	4 2	8 8
1, 1S, 2S, 3, 4	10	200-240 380-440	60 60	6 6	10 10

■ Dimensions, mm

● Open type

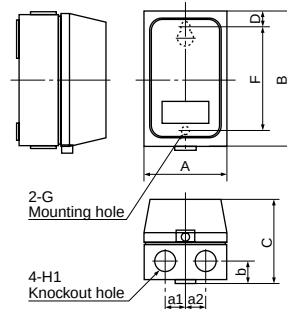
FW-0/3H, FW-0S/3H



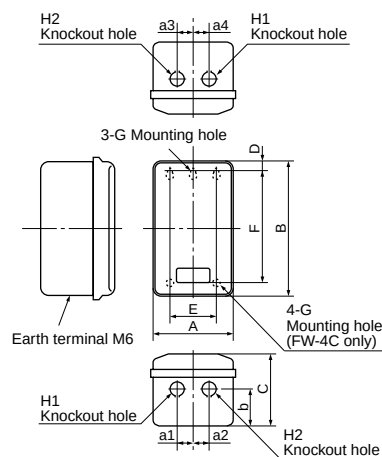
Mass: 0.29kg (with 3-thermal element)

● Enclosed type

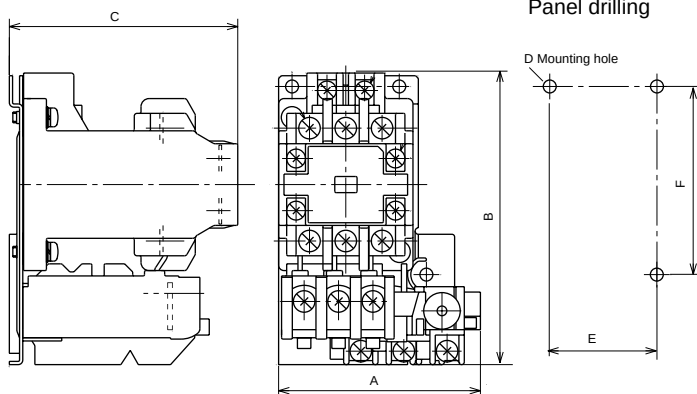
FW-0C, 0SC, 1C



FW-1SC, 2SC, 3C, 4C



FW-1/3H, FW-1S/3H, 2S/3H, 3/3H, 4/3H



Type	A	B	C	D	E	F	Mass (kg)
FW-1/3H	75	108.5	85	2-M4	50	70	0.49
FW-1S/3H	68	121	90	2-M4	40	110	0.55
FW-2S/3H	78	138.5	91.5	2-M4	45	70	0.71
FW-3/3H	78	138.5	91.5	2-M4	45	70	0.71
FW-4/3H	90	175	109	3-M5	75	160	1.3

Mass: With 3-thermal element

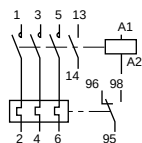
Dimensions for reference only. Confirm before construction begins.

Type	A	B	C	D	E	F	G
FW-0C, 0SC*	71	120	79	15	—	90	ø5.3
FW-1C	94	166	95	15.5	—	135	ø5.5
FW-1SC	120	195	115	21.5	80	150	ø7
FW-2SC, 3C	130	230	124	20	80	190	ø7
FW-4C	175	320	145	35	110	250	ø7

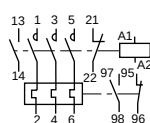
Type	H1	H2	a1	a2	a3	a4	b	Mass(kg)
FW-0C, 0SC*	ø17	—	17.5	17.5	17.5	17.5	20	0.25
FW-1C	ø22	—	20	20	20	20	24	0.7
FW-1SC	ø22	ø22	22.5	22.5	20	20	35	1.5
FW-2SC, 3C	ø28	ø28	27	27	20	20	52	2
FW-4C	ø35	ø28	15	35	35	15	70	3.7

■ Wiring diagrams

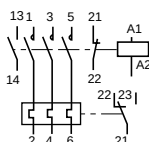
FW-0/3H, 0S/3H



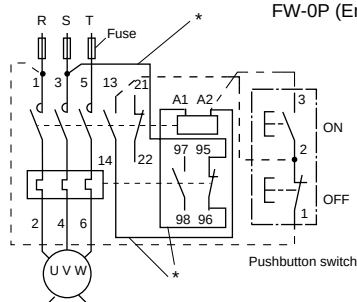
FW-1S/3H to 4/3H



FW-1/3H



Example FW-2S/3H



Note: * The enclosure dimensions given here are based on a "TR-0 thermal overload relay and 2-elements" being incorporated in the case. The temperature rise inside the enclosure may sometimes become a problem if a 3-element is used instead of a 2-element. In this case the FW-0P (Enclosure with pushbuttons) is recommended.

Note: * Open type: Wirings from 3 to 95, A2 to 14 and A1 to 96 are not connected at factory. Connect the wires at site.

Magnetic Contactors and Starters

FC and FW series

Thermal overload relays for FW series

Type* ¹ (3-element)	Setting current (3-element)* ¹				Reset	Contact
	Range (A)	Ordering code	Range (A)	Ordering code		
TR-0/3	0.24–0.36	TB13DW-E	4–6	TB13DW-S	Manual * ²	SPDT
	0.48–0.72	TB13DW-H	5–8	TB13DW-T		
	0.8–1.2	TB13DW-K	6–9	TB13DW-U		
	0.95–1.45	TB13DW-L	7–11	TB13DW-V		
	1.4–2.2	TB13DW-M	9–13	TB13DW-W		
	1.7–2.6	TB13DW-N				
	2.8–4.2	TB13DW-R				
RCa3737-1CNF/3	4–8	TC20DF-S			Manual	
	8–16	TC20DF-V				
	12–18	TC20DF-X				
TR-1SN/3	13–20	TR26DW-X			Manual and auto	1NO+1NC
	20–26	TR26DW-Y				
TR-2NF/3	12–18	TR35DW-X	28–40	TR35DW-F	Manual and auto	
	18–26	TR35DW-B	34–50	TR35DW-G		
	24–36	TR35DW-E				
TR-3N/3	24–36	TR65DW-E	34–50	TR65DW-G	Manual and auto	
	28–40	TR65DW-F	45–67	TR65DW-J		

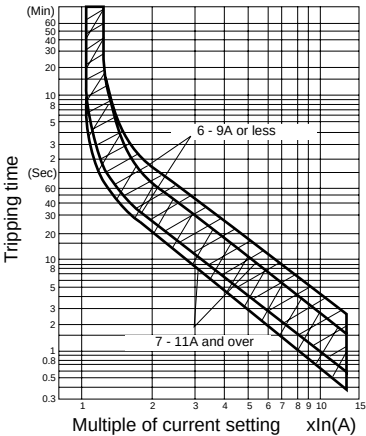
Notes: *1 2-element is also available on request.
*2 Auto reset type is available on request. Specify "Auto reset" when ordering.

Maximum setting ranges at 380–440V AC for starter use

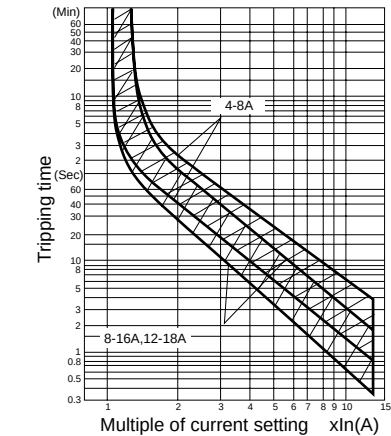
TR-0/3	4–6A	TR-2N/3	18–26A (for FW-2S/3H)
RCa3737-1CNF/3	8–16A		34–50A (for FW-3/3H)
TR-1SN/3	13–20A	TR-3N/3	45–67A (for FW-4/3H)

■ Characteristic curves (Cold start)

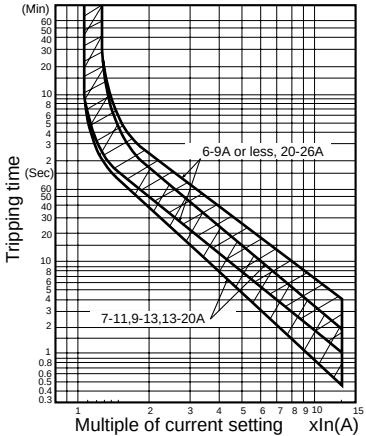
TR-0/3



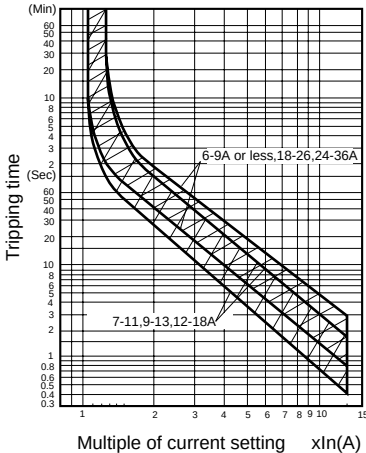
RCa3737-1CNF/3



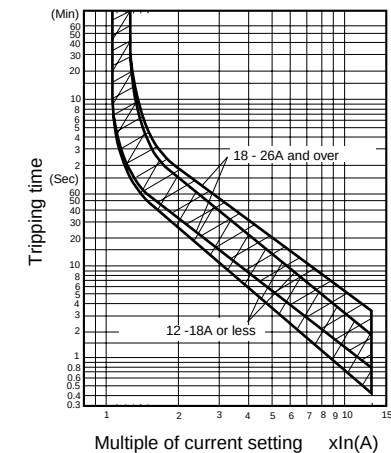
TR-1SN/3



TR-2NF/3



TR-3N/3



Magnetic motor starters with pushbuttons

Up to 4.5kW 440 Volts 3-phase

Description

FW series magnetic motor starter is provided with square-shaped ON-OFF pushbuttons. Internal wirings are connected. The starter is housed in a plastic enclosure. The two operating buttons are color-coded; green for ON and red for OFF. Thermal overload relay is fitted with 2 or 3-element and is of manual reset type.

Ordering information

Specify the following:

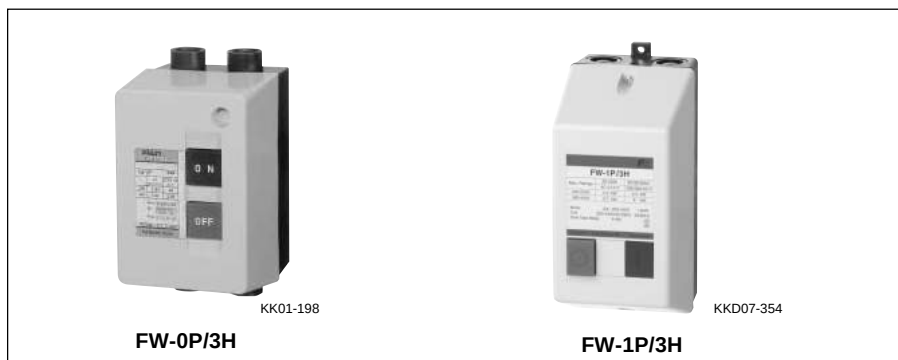
1. Ordering code
 2. Operating coil voltage
 3. Main circuit voltage.
 4. Overload relay setting range code
- See page 01/86.

Performance data

Same as FW series. See page 01/84.

Characteristic curves (Cold start)

See page 01/86.



Types and ratings

Max. motor capacity (kW)		Operational current (A)		2-thermal element		3-thermal element	
3-phase		200-240V		Type	Ordering code	Type	Ordering code
200-240V	380-440V	12	6	FW-0P	SF12BPAN-■10T□	FW-0P/3H	SF12BPAN-■10T□D
3.0	2.5	15	10	FW-0SP	SF15BPAN-■10T□	FW-0SP/3H	SF15BPAN-■10T□D
3.5	4.5						
5.5	5.5	20	13	FW-1P	SF20BPAN-■11T□	FW-1P/3H	SF20BPAN-■11T□D
3.0	2.5	12	6	FW-0PL	SF12BKAN-■10T□	FW-0PL/3H	SF12BKAN-■10T□D
3.5	4.5	15	10	FW-0SPL	SF15BKAN-■10T□	FW-0SPL/3H	SF15BKAN-■10T□D

Notes: Auxiliary contact 1NC is available on request. (0P)

Conforming to IEC 60947-4-1 AC-3.

■: Enter the operating coil voltage code.

□: Enter the thermal overload relay ampere setting range code.

Thermal overload relay

Type	Setting range (A)	Contact	Starter type
TR-0 (2 or 3-element)	0.24–0.36, 0.48–0.72, 0.8–1.2, 0.95–1.45 1.4–2.2, 1.7–2.6, 2.8–4.2, 4–6, 5–8, 6–9 7–11, 9–13	SPDT 95 — 96 — 98	FW-0P, FW-0P/3H, FW-0PL, FW-0PL/3H, FW-0SP, FW-0SP/3H
TR-5-1N (2 or 3-element)	4–6, 5–8, 6–9, 7–11, 9–13, 12–18	SPDT 95 — 96 97 — 98	FW-1P, FW-1P/3H

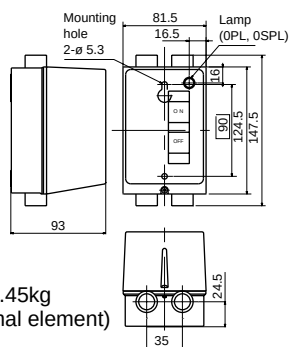
Note: Maximum setting ranges at 440V AC for starter use:

TR-0: 4-6A, RCa3737-1CNF: 8-16A

Dimensions, mm

FW-0P, 0PL, 0SP, 0SPL

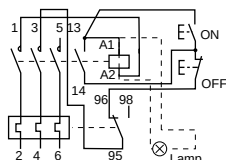
Plastic enclosure



Mass: 0.45kg
(3-thermal element)

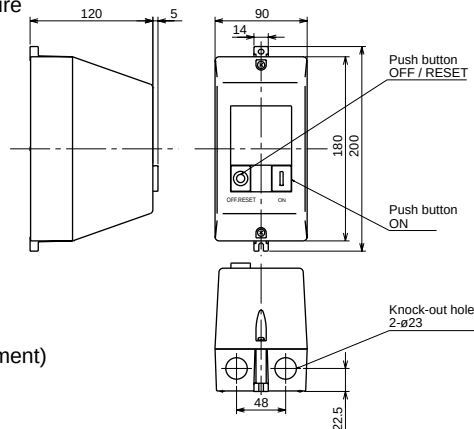
Wiring diagrams

FW-0P/3H, 0PL/3H, 0SP/3H, 0SPL/3H



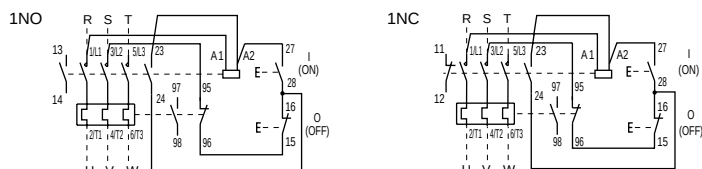
FW-1P

Plastic enclosure



Mass: 0.92kg
(3-thermal element)

FW-1P/3H



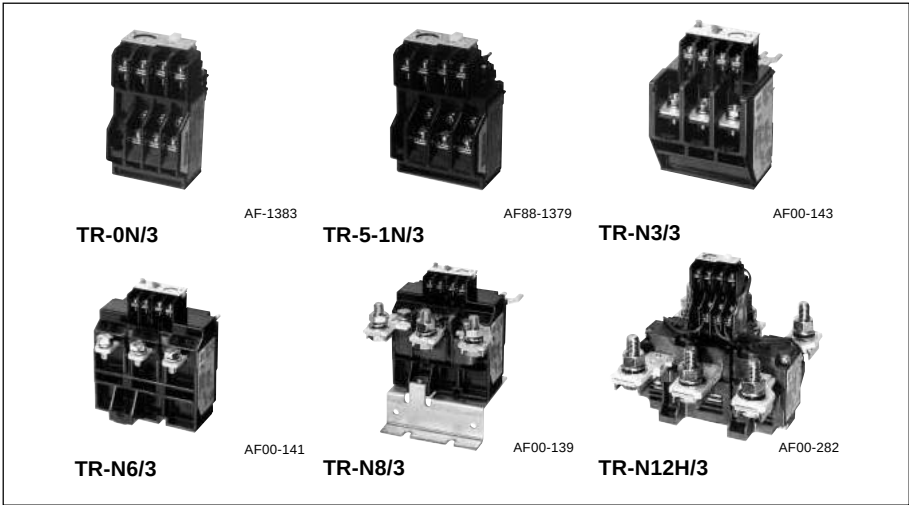
Thermal Overload Relays
TR series
General information

Standard type thermal overload relays

- Description
Highly reliable thermal overload relays
FUJI thermal overload relays are designed to provide overload protection to meet the thermal characteristics of low voltage induction motors.
Adjustable thermal overload relays give motors positive overcurrent protection. The starter contacts cannot be held closing under overload conditions. However, once the bimetal element has cooled, the reset button can be depressed and the motor can be restarted in the normal manner. Ordinarily this reset is carried out manually but the starter can be changed over to 'automatic reset' by means of a screw-driver.
FUJI thermal overload relay is subjected to stringent testing in the factory to check performance and actual values are calibrated with the markings on the adjustable dial. Consequently, they provide a positive protection.
Relays are also provided with ambient temperature compensators, so that their performance will be maintained in spite of temperature changes. The ambient temperature is regulated for 20°C.
The heater elements are available for either 2- or 3-pole use.

Long time operating type
In the case of loads having large inertia moments such as blowers, winders or centrifuges the starting time is extended. This will cause the standard-type thermal overload relay to operate during starting so isolating the motor. If necessary FUJI will supply thermal relays with saturable reactors. (Time-delay type).

Quick operating type overload relays
The windings of submersible pump and compressor motors normally have a smaller overload capacity than those of standard motors, since they are generally cooled by the water and other medium being pumped. Q type overload relays will operate more quickly than the standard type in the face of a locked rotor current.

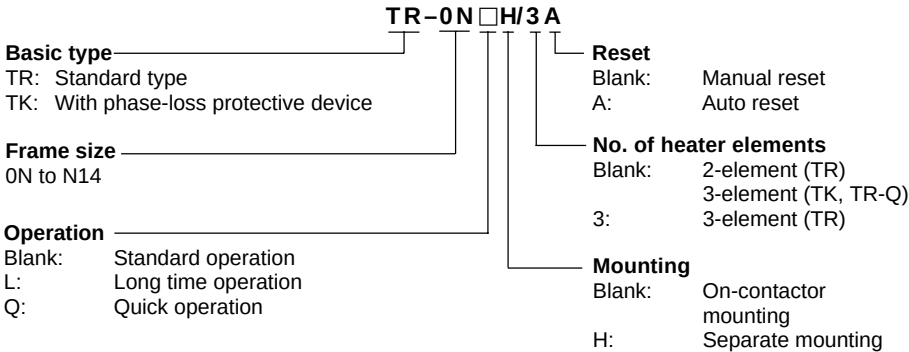


- Features
Isolated NO and NC contacts can be used with different potentials.
Gold-flashed silver contact assures high contact reliability (TR-0N/3 to N14/3).
Stable operating characteristics protect motors from burnout due to overload or locked rotor currents.
Easy setting of current value with a calibrated dial.
Both manual and auto reset available. A manual trip button is provided to facilitate sequence testing.
Mechanical trip indication
Trip-free mechanism is provided.
Reset release button and trip indicator are optional accessories.

Warning
All FUJI thermal overload relays have been tested and calibrated at the factory. They should not be tampered with or stripped down at the job site since this would affect their accuracy. A special feature of the FUJI starter series is the ease by which the relay current ratings can be varied to match the requirements of the load. The changeover is effected by simply turning a dial to the new value required. The range of adjustment is approximately 100%–125%–150% and details are given overleaf.

Ordering information
Specify the following:
1. Ordering code
2. Setting range code
See page 01/89.

Type number nomenclature



■ Ordering code system

T	R	2	0	B	N	W	—	T	A
①	②	③	④	⑤	⑥	⑦		⑧	⑨

① Product category

Description	Code
Thermal overload relay	T

② Series category

Description	Code
TR-N□ series	R

③④ Frame size

Frame size	Code	
	③	④
0N	1	3
5-1N	2	0
N2	3	5
N3	6	5
N5	9	3
N6	1	C
N7	1	F
N8	1	J
N10	2	C
N12	4	A
N14	6	A

⑤ Index

Type	Code
TR-0N, 5-1N	Blank
TR-N2 to N14	B

⑥ Version

Description	No. of element	Code
Standard	2 3	N D
Long time operation	2 3	L F
Quick operation	3	S
With phase-loss	3	E

⑦ Mounting

Description	Code
On-contactor mounting	W
Separate mounting	H

⑨ Reset

Description	Code
Manual reset	Blank
Auto reaset	A

⑧ Thermal overload relay
ampere setting range

Ampere setting range (A)	Code
0.1 — 0.15	A
0.13 — 0.2	B
0.15 — 0.24	C
0.2 — 0.3	D
0.24 — 0.36	E
0.3 — 0.45	F
0.36 — 0.54	G
0.48 — 0.72	H
0.64 — 0.96	J
0.8 — 1.2	K
0.95 — 1.45	L
1.4 — 2.2	M
1.7 — 2.6	N
2.2 — 3.4	P
2.8 — 4.2	R
4 — 6	S
5 — 8	T
6 — 9	U
7 — 11	V
9 — 13	W
12 — 18	X
16 — 22	Q
18 — 26	B
24 — 36	E
28 — 40	F
32 — 42	I
34 — 50	G
45 — 65	J
48 — 68	O
53 — 80	L
65 — 95	M
85 — 105	I
85 — 125	N
110 — 160	P
125 — 185	R
160 — 240	S
200 — 300	T
240 — 360	U
300 — 450	V
400 — 600	W

Ordering example

① Thermal overload relay	T
② TR-N□ series	R
③④ Frame size: 5-1N	20
⑤ Index	Blank
⑥ Standard type, 3-element	D
⑦ On-contactor mounting	W
⑧ Ampere setting range 4-6A	S
⑨ Auto reset	A

TR20DW-SA

① Thermal overload relay	T
② TR-N□ series	R
③④ Frame size: N3	65
⑤ Index	B
⑥ With phase-loss protection	E
⑦ On-contactor mounting	W
⑧ Ampere setting range 24-36A	E
⑨ Manual reset	Blank

TR65BEW-E

Thermal Overload Relays

TR series

■ Features

● Manual trip

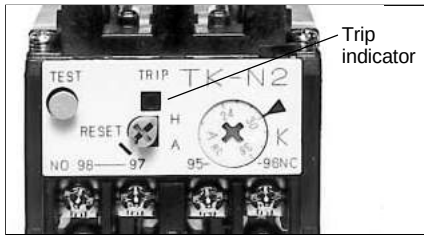
These relays can be manually tripped for sequence inspection by pressing manual trip bar (TR-0N/3, TR-5-1N/3). A sequence inspection will be performed when the test button is pulled out. When the test button is pressed in, only the NC contact will turn OFF. The original status will be restored when the test button is then released. (TR-N2/3 to N8/3)

● Trip-free mechanism

Even if the reset button is carelessly pressed, this relay trips without trouble (Trip-free mechanism).

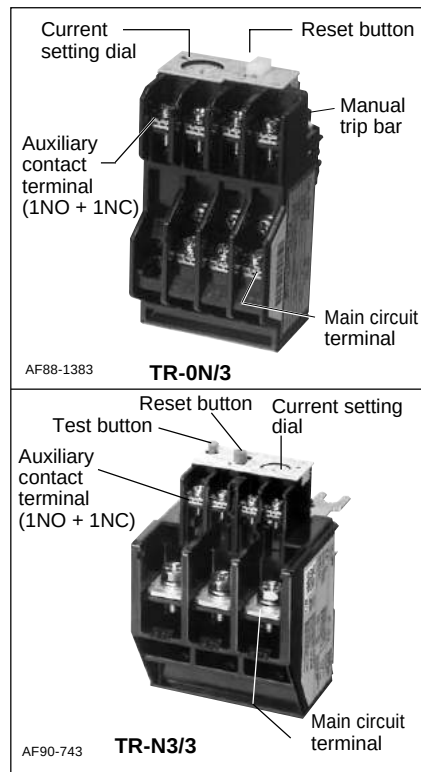
● Easy visual checking of operating status

Trip indicator and manual trip bar permit visual check of tripping status.



● Dial ampere setting

The setting dial uses a RC (Rated Current) marking which is set to the motor full load current.



■ Versatile optional accessories

Trip indicator



Reset release



Base unit for separate mounting



■ Optional accessories

Description			Type	Ordering code	Used with thermal overload relay
Reset release	Lead length	300 mm 500 mm 700 mm	SZ-R1 SZ-R2 SZ-R3	TZ1R1 TZ1R2 TZ1R3	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N
You can reset these relays remotely on the front panels of switchboards.	Lead length	300 mm 500 mm 700 mm	SZ-R4 SZ-R5 SZ-R6	TZ2R4 TZ2R5 TZ2R6	TR-N10 to N14, TK-N10 to N14
Trip indicator	100–110V AC 50/60Hz 200–220V AC 50/60Hz		SZ-L100 SZ-L200	TZ1L100 TZ1L200	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N TR-N10 to N14, TK-N10 to N14
Easier checking of trip status	100–110V AC 50/60Hz 200–220V AC 50/60Hz		SZ-L100N2 SZ-L200N2	TZ2L100N2 TZ2L200N2	TR-N2/3 to N8/3, TK-N2 to N8
Dial cover For protection against the current setting being changed in error			SZ-DA	SZ1DA	TR-0N/3, TR-5-1N/3, TK-0N, TK-5-1N TR-N2/3 to N14/3, TK-N2 to N14
Base unit for separate mounting			SZ-HB	TZ1HB	TR-0N/3, TK-0N
The unit can be screw-mounted and rail-mounted.			SZ-HC	TZ1HC	TR-5-1N/3, TK-5-1N
			SZ-HD	TZ2HD	TR-N2/3, TK-N2
			SZ-HE	TZ2HE	TR-N3/3, TK-N3
Terminal cover			SZ-T10	SZ1T10	Base unit for separate mounting SZ-HB
			SZ-T11	SZ1T11	Base unit for separate mounting SZ-HC
			SZ-T14	SZ2T14	For separate mounting TR-N2H/3, TK-N2H
			SZ-T15	SZ2T15	For separate mounting TR-N3H/3, TK-N3H
			SZ-RN6T	SZ2RN6T	For separate mounting TR-N6H/3, TK-N6H
			SZ-T12	TZ1T12	TR-0N/3, TK-0N
			SZ-T13	TZ1T13	TR-5-1N/3, TK-5-1N
			SZ-T16	SZ2T16	TR-N2/3, TK-N2
			SZ-T17	SZ2T17	TR-N3/3, TK-N2

■ Selection guide/Standard type

On-contactor mounting		3-element	TR-0N/3 (TR13DW) TR-0N (TR13NW)		TR-5-1N/3 (TR20DW) TR-5-1N (TR20NW)		TR-N2/3 (TR35BDW) TR-N2 (TR35BNW)		TR-N3/3 (TR65BDW) TR-N3 (TR65BNW)	
Separate mounting		3-element	TR-0NH/3 (TR13DH) TR-0NH (TR13NH)		TR-5-1NH/3 (TR20DH) TR-5-1NH (TR20NH)		TR-N2H/3 (TR35BDH) TR-N2H (TR35BNH)		TR-N3H/3 (TR65BDW) TR-N3H (TR65BNW)	
Contactor to be combined			SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2	SC-N2S	SC-N3
Ampere setting range (A)	Code	A	0.1 – 0.15	0.1 – 0.15	0.1 – 0.15	0.1 – 0.15				
		B	0.13 – 0.2	0.13 – 0.2	0.13 – 0.2	0.13 – 0.2				
		C	0.15 – 0.24	0.15 – 0.24	0.15 – 0.24	0.15 – 0.24				
		D	0.2 – 0.3	0.2 – 0.3	0.2 – 0.3	0.2 – 0.3				
		E	0.24 – 0.36	0.24 – 0.36	0.24 – 0.36	0.24 – 0.36				
		F	0.3 – 0.45	0.3 – 0.45	0.3 – 0.45	0.3 – 0.45				
		G	0.36 – 0.54	0.36 – 0.54	0.36 – 0.54	0.36 – 0.54				
		H	0.48 – 0.72	0.48 – 0.72	0.48 – 0.72	0.48 – 0.72				
		J	0.64 – 0.96	0.64 – 0.96	0.64 – 0.96	0.64 – 0.96				
Specify the setting range code when ordering.	K	0.8 – 1.2	0.8 – 1.2	0.8 – 1.2	0.8 – 1.2					
	L	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45					
	M	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2					
	N	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6					
	P	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4					
	R	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2					
	S	4 – 6	4 – 6	4 – 6	4 – 6					
	T	5 – 8	5 – 8	5 – 8	5 – 8	4 – 6	4 – 6			
	U	6 – 9	6 – 9	6 – 9	6 – 9	5 – 8	5 – 8			
	V	7 – 11	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9			
	W		7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	
	X		9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	
	Q			12 – 18	12 – 18	12 – 18	12 – 18	12 – 18	12 – 18	
	B				16 – 22					
	E					18 – 26	18 – 26	18 – 26	18 – 26	
	F					24 – 36	24 – 36	24 – 36	24 – 36	
	I						32 – 42	28 – 40	28 – 40	
	G							34 – 50	34 – 50	
	J							45 – 65	45 – 65	
O								48 – 68		
L								53 – 80*		
M								65 – 95*		
I								85 – 105*		

On-contactor mounting	3-element	TR-N5/3 (TR80BDW)		TR-N6/3 (TR1CBDW)	TR-N7/3 (TR1FBDW)	TR-N8/3 (TR1JBDW)	TR-N10/3 (TR2CBDW)	TR-N12/3 (TR4ABDW)		TR-N14/3 (TR8ABDW)	
	2-element	TR-N5 (TR80BNW)		TR-N6 (TR1CBNW)	TR-N7 (TR1FBNW)	TR-N8 (TR1JBNW)	TR-N10 (TR2CBNW)	TR-N12 (TR4ABNW)		TR-N14 (TR8ABNW)	
Separate mounting	3-element	–		TR-N6H/3 (TR1CBDW)	–	–	TR-N10H/3 (TR2CBDH)	TR-N12H/3 (TR4ABDH)		TR-N14H/3 (TR8ABDH)	
	2-element	–		TR-N6H (TR1CBNW)	–	–	TR-N10H (TR2CBNH)	TR-N12H (TR4ABNH)		TR-N14H (TR8ABNH)	
Contactor to be combined		SC-N4	SC-N5A	SC-N6	SC-N7	SC-N8	SC-N10	SC-N11	SC-N12	SC-N14	
Ampere setting range (A)	Code	B	18 – 26	18 – 26							
		E	24 – 36	24 – 36							
		F	28 – 40	28 – 40							
		G	34 – 50	34 – 50							
		J	45 – 65	45 – 65	45 – 65	45 – 65					
		L	53 – 80	53 – 80	53 – 80	53 – 80					
		M		65 – 95	65 – 95	65 – 95	65 – 95				
		I		85 – 105							
		N			85 – 125	85 – 125	85 – 125	85 – 125			
		P			110 – 160*	110 – 160	110 – 160	110 – 160	110 – 160	110 – 160	
		R					125 – 185	125 – 185	125 – 185	125 – 185	
		S						160 – 240	160 – 240	160 – 240	
		T							200 – 300	200 – 300	
U								240 – 360	240 – 360		
V								300 – 450	300 – 450		
W									400 – 600		

Notes: • TR-N10/3 to N14/3 types are provided with CTs.
• Max. setting ranges of these starters are as shown in the table on the right.
• When ordering the thermal overload relays for starter use, select the applicable setting range.
(): Basic ordering code (When ordering phase-loss protective type, enter the version code E instead of D)
*: Separate mounting only

Motor starter	Maximum applicable heater range (A) 200–240V	380–440V
SW-03/3H	7–11	6–9
SW-4-0/3H	12–18	12–18
SW-N1/3H	24–36	24–36
SW-N2S/3H	34–50	34–50
SW-N4/3H	53–80	53–80
SW-N6/3H	85–125	85–125

Thermal Overload Relays

TR series

Long time operating type

■ Selection guide/Long time operating type

On-contactor mounting	3-element	–		–		TR-N2L/3 (TR35BFW) TR-N2L (TR35BLW)		TR-N3L/3 (TR65BFW) TR-N3L (TR65BLW)		
	2-element	–		–						
Separate mounting	3-element	TR-0NLH/3 (TR13FH)		TR-5-1NLH/3 (TR20FH)		TR-N2LH/3 (TR35BFH)		TR-N3LH/3 (TR65BFH)		
	2-element	TR-0NLH (TR13LH)		TR-5-1NLH (TR20LH)		TR-N2LH (TR35BLH)		TR-N3LH (TR65BLH)		
Contactor to be combined		SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2	SC-N2S	SC-N3	
Ampere setting range (A)	Code	L	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45	0.95 – 1.45				
		M	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2	1.4 – 2.2				
		N	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6	1.7 – 2.6				
		P	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4	2.2 – 3.4				
		R	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2	2.8 – 4.2				
		S	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6	4 – 6		
		T	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8		
		U	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9	6 – 9		
		V	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11	7 – 11
		W		9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13	9 – 13
		X			12 – 18	12 – 18	12 – 18	12 – 18	12 – 18	12 – 18
		B					18 – 26	18 – 26	18 – 26	18 – 26
		E						24 – 36	24 – 36	24 – 36
		F							28 – 40	28 – 40
		G							34 – 50	34 – 50
		J								45 – 65
L								53 – 80*		
M								65 – 95*		

On-contactor mounting	3-element	TR-N5L/3 (TR80BFW)		TR-N6L/3 (TR1CBFW)	TR-N7L/3 (TR1FBFW)	TR-N10L/3 (TR2CBFW)		TR-N12L/3 (TR4ABFW)		TR-N14L/3 (TR8ABFW)
	2-element	TR-N5L (TR80BLW)		TR-N6L (TR1CBLW)	TR-N7L (TR1FBLW)	TR-N10L (TR2CBLW)		TR-N12L (TR4ABLW)		TR-N14L (TR8ABLW)
Separate mounting	3-element	–		TR-N6LH/3 (TR1CBFH)	–	TR-N10LH/3 (TR2CBFH)		TR-N12LH/3 (TR4ABFH)		TR-N14LH/3 (TR8ABFH)
	2-element	–		TR-N6LH (TR1CBLH)	–	TR-N10LH (TR2CBLH)		TR-N12LH (TR4ABLH)		TR-N14LH (TR8ABLH)
Contactor to be combined		SC-N4	SC-N5A	SC-N6	SC-N7	SC-N8	SC-N10	SC-N11	SC-N12	SC-N14
Ampere setting range (A) <										

Notes: Maximum setting ranges of the these starters are as shown in the table below.

Select the applicable setting range when ordering the thermal overload relays for starter use.

(): Basic ordering code

*: Separate mounting only

Motor starter	Maximum applicable heater range (A)	
	200–240V	380–440V
SW-03/2L, 3L	7–11	6–9
SW-N2S/2L, 3L	34–50	34–50
SW-N4/2L, 3L	53–80	53–80
SW-N6/2L, 3L	85–125	85–125

■ Selection guide/Quick operating type

On-contactor mounting	3-element	TR-0NQ (TR13SW)		TR-5-1NQ (TR20SW)		TR-N2Q (TR35BSW)	
Separate mounting	3-element	—		—		—	
Contactor to be combined		SC-03	SC-0 SC-05	SC-4-0	SC-4-1 SC-5-1	SC-N1	SC-N2
Rated operational current (A)		200–240V 380–440V	11 9	13 12	18 16	22 22	27 30 39 37
Ampere setting range (A)		Code	M	N	P	R	S
			1.4 – 2.2	1.7 – 2.6	2.2 – 3.4	2.8 – 4.2	4 – 6
			1.7 – 2.6	2.2 – 3.4	2.8 – 4.2	4 – 6	5 – 8
			2.2 – 3.4	2.8 – 4.2	4 – 6	5 – 8	6 – 9
			2.8 – 4.2	4 – 6	5 – 8	6 – 9	7 – 11 * ¹
			4 – 6	5 – 8	6 – 9	7 – 11 * ¹	9 – 13 * ¹
			5 – 8	6 – 9	7 – 11 * ¹	9 – 13 * ¹	12 – 18
			6 – 9	7 – 11 * ¹	9 – 13 * ¹	12 – 18	18 – 26
			7 – 11 * ¹	9 – 13 * ¹	12 – 18	18 – 26	24 – 36
			9 – 13 * ¹	12 – 18	18 – 26	24 – 36	
			12 – 18	18 – 26	24 – 36		
			18 – 26	24 – 36			
			24 – 36				

On-contactor mounting	3-element	TR-N3Q (TR65BSW)		TR-N5Q (TR80SW)	
Separate mounting	3-element	TR-N3Q (TR65BSW)		—	
Contactor to be combined		SC-N2S	SC-N3	SC-N4	SC-N5A
Rated operational current (A)		200–240V 380–440V	52 48	65 65	80 80 105 105
Ampere setting range (A)		Code	B	E	F
			18–26	24–36	28–40
			24–36	28–40	34–50
			28–40	34–50	45–65
			34–50	45–65	53–80
			45–65	53–80	65–95
			53–80	65–95	
			65–95		

Notes: *¹ Thermal overload relay with phase-loss protection is available with *¹ marked setting ranges of TR-0NQ, TR-5-1NQ and all setting ranges of TR-N2Q to N5Q.

Type numbers are TK-0NQ, TK-5-1NQ, TK-N2Q to N5Q. The setting ranges of these TK-□Q type relays are as same as those of the above setting ranges.

*² Separate mounting only.

() Basic ordering code

■ Ratings of auxiliary contact

Type	Rated thermal current (A)	Rated voltage (V)	Rated AC operational current (A)	Rated DC operational current (A)
TR-0N, 5-1N TR-0N/3, 5-1N/3 TK-0N, 5-1N TR-0NQ, 5-1NQ	3	24 100-120 200-240 380-440 500-600	3 (0.3)* 2.5 (0.3)* 2 (0.3)* 1 (0.3)* 0.6 (0.3)*	1.1 (0.3)* 0.28 0.14 — —
TR-N2 to N8 TR-N2/3 to N8/3 TK-N2 to N8 TR-N2Q to N5Q	5	24 100-120 200-240 380-440 500-600	3 (0.5)* 2.5 (0.5)* 2 (0.5)* 1 (0.5)* 0.6 (0.5)*	1.1 (0.3)* 0.28 0.14 — —
TR-N10 to N14 TR-N10/3 to N14/3 TK-N10 to N14	5	24 100-120 200-240 380-440 500-600	3 (0.3)* 2.5 (0.3)* 2 (0.3)* 1 (0.3)* 0.6 (0.3)*	1.1 (0.3)* 0.28 0.14 — —

Notes: Conforming to Class AC-15, DC-13, IEC, JIS, and JEM.

() * NO contact of auto reset type.

Thermal Overload Relays

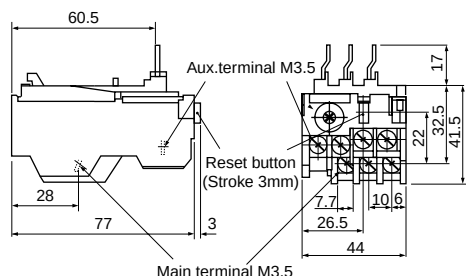
TR series

■ Dimensions, mm

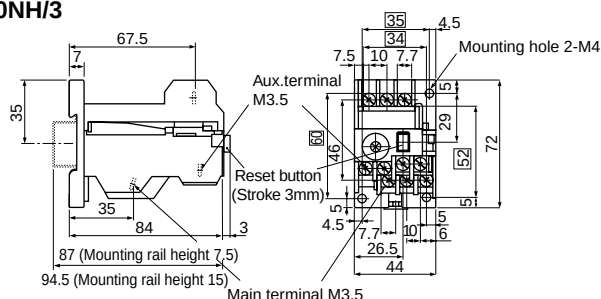
Standard and quick operating types

TR-0N/3, TR-0NQ

On-contactor mounting

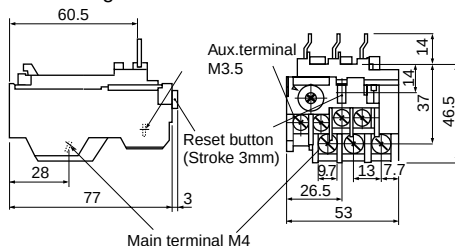


TR-0NH/3

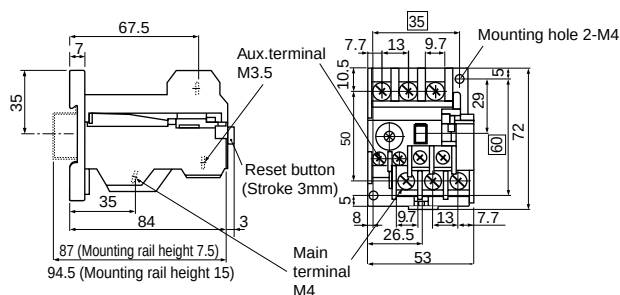


TR-5-1N/3, TR-5-1NQ

On-contactor mounting

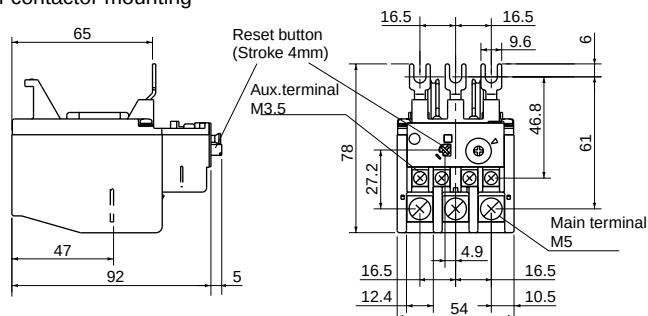


TR-5-1NH/3

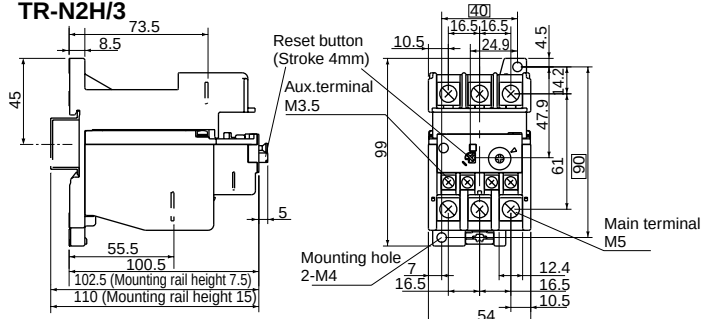


TR-N2/3, TR-N2Q

On-contactor mounting

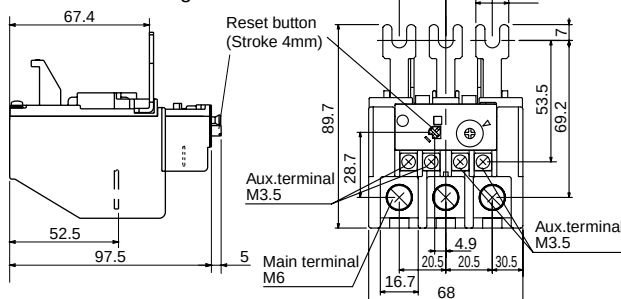


TR-N2H/3

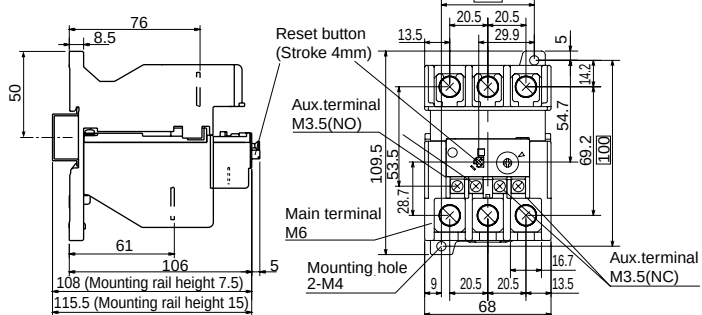


TR-N3/3, TR-N3Q

On-contactor mounting

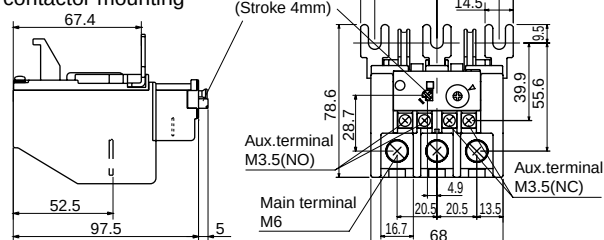


TR-N3H/3



TR-N5/3, TR-N5Q

On-contactor mounting

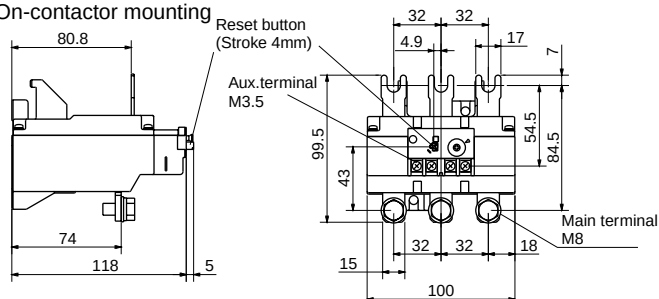


□ : Mounting pitch
Mass: See page 01/96.

■ Dimensions, mm Standard and quick operating types

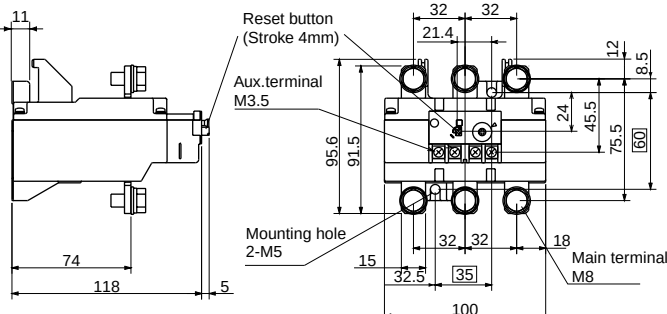
TR-6N/3

On-contactor mounting



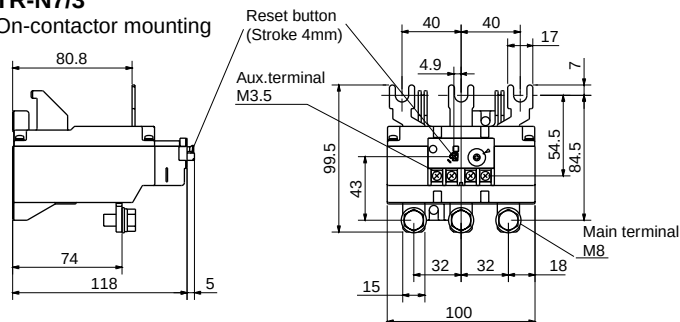
TR-N6H/3

On-contactor mounting



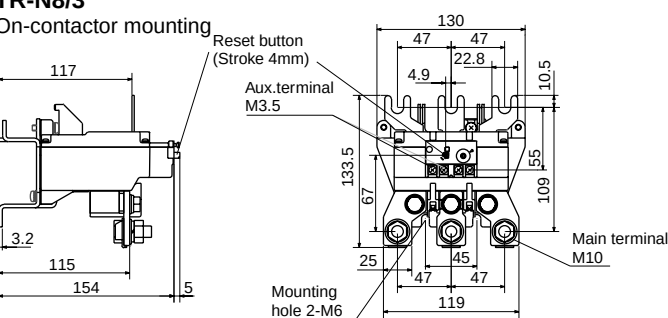
TR-N7/3

On-contactor mounting



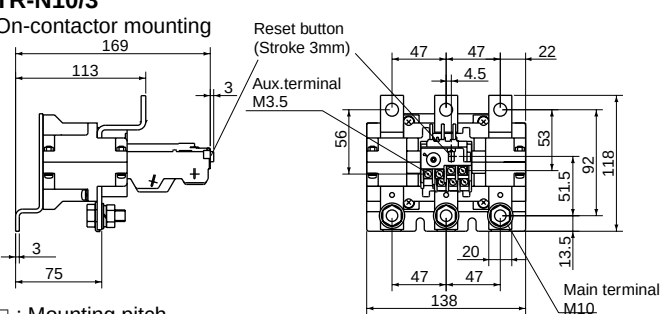
TR-N8/3

On-contactor mounting



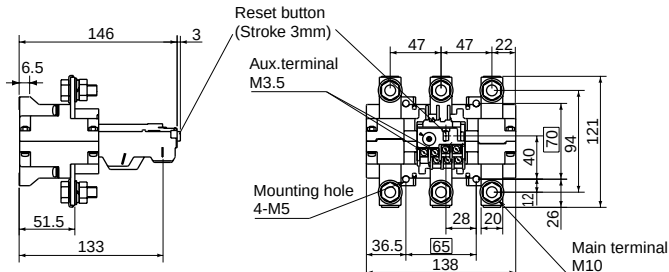
TR-N10/3

On-contactor mounting



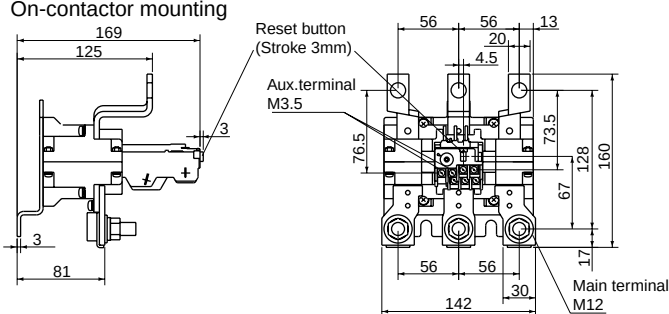
TR-N10H/3

On-contactor mounting



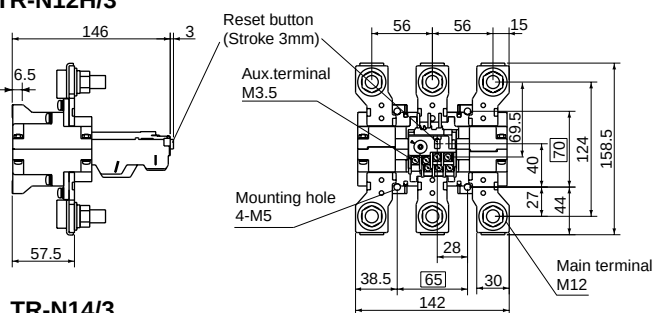
TR-N12/3

On-contactor mounting



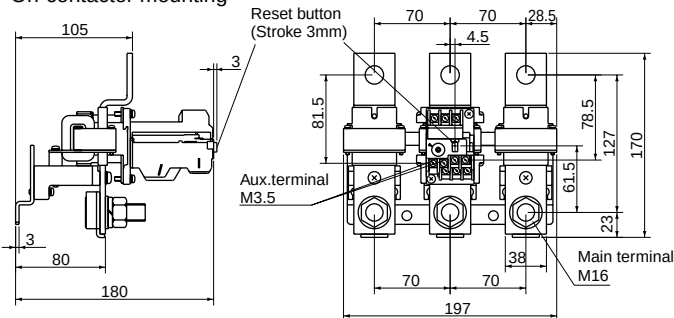
TR-N12H/3

On-contactor mounting



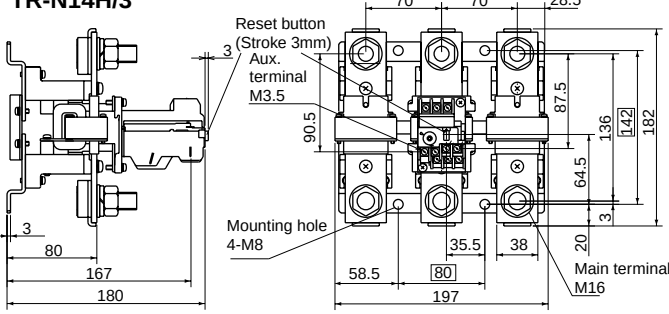
TR-N14/3

On-contactor mounting



TR-N14H/3

On-contactor mounting



□ : Mounting pitch

Mass: See page 01/96.

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Information subject to change without notice

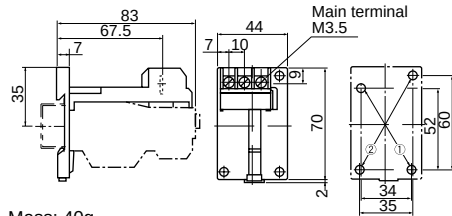
Thermal Overload Relays

TR series

■ Dimensions, mm

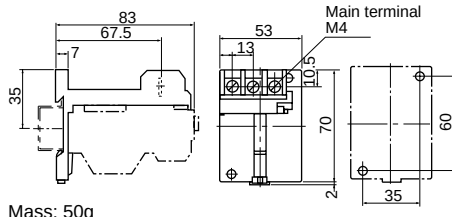
Base unit for separate mounting

SZ-HB



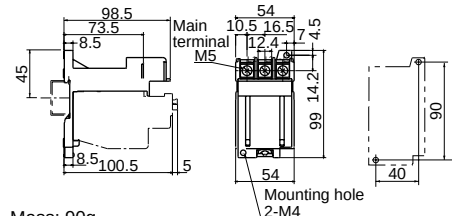
Mass: 40g

SZ-HC



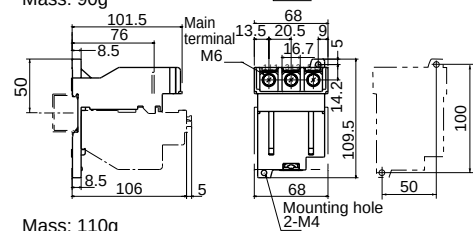
Mass: 50g

SZ-HD



Mass: 90g

SZ-HE



Mass: 110g

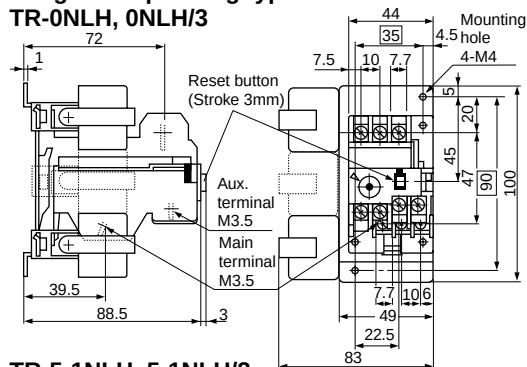
■ Mass/Standard and quick operating types

On-contactor mounting Type	Mass	Separate mounting Type	Mass	On-contactor mounting Type	Mass	Separate mounting Type	Mass
TR-0N	0.09kg	TR-0NH	0.13kg	TR-N7	0.61kg	—	—
TR-0N/3	0.10kg	TR-0NH/3	0.14kg	TR-N7/3	0.61kg	—	—
TR-0NQ	0.10kg	—	—	—	—	—	—
TR-5-1N	0.11kg	TR-5-1NH	0.16kg	TR-N8	1.2kg	—	—
TR-5-1N/3	0.12kg	TR-5-1NH/3	0.17kg	TR-N8/3	1.2kg	—	—
TR-5-1NQ	0.12kg	—	—	—	—	—	—
TR-N2, N2/3	0.2kg	TR-N2H	0.29kg	TR-N10	1.85kg	TR-10NH	1.5kg
TR-N2Q	0.2kg	TR-N2H/3	0.29kg	TR-N10/3	1.85kg	TR-10NH/3	1.5kg
TR-N3, N3/3	0.27kg	TR-N3H, N3H/3	0.38kg	TR-N12, N12/3	2.3kg	TR-12NH, 12NH/3	2.25kg
TR-N3Q	0.27kg	—	—	—	—	—	—
TR-N5, N5/3	0.27kg	—	—	TR-N14, N14/3	3.5kg	TR-14NH, 14NH/3	4kg
TR-N5Q	0.27kg	—	—	—	—	—	—
TR-N6, N6/3	0.61kg	TR-N6H, N6H/3	0.67kg	—	—	—	—

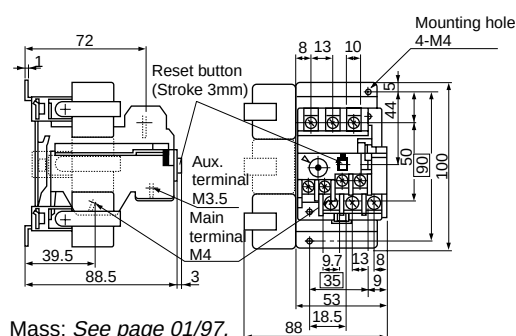
■ Dimensions, mm

Long time operating type

TR-0NLH, 0NLH/3



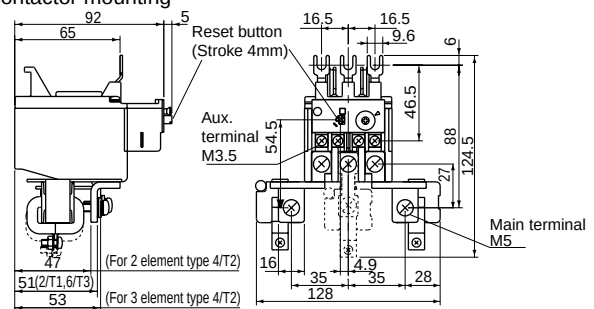
TR-5-1NLH, 5-1NLH/3



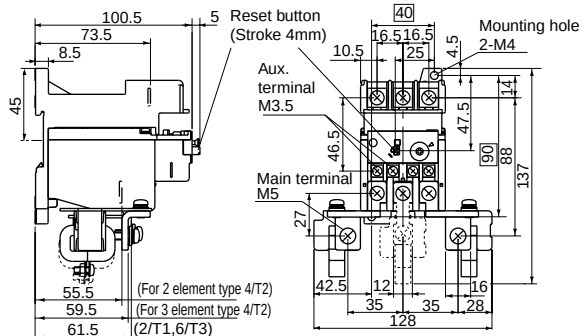
Mass: See page 01/97.

TR-N2L, N2L/3

On-contactor mounting



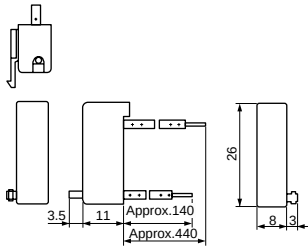
TR-N2LH, N2LH/3



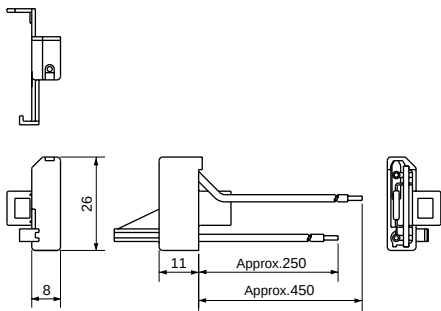
Thermal Overload Relays
TR series

■ Dimensions, mm
Optional accessories
Trip indicator

SZ-L100
SZ-L200

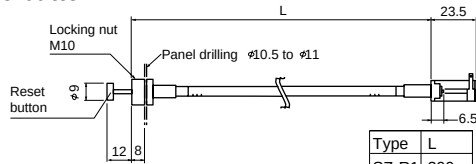


SZ-L100N2
SZ-L200N2



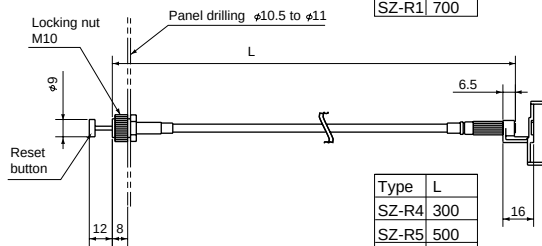
Reset release button

SZ-R1
SZ-R2
SZ-R3



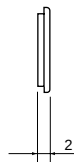
Type	L
SZ-R1	300
SZ-R1	500
SZ-R1	700

SZ-R4
SZ-R5
SZ-R6



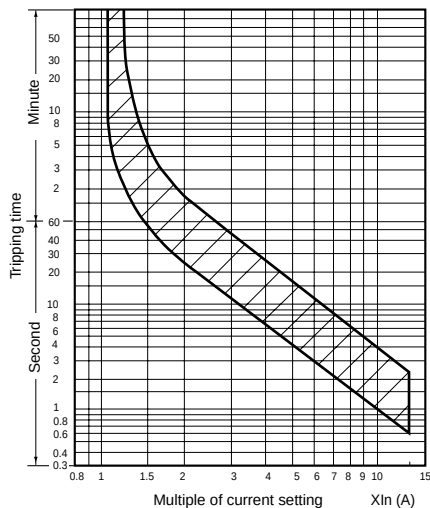
Type	L
SZ-R4	300
SZ-R5	500
SZ-R6	700

Dial cover
SZ-DA

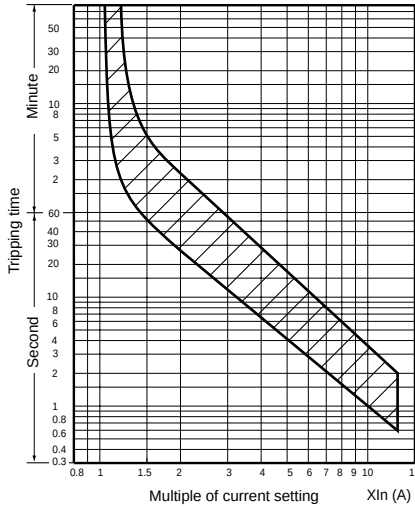


■ Characteristic curves These curves show cold starting characteristics.

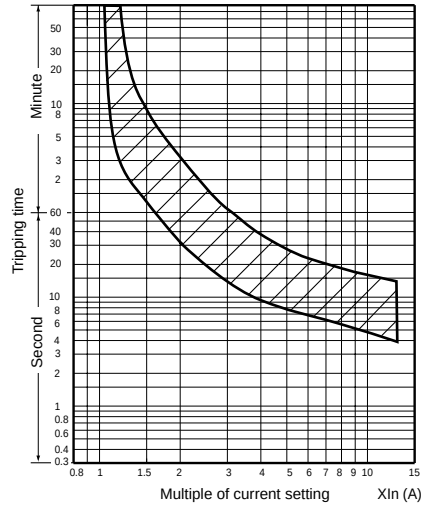
● Standard type
TR-0N, 5-1N,
TR-0N/3, 5-1N/3,
TR-0NH, 5-1NH,
TR-0NH/3, 5-1NH/3



TR-N2 to N8
TR-N2/3 to N8/3
TR-N2H, N3H, N6H
TR-N2H/3, N3H/3, N6H/3



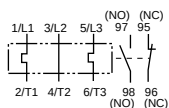
TR-N10 to N14,
TR-N10/3 to N14/3,
TR-N10H to N14H
TR-N10H/3 to N14H/3



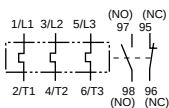
■ Wiring diagrams

● Standard type
TR-0N to N8
TR-0N/3 to N8/3
TR-0NH, 5-1NH, N2H, N3H, N6H
TR-0NH/3, 5-1NH/3, N2H/3, N3H/3, N6H/3

2-element

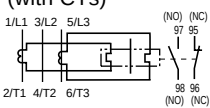


3-element

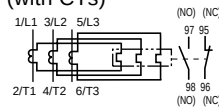


TR-N10 to N14
TR-N10/3 to N14/3
TR-N10H to N14H
TR-N10H/3 to N14H/3

2-element
(with CTs)



3-element
(with CTs)



■ **Characteristic curves** These curves show cold starting characteristics

● **Long time operating type** (When setting at the center dial current)

TR-0NL, 5-1NL

TR-0NL/3, 5-1NL/3

TR-0NLH, 5-1NLH

TR-0NLH/3, 5-1NLH/3

TR-N2L to N7L

TR-N2L/3 to N7L/3

TR-N2LH, N3LH, N6LH

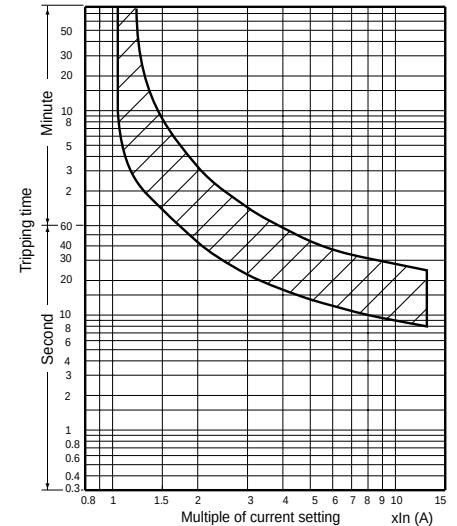
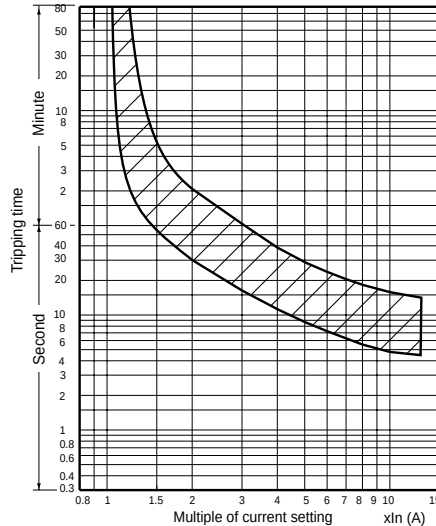
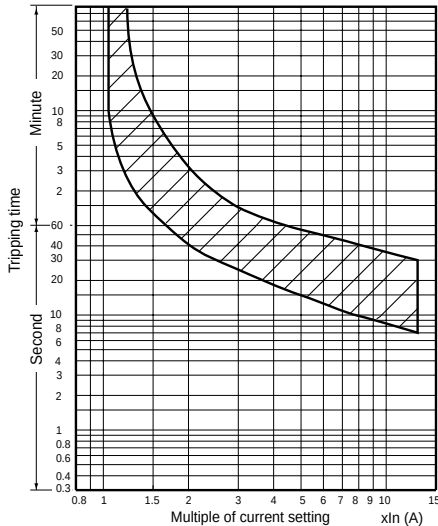
TR-N2LH/3, N3LH/3, N6LH/3

TR-N10L to N14L

TR-N10L/3 to N14L/3

TR-N10LH to N14LH

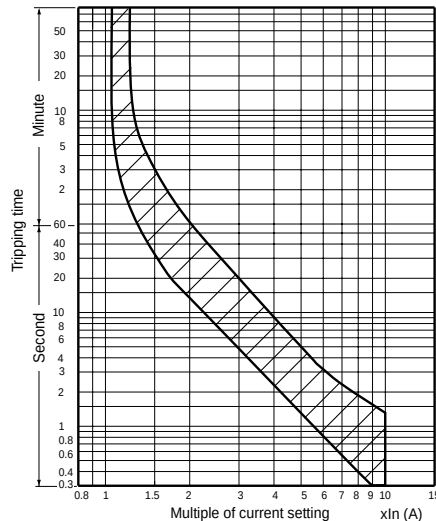
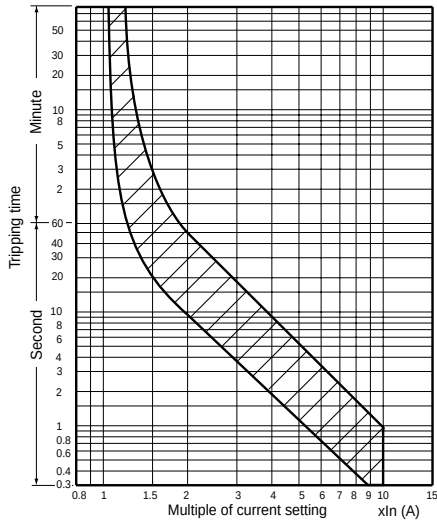
TR-N10LH/3 to N14LH/3



● **Quick operating type**

TR-0NQ, 5-1NQ

TR-N2Q, N3Q, N5Q



■ **Wiring diagrams**

● **Long time operating type**

TR-0NL to N7L

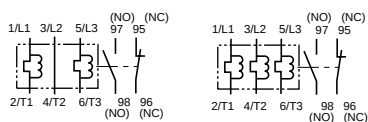
TR-0NL/3 to N7L/3

TR-0NLH, 5-1NLH, N2LH, N3LH, N6LH

TR-0NLH/3, 5-1NLH/3, N2LH/3, N3LH/3, N6LH/3

2-element

3-element



TR-N10L to N14L

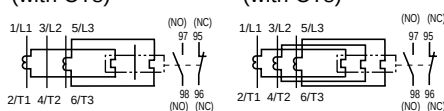
TR-N10L/3 to N14L/3

TR-N10LH to N14LH

TR-N10LH/3 to N14LH/3

2-element
(with CTs)

3-element
(with CTs)

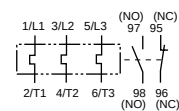


● **Quick operating type**

TR-0NQ, 5-1NQ

TR-N2Q, N3Q, N5Q

3-element

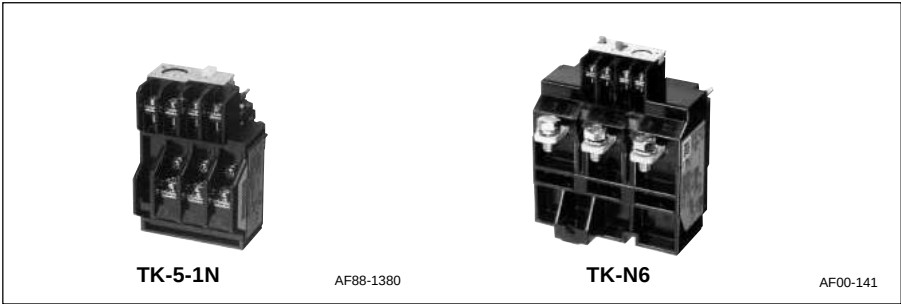


Thermal Overload Relays
TK series
With phase-loss protective device

Thermal overload relays with
phase-loss protective device

■ Description
FUJI TK series consists of a 3-heater element thermal overload relay and an phase-loss protective device. These two elements are assembled to make the relay unit. The overload relay characteristics are designed to meet the thermal characteristics of a squirrel-cage motors at the time of overload. A FUJI ADL mechanism is also provided to protect from phase-loss. This ADL mechanism is incorporated with the overload relay. The characteristics are coordinated with the temperature rise curve in stator winding at the time of motor phase-loss. They respond quickly to overloads. Other features include the following.

■ Characteristics
The operating characteristics of a thermal overload relays represents its tripping time and response current starting from cold or hot state.



A trip-free mechanism, wide-range dial ampere adjustment, manual/auto reset chageover lever, operating indicator, and ambient temperature compensators. Types are available ranging from TK-0N to TK-N14.

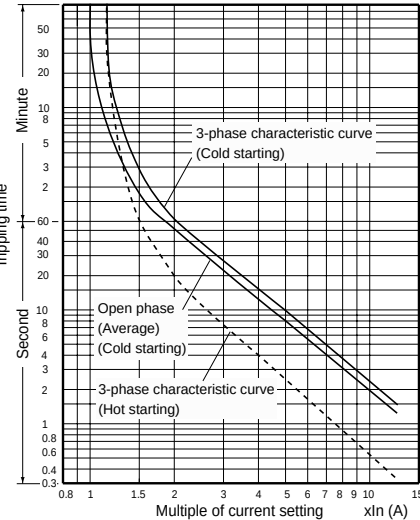
■ Ordering information
Specify the following:
1. Ordering code
See pages 01/89.

Cold starting characteristics
In cold starting, tripping time is measured from the time when the temperature of the thermal overload relay is equal to the ambient temperature.

Hot starting characteristics
In hot starting, tripping time is measured from the time when the thermal overload relay reaches the steady state after non-tripping current flows two hours.

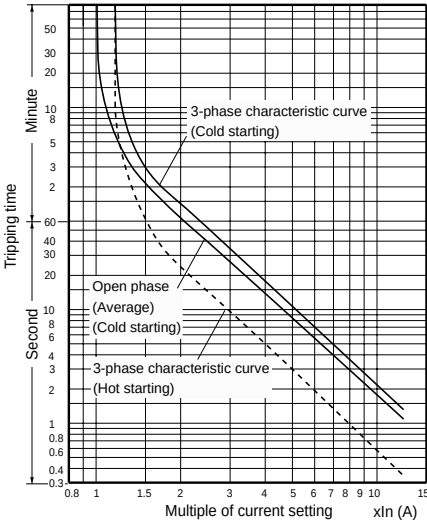
Table with 4 main columns: Standard, When all poles are equally energized, When all poles are not equally energized, and Ambient temp. It details IEC 60947-4-1 specifications for various relay classes and energization scenarios.

TK-0N, 5-1N
TK-0NH, 5-1NH



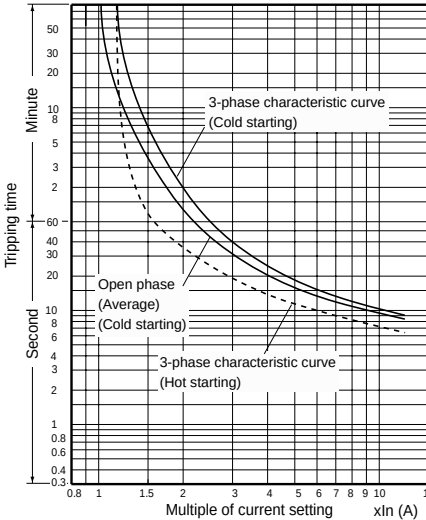
■ Dimensions, mm
TK-0N to N14 types:
Same as standard types
See pages 01/94, 01/95.

TK-N2, N3, N5, N6, N7, N8
TK-N2H, N3H, N6H



■ Wiring diagrams
TK-0N to N14 types:
Same as standard 3-heater element types
See pages 01/98.

TK-N10, N12, N14
TK-N10H, N12H, N14H



■ Ratings of auxiliary contact
Same as standard types.
See Page 01/93.

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Caution "Safety precautions"

- 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.
- Follow the regulations of industrial wastes when the product is to be discarded.
- The products covered in this catalog have not been designed or manufactured for use in equipment or systems which, in the event of failure, can lead to loss of human life.
- If you intend to use the products covered in this catalog for special applications, such as for nuclear energy control, aerospace, medical, or transportation, please consult our Fuji Electric FA agent.
- Be sure to provide protective measures when using the product covered in these catalogs in equipment which, in the event of failure, may lead to loss of human life or other grave results.
- Follow the directions of the operating instructions when mounting the product.

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INDIVIDUAL CATALOG 01

from D&C CATALOG 20th Edition

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