

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.

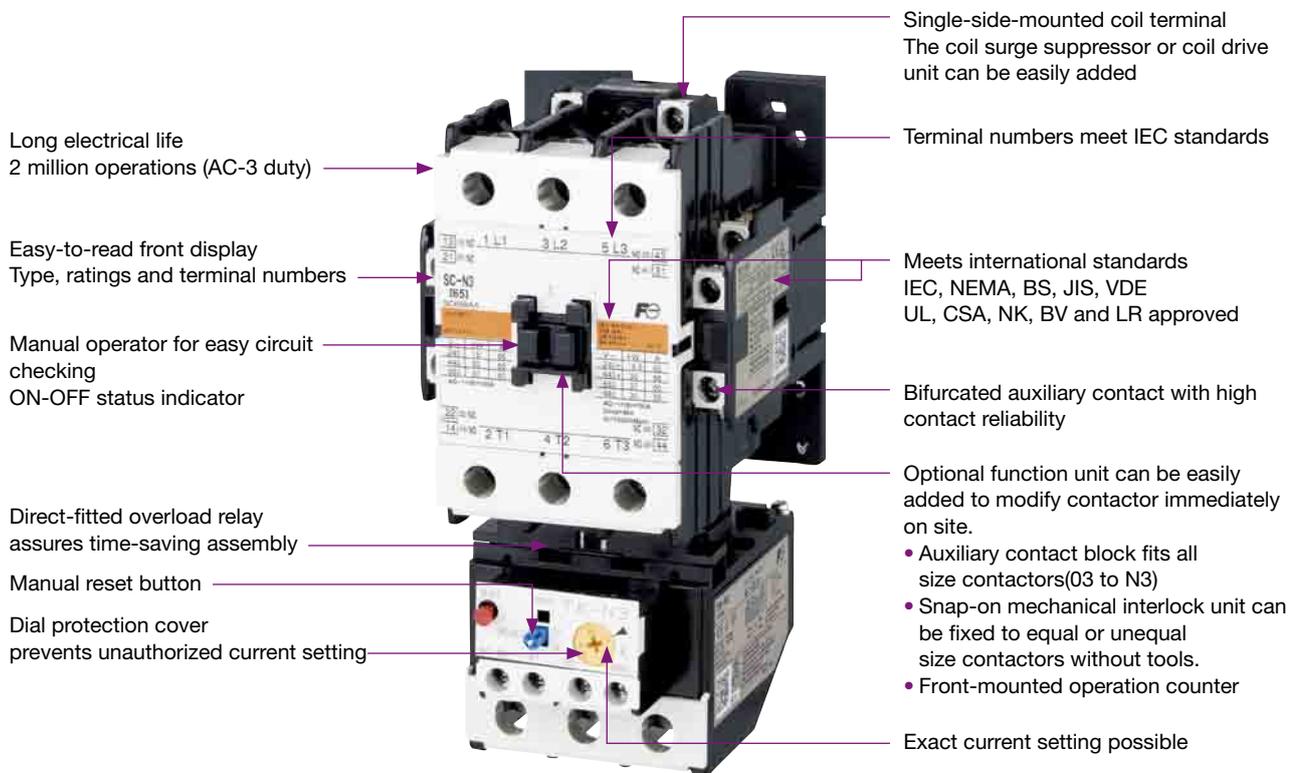
The SC line up, which is based on high level technology, now extends from the SC-03 to the SC-N16.

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



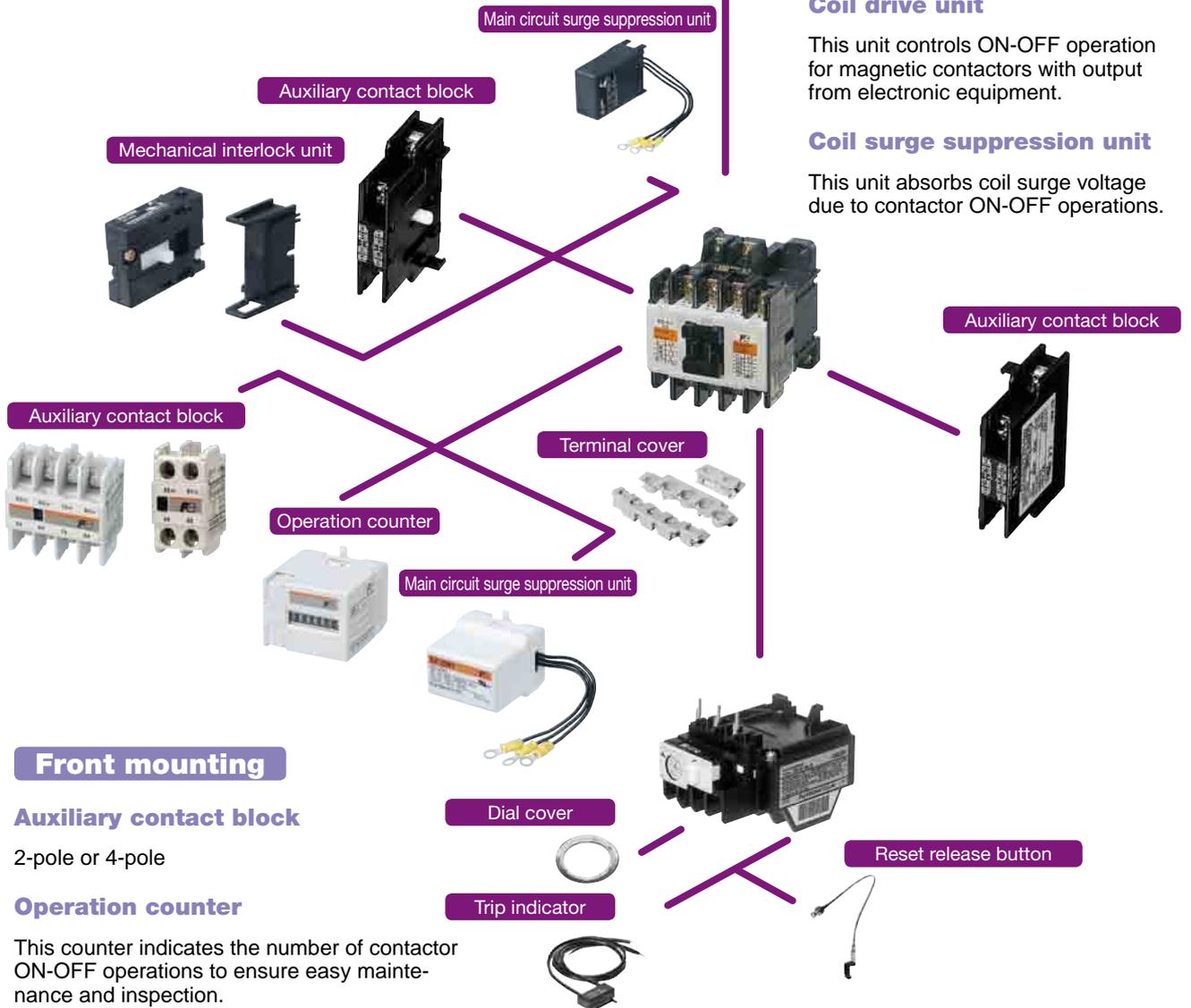
Top mounting

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

Dial cover



Trip indicator



Reset release button



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.

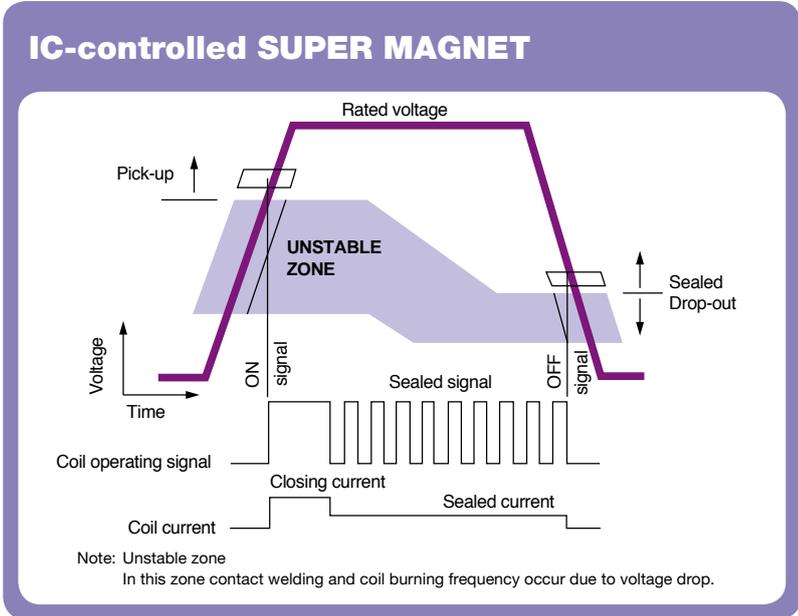
□ : Frame size N1 to N14 and N16(Contactor only)

* : When ordering the ccc standard type, add(ccc)suffix to the type number.

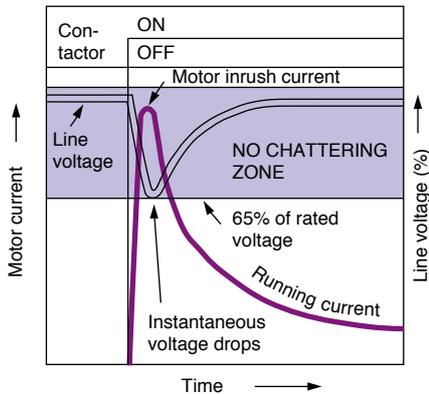
Advantages of SUPER MAGNET

● 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.

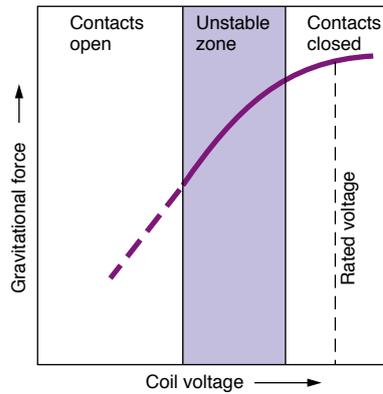


Motor starting

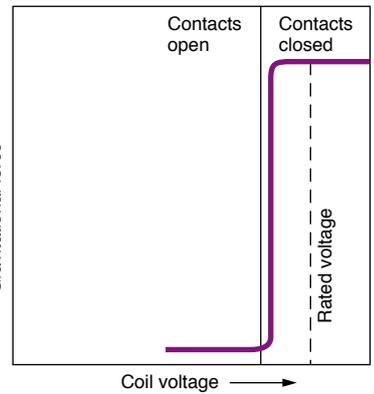


Note: No chattering occurs even if instantaneous voltage drops to 65% of rated voltage.

Existing series



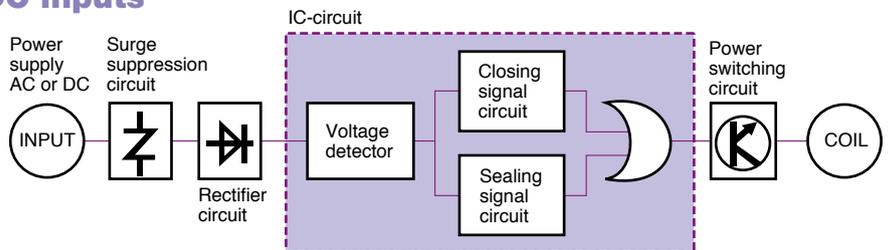
SC-N series



Note: Since SC series contactors are electronically controlled there is no unstable zone.

● 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.

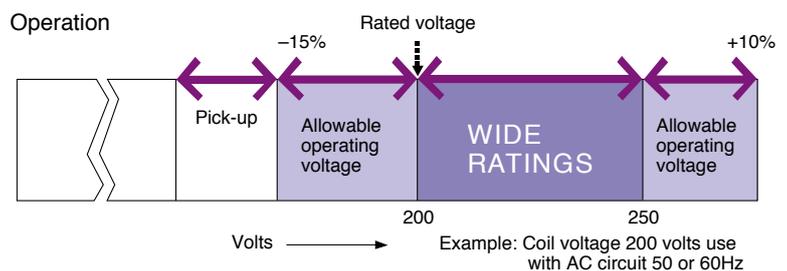


Coils (SC-N6 to SC-N16)

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.



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)

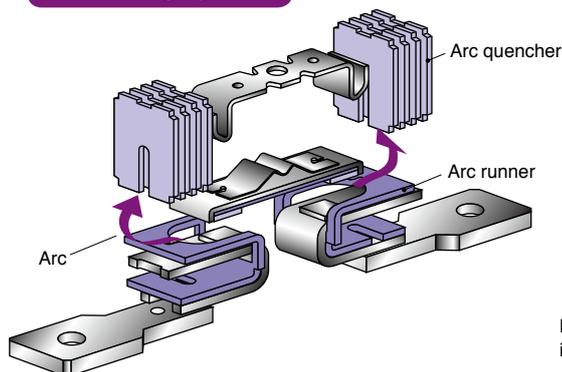
The contactor with mirror contacts has been certified by TÜV. Mirror contact conforms to the requirement for auxiliary contact that is intended to be included in the future amendment to IEC 60947-4-1.
Mirror contact : Normally closed auxiliary contact, which cannot be in closed position simultaneously with the normally open main contact.

Free arc space

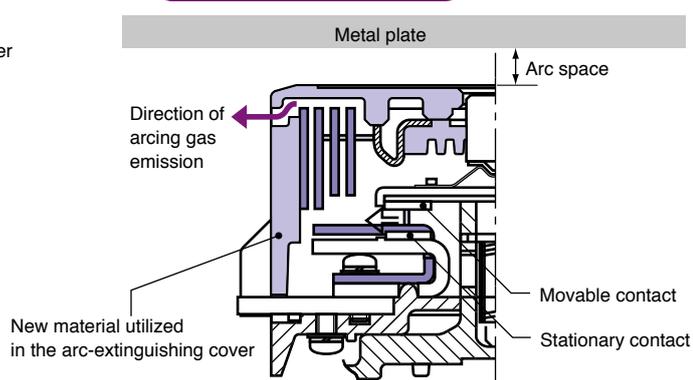
A new arc-extinguishing method, which makes full use of magnetic field analysis technology, and a new material (UL94V-0) that has been incorporated into the design of this new type of arc-extinguishing chamber to provide a free arc space. This new method and design reduces the depth size, not only of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

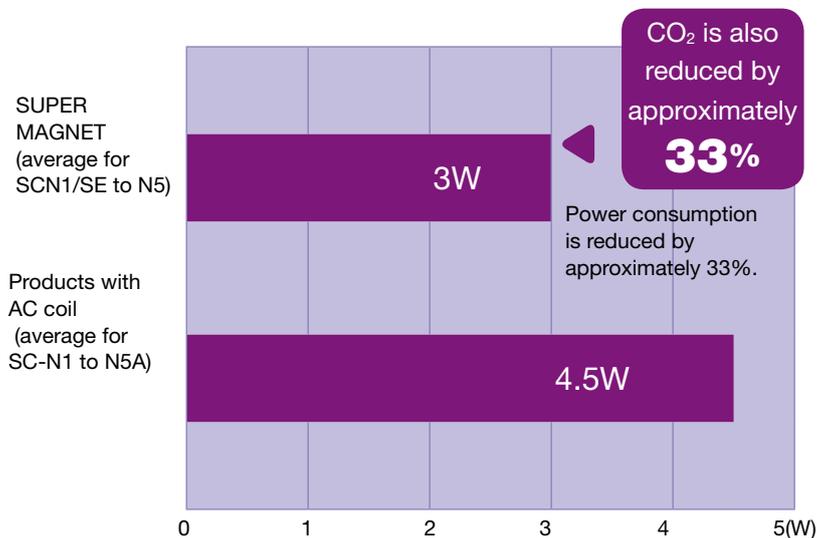
Motor starter manufactured at ISO9001 and ISO14001-certified factory

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.

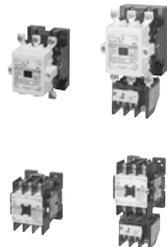
This reduces CO₂ emissions by 33% over products with AC coils (average for SC-N1/SE to N5 (inhouse comparison)).



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	<ul style="list-style-type: none"> 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
	 <p>(No.KK04-090,49 1KK05-053, 056)</p>	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
	 <p>(No.KKD06-013, 021)</p>	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
				 <p>(No.KKD06-013, 021)</p>	<ul style="list-style-type: none"> Standard type DC-operating type Standard type with DPST-NO/SPST-NC contacts DC-operating type with DPST-NO/SPST-NC contacts
FC Series	Magnetic Contactors and Starters	01/81 ∩ 01/87	<ul style="list-style-type: none"> 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
				 <p>(No.KKD05-266)</p>	<ul style="list-style-type: none"> Standard type Tab terminal type P.C.board direct-mounting type DC-operating type Enclosed type Magnetic switch with pushbutton

Magnetic Contactors and Starters

General information

■ Overview of Product Series

Series		Page	Features	Main models and types	
TR/TK Series	Thermal overload Relays  (No.AF00-140, 144)	01/88 ∩ 01/100	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Standard type • 2E type • Long time operating type • Quick operating type 	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	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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) 	Type SS□1 SS□1H SS□2, SS□3 SS□2H, SS□3H

