

MOTOR CONTROL

Contactors and Thermal Overload Relays

FJ Series





CÔNG TY TNHH THƯƠNG MẠI KỸ THUẬT ĐIỆN CITY

Nhà phân phối thiết bị điện công nghiệp hàng đầu Việt Nam

TOTHI

KAKU[®]

INOVANCE

IDEC

Think Automation and beyond...

FE Fuji Electric
Innovating Energy Technology

**MITSUBISHI
ELECTRIC**
Changes for the Better

T TAIWAN METERS



LIÊN HỆ VỚI CHÚNG TÔI

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The FJ Series is compact, safety, environmental friendly and the world's smallest magnetic contactors.
(applied motor capacity: 440 VAC, 2.2 to 45 kW)

Compact

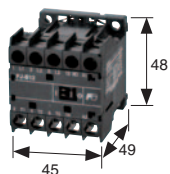
Compact and space-saving of magnetic contactor and thermal overload relay

Unit:mm

Contactors

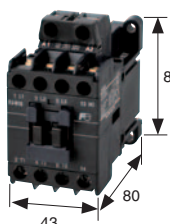
Type : **World's smallest**

FJ-B06
FJ-B09
FJ-B12



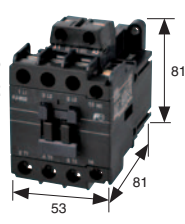
Type :

FJ-B18



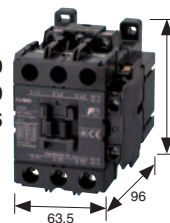
Type :

FJ-B25
FJ-B32



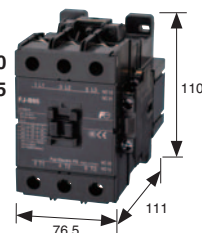
Type :

FJ-B40
FJ-B50
FJ-B65



Type :

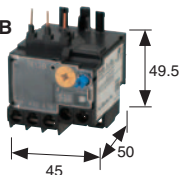
FJ-B80
FJ-B95



Thermal overload relays

Type :

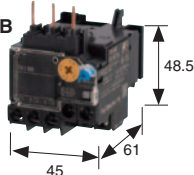
TK12B



12A frame

Type :

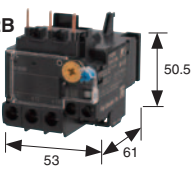
TK18B



18A frame

Type :

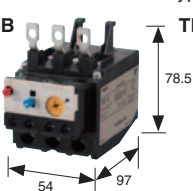
TK32B



32A frame

Type :

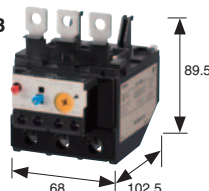
TK65B



65A frame

Type :

TK95B



95A frame

Motor rating
440V AC

FJ-B06 2.2kW
FJ-B09 4kW
FJ-B12 5.5kW

FJ-B18 7.5kW

FJ-B25 11kW
FJ-B32 15kW

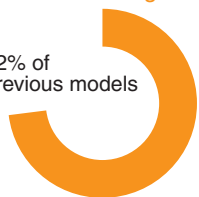
FJ-B40 18.5kW
FJ-B50 22kW
FJ-B65 30kW

FJ-B80 40kW
FJ-B95 45kW

- Average of FJ-B06 to B95 types

Floor mounting area

72% of previous models



Volume

62% of previous models



- Average of models with thermal overload relay

Floor mounting area

82% of previous models



Volume

68% of previous models

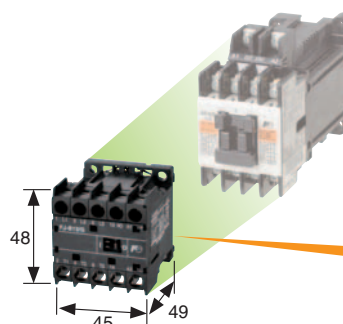


Compact DC operated Contactor

- 6 to 12 A frame products have been made much smaller and lighter by adopting a newly developed electromagnet.

Volume ratio
72% DOWN

Weight ratio
68% DOWN



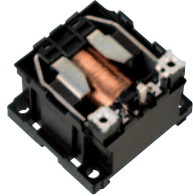
Previous DC operated types

DC operated types
• FJ-B06/G
• FJ-B09/G
• FJ-B12/G

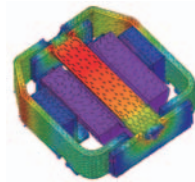
Highly efficient electromagnet has been developed by using a computer simulation with 3D magnetic field analysis so that AC and DC electromagnets have the same appearance. (FJ-B06, B09, and B12 types)

Developing DC electromagnet

- Developing compact and highly efficient electromagnet by using permanent magnet and making use of coil energy
- The DC electromagnet can be directly powered by 2.4 W through semiconductor output by minimizing the leaked magnetic flux, distributing optimized magnetic flux, and satisfying demand for both less loss and smaller size.



DC operated electromagnet
(FJ-B06/G, B09/G, and B12/G types)

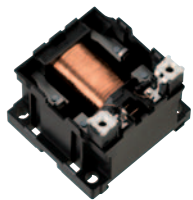


Analyzing electromagnet
(distribution of magnetic flux density and magnetic flux flow)

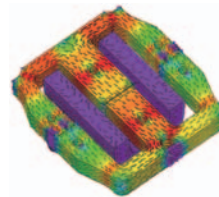
Developing AC electromagnet

- A compact electromagnet has been developed by optimizing the sectional area of each iron core part and excluding magnetic flux saturation and not having a wasteful shape
- The iron-core-fixing rivets are optimally arranged in order to remove the impact on magnetic flux route and the rivets can reduce eddy current loss.

This optimal design makes it possible to develop an energy saving electromagnet that has 4.5 VA of electromagnetic capacity.



AC operated electromagnet
(FJ-B06, B09, and B12 types)



Analyzing electromagnet
(distribution of magnetic flux density and magnetic flux flow)

Optimization was achieved through 3D thermal analysis and inversion mechanism simulation.

3D thermal analysis simulation

To increase the accuracy of overcurrent detection, the temperature rise in the built-in heater, the bimetal differential, and the interphase thermal interference must be known in detail.

To achieve this, interaction analysis of "current, heat transfer, bimetal differential" as shown in the Fig. 1 was performed. Through research of the most efficient heat transfer path, downsizing and reduction of power consumption for the heaters were achieved.

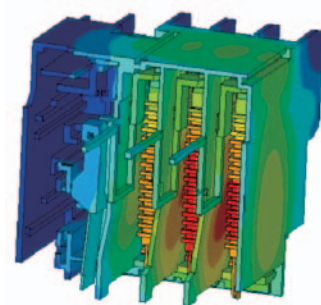


Fig. 1 3D Thermal Analysis Simulation

New inversion mechanism

To downsize the relays and to stabilize high-performance operating characteristics, a toggle inversion mechanism with a tension spring was used for the inversion mechanism as shown in the Fig. 2.

An inversion mechanism simulation was carried out on the tension spring which is the core of the inversion mechanism. The purpose was to verify that the input-output characteristics of the loads and variants as well as the space efficiency had been optimized.

In this way, the operating characteristics have been stabilized while the spring size has been minimized to reduce the necessary space.

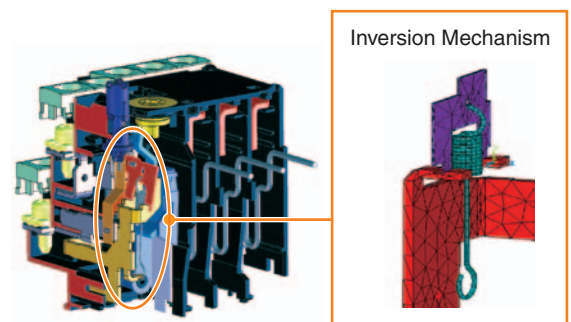


Fig. 2 Inversion Mechanism Simulation

Safety

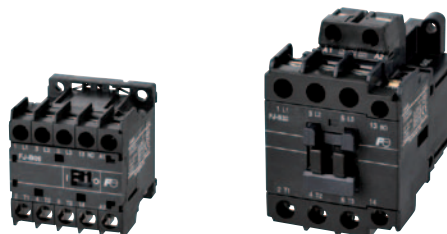
Standards

Standard models of the FJ Series are certified by CCC and have obtained a CE mark, and that is shown on the nameplate of the main unit.



Terminal cover for finger protection

The terminal cover satisfies the requirements of Machinery Directive EN60204-1 "Direct Contact Prevention" concerning mechanical safety.



Magnetic contactor equipped with mirror contact

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.

Ecology

Environmental friendly

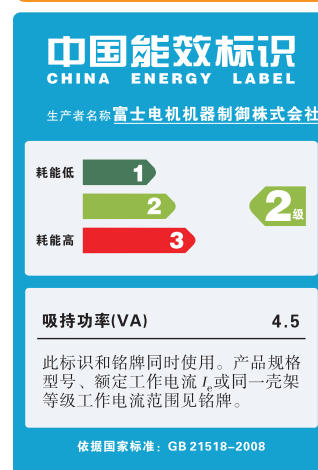
Compliant with RoHS directive (Restriction of Hazardous Substances in the EU)

The materials used do not contain any of the six substances that are specified in the RoHS Directive or have less than the specified content percentages of those substances.

China Energy Label

The FJ Series of magnetic contactors is highly energy efficient and they have met the specified value defined by the Energy Efficiency Label Management Method. Especially, FJ-B06, B09, B12, B40, B50, B65, B80 and B95 types are energy saving with an energy efficiency class of 2.

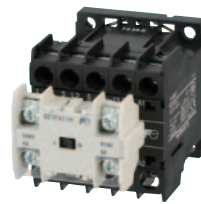
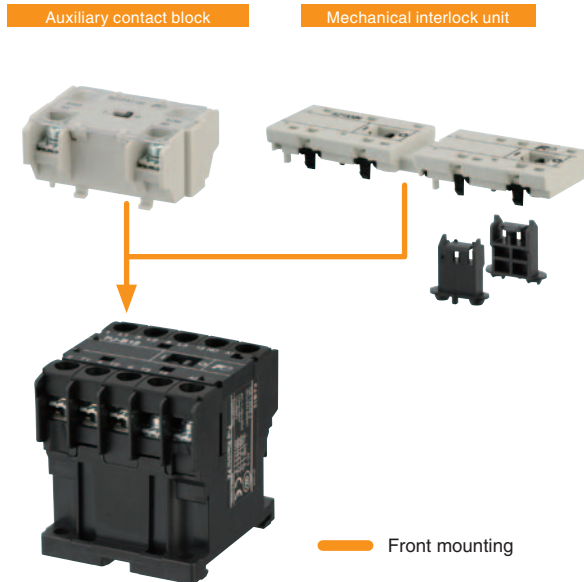
Energy Efficiency Label



| Frame | 06 | 09 | 12 | 18 | 25 | 32 | 40 | 50 | 65 | 80 | 95 |
|-----------|-----|-----|-----|----|----|----|------|------|------|------|------|
| Sealed VA | 4.5 | 4.5 | 4.5 | 9 | 9 | 9 | 12.7 | 12.7 | 12.7 | 13.4 | 13.4 |
| Class | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |

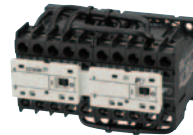
Many options

Options for FJ-B06 to B12 types



Auxiliary contact block (front mounting)
SZ1FA11, SZ1FA11H

Auxiliary contact block with 2-pole or 4-pole contacts adopting a bifurcated contact. Easy to mount on a magnetic contactor.



Mechanical interlock unit
SZ1KRW1W

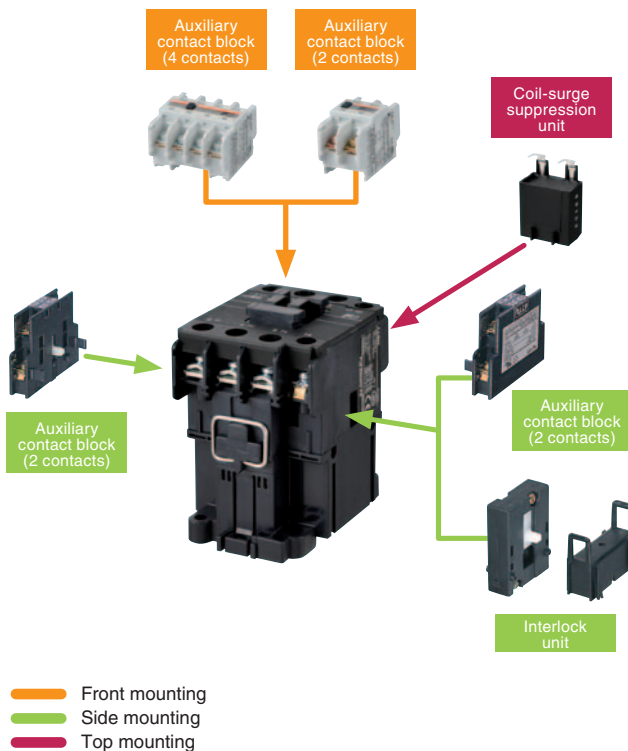
The mechanical interlock unit is used to interlock two contactors for reversing. One size fits all contactors.



Power Connection Kit for Reversing
SZ1KRW1W

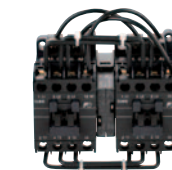
Cable kit for reversible circuit between main circuit terminals for two magnetic contactors.

Options for FJ-B18 to B95 types



Auxiliary contact block (front mounting)
SZ-A□

Two and four auxiliary contact blocks adopting a bifurcated contact. Easy to mount on a magnetic contactor.



Auxiliary contact block (side mounting)
SZ-A□

Auxiliary contact block with 2 (1NO1NC) contacts adopting a highly reliable auxiliary contact. Easy to mount on a magnetic contactor.

Mechanical interlock unit
SZ-RM

Two magnetic contactors are mechanically interlocked. Reversible and easy to assemble.









Coil-surge suppression unit
SZ-Z□

Built-in surge voltage suppression elements (varistor, CR) while the coil is turned off.


List of Products

● Magnetic contactors












| Series | | | FJ Series | | | | |
|---|--------------------------------|----------------|--|---|---|--|--|
| Frame | | | 06 | 09 | 12 | | |
| Appearance | | |  |  |  | | |
| Type | AC operated type | | FJ-B06 | FJ-B09 | FJ-B12 | | |
| | DC operated type | | FJ-B06/G | FJ-B09/G | FJ-B12/G | | |
| Max. motor capacity (kW) AC-3, IEC60947-4-1 | 200/240V | | 1.5kW | 2.2kW | 3kW | | |
| | 380/440V | | 2.2kW | 4kW | 5.5kW | | |
| | 600/690V | | 2.7kW | 4kW | 5.5kW | | |
| Operational current (A) | 200/240V | | 6A | 9A | 12A | | |
| | 380/440V | | 6A | 9A | 12A | | |
| | 600/690V | | 3A | 5A | 6A | | |
| Conventional free air thermal current (rated thermal current) Ith (A) | | | 20A | 20A | 20A | | |
| Auxiliary contact arrangement | | | 1NO or 1NC | 1NO or 1NC | 1NO or 1NC | | |
| Dimensions W × H × D (mm) | AC operated type | | 45 × 48 × 49 | | | | |
| | DC operated type | | | | | | |
| Optional unit | Auxiliary contact block | Front mounting | SZ1FA11 or SZ1FA11H | | | | |
| | | Side mounting | — | | | | |
| | Coil surge suppression unit *1 | | — | | | | |
| Standards | | |    | | | | |





Note: *1. Attach "S" behind the built-in order model of coil surge suppression unit.

● Thermal overload relays

| Type | | TK12B-□ | |
|---------------------------------|--|--|--|
| Appearance | |  | |
| Protection function | | Overload | |
| Tripping class | | 10A | |
| Ampere setting range (A) / code | | 0.1-0.15 [P10] 0.13-0.2 [P13] 0.18-0.27 [P18] 0.24-0.36 [P24] 0.34-0.52 [P34] 0.48-0.72 [P48] 0.64-0.96 [P64] 0.8-1.2 [P80] 0.95-1.45 [P95] 1.4-2.1 [1P4] | 1.7-2.6 [1P7] 2.2-3.4 [2P2] 2.8-4.2 [2P8] 4-6 [004] 5-7.5 [005] 6-9 [006] 7-10.5 [007] 9-13 [009] |
| Applicable contactors | | FJ-B06, B09, B12 | |
| Dimensions W × H × D (mm) | | 45 × 49.5 × 50 | |

Note: Replace the □ mark in the type number by the Ampere setting range code.

| | 18 | 25 | 32 | 40 | 50 | 65 | 80 | 95 |
|--|---|---|---|---|--|---|---|---|
| |  |  |  |  |  |  |  |  |
| | FJ-B18 | FJ-B25 | FJ-B32 | FJ-B40 | FJ-B50 | FJ-B65 | FJ-B80 | FJ-B95 |
| | FJ-B18/G | FJ-B25/G | FJ-B32/G | — | — | — | — | — |
| | 4kW | 5.5kW | 7.5kW | 11kW | 15kW | 18.5kW | 22kW | 25kW |
| | 7.5kW | 11kW | 15kW | 18.5kW | 22kW | 30kW | 40kW | 45kW |
| | 7.5kW | 7.5kW | 7.5kW | 11kW | 15kW | 22kW | 30kW | 37kW |
| | 18A | 25A | 32A | 40A | 50A | 65A | 80A | 95A |
| | 18A | 25A | 32A | 40A | 50A | 65A | 80A | 95A |
| | 7A | 9A | 10A | 15A | 19A | 26A | 38A | 44A |
| | 25A | 32A | 40A | 50A | 60A | 65A | 100A | 105A |
| | 1NO or 1NC | 1NO or 1NC | 1NO or 1NC | 1NO1NC | 1NO1NC | 1NO1NC | 1NO1NC | 1NO1NC |
| | 43 × 81 × 80 | 53 × 81 × 81 | | 63.5 × 90 × 96 | 63.5 × 90 × 96 | 63.5 × 90 × 96 | 76.5 × 110 × 111 | 76.5 × 110 × 111 |
| | 43 × 81 × 107 | 53 × 81 × 108 | | — | — | — | — | — |
| | SZ-A□ (2pole or 4pole) | | | | | | | |
| | SZ-AS1 | | | | | | | |
| | SZ-Z1 to Z9 | | | SZ-Z31 to Z35 | | | | |
| | <div><div></div><div></div><div></div></div> | | | | | | | |

| | TK18B-□ | TK32B-□ | TK65B-□ | TK95B-□ |
|--|--|--|--|--|
| |  |  |  |  |
| | Overload | Overload | Overload | Overload |
| | 10A | 10A | 10A | 10A |
| | 0.1-0.15 [P10] 1.7-2.6 [1P7] 0.13-0.2 [P13] 2.2-3.4 [2P2] 0.18-0.27 [P18] 2.8-4.2 [2P8] 0.24-0.36 [P24] 4-6 [004] 0.34-0.52 [P34] 5-7.5 [005] 0.48-0.72 [P48] 6-9 [006] 0.64-0.96 [P64] 7-10.5 [007] 0.8-1.2 [P80] 9-13 [009] 0.95-1.45 [P95] 13-18 [013] 1.4-2.1 [1P4] | 0.1-0.15 [P10] 1.7-2.6 [1P7] 0.13-0.2 [P13] 2.2-3.4 [2P2] 0.18-0.27 [P18] 2.8-4.2 [2P8] 0.24-0.36 [P24] 4-6 [004] 0.34-0.52 [P34] 5-7.5 [005] 0.48-0.72 [P48] 6-9 [006] 0.64-0.96 [P64] 7-10.5 [007] 0.8-1.2 [P80] 9-13 [009] 0.95-1.45 [P95] 12-18 [012] 1.4-2.1 [1P4] 16-22 [016] 20-26 [020] 26-32 [026] | 4-6 [004] 5-8 [005] 6-9 [006] 7-11 [007] 9-13 [009] 12-18 [012] 18-26 [018] 24-36 [024] 32-42 [032] 40-50 [040] 44-54 [044] 53-65 [053] | 7-11 [007] 9-13 [009] 12-18 [012] 18-26 [018] 24-36 [024] 28-40 [028] 34-50 [034] 45-65 [045] 48-68 [048] 64-80 [064] 68-86 [068] 86-96 [086] |
| | FJ-B18 | FJ-B25, B32 | FJ-B40, B50, B65 | FJ-B80, B95 |
| | 45 × 48.5 × 61 | 53 × 50.5 × 61 | 54 × 78.5 × 97 | 68 × 89.5 × 102.5 |

List of Products, Model Information

■ List of Products

| Type | | | Frame Size | | | | | | | | | | |
|--------------------------|-------------|-------------------|------------|----|----|----|----|----|----|----|----|----|----|
| | | | 06 | 09 | 12 | 18 | 25 | 32 | 40 | 50 | 65 | 80 | 95 |
| Standard type contactors | AC Operated | FJ-B □ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | DC Operated | FJ-B □/G | ○ | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — |
| Reversing contactors | AC Operated | FJ-B □RM | ○ | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — |
| | DC Operated | FJ-B □RM/G | ○ | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — |

■ Type number nomenclature

(1) **FJ-B** (2) **12** (3) **RM** (4) **/G** (5) **S** (6) **E** (7) **01**

| (1) Basic type | Code |
|----------------|------|
| AC Contactor | FJ-B |

| (2) Frame Size | Code |
|----------------|------|
| 6A | 06 |
| 9A | 09 |
| 12A | 12 |
| 18A | 18 |
| 25A | 25 |
| 32A | 32 |
| 40A | 40 |
| 50A | 50 |
| 65A | 65 |
| 80A | 80 |
| 95A | 95 |

| (3) Non-reversing or reversing | Code |
|--------------------------------|-------|
| Non-reversing | Blank |
| Reversing | RM |

| (4) Operating method | Code |
|----------------------|-------|
| AC operated | Blank |
| DC operated | /G |

| (7) Contact arrangement | Code |
|--------------------------|------|
| Auxiliary contact 1NO | 10 |
| Auxiliary contact 1NC | 01 |
| Auxiliary contact 1NO1NC | 11 |

| (6) Rated voltage of AC coil | Code |
|-------------------------------|------|
| 24V 50Hz / 24-26V 60Hz | E |
| 48V 50Hz / 48-52V 60Hz | F |
| 100V 50Hz / 100-110V 60Hz | 1 |
| 100-110V 50Hz / 110-120V 60Hz | H |
| 110-120V 50Hz / 120-130V 60Hz | K |
| 200V 50Hz / 200-220V 60Hz | 2 |
| 200-220V 50Hz / 220-240V 60Hz | M |
| 220-240V 50Hz / 240-260V 60Hz | P |
| 346-380V 50Hz / 380-420V 60Hz | S |
| 380-400V 50Hz / 400-440V 60Hz | 4 |
| 415-440V 50Hz / 440-480V 60Hz | T |
| 480-500V 50Hz / 500-550V 60Hz | 5 |

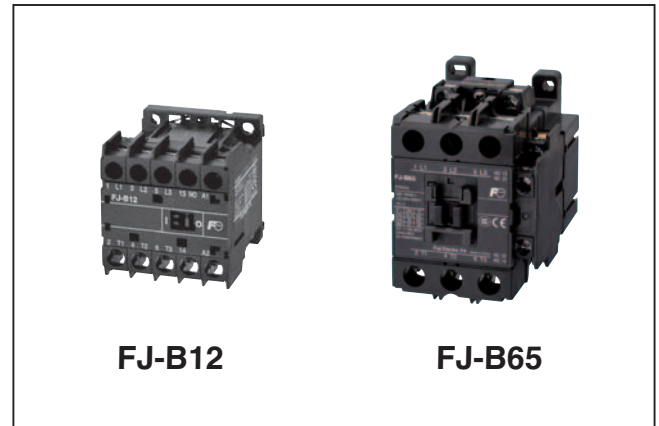
| (6) Rated voltage of DC coil | Code |
|------------------------------|------|
| DC24V | E |
| DC48V | F |
| DC110V | H |
| DC220V | M |

| (5) Built-in coil surge | Code |
|----------------------------|-------|
| None | Blank |
| Built-in (06, 09, 12 only) | S |

Magnetic Contactor

■ Features

- The smallest one in the basic type series (6A, 9A, 12A rated products)
- 6A, 9A and 12A rated products are small sized AC contactors of AC and DC coil products with the same outline dimensions.
- DC coil products are low-power-consumption products that can be driven directly by PLC. (FJ-B06/G to B12/G type DC24V coil)
- Energy-saving type with an energy efficiency level of 2. (6A, 9A, 12A, 40A to 95A rated products)



■ Types and ratings

● Standard-type (non-reversing)

| Frame | Max. motor capacity (kW) AC-3, IEC60947-4-1 | | | Operational current (A) | | | Operational current (A) AC-1 Under 440V | Conventional free air thermal current (A) | Auxiliary contact arrangement | Type | |
|-------|--|----------|----------|-------------------------|----------|----------|---|---|-------------------------------|---------------|-----------------|
| | 200/240V | 380/440V | 600/690V | 200/240V | 380/440V | 600/690V | | | | AC operated | DC operated |
| 06 | 1.5 | 2.2 | 2.7 | 6 | 6 | 3 | 20 | 20 | 1NO or 1NC | FJ-B06 | FJ-B06/G |
| 09 | 2.2 | 4 | 4 | 9 | 9 | 5 | 20 | 20 | 1NO or 1NC | FJ-B09 | FJ-B09/G |
| 12 | 3 | 5.5 | 5.5 | 12 | 12 | 6 | 20 | 20 | 1NO or 1NC | FJ-B12 | FJ-B12/G |
| 18 | 4 | 7.5 | 7.5 | 18 | 18 | 7 | 25 | 25 | 1NO or 1NC | FJ-B18 | FJ-B18/G |
| 25 | 5.5 | 11 | 7.5 | 25 | 25 | 9 | 32 | 32 | 1NO or 1NC | FJ-B25 | FJ-B25/G |
| 32 | 7.5 | 15 | 7.5 | 32 | 32 | 10 | 40 | 40 | 1NO or 1NC | FJ-B32 | FJ-B32/G |
| 40 | 11 | 18.5 | 11 | 40 | 40 | 15 | 50 | 50 | 1NO1NC | FJ-B40 | — |
| 50 | 15 | 22 | 15 | 50 | 50 | 19 | 60 | 60 | 1NO1NC | FJ-B50 | — |
| 65 | 18.5 | 30 | 22 | 65 | 65 | 26 | 65 | 65 | 1NO1NC | FJ-B65 | — |
| 80 | 22 | 40 | 30 | 80 | 80 | 38 | 100 | 100 | 1NO1NC | FJ-B80 | — |
| 95 | 25 | 45 | 37 | 95 | 95 | 44 | 105 | 105 | 1NO1NC | FJ-B95 | — |

(Note 1) The rated values meet the standards IEC60947-4-1 and GB14048.4.

● Reversing-type

| Frame | Max. motor capacity (kW) AC-3, IEC60947-4-1 | | | Operational current (A) | | | Operational current (A) AC-1 Under 440V | Conventional free air thermal current (A) | Auxiliary contact arrangement *1 | Type | |
|-------|--|----------|----------|-------------------------|----------|----------|---|---|-------------------------------------|-----------------|-------------------|
| | 200/240V | 380/440V | 600/690V | 200/240V | 380/440V | 600/690V | | | | AC operated | DC operated |
| 06 | 1.5 | 2.2 | 2.7 | 6 | 6 | 3 | 20 | 20 | 1NCx2 or 1NOx2 *2 | FJ-B06RM | FJ-B06RM/G |
| 09 | 2.2 | 4 | 4 | 9 | 9 | 5 | 20 | 20 | | FJ-B09RM | FJ-B09RM/G |
| 12 | 3 | 5.5 | 5.5 | 12 | 12 | 6 | 20 | 20 | | FJ-B12RM | FJ-B12RM/G |
| 18 | 4 | 7.5 | 7.5 | 18 | 18 | 7 | 25 | 25 | | FJ-B18RM | FJ-B18RM/G |
| 25 | 5.5 | 11 | 7.5 | 25 | 25 | 9 | 32 | 32 | | FJ-B25RM | FJ-B25RM/G |
| 32 | 7.5 | 15 | 7.5 | 32 | 32 | 10 | 40 | 40 | | FJ-B32RM | FJ-B32RM/G |

(Note 1) The rated values meet the standards IEC60947-4-1 and GB14048.4.

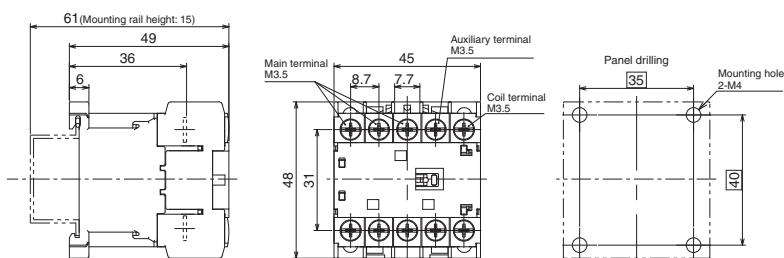
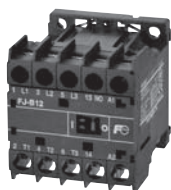
*1 In the auxiliary contact arrangement, "1NC" indicates the number of contacts of 1 AC contactor, while "x2" means the total values of 2 contactors. Please make orders according to the codes of the auxiliary contacts of each piece of equipment.

*2 Auxiliary contact 1NOx2 is available on request. However, these contactors are not electrically interlocked. Be sure to arrange electrical interlock circuit externally to avoid short-circuit accidents.

Outline Drawing

• Magnetic Contactor (AC operated)

FJ-B06
FJ-B09
FJ-B12

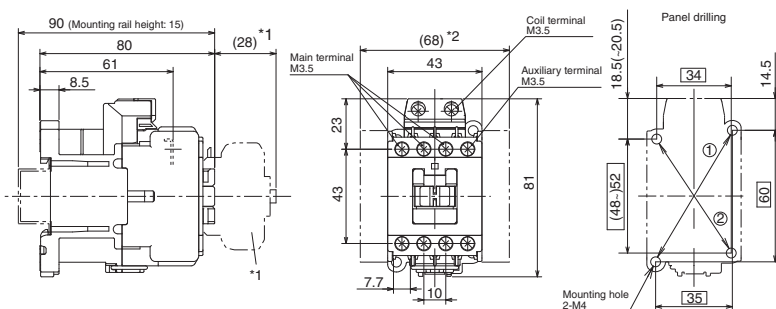
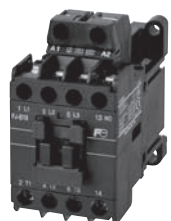


| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 2/T1 4/T2 6/T3 14</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 2/T1 4/T2 6/T3 22</p> |

Mount it using the 2 holes on the diagonal line.

Mass: 0.14kg

FJ-B18



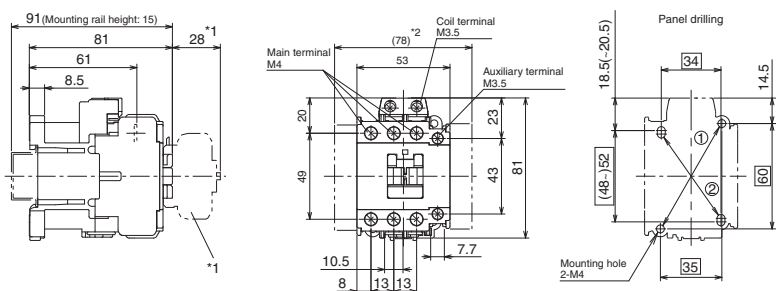
| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 2/T1 4/T2 6/T3 14</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 2/T1 4/T2 6/T3 22</p> |

Mounting dimension: mounting according to (1) or (2)
(1)...35x60
(2)...34x(48-52)
Mount it using the 2 holes on the diagonal line.

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

Mass: 0.33kg

FJ-B25
FJ-B32



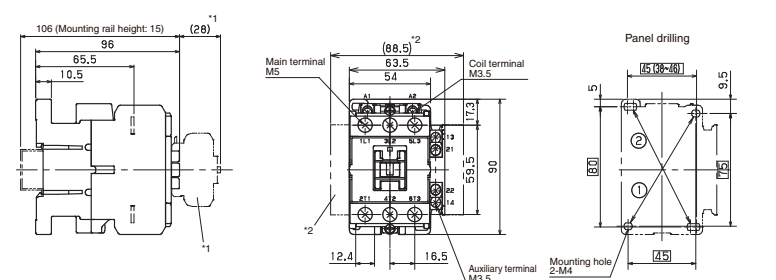
| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 2/T1 4/T2 6/T3 14</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 2/T1 4/T2 6/T3 22</p> |

Mounting dimension: mounting according to (1) or (2)
(1)...35x60
(2)...34x(48-52)
Mount it using the 2 holes on the diagonal line.

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

Mass: 0.35kg

FJ-B40
FJ-B50
FJ-B65



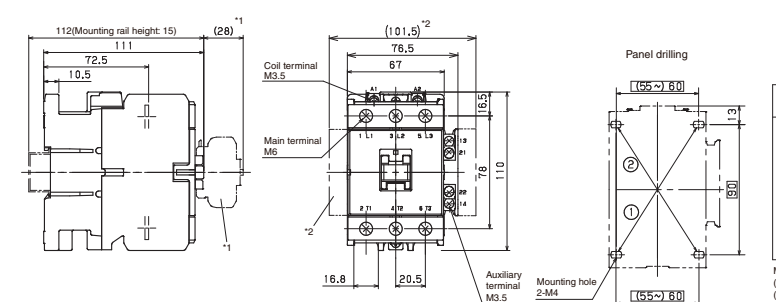
| Wiring diagrams |
|--|
| <p>1/L1 3/L2 5/L3 13 2/T1 4/T2 6/T3 14</p> |

Mounting dimension: mounting according to (1) or (2)
(1)...45x75
(2)...45(38-46)x52
Mount it using the 2 holes on the diagonal line.

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

Mass: 0.54kg

FJ-B80
FJ-B95



| Wiring diagrams |
|--|
| <p>1/L1 3/L2 5/L3 13 2/T1 4/T2 6/T3 14</p> |

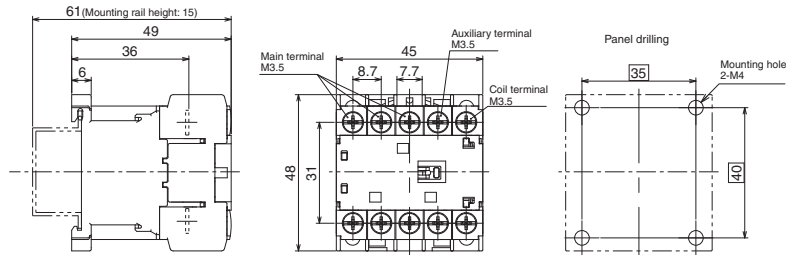
Mounting dimension: mounting according to (1) or (2)
(1)...(55-60)x90
(2)...(55-60)x90
Mount it using the 2 holes on the diagonal line.

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

Mass: 0.97kg

● Magnetic Contactor (DC operated)

FJ-B06/G
FJ-B09/G
FJ-B12/G

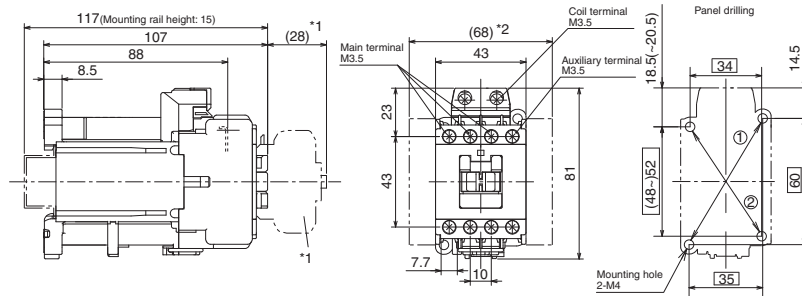


| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 (+) (-) 2/T1 4/T2 6/T3 14 A1 A2</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 (+) (-) 2/T1 4/T2 6/T3 22 A1 A2</p> |

(Note) Please note that the terminal of the control coil has polarity.
Mount it using the 2 holes on the diagonal line.

Mass: 0.17kg

FJ-B18/G



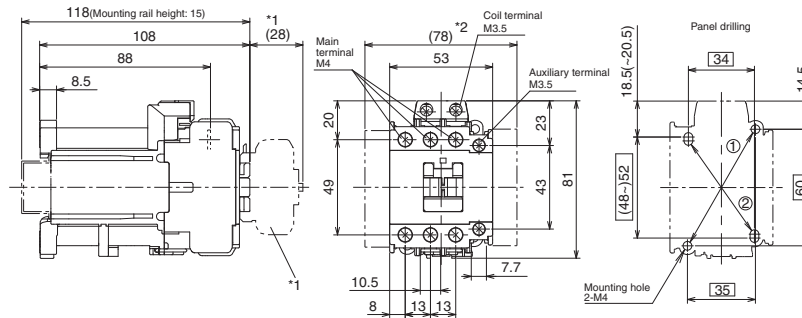
| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 (+) (-) 2/T1 4/T2 6/T3 14 A1 A2</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 (+) (-) 2/T1 4/T2 6/T3 22 A1 A2</p> |

Mounting dimension: mounting according to (1) or (2)
(1)...35x60
(2)...34x(48-52)
Mount it using the 2 holes on the diagonal line.

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

Mass: 0.57kg

FJ-B25/G
FJ-B32/G



| Auxiliary contact | Wiring diagrams |
|-------------------|--|
| 1NO (1a) | <p>1/L1 3/L2 5/L3 13 (+) (-) 2/T1 4/T2 6/T3 14 A1 A2</p> |
| 1NC (1b) | <p>1/L1 3/L2 5/L3 21 (+) (-) 2/T1 4/T2 6/T3 22 A1 A2</p> |

Mounting dimension: mounting according to (1) or (2)
(1)...35x60
(2)...34x(48-52)
Mount it using the 2 holes on the diagonal line.

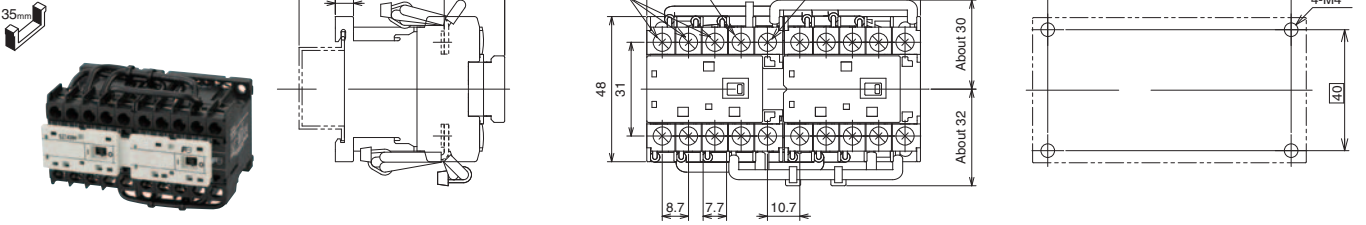
*1 For front mounting aux. contact blocks mounted.
*2 For two side mounting aux. contact blocks mounted.

Mass: 0.59kg

Outline Drawing

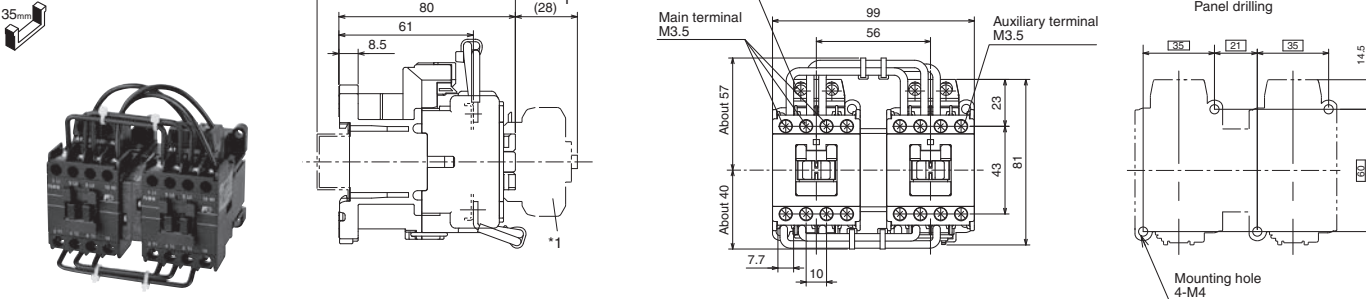
- Reversing-type (AC operated)

FJ-B06RM
FJ-B09RM
FJ-B12RM



Mass: 0.32kg

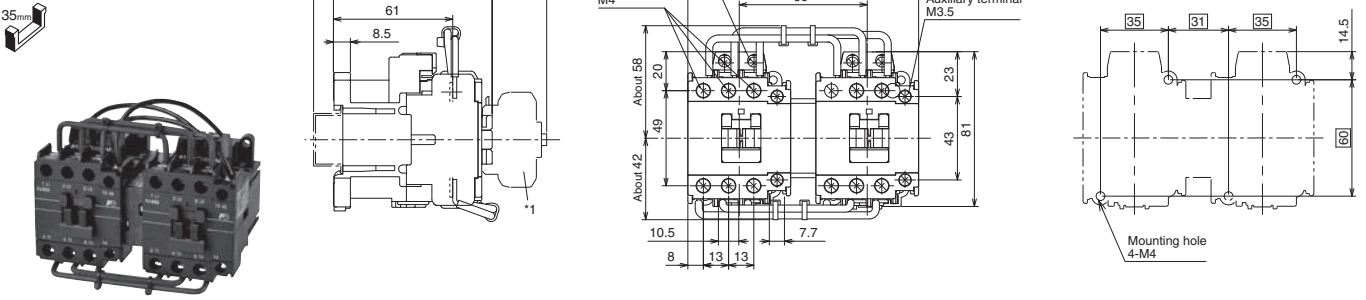
FJ-B18RM



*1 For front mounting aux. contact blocks mounted.

Mass: 0.7kg

FJ-B25RM
FJ-B32RM



*1 For front mounting aux. contact blocks mounted.

Mass: 0.75kg






| Auxiliary contact | Wiring diagram |
|-------------------|----------------|
| 1NCx2 | |

| Auxiliary contact | Wiring diagram |
|-------------------|----------------|
| 1NOx2 | |

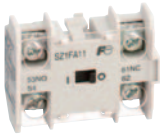




Note: The interlock unit can be set separately.

Thermal Overload Relay/Optional Unit

■ Thermal overload relay

| Type | Ampere setting range (A) | | | | | | | | Contactor to be combined |
|-------|---|-----------------|-----------------|---------------|-------------|--|----------------------------|--|--------------------------|
| TK12B |  | 0.1-0.15 [P10] | 0.48-0.72 [P48] | 1.7-2.6 [1P7] | 6-9 [006] | FJ-B06, B09, B12 FJ-B06/G, B09/G, B12/G | | | |
| | 0.13-0.2 [P13] | 0.64-0.96 [P64] | 2.2-3.4 [2P2] | 7-10.5 [007] | | | | | |
| | 0.18-0.27 [P18] | 0.8-1.2 [P80] | 2.8-4.2 [2P8] | 9-13 [009] | | | | | |
| | 0.24-0.36 [P24] | 0.95-1.45 [P95] | 4-6 [004] | | | | | | |
| | 0.34-0.52 [P34] | 1.4-2.1 [1P4] | 5-7.5 [005] | | | | | | |
| TK18B |  | 0.1-0.15 [P10] | 0.48-0.72 [P48] | 1.7-2.6 [1P7] | 6-9 [006] | FJ-B18 FJ-B18/G | | | |
| | 0.13-0.2 [P13] | 0.64-0.96 [P64] | 2.2-3.4 [2P2] | 7-10.5 [007] | | | | | |
| | 0.18-0.27 [P18] | 0.8-1.2 [P80] | 2.8-4.2 [2P8] | 9-13 [009] | | | | | |
| | 0.24-0.36 [P24] | 0.95-1.45 [P95] | 4-6 [004] | 13-18 [013] | | | | | |
| | 0.34-0.52 [P34] | 1.4-2.1 [1P4] | 5-7.5 [005] | | | | | | |
| TK32B |  | 0.1-0.15 [P10] | 0.64-0.96 [P64] | 2.8-4.2 [2P8] | 12-18 [012] | FJ-B25 FJ-B25/G FJ-B32 FJ-B32/G | | | |
| | 0.13-0.2 [P13] | 0.8-1.2 [P80] | 4-6 [004] | 16-22 [016] | | | | | |
| | 0.18-0.27 [P18] | 0.95-1.45 [P95] | 5-7.5 [005] | 20-26 [020] | | | | | |
| | 0.24-0.36 [P24] | 1.4-2.1 [1P4] | 6-9 [006] | 26-32 [026] | | | | | |
| | 0.34-0.52 [P34] | 1.7-2.6 [1P7] | 7-10.5 [007] | | | | | | |
| TK65B |  | 4-6 [004] | 18-26 [018] | | | | FJ-B40 FJ-B50 FJ-B65 | | |
| | 5-8 [005] | 24-36 [024] | | | | | | | |
| | 6-9 [006] | 32-42 [032] | | | | | | | |
| | 7-11 [007] | 40-50 [040] | | | | | | | |
| | 9-13 [009] | 44-54 [044] | | | | | | | |
| TK95B |  | 12-18 [012] | 53-65 [053] | | | | FJ-B80 FJ-B95 | | |
| | 7-11 [007] | 34-50 [034] | | | | | | | |
| | 9-13 [009] | 45-65 [045] | | | | | | | |
| | 12-18 [012] | 48-68 [048] | | | | | | | |
| | 18-26 [018] | 64-80 [064] | | | | | | | |
| | 24-36 [024] | 68-86 [068] | | | | | | | |
| | 28-40 [028] | 86-95 [086] | | | | | | | |

■ Optional Unit

| Optional unit | | Type | Description | Used with | | |
|---|---------------|----------|---|--|------------------------|--|
| <div>Auxiliary contact block (Front mounting)</div>  | Bifurcated | SZ1FA11 | 1NO1NC | FJ-B06, B09, B12 | | |
| | Single button | SZ1FA11H | 1NO1NC | FJ-B06/G, B09/G, B12/G | | |
| | Bifurcated | SZ-A40 | 4NO | FJ-B18, B25, B32, B40, B50, B65, B80, B95 | | |
| | | SZ-A31 | 3NO1NC | FJ-B18/G, B25/G, B32/G | | |
| | | SZ-A22 | 2NO2NC | | | |
| | | SZ-A20 | 2NO | | | |
| | | SZ-A11 | 1NO1NC | | | |
| | | SZ-A02 | 2NC | | | |
| <div>Auxiliary contact block (Side mounting)</div>  | Bifurcated | SZ-AS1 | 1NO1NC | | | |
| <div>Mechanical interlock unit</div>  | | SZ1KRM | Reversing-type assembly, mechanical interlock | FJ-B06, B09, B12 FJ-B06/G, B09/G, B12/G | | |
| | | SZ-RM | | FJ-B18, B25, B32 FJ-B18/G, B25/G, B32/G | | |
| <div>Power connection kit for reversing</div>  | | SZ1KRW1W | Power connection kit (power side, load side) | FJ-B06, B09, B12 FJ-B06/G, B09/G, B12/G | | |
| | | SZ-RW21 | | FJ-B18, B18/G | | |
| | | SZ-RW23 | | FJ-B25, B32, B25/G, B32/G | | |
| <div>Coil-surge suppression unit</div>  | | SZ-Z1 | Varistor: 24 to 48V AC/DC | FJ-B18, B25, B32 | FJ-B18/G, B25/G, B32/G | |
| | | SZ-Z2 | Varistor: 100 to 250V AC/DC | | | |
| | | SZ-Z3 | Varistor: 380 to 440V AC/DC | | | |
| | | SZ-Z4 | CR: 24 to 48V AC/DC | | | |
| | | SZ-Z5 | CR: 100 to 250V AC/DC | | | |
| | | SZ-Z31 | Varistor: 24 to 48V AC/DC | FJ-B40, B50, B65, B80, B95 | | |
| | | SZ-Z32 | Varistor: 100 to 250V AC/DC | | | |
| | | SZ-Z33 | Varistor: 380 to 440V AC/DC | | | |
| | | SZ-Z34 | CR: 24 to 48V AC/DC | | | |
| | | SZ-Z35 | CR: 100 to 250V AC/DC | | | |

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- Follow the regulations of industrial wastes when the product is to be discarded.
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