FUJI ELECTRIC

INSTRUCTION MANUAL

Magnetic Contactor

Type SC-E1, E1/G
SC-E2, E2/G
SC-E2S, E2S/G
SC-E3, E3/G
SC-E4, E4/G
SC-E5
SC-E6
SC-E7

This manual should be given to the person who actually uses the products and is responsible for their maintenance.

Safety Precautions

To ensure proper use of the product. be sure to read this manual and the other attached documents carefully before starting installation, operation, maintenance and inspection. Within this instruction manual, safety precautions are ranked, in order of importance, as either "Warning" or "Caution" .

⚠ WARNING — An operator may be killed or seriously injured by a hazardous condition resulting from improper operation.

⚠ CAUTION — An operator may be suffer minor injuries and/or objects may be damaged by a hazardous condition resulting from improper operation.

Under certain conditions, improper operation may result in serious injury and/or damage even if it is labeled only as "Caution" . Every item indicated by either "Warning" or "Caution" should be considered significant. Be sure to give particular care to those items.

⚠WARNING

- Do not touch the product or approach it. Electric shock or burns may result.
- Turn off the power before starting maintenance or inspection. Failure to turn off power may result in Electric shock or burns.

⚠ CAUTION

- For wiring, select wire sizes suitable for the applied voltage and current. Tighten wires with the tightening torque specified in the instruction manual. Failure to do so may result in fire.
- Do not touch the product immediately after the power is turned off. As it may still be hot, burns may result.
- Do not use the product after removing its arc-extinguishing chamber. Electric shock or burns may result.
- Treat the product as industrial waste when discarding.

1. Unpacking

(1) Check that the type, coil voltage, contact-arrangement and applicable capacity match the requested specifications.
(2) Make sure that no parts have been lost or damaged.

2. Mounting

(1) Mount in a dry, clean and stable location.
(2) Mounting on a vertical surface. The product must not incline more than 30° . (Fig.1)
(3) The rail mounting type can be attached on a standard 35mm IEC(Pub.715) mounting rail. TH35-15 mounting rail is recommended. Fig.2 shows how to attach the rail on the panel and Fig.3 shows how to attach (Fig.3a) and remove (Fig.3b) the product.
(4) If the conductor is provided with four mounting holes, use any two mounting holes on a diagonal line. (Fig.4)

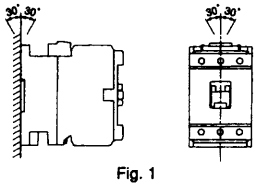


Fig. 1

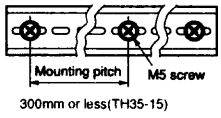
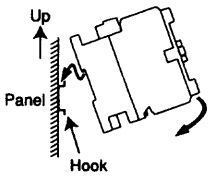
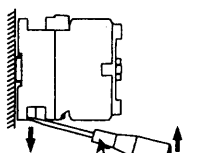


Fig. 2



Mounting
Fig. 3a



Removing
Fig. 3b

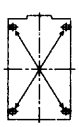


Fig. 4

3. Connection

(1) Tighten all terminal screws even if not used.
(2) After alignment or bending back of connected leads, check the tightening torque of the clamping screws.
(3) Permissible conductor cross-section, stripping length for conductors and tighten tools are shown in Table 1

4. Maintenance and Inspection

(1) Check that the operating voltage is within the allowable flucutuation range, 85 to 110% of the coil voltage.
(2) Check that all terminals are tightened with the proper torque periodically.

Note:

If necessary. remove arc chamber and separate slightly welded contacts with a screwdriver.
Dark or rough contacts can still function. Do not refinish or grease them. If the contact facings are so badly eroded that the carrier material is visible, do not use the product.

5. Short-circuit protective device (SCPD)

(1) Selection table according to IEC60947-4-1 is shown in Table 2.

Table 2

Type	Type 1			Type 2	
	Prospective Current Iq	Fuji Breakers		Prospective Current Iq	IEC269-1 gG and gM Fuses
		Part No.	Max. Rating		Max. Rating
	(kA)		(A)	(kA)	(A)
SC-E1 SC-E1/G	18	SA103RA/60	60	50	50
SC-E2 SC-E2/G			60		50
SC-E2S SC-E2S/G		SA103RA/100	100		80
SC-E3 SC-E3/G			100		80
SC-E4 SC-E4/G			100		100
SC-E5		H203B/150	150		125
SC-E6	25	H203B/225	225		125
SC-E7			225		160

(2) Short circuit protection according to UL508
Suitable for use on a circuit capable of delivering not more than 5,000 (SC-E1, E1/G, E2, E2/G, E3, E3/G, E4, E4/G), 10,000 (SC-E5, E6, E7) rms symmetrical amperes, 600V max. Maximum circuit breaker and fuse rating are described in the name plate.

Circuit diagram

(1) 3-wire control circuit is shown in Fig.5.
(2) 2-wire control circuit is shown in Fig.6.

In 2 wire control circuits, be careful of the following points when using thermal overload relay with setting reset button to auto reset mode. If over-current flows, which is not large enough to blow the fuse or to operate the circuit breaker, the magnetic contactor repeats make/break operations. It does this because the thermal overload relay repeats the resets and the trips automatically. This repeated make/break operations would damage the magnetic contactor and the thermal overload relay. Eventually, contact welding short-circuit (phase to phase) or grounding occur, and the fuse blow or circuit breaker operate. In this case, check the magnetic contactor and the thermal overload relay. Replace them if they have been damaged.

6. For further data and accessories

See catalogue.

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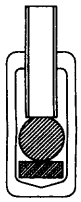
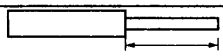
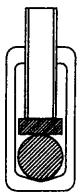
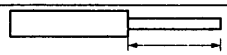
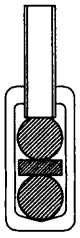
Table 1

Wire size and proper tightening torque for main terminals.

Types		Connectable wire size			
		Magnetic contactor			
		SC-E1, E2, E2S	SC-E3, E4	SC-E5, E6	SC-E7
Terminal screw	Size	M6	M8	M8	M8
	Kinds of screw [Note 1]	⊕ ⊖	⬡	⬡	⬡
	Solid and stranded [mm²][Note 2]	0.75 to 35	1.5 to 70	4.0 to 70	4.0 to 120
	Finely stranded with end sleeve [mm²]	0.75 to 25	1.5 to 50	2.5 to 50	2.5 to 95
	Finely stranded without end sleeve [mm²]	0.75 to 25	1.5 to 50	4.0 to 50	4.0 to 95
	AWG conductor connections [AWG]	18 to 2	16 to 2/0	12 to 2/0	12 to 250MCM
	Stripped lengh [mm] 	15	20	27	29
	Solid and stranded [mm²][Note 2]	0.75 to 25	1.5 to 50	4.0 to 70	4.0 to 120
	Finely stranded with end sleeve [mm²]	0.75 to 16	1.5 to 35	2.5 to 50	2.5 to 95
	Finely stranded without end sleeve [mm²]	0.75 to 16	1.5 to 35	4.0 to 50	4.0 to 95
	AWG conductor connections [AWG]	18 to 3	16 to 1/0	12 to 2/0	12 to 250MCM
	Stripped lengh [mm] 	13	16	27	29
	Solid and stranded [mm²][Note 2]	0.75 to 25 + 0.75 to 25	1.5 to 50 + 1.5 to 50	4.0 to 70 + 4.0 to 70	4.0 to 120 + 4.0 to 120
	Finely stranded with end sleeve [mm²]	0.75 to 16 + 0.75 to 16	1.5 to 35 + 1.5 to 35	2.5 to 50 + 2.5 to 50	2.5 to 95 + 2.5 to 95
	Finely stranded without end sleeve [mm²]	0.75 to 16 + 0.75 to 16	1.5 to 35 + 1.5 to 35	4.0 to 50 + 4.0 to 50	4.0 to 95 + 4.0 to 95
	AWG conductor connections [AWG]	18 to 3 + 18 to 3	16 to 1/0 + 16 to 1/0	12 to 2/0 + 12 to 2/0	12 to 250MCM + 12 to 250MCM
Tightening torque [N · m](lb.in)		2.5(22)	8(70)	8(70)	10(89)
Loosening torque [N · m](lb.in) [Note 3]		1(9)	2(18)	2(18)	2(18)

[Note 1] ⊕ :Philips PH2 ϕ 6 ⊖ :Slotted-head screws I 1 × 5.5 type B

⬡ :Hexagon socket screw keys 

[Note 2] Stranded wire (0 to 22[mm²]) :Number of solids ≦ 7

Stranded wire (38 to 120[mm²]) :Number of solids ≦ 19 (38 to 120[mm²])

Except above stranded wire :Finely stranded with end sleeve

[Note 3] Do not tighten screws counterclockwise strongly further the loosening torque, or terminals may be broken.

Wire size and proper tightening torque for auxiliary terminals.

Screw size : M3.5

Wire size : 0.75 to 2.5mm², AWG 18 to 14

Tightening torque[N · m](lb.in) : 0.8 to 1 (7 to 9)

Stripped length [mm] : 10

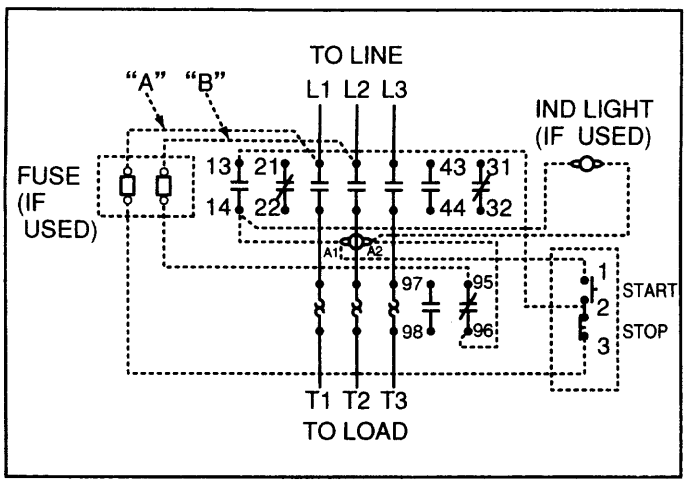


Fig. 5

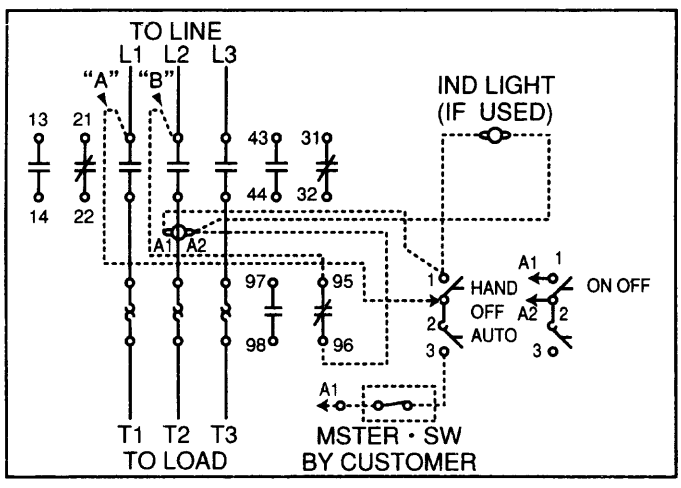


Fig. 6