MITSUBISHI

A1SD75M1/M2/M3 Positioning Module

User's Manual

(Installation)

Thank you for buying the Mitsubishi general-purpose programmable logic controller MELSEC-A Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.

MODEL	A1SD75M-U-E(H/W)
MODEL CODE	13J884
IB(NA)-66734-E (0110)MEE	

● SAFETY PRECAUTIONS ●

(Always read before starting use)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to using CPU module user's manual for a description of the PLC system safety precautions.

These ●SAFETY PRECAUTIONS● classify the safety precautions into two categories: "DANGER" and "CAUTION".

DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.
CAUTION	Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by **CAUTION** may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

⚠DANGER

- Configure a safety circuit so that the safety of the overall system is maintained even when an external power error or PLC error occurs.
  An accident may occur by a false output or a malfunction.
  (1) Outside of the PLC, construct mechanical damage preventing interlock circuits such as emergency stop, positioning upper and lower limit switches.
  (2) During zero return operation, the module is controlled by two data: zero return direction and zero return speed, and speed begins to decelerate when the near point dog turns on. If the zero return direction is set incorrectly, the module may continue to operate without decelerating. To prevent damage to the module in such cases, configure an interlock circuit outside the PLC.

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100 mm (3.9 inch) or more from each other.
  Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the PLC in an environment that meets the general specifications contained in this manual.Using this PLC in an environment outside the range of the general specifications could result in electric shook, fire, malfunction, and damage to or deterioration of the product.
- Insert the tabs at the bottom of the module into the mounting holes in the base module, and tighten the screws using the specified torque.
  If the module is not properly installed, it may result in malfunctions, failure, or fallout.
- Verify that the external device connector, SSCNET connector and RS-422 connector are securely attached to the connectors on the module. Confirm that they connect with an audible click.
  If not attached properly, a contact error may occur, resulting in incorrect input or output.
- Always attach a cover to connectors that are not used. If not covered, malfunctions may occur.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause malfunction or failure in the module.

[WIRING PRECAUTIONS]

⚠CAUTION

- Be sure there are no foreign substances such as sawdust or wiring debris inside the module.
  Such debris could cause fires, failure, or malfunction.
- Perform soldering of the external device connector and SSCNET connector after verifying the pin layout.
- Perform soldering of those connectors correctly. False soldering may cause short circuits and malfunctions.

[STARTUP AND MAINTENANCE PRECAUTIONS]

⚠DANGER

- Make sure to switch all phases of the external power supply off before cleaning.
  If you do not switch off the external power supply, it will cause malfunctions of the module.
- Do not disassemble or modify the modules. Doing so could cause failure, malfunction, injury, or fire.
- Make sure to switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause failure or malfunction of the module.
- Remove the external device connector and SSCNET connector after the system has been stopped.
  The system will stop if they are removed while the system is running.
- When performing test operation, set the parameter for the speed limit value to a slow setting and prepare for an immediate stop of the module should a dangerous condition occur during operation verification.

[USAGE PRECAUTIONS]

⚠CAUTION

- Exercise caution when the reference-axis speed for interpolation operation has been specified, since the speed of the opposite axis (second axis) can get greater than the set speed (speed limit value).

[DISPOSAL PRECAUTIONS]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

About the Manuals

The following product are available for this equipment.
Refer to the table given below to choose suitable manuals.

Detailed Manual

Manual name	Manual No. (Model code)
Positioning module type A1SD75M1/M2/M3, AD75M1/M2/M3 User's Manual	IB-66715 (13J870)

Related Manual

Manual name	Manual No. (Model code)
Positioning module software package type SW1IVD-AD75P Operating Manual	IB-66714 (13J915)
GX Configurator-AP Version 1 Operating Manual	IB-66900 (13J948)

Correspondence to EMC DIRECTIVE

For instructions to make the PLC compatible with EMC standards, refer to "EMC AND LOW-VOLTAGE DIRECTIVE" in PLC CPU User's Manual (Hardware).

* When the PLC CPU user's manual (Hardware) does not include Chapter 3 "EMC AND LOW-VOLTAGE DIRECTIVE", refer to QnA Series CPU Compatible High-Speed Accessing Basic Base Unit-Additional Explanation for Product Conforming to EMC Standards (IB-68837) (optional).

1. Overview

This manual describes how to install A1SD75M1/M2/M3 Positioning Module (hereafter abbreviated as A1SD75) and how to wire them with external devices.
After unpacking A1SD75, please confirm that the following products are contained.

Product name		Quantity		
A1SD75M1 Positioning Module		1		
A1SD75M2 Positioning Module			1	
A1SD75M3 Positioning Module				1
External connector (Model)	Connector (10136-3000VE)	1	2	3
	Connector cover (10336-56F0-008)	1	2	3

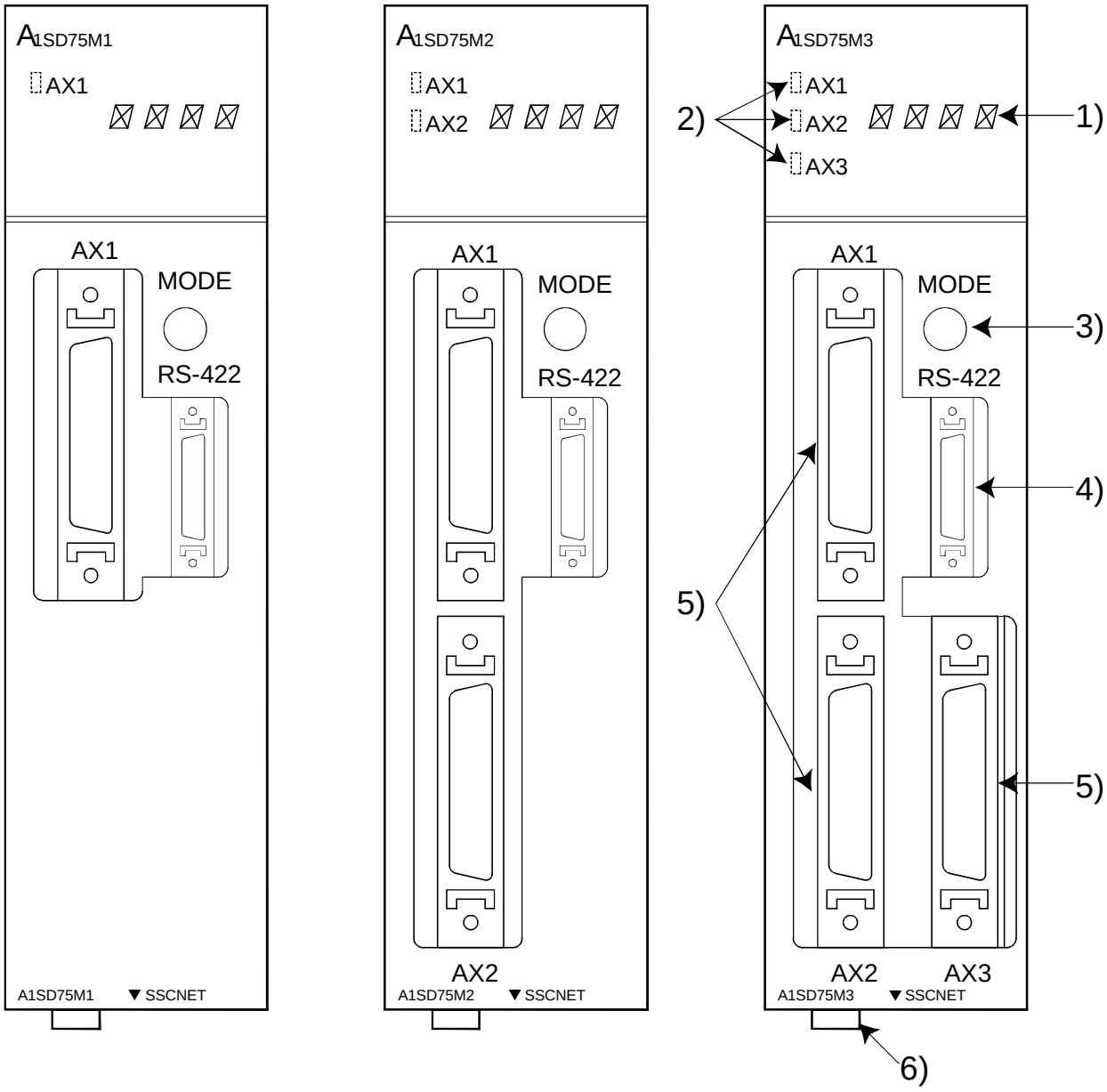
2. Performance Specifications

The performance specifications for the A1SD75 are shown below.

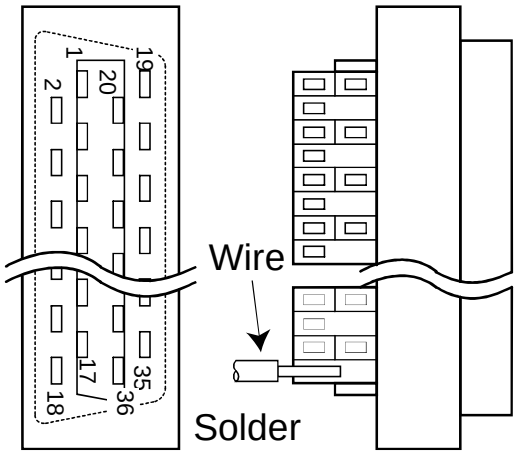
Item	Specifications
Maximum output command speed	1Mpps
Maximum connection distance between servos	Overall distance of SSCNET cable: 30m (98.43 ft.)
Number of occupied I/O points	32 points
Internal current consumption	5VDC, 0.7A or less
Flash ROM write counts	Max. 100,000 times
Access counts to the FeRAM when the absolute position detection system is employed	Max. 9,999,900,000 times
External dimensions (mm)[inch]	130[5.12](H)×34.5[1.36](W)×93.6[3.69](D)
Weight (kg)[lb]	0.35[0.77]

3. Names of Each Part

The following shows the name of each part.



A1SD75M1 front view A1SD75M2 front view A1SD75M3 front view

No.	Name	Description
1)	17-segment LED	• Indicates the operation status. • When the mode switch is pressed, it displays a message for the selected mode.
2)	Axis display LEDs AX1 to 3	• Indicate the status of respective axes based on the message displayed on the 17-segment LED.
3)	Mode switch	• A selector switch that changes the mode. • The mode is changed each time the switch is pressed.
4)	RS-422 connector	• Connector for connection to peripheral device.
5)	External device connector	• Connector for mechanical system input or manual pulsar. The applicable wire size for the connector is AWG #24 to #30 (0.05 to 0.2). The pin layout for the included external device connector is as follows. Perform wiring according to the interface.  The pin layout viewed from the top is shown. The connector pins are referred to as 1 to 36.
6)	SSCNET connector	Connector for SSCNET-compatible servo amplifier

4. Loading and Installation

The following is explanations of the handling precautions and installation environment which is common to modules when handling A1SD75 from unpacking to installation.
For the details of loading and installation of the module, refer to User's Manual of PLC CPU module to be used.

4.1 Handling precautions

(1) Because the case of the module is made of resin, be careful not to drop it or expose it to strong impact.
(2) Do not remove the printed circuit board of the module from the case. This may cause malfunctions.
(3) Be careful not to let foreign matters such as filings or wire chips get inside the module during wiring. When such matters do enter, be sure to remove them.
(4) Execute tightening of the module's installation screws within the range indicated below.

Screw position	Tightening torque range
Module fixing screw (M4 screw)	78 to 118 Ncm (6.9 to 10.4 lb•inch)

4.2 Installation environment

Do not install the A series PLC in the following environments.
(1) Where the ambient temperature exceeds the 0 to 55°C range.
(2) Where the ambient humidity exceeds the 10 to 90 % RH range.
(3) Where condensation is produced by sudden temperature changes.
(4) Where corrosive or combustible gas is present.
(5) Where dust, iron powder and other conductive powder, oil mist, salt, or organic solvents are prevalent.
(6) In direct sunlight.
(7) Where a strong electric or magnetic field is generated.
(8) Where vibration and shock may be transmitted directly to the module.

5. Wiring

Precautionary notes when wiring as well as the interface are described below.

5.1 Precautionary notes when wiring

This section describes the precautionary notes for the wiring process between the A1SD75 and outside (servo amplifier).

(1) Signal wiring

(a) Do not bundle I/O signal wires with, or lay them close to, power lines or main circuit lines.

(b) If I/O signal wires have to be laid close to these lines, either use a partitioned duct or separate conduits.

(c) If there is no alternative but to bundle the cables together, use a shielded cable and ground its shielding at the PLC CPU side.

(d) If conduits are used for wiring, ground the conduits.

(e) If the connecting cable is too long, or is too close to a main circuit line, malfunctions could occur due to noise.

(2) Fitting connectors to the A1SD75

(a) Make sure that the external device connector, connector for connection to the SSCNET, and connector for connecting the peripheral device, are securely engaged with the corresponding connector at the A1SD75, and have clicked into place.

If the connector is not engaged securely the contact will be defective, and this could cause erroneous inputs and outputs.

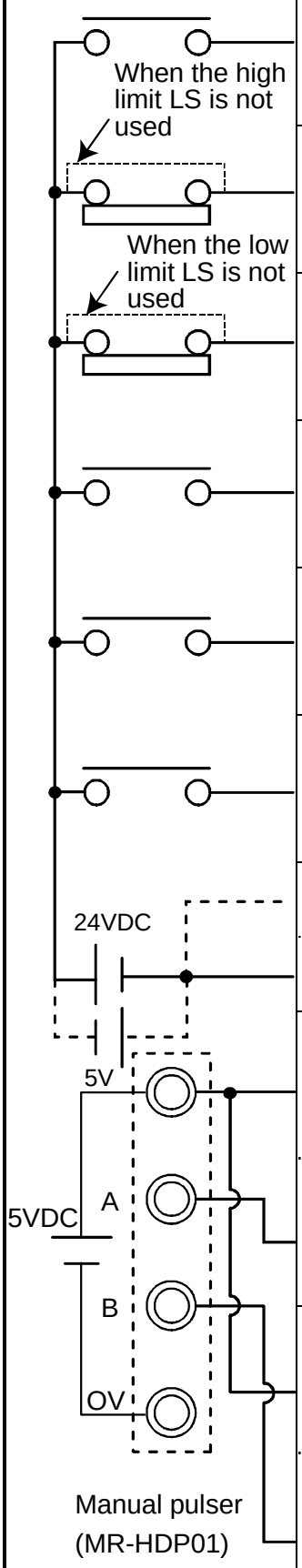
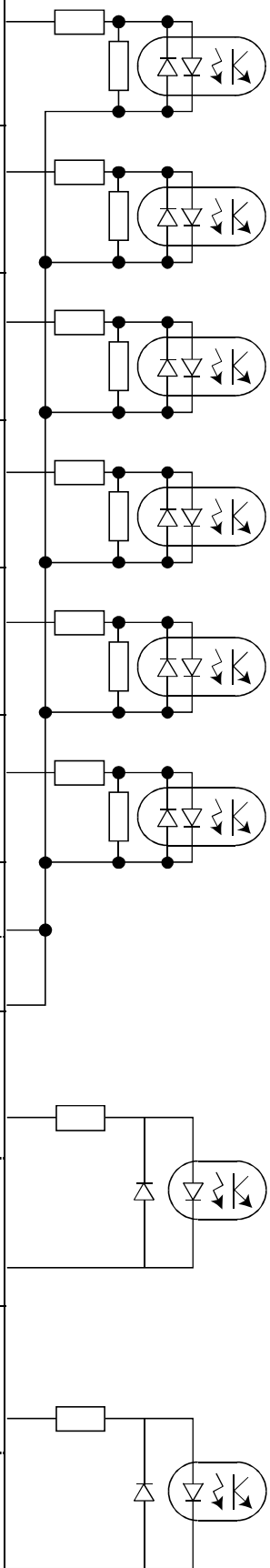
(b) Disconnect the external device connector and SSCNET connector while the system is stopped.

If these connectors are disconnected while the system is in operation, the system will stop.

Note) Refer to Servo Amplifier Instruction Manual for the cable and terminal connector that are required for connection to a servo amplifier in SSCNET.

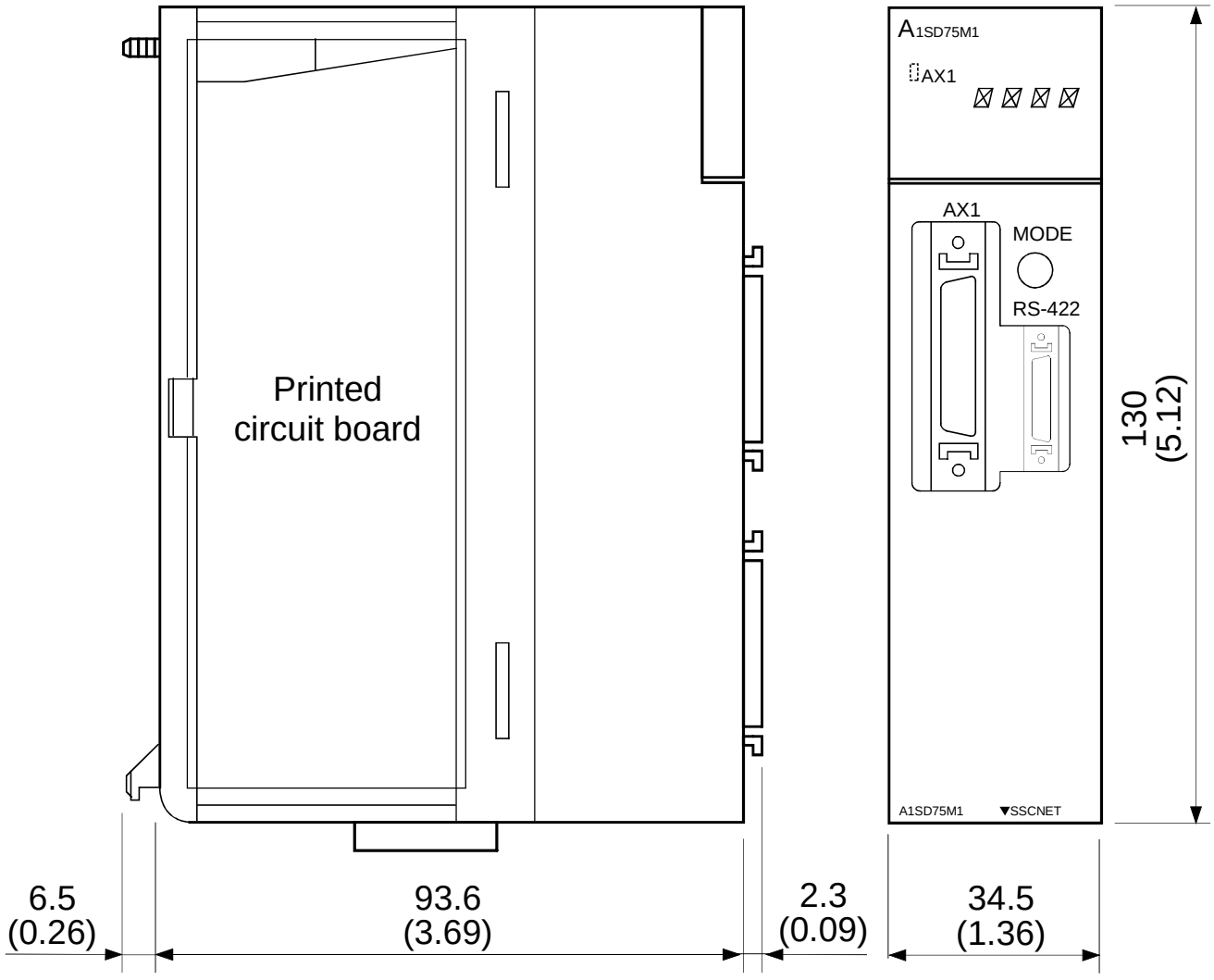
5.2 Interface

○ : Wiring required △ : Wiring performed as required

External wiring	Pin number	Internal circuit	Signal name		Wiring requirement
	11		Near-point dog signal	DOG	△
	12		High limit LS signal	FLS	○
	13		Low limit LS signal	RLS	○
	14		Stop signal	STOP	△
	15		Speed/ position switch signal	CHG	△
	16		External start signal	STRT	△
	35 36		Common	COM	○
	(+) 9		Manual pulser phase A	PULSER A+	△
	(-) 27			PULSER A-	
	(+) 10		Manual pulser phase B	PULSER B+	
	(-) 28			PULSER B-	

6. External Dimensions

A1SD75M1 is shown.



Unit:mm(inch)

* External dimensions are the same for A1SD75M1, M2 and M3.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

Country/Region	Sales office/Tel
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061 Tel : +1-847-478-2100
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Av. Rio Branco, 123-15 ,and S/1507, Rio de Janeiro, RJ CEP 20040-005, Brazil Tel : +55-21-221-8343
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY Tel : +49-2102-486-0
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Herts., AL10 8XB,UK Tel : +44-1707-276100
Italy	Mitsubishi Electric Europe B.V. Italian Branch Centro Dir. Colleoni, Pal. Perseo - Ingr.2 Via Paracelso 12, 20041 Agrate B., Milano, Italy Tel:+39-039-6053301
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi 76-80 08190 - Sant Cugat del Valles, Barcelona, Spain Tel:+34-935-653135
South Africa	Circuit Breaker Industries LTD. Private Bag 2016, Isando 1600, Johannesburg, South Africa Tel : +27-11-928-2000
Hong Kong	Ryoden International Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, HongKong Tel : +852-2887-8870

Country/Region	Sales office/Tel
China	Ryoden International Shanghai Ltd. 3F Block5 Building Automation Instrumentation Plaza 103 Cao Bao Rd. Shanghai 200233 China Tel : +86-21-6475-3228
Taiwan	Setsuyo Enterprise Co., Ltd. 6F., No.105 Wu-Kung 3rd.RD, Wu-Ku Hsiang, Taipei Hsine, Taiwan Tel : +886-2-2299-2499
Korea	HAN NEUNG TECHNO CO.,LTD. 1F Dong Seo Game Channel Bldg., 660-11, Deungchon-dong Kangsec-ku, Seoul, Korea Tel : +82-2-3668-6567
Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 ALEXANDRA ROAD #05-01/02, MITSUBISHI ELECTRIC BUILDING SINGAPORE 159943 Tel : +65-473-2480
Thailand	F. A. Tech Co.,Ltd. 898/28,29,30 S.V.City Building,Office Tower 2,Floor 17-18 Rama 3 Road, Bangkpongpang, Yannawa, Bangkok 10120 Tel : +66-2-682-6522
Indonesia	P.T. Autoteknindo SUMBER MAKMUR Jl. Muara Karang Selatan Block A Utara No.1 Kav. No.11 Kawasan Industri/ Pergudangan Jakarta - Utara 14440 Tel : +62-21-663-0833
India	Messung Systems Put,Ltd. Electronic Sadan NO:111 Unit No15, M.I.D.C BHOSARI,PUNE-411026 Tel : +91-20-7128927
Australia	Mitsubishi Electric Australia Pty. Ltd. 348 Victoria Road, PostalBag, No 2, Rydalmere, N.S.W 2116, Australia Tel : +61-2-9684-7777

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE : 1-8-12, OFFICE TOWER Z 14F HARUMI CHUO-KU 104-6212, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI5, HIGASHI-KU, NAGOYA, JAPAN

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