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**mitsubishi
electric**

Changes for the Better

FACTORY AUTOMATION

ELECTRONIC MULTI-MEASURING INSTRUMENT ME96SS

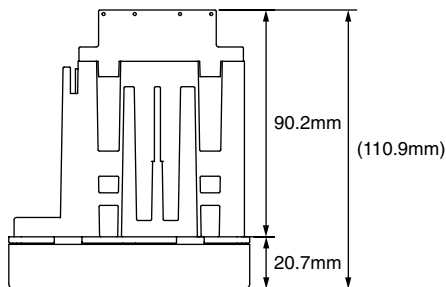


SS Ver.B
Super-S Series

Outline and Features

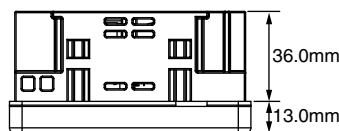
Compact size

- Realized downsizing for ME96SSEB-MB.



ME96SSEA-MB
(Conventional type)

It contributes to
space saving!



ME96SSEB-MB
(New type)

Improved Measurement Functions

- Added measurement function, reactive energy, apparent energy, reactive power and apparent power for ME96SSEB-MB.



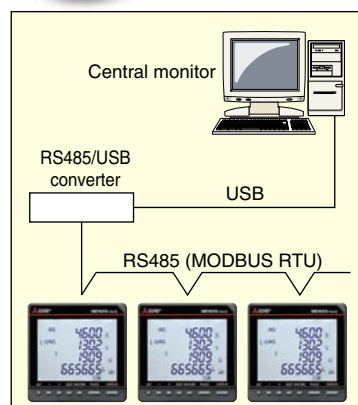
Model name	Transmission/Option specifications	Main measurement items
ME96SSHB-MB (High-performance model)	MODBUS RTU communication Plug-in module (options) <ul style="list-style-type: none"> Analog/Pulse/Contact output/input CC-Link communication Digital input/output (for MODBUS RTU communication) Backup (on SD card) MODBUS TCP communication 	A, DA, V, Hz = $\pm 0.1\%$ W, var, VA, PF = $\pm 0.2\%$ VAh = $\pm 2.0\%$ Wh = class 0.5S (IEC62053-22) varh = class 1S (IEC62053-24) Harmonics = 31 st -deg (max) Rolling demand = W, var, VA
ME96SSRB-MB (Standard model)	MODBUS RTU communication Plug-in module (options) <ul style="list-style-type: none"> Analog/Pulse/Contact output/input CC-Link communication Digital input/output (for MODBUS RTU communication) Backup (on SD card) MODBUS TCP communication 	A, DA, V = $\pm 0.2\%$ Hz = $\pm 0.1\%$ W, var, VA, PF = $\pm 0.5\%$ VAh = $\pm 2.0\%$ Wh = class 0.5S (IEC62053-22) varh = class 1S (IEC62053-24) Harmonics = 19 th -deg (max) Rolling demand = W, var, VA
ME96SSEB-MB (Economy model)	MODBUS RTU communication	A, DA, V = $\pm 0.5\%$ Hz = $\pm 0.2\%$ W, var, VA, PF = $\pm 0.5\%$ VAh = $\pm 2.0\%$ Wh = class 0.5S (IEC62053-22) varh = class 1S (IEC62053-24) Harmonics = Only total

Optional Plug-in Modules

Model name	Analog output	Pulse/Alarm output	Contact input	Contact output	Transmission function	Used with
ME-4210-SS96B	4	2	1	—	—	ME96SSHB-MB ME96SSRB-MB
ME-0040C-SS96	—	—	4	—	CC-Link	
ME-0052-SS96	—	—	5	2	—	
ME-0000BU-SS96	—	—	—	—	SD CARD	
ME-0000MT-SS96	—	—	—	—	MODBUS TCP	

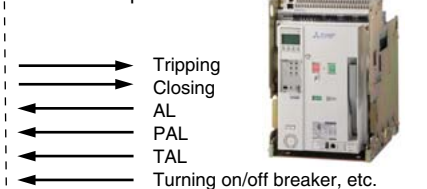
Note: Optional Plug-in Module can not be used with ME96SSEB-MB.

MODBUS RTU System



- MODBUS RTU communication system optimizes computer monitoring operations.
- In addition, when ME-0052-SS96 is installed, remote monitoring of contact input signals and on/off control of contact output signals are possible. Therefore, no other DI/DO terminals are required.
- Digital input signals can be latched for over 30ms, and there is no need for external latch circuits.

ME-0052-SS96
optional unit



<MODBUS RTU Interface Specifications>

- Max. Baud rate: 38.4kbps
- Max. Connection Distance: 1,200m
- Max. Connection Units: 31

<Optional Plug-in Module ME-0052-SS96>

- Digital Input: 5 points (24VDC)
- Digital Output: 2 points (35VDC)

Impressive Monitoring Functions

Advanced Alarm Display

- (1) A function to blink the backlight upon occurrence of an alarm is provided.

The product has a setting function to blink the backlight upon occurrence of an alarm.

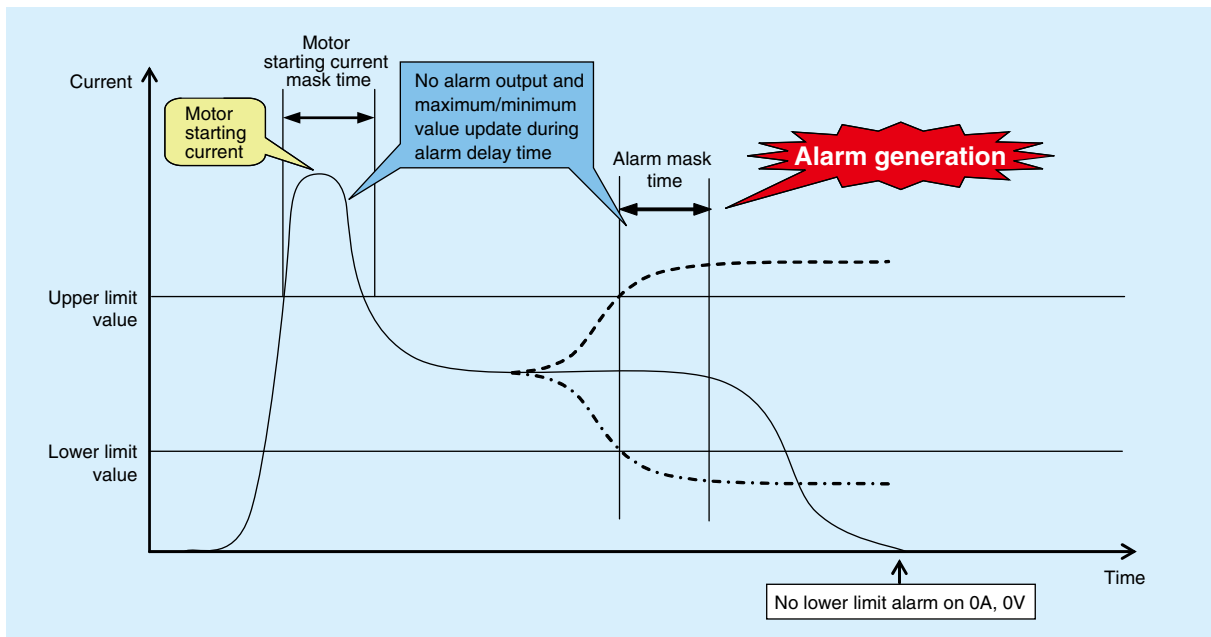
- (2) The automatic or manual alarm cancel mode can be selected.

- (3) Up to four points of upper and lower limits can be monitored.

- (4) The alarm output delay time (alarm mask time) can be set.

Time of alarm output after the maximum value and minimum value is reached can be set.

With this function, alarm output caused by frequency change at start-up current of a motor and start-up of private power generating facility can be avoided.

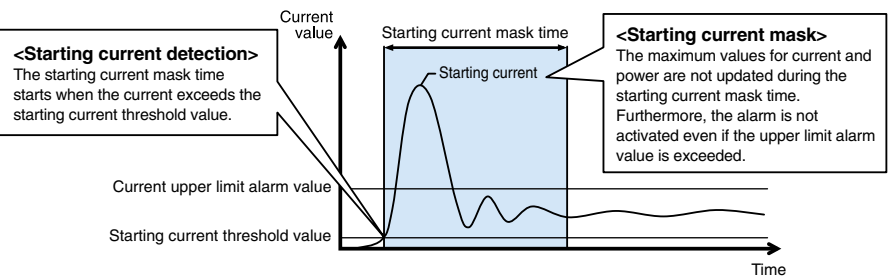


Motor Starting Current Mask Function

The use of the motor starting current mask function for monitoring the motor current can prevent updating of the maximum value and alarm output caused by the motor starting current.

Although the maximum value is not updated, the current value is displayed.

The starting current mask time can be set in the range from 1s to 5min.



Note: Set the starting current threshold to a value lower than the lower limit value in consideration of fluctuations in load current during operation.

ME96 Super-S Series Ver.B Features

Variety of Complementary Features

Password Function

With the password function, the following items can be protected from an accidental execution.

No.	Password-protected item	No.	Password-protected item
1	Shift to the setting mode	5	Adjust the time limit of rolling demand
2	Reset the max./min. values	6	Reset the peak value of rolling demand
3	Reset the value of active energy, reactive energy and apparent energy	7	Reset the value of operating time
4	Reset the value of periodic active energy		

Special Primary Voltage/Current and Special Secondary Voltage are settable

(1) Special primary current

1A-30kA



(2) Special primary voltage

60V-750kV



(3) Special secondary voltage

Three phase 4-wire system

[63.5V, 100V, 110V, 115V, 120V]

Three phase 3-wire, Single phase 2-wire system

[100V, 110V, 220V]



Periodic Monitoring Function

Power consumption can be measured in three individual intervals (e.g., peak, off-peak and shoulder, etc.).

The time segments can be switched according to the setting via communication or the digital input (DI).

(The time segments cannot be switched manually (button operation).)



Power consumption (period 1)



Power consumption (period 2)



Power consumption (period 3)

Rolling Demand Function

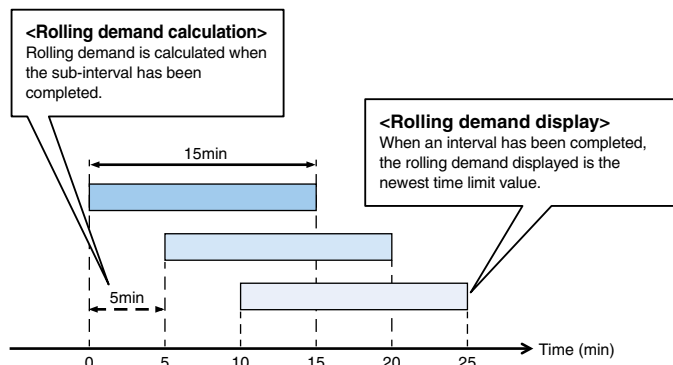
Rolling demand is the estimated power consumption in a specified period (interval).

For the block interval demand, select the duration (interval) of the block to be used for demand calculation.

① Rolling block

Use rolling block to set the interval and sub-intervals from 1-60min (1min intervals). Rolling demand is calculated and updated at the end of each sub-interval. However, Present and predictive values are always calculated.

<Example: Interval, 15min; Sub-interval, 5min>

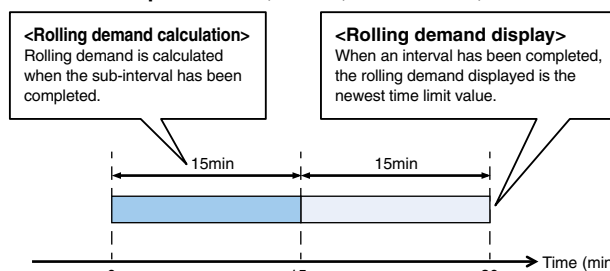


② Fixed block

Use fixed block to set the interval from 1-60min (1min intervals). Rolling demand is calculated and updated at the end of each interval. However, Present and predictive values are always calculated.

(For fixed block, use the same time limits both of interval and sub-interval).

<Example: Interval, 15min; Sub-interval, 15min>



Specifications

ME96SSEB-MB

Model name			ME96SSEB-MB	
Phase wire system			3-phase 4-wire, 3-phase 3-wire (3CT, 2CT), 1-phase 3-wire, 1-phase 2-wire (common use)	
Rating		Current	5 A AC, 1 A AC (common use)	
		Voltage	3-phase 4-wire: max 277/480 V AC 3-phase 3-wire: (DELTA) max 220 V AC, (STAR) max 440 V AC 1-phase 3-wire: max 220/440 V AC 1-phase 2-wire: (DELTA) max 220 V, (STAR) max AC 440 V AC	
		Frequency	50/60 Hz (common use)	
Item			Measuring Item	Class
Measuring element	Current (A)		A1, A2, A3, AN, A _{AVG}	±0.5%
	Current demand (DA)		DA1, DA2, DA3, DAN, DA _{AVG}	
	Voltage (V)		V12, V23, V31, V _{AVG} (L-L), V1N, V2N, V3N, V _{AVG} (L-N)	
	Active power (W)		W1, W2, W3, ΣW	
	Reactive power (var)		var1, var2,var3, Σvar	
	Apparent power (VA)		VA1, VA2, VA3, ΣVA	
	Power factor (PF)		PF1, PF2, PF3, ΣPF	±0.5%
	Frequency (Hz)		Hz	±0.2%
	Active energy (Wh)		Imported, Exported	Class 0.5S (IEC62053-22)
	Reactive energy (varh)		Imported lag, Imported lead, Exported lag, Exported lead	Class 1S (IEC62053-24)
	Apparent energy (VAh)		Imported + Exported	±2.0%
	Harmonic current (HI)		Total	±2.0%
	Harmonic voltage (HV)		Total	
	Operating time (h)		Operating time 1, Operating time 2	(Reference)
Measuring method		Instantaneous value	A, V: RMS value calculation; W, var, VA, Wh, varh, VAh: Digital multiplication; PF: Power ratio calculation; Hz: Zero-cross; HI, HV: FFT	
		Demand value	DA: Thermal type calculation	
Display	Display type		LCD with LED backlight	
	The number of display digits or The number of segments	Digital section	First to Third line display: 4 digits, Fourth line display: 6 digits	
			A, DA, V, W, var, VA, PF: 4 digits; Hz: 3 digits; Wh, varh, VAh: 9 digits (6-digit or 12-digit is also available.); Harmonic distortion ratio/content rate: 4 digits; Harmonic RMS value: 4 digits; Operating time: 6 digits	
			Display update time interval	
Communication			MODBUS RTU communication	
Connectable Optional Plug-in Module			Cannot connect optional module	
Power interruption backup			Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy, reactive energy, apparent energy, operating time)	
VA consumption	Voltage circuit		Each phase: 0.1 VA (at 110 V AC), 0.2 VA (at 220 V AC), 0.4 VA (at 440 V AC)	
	Current circuit		Each phase: 0.1 VA	
	Auxiliary power circuit		4 VA (at 110 V AC), 5 VA (at 220 V AC), 3 W (at 100 V DC)	
Auxiliary power			100 V to 240 V AC (±15%), 100 V to 240 V DC (-30% +15%)	
Weight			0.3 kg	
Dimensions			96 (H) × 96 (W) × 36 (D) mm	
Mounting method			Embedded	
Operating temperature/humidity			-5°C to +55°C (Daily average temperature: 35°C or less), 0% to 85% RH, Non condensing	
Storage temperature/ humidity			-25°C to +75°C (Daily average temperature: 35°C or less), 0% to 85% RH, Non condensing	

Note 1. The class value is a percentage of rated value (100%).

Note 2. For harmonics measurement where distortion ratio (content rate) is 100% or more, it can exceed ±2.0%.

Note 3. When there is no voltage input, harmonic current cannot be measured.

Standards Compliance

Electromagnetic Compatibility		
	Emissions	
	Radiated Emission	EN 61326-1 / EN 55011, CISPR 11 FCC Part15 Subpart B Class A
	Conducted Emission	EN 61326-1 / EN 55011, CISPR 11 FCC Part15 Subpart B Class A
	Harmonics Measurement	EN 61000-3-2
	Flicker Meter Measurement	EN 61000-3-3
	Immunity	
	Electrostatic discharge Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-2
	Radio Frequency Electromagnetic field Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-3
	Electrical Fast Transient/Burst Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-4
	Surge Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-5
	Conducted Disturbances, Induced By Radio Frequency Fields Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-6
	Power Frequency Magnetic Field Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-8
	Voltage Dips and Short Interruptions	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-11
Safety		
	Europe	CE, as per EN61010-1: 2010 (3 rd Edition)
	U.S. and Canada	UL Recognized Component as per UL 61010-1, IEC 61010-1
	Installation Category	III
	Measuring Category	III
	Pollution Degree	2

MODBUS RTU Communication Specifications

Item	Specification
Interface	RS-485 2-wire half-duplex transmission
Protocol	RTU (binary data transfer)
Transmission method	Asynchronous
Connection type	Multi-point bus
Baud rate	2400, 4800, 9600, 19200, 38400bps
Data bit	8
Stop bit	1, 2
Parity	ODD, EVEN, NONE
Address	1 to 255 (0: for broadcast mode)
Distance	1,200m (max)
Max. connectable units	31 units
Terminal Resistance	120Ω 1/2W
Recommended Cable	Shielded twisted-pair AWG24 to 14

■ For more information on data, please refer to the following document.
 · Electronic Multi-Measuring Instrument ME series MODBUS Interface specifications...LSPM-0075

CC-Link Communication Specifications for optional plug-in module

Item	Specification
No. of occupied stations	1 Station Remote device station
CC-Link version	CC-Link Ver 1.10 / Ver 2.00
Baud rate	10Mbps / 5Mbps / 2.5Mbps / 625kbps / 156kbps
Transmission method	Broadcast polling system
Synchronous method	Frame synchronous system
Encoding method	NRZI
Transmission path format	Bus format (EIA RS485)
Transmission format	HDLC
Error control system	CRC ($X^{16} + X^{12} + X^5 + 1$)
Number of connectable units	42 units (max, remote device station)
Remote station numbers (station numbers)	1 to 64

■ For CC-Link connection cables, please use the dedicated cables.
 For information regarding dedicated cables, please refer to the CC-Link Partner Product Catalog published by the CC-Link Partner Association or CC-Link Partner Product Information on the CC-Link Partner Association website (<http://www.cc-link.org>).
 Notes 1. Dedicated CC-Link cables compatible with Ver. 1.00 cannot be used in tandem with dedicated CC-Link high-performance cables compatible with Ver. 1.00.
 Notes 2. In the case of systems consisting of units compatible with Ver. 1.00, 1.10 or 2.00 used in tandem with Ver. 1.00 or 1.10 cables, Ver. 1.00 specifications will apply for the maximum total cable length and length of cables between stations.
 Notes 3. For terminal resistance, be sure to use 110 Ω ±5% (1/2W product) when using dedicated CC-Link cables or 130 Ω ±5% (1/2W product) when using dedicated CC-Link high-performance cables.
 ■ For more information on data, please refer to the following document.
 · Electronic Multi-Measuring Instrument programming manual (CC-Link).....LEN080334
 · Electronic Multi-Measuring Instrument programming manual (CC-Link)(For ver. 2 remote device station)...LEN130391

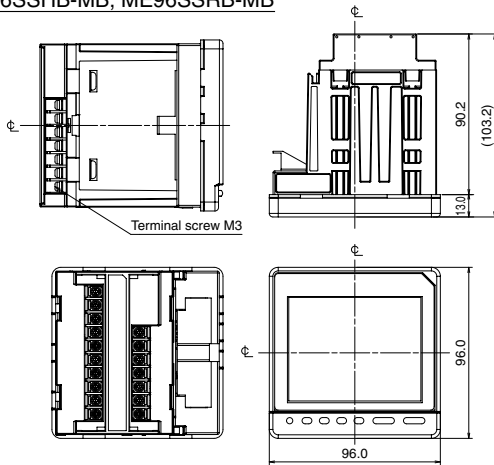
Input/Output Specifications

Item	Specification	Optional Plug-in Module type
Analog output	4-20mA (0-600 Ω)	ME-4210-SS96B
Pulse/Alarm output	No-voltage "a" contact Capacity: 35VDC, 0.1A	ME-4210-SS96B
Digital input	19-30VDC 7mA or less	ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96
Digital output	No-voltage a contact Capacity: 35VDC, 0.2A	ME-0052-SS96

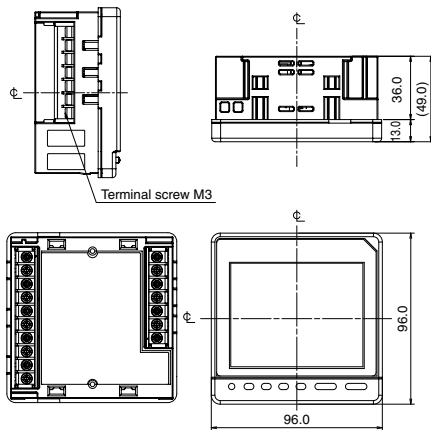
External Dimensions/Installation/Connections

Dimensions

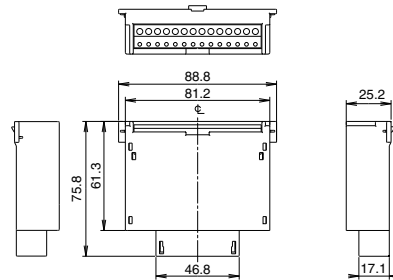
ME96SSHB-MB, ME96SSRB-MB



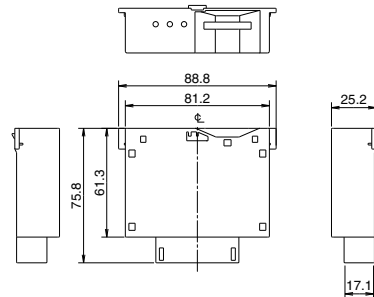
ME96SSEB-MB



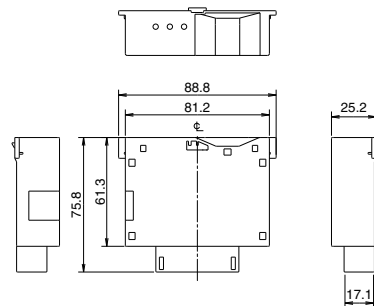
Optional Plug-in Module : ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96



Optional Plug-in Module : ME-0000BU-SS96



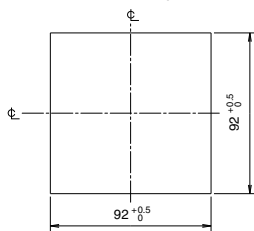
Optional Plug-in Module : ME-0000MT-SS96



Mounting

1 Dimension of panel

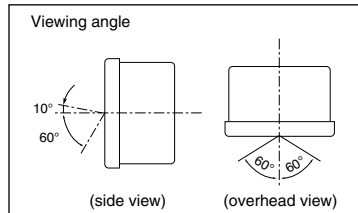
Panel hole dimensions are as shown in the following figure. It can be attached to a panel with thickness of 1.6 to 4.0mm.



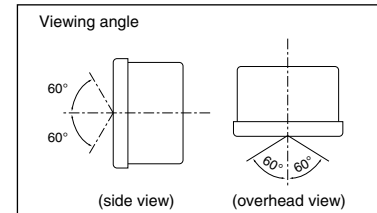
2 View Angle

The contrast of the display changes at view angle. Mount it at the position that is easy to see.

ME96SSEB-MB



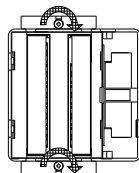
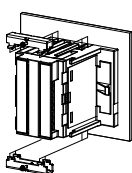
ME96SSHB-MB/ME96SSRB-MB



3 Attachment

For attachment of the basic device into the panel hole, attach according to the following procedure.

- ① The attachment lug is installed in two holes of the top and bottom of the basic device.
- ② Tighten the screws of the lug, and fix onto the panel.



Note

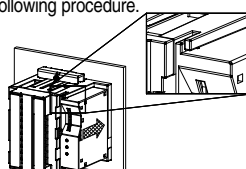
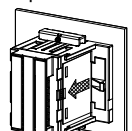
To prevent damage to the panel and screws, do not overtighten the screws.
The recommended torque for this product is 0.3 N·m to 0.5 N·m (about half the normal torque).
Tighten the two screws evenly.

Main unit mounting screws: M3

4 Installing Optional Plug-in Module

When installing the optional plug-in module onto the basic device, install according to the following procedure.

- ① Remove the optional cover.
- ② Attach the optional unit to the main unit.

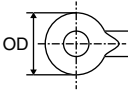


Fit the protruding part of the optional unit into the slot in the main unit.

Wiring

1 Applicable Cable Size

The table on the right describes the applicable wire size.

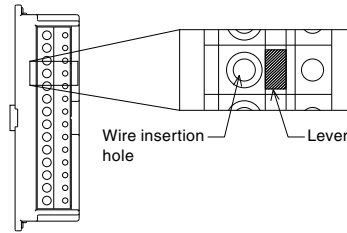
Part	Screw type	Wire specifications	Tightening torque
Product main body (auxiliary power supply, voltage input, current input and MODBUS RTU communication terminals)	M3	<ul style="list-style-type: none"> Use of crimp-style terminals: AWG26 to 14 (2 wires can be connected.) Applicable crimp-style terminal: OD of 6 mm or less, for screw M3 	0.6 to 0.8 N·m
Optional unit terminal (ME-0052-SS96, ME-0040C-SS96, ME-4210-SS96B)	Screwless	<ul style="list-style-type: none"> Single wire and stranded wire: AWG24 to 14 (Rod terminal can be used together with stranded wire.) Wire stripping length: 10 to 11 mm *1: To conform to UL Standard, use in accordance with the following requirements. <ul style="list-style-type: none"> Single wire and stranded wire: AWG24 to 18 Use of a bar terminal is not allowed. *2: When using a bar terminal for inserting two wires, select a terminal whose insertion part into the terminal block is 12 to 13 mm long. 	—

2 Wiring

Optional Plug-in Module Terminal

- Remove the wire casing at the end of the wire and solder to the rod terminal.
- With the lever pushed in, insert the wire and then release the lever to connect.

Optional Plug-in Module Terminal



3 Confirmations

After wiring, make sure the following:

- ☐ All wiring is connected
- ☐ There is no misitake in wiring

Note

Protective sheet

There is a protective sheet covering the LCD screen to prevent scratching during panel installation. Please remove the sheet before using the meter. When removing the sheet, the LCD may turn on due to the static electricity generated. This is not abnormal; the LCD will turn off after a short time.

Installation position

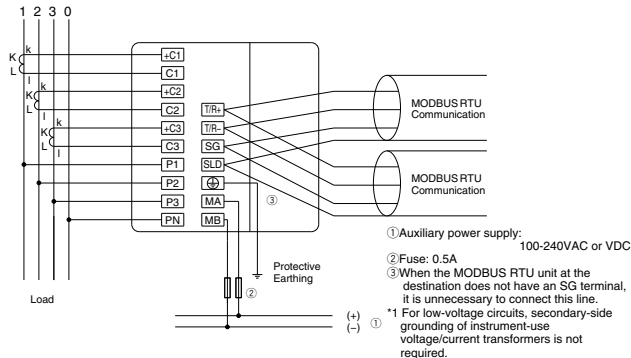
If installing the unit at the panel edge, choose an installation position where there is sufficient space for wiring work.

Optional unit

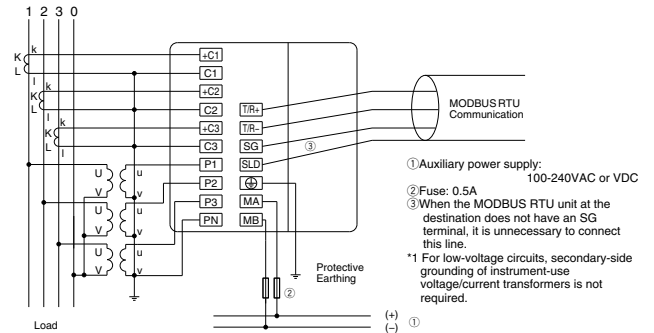
Turn the auxiliary power supply off before attaching the optional unit. If attached with the power on, the main unit will not recognize the optional unit. To remedy this, turn off/restart the auxiliary power supply or execute the "instrument restart" operation.

Wiring Diagrams

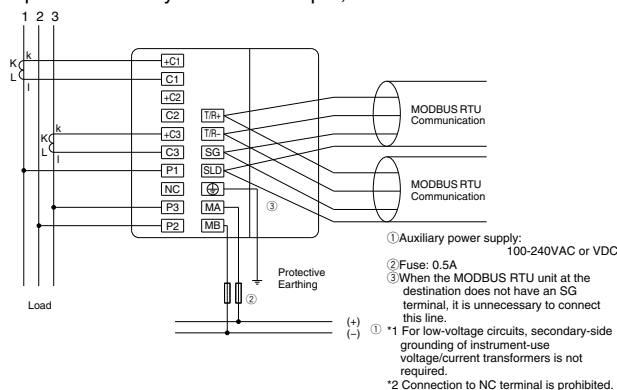
Three phase 4-wire system: Direct input



Three phase 4-wire system: With VT



Three phase 3-wire system: Direct input, 2CT



Three phase 3-wire system: With VT, 3CT

