



for a greener tomorrow



**mitsubishi
electric**

Changes for the Better

FACTORY AUTOMATION

ELECTRONIC MULTI-MEASURING INSTRUMENT ME96SS



SS Ver.B
Super-S Series

ME96 Super-S Series Electronic Indicating Instruments functions and optional units

Highly appreciated ME96SS Series Electronic Multi-Measuring Instruments measuring functions and network capability has been released.

① ME96SSHB-MB (high-performance model)

Major features

- [1] Supports highly accurate measurement (accuracy of current/voltage: 0.1%, active energy: class 0.5S) and high-order harmonic measurement (1st to 31st).
- [2] Incorrect wiring determination support function
- [3] Wide viewing angle LCD
- [4] Built-in logging function
- [5] Display 4 items at the sametime

② ME96SSRB-MB (standard model)

Major features

- [1] Incorrect wiring determination support function
- [2] Wide viewing angle LCD
- [3] Built-in logging function
- [4] Display 4 items at the sametime

③ ME96SSEB-MB (economy model)

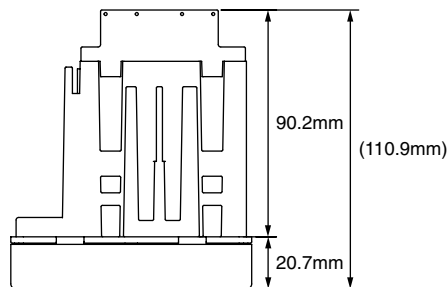
Major features

- [1] Compact size
- [2] Incorrect wiring determination support function
- [3] Display 4 items at the sametime

Outline and Features

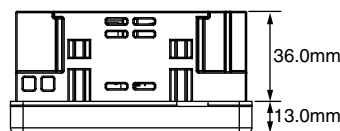
Compact size

- 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.



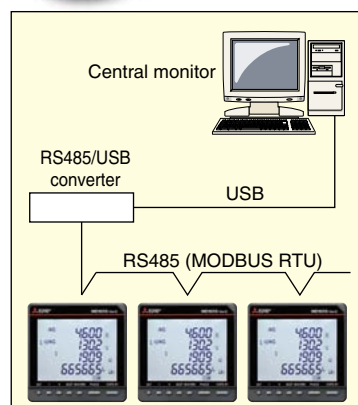
Model name	Transmission/Option specifications	Main measurement items
ME96SSHB-MB (High-performance model)	MODBUS RTU communication Plug-in module (options) <ul style="list-style-type: none"> Analog/Pulse/Contact output/input CC-Link communication Digital input/output (for MODBUS RTU communication) Backup (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

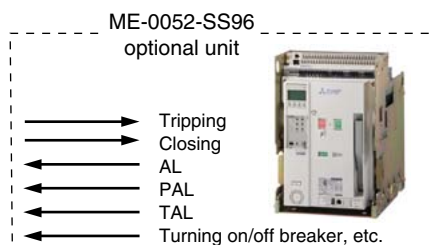
Model name	Analog output	Pulse/Alarm output	Contact input	Contact output	Transmission function	Used with
ME-4210-SS96B	4	2	1	—	—	ME96SSHB-MB ME96SSRB-MB
ME-0040C-SS96	—	—	4	—	CC-Link	
ME-0052-SS96	—	—	5	2	—	
ME-0000BU-SS96	—	—	—	—	SD CARD	
ME-0000MT-SS96	—	—	—	—	MODBUS TCP	

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.



<MODBUS RTU Interface Specifications>

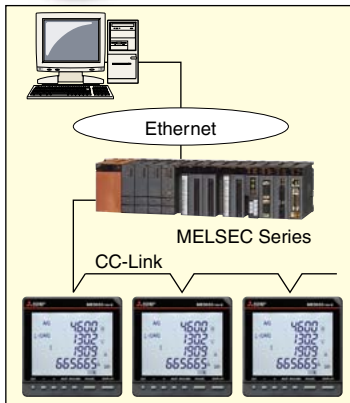
- Max. Baud rate: 38.4kbps
- Max. Connection Distance: 1,200m
- Max. Connection Units: 31

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

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

ME96 Super-S Series Ver.B Features

CC-Link System (ME96SSHB-MB/ME96SSRB-MB with ME-0040C-SS96 (optional plug-in module))



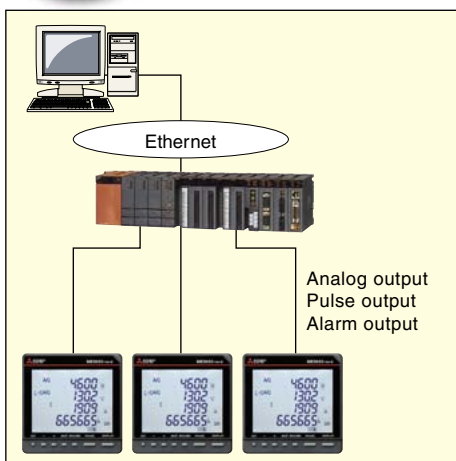
- Optimum transmission system for remote monitoring using Mitsubishi PLC
- Contact signals can be remotely monitored by installing the optional module ME-0040C-SS96. This is helpful in wiring and space saving.
- Digital unit signal can be latched for over 30ms, and there is no need for external latch circuits

- ← Abnormal Signal (Facility)
- ← Abnormal Signal (Earth Leakage)
- ← Abnormal Signal (Temperature)
- ← Circuit Breaker Status Signal, etc.

<CC-Link Interface>

- Max. Baud rate: 10Mbps
- Max. Connection Distance: 100m (10Mbps)-1,200m (156kbps)
- Max. Connection Units: 42
- Digital Input: 4 points (24VDC)

Analog/Pulse/Alarm Output System (ME96SSHB-MB/ME96SSRB-MB with ME-4210-SS96B (optional plug-in module))



- Applicable to analog output, pulse output and alarm output with the aid of the optional module ME-4210-SS96B
- Remote monitoring of A, DA, V, W, var, VA, PF, Hz, Harmonics Current RMS value and Harmonics voltage RMS value at 4 to 20mA output (max. 4 outputs)
- Active energy, reactive energy, apparent power and periodic energy can be monitored by pulse output (max. 2 pulses)
- Can remotely monitor upper/lower limit alarm by contact output (max. 2 points)

<Analog output specifications>

- 4-20mA
- 4 outputs
- Resistance load 600Ω or less

<Pulse output specifications>

- No-voltage a contact point
- 35VDC, 0.1A
- Select output from pulse widths of 0.125, 0.5 or 1s

<Alarm output specifications>

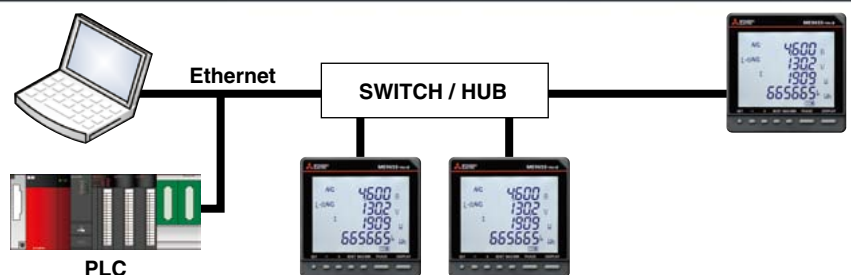
- No-voltage a contact point
- 35VDC, 0.1A

<Digital input specifications>

- 1 point (24VDC)

MODBUS TCP Communication (ME96SSHB-MB/ME96SSRB-MB with ME-0000MT-SS96 (optional plug-in module))

- This is a MODBUS TCP communication unit that can be used in the Ethernet system. The number of network system selection methods is increased, and Ethernet and MODBUS RTU communication can be duplicated.



Data Logging (built-in logging function and optional plug-in module)

- ME96SSHB/ME96SSRB are available with built-in logging function and an optional module (ME-0000BU-SS96) which can retain data even when communication cannot be established.



CSV file data



Data in more than one logging unit can be managed with one SD memory card.

Note: Use the SD memory card (EMU4-SD2GB) made by Mitsubishi Electric.

Use of any memory card other than our product (EMU4-SD2GB) is not covered by the warranty.



ME96 Super-S Series Ver.B Features

Succeeded Display Functions

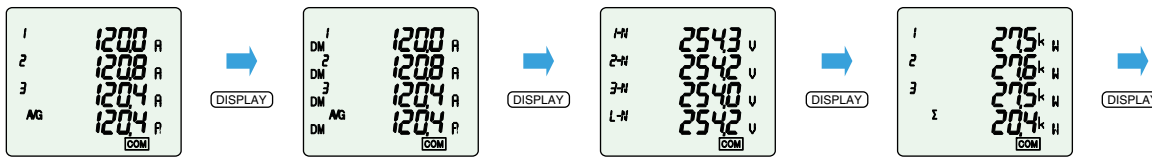
Concurrent Display of 4 items

The 4 measured values can be digitally confirmed on one screen.



Concurrent Display of Each Phase Measured Values

In Display Pattern P02, measured values of each phase can be concurrently displayed.



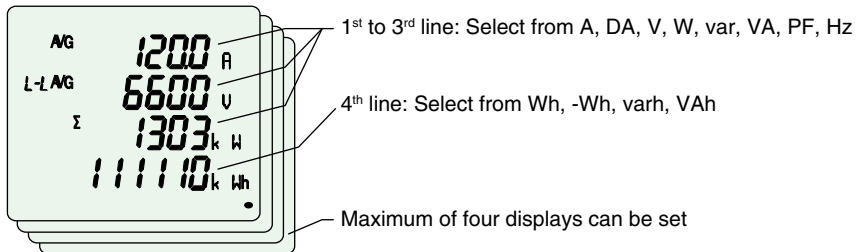
Cyclic Display Function

In the cyclic display function, the display screen can be changed over in every 5 seconds without [DISPLAY] button operation.

Special Display Function

Special Display by Display Pattern P00

Display can be selected as desired Display Pattern P00.



Max/Min Display Function

Maximum/Minimum Value Display

The maximum and minimum value of each measuring items can be displayed. Since the max/min display shows the current value as well as max/min values, the display can be used for monitoring.

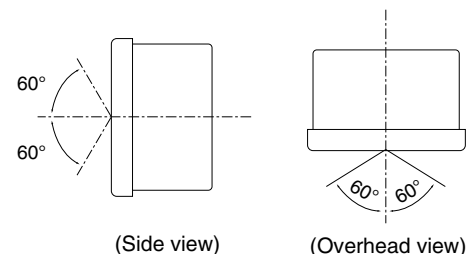


Wide-viewing-angle (ME96SSHB-MB, ME96SSRB-MB)

As the wide-viewing-angle LCD is mounted, good visibility is obtained even when the instrument is mounted at a level lower than the eye line.

Type	Model number	When viewed from the side		When viewed from the above	
		Up	Down	Left	Right
New type	ME96SSHB-MB ME96SSRB-MB	60°	60°	60°	60°
Old type	ME96SSHA-MB ME96SSRA-MB	10°	60°	60°	60°

Note: ME96SSEB-MB has the same viewing angle as the old type.



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.

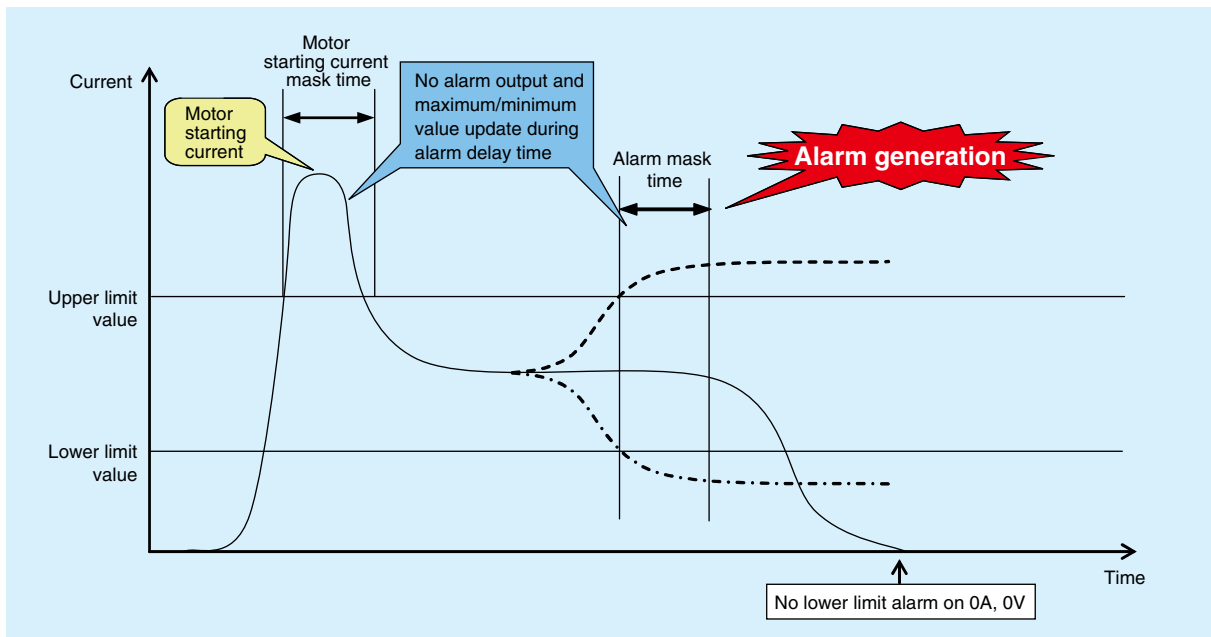
- (2) The automatic or manual alarm cancel mode can be selected.

- (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.

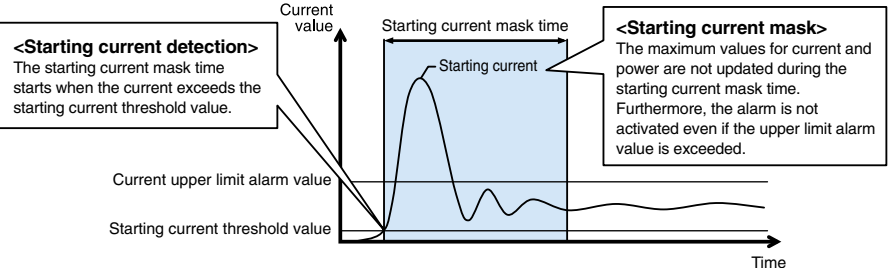


Motor Starting Current Mask Function

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

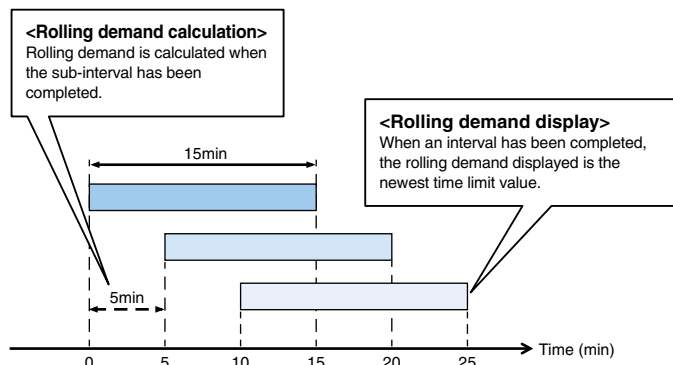
Rolling demand is the estimated power consumption in a specified period (interval).

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>

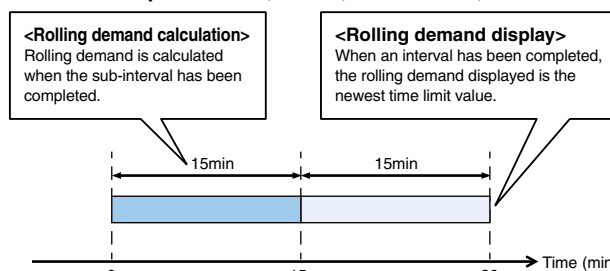


② Fixed block

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>

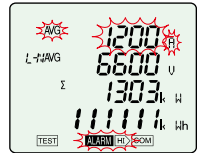


Test Function

- A test function is provided to check the wiring for communication, alarm output/contact output, analog output and pulse output without input of voltage or current.
- At the time of wiring test before shipment of the board and counter test for system validation on site, test signals can be output only by applying the auxiliary power.
Note: Depending on the optional unit and settings, the test function may not be available (may not be displayed).

(1) Communications Test

- Display
 - The same as for the operating mode, display patterns and other data are shown as set.
 - Both maximum and minimum values can be displayed.
- Communication data
 - Communication items and value are the same one on the display. The items value that are not displayed is 0 (zero).
 - Measuring items set for alarm will be displayed at the time of an alarm.
 - Input/Output contact status can be monitored.



(2) Alarm/Contact Output Operation Test

- Displays current alarm and contact status.
- Press the Reset button for 2sec, and regardless if there is an alarm or not, the display and contact output will operate as follows.

Status	Display	Output terminal
Alarm	ON	Closed
No alarm	OFF	Open



(3) Analog Output Operation Test

- Display the output items.
- Press the (+) or (-) button to change the analog output.
Note: Default value is 0%.

0%
25%
50%
75%
100%

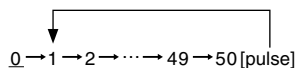
Output	Output specs
	4-20mA
0%	4mA
25%	8mA
50%	12mA
75%	16mA
100%	20mA



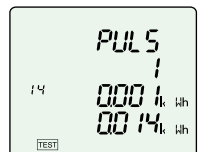
(4) Pulse Output Operation Test

Press the Reset button one time to output one pulse.

Note: After reaching 50, count will return to 1.



Note: Default value is 0 pulses.



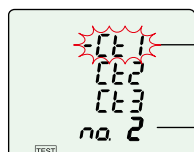
Checking Input Wiring Support Function

(1) Incorrect wiring pattern display function

- Whether the voltage/current input wirings are correct or not is displayed. As for the incorrect wiring display pattern, see the instruction manual.



Normal state



When Side 1 CT is inversely connected

Incorrectly connected spot is displayed in blinking.
Incorrect wiring pattern No. is displayed.

Note 1: When wiring of either one of the current/voltage terminals is not correct, the incorrectly connected spot is easily identified.

Note 2: Not all incorrect wirings can be identified. When the voltage input is incorrectly connected and the current input is also incorrectly connected, a different pattern of incorrect wiring may be displayed.



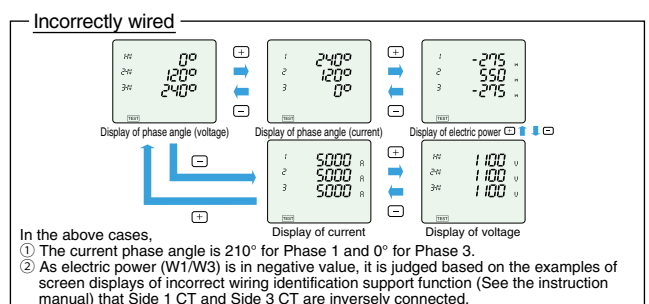
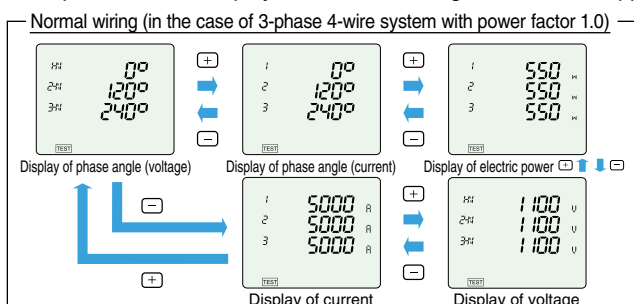
When incorrect wiring pattern cannot be detected

Display	Content	Display	Content
01	Low voltage	03	Voltage unbalance
02	Low current	04	Incorrect connections at multiple spots

Check by using the incorrect wiring identification support display function.

(2) Incorrect Wiring Identification Support Display Function

- This function displays each phase angle (voltage side 1 standard) of voltage and current, power values (W1, W2, W3) of each phase, voltage value & current values to support identifying incorrect wirings. By knowing abnormality in the phase angle of voltage/current and by comparing it with the normal value, you can more easily identify an incorrectly wired spot.
- Examples of screen displays of incorrect wiring identification support function.



Standards

Specifications

ME96SSHB-MB

Model name			ME96SSHB-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 AC, (STAR) max 440 V AC		
	Frequency		50/60 Hz (common use)		
Item			Measuring Item		Class
Measuring element	Current (A)		A1, A2, A3, AN, A _{AVG}		±0.1%
	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		±0.1%
	Power factor (PF)		PF1, PF2, PF3, ΣPF		
	Frequency (Hz)		Hz		
	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, 1 st to 31 st (Odd degree only)		±1.0%
	Harmonic voltage (HV)		Total, 1 st to 31 st (Odd degree only)		
	Rolling demand active power (DW)		Rolling block, Fixing block (Select either of them according to the settings.)		±0.2%
	Rolling demand reactive power (Dvar)		Rolling block, Fixing block (Select either of them according to the settings.)		±1.0%
	Rolling demand apparent power (DVA)		Rolling block, Fixing block (Select either of them according to the settings.)		
	Periodic active energy (Wh)		Periodic active energy 1, Periodic active energy 2, Periodic active energy 3		Class 0.5S
	Operating time (h)		Operating time 1, Operating time 2		(Reference)
	Current unbalance rate (Aunb)		Aunb		(Reference)
	Voltage unbalance rate (Vunb)		Vunb		(Reference)
CO ₂ equivalent		kg		(Reference)	
Item			Specifications		
Analog output response time			1 second or less (Hz: 2 seconds or less, HI, HV: 5 seconds or less)		
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, DW, Dvar, DVA: Rolling demand calculation		
Display	Display type		LCD with LED backlight		
	Number of display digits or segments	Digital section	First to third line indication: 4 digits, Fourth line indication: 6 digits		
			A, DA, V, W, var, VA, PF, DW, Dvar, DVA: 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; Contact input/output: I/O		
Display update time interval		0.5 s, 1 s (selectable)			
Communication			MODBUS RTU communication		
Built-in logging	Logging mode		Automatic overwrite update		
	Logging data type	Measuring data ¹⁾	Measuring data and time data are logged at the interval set at the data logging period. (15 min, 30 min, 60 min)		
		Alarm log	Time data at alarm generating/cancellation and at waiting for alarm cancellation		
		The recorded time of the Max/Min value	Max/Min value data and time data		
	Number of logging items	Measuring data	Integrated value data: 5 items, Data other than integrated value: 15 items, Total: A maximum of 20 items		
		Alarm log	The number of the set alarms		
		The recorded time of the Max/Min value	The total is 19 items: Current Max/Min (AVG), Line voltage Max/Min (AVG), Phase voltage Max/Min (AVG), Total active power Max/Min (AVG), Total power factor Max/Min (AVG), Frequency Max/Min (AVG), Total reactive power Max/Min, Total apparent power Max/Min, Total harmonic current RMS Max value, Harmonic line voltage distortion ratio Max total, Harmonic phase voltage distortion ratio Max total		
	Internal memory logging period	Measuring data	30 days (Logging period: 15 minutes), 60 days (Logging period: 30 minutes), 120 days (Logging period: 60 minutes),		
		Alarm log	100 records		
		The recorded time of the Max/Min value	1 record for every Max/Min value factor		
	System log data		100 records		
	Saving logging data		Use of nonvolatile memory		
	How to acquire logging data		Acquire the logging data via MODBUS [®] RTU Communication		
	Clock accuracy		1 minute difference/Month (typical)		
	Connectable Optional Plug-in Module			ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96, ME-0000MT-SS96, ME-0000BU-SS96	
Analog output		Output specifications (Load)	4 mA to 20 mA DC (0 to 600 Ω)		
Pulse/Alarm output	Switch type		Semiconductor relay/No-voltage a-contact		
	Contact capacity		35 V DC, 0.1 A		
	Pulse width		0.125 s, 0.5 s, 1.0 s		
Contact input (DI)	Contact capacity		24 V DC (19 V to 30 V DC), 7 mA or less		
	Signal width		30 ms or more		
Contact output (DO)		Switch type	Semiconductor relay/No-voltage a-contact		
Power interruption backup		Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy, reactive energy, apparent energy, periodic active energy, rolling demand, operating time)			
		Built-in logging		Use of nonvolatile memory (Logging data, System log data)	
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		13 VA (at 110 V AC), 14 VA (at 220 V AC), 9 W (at 100 V DC)	
Auxiliary power			100 V to 240 V AC (±15%), 100 V to 240 V DC (-30% +15%)		
Weight			0.5 kg		
Dimensions			96 (H) × 96 (W) × 90 (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 represents the ratio to the rated value (100%).

Note 2. For measurement where the harmonic distortion ratio (content rate) is 100% or more, the class can exceed ±1.0%.

Note 3. Harmonic current cannot be measured without voltage input.

Note 4. Using the conventional ME-4210-SS96 (Optional Plug-in Module), the CE marking and UL standards safety certification requirements cannot be met.

*1: Integrated values (Wh, varh, and VAh) are measured values of ME96SS. They are not differential values by logging period.

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
	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

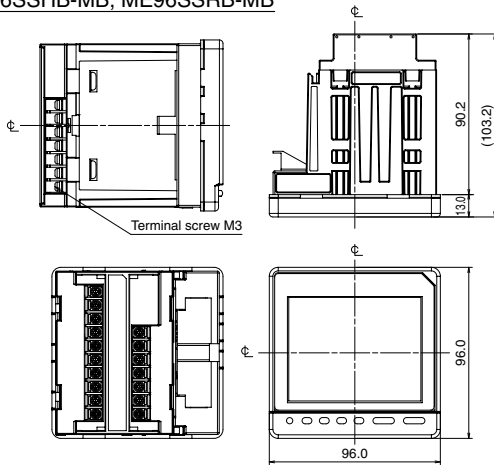
Input/Output Specifications

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

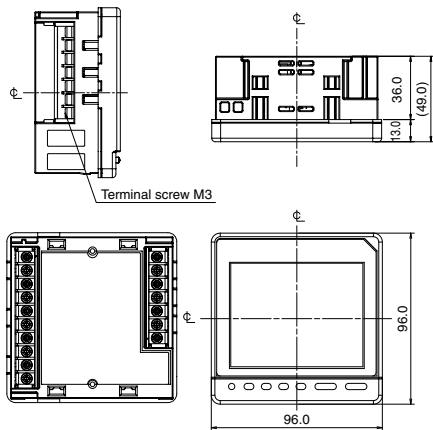
External Dimensions/Installation/Connections

Dimensions

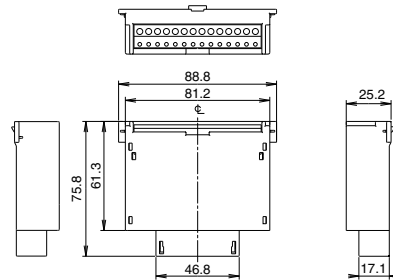
ME96SSHB-MB, ME96SSRB-MB



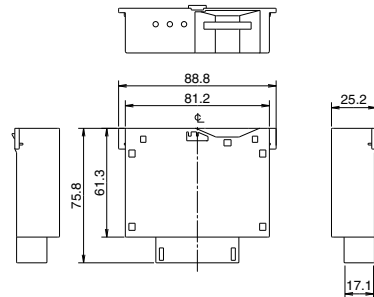
ME96SSEB-MB



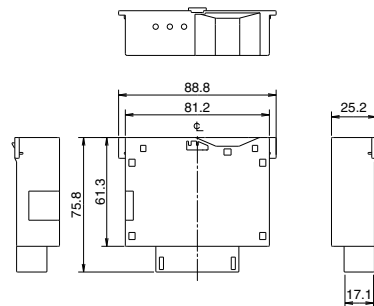
Optional Plug-in Module : ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96



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



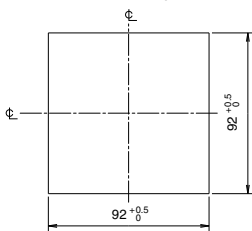
Optional Plug-in Module : ME-0000MT-SS96



Mounting

1 Dimension of panel

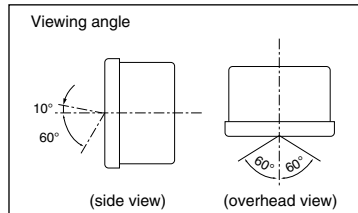
Panel hole dimensions are as shown in the following figure. It can be attached to a panel with thickness of 1.6 to 4.0mm.



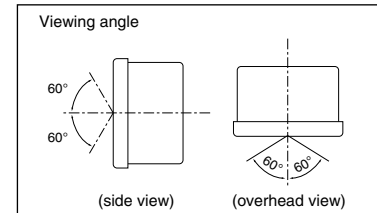
2 View Angle

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

ME96SSEB-MB



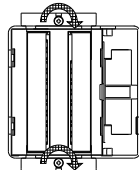
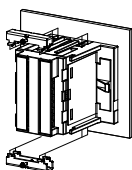
ME96SSHB-MB/ME96SSRB-MB



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).

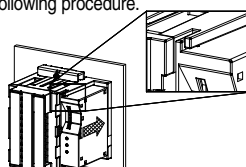
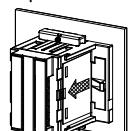
Tighten the two screws evenly.

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.

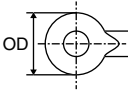


Fit the protruding part of the optional unit into the slot in the main unit.

Wiring

1 Applicable Cable Size

The table on the right describes the applicable wire size.

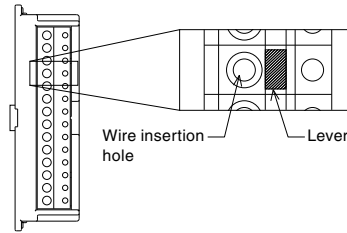
Part	Screw type	Wire specifications	Tightening torque
Product main body (auxiliary power supply, voltage input, current input and MODBUS RTU communication terminals)	M3	<ul style="list-style-type: none"> Use of crimp-style terminals: AWG26 to 14 (2 wires can be connected.) Applicable crimp-style terminal: 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 mistake 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

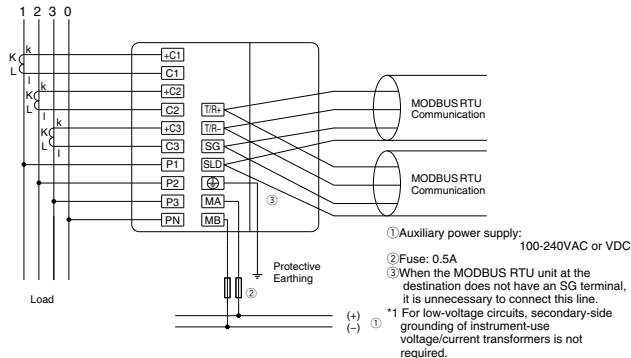
If installing the unit at the panel edge, choose an installation position where there is sufficient space for wiring work.

Optional unit

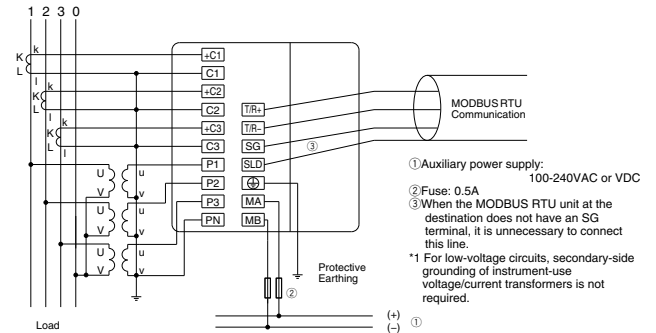
Turn the auxiliary power supply off before attaching the optional unit. If attached with the power on, the main unit will not recognize the optional unit. To remedy this, turn off/restart the auxiliary power supply or execute the "instrument restart" operation.

Wiring Diagrams

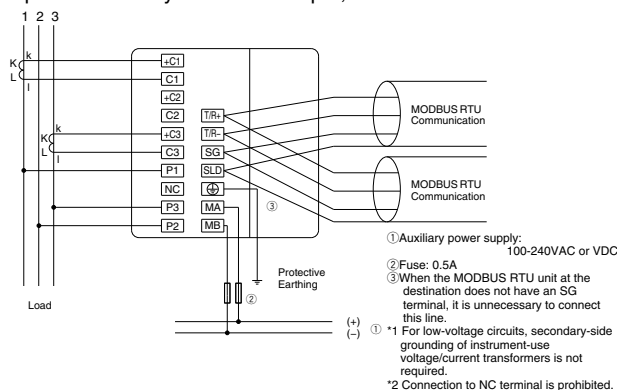
Three phase 4-wire system: Direct input



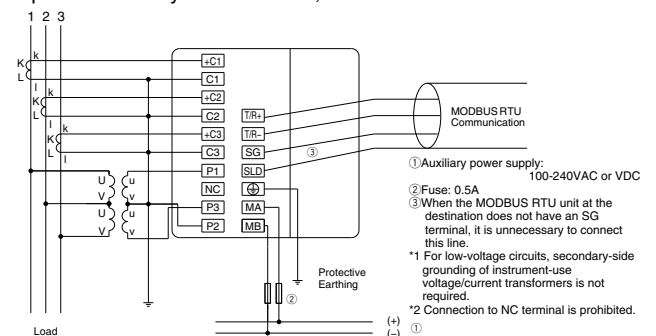
Three phase 4-wire system: With VT



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



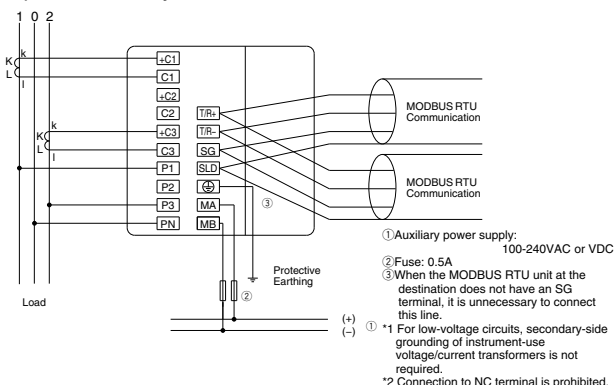
Three phase 3-wire system: With VT, 3CT



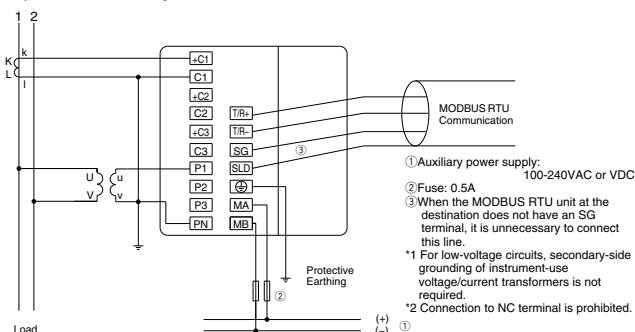
External Dimensions/Installation/Connections

Wiring Diagrams (Continued)

Single phase 3-wire system



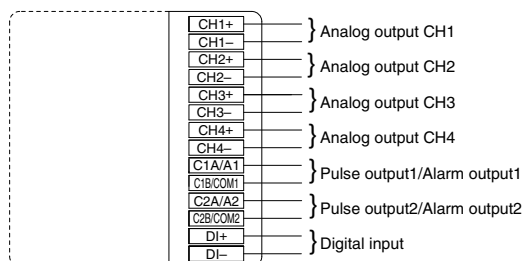
Single phase 2-wire system: With VT



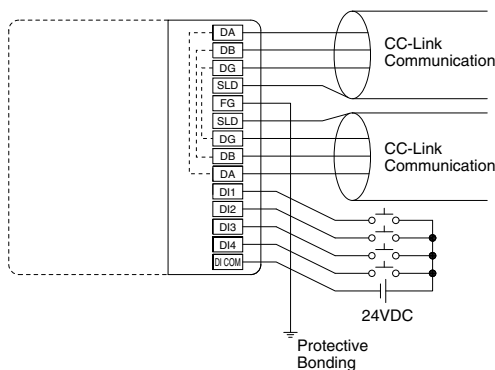
Note

1. The voltage input terminal will vary depending on if it is a 3-phase, 3-wire system or otherwise.
2. VT/CT polarity errors will cause incorrect measurement.
3. Always use the grounding terminal (⊕) in a grounded state. Perform grounding with a grounding resistance of 100Ω or less. Insufficient grounding may cause erroneous operation.
4. Use shielded twisted-pair cables for transmission signal lines.
5. Install 120Ω terminating resistors between terminals "T/R+" and "T/R-" for devices at both ends of MODBUS RTU communication line.
6. Use the thickest possible grounding wire to ensure low impedance.
7. MODBUS RTU transmission signal cables must not be in close proximity or bundled with high-voltage cables.

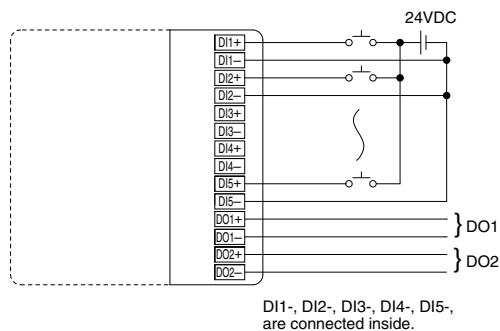
Optional Plug-in Module: ME-4210-SS96B



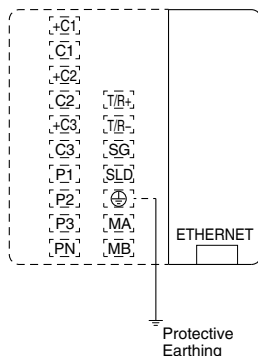
Optional Plug-in Module: ME-0040C-SS96



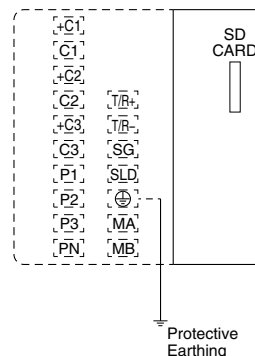
Optional Plug-in Module: ME-0052-SS96



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



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



Wiring Diagrams (Continued)

Note

- Pulse output, alarm output, and contact input/output cables must not be in close proximity or bundled with power cables or high-voltage cables. When laid parallel, separate by the distance shown in the following table.

Condition	Distance
Power lines of 600V or less	300mm or more
Other power lines	600mm or more
- Analog output cables must not be in close proximity or bundled with other power cables or input cables (e.g., VT, CT, auxiliary power supply). In addition, to prevent noise, surge and induction, use shielded cables or twisted-pair cables. Make sure that cables are as short as possible.
- There is no insulation between the MODBUS RTU communication portion and the optional module ME-4210-SS96B, ME-0040C-SS96 or ME-0000MT-SS96.
- Use only designated cables when connecting the CC-Link (see communication specifications). CC-Link dedicated cables cannot be used at the same time as CC-Link dedicated high-performance cables. Normal data transmission cannot be guaranteed if used at the same time.
The terminal resistance value varies depending on the type of dedicated cable.
- For cables connecting the CC-Link, connect shielded cables to "SLD" and ground "FG" cables. "SLD" and "FG" cables are connected inside the unit.
- CC-Link transmission lines are small signal circuits: separate from strong electrical circuits by a distance of 10cm or more, or 30cm or more if laid in parallel over a long distance.
Ground the terminal before use.
- For CC-Link transmission, always use dedicated lines and comply with conditions for total wiring distance, distance between stations and terminal resistance values according to the communication speed. Not doing so may prevent normal communication (see the CC-Link Master Unit Operations Manual for information on dedicated lines and wiring conditions).
- The terminal resistance supplied with the CC-Link Master Unit must always be used for the units at both ends of the CC-Link transmission line. If the meter is at the end of the CC-Link transmission line, connect it between the DA and DB terminals.
- Communication errors may occur under the influence of high-frequency noise from other devices in the installation environment during high-speed communication (100 Mbps) via 100BASE-TX connection of MODBUS TCP.
Measures to be taken when the network system is configured to avoid the influence of high-frequency noise are shown below.
 - Wiring connection
 - When laying a twisted pair cable, do not bundle the cable together with any main circuit line or power line or lay it close to such a line.
 - Keep the twisted pair cables in the duct.
 - Communication method
 - Increase the number of communication retries as needed.
 - Replace the hub to be used for connection with that for 10 Mbps, and communicate at a data transmission speed of 10 Mbps.
- Do not connect any terminal or RJ45 connector in the live state.
- Do not insert or remove the SD memory card in the live state.

Rated voltage for each phase/wire system

Phase/Wire	Connection	Rated voltage	Figure
Three phase 4-wire	Star	Max. 277VAC (L-N)/480VAC(L-L)	Figure 1
Three phase 3-wire	Delta	Max. 220VAC (L-L)	Figure 2
	Star	Max. 440VAC (L-L)	Figure 3
Single phase 3-wire	-	Max. 220VAC (L-N)/440VAC(L-L)	Figure 4
Single phase 2-wire*	Delta	Max. 220VAC (L-L)	Figure 5
	Star	Max. 440VAC (L-L)	Figure 6

* The circuit derived from the three-phase 3-wire delta connection and the single-phase 2-wire transformer circuit have the maximum rating of 220 VAC.
The circuits derived from the three-phase 4-wire and three-phase 3-wire star connections and single-phase 3-wire connection have the maximum rating of 440 VAC.

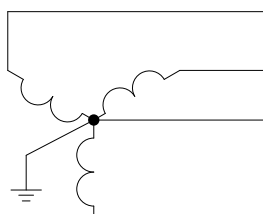


Fig. 1. Three phase 4-wire (star)

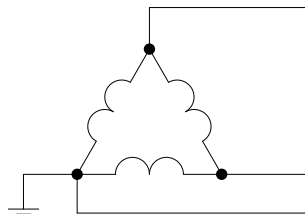


Fig. 2. Three phase 3-wire (delta)

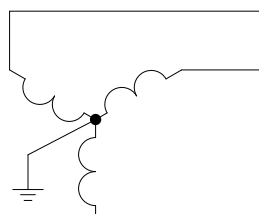


Fig. 3. Three phase 3-wire (star)

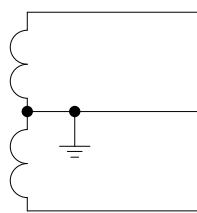


Fig. 4. Single phase 3-wire

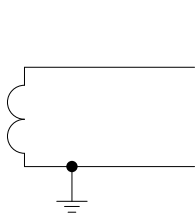


Fig. 5. Single phase 2-wire (delta)

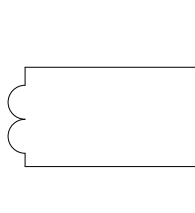


Fig. 6. Single phase 2-wire (star)