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FACTORY AUTOMATION

ELECTRONIC MULTI-MEASURING INSTRUMENT ME96SS





ME96 Super-S Series Series Super-S Series Super-S Series Seri

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

with enhanced measuring

have been remodeled, and ME96 Super-S Series 555 with enhanced.

4 Optional plug-in modules

Major features

- [1] MODBUS TCP communication unit
- [2] Data logging unit
- [3] CC-Link communication unit
- [4] Digital input and output unit
- [5] Analog, pulse and alarm output unit

Remarks

MODBUS RTU communication function provided as standard

Contents

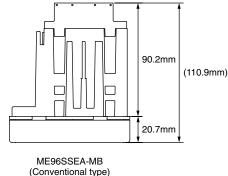
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Outline and Features

Compact size

Realized downsizing for ME96SSEB-MB.





It contributes to space saving! 36.0mm

(New type)

Improved Measurement Functions

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



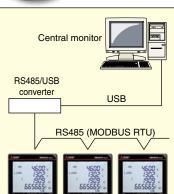
Model name	Transmission/Option specifications	Main measurement items
ME96SSHB-MB (High-performance model)	MODBUS RTU communication Plug-in module (options) • Analog/Pulse/Contact output/input • CC-Link communication • Digital input/output (for MODBUS RTU communication) • Backup (on SD card) • MODBUS 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) 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^{m} -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

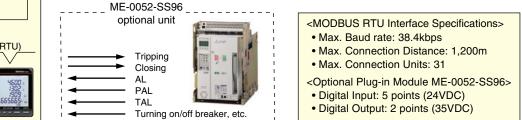
Model name	Analog output	Pulse/Alarm output	Contact input	Contact output	Transmission function	Used with
ME-4210-SS96B	4	2	1	—	—	
ME-0040C-SS96	—	—	4	—	CC-Link	ME96SSHB-MB
ME-0052-SS96	—	—	5	2	—	ME96SSRB-MB
ME-0000BU-SS96	—	—	—	—	SD CARD	ME9055RD-MD
ME-0000MT-SS96	—	—	—	—	MODBUS TCP	

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.

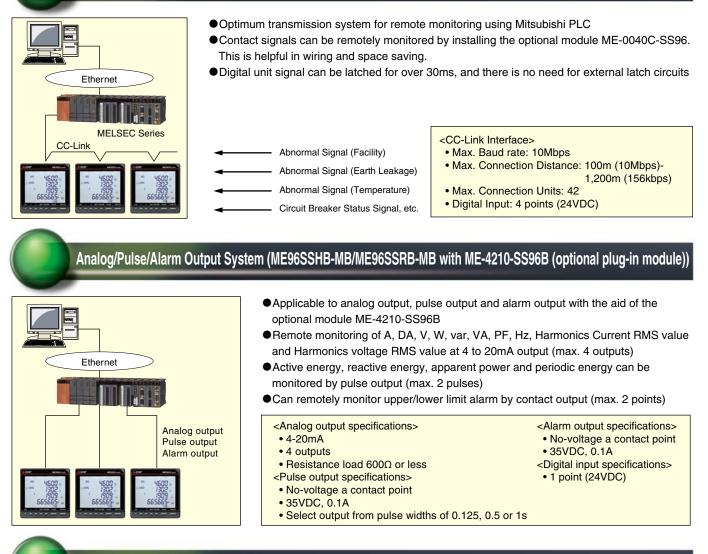


Super-S Series

Features

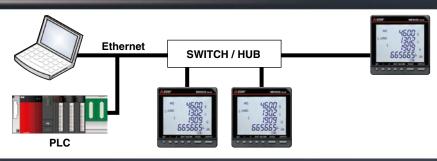
ME96 Super-S Series

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



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)

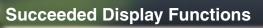
• ME96SSHB/ME96SSRB are available with built-in logging function and an optional module (ME-0000BU-SS96) which can retain data even when communication cannot be established.



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

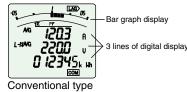
Use of any memory card other than our product (EMU4-SD2GB) is not covered by the warranty.

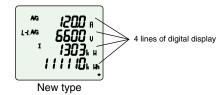
ME96 Super-S Series Ver.B Features



Concurrent Display of 4 items

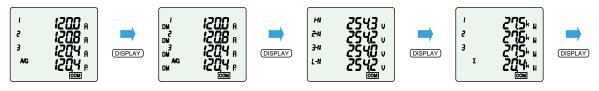
The 4 measured values can be digitally confirmed on one screen.





Concurrent Display of Each Phase Measured Values

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



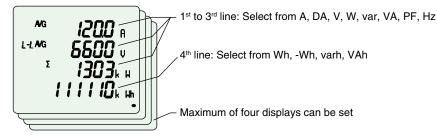
• Cyclic Display Function

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

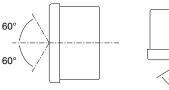
The maximum and minimum value of each measuring items can be displayed. Since the max/min display shows the current value as well as max/min values, the display can be used for monitoring.

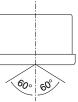


Wide-viewing-angle (ME96SSHB-MB, ME96SSRB-MB)

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.

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





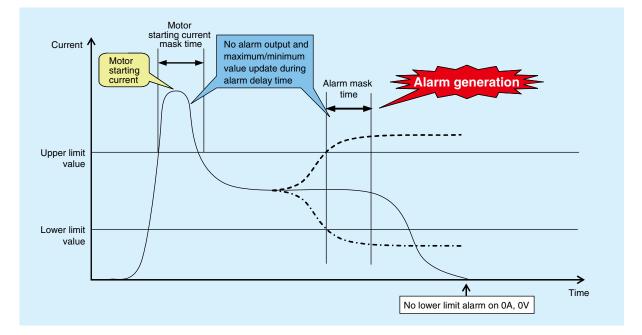
Note: ME96SSEB-MB has the same viewing angle as the old type.

(Side view)

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.

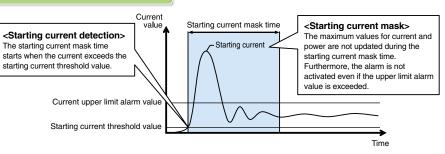


Motor Starting Current Mask Function

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.



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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).)

Rolling Demand Function

na l п **3**45878 Power consumption Power consumption

(period 1)



(period 2)



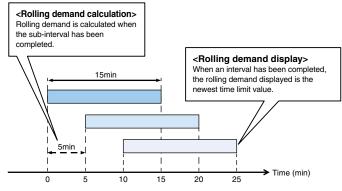
Power consumption (period 3)

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>

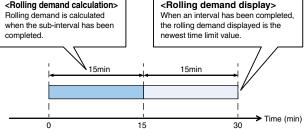


2 Fixed block

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> <Rolling demand calculation> <Rolling demand display>





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.

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Note: Depending on the optional unit and settings, the test function may not be available (may not be displayed).

(1) Communications Test

- (1)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.
- 2 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

1 Displays current alarm and contact status.

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

(3) Analog Output Operation Test	Output	Output spec	
		Output	4-20mA
①Display the output items.	V	0%	4mA
②Press the (+) or (-) button to change the	<u>0%</u> 25%	25%	8mA
analog output.	50%	50%	12mA
Note: Default value is 0%.	75%	75%	16mA
Note. Delaut value 13 0 %.	100%	100%	20mA

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Status

Alarm

No alarm

Display

ON

OFF

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(4) Pulse Output Operation Test

Press the Reset button one time to output one pulse.

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

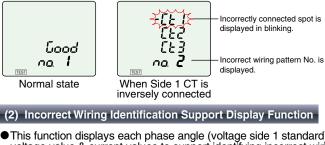
$$0 \rightarrow 1 \rightarrow 2 \rightarrow \cdots \rightarrow 49 \rightarrow 50 \text{ [pulse]}$$

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.



Note 1: When wiring of either one of the current/voltage terminals is

not correct, the incorrectly connected spot is easily identified.

Output terminal

Closed

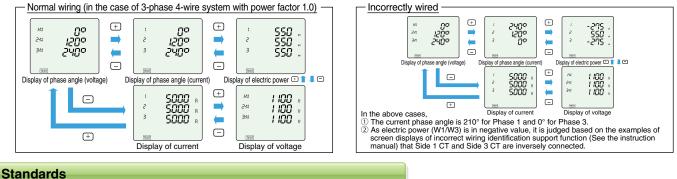
Open

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.

	Display	Content	Display	Content
лч [/]	01	Low voltage	03	Voltage unbalance
not	02	Low current	04	Incorrect connections at multiple spots
Found		neck by usir entification s	ng the in support	ncorrect wiring display function.

When incorrect wiring pattern cannot be detected

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.



All products are compliant with CE Marking, UL Standards, KC mark and FCC/IC.









Specifications

ME96SSHB-MB

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_		Model name Phase wire syste	em	ME96SSHB-MB 3-phase 4-wire, 3-phase 3-wire (3CT, 2CT), 1-phase 3-wire, 1-phase 2-	wire (common use)		
			Current	5 A AC, 1 A AC (common use)			
				3-phase 4-wire: max 277/480 V AC			
	,	Dating	Valtaga	3-phase 3-wire: (DELTA) max 220 V AC, (STAR) max 440 V AC			
	ſ	Rating	Voltage	1-phase 3-wire: max 220/440 V AC			
				1-phase 2-wire: (DELTA) max 220 V AC, (STAR) max 440 V AC			
	Frequency		Frequency	50/60 Hz (common use)			
		Item		Measuring Item	Class		
		Current (A)		A1, A2, A3, AN, AAVG			
		Current demand (DA)		DA1, DA2, DA3, DAN, DA _{AVG} ±0.1%			
		Voltage (V)		V12, V23, V31, V _{AVG} (L-L), V1N, V2N, V3N, V _{AVG} (L-N)			
		Active power (W) Reactive power (var)		W1, W2, W3, ΣW			
				var1, var2, var3, Σvar ±0.2%			
		Apparent power (VA)		VA1, VA2, VA3, ΣVA	±0.2 /8		
		Power factor (PF)		PF1, PF2, PF3, ΣPF			
		Frequency (Hz)		Hz	±0.1%		
		Active energy (Wh)		Imported, Exported	Class 0.5S (IEC62053-22		
Meas	suring	Reactive energy (varh)		Imported lag, Imported lead, Exported lag, Exported lead	Class 1S (IEC62053-24)		
	nent	Apparent energy (VAh)		Imported + Exported	±2.0%		
0.01		Harmonic current (HI)		Total, 1 st to 31 st (Odd degree only)	±1.0%		
		Harmonic voltage (HV)		Total, 1st to 31st (Odd degree only)	1.0 %		
		Rolling demand active		Rolling block, Fixing block (Select either of them according to the settings.)	±0.2%		
		Rolling demand reactive		Rolling block, Fixing block (Select either of them according to the settings.)	±1.0%		
		Rolling demand appare		Rolling block, Fixing block (Select either of them according to the settings.)	-1.0/0		
		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	(Reference)		
		Voltage unbalance rate	(Vunb)	Vunb	(Reference)		
		CO ₂ equivalent		kg	(Reference)		
		Item		Specifications			
		Analog output respon	se time	1 second or less (Hz: 2 seconds or less, HI, HV: 5 seconds or less)			
	Measuring Instantaneous Value		Instantaneous Value	A, V: RMS value calculation; W, var, VA, Wh, varh, VAh: Digital multiplicati	on;		
		Aethod		PF: Power ratio calculation; Hz: Zero-cross; HI, HV: FFT			
			Demand Value	DA: Thermal type calculation, DW, Dvar, DVA: Rolling demand calculation	1		
	Display t		type	LCD with LED backlight			
				First to third line indication: 4 digits, Fourth line indication: 6 digits			
	Number of display digits or segments			A, DA, V, W, var, VA, PF, DW, Dvar, DVA: 4 digits; Hz: 3 digits;			
isplay			Digital section	Wh, varh, VAh: 9 digits (6-digit or 12-digit is also available.);	- 11 -		
				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		ime interval	0.5 s, 1 s (selectable)			
		Communication		MODBUS RTU communication			
				Automatic overwrite update			
	Logging mode			Measuring data and time data are logged at the interval set at the data logging period. (15 min, 30 mi			
	Logging data type		Measuring data ¹¹	Measuring data and time data are logged at the interval set at the data logging period. (15 min, 30 60 min)			
			Alarm log	Time data at alarm generating/cancellation and at waiting for alarm cancel	ellation		
			The recorded time of the				
			Max/Min value	Max/Min value data and time data			
			Measuring data	Integrated value data: 5 items, Data other than integrated value: 15 items,	Total: A maximum of 20 it		
			Alarm log	The number of the set alarms			
	Number	of logging items		The total is 19 items: Current Max/Min (AVG), Line voltage Max/Min (AVG	a), Phase voltage Max/Min		
Built-in	Number of logging items		The recorded time of the	(AVG), Total active power Max/Min (AVG), Total power factor Max/Min (AVG)			
ogging			Max/Min value	Total reactive power Max/Min, Total apparent power Max/Min, Total harmonic	onic current RMS Max val		
359				Harmonic line voltage distortion ratio Max total, Harmonic phase voltage	uistortion ratio Max total		
			Measuring data	30 days (Logging period: 15 minutes), 60 days (Logging period: 30 minute	es), 120 days (Logging pe		
	Internal	memory logging pariod	Alarm log	60 minutes), 100 records			
	Internal memory logging period		The recorded time of the				
			Max/Min value	1 record for every Max/Min value factor			
		System lo		100 records			
		Saving logg		Use of nonvolatile memory			
		How to acquire I		Acquire the logging data via MODBUS [®] RTU Communication			
		Clock acc		1 minute difference/Month (typical)			
		Connectable Optional Plu		1 minute difference/Month (typical) ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96, ME-0000MT-SS96, ME-0000BU-SS96			
_		log output	Output specifications (Load)		ME 000000-0080		
_	Ana	log output	Switch type	Semiconductor relay/No-voltage a-contact			
	Pulse	Alarm output	Contact capacity	35 V DC, 0.1 A			
	i uise//	aann output	Pulse width	0.125 s, 0.5 s, 1.0 s			
			Contact capacity	24 V DC (19 V to 30 V DC), 7 mA or less			
	Conta	ct input (DI)		30 ms or more			
Signal width			Semiconductor relay/No-voltage a-contact				
	Contac		Switch type	Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy	w reactive operation		
	Power inte	rruption backup		energy, periodic active energy, rolling demand, operating time)	ly, reactive energy, appare		
Built-in logging Voltage circuit VA Consumption Current circuit Auxiliary power circuit		Built-in logging	Use of nonvolatile memory (Logging data, System log data)				
			Each phase: 0.1 VA (at 110 V AC), 0.2 VA (at 220 V AC), 0.4 VA (at 440 V				
		anoumation			AU)		
		onsumption		Each phase: 0.1 VA			
			13 VA (at 110 V AC), 14 VA (at 220 V AC), 9 W (at 100 V DC)				
		Auxiliary powe		100 V to 240 V AC (±15%), 100 V to 240 V DC (-30% +15%)			
		Weight		0.5 kg			
				$06(H) \times 06(M) \times 00(D)$ mm			
		Dimensions	d	96 (H) × 96 (W) × 90 (D) mm			
				96 (H) × 96 (W) × 90 (D) mm Embedded -5°C to +55°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.



ME96SSRB-MB

Phase areasy of the server (CL) Control (CL) Control (CL) Control (CL) Practice SA AC, LA AC, SOL (CL) Control (CL) Control (CL) Control (CL) Practice SA AC, LA AC, SOL (CL) Control (CL) Control (CL) Control (CL) Practice SA AC, LA AC, SOL (CL) Control (CL) Control (CL) Control (CL) Practice Figure (CL) Control (CL) Control (CL) Control (CL) Control (CL) Practice Figure (CL) Control (CL	Model name				ME96SSRB-MB			
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Baing Springe Springe State			1 1100 1110 0 9010					
Human Human <th< td=""><td></td><td></td><td></td><td></td><td colspan="3">3-phase 4-wire: max 277/480 V AC</td></th<>					3-phase 4-wire: max 277/480 V AC			
Head of the second s		F	Rating	Voltage				
Image: mage: market in the second of the second			iating	- Chago				
Image: The second of				Frequency				
			Item	Trequency				
Vertex Vert V23, V31, Van (L-1, VII), V2N, V3N, Van (L-9) Herein Measuring Van Vertex VII, V22, V31, Van (L-1, VII), V2N, V3N, Van (L-9) +0.5% Measuring Van Vertex VII, V22, V31, Van (L-1, VII), V2N, V3N, Van (L-9) +0.5% Measuring Van Vertex PI, I-192, P3, 219 AD 1% Measuring Van Vertex PI, I-192, P3, 219 AD 1% Measuring Van Vertex Pinoted Lag, Inported Lagoried Lag, Deported Legoried Lag, Exported Lagoried Lag, AD 1% AD 1% Measuring Van Vertex Pinoted Lag, Inported Lagoried Lagorie			Current (A)		A1, A2, A3, AN, AAVG			
Active power (VV) WI. WZ. VG. S.W. Apparent power (VA) Apparent power po						±0.2%		
Image:								
Metalling Adds over lador (PF) PF1 PF2 PF3 3PF -40.5% Prequency (Pd2 Hz Case 305 (EC02005-22) -21.5% Add S = Adds exercy (Wh) Imported S Exported ing Exported ing Exported ing Case 305 (EC02005-22) -22.5% Agement instance (Wh) Imported S Exported ing Exp					, , , ,			
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Display Manufact or display data or segments Digital section Wm, varh, VAh 9: digits (6-digit or 12-digits also available); Harmonic disortion ratio Contract rate 4 digits. Harmonic RMS value: 4 digits. Operating time 6 digits: Contact input/output: I/O 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) 0.5 a.1 is cleactable) Mazaring data and time data are logged at the interval set at the data logging period. (15 min, 30 min dom) 0.5 min 30 min dom Logging data type Mazaring data Measuring data and time data are logged at the interval set at the data logging period. (15 min, 30 min dom min) Number of logging items Measuring data Integrated value data.5 items, Data other than integrated value: 15 items, Total A maximum of 20 items (AVG), Total period these talams Number of logging items Maximi ogata Integrated value data.5 items, Data other watue: 15 items, Total A maximum of 20 items (AVG), Total period tala curve power factor Max/Min (AVG), Pease voltage Max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala max/Min (AVG), Total period tala the interval tala the data other watue (AVG), Total period tala the interval tala the data tare logged tala (AVG), Total period tala the interval tala tala tala tala the data logging period tala tala tala tala tala tala tala tal								
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Induction Induction System log data 100 records Saving logging data Acquire the logging data via MODBUS® RTU Communication How to acquire logging data Acquire the logging data via MODBUS® RTU Communication 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) Switch type Semiconductor relay/No-voltage a-contact Contact capacity 35 V DC, 0.1 A Pulse/Alarm output Contact capacity 35 V DC, 0.1 S Contact capacity 35 V DC, 0.1 A Pulse width 0.125 s, 0.5 s, 1.0 s 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 Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy, reactive energy, apparent energy, periodic active energy, roling demand, operating time) Power interruption backup Built-in logging Use of nonvolatile memory (Logging data, System log data) VA Consumption Current circuit Each phase: 0.1 VA (at 110 V AC), 0.2 VA (at 2					1 record for every Max/Min value factor			
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	Note 1	. The clas				i, i ton oondonoing		

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A/G LHNAVG

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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.

Specifications

ME96SSEB-MB

		Model name		ME96SSEB-MB		
		Phase wire syste	em	3-phase 4-wire, 3-phase 3-wire (3CT, 2CT), 1-phase 3-wire, 1-phase 2-wire (common use)		
			Current	5 A AC, 1 A AC (common use)		
	Rating Voltage		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		Frequency	50/60 Hz (common use)		
		Item		Measuring Item	Class	
		Current (A)		A1, A2, A3, AN, AAVG		
		Current demand (DA)		DA1, DA2, DA3, DAN, DA _{AVG}		
		Voltage (V)		V12, V23, V31, VAVG (L-L), V1N, V2N, V3N, VAVG (L-N)	0.5%	
		Active power (W)		W1, W2, W3, ΣW	±0.5%	
		Reactive power (var)		var1, var2,var3, Σvar		
		Apparent power (VA)		VA1, VA2, VA3, ΣVA		
Meas	suring	Power factor (PF)		PF1, PF2, PF3, ΣPF	±0.5%	
elen		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	0.00/	
		Harmonic voltage (HV)		Total	±2.0%	
		Operating time (h)		Operating time 1, Operating time 2	(Reference)	
		asuring nethod	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		
	n	letilod	Demand value	DA: Thermal type calculation		
		Display	type	LCD with LED backlight		
				First to Third line display: 4 digits, Fourth line display: 6 digits		
Display		ber of display digits or ber of segments	Digital section	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: Operating time: 6 digits	4 digits;	
		Display update	time interval	0.5 s, 1 s (selectable)		
		Communication	n	MODBUS RTU communication		
	C	onnectable Optional Plu	g-in Module	Cannot connect optional module		
		Power interruption b	ackup	Use of nonvolatile memory (Items: settings, MAX/MIN value, active energy, reactive energy, apparent energy, operating time)		
		Voltage circuit		Each phase: 0.1 VA (at 110 V AC), 0.2 VA (at 220 V AC), 0.4 VA (at 4	40 V AC)	
VA cons	umption	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			r	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%	6 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

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-
Radio Frequency Electromagnetic field Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-
Electrical Fast Transient/Burst Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-
Surge Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-
Conducted Disturbances, Induced By Radio Frequency Fie	lds Immunity EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-
Power Frequency Magnetic Field Immunity	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-
Voltage Dips and Short Interruptions	EN 61326-1, EN IEC 61000-6-2 / EN 61000-4-

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Sa	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					
Measuring Category III		III				
	Pollution Degree	2				

MODBUS RTU Communication Specifications

Specification
RS-485 2-wire half-duplex transmission
RTU (binary data transfer)
Asynchronous
Multi-point bus
2400, 4800, 9600, 19200, 38400bps
8
1, 2
ODD, EVEN, NONE
1 to 255 (0: for broadcast mode)
1,200m (max)
31 units
120Ω 1/2W
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)......LEN080
 Electronic Multi-Measuring Instrument programming manual (CC-Link)(For ver. 2 remote device station)...LEN130391LEN080334

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

MODBUS TCP Communication Specifications for optional plug-in module

Item		Specification					
Interface		port (10BASE-T/100BASE-TX)					
Transmission method		Base band					
Number of stages conr	ected in cascade	Max. 4 stages (10BASE-T), max. 2 stages (100BASE-TX) (when repeater hub is used)					
Max. distance betwee	n nodes	200m					
Max. segment length		100m					
Connector applicable	o external wiring	RJ45					
	10BASE-T	Cable meeting IEEE802.3 10BASE-T standard (Unshielded twisted pair cable (UTP cable), category 3 or higher)					
Cable	100BASE-TX	Cable meeting IEEE802.3 100BASE-TX standard (Shielded twisted pair cable (STP cable), category 5 or higher)					
Protocol		MODBUS TCP (port No.502)					
Max. number of conne	ections	4					
Support functions		Auto-negotiation function (automatic recognition of 10BASE-T/100BASE-TX) Auto-MDIX function (automatic recognition of straight cable/cross cable)					

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

Logging Specifications for optional plug-in module

	-							
Iten	n	Specification						
Logging mode		Automatic updating by overwriting (not provided with a function to automatically start according to the start time setting)						
Kinds of logging	Detailed data	Measurement data is stored at the specified "detailed data logging interval" (1 min, 5 min, 10 min, 15 min or 30 min). Note: The data will be output as a detailed data file. Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output.						
data	1-hour data	Measurement data is stored at a one-hour interval. Note: The data will be output as a one-hour data file or a one-day data file. Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output.						
Number of logging	Detailed data	Max. 6 elements						
elements	1-hour data	Max. 6 elements						
Internal memory logging period	Detailed data	Detailed data logging interval: 1 min for 2 days Detailed data logging interval: 5 min for 10 days Detailed data logging interval: 10 min for 20 days Detailed data logging interval: 15 min for 30 days Detailed data logging interval: 30 min for 60 days						
	1-hour data	400 days (about 13 months)						
SD memory card (20	BB) logging period	10 years or more						
System log data		200 records						
Logging data / system format	m log data output	CSV format (ASCII code)						
Power failure compe	nsation	Backup by built-in lithium battery Total power interruption backup time: 5 years (at daily average temperature of 35°C or less) (The life of the lithium battery is 10 years (at a daily average temperature of 35°C or less).) The battery cannot be replaced by the customer. Please consider updating the module.						
	, logging elements ed data logging	Stored in FRAM (non-volatile memory) Note: The data will not be deleted even if power interruption is caused by battery voltage drop (BAT. LED is on).						
Logging data and	system log data	Stored in SRAM (volatile memory) Note: The data will be deleted if power interruption is caused by battery voltage drop (BAT. LED is on).						
Clock operation		Note: The clock operation will stop if power interruption is caused by battery voltage drop (BAT. LED is on). After power restoration, the clock operation will start from 00:00 on Jan. 1, 2016.						
Clock accuracy		1 min / month						
Output data storage	medium	SD memory card (SD or SDHC)						
Optional accessory		SD memory card (EMU4-SD2GB) ^{*1}						
*1: Use the SD memory	card (EMU4-SD2GB) made by Mitsubishi Electric.						

*1: 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.

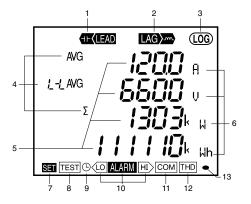
■ For more information on data, please refer to the following document. Logging specifications…LSPM-0092

Operating Instructions



Functions

LCD Functions



No.	Name of each part	Function									
1	LEAD status	Light up when leading reactive energy is measured									
2	LAG status	Light up when lagging reactive energy is measured									
3	Built-in logging status	Light up when the built-in logging function is operating									
4	Digital element display	Display measuring elem	nents exp	pressed in digital numbers							
5	Digital display	Display measured value	es in digit	tal numbers							
6	Unit	Display the units of mea		alues							
7	Setup status	Light up in the setting m Blink in the setting confi		mode							
8	Test mode status	Light up in the test mod	е								
9	Clock status	Light up when the date									
10	Upper/lower limit alarm status	Blink when the upper/lower limit alarm is generating									
		Specification	ON	Blink	OFF						
		CC-Link communication	Normal	CC-Link version mismatches, Hardware abnormality	Hardware abnormality						
11	Communication/	MODBUS RTU communication MODBUS TCP communication	Normal	Communication error such as wrong address ¹	Hardware abnormality						
	Option logging status	Logging function	Error occurrence such as setting abnormality, SD memory card error, or battery voltage drop ¹	Hardware abnormality							
		*1. For details, refer to U									
12	Harmonics	Light up when harmonic is displayed									
13	Metering status	Blink when Imported active energy is measured "Note 1 *It appears on the imported active energy display screen only									
Note	1. The blinking cycle is constant	nt regardless of measuri	ng input	size.							

ME9655-vera

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Button Functions

	Basic performance	Special performance					
Button operation	Functions	Button op	peration	Functions			
SET	Used to set items such as primary voltage and	DISPLAY	Push for 2 seconds	Used to switch display between manual display change ⇔ cyclic display change			
	current, and to choose setting items	PHASE	Push for 2 seconds	Used to switch display between manual phase change ⇔ cyclic phase change			
\oplus or \bigcirc	Used to switch display between setting	+ -	Push for 2 seconds	Used to change Wh, etc. to another unit and to low order zoom display			
(MAX/MIN)	Used to switch display between max/min values and instantaneous value	+ RESET	Push for 2 seconds	Used to perform batch reset of all the max/min values			
PHASE	Used to change over phase	+ or -	Push for 1 seconds	Used to perform fast-forward or fast-return of numerical values in numerical value setting			
DISPLAY	Used to change over the display screen	(SET) + (RESE	T) + (PHASE)	Used to reset Wh, varh, and VAh to zero by concurrently pushing for 2 seconds			

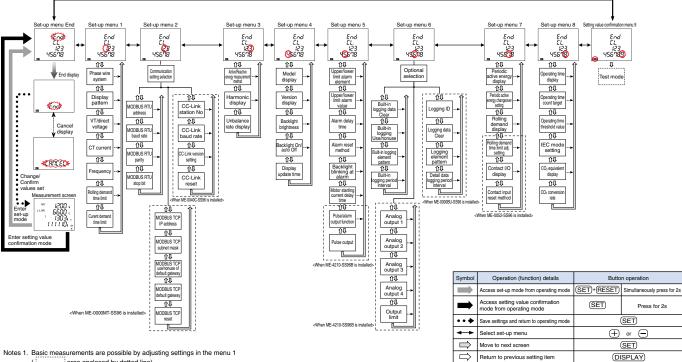
Note. An example. For details, refer to the user's manual.

Set-up

For correct measurement, it is necessary to set the primary voltage/current in the set-up mode.

Enter the setting mode from the operating mode and set the necessary items. Any items not set remain in the factory default.

Set-up workflow (Example for ME96SSHB-MB)



Notes 1. Basic measurements are possible by adjusting settings in the menu 1

(area enclosed by dotted line). Notes 2. Item settings vary depending on the model.

Notes 3. Setting confirmation menu 9 (test mode) is not displayed in the setting mode.

Press for 1s (+) or (--)

(SET)

Skip remaining settings

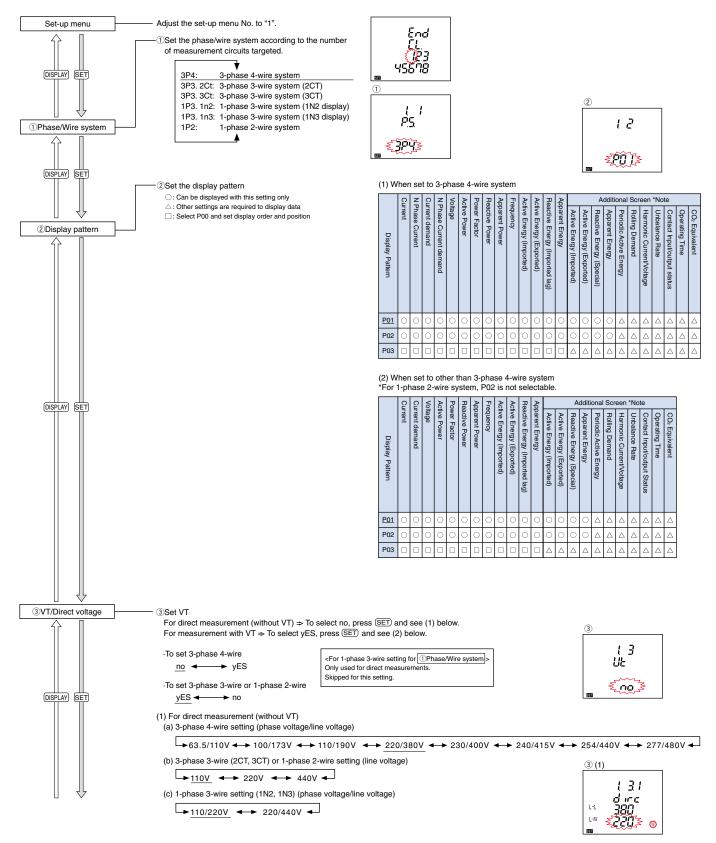
-->-Select cancel

Basic Set-up Operations

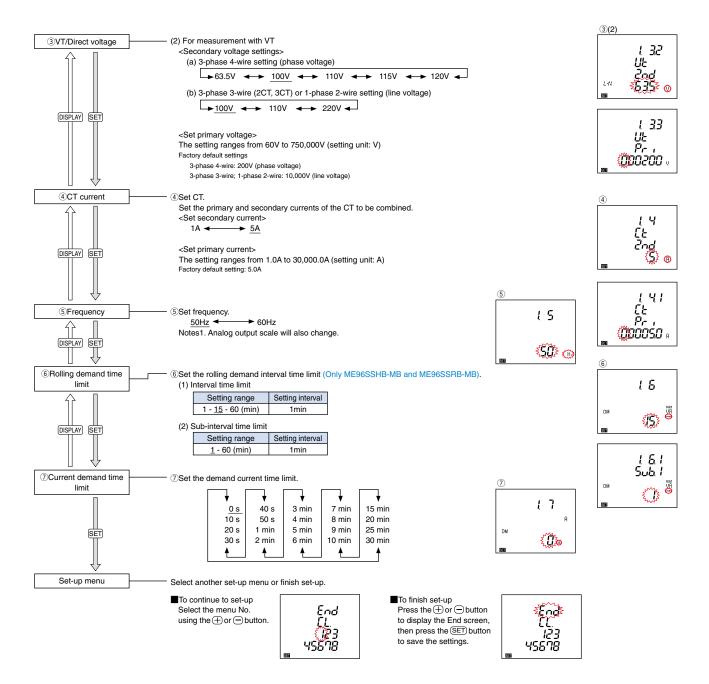
To access the setting mode, press and hold the (\underline{SET}) and (\underline{RESET}) buttons down at the same time for 2s. Press the (\underline{SET}) button to display the items to be set, and the + and - buttons, set the details. To save setting for each setting menu, press the (\underline{SET}) button when the End screen is displayed.

The underlined setting parameters are the initial value.

Set-up menu 1: Basic settings (set phase wire system, display pattern, Using VT/direct input, CT primary current, etc.)







ME9655-WAR

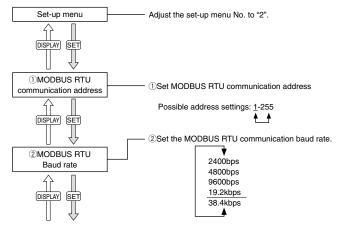
4600 1302 1909

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Set-up menu 2: MODBUS RTU Communication settings (When ME-0040C-SS96 and ME-0000MT-SS96 are not installed)

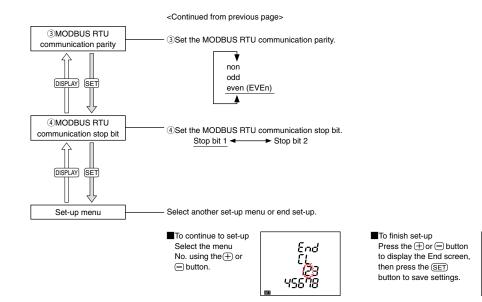








Operating Instructions







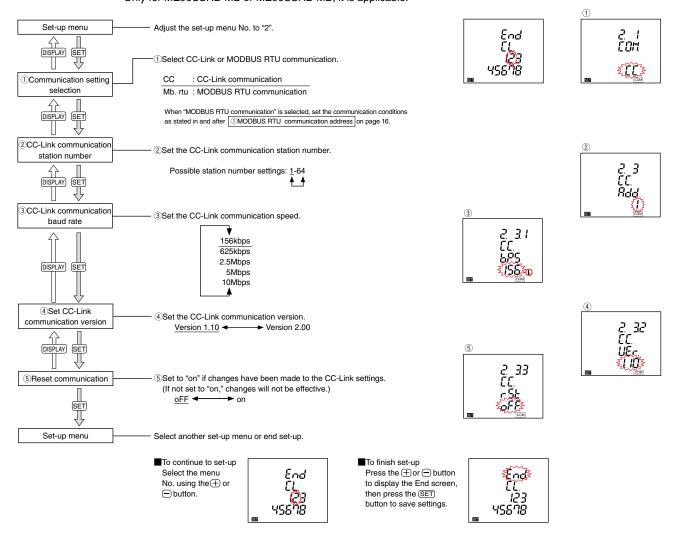
Ends

123

El

45678

Set-up menu 2: CC-Link Communication settings (when ME-0040C-SS96 is installed) *Only for ME96SSHB-MB or ME96SSRB-MB, it is applicable.

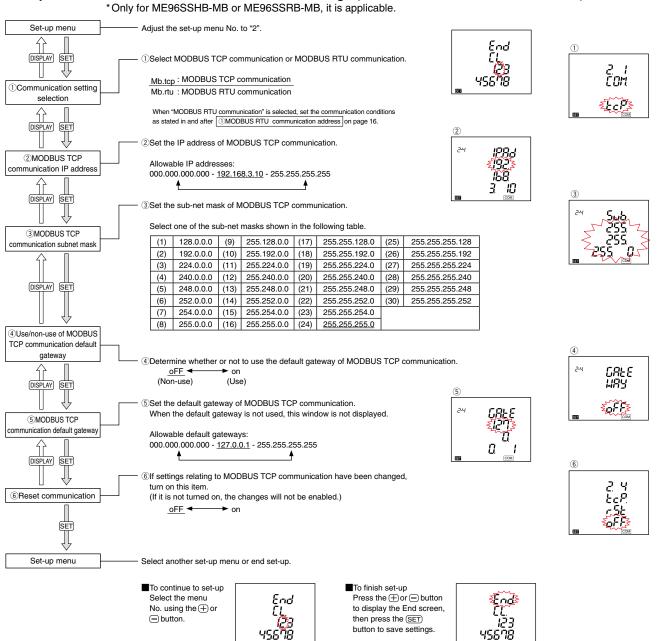




ME9655-vera

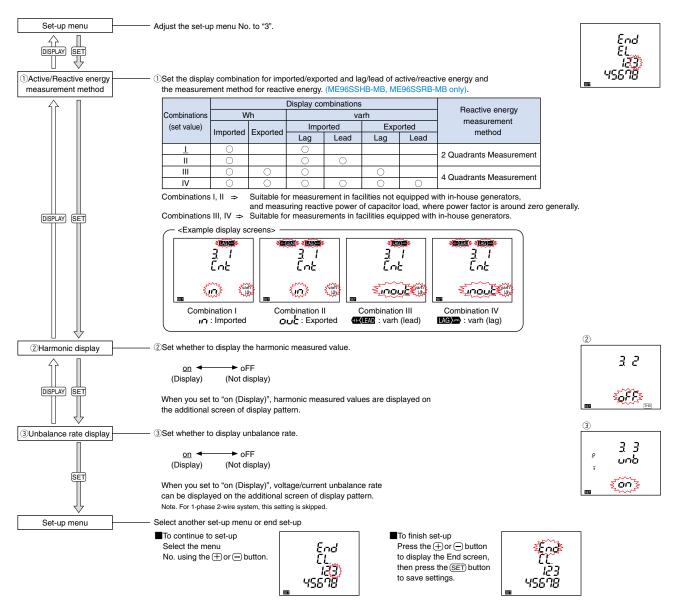
AG

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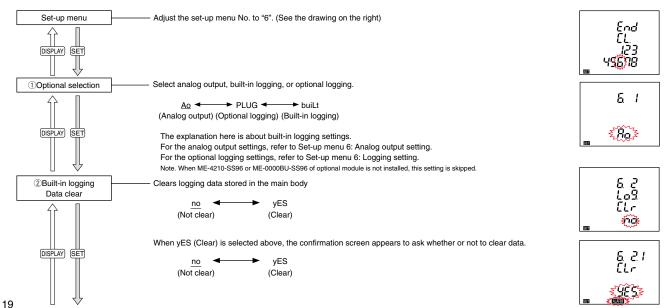
Operating Instructions

Set-up menu 3: Display settings (active energy, harmonics measurement, etc.)



Set-up menu 6: Built-in logging settings

*Only for ME96SSHB-MB, ME96SSRB-MB, it is applicable.



Super-S Series

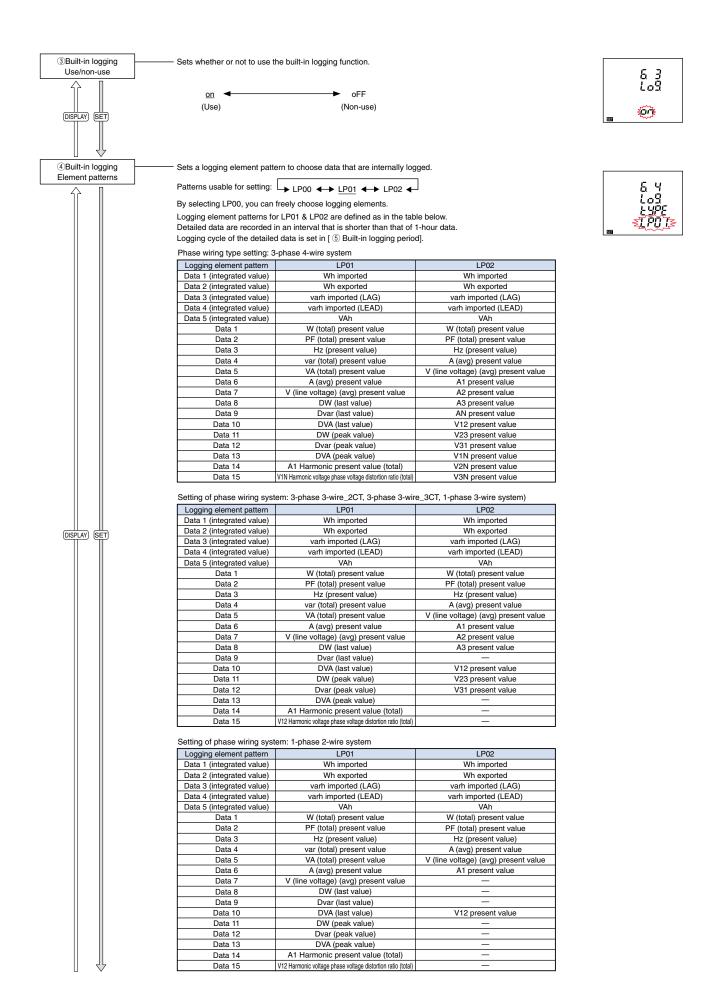
ME9655-Vera

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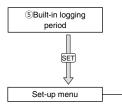
HIAIG



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Operating Instructions

<Continued from previous page>



3 Use this to set the cycle in which detailed data of the built-in logging element pattern "LP01" or "LP02" are logged.

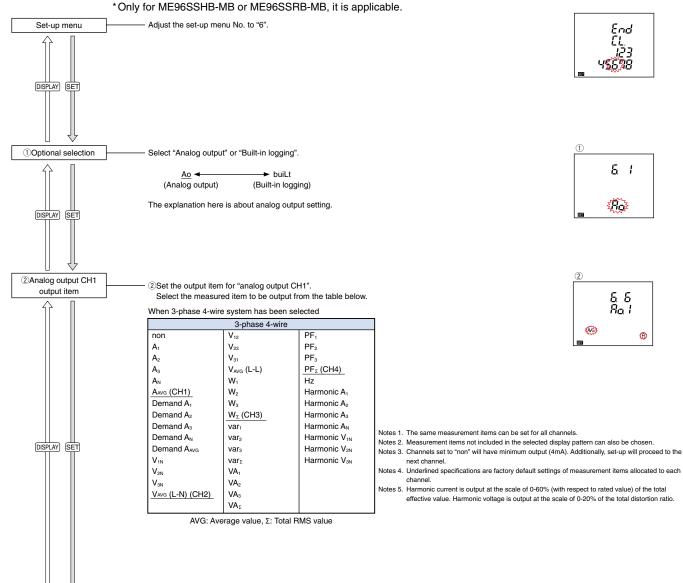
▶<u>15min</u> ◀ ▶ 30min ◀ ▶ 60min ◀

According to "3.1 Set-up Flow", either exit from setting or continue setting in any other set-up menu.

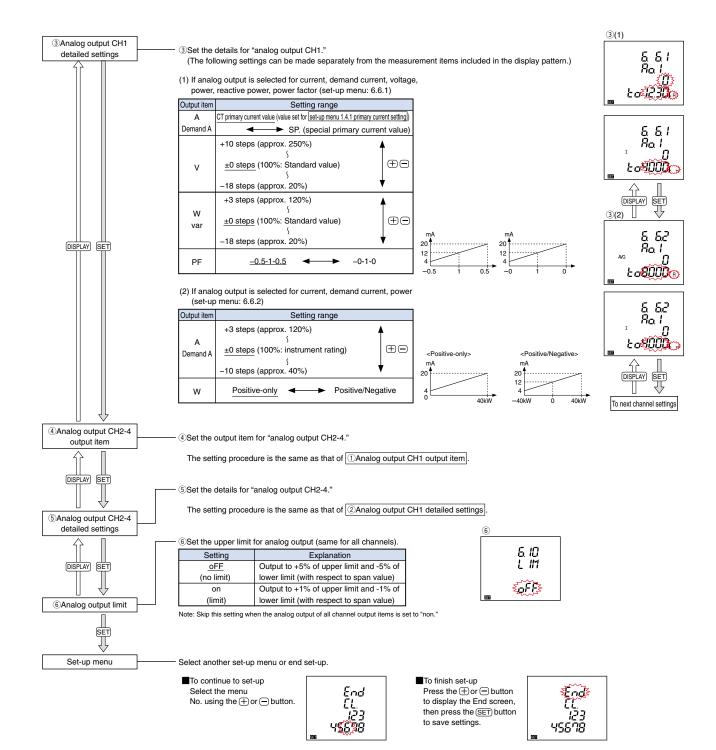




Set-up menu 6: Analog output setting (only when ME-4210-SS96B is installed)







ME9655-ver.8

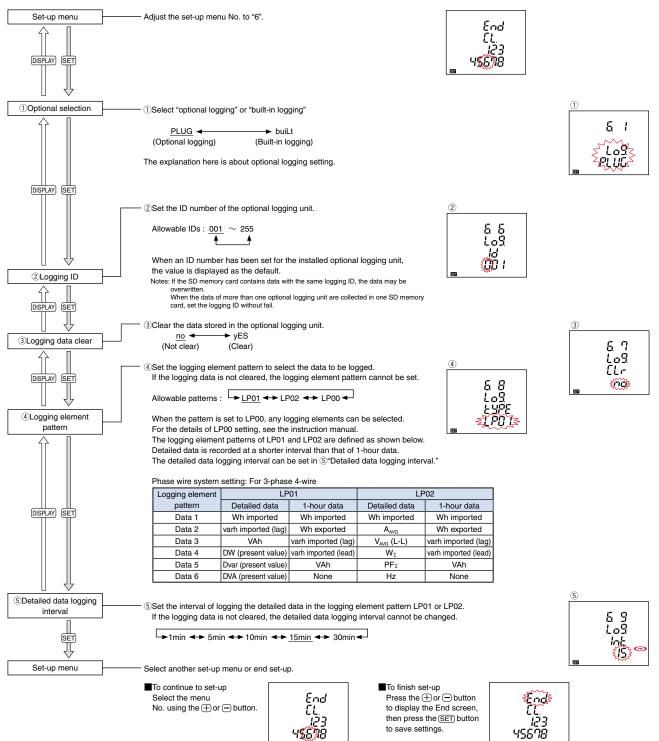
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Operating Instructions

Set-up menu 6: Logging setting (only when ME-0000BU-SS96 is installed)

* Only for ME96SSHB-MB or ME96SSRB-MB, it is applicable.



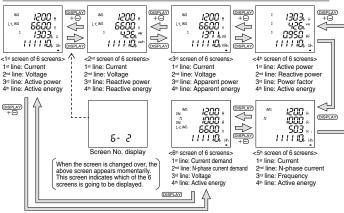


Operation (for ME96SSHB-MB)

Display Change

Press (DISPLAY), the measurement display switches over. When the (DISPLAY) and (-) buttons are held down for 2 seconds or more, the display will change in reverse order.

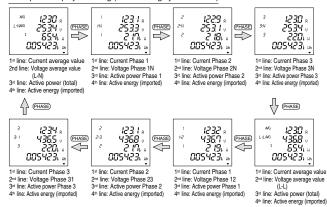
Example of display switching (Phase wiring system: 3P4W, Display pattern: P01, No additional screen)



Changing Phases

Press (PHASE), the current phase and the voltage phase switches over.

Example of display switching (Phase wiring system: 3P4W)



Maximum/Minimum Display Values

Press the (MAX/MIN) button to change to the maximum and minimum values of the display screen. Press it again to return to the current value display screen.

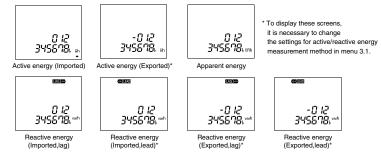
Reset Maximum/Minimum Values

Press the (RESET) button for 2s to reset the maximum/minimum values of the measurement items displayed. The maximum/minimum values will become the current values.

Press the (RESET) and (+) buttons simultaneously for 2s to reset all

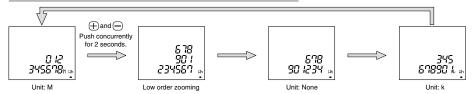
maximum/minimum values. The maximum/minimum values will become the current values.

Displaying Active energy/Reactive energy/Apparent energy



Change the unit (M, k, none) or increase the digits in the bottom display for power used/reactive power used/apparent power used/time-based power used to check the lower/higher-order digits. Push the + and - buttons simultaneously for 2s to switch between screens.

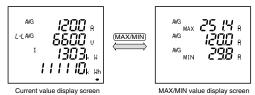
Active energy (imported): Example of switching 012, 345, 678, 901, 234, 567Wh



• Reset Active energy/Reactive energy/Apparent energy

Press the SET), RESET and PHASE buttons simultaneously for 2s to reset all of the following together: active energy/reactive energy/apparent energy (this operation only works on the current value display screen).

Example of display switching between the current value display screen and MAX/MIN value display screen

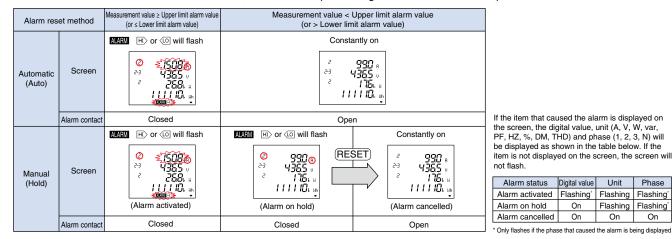


Changing Upper/Lower Limits for Alarm Activation and Cancellation

When measurement values exceed the upper/lower limit values that have been set, an alarm activates and the screen begins to blink.

During Alarm Generation

Alarm condition: When a measured value exceeds the alarm value setting, the screen begins to flash and the alarm contact closes. Alarm cancelled: When the alarm is cancelled, the screen stops flashing and the alarm contact opens.



Alarm Cancel

The alarm can be reset automatically or manually. The alarm recovery method varies according to the reset method setting.

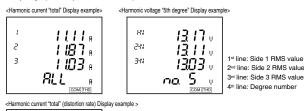
Alarm reset method	Cancellation method
Automatic (Auto)	The alarm resets automatically when the measurement value returns to within the upper/lower limit set value.
	The alarm setting changes to "on hold" even after the measurement value becomes returns to within the upper/lower limit value setting. Once the
	value returns to within the upper/lower limit value set, perform the following alarm recovery operations.
	(Note: Alarm recovery operations cannot be carried out from the maximum/minimum value display screen or contact input screen.)
	<to alarm="" and="" cancel="" item="" select=""></to>
Manual (Hold)	When the item that caused the alarm is displayed, press the (RESET) button to deactivate the alarm.
	(For items with phases such as current and voltage, it is necessary to press the (RESET) button for each phase to cancel the alarm.
	<to alarms="" all="" cancel="" for="" items=""></to>
	To cancel alarms for all items at once (batch), press the RESET button for 2s when in operating mode.

Alarm delay Time

If an alarm delay time has been set, alarm notification begins only when the measurement value exceeds the upper/lower limit alarm value for a period longer than the alarm delay time.

Harmonic Display

The harmonic effective value, distortion ratio and content ratio can be displayed. To do so, first set the harmonic display (set-up menu: 3.2).





1st line: Side 1 distortion ratio (content rate) 2nd line: Side 2 distortion ratio (content rate 3rd line: Side 3 distortion ratio (content rate) 4th line: Degree number

	Harmoni	c current	N-phase harr	monic current	Harmonic voltage		
Degree	RMS	Distortion (content) ratio	RMS	Distortion (content) ratio	RMS	Distortion (content) ratio	
Harmonic total	0	0	0	1	0	0	
1st (fundamental)	0	_	0	1	0	-	
3rd, 5th, 7th, 9th, 11th, 13th, 15th, 17th, 19th, 21st, 23rd, 25th, 27th, 29th and 31st	0	0	0	_	0	0	

Changing the Harmonic Degree Display

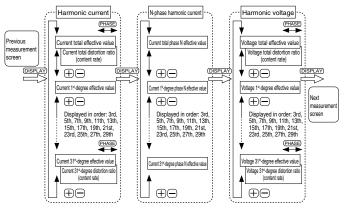
Press the \oplus or \bigcirc button to change the harmonic degree.

Phase

On

Flashing Flashing

On





Display Pattern Contents

The items set in display patterns and additional settings will be displayed as explained in the following table. ME96SSHB-MB/ME96SSRB-MB Screen Display (3-phase 4-wire)

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Display pattern				Sc	reen se	t based	on disp	lay patte	ern						
Display	pattern	No.1	No.2	No.3	No.4	V A DA ar AN DAN									
	1 st line	A	A	Α	W	Α	DA								
P01	2 nd line	V	V	V	var	AN	DAN								
FUI	3rd line	W	var	VA	PF	Hz	V								
	4 th line	Wh	varh	VAh	Wh	Wh	Wh								
	1 st line	A1	DA1	V1N	W1	var1	VA1	PF1	A	Α	DA				
	2 nd line	A2	DA2	V2N	W2	var2	VA2	PF2	Hz	AN	DAN				
P02	3 rd line	A3	DA3	V3N	W3	var3	VA3	PF3	W	var	VA				
	4 th line	Aavg	DAavg	VLN avg	WΣ	varΣ	νας	PFΣ	Wh	varh	VAh				
	1 st line	Free 1	Free 1	Free 1	Free 1										
P00	2 nd line	Free 1	Free 1	Free 1	Free 1										
F-00	3rd line	Free 1	Free 1	Free 1	Free 1										
	4 th line	Free 2	Free 2	Free 2	Free 2										

Note 1, Selectable elements for "Free 1" include A. AN, DA, DAN, V. W var, VA, PF, and Hz, Selectable elements for "Free 2" include Wh, -Wh, varh, and VAh,

			Additional screens (set in set-up menu Nos. 1, 3, 7 and 8)																				
		No.11	No.12	No.13	No.14	No.15	No.16	No.17	No.18	No.19	No.20	No.21	No.22	No.23	No.24	No.25	No.26	No.27	No.28	No.29	No.30	No.31	No.32
Display	pattern		Wh		varh	varh	varh		Period	Period	Period	Rol	ling dem	and	Harmonic	Harmonic	Harmonic	Unbalance	DI	DO	Operating	Onerating	CO ₂
		Wh	(exported)	varh	imported (Lead)	exported (Lag)	exported (Lead)	VAh	Wh1	Wh2		DW	Dver	DVA	Current	Current Phase N	voltage	rate	status	status	time 1		equivalent
	1 st line	-	-	-	-	-	-	-	No.1	No.2	No.3	F	eak valu	e	Side 1 value	Side N value	Side 1 value	-	-	-	hour	hour	-
	2 nd line											Rolling demand, active power Predictive value	Rolling demand, reactive power Predictive value	Rolling demand, apparent power Predictive value	Side 2 value	-	Side 2 value	Aunb	DI	DO	1	2	CO ₂
Common to P00 to P02		Wh	Wh exported	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Period Wh1	Period Wh2	Period Wh3	Rolling demand, active power Last value	Rolling demand, reactive power Last value	Rolling demand, apparent power Last value	Side 3 value	-	Side 3 value	Vunb	DO No.	DO No.	-	-	- Equivalent
	4 th line											Rolling demand, active power Present value	Rolling demand, reactive power Present value	Rolling demand, apparent power Present value	Degree number	Degree number	Degree number	"unb"	Contact status	Contact status	Operating time		· ·

Note 2. When an additional screen is added, a screen No. is also added.

Note 3. Wh in the table indicates Wh imported. The varh indicates varh imported (Lag). Note 4. The additional screen for Wh, varh, and VAh of "P00" is not displayed unless Wh, varh, and VAh are set as the display elements.

ME96SSHB-MB/ME96SSRB-MB Screen Display (3-phase 3-wire, 1-phase 3-wire, 1-phase 2-wire)

Display	nattorn	Sc	reen se	t based	on disp	lay patte	ern		
Dispidy	pattern	No.1	No.2	.2 No.3 No.4 No.5 N					
	1 st line	A	A	A	W	A			
P01	2 nd line	V	V	V	var	DA			
FUI	3rd line	W	var	VA	PF	Hz			
	4 th line	Wh	varh	VAh	Wh	Wh			
	1 st line	A1	DA1	V12	W	A	Α		
P02	2 nd line	A2	DA2	V23	var	Hz	V		
F02	3rd line	A3	DA3	V31	PF	var	VA		
	4 th line	Aavg	Davg	Vavg	Wh	varh	VAh		
	1 st line	Free 1	Free 1	Free 1	Free 1				
P00	2 nd line	Free 1	Free 1	Free 1	Free 1				
FUU	3rd line	Free 1	Free 1	Free 1	Free 1				
	4 th line	Free 2	Free 2	Free 2	Free 2				

Note 1. For 1-phase 2-wire setting, the display pattern P02 cannot be set. Note 2. Selectable elements for Free 1 include A, DA, V, W, var, VA, PF, and Hz. Selectable elements for Free 2 include Wh, -Wh, varh, and VAh.

									Additio	onal scree	ens (set i	n set-up i	menu No	s. 1, 3, 7	and 8)								
		No.7	No.8	No.9	No.10	No.11	No.12	No.13	No.14	No.15	No.16	No.17	No.18	No.19	No.20	No.21	No.22	No.23	No.24	No.25	No.26	No.27	
Display	Display pattern		Wh		varh	varh	varh		Period	Period	Period	Rol	ling dem	and	Harmonic	Harmonic	nonic Unbalance	DI	DO	Operating	Operating	CO2	
		Wh	(exported)	varh	imported (Lead)	exported (Lag)	exported (Lead)	VAh	Wh1	Wh2	Wh3	DW	Dvar	DVA	Current	voltage	rate	status	status	time 1	time 2	equivalent	
	1 st line	-	-	-	-	-	-	-	No.1	No.2	No.3	F	Peak valu	e	Side 1 value	Side 1 value	-	-	-	hour	hour	-	
	2 nd line											Rolling demand, active power Predictive value	Rolling demand, reactive power Predictive value	Rolling demand, apparent power Predictive value	Side 2 value	Side 2 value	Aunb	DI	DO	1	2	CO ₂	
Common to P00 to P02		Wh	Wh exported	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Period Wh1	Period Wh2	Period Wh3	Rolling demand, active power Last value	Rolling demand, reactive power Last value	Rolling demand, apparent power Last value	Side 3 value	Side 3 value	Vunb	DO No.	DO No.	-	-		
4*	4 th line												Rolling demand, active power Present value	Rolling demand, reactive power Present value	Rolling demand, apparent power Present value	Degree number	Degree number	"unb"	Contact status	Contact status	Operating time	Operating time	Equivalent

Note 3. When an additional screen is added, a screen No. is also added.

Note 4. Wh in the table indicates Wh imported. The varh indicates varh imported (Lag). Note 5. The additional screen for Wh, varh, and VAh of "P00" is not displayed unless Wh, varh, and VAh are set as the display elements.

Note 6. For 1-phase 2-wire system, Unbalance rate (No.22) is not displayed.

Operating Instructions

•ME96SSEB-MB Screen Display (3-phase 4-wire)

Display	Display pattern				Screen s	et based	on displa	ay pattern			
Display			No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10
	1 st line	A	A	A	W	Α	DA				
P01	2 nd line	V	V	V	var	AN	DAN				
	3rd line	W	var	VA	PF	Hz	V				
	4 th line	Wh	varh	VAh	Wh	Wh	Wh				
	1 st line	A1	DA1	V1N	W1	var1	VA1	PF1	Α	A	DA
	2 nd line	A2	DA2	V2N	W2	var2	VA2	PF2	Hz	AN	DAN
P02	3rd line	A3	DA3	V3N	W3	var3	VA3	PF3	W	var	VA
	4 th line	Aavg	DAavg	VLN avg	WΣ	varΣ	νας	ΡΕΣ	Wh	varh	VAh
	1 st line	Free 1	Free 1	Free 1	Free 1						
P00	2 nd line	Free 1	Free 1	Free 1	Free 1						
F00	3rd line	Free 1	Free 1	Free 1	Free 1						
	4 th line	Free 2	Free 2	Free 2	Free 2						

Note 1. Selectable elements for "Free 1" include A, AN, DA, DAN, V, W var, VA, PF, and Hz. Selectable elements for "Free 2"include Wh, -Wh, varh, and VAh.

				A	dditiona	al screer	ns (set ir	i set-up	menu N	os. 3 and	8)		
			No.12	No.13	No.14	No.15	No.16	No.17	No.18	No.19	No.20	No.21	No.22
Display pattern		Wh	Wh (exported)	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Harmonic current	Harmonic current Phase N	Harmonic voltage	Operating time 1	Operating time 2
	1 st line	-	-	-	-	-	-	-	Side 1 value	Side N value	Side 1 value	hour	hour
Common to	2 nd line		Wh Wh exported	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Side 2 value	-	Side 2 value	1	2
P00 to P02	3 rd line	Wh							Side 3 value	-	Side 3 value	-	-
	4 th line								Degree number	Degree number	Degree number	Operating time	Operating time

Note 2. When an additional screen is added, a screen No. is also added.

Note 3. Wh in the table indicates Wh imported. The varh indicates varh imported (Lag). Note 4. The additional screen for Wh, varh, and VAh of "P00" is not displayed unless Wh, varh, and VAh are set as the display elements.

●ME96SSEB-MB Screen Display (3-phase 3-wire, 1-phase 3-wire, 1-phase 2-wire)

Display	Display pattern		Screen s	et based	on displa	ıy pattern	
Display	pattern	No.1	No.2	No.3	No.4	No.5	No.6
	1 st line	A	A	A	W	A	
P01	2 nd line	V	V	V	var	DA	
	3rd line	W	var	VA	PF	Hz	
	4 th line	Wh	varh	VAh	Wh	Wh	
	1 st line	A1	DA1	V12	W	Α	Α
P02	2 nd line	A2	DA2	V23	var	Hz	V
F02	3rd line	A3	DA3	V31	PF	var	VA
	4 th line	Aavg	DAavg	Vavg	Wh	varh	VAh
	1 st line	Free 1	Free 1	Free 1	Free 1		
P00	2 nd line	Free 1	Free 1	Free 1	Free 1		
-00	3rd line	Free 1	Free 1	Free 1	Free 1		
	4 th line	Free 2	Free 2	Free 2	Free 2		

Note 1. In the case of 1-phase 2-wire setting, the display pattern P02 cannot be set. Note 2. Selectable elements for Free 1 include A, DA, V, W, var, VA, PF, and Hz. Selectable elements for Free 2 include Wh, -Wh, varh, and VAh.

			Additional screens (set in set-up menu Nos. 3 and 8)										
			No.8	No.9	No.10	No.11	No.12	No.13	No.14	No.15	No.16	No.17	
Display pattern		Wh	Wh (exported)	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Harmonic current	Harmonic voltage	Operating time 1	Operating time 2	
	1 st line	-	-	-	-	-	-	-	Side 1 value	Side 1 value	hour	hour	
Common to	2 nd line		Wh exported	varh	varh imported (Lead)	varh exported (Lag)	varh exported (Lead)	VAh	Side 2 value	Side 2 value	1	2	
P00 to P02	3 rd line	Wh							Side 3 value	Side 3 value	-	-	
	4 th line								Degree number	Degree number	Operating time	Operating time	

Note 3. When an additional screen is added, a screen No. is also added.

Note 4. Wh in the table indicates Wh imported. The varh indicates varh imported (Lag). Note 5. The additional screen for Wh, varh, and VAh of "P00" is not displayed unless Wh, varh, and VAh are set as the display elements.

Phase/Wire Displays

The phase/wire system will be displayed as shown in the following table and is common for all models.

Top phase disp	Phase/Wire settings	1P2W	1P3W(1N2)	1P3W(1N3)	3P3W
	1	None	1	1	1
current	2	None	N	N	2
	3	None	2	3	3
	12	None	1N	1N	12
Voltage	23	None	2N	ЗN	23
	31	None	12	13	31



Memo

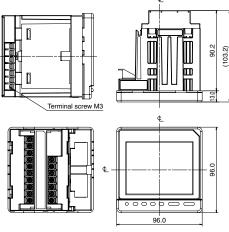
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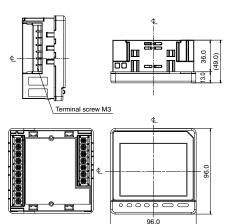
External Dimensions/Installation/Connections

Dimensions

ME96SSHB-MB, ME96SSRB-MB



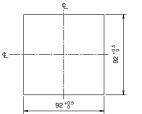
ME96SSEB-MB



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.



3 Attachment

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

①The attachment lug is installed in two holes of the top and bottom of the basic device.



4 Installing Optional Plug-in Module

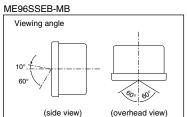
When installing the optional plug-in module onto the basic device, install according to the following procedure.

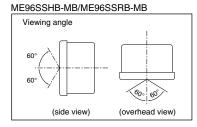
 \bigcirc Remove the optional cover.



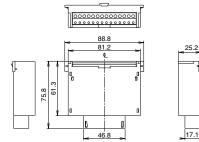


The contrast of the display changes at view angle. Mount it at the position that is easy to see.

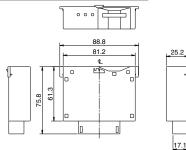




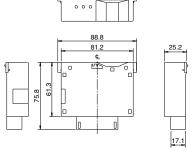
Optional Plug-in Module : ME-4210-SS96B, ME-0040C-SS96, ME-0052-SS96



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



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



②Attach the optional unit to the main unit.

2 Tighten the screws of the lug,

and fix onto the panel.



the screws.

(about half the normal torque). Tighten the two screws evenly.

Main unit mounting screws: M3

Note

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

To prevent damage to the panel and screws, do not overtighten

The recommended torque for this product is 0.3 N·m to 0.5 N·m



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	• 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	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. Single wire and stranded wire: AWG24 to 18	_

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2 Wiring

Optional Plug-in Module Terminal

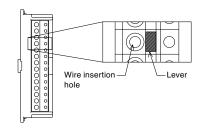
- ①Remove the wire casing at the end of the wire and solder to the rod terminal. 2 With the lever pushed in, insert the wire and
- then release the lever to connect.

3 Confirmations

After wiring, make sure the following:

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

Optional Plug-in Module Terminal



	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.
Note	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

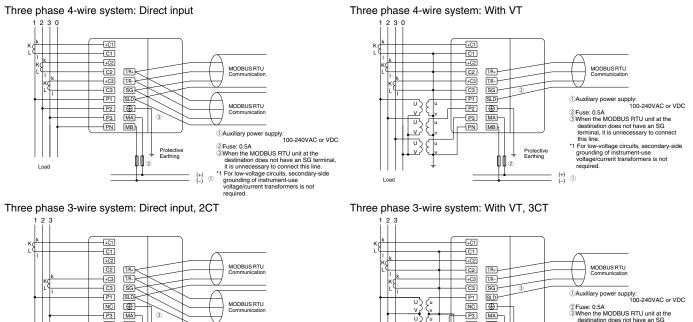
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Load



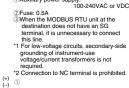
Load

①Auxiliary power supply: 100-240VAC or VDC

20-240VAC or VDC
 2Fuse: 0.5A
 3When the MODBUS RTU unit at the
 destination does not have an SG
 terminal, it is unnecessary to connect
 this line.
 *1 For low-voltage circuits, secondary-side

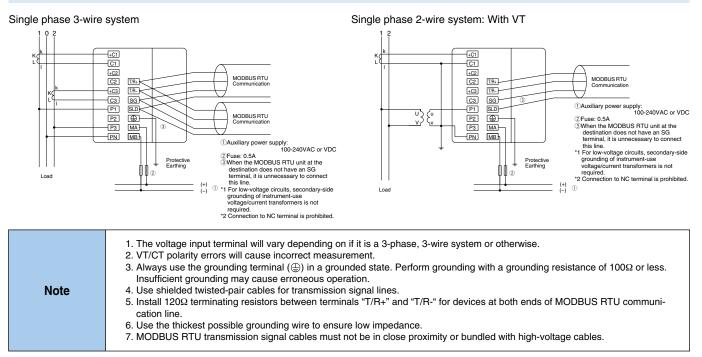
grounding of instrument-use voltage/current transformers is not required. *2 Connection to NC terminal is prohibited.

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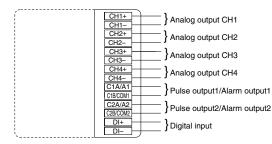


External Dimensions/Installation/Connections

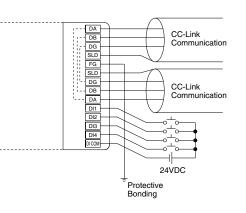
Wiring Diagrams (Continued)



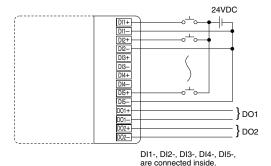
Optional Plug-in Module: ME-4210-SS96B

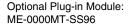


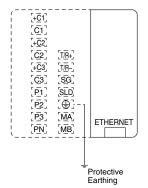
Optional Plug-in Module: ME-0040C-SS96



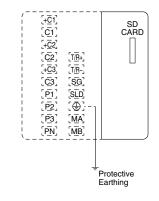
Optional Plug-in Module: ME-0052-SS96







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





Wiring Diagrams (Continued)

	-
	 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
Note	Other power lines 600mm or more 2. 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. 3. There is no insulation between the MODBUS RTU communication portion and the optional module ME-4210-SS96B, ME-0040C-SS96 or ME-0000MT-SS96. 4. Use only designated cables when connecting the CC-Link (see communication specifications). CC-Link dedicated cables cannot be used at the same time. The terminal resistance value varies depending on the type of dedicated cable. 5. For cables connecting the CC-Link, connect shielded cables to "SLD" and ground "FG" cables. "SLD" and "FG" cables are connected inside the unit. 6. 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. 7. For CC-Link transmission, always use dedicated lines and comply with conditions for total wiring distance, distance between stations and terminal before use. 7. For CC-Link Master Unit Operations Manual for information on dedicated lines and wiring conditions). 8. The terminal resistance values according to the co-Link transmission line, 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. 9. Communication errors may occur under the influence of high-frequency noise from other devices in the installation environment duri

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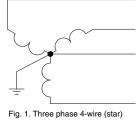
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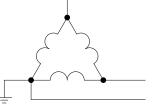
+MA/G

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

Rated voltage for each phase/wire system

* 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.





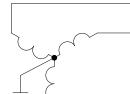
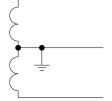


Fig. 3. Three phase 3-wire (star)



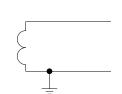
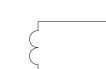


Fig. 2. Three phase 3-wire (delta)



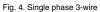


Fig. 5. Single phase 2-wire (delta)

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

Related Products

EcoWebServerIII

Mitsubishi Electric Energy-saving Data Collection Server From visualization to publication of energy data

Simple Set-up

When using the set-up software supplied, power management meters connected to CC-Link and measurement data can be set by mouse and keyboard operations.

Display Measurement Data as Graphs on a Web Browser

The main unit has a built-in web server that allows anyone, anywhere to understand the amount of energy being used in real time via computer without requiring additional software, thereby supporting early detection of energy waste.

Automatic Transmission of Data Collected, Mail Notifications and Contact Output

Users are notified of changes in energy, facilities, etc. via e-mail and alarms. Energy management targets and status monitoring of entire factories and buildings help ensure that problems onsite are detected without fail.

 $\bigcirc \mathsf{PLC}$ data can also be sent to EcoWebServerIII by Ethernet.

 $\diamondsuit \mbox{Data of various sites can be browsed in the head office by utilizing the internal network.}$

EcoMonitorPlus

Energy measuring units helpful in adding units for increased number of measuring circuits and preventive maintenance by simultaneous measurement of electric power and leakage

Phased expansion of energy-saving system

- At first, energy-saving measurement can be started on a small scale from a desired place.
- The system can be configured by adding units according to the increase of measuring circuits.

Leakage current monitoring

Lineup of basic units for monitoring insulation

Helpful in early detection of equipment problems through accurate leakage current trend monitoring by lor method

* lor: Leakage current caused by insulation deterioration (leakage current of resistive component)

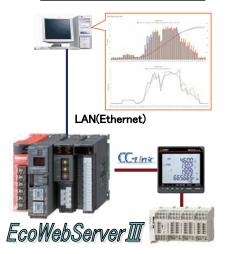
Simple management of measurement data with prepared forms and graphs

Data can be collected by the logging unit (SD memory card) without the host application on the PC, etc.

Forms and graphs can be easily prepared by using the spreadsheet software (logging unit utility*).

* The logging unit utility can be downloaded for free from Mitsubishi Electric FA site.

Collection, storage, visualization, publication on the web, analysis and monitoring All can be realized by one server.



Energy Measuring Unit





EcoMonitorLight

Energy measuring unit with integrated display for easily realizing the visualization of energy

A three-model line-up: a Three phase 3-wire system designed for users wanting simple power measurements at low cost; and a Three phase 4-wire system designed for users looking for basic power measurements plus something extra (harmonic measurements, alarm monitoring, etc.).

Simple Measurements

The built-in LCD enables easy setting, measurement and display of power used for energy management.

MODBUS RTU (RS-485) Communication as Standard Equipment

Meters come with MODBUS RTU communication as standard equipment, allowing the device to be used as a PLC system, other high-order system, display device (GOT), etc.

Logging/Communication Units for Expanded Measurement Applications

The product line-up also includes logging units/communication units (CC-Link communication unit) that can be incorporated as add-on options, enabling installations that best match to the customer's usage environment.

■Logging unit: Data measured by the main unit (current, voltage, power, etc.) can be output to an SD memory card in CSV file format, realizing simple data management.

Highly Accurate Measurements and Support Functions

Customer activities are supported through functions such as 250µs high-precision (short-cycle load) measurement, operating time measurement, wiring error detection and test output.

Energy Measuring Unit

ME94

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Safety Precautions

To ensure safety, read the following items carefully before use and always comply with procedures during use. Special attention should be given to items enclosed in a box and marked "Caution." Additionally, please carefully read the operations manual supplied with the product before use, and ensure that the manual read by the end user as well.

1 Usage Environment and Conditions

- Do not use these products under any of the following conditions. Doing so may cause erroneous operation and/or reduced service life.
 - Ambient temperature is outside the range of -5°C to +55°C
 Daily average temperature over 35°C
 Presence of excessive dust, corrosive gas, salt or oil/smoke
 Product is subject to excessive vibration or shock
 Product is in direct contact with rain, water drops or sounlight
 Altitude is above 2,000m
 Excessive external noise
 Pollution level is 2 or higher
 Transient overvoltage is 4,000V or higher
 Presence of metal fragments or conducting substances

2 Installation

Please note the following items regarding installation. To ensure safety, installation is to be performed by a qualified technical electrician.

Affix the main unit to the panel before us
The LCD display contrast changes depending on the angle from which it is viewed. Install it in a position that ensures a suitable angle of view.
Tighten screws using a torque of approx. 0.3-0.5N·m
To prevent damage to the LCD, take care not to subject the LCD/front of the main unit to shock/impact.

Auxiliary power supply and instrument ratings

Auxiliary p supply	ower	100-240VAC (±15%) 50-60Hz 100-240VDC (-30%, +15%)
Instrument ratings	Voltage	Three phase, 4-wire: Max. 277/480VAC Three phase, 3-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC Single phase, 3-wire: Max. 220/440VAC Single phase, 2-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC
	Current	5A/1A
	Frequency	50-60Hz (dual use)

3 Connections

See pages 30-32 of this catalog for information regarding connections.

▲ CAUTION	 To ensure safety, connections are to be performed by an electrical engineer qualified in wiring. Check connection diagrams carefully before performing connections. Incorrect connections may result in VT burnout caused by a VT secondary-side short circuit or high voltage on the CT secondary side, which may lead to device malfunction, fire or electrical shock. Do not work with live wires; there is a risk of electric shock and exposure to high voltage due to short-circuiting or CT secondary side opening, which may lead to malfunction, fire or electrical shock. Use electrical wire sizes compatible with the rated current. Use of unsuitable sizes may cause heat generation, which may lead to a fire. After performing connections, check that no connections have been missed. Missed connections may result in erroneous operation or high voltage on the CT secondary side, which may lead to a fire or electrical shock. At the time of wiring, an electric wire can be broken by pulling with strong power. (The load of pulling is less than 3-9 N)
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4 Preparations Before Use

• Before use, perform settings such as the VT primary voltage, CT primary current, power scale and demand time limit in accordance with the operations manual supplied with the product; setting errors may cause incorrect measurement/operation.

5 Usage Procedures

- Use the products within the rated range. Using the products outside the rated range may cause erroneous operation or product malfunction.
- Do not use the products for special applications such as nuclear power, aerospace or medical devices/systems.

CAUTION • Do not make any modifications to the products. Using products after modification may cause a malfunction, electrical shock or fire.



6 Repairing at Time of Malfunction/Error

• If a product listed in this catalog malfunctions, read the troubleshooting section of the operations manual (detailed version) and confirm the symptoms. If the problem is not listed, please contact a Mitsubishi Electric representative.

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7 Maintenance/Inspections

- Wipe away any dust/dirt on the surface of the product with a soft cloth.
- Do not leave chemical cloths, etc. in contact with the product for long periods, and avoid the use of benzene, thinner, etc. when wiping the product surface. Doing so may cause deformation or cause the coating to peel away.
- To ensure correct use for the full service life of the product, please perform the following inspections:

①Check for damage to the product ②Check for display malfunctions (e.g., does not respond to input) ③Check for loose installation or terminal block wire connections (check regularly once every six months/year) always making sure that power has been turned off beforehand) ④Check for unusual smell, noise or rise in temperature.

8 Storage

Do not store the product for long periods of time under any of the following conditions. Doing so may lead to a malfunction or reduced service life. • Ambient temperature outside the range of -25°C to +75°C • Daily average temperature of more than 35°C • Relative humidity exceeding 85% RH or condensation present • Excessive dust, corrosive gas, salt or oil/smoke present • Product is subject to excessive vibration or shock • Product is in direct contact with rain, water drops or sunlight

9 Disposal

- These products do not use nickel-cadmium batteries. Dispose of them as industrial waste.
- The optional module ME-0000BU-SS96 contains a lithium battery. Dispose of the battery in accordance with the municipal regulations.
- In EU member states, there is a separate collection system for used batteries. Dispose of the batteries properly at the local collection/recycling center. The following symbol is printed on the package of ME-0000BU-SS96.



This symbol is applicable only in EU member states. The symbol is designated in Article 20 "Information for end-users" and Annex II of the new European Directive on batteries (2006/66/EC).

The above symbol indicates that the batteries must be disposed of after separation from general waste.



• The optional module ME-0000BU-SS96 contains a lithium battery. Therefore, if it is thrown into the fire, it may generate heat, rupture or ignite. Dispose of the lithium battery in accordance with the municipal regulations.

10 Warranty Period

The warranty period for the products in this catalog expires one year from the date of purchase or one year and six months after the date of manufacture; whichever is earliest. Even during the warranty period, the warranty shall not apply to malfunctions attributable to intentional negligence or erroneous use by the customer, and the fee for any repair required as the result of such negligence shall be the liability of the customer.

Mitsubishi Electric shall not be liable for: Damage that cannot be attributed to Mitsubishi Electric; lost opportunity or earnings resulting from failure of a Mitsubishi Electric product; damage, secondary damage or compensation for an accident resulting from special circumstances regardless of whether or not the circumstances were foreseeable; or damage to products or other services for products not manufactured by Mitsubishi Electric.

11 Product Exchange Cycle

Although it depends on usage conditions, as a guide, it is recommended that the products listed in this catalog be renewed after 10 years.

Trademarks

- MODBUS is a trademark of Schneider Electric USA Inc.
- Ethernet is a trademark of Fuji Xerox Co., Ltd.
- Other company and product names herein are trademarks or registered trademarks of their respective owners.
- In the text, trademark symbols such as "TM" and "®" may not be written.





ELECTRONIC MULTI-MEASURING INSTRUMENT

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