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MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

# ELECTRONIC MULTI-MEASURING INSTRUMENT ME96SS


SS Ver.A
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.**
**This new series has improved measuring accuracy; even the economy model MODBUS® TCP communication unit for Ethernet communication and logging will be helpful in realizing more effective measurement monitoring systems**

## ① ME96SSEA-MB (economy model)

Major features

[1] Active energy measuring accuracy of class 0.5S
[2] Applicable to harmonics (THD)
[3] Applicable to current demand

## ② ME96SSRA-MB (standard model)

Major features

[1] Active energy measuring accuracy of class 0.5S
[2] Applicable to harmonics of ±1.0% (19th)
[3] Applicable to demands A and W,var,VA
[4] Optional units can be added.

## ③ ME96SSHA-MB (high-performance model)

Major features

[1] Active energy measuring accuracy of class 0.5S
[2] Applicable to harmonics of ±1.0% (31st)
[3] Applicable to demands A and W,var,VA
[4] Optional units can be added.

# with enhanced measuring

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

**has an active energy measuring accuracy corresponding to Class 0.5S. The unit for enhanced data backup can be added to the models. The new series and energy-saving measurement monitoring.**

## ④ Optional plug-in modules

### Major features

[1] MODBUS® TCP communication unit **NEW**
[2] Data logging unit **NEW**
[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

# Outline and Features

## Improved Measurement Functions

●Improved accuracy of active energy, reactive energy and power factor and expanded measurement ranges of harmonics and demand values have been realized.

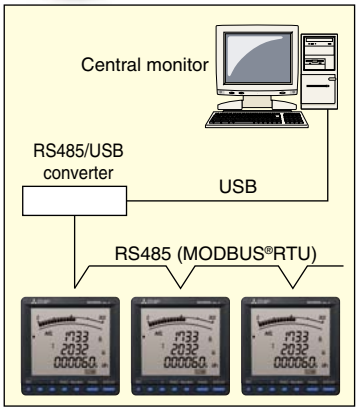
| Model name | Transmission/Option specifications | Main measurement items |
|---|---|---|
| ME96SSHA-MB<br>(High-performance class) | MODBUS® RTU communication<br><br>Plug-in module (options)<br>• Analog/Pulse/Contact output/input<br>• CC-Link communication<br>• Digital input/output (for MODBUS® RTU communication)<br>• Backup (on SD card)<br>• MODBUS® TCP communication | A, DA, V, Hz = ±0.1%<br>W, var, VA, PF = ±0.2%<br>Wh = class 0.5S (IEC62053-22)<br>varh = class 1S (IEC62053-24)<br>Harmonics = 31st-deg (max)<br>Rolling demand = W, var, VA |
| ME96SSRA-MB<br>(Standard class) | MODBUS® RTU communication<br><br>Plug-in module (options)<br>• Analog/Pulse/Contact output/input<br>• CC-Link communication<br>• Digital input/output (for MODBUS® RTU communication)<br>• Backup (on SD card)<br>• MODBUS® TCP communication | A, DA, V = ±0.2%<br>Hz = ±0.1%<br>W, var, VA, PF = ±0.5%<br>Wh = class 0.5S (IEC62053-22)<br>varh = class 1S (IEC62053-24)<br>Harmonics = 19th-deg (max)<br>Rolling demand = W, var, VA |
| ME96SSEA-MB<br>(Economy class) | MODBUS® RTU communication | A, DA, V = ±0.5%<br>Hz = ±0.2%<br>W, PF = ±0.5%<br>Wh = class 0.5S (IEC62053-22)<br>Harmonics = Only total |

Optional Plug-in Modules

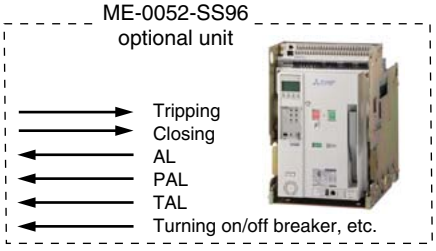
| Model name | Analog output | Pulse/Alarm output | Contact input | Contact output | Transmission function | Used with |
|---|---|---|---|---|---|---|
| ME-4210-SS96 | 4 | 2 | 1 | — | — | ME96SSHA-MB<br>ME96SSRA-MB |
| ME-0040C-SS96 | — | — | 4 | — | CC-Link | |
| ME-0052-SS96 | — | — | 5 | 2 | — | |
| ME-0000BU-SS96 | — | — | — | — | SD CARD | |
| ME-0000MT-SS96 | — | — | — | — | MODBUS® TCP | |

Note: Optional Plug-in Module can not be used with ME96SSEA-MB.

## MODBUS® RTU System (ME96SSHA-MB/ME96SSRA-MB with ME-0052-SS96 (optional plug-in module))




●MODBUS® RTU communication system optimizes computer monitoring operations
●Attachment of ME-0052-SS96 (optional) enables remote monitoring of the contact input signal and on/off control of the contact output signal
●Digital input signals can be latched for over 30ms, and there is no need for external latch circuits

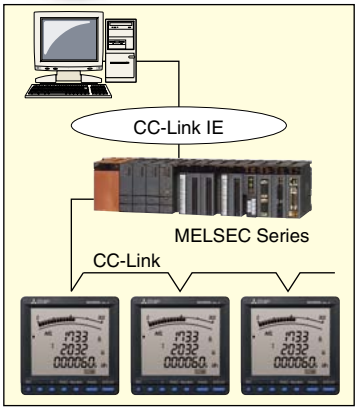



<MODBUS® RTU Interface Specifications>
• Max. Baud rate: 38.4kbps
• Max. Connection Distance: 1,200m
• Max. Connection Units: 31

<Optional Plug-in Module ME-0052-SS96>
• Digital Input: 5 points (24VDC)
• Digital Output: 2 points (35VDC)

# ME96 Super-S Series Ver.A Features

## CC-Link System (ME96SSHA-MB/ME96SSRA-MB with ME-0040C-SS96 (optional plug-in module))

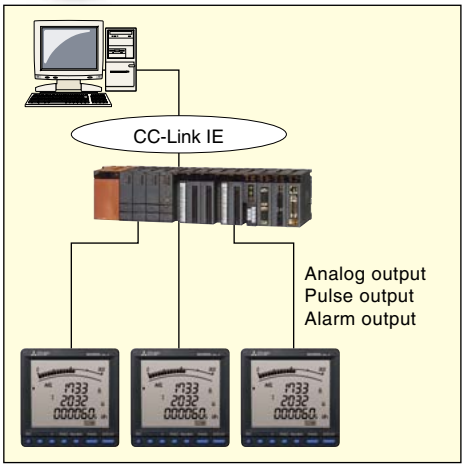



- Optimum transmission system for remote monitoring using Mitsubishi PLC
- Contact signals can be remotely monitored by installing the optional module ME-0040C-SS96. This is helpful in wiring and space saving.
- Digital unit signal can be latched for over 30ms, and there is no need for external latch 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 (ME96SSHA-MB/ME96SSRA-MB with ME-4210-SS96 (optional plug-in module))




- Applicable to analog output, pulse output and alarm output with the aid of the optional module ME-4210-SS96
- 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 (ME96SSHA-MB) 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

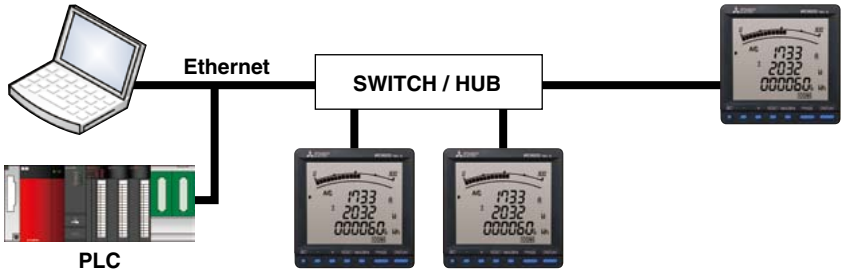
<Pulse output specifications>
- No-voltage a contact point
- 35VDC, 0.1A
- Select output from pulse widths of 0.125, 0.5 or 1s

<Alarm output specifications>
- No-voltage a contact point
- 35VDC, 0.1A

<Digital input specifications>
- 1 point (24VDC)

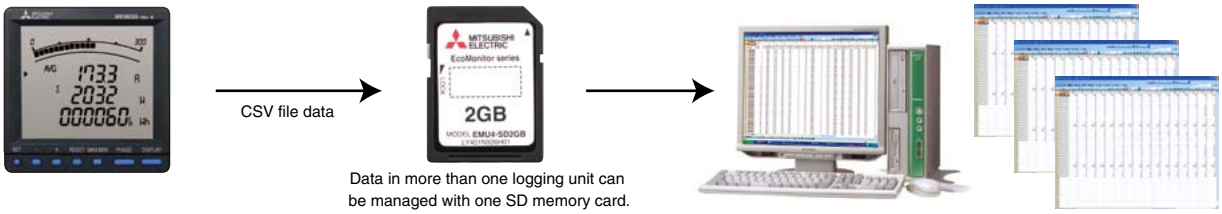
## MODBUS® TCP Communication (ME96SSHA-MB/ME96SSRA-MB with ME-0000MT-SS96 (optional plug-in module))

- There is available an optional module usable not only for the conventional MODBUS® RTU (RS-485) communication and CC-Link communication, but also for MODBUS® TCP communication in an Ethernet environment.




## Data Logging (ME96SSHA-MB/ME96SSRA-MB with ME-0000BU-SS96 (optional plug-in module))

- There is available an optional module which can retain data even when communication cannot be established.




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.A Features

## Succeeded Display Functions

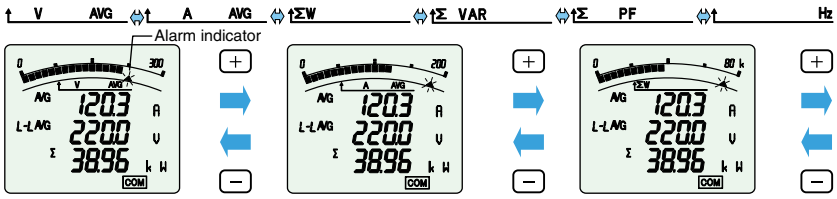
### Large Bar Graph Display Special

●Bar Graph Display

Each measuring items can be displayed by a bar graph. With bar graph display, one can grasps the rated value and percentage against the alarm value instantly.

(1) Bar Graph Fixed Display

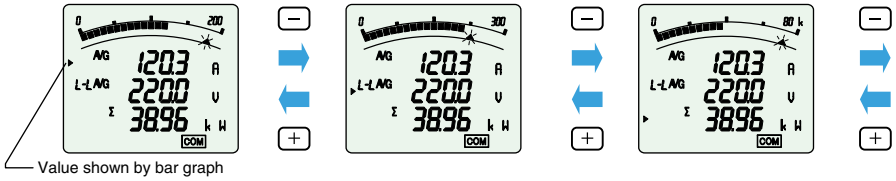
Measuring items can be displayed by bar graph. The ↑ mark indicates that display is fixed. Furthermore, the (+) and (−) buttons can be used to change the display between items measured.




Note: Alarm indicator blinks when it is set on alarm mode.

(2) Digital Values Display by Bar Graph

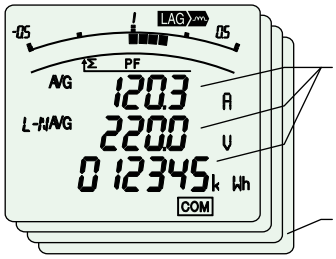
Values on the tri-level digital display can be shown by bar graphs (Except when the tri-level display is measuring the same items). Bar graph shows the digital value of ▶




### Special Display Function

●Special Display by Display Pattern P00

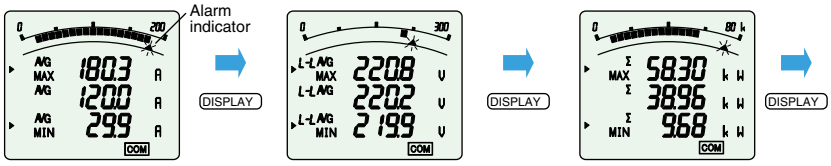
Display can be selected as desired Display Pattern P00.




### 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. Also, range of minimum value to maximum value is shown by bar graph.




### High-brightness Backlight

●High-reliability and high-brightness backlight is built in
●Backlight brightness can be adjusted from level 1 to 5 (default setting is 3)
●"Always-on mode" or "Automatic off mode" can be selected (default setting is automatic off mode)

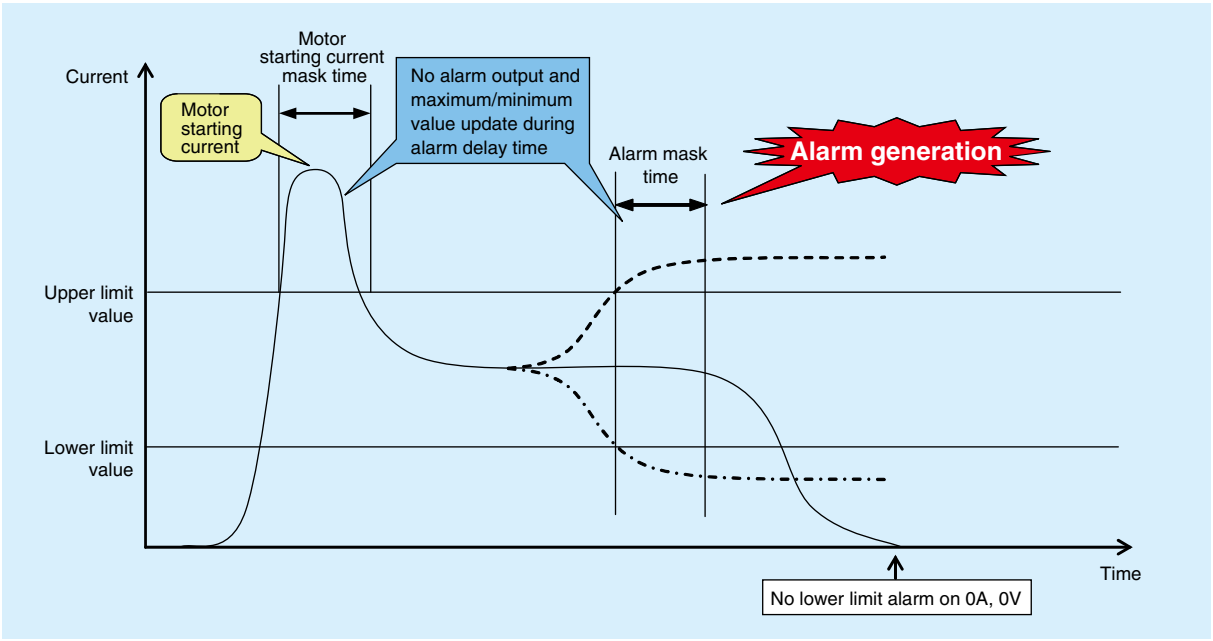

ME96NS Series


ME96SS Series

# Impressive Monitoring Functions

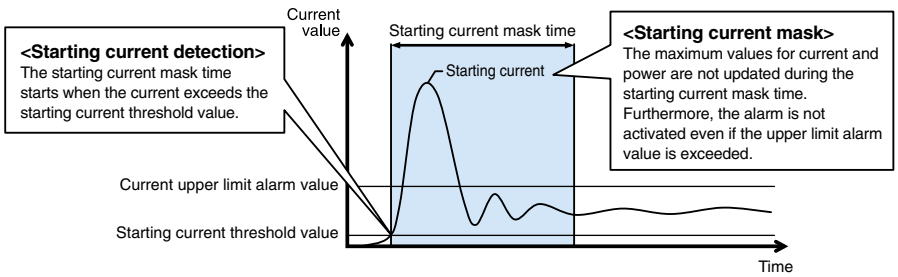
## Advanced Alarm Display

(1) A function to blink the backlight upon occurrence of an alarm is provided.
On the conventional models, the display was lit up upon occurrence of an alarm. The new product has a setting function to blink the backlight upon occurrence of an alarm.
(2) As with the conventional models, the automatic or manual alarm cancel mode can be selected.
(3) As with the conventional models, 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.A 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

〔Under 10A: Top two digits setting
Over 10A: Top three digits setting〕

**(2) Special primary voltage**

60V~750kV

〔Under 100V: Top two digits setting
Over 100V: Top three digits setting〕

**(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 two individual intervals (e.g., peak/off-peak, day/night, 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)

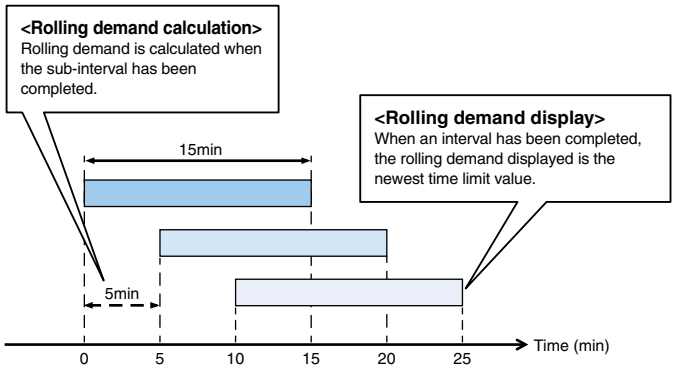
### Rolling Demand Function

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.

①Rolling 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.

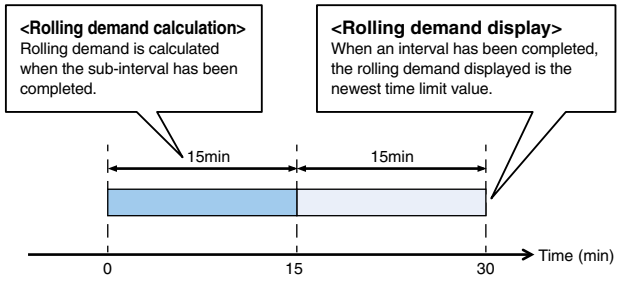
**<Example: Interval, 15min; Sub-interval, 5min>**




②Fixed 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.
(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).

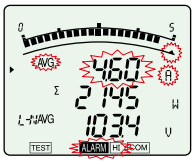
### (1) Communications Test

①Display

- The same as for the operating mode, display patterns and other data are shown as set.
- Both maximum and minimum values can be displayed.

②Communication 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.

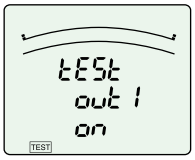


### (2) Alarm/Contact Output Operation Test

①Displays current alarm and contact status.

②Press 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 | Open |
| No alarm | OFF | Closed |




### (3) Analog Output Operation Test

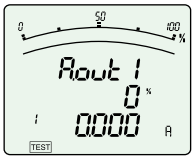
①Display the output items.

②Press the ⊕ or ⊖ button to change the analog output.

Note: Default value is 0%.

0% → 25% → 50% → 75% → 100% → 0%

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



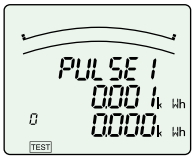

### (4) Pulse Output Operation Test

Press the Reset button one time to output one pulse.

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

0 → 1 → 2 → ··· → 49 → 50 [pulse]

Note: Default value is 0 pulses.




## Standards

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

# Specifications

## ■ME96SSHA-MB

| Model name | | | ME96SSHA-MB | |
|---|---|---|---|---|
| Phase wire | | | Three phase 4-wire, Three phase 3-wire (3CT, 2CT), Single phase 3-wire, Single phase 2-wire (common use) | |
| Rating | | Current | 5AAC, 1AAC (common use) | |
| | | Voltage | Three phase 4-wire: 277/480VAC (max)<br>Three phase 3-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max)<br>Single phase 3-wire: 220/440VAC (max)<br>Single phase 2-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max) | |
| | | Frequency | 50-60Hz (common use) | |
| | | | Measurement items | Class |
| Measurement items and accuracy | Current (A) | | A1, A2, A3, AN, $A_{AVG}$ | ±0.1% |
| | Current demand (DA) | | DA1, DA2, DA3, DAN, $DA_{AVG}$ | ±0.1% |
| | Voltage (V) | | V12, V23, V31, $V_{AVG}$ (L-L)<br>V1N, V2N, V3N, $V_{AVG}$ (L-N) | ±0.1% |
| | Active power (W) | | W1, W2, W3, ΣW | ±0.2% |
| | Reactive power (var) | | var1, var2, var3, Σvar | ±0.2% |
| | Apparent power (VA) | | VA1, VA2, VA3, ΣVA | ±0.2% |
| | Power factor (PF) | | PF1, PF2, PF3, ΣPF | ±0.2% |
| | Frequency (Hz) | | Hz | ±0.1% |
| | Active energy (Wh) | | Imported, Exported | class 0.5S (IEC62053-22) |
| | Reactive energy (varh) | | Imported lead, lag<br>Exported lead, lag | class 1S (IEC62053-24) |
| | Apparent energy (Vah) | | — | ±2.0% |
| | Harmonic current (HI) | | Total, 1st to 31st degree (odd number degree only) | ±1.0% |
| | Harmonic voltage (HV) | | Total, 1st to 31st degree (odd number degree only) | ±1.0% |
| | Rolling demand (DW) | | Rolling block, fixed block | ±0.2% |
| | Rolling demand, reactive power (Dvar) | | Rolling block, fixed block | ±1.0% |
| | Rolling demand, apparent power (DVA) | | Rolling block, fixed block | ±1.0% |
| | Periodic Active energy (Wh) | | Periodic active energy 1, 2 | class 0.5S (IEC62053-22) |
| | Operating time | | Operating time 1, 2 | (Reference) |
| Analog output response time | | | 2s or less (HI, HV: 10s or less) | |
| Measuring method | | Instantaneous value | A/V: RMS calculation, W/ var/ VA/ Wh/ varh/ VAh: Digital multiplication,<br>PF: Power ratio calculation, Hz: Zero-cross, HI/HV: FFT | |
| | | Demand value | DA: Thermal type calculation DW, Dvar, DVA: Rolling demand calculation | |
| Display | Indicator | | LCD with LED backlight | |
| | No. of display digits and segments | Digital display | 6 digits each at upper, middle, and lower line | |
| | | | A, DA, V, W, var, VA, PF, DW, Dvar, DVA: 4 digits Hz: 3 digits<br>Wh, varh, VAh: 9 digits (6 or 12 possible)<br>Harmonic distortion ratio, content ratio: 3 digits Harmonic RMS: 4 digits<br>Operating time: 6 digits Contact input/output: I/O | |
| | | Bar graph | 21 segment bar graph, 22 segment indicator | |
| | Display updating time interval | | 0.5s or 1s (selectable) | |
| Communication | | | MODBUS® RTU communication | |
| Available optional plug-in module | | | ME-4210-SS96 ME-0000BU-SS96<br>ME-0040C-SS96 ME-0000MT-SS96<br>ME-0052-SS96 | |
| Power failure compensation | | | Non-volatile memory used (items: setting value, max/min value, active/reactive energy, apparent energy, periodic active energy, rolling demand, operating time) | |
| Consumption (VA) | VT | | Each phase 0.1VA (110VAC), 0.2VA (220VAC), 0.4VA (440VAC) | |
| | CT | | Each phase 0.1VA (5AAC) | |
| | Auxiliary power circuit | | 7VA (at 110VAC), 8VA (at 220VAC), 5W (at 100VDC) | |
| Auxiliary power | | | 100-240VAC (±15%), 100-240VDC (-30% +15%) | |
| Weight | | | 0.5kg | |
| Dimensions | | | 96 (H) × 96 (W) × 90 (D) | |
| Installation method | | | Embedded | |
| Operating temperature | | | -5~+55°C (average operating temperature: 35°C or less per day) | |
| Operating humidity | | | 0~85% RH (non condensing) | |
| Storage temperature | | | -25~+75°C (average temperature: 35°C or less per day) | |
| Storage humidity | | | 0~85% RH (non condensing) | |

Notes 1. Class values based on 100% of rated value.
Notes 2. Harmonic measurements where distortion ratio (content rate) is 100% or more may exceed ±1.0%.
Notes 3. Harmonic current cannot be measured without voltage input.


## ■ME96SSRA-MB

| Model name | | | ME96SSRA-MB | |
|---|---|---|---|---|
| Phase wire | | | Three phase 4-wire, Three phase 3-wire (3CT, 2CT), Single phase 3-wire, Single phase 2-wire (common use) | |
| Rating | | Current | 5AAC, 1AAC (common use) | |
| | | Voltage | Three phase 4-wire: 277/480VAC (max)<br>Three phase 3-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max)<br>Single phase 3-wire: 220/440VAC (max)<br>Single phase 2-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max) | |
| | | Frequency | 50-60Hz (common use) | |
| | | | Measurement items | Class |
| Measurement items and accuracy | Current (A) | | A1, A2, A3, AN, $A_{AVG}$ | ±0.2% |
| | Current demand (DA) | | DA1, DA2, DA3, DAN, $DA_{AVG}$ | ±0.2% |
| | Voltage (V) | | V12, V23, V31, $V_{AVG}$ (L-L)<br>V1N, V2N, V3N, $V_{AVG}$ (L-N) | ±0.2% |
| | Active power (W) | | W1, W2, W3, ΣW | ±0.5% |
| | Reactive power (var) | | var1, var2, var3, Σvar | ±0.5% |
| | Apparent power (VA) | | VA1, VA2, VA3, ΣVA | ±0.5% |
| | Power factor (PF) | | PF1, PF2, PF3, ΣPF | ±0.5% |
| | Frequency (Hz) | | Hz | ±0.1% |
| | Active energy (Wh) | | Imported, Exported | class 0.5S (IEC62053-22) |
| | Reactive energy (varh) | | Imported lead, lag<br>Exported lead, lag | class 1S (IEC62053-24) |
| | Apparent energy (Vah) | | — | ±2.0% |
| | Harmonic current (HI) | | Total, 1st to 19th degree (odd number degree only) | ±1.0% |
| | Harmonic voltage (HV) | | Total, 1st to 19th degree (odd number degree only) | ±1.0% |
| | Rolling demand (DW) | | Rolling block, fixed block | ±0.5% |
| | Rolling demand, reactive power (Dvar) | | Rolling block, fixed block | ±1.0% |
| | Rolling demand, apparent power (DVA) | | Rolling block, fixed block | ±1.0% |
| | Periodic Active energy (Wh) | | Periodic active energy 1, 2 | class 0.5S (IEC62053-22) |
| | Operating time | | Operating time 1, 2 | (Reference) |
| Analog output response time | | | 2s or less (HI, HV: 10s or less) | |
| Measuring method | | Instantaneous value | A/V: RMS calculation, W/var/VA/Wh/varh: Digital multiplication,<br>PF: Power ratio calculation, Hz: Zero-cross, HI/HV: FFT | |
| | | Demand value | DA: Thermal type calculation DW, Dvar, DVA: Rolling demand calculation | |
| Display | Indicator | | LCD with LED backlight | |
| | No. of display digits and segments | Digital display | 6 digits each at upper, middle, and lower line | |
| | | | A, DA, V, W, var, VA, PF, DW, Dvar, DVA: 4 digits Hz: 3 digits<br>Wh, varh: 9 digits (6 or 12 possible)<br>Harmonic distortion ratio, content ratio: 3 digits Harmonic RMS: 4 digits<br>Operating time: 6 digits Contact input/output: I/O | |
| | | Bar graph | 21 segment bar graph, 22 segment indicator | |
| | Display updating time interval | | 0.5s or 1s (selectable) | |
| Communication | | | MODBUS® RTU communication | |
| Available optional plug-in module | | | ME-4210-SS96 ME-0000BU-SS96<br>ME-0040C-SS96 ME-0000MT-SS96<br>ME-0052-SS96 | |
| Power failure compensation | | | Non-volatile memory used (items: setting value, max/min value, active/reactive energy, apparent energy, periodic active energy, rolling demand, operating time) | |
| Consumption (VA) | VT | | Each phase 0.1VA (110VAC), 0.2VA (220VAC), 0.4VA (440VAC) | |
| | CT | | Each phase 0.1VA (5AAC) | |
| | Auxiliary power circuit | | 7VA (at 110VAC), 8VA (at 220VAC), 5W (at 100VDC) | |
| Auxiliary power | | | 100-240VAC (±15%), 100-240VDC (-30% +15%) | |
| Weight | | | 0.5kg | |
| Dimensions | | | 96 (H) × 96 (W) × 90 (D) | |
| Installation method | | | Embedded | |
| Operating temperature | | | -5~+55°C (average operating temperature: 35°C or less per day) | |
| Operating humidity | | | 0~85% RH (non condensing) | |
| Storage temperature | | | -25~+75°C (average temperature: 35°C or less per day) | |
| Storage humidity | | | 0~85% RH (non condensing) | |

Notes 1. Class values based on 100% of rated value.
Notes 2. Harmonic measurements where distortion ratio (content rate) is 100% or more may exceed ±1.0%.
Notes 3. Harmonic current cannot be measured without voltage input.

# Specifications

## ■ME96SSEA-MB

| Model name | | | ME96SSEA-MB | |
|---|---|---|---|---|
| Phase wire | | | Three phase 4-wire, Three phase 3-wire (3CT, 2CT), Single phase 3-wire, Single phase 2-wire (common use) | |
| Rating | | Current | 5AAC, 1AAC (common use) | |
| | | Voltage | Three phase 4-wire: 277/480VAC (max)<br>Three phase 3-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max)<br>Single phase 3-wire: 220/440VAC (max)<br>Single phase 2-wire: Delta connections: 220VAC (max), Star connections: 440VAC (max) | |
| | | Frequency | 50-60Hz (common use) | |
| | | | Measurement items | Class |
| Measurement items and accuracy | Current (A) | | A1, A2, A3, AN, $A_{AVG}$ | ±0.5% |
| | Current demand (DA) | | DA1, DA2, DA3, DAN, $DA_{AVG}$ | ±0.5% |
| | Voltage (V) | | V12, V23, V31, $V_{AVG}$ (L-L)<br>V1N, V2N, V3N, $V_{AVG}$ (L-N) | ±0.5% |
| | Active power (W) | | W1, W2, W3, ΣW | ±0.5% |
| | Reactive power (var) | | — | — |
| | Apparent power (VA) | | — | — |
| | Power factor (PF) | | PF1, PF2, PF3, ΣPF | ±0.5% |
| | Frequency (Hz) | | Hz | ±0.2% |
| | Active energy (Wh) | | Receiving | class 0.5S (IEC62053-22) |
| | Reactive energy (varh) | | — | — |
| | Apparent energy (Vah) | | — | — |
| | Harmonic current (HI) | | Total | ±2.0% |
| | Harmonic voltage (HV) | | Total | ±2.0% |
| | Rolling demand (DW) | | — | — |
| | Rolling demand, reactive power (Dvar) | | — | — |
| | Rolling demand, apparent power (DVA) | | — | — |
| | Periodic Active energy (Wh) | | — | — |
| | Operating time | | Operating time 1, 2 | (Reference) |
| Analog output response time | | | — | |
| Measuring method | | Instantaneous value | A/V: RMS calculation, W: Digital multiplication, PF: Power ratio calculation,<br>Hz: Zero-cross, HI/HV: FFT | |
| | | Demand value | DA: Thermal type calculation | |
| Display | Indicator | | LCD with LED backlight | |
| | No. of display digits and segments | Digital display | 6 digits each at upper, middle, and lower line | |
| | | | A, DA, V, W, PF: 4 digits Hz: 3 digits<br>Wh: 9 digits (6 or 12 possible) Relative harmonic content: 3 digits<br>Harmonic RMS value: 4 digits Operating time: 6 digits | |
| | | Bar graph | 21 segment bar graph, 22 segment indicator | |
| | Display updating time interval | | 0.5s or 1s (selectable) | |
| Communication | | | MODBUS® RTU communication | |
| Available optional plug-in module | | | — | |
| Power failure compensation | | | Non-volatile memory used (items: setting value, max/min value, active energy, operating time) | |
| Consumption (VA) | VT | | Each phase 0.1VA (110VAC), 0.2VA (220VAC), 0.4VA (440VAC) | |
| | CT | | Each phase 0.1VA (5AAC) | |
| | Auxiliary power circuit | | 7VA (at 110VAC), 8VA (at 220VAC), 5W (at 100VDC) | |
| Auxiliary power | | | 100-240VAC (±15%), 100-240VDC (-30% +15%) | |
| Weight | | | 0.5kg | |
| Dimensions | | | 96 (H) × 96 (W) × 90 (D) | |
| Installation method | | | Embedded | |
| Operating temperature | | | -5~+55°C (average operating temperature: 35°C or less per day) | |
| Operating humidity | | | 0~85%RH (non condensing) | |
| Storage temperature | | | -25~+75°C (average temperature: 35°C or less per day) | |
| Storage humidity | | | 0~85%RH (non condensing) | |

Notes 1. Class values based on 100% of rated value.
Notes 2. Harmonic measurements where distortion ratio (content rate) is 100% or more may exceed ±2.0%.


## ■Standards Compliance

| | | | |
|---|---|---|---|
| Electromagnetic Compatibility | | | |
| | Emissions | | |
| | | Radiated Emission | EN61326-1/CISPR 11,<br>FCC Part15 Subpart B Class A |
| | | Conducted Emission | EN61326-1/CISPR 11,<br>FCC Part15 Subpart B Class A |
| | | Harmonics Measurement | EN61000-3-2 |
| | | Flicker Meter Measurement | EN61000-3-3 |
| | Immunity | | |
| | | Electrostatic discharge Immunity | EN61326-1/EN61000-4-2 |
| | | Radio Frequency Electromagnetic field Immunity | EN61326-1/EN61000-4-3 |
| | | Electrical Fast Transient/Burst Immunity | EN61326-1/EN61000-4-4 |
| | | Surge Immunity | EN61326-1/EN61000-4-5 |
| | | Conducted Disturbances, Induced By Radio Frequency Fields Immunity | EN61326-1/EN61000-4-6 |
| | | Power Frequency Magnetic Field Immunity | EN61326-1/EN61000-4-8 |
| | | Voltage Dips and Short Interruptions | EN61326-1/EN61000-4-11 |

| | | |
|---|---|---|
| Safety | | |
| | Europe | CE, as per EN61010-1 |
| | U.S. and Canada | cRUus as per UL61010-1, IEC61010-1 |
| | 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…LMS-0492

## ■CC-Link Communication Specifications

| 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-SS96 |
| Pulse/Alarm output | No-voltage “a” contact Capacity: 35VDC, 0.1A | ME-4210-SS96 |
| Digital input | 19-30VDC 7mA or less | ME-4210-SS96, ME-0040C-SS96, ME-0052-SS96 |
| Digital output | No-voltage a contact Capacity: 35VDC, 0.2A | ME-0052-SS96 |

# Specifications

## ■MODBUS® TCP Communication Specifications

| Item | | Specification |
|---|---|---|
| Interface | | 1 port (10BASE-T/100BASE-TX) |
| Transmission method | | Base band |
| Number of stages connected in cascade | | Max. 4 stages (10BASE-T), max. 2 stages (100BASE-TX) (when repeater hub is used) |
| Max. distance between nodes | | 200m |
| Max. segment length | | 100m |
| Connector applicable to external wiring | | RJ45 |
| Cable | 10BASE-T | Cable meeting IEEE802.3 10BASE-T standard<br>(Unshielded twisted pair cable (UTP cable), category 3 or higher) |
| | 100BASE-TX | Cable meeting IEEE802.3 100BASE-TX standard<br>(Shielded twisted pair cable (STP cable), category 5 or higher) |
| Protocol | | MODBUS® TCP (port No.502) |
| Max. number of connections | | 4 |
| Support functions | | Auto-negotiation function (automatic recognition of 10BASE-T/100BASE-TX)<br>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…LMS-0492

## ■Logging Specifications

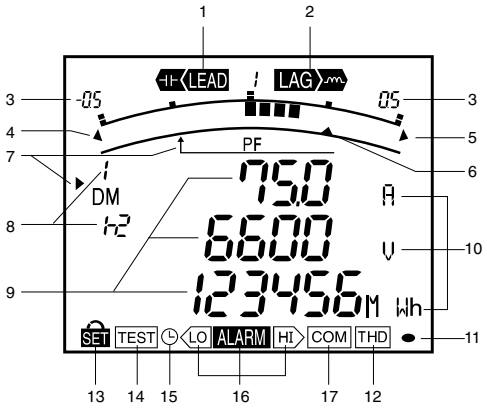
| Item | | Specification |
|---|---|---|
| Logging mode | | Automatic updating by overwriting (not provided with a function to automatically start according to the start time setting) |
| Kinds of logging data | Detailed data | Measurement data is stored at the specified “detailed data logging interval” (1 min, 5 min, 10 min, 15 min or 30 min).<br>Note: The data will be output as a detailed data file.<br>Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output. |
| | 1-hour data | Measurement data is stored at a one-hour interval.<br>Note: The data will be output as a one-hour data file or a one-day data file.<br>Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output. |
| Number of logging elements | Detailed data | Max. 6 elements |
| | 1-hour data | Max. 6 elements |
| Internal memory logging period | Detailed data | Detailed data logging interval: 1 min for 2 days<br>Detailed data logging interval: 5 min for 10 days<br>Detailed data logging interval: 10 min for 20 days<br>Detailed data logging interval: 15 min for 30 days<br>Detailed data logging interval: 30 min for 60 days |
| | 1-hour data | 400 days (about 13 months) |
| SD memory card (2GB) logging period | | 10 years or more |
| System log data | | 1200 records |
| Logging data / system log data output format | | CSV format (ASCII code) |
| Power failure compensation | | Backup by built-in lithium battery<br>Total power interruption backup time: 5 years (at daily average temperature of 35°C or less)<br>(The life of the lithium battery is 10 years (at a daily average temperature of 35°C or less).)<br>The battery cannot be replaced by the customer. Please consider updating the module. |
| Set values (logging ID, logging elements and detailed data logging interval) | | Stored in FRAM (non-volatile memory)<br>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)<br>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).<br>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.
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…LMS-0551

# ■Functions

## ●LCD Functions




| No. | Segment name | Description |
|---|---|---|
| 1 | Lead Status | Power factor status is lead |
| 2 | Lag status | Power factor status is lag |
| 3 | Scale of the bar graph | The scale of the bar graph |
| 4 | Excessively low input | On when the measurement value is lower than the minimum scale value |
| 5 | Excessively high input | On when the measurement value is higher than the maximum scale value |
| 6 | Upper/lower limit alarm indicator | Flashing when the upper and lower limit alarm values have been set |
| 7 | Bar graph status | The item expressed with the bar graph |
| 8 | Phase status | The phase for each of the digital displays |
| 9 | Digital | The measured value is displayed in a digital number |
| 10 | Unit | The unit for each of the digital display |
| 11 | Metering status | When it is blinking, the instrument is counting active energy |
| 12 | Harmonics | On when harmonics values are displayed |
| 13 | Setup status | SET is on in the test mode.<br>SET is flashing in the set value check mode. |
| 14 | Test status | On in the test mode |
| 15 | Clock status | When it is blinking, the instrument is counting operating time |
| 16 | Upper/lower limit alarm status | Flashing when upper/lower limit alarm has occurred |
| 17 | Communication status | On in normal state, and flashing or off in abnormal state |

## ●Button Functions

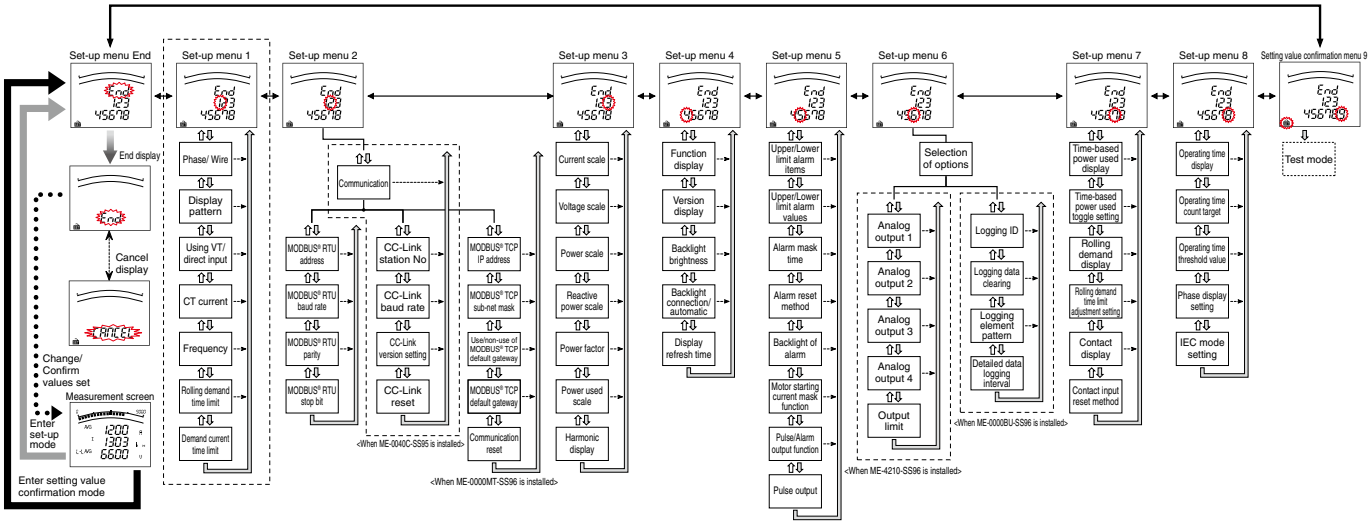
| Basic functions | | Special functions | | |
|---|---|---|---|---|
| Button | Functions | Button | | Functions |
| SET | Set up setting items such as primary voltage and current, and choose and indicate setting itmes | DISPLAY | Push for 2s | Manual display change ⇔ Cyclic display change |
| | | PHASE | Push for 2s | Manual phase change ⇔ Cyclic phase change |
| ⊕ or ⊖ | Change setting and bar graph display | ⊕ + ⊖ | Push for 2s | Zoom display of Wh, varh etc |
| MAX/MIN | Change display from Max/Min to instantaneous value | ⊕ + RESET | Push for 2s | Reset all the Max/Min values |
| PHASE | Change phase | ⊕ or ⊖ | Push for 1s | Fast forward or fast return values when setting |
| DISPLAY | Change display | SET + RESET + PHASE | | Reset Wh, varh, Vah values to zero by holding down the buttons for 2 sec |

# ■Set-up

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

Access set-up mode from the measurement mode and set the necessary items. Factory default settings will apply to items not set.

## ●Set-up workflow (in the case of ME96SSHA-MB)




| Symbol | Operation (function) details | Button operation |
|---|---|---|
| ➡ | Access set-up mode from operating mode | SET+RESET Simultaneously press for 2s |
| ➡ | Access setting value confirmation mode from operating mode | SET Press for 2s |
| • • ➡ | Save settings and return to operating mode | SET |
| ⟷ | Select set-up menu | ⊕ or ⊖ |
| ⇨ | Move to next screen | SET |
| ⇦ | Return to previous setting item | DISPLAY |
| ⇢ | Skip remaining settings | SET Press for 1s |
| ⟷ | Select cancel | ⊕ or ⊖ |

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

## ●Basic Set-up Operations

To access setting mode, press and hold the (SET) and (RESET) buttons down at the same time for 2s. Press the (SET) button to display the items to be set, and the (+) and (−) buttons to set the details. Settings can be saved for each set-up menu No. To do so, press the (SET) button when the End screen is displayed.

The underlined setting parameters are the initial value.

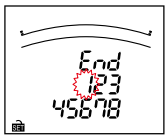
### Set-up menu 1: Basic settings (set phase wire system, display pattern, Using VT/direct input, CT primary current, etc.)

Set-up menu — Adjust the set-up menu No. to "1".

DISPLAY / SET

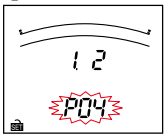
①Phase/Wire system — ①Set the phase/wire system according to the number of measurement circuits targeted.

| | |
|---|---|
| 3P4: | 3-phase, 4-wire system |
| 3P3. 2Ct: | 3-phase, 3-wire system (2CT) |
| 3P3. 3Ct: | 3-phase, 3-wire system (3CT) |
| 1P3. 1n2: | 1-phase, 3-wire system (1N2 display) |
| 1P3. 1n3: | 1-phase, 3-wire system (1N3 display) |
| 1P2: | 1-phase, 2-wire system |




①


②




DISPLAY / SET

②Display pattern — ②Set the display pattern

○: Can be displayed with this setting only
△: Other settings are required to display data
□: Select P00 and set display order and position

(1) ME96SSHA-MB / ME96SSRA-MB

| Display pattern | A | DA | V | W | PF | Var | VA | Hz | Wh (Imported) | Wh (Exported) | Varh (Imported lag) | Vah | Additional screens: Wh (Imported) | Wh (Exported) | varh | Wh (periodic) | DW | HI/HV | DI/DO | Operating time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P01 | ○ | | ○ | ○ | ○ | | | | | | | | | | | △ | △ | △ | △ | △ |
| P02 | ○ | | ○ | ○ | ○ | | | | ○ | | | | ○ | △ | | △ | △ | △ | △ | △ |
| P03 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | △ | △ | △ | △ | △ |
| P04 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | △ | △ | △ | △ | △ | △ | △ |
| P05 | | | | ○ | ○ | ○ | ○ | ○ | | | | | | | | △ | △ | △ | △ | △ |
| P06 | ○ | | ○ | | | | | | | | | | | | | △ | △ | △ | △ | △ |
| P07 | ○ | | ○ | ○ | | | | | | | | | | | | △ | △ | △ | △ | △ |
| P08 | ○ | | ○ | ○ | | | | | ○ | | | | ○ | △ | | △ | △ | △ | △ | △ |
| P09 | ○ | ○ | ○ | | | | | | | | | | | | | △ | △ | △ | △ | △ |
| P10 | ○ | ○ | ○ | ○ | | | | | | | | | | | | △ | △ | △ | △ | △ |
| P11 | ○ | ○ | ○ | | | | | | ○ | | | | ○ | △ | | △ | △ | △ | △ | △ |
| P12 | ○ | ○ | ○ | ○ | | | | | ○ | | | | ○ | △ | | △ | △ | △ | △ | △ |
| P13 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | △ | △ | △ | △ | △ | △ | △ |
| P00 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | △ | △ | △ | △ | △ | △ | △ | △ |

(2) ME96SSEA-MB

| Display pattern | A | DA | V | W | PF | Hz | Wh (Imported) | Additional screens: Wh (Imported) | HI/HV | Operating time |
|---|---|---|---|---|---|---|---|---|---|---|
| P01 | ○ | | ○ | ○ | ○ | | | | △ | △ |
| P02 | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | △ | △ |
| P03 | ○ | | ○ | | | | | | △ | △ |
| P04 | ○ | | ○ | ○ | | | | | △ | △ |
| P05 | ○ | | ○ | ○ | | | ○ | ○ | △ | △ |
| P06 | ○ | ○ | ○ | | | | | | △ | △ |
| P07 | ○ | ○ | ○ | ○ | | | | | △ | △ |
| P08 | ○ | ○ | ○ | | | | ○ | ○ | △ | △ |
| P09 | ○ | ○ | ○ | ○ | | | ○ | ○ | △ | △ |
| P00 | □ | □ | □ | □ | □ | □ | □ | △ | △ | △ |

DISPLAY / SET

③VT/Direct voltage — ③Set VT

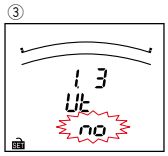
In the case of direct measurements (without VT) ⇒ To select no, press (SET) and see (1) below.
In the case of using VT ⇒ To select yES, press (SET) and see (2) below.

·To set Three phase 4-wire
no ◄——► yES

·To set Three phase 3-wire or Single phase 2-wire
yES ◄——► no

<For Single phase 3-wire setting for ①Phase/Wire system>
Only used for direct measurements.
Skipped for this setting.

③




(1) In the case of direct measurements (without VT)

(a) Three phase 4-wire setting (phase voltage/line voltage)

►63.5/110V ◄► 100/173V ◄► 110/190V ◄► 220/380V ◄► 230/400V ◄► 240/415V ◄► 254/440V ◄► 277/480V ◄

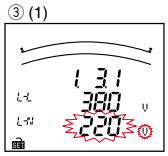
(b) Three phase 3-wire (2CT, 3CT) or Single phase 2-wire setting (line voltage)

►110V ◄► 220V ◄► 440V ◄

(c) Single phase 3-wire setting (1N2, 1N3) (phase voltage/line voltage)

►110/220V ◄► 220/440V ◄

③ (1)



③VT/Direct voltage

(2) In the case of using with VT

<Secondary voltage settings>

(a) Three phase 4-wire setting (phase voltage)

63.5V ⟷ 100V ⟷ 110V ⟷ 115V ⟷ 120V

(b) Three phase 3-wire (2CT, 3CT) or Single phase 2-wire setting (line voltage)

100V ⟷ 110V ⟷ 220V

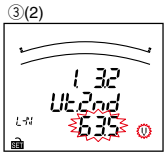
<Set primary voltage>

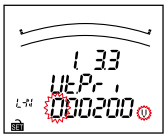
Can be set in 60~750,000V range (setting unit: V)

Under 100V: Top two digits settings — Factory default settings

Over 100V: Top three digits settings — Three phase 4-wire: 200V (phase voltage); Three phase 3-wire; Single phase 2-wire: 10,000V (line voltage)

③(2)




④CT current

④Set CT.

Set the primary and secondary currents of the CT to be combined.

<Set secondary current>

1A ⟷ 5A

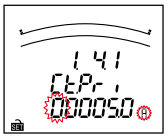
<Set primary current>

Can be set in1.0~30,000.0A range (setting unit: A)

Under 10A: Top two digits settings — Factory default setting: 5.0A

Over 10A: Top three digits settings

④


⑤Frequency

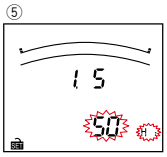
⑤Set frequency.

50Hz ⟷ 60Hz

Notes1. Frequency scale on bar graph display will also change.

Notes2. Analog output scale will also change.

⑤




⑥Rolling demand time limit

⑥Set the rolling demand interval time limit (Only ME96SSHA-MB and ME96SSRA-MB).

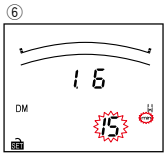
(1) Interval time limit

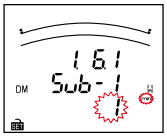
| Setting range | Setting interval |
|---|---|
| 1 ~ 15 ~ 60 (min) | 1min |

(2) Sub-interval time limit

| Setting range | Setting interval |
|---|---|
| 1 ~ 60 (min) | 1min |

⑥



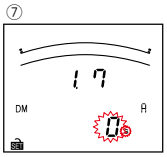




⑦Demand current time limit

⑦Set the demand current time limit.

| | | | | |
|---|---|---|---|---|
| 0 s | 40 s | 3 min | 7 min | 15 min |
| 10 s | 50 s | 4 min | 8 min | 20 min |
| 20 s | 1 min | 5 min | 9 min | 25 min |
| 30 s | 2 min | 6 min | 10 min | 30 min |

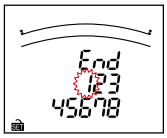
⑦



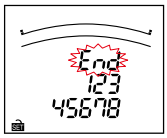

Set-up menu

Select another set-up menu or finish set-up.

■To continue to set-up
Select the menu No.
using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button
to display the End screen,
then press the SET button
to save the settings.



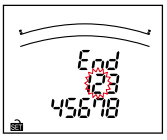

## Set-up menu 2: MODBUS® RTU Communication settings

## (when ME4210-SS96, ME0052-SS96 or ME0000BU-SS96 is installed and any options are not installed)

*Only in the case of ME96SSHA-MB or ME96SSRA-MB, it is applicable.

Set-up menu

Adjust the set-up menu No. to “2”.

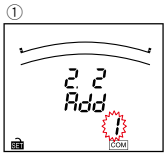



①MODBUS® RTU communication address

①Set MODBUS® RTU communication address

Possible address settings: 1~255

①




②MODBUS® RTU communication address

②Set the MODBUS® RTU communication baud rate.

2400bps
4800bps
9600bps
19.2kbps
38.4kbps

②

<Continued from previous page>

③MODBUS® RTU communication parity

③Set the MODBUS® RTU communication parity.

non
odd
even (EVEn)

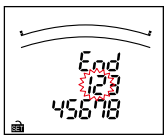

④MODBUS® RTU communication stop bit

④Set the MODBUS® RTU communication stop bit.
Stop bit 1 ◄——► Stop bit 2

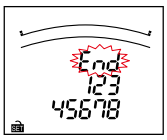

Set-up menu

Select another set-up menu or end set-up.

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.

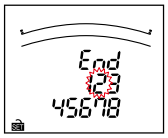



## Set-up menu 2: CC-Link Communication settings (when ME-0040C-SS96 is installed)

*Only in the case of ME96SSHA-MB or ME96SSRA-MB, it is applicable.

Set-up menu

Adjust the set-up menu No. to "2".





①Select communication system

①Select CC-Link or MODBUS® RTU communication.

CC : CC-Link communication
Mb. rtu : MODBUS® RTU communication

When "MODBUS® RTU communication" is selected, set the communication conditions as stated in and after ②MODBUS® RTU communication address on page 16.

②CC-Link communication station number

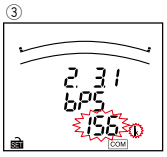
②Set the CC-Link communication station number.

Possible station number settings: 1~64


③CC-Link communication speed

③Set the CC-Link communication speed.

156kbps
625kbps
2.5Mbps
5Mbps
10Mbps

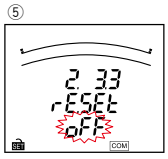



④Set CC-Link communication version

④Set the CC-Link communication version.
Version 1.10 ◄——► Version 2.00


⑤Reset communication

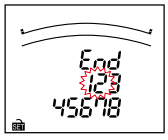
⑤Set to "on" if changes have been made to the CC-Link settings.
(If not set to "on," changes will not be effective.)
oFF ◄——► on



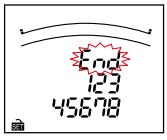

Set-up menu

Select another set-up menu or end set-up.

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.



## Set-up menu 2: MODBUS® TCP Communication settings (when ME-0000MT-SS96 is installed)

*Only in the case of ME96SSHA-MB or ME96SSRA-MB, it is applicable.

Set-up menu — Adjust the set-up menu No. to "2".

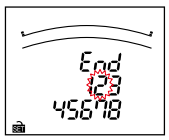
DISPLAY / SET

①Select communication system

①Select MODBUS® TCP communication or MODBUS® RTU communication.

Mb.tcp : MODBUS® TCP communication
Mb.rtu : MODBUS® RTU communication

When "MODBUS® RTU communication" is selected, set the communication conditions as stated in and after ②MODBUS® RTU communication address on page 16.



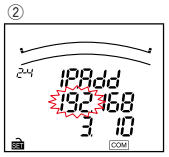


DISPLAY / SET

②MODBUS® TCP communication IP address

②Set the IP address of MODBUS® TCP communication.

Allowable IP addresses:
000.000.000.000 ~ 192.168.3.10 ~ 255.255.255.255



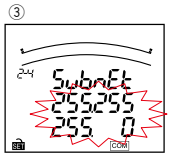

DISPLAY / SET

③MODBUS® TCP communication sub-net mask

③Set the sub-net mask of MODBUS® TCP communication.

Select one of the sub-net masks shown in the following table.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (1) | 128.0.0.0 | (9) | 255.128.0.0 | (17) | 255.255.128.0 | (25) | 255.255.255.128 |
| (2) | 192.0.0.0 | (10) | 255.192.0.0 | (18) | 255.255.192.0 | (26) | 255.255.255.192 |
| (3) | 224.0.0.0 | (11) | 255.224.0.0 | (19) | 255.255.224.0 | (27) | 255.255.255.224 |
| (4) | 240.0.0.0 | (12) | 255.240.0.0 | (20) | 255.255.240.0 | (28) | 255.255.255.240 |
| (5) | 248.0.0.0 | (13) | 255.248.0.0 | (21) | 255.255.248.0 | (29) | 255.255.255.248 |
| (6) | 252.0.0.0 | (14) | 255.252.0.0 | (22) | 255.255.252.0 | (30) | 255.255.255.252 |
| (7) | 254.0.0.0 | (15) | 255.254.0.0 | (23) | 255.255.254.0 | | |
| (8) | 255.0.0.0 | (16) | 255.255.0.0 | (24) | 255.255.255.0 | | |




DISPLAY / SET

④Use/non-use of MODBUS® TCP communication default gateway

④Determine whether or not to use the default gateway of MODBUS® TCP communication.

oFF ◄——► on
(Non-use) (Use)


DISPLAY / SET

⑤MODBUS® TCP communication default gateway

**⑤Set the default gateway of MODBUS® TCP communication.**
**When the default gateway is not used, this window is not displayed.**

Allowable default gateways:
000.000.000.000 ~ 127.0.0.1 ~ 255.255.255.255


DISPLAY / SET

⑥Reset communication

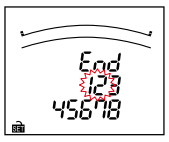
⑥If settings relating to MODBUS® TCP communication have been changed, turn on this item.
(If it is not turned on, the changes will not be enabled.)

oFF ◄——► on

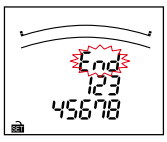

SET

Set-up menu — Select another set-up menu or end set-up.

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.



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

Set-up menu — Adjust the set-up menu No. to “3”.

DISPLAY / SET

①Current scale

①Set the maximum current scale value on the bar graph.

(1)Maximum current scale value

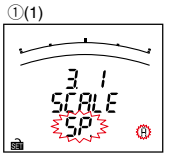
CT primary current value ⟷ SP. (special primary current value)

Set-up menu 1.4.1 primary current setting

Set value

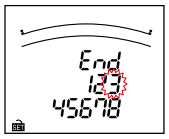
(2)Maximum current scale value special setting

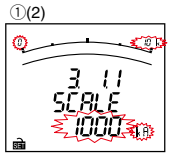
+ 3 steps (approx. 120%)
〜
± 0 steps (100%: instrument rating)
〜
- 10 steps (approx. 40%)




①(1)

This screen will not appear if the current is not selected in the display pattern.




①(2)

This screen will not appear if “CT primary current value” is selected.

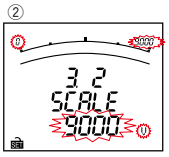
DISPLAY / SET

②Voltage scale

②Set the maximum voltage scale value on the bar graph

Maximum scale value.

+ 10 steps (approx. 250%)
〜
± 0 steps (100%: instrument rating)
〜
−18 steps (approx. 20%)




②

This screen will not appear if the voltage is not selected in the display pattern.

DISPLAY / SET

③Power scale

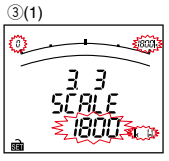
③Set the maximum power/rolling demand scale value on the bar graph, and select positive-only scale or positive/negative scale (The rolling demand must be set only for ME96SSHA-MB and ME96SSRA-MB).

(1)Maximum scale value

+ 3 steps (approx. 120%)
〜
± 0 steps (100%: instrument rating)
〜
−18 steps (approx. 20%)

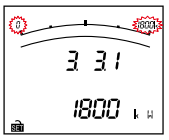
(2)Positive-only or Positive/Negative

Positive-only ⟷ Positive/Negative




③(1)

DISPLAY / SET




This screen will not appear if the power is not selected in the display pattern.

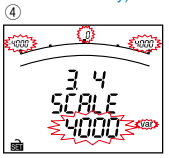
DISPLAY / SET

④Reactive power scale

④Set the maximum reactive power scale value on the bar graph (ME96SSHA-MB, ME96SSRA-MB only).

The setting procedure is the same as that described in ③Power unit (1) Max. scale value.

The reactive power scale can only be positive/negative.




④

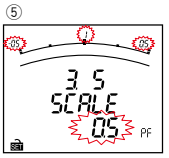
This screen will not appear if the reactive power is not selected in the display pattern.

DISPLAY / SET

⑤Power factor scale

⑤Set the power factor scale on the bar graph.

−0.5 〜1〜 0.5 ⟷ 0〜1〜0




⑤

DISPLAY / SET

⑥Measure power consumption

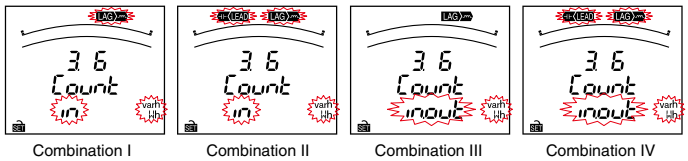
⑥Set display combinations of receiving/transmitting, lag/lead, power used/reactive power used and the measurement method for reactive power used (ME96SSHA-MB, ME96SSRA-MB only).

| Combinations (set value) | Display combinations | | | | | | Reactive energy used measurement method |
|---|---|---|---|---|---|---|---|
| | Wh | | varh | | | | |
| | Imported | Exported | Imported | | Exported | | |
| | | | Lag | Lead | Lag | Lead | |
| I | ○ | | ○ | | | | 2 Quadrants Measurement |
| II | ○ | | ○ | ○ | | | |
| III | ○ | ○ | ○ | | ○ | | 4 Quadrants Measurement |
| IV | ○ | ○ | ○ | ○ | ○ | ○ | |

Combinations I, II ⇒ Suitable for measuring reactive power in facilities not equipped with in-house generators, and generally for capacitor loads where the power factor is close to zero.

Combinations III, IV ⇒ Suitable for measurements in facilities equipped with in-house generators.

<Example display screens>




Combination I | Combination II | Combination III | Combination IV

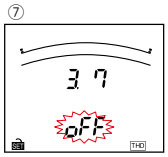
in : Imported  out : Exported  LEAD : varh lead  LAG : varh lag

⑦Harmonic display

⑦Select with or without harmonic display.

oFF (without) ⟷ on (with)

When the display is set to “on,” the harmonic value measured will be displayed on an additional screen.

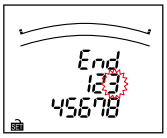



SET

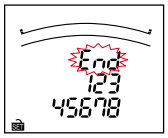
Set-up menu

Select another set-up menu or end set-up

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.



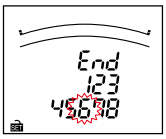

## Set-up menu 6: Analog output setting (only when ME-4210-SS96 is installed)

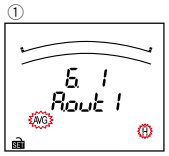
*Only in the case of ME96SSHA-MB or ME96SSRA-MB, it is applicable.

This menu will not appear if ME-4210-SS96 (optional) is not installed.

Set-up menu

Adjust the set-up menu No. to “6”.




DISPLAY SET

①Analog output CH1 output items

①Set the output items for “analog output CH1”.
Select the measured items to be output from the table below.

When 3-phase 4-wire system has been selected

| Three phase 4-wire | | |
|---|---|---|
| non | $V_{12}$ | $PF_1$ |
| $A_1$ | $V_{23}$ | $PF_2$ |
| $A_2$ | $V_{31}$ | $PF_3$ |
| $A_3$ | $V_{AVG}$ (L-L) | $PF_\Sigma$ (CH4) |
| $A_N$ | $W_1$ | Hz |
| $A_{AVG}$ (CH1) | $W_2$ | Harmonic $A_1$ |
| Demand $A_1$ | $W_3$ | Harmonic $A_2$ |
| Demand $A_2$ | $W_\Sigma$ (CH3) | Harmonic $A_3$ |
| Demand $A_3$ | $var_1$ | Harmonic $A_N$ |
| Demand $A_N$ | $var_2$ | Harmonic $V_{1N}$ |
| Demand $A_{AVG}$ | $var_3$ | Harmonic $V_{2N}$ |
| $V_{1N}$ | $var_\Sigma$ | Harmonic $V_{3N}$ |
| $V_{2N}$ | $VA_1$ | |
| $V_{3N}$ | $VA_2$ | |
| $V_{AVG}$ (L-N) (CH2) | $VA_3$ | |
| | $VA_\Sigma$ | |

AVG: Average value, Σ: Total effective value

Notes 1. The same measurement items can be set for all channels.
Notes 2. Measurement items not included in the selected display pattern can also be chosen.
Notes 3. Channels set to “non” will have minimum output (4mA). Additionally, set-up will proceed to the next channel.
Notes 4. Underlined specifications are factory default settings of measurement items allocated to each channel.
Notes 5. Harmonic current is output at the scale of 0~60% (with respect to rated value) of the total effective value. Harmonic voltage is output at the scale of 0~20% of the total distortion ratio.

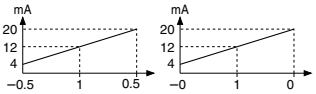
DISPLAY SET

②Analog output CH1 detailed settings

②Set the details for “analog output CH1.”
(The following settings can be made separately from the measurement items included in the display pattern.)

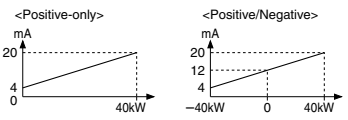
(1) If analog output is selected for current, demand current, voltage, power, reactive power, power factor (set-up menu: 6.1.1)

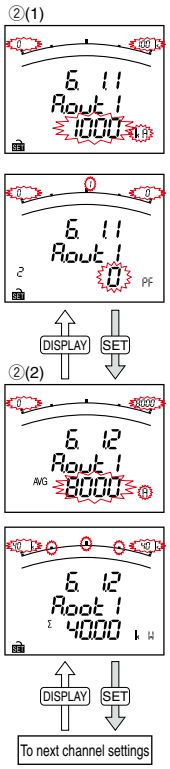
| Output item | Setting range |
|---|---|
| A<br>Demand A | CT primary current value (value set for set-up menu 1.4.1 primary current setting) ⟷ SP. (special primary current value) |
| V | +10 steps (approx. 250%)<br>≀<br>±0 steps (100%: standard max. scale value)<br>≀<br>−18 steps (approx. 20%) ⊕⊖ |
| W<br>var | +3 steps (approx. 120%)<br>≀<br>±0 steps (100%: instrument rating)<br>≀<br>−18 steps (approx. 20%) ⊕⊖ |
| PF | −0.5~1~0.5 ⟷ −0~1~0 |




(2) If analog output is selected for current, demand current, power (set-up menu: 6.1.2)

| Output item | Setting range |
|---|---|
| A<br>Demand A | +3 steps (approx. 120%)<br>≀<br>±0 steps (100%: instrument rating)<br>≀<br>−10 steps (approx. 40%) ⊕⊖ |
| W | Positive-only ⟷ Positive/Negative |



<Continued from previous page>

③Analog output CH2~4 output items

DISPLAY SET

④Analog output CH2~4 detailed settings

DISPLAY SET

⑤Analog output limit

SET

Set-up menu

③Set the output items for “analog output CH2~4.”

The setting procedure is the same as that of ①Analog output CH1 output items.

④Set the details for “analog output CH2~4.”

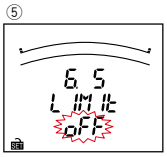
The setting procedure is the same as that of ②Analog output CH1 detailed settings.

⑤Set the upper limit for analog output (same for all channels).

| Setting | Explanation |
|---|---|
| oFF (no limit) | Output to +5% of upper limit and -5% of lower limit (with respect to span value) |
| on (limit) | Output to +1% of upper limit and -1% of lower limit (with respect to span value) |

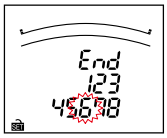
Note: Skip this setting when the analog output of all channel output items is set to “non.”

⑤

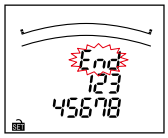



Select another set-up menu or end set-up.

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.




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

*Only in the case of ME96SSHA-MB or ME96SSRA-MB, it is applicable.

Set-up menu

DISPLAY SET

①Logging ID

DISPLAY SET

②Logging data clearing

DISPLAY SET

③Logging element pattern

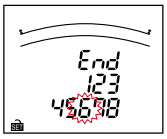
DISPLAY SET

④Detailed data logging interval

SET

Set-up menu

Adjust the set-up menu No. to “6”.



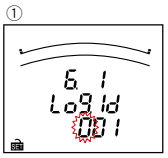

①Set the ID number of the optional logging unit.

Allowable IDs : 001 ～ 255

When an ID number has been set for the installed optional logging unit, the value is displayed as the default.

Notes: If the SD memory card contains data with the same logging ID, the data may be overwritten.
When the data of more than one optional logging unit are collected in one SD memory card, set the logging ID without fail.

①




②Clear the data stored in the optional logging unit.

no ◄► yES
(Not clear) (Clear)

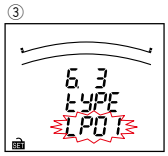
②


③Set the logging element pattern to select the data to be logged.
If the logging data is not cleared, the logging element pattern cannot be set.

Allowable patterns : ►LP01 ◄► LP02 ◄► LP00◄

When the pattern is set to LP00, any logging elements can be selected.
For the details of LP00 setting, see the instruction manual.
The logging element patterns of LP01 and LP02 are defined as shown below.
Detailed data is recorded at a shorter interval than that of 1-hour data.
The detailed data logging interval can be set in ④“Detailed data logging interval.”

③



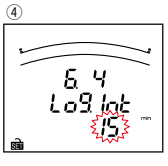

Phase wire system setting: For three-phase four-wire

| Logging element pattern | LP01 | | LP02 | |
|---|---|---|---|---|
| | Detailed data | 1-hour data | Detailed data | 1-hour data |
| Data 1 | Wh receiving | Wh receiving | Wh receiving | Wh receiving |
| Data 2 | varh receiving (lag) | Wh sending | $A_{AVG}$ | Wh sending |
| Data 3 | VAh | varh receiving (lag) | $V_{AVG}$ (L-L) | varh receiving (lag) |
| Data 4 | DW (current value) | varh receiving (lead) | $W_{\Sigma}$ | varh receiving (lead) |
| Data 5 | Dvar (current value) | VAh | $PF_{\Sigma}$ | VAh |
| Data 6 | DVA (current value) | None | Hz | None |

④Set the interval of logging the detailed data in the logging element pattern LP01 or LP02.
If the logging data is not cleared, the detailed data logging interval cannot be changed.

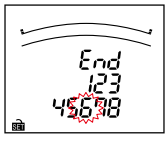
►1min ◄► 5min ◄► 10min ◄► 15min ◄► 30min◄

④

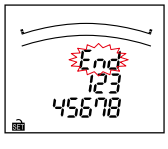



Select another set-up menu or end set-up.

■To continue to set-up
Select the menu No. using the ⊕ or ⊖ button.




■To finish set-up
Press the ⊕ or ⊖ button to display the End screen, then press the SET button to save settings.



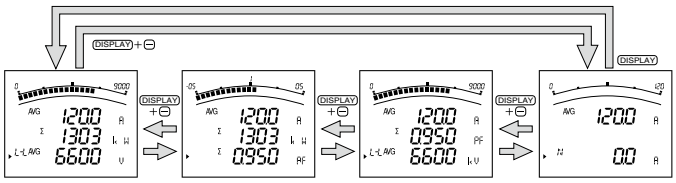
# ■Operation (for ME96SSHA-MB)

## ●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 changing display (Three phase 4-wire system; display pattern: P01; no additional screens)



<Screen 1 of 4>
Upper: Current
Middle: Power
Lower: Voltage

<Screen 2 of 4>
Upper: Current
Middle: Power
Lower: Power factor

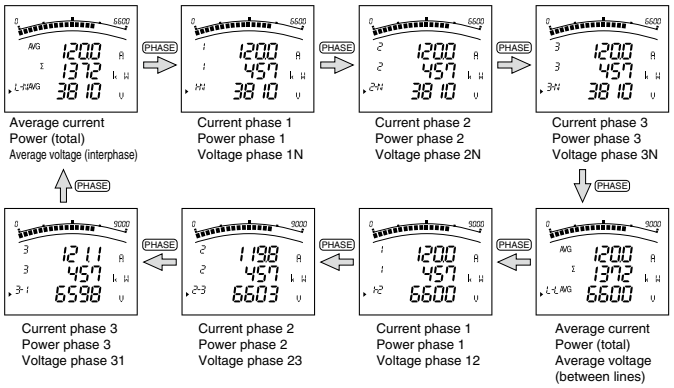
<Screen 3 of 4>
Upper: Current
Middle: Power
Lower: Voltage

<Screen 4 of 4>
Upper: Current
Middle: No display
Lower: N-phase current

## ●Changing Phases

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

Example of changing phases (Three phase 4-wire system)



Average current
Power (total)
Average voltage (interphase)

Current phase 1
Power phase 1
Voltage phase 1N

Current phase 2
Power phase 2
Voltage phase 2N

Current phase 3
Power phase 3
Voltage phase 3N

Current phase 3
Power phase 3
Voltage phase 31

Current phase 2
Power phase 2
Voltage phase 23

Current phase 1
Power phase 1
Voltage phase 12

Average current
Power (total)
Average voltage
(between lines)

## ●Bar Graph Display

Items measured can be displayed on the bar graph. By displaying one item by a bar graph and other three items by digital numbers four elements can be displayed at once.

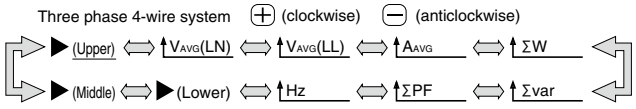
- **Bar graph explanation**

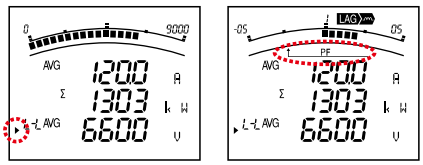
The ▶ or ⌊___ mark indicates that the measurement item is displayed on the bar graph.

- **Select bar graph**

Press the (+) or (−) button to select the measurement items to be displayed on the bar graph.

Three phase 4-wire system (+) (clockwise) (−) (anticlockwise)



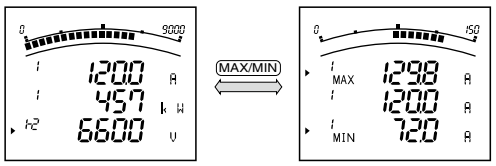
Example of bottom item displayed in the bar graph

Example of power factor displayed in the bar graph

## ●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.

Example of switching between changing current value display and maximum/minimum value display screens




Current value display screen

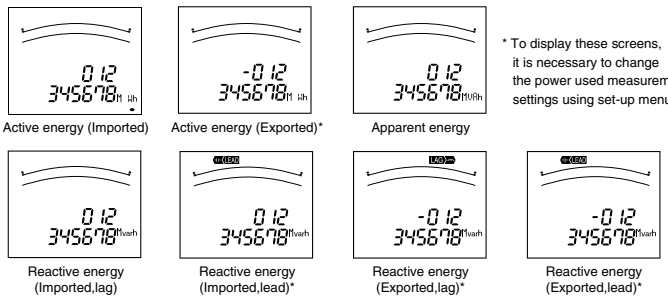
Maximum/Minimum value display screen

### ●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



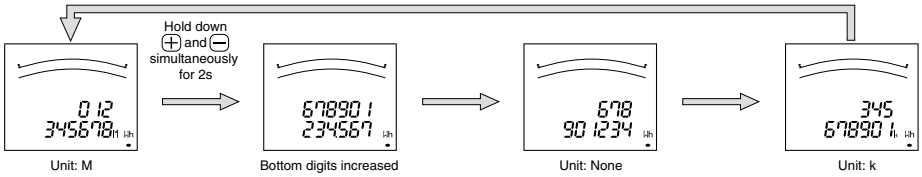
Active energy (Imported)
Active energy (Exported)*
Apparent energy

* To display these screens, it is necessary to change the power used measurement settings using set-up menu 3.

Reactive energy (Imported,lag)
Reactive energy (Imported,lead)*
Reactive energy (Exported,lag)*
Reactive energy (Exported,lead)*

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.

Power used (receiving): Example of changing 012,345,678,901,234.567Wh




Unit: M
Bottom digits increased
Unit: None
Unit: k

## ●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).

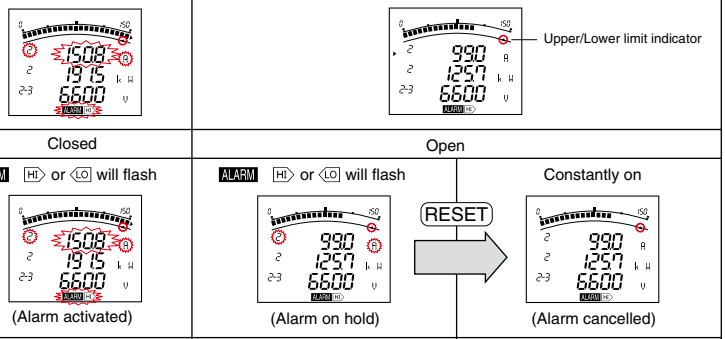
## ●Changing Upper/Lower Limits for Alarm Activation and Cancellation

When measurement values exceed the upper/lower limit values that have been set, an alarm activates and the screen begins to blink. The blinking ▲ mark on the bar graph indicates the current upper/lower limit value settings.

### ●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 reset method | | Measurement value ≥ Upper limit alarm value (or ≤ Lower limit alarm value) | Measurement value < Upper limit alarm value (or > Lower limit alarm value) | |
|---|---|---|---|---|
| Automatic (Auto) | Screen | ALARM HI or LO will flash | Constantly on | |
| | Alarm contact | Closed | Open | |
| Manual (Hold) | Screen | ALARM HI or LO will flash | ALARM HI or LO will flash | Constantly on |
| | | (Alarm activated) | (Alarm on hold) | (Alarm cancelled) |
| | Alarm contact | Closed | Closed | Open |




If the item that caused the alarm is displayed on the screen, the digital value, unit (A, V, W, var, PF, HZ, %, DM, THD) and phase (1, 2, 3, N) will be displayed as shown in the table below. If the item is not displayed on the screen, the screen will not flash.

| Alarm status | Digital value | Unit | Phase |
|---|---|---|---|
| Alarm activated | Flashing* | Flashing | Flashing* |
| Alarm on hold | On | Flashing | Flashing* |
| Alarm cancelled | On | On | On |

* Only flashes if the phase that caused the alarm is being displayed.

### ●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. |
| Manual (Hold) | 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.<br>(Note: Alarm recovery operations cannot be carried out from the maximum/minimum value display screen or contact input screen.)<br><To select item and cancel alarm><br>When the item that caused the alarm is displayed, press the RESET button to deactivate the alarm.<br>( For items with phases such as current and voltage, it is necessary to press the RESET button for each phase to cancel the alarm. )<br><To cancel alarms for all items><br>To cancel alarms for all items at once (batch), press the RESET button for 2s when in operating mode. |

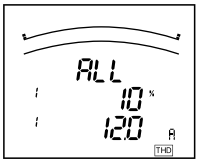
### ●Alarm delay Time

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.

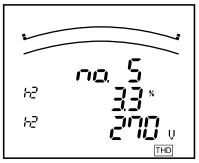
## ●Harmonic Display

The harmonic effective value, distortion ratio and content ratio can be displayed. To do so, first set the harmonic display (set-up menu: 3.7).

<Example of total harmonic current display>




<Example of 5th-deg harmonic voltage display>

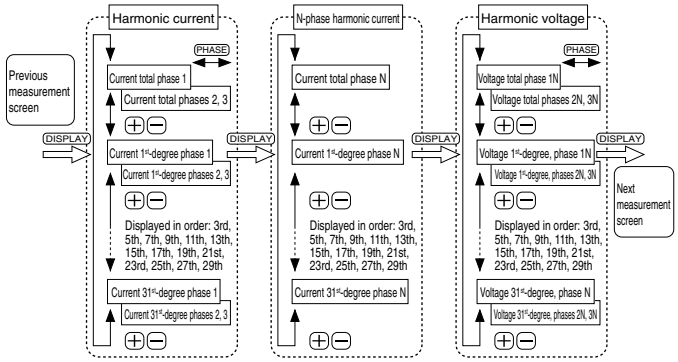



Upper: Degree No.
Middle: Distortion (content) ratio
Lower: Effective value

| Degree | Harmonic current | | N-phase harmonic current | | Harmonic voltage | |
|---|---|---|---|---|---|---|
| | RMS | Distortion (content) ratio | RMS | Distortion (content) ratio | RMS | Distortion (content) ratio |
| Harmonic total | ○ | ○ | ○ | — | ○ | ○ |
| 1st (fundamental) | ○ | — | ○ | — | ○ | — |
| 3rd, 5th, 7th, 9th, 11th, 13th, 15th, 17th, 19th, 21st, 23rd, 25th, 27th, 29th and 31st | ○ | ○ | ○ | — | ○ | ○ |

## ●Changing the Harmonic Degree Display

Press the ⊕ or ⊖ button to change the harmonic degree.



# ■Display Pattern Contents

The items set in display patterns and additional settings will be displayed as explained in the following table.

## ●ME96SSHA-MB Screen Display (Three phase 4-wire)

| Display pattern (digital display) | | Screen set based on display pattern | | | | | | | | | Additional screens (set in set-up menu Nos. 3, 7 and 8) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | 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 | No.28 |
| | | | | | | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | Periodic active energy Wh1 | Periodic active energy Wh2 | Rolling demand (DW) | Rolling demand (Dvar) | Rolling demand (DVA) | Harmonic current | Harmonic current N-phase | Harmonic voltage | DI status | DO status | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | A | | | | | | | | | | | | | – | – | – | – | – | Degree No. | Degree No. | Degree No. | DI | DO | – | – |
| | Middle | W | W | PF | – | | | | | | | | | | | | | Periodic active energy Wh1 | Periodic active energy Wh2 | Peak value | Peak value | Peak value | Distortion (content) ratio | – | Distortion (content) ratio | DI No. | DO No. | hour1 | hour2 |
| | Lower | V | PF | V | AN | | | | | | | | | | | | | | | Rolling demand, active energy | Rolling demand, reactive energy | Rolling demand, apparent energy | RMS | RMS | RMS | Contact status | Contact status | Operating time | Operating time |
| P02 | Upper | A | A | A | A | | | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | – | | | | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P03 | Upper | A | A | A | A | A | A | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | PF | PF | PF | PF | PF | – | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | var | VA | Hz | AN | | | | | | | | | | | | | | | | | | | | | | |
| P04 | Upper | A | A | A | A | A | A | A | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | var | VA | PF | Hz | – | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |
| | Lower | Wh | Wh | varh | VAh | Wh | Wh | AN | | | | | | | | | | | | | | | | | | | | | |
| P05 | Upper | PF | Hz | VA | | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | W | W | W | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | var | var | var | | | | | | | | | | | | | | | | | | | | | | | | | |
| P06 | Upper | A1 | V1N | A | A | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | A3 | V3N | V | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P07 | Upper | A | A1 | V1N | A | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V2N | – | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | W | A3 | V3N | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P08 | Upper | A | A | A1 | V1N | A | | | | | | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V2N | – | | | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | A3 | V3N | AN | | | | | | | | | | | | | | | | | | | | | | | |
| P09 | Upper | A | A1 | DA1 | V1N | A | DA | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | A3 | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | | |
| P10 | Upper | A | A | A1 | DA1 | V1N | A | DA | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | A3 | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | |
| P11 | Upper | A | A | DA1 | V1N | A | DA | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V2N | – | – | | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | | |
| P12 | Upper | A | A | A | DA | W | A | DA | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | – | – | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | AN | DAN | | | | | | | | | | | | | | | | | | | | | |
| P13 | Upper | A1 | V1N | W1 | var1 | VA1 | PF1 | V | V | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V2N | W2 | var2 | VA2 | PF2 | Hz | Hz | AN | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |
| | Lower | A3 | V3N | W3 | var3 | VA3 | PF3 | Wh | varh | VAh | | | | | | | | | | | | | | | | | | | |
| P00 | Upper | Free | Free | Free | Free | | | | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |
| | Lower | Free | Free | Free | Free | | | | | | | | | | | | | | | | | | | | | | | | |

## ●ME96SSHA-MB Screen Display (Three phase 3-wire, Single phase 3-wire, Single phase 2-wire)

| Display pattern | | Screen set based on display pattern | | | | | | Additional screens (set in set-up menu Nos. 3, 7 and 8) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | 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 |
| | | | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | Periodic active energy Wh1 | Periodic active energy Wh2 | Rolling demand (DW) | Rolling demand (Dvar) | Rolling demand (DVA) | Harmonic current | Harmonic voltage | DI Status | DO Status | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | | | | | | | | | | | – | – | – | – | – | Degree No. | Degree No. | DI | DO | – | – |
| | Middle | W | W | PF | | | | | | | | | | | Periodic active energy Wh1 | Periodic active energy Wh2 | Peak value | Peak value | Peak value | Distortion (content) ratio | Distortion (content) ratio | DI No. | DO No. | hour1 | hour2 |
| | Lower | V | PF | V | | | | | | | | | | | | | Rolling demand, active energy | Rolling demand, reactive energy | Rolling demand, apparent energy | RMS | RMS | Contact status | Contact status | Operating time | Operating time |
| P02 | Upper | A | A | A | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | | | | | | | | | | | | | | | | | | | | | |
| P03 | Upper | A | A | A | A | A | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | PF | PF | PF | PF | PF | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | var | VA | Hz | | | | | | | | | | | | | | | | | | | |
| P04 | Upper | A | A | A | A | A | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | var | VA | PF | Hz | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |
| | Lower | Wh | Wh | varh | VAh | Wh | Wh | | | | | | | | | | | | | | | | | | |
| P05 | Upper | PF | Hz | VA | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | W | W | W | | | | | | | | | | | | | | | | | | | | | |
| | Lower | var | var | var | | | | | | | | | | | | | | | | | | | | | |
| P06 | Upper | A1 | V12 | A | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V23 | – | | | | | | | | | | | | | | | | | | | | | |
| | Lower | A3 | V31 | V | | | | | | | | | | | | | | | | | | | | | |
| P07 | Upper | A | A1 | V12 | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V23 | | | | | | | | | | | | | | | | | | | | | |
| | Lower | W | A3 | V31 | | | | | | | | | | | | | | | | | | | | | |
| P08 | Upper | A | A | A1 | V12 | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V23 | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | A3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P09 | Upper | A | A1 | DA1 | V12 | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V23 | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | A3 | DA3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P10 | Upper | A | A | A1 | DA1 | V12 | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V23 | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | A3 | DA3 | V31 | | | | | | | | | | | | | | | | | | | |
| P11 | Upper | A | A | DA1 | V12 | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V23 | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | DA3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P12 | Upper | A | A | A | DA | W | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | | | | | | | | | | | | | | | | | | | |
| P13 | Upper | A1 | V12 | W | V | V | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V23 | var | Hz | Hz | VA | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |
| | Lower | A3 | V31 | PF | Wh | varh | VAh | | | | | | | | | | | | | | | | | | |
| P00 | Upper | Free | Free | Free | Free | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |
| | Lower | Free | Free | Free | Free | | | | | | | | | | | | | | | | | | | | |

## ■Display Pattern Contents

The items set in display patterns and additional settings will be displayed as explained in the following table.

### ●ME96SSRA-MB Screen Display (Three phase 4-wire)

| Display pattern (digital display) | | Screen set based on display pattern | | | | | | | | | Additional screens (set in set-up menu Nos. 3, 7 and 8) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | 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 | No.28 |
| | | | | | | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | Periodic active energy Wh1 | Periodic active energy Wh2 | Rolling demand (DW) | Rolling demand (Dvar) | Rolling demand (DVA) | Harmonic current | Harmonic current N-Phase | Harmonic voltage | DI Status | DO Status | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | A | | | | | | | | | | | | | – | – | – | – | – | Degree No. | Degree No. | Degree No. | DI | DO | – | – |
| | Middle | W | W | PF | – | | | | | | | | | | | | | Periodic active energy Wh1 | Periodic active energy Wh2 | Peak value | Peak value | Peak value | Distortion (content) ratio | – | Distortion (content) ratio | DI No. | DO No. | hour1 | hour2 |
| | Lower | V | PF | V | AN | | | | | | | | | | | | | | | Rolling demand, active energy | Rolling demand, reactive energy | Rolling demand, apparent energy | RMS | RMS | RMS | Contact status | Contact status | Operating time | Operating time |
| P02 | Upper | A | A | A | A | | | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | – | | | | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P03 | Upper | A | A | A | A | A | A | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | PF | PF | PF | PF | PF | – | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | var | VA | Hz | AN | | | | | | | | | | | | | | | | | | | | | | |
| P04 | Upper | A | A | A | A | A | A | A | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | var | VA | PF | Hz | – | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |
| | Lower | Wh | Wh | varh | VAh | Wh | Wh | AN | | | | | | | | | | | | | | | | | | | | | |
| P05 | Upper | PF | Hz | VA | | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | W | W | W | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | var | var | var | | | | | | | | | | | | | | | | | | | | | | | | | |
| P06 | Upper | A1 | V1N | A | A | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | A3 | V3N | V | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P07 | Upper | A | A1 | V1N | A | | | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V2N | – | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | W | A3 | V3N | AN | | | | | | | | | | | | | | | | | | | | | | | | |
| P08 | Upper | A | A | A1 | V1N | A | | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V2N | – | | | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | A3 | V3N | AN | | | | | | | | | | | | | | | | | | | | | | | |
| P09 | Upper | A | A1 | DA1 | V1N | A | DA | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | A3 | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | | |
| P10 | Upper | A | A | A1 | DA1 | V1N | A | DA | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V2N | – | – | | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | A3 | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | |
| P11 | Upper | A | A | DA1 | V1N | A | DA | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V2N | – | – | | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | DA3 | V3N | AN | DAN | | | | | | | | | | | | | | | | | | | | | | |
| P12 | Upper | A | A | A | DA | W | A | DA | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | – | – | | | Wh | Wh exported | | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | AN | DAN | | | | | | | | | | | | | | | | | | | | | |
| P13 | Upper | A1 | V1N | W1 | var1 | VA1 | PF1 | V | V | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V2N | W2 | var2 | VA2 | PF2 | Hz | Hz | AN | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |
| | Lower | A3 | V3N | W3 | var3 | VA3 | PF3 | Wh | varh | VAh | | | | | | | | | | | | | | | | | | | |
| P00 | Upper | Free | Free | Free | Free | | | | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lower | Free | Free | Free | Free | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | | |

### ●ME96SSRA-MB Screen Display (Three phase 3-wire, Single phase 3-wire, Single phase 2-wire)

| Display pattern | | Screen set based on display pattern | | | | | | Additional screens (set in set-up menu Nos. 3, 7 and 8) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | 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 |
| | | | | | | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | Periodic active energy Wh1 | Periodic active energy Wh2 | Rolling demand (DW) | Rolling demand (Dvar) | Rolling demand (DVA) | Harmonic current | Harmonic voltage | DI Status | DO Status | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | | | | | | | | | | | – | – | – | – | – | Degree No. | Degree No. | DI | DO | – | – |
| | Middle | W | W | PF | | | | | | | | | | | Periodic active energy Wh1 | Periodic active energy Wh2 | Peak value | Peak value | Peak value | Distortion (content) ratio | Distortion (content) ratio | DI No. | DO No. | hour1 | hour2 |
| | Lower | V | PF | V | | | | | | | | | | | | | Rolling demand, active energy | Rolling demand, reactive energy | Rolling demand, apparent energy | RMS | RMS | Contact status | Contact status | Operating time | Operating time |
| P02 | Upper | A | A | A | | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | | | | | | | | | | | | | | | | | | | | | |
| P03 | Upper | A | A | A | A | A | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | PF | PF | PF | PF | PF | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | var | VA | Hz | | | | | | | | | | | | | | | | | | | |
| P04 | Upper | A | A | A | A | A | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | var | VA | PF | Hz | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |
| | Lower | Wh | Wh | varh | VAh | Wh | Wh | | | | | | | | | | | | | | | | | | |
| P05 | Upper | PF | Hz | VA | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | W | W | W | | | | | | | | | | | | | | | | | | | | | |
| | Lower | var | var | var | | | | | | | | | | | | | | | | | | | | | |
| P06 | Upper | A1 | V12 | A | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V23 | – | | | | | | | | | | | | | | | | | | | | | |
| | Lower | A3 | V31 | V | | | | | | | | | | | | | | | | | | | | | |
| P07 | Upper | A | A1 | V12 | | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V23 | | | | | | | | | | | | | | | | | | | | | |
| | Lower | W | A3 | V31 | | | | | | | | | | | | | | | | | | | | | |
| P08 | Upper | A | A | A1 | V12 | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V23 | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | A3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P09 | Upper | A | A1 | DA1 | V12 | | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V23 | | | | | | | | | | | | | | | | | | | | |
| | Lower | V | A3 | DA3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P10 | Upper | A | A | A1 | DA1 | V12 | | | | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V23 | | | | | | | | | | | | | | | | | | | |
| | Lower | V | W | A3 | DA3 | V31 | | | | | | | | | | | | | | | | | | | |
| P11 | Upper | A | A | DA1 | V12 | | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V23 | | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | DA3 | V31 | | | | | | | | | | | | | | | | | | | | |
| P12 | Upper | A | A | A | DA | W | | – | – | | | | | | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | | Wh | Wh exported | | | | | | | | | | | | | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | | | | | | | | | | | | | | | | | | | |
| P13 | Upper | A1 | V12 | W | V | V | A | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V23 | var | Hz | Hz | VA | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |
| | Lower | A3 | V31 | PF | Wh | varh | VAh | | | | | | | | | | | | | | | | | | |
| P00 | Upper | Free | Free | Free | Free | | | – | – | – | – | – | – | – | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | | | | | | | | | | | | | | | | | | | |
| | Lower | Free | Free | Free | Free | | | Wh | Wh exported | varh | varh Imported (lead) | varh exported (lag) | varh exported (lead) | VAh | | | | | | | | | | | |


## ●ME96SSEA-MB Screen Display (Three phase 4-wire)

| Display pattern (digital display) | | Screen set based on display pattern | | | | | | | Additional screens (set in set-up menu Nos.3 and 8) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | No.7 | No.8 | No.9 | No.10 | No.11 | No.12 | No.13 |
| | | | | | | | | | Wh | Harmonic current | Harmonic current N-phase | Harmonic voltage | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | A | | | | | Total | Total | Total | – | – |
| | Middle | W | W | PF | – | | | | | Total distortion ratio | – | Distortion (content) ratio | hour1 | hour2 |
| | Lower | V | PF | V | AN | | | | | Total RMS | Total RMS | Total RMS | Operating time | Operating time |
| P02 | Upper | A | A | A | A | A | | | – | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | – | Hz | | | Wh | | | | | |
| | Lower | Wh | Wh | Wh | AN | Wh | | | | | | | | |
| P03 | Upper | A1 | V1N | A | A | | | | | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V2N | – | – | | | | | | | | | |
| | Lower | A3 | V3N | V | AN | | | | | | | | | |
| P04 | Upper | A | A1 | V1N | A | | | | | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V2N | – | | | | | | | | | |
| | Lower | W | A3 | V3N | AN | | | | | | | | | |
| P05 | Upper | A | A | A1 | V1N | A | | | – | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V2N | – | | | Wh | | | | | |
| | Lower | Wh | Wh | A3 | V3N | AN | | | | | | | | |
| P06 | Upper | A | A1 | DA1 | V1N | A | DA | | | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V2N | – | – | | | | | | | |
| | Lower | V | A3 | DA3 | V3N | AN | DAN | | | | | | | |
| P07 | Upper | A | A | A1 | DA1 | V1N | A | DA | | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V2N | – | – | | | | | | |
| | Lower | V | W | A3 | DA3 | V3N | AN | DAN | | | | | | |
| P08 | Upper | A | A | DA1 | V1N | A | DA | | – | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V2N | – | – | | Wh | | | | | |
| | Lower | Wh | Wh | DA3 | V3N | AN | DAN | | | | | | | |
| P09 | Upper | A | A | A | DA | W | A | DA | – | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | – | – | Wh | | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | AN | DAN | | | | | | |
| P00 | Upper | Free | Free | Free | Free | | | | – | Same as above | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | | | Wh | | | | | |
| | Lower | Free | Free | Free | Free | | | | | | | | | |

## ●ME96SSEA-MB Screen Display (Three phase 3-wire, Single phase 3-wire, Single phase 2-wire)

| Display pattern | | Screen set based on display pattern | | | | | Additional screens (set in set-up menu Nos.3 and 8) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No.1 | No.2 | No.3 | No.4 | No.5 | No.6 | No.7 | No.8 | No.9 | No.10 |
| | | | | | | | Wh Imported | Harmonic current | Harmonic voltage | Operating time 1 | Operating time 2 |
| P01 | Upper | A | A | A | | | | Total | Total | – | – |
| | Middle | W | W | PF | | | | Total distortion ratio | Total distortion ratio | hour1 | hour2 |
| | Lower | V | PF | V | | | | Total RMS | Total RMS | Operating time | Operating time |
| P02 | Upper | A | A | A | A | | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | PF | Hz | | Wh | | | | |
| | Lower | Wh | Wh | Wh | Wh | | | | | | |
| P03 | Upper | A1 | V12 | A | | | | Same as above | Same as above | Same as above | Same as above |
| | Middle | A2 | V23 | – | | | | | | | |
| | Lower | A3 | V31 | V | | | | | | | |
| P04 | Upper | A | A1 | V12 | | | | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | A2 | V23 | | | | | | | |
| | Lower | W | A3 | V31 | | | | | | | |
| P05 | Upper | A | A | A1 | V12 | | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | V | W | A2 | V23 | | Wh | | | | |
| | Lower | Wh | Wh | A3 | V31 | | | | | | |
| P06 | Upper | A | A1 | DA1 | V12 | | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | A2 | DA2 | V23 | | Wh | | | | |
| | Lower | V | A3 | DA3 | V31 | | | | | | |
| P07 | Upper | A | A | A1 | DA1 | V12 | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | DA | A2 | DA2 | V23 | Wh | | | | |
| | Lower | V | W | A3 | DA3 | V31 | | | | | |
| P08 | Upper | A | A | DA1 | V12 | | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | V | DA2 | V23 | | Wh | | | | |
| | Lower | Wh | Wh | DA3 | V31 | | | | | | |
| P09 | Upper | A | A | A | DA | W | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | DA | W | V | V | V | Wh | | | | |
| | Lower | Wh | Wh | Wh | Wh | Wh | | | | | |
| P00 | Upper | Free | Free | Free | Free | | – | Same as above | Same as above | Same as above | Same as above |
| | Middle | Free | Free | Free | Free | | Wh | | | | |
| | Lower | Free | Free | Free | Free | | | | | | |

## ●Phase/Wire Displays

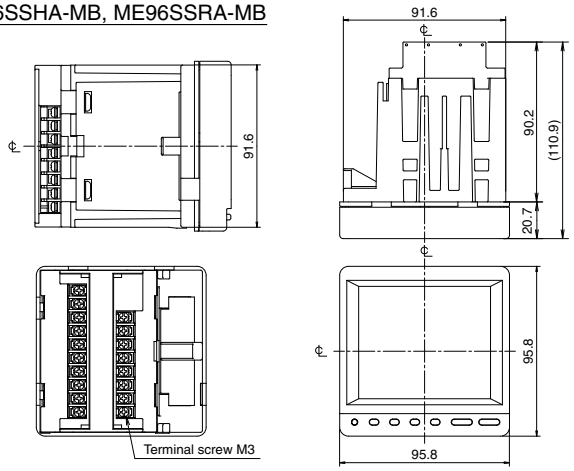
The phase/wire system will be displayed as shown in the following table and is common for all models.

| Top phase display \ Phase/Wire settings | | 1P2W | 1P3W(1N2) | 1P3W(1N3) | 3P3W |
|---|---|---|---|---|---|
| current | 1 | None | 1 | 1 | 1 |
| | 2 | None | N | N | 2 |
| | 3 | None | 2 | 3 | 3 |
| Voltage | 12 | None | 1N | 1N | 12 |
| | 23 | None | 2N | 3N | 23 |
| | 31 | None | 12 | 13 | 31 |

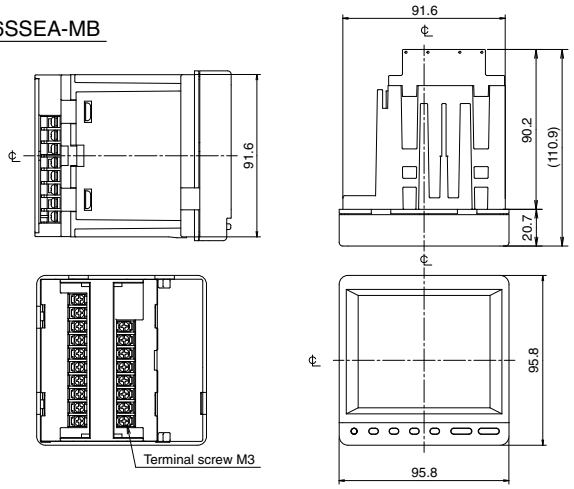
# External Dimensions/Installation/Connections

## Dimensions

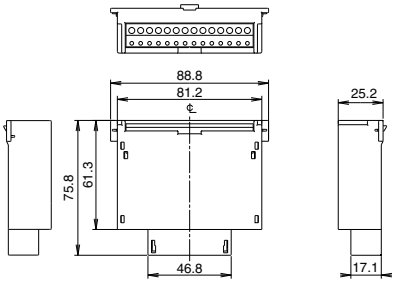
ME96SSHA-MB, ME96SSRA-MB



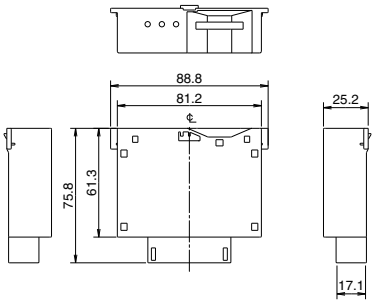

ME96SSEA-MB



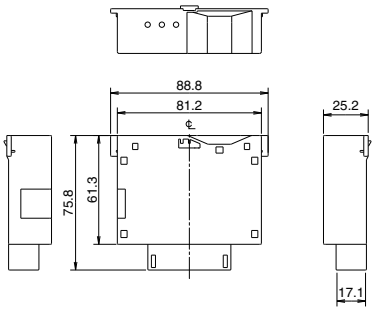

Optional Plug-in Module : ME-4210-SS96, ME-0040C-SS96, ME-0052-SS96




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



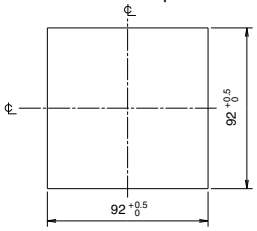

Optional Plug-in Module : ME-0000MT-SS96




## Mounting

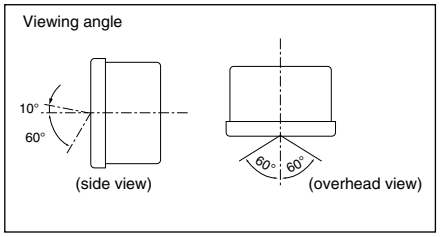
### 1 Dimension of panel

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

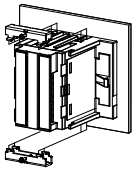
The contrast of the display changes at view angle. Mount it at the position that is easy to see.



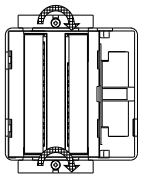

### 3 Attachment

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.



②Tighten the screws of the lug, and fix onto the panel.



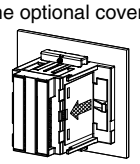
| Note | To prevent damage to the panel and screws, do not fasten screws too tightly.<br>Recommended torque for these products: 0.3~0.5N·m (approx. half of standard torque)<br>Also, please tighten the upper and lower screws at the same time. |
|---|---|

Main unit mounting screws: M3

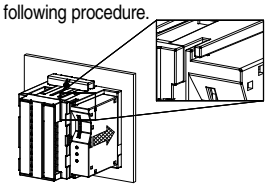
### 4 Installing Optional Plug-in Module

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

①Remove the optional cover.



②Attach the optional unit to the main unit.

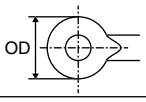


Fit the protruding part of the optional unit into the slot in the main unit.

# 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 | • 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-SS96) | 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 •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. | – |

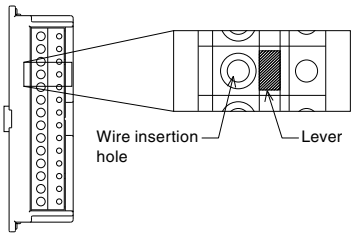
## 2 Wiring

### ■Optional Plug-in Module Terminal

①Remove the wire casing at the end of the wire and solder to the rod terminal.

②With the lever pushed in, insert the wire and then release the lever to connect.

### ■Optional Plug-in Module Terminal




## 3 Confirmations

After wiring, make sure the following:

☐ All wiring is connected

☐ There is no misitake in wiring

**Note**

**Protective sheet**

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

**Installation position**

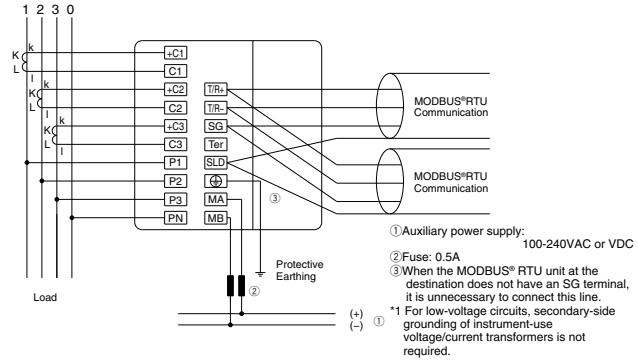
If installing the unit at the panel edge, choose an installation position where there is sufficient space for wiring work.

**Optional unit**

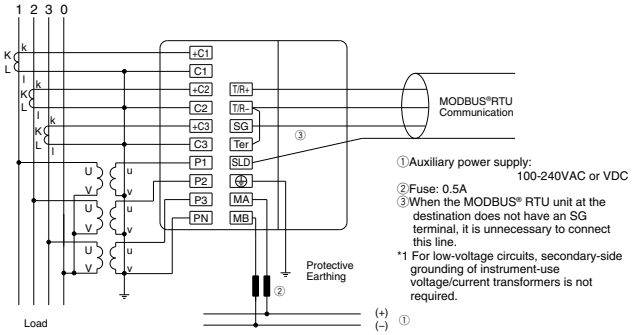
Turn the auxiliary power supply off before attaching the optional unit. If attached with the power on, the main unit will not recognize the optional unit. To remedy this, turn off/restart the auxiliary power supply or execute the “instrument restart” operation.

# Wiring Diagrams

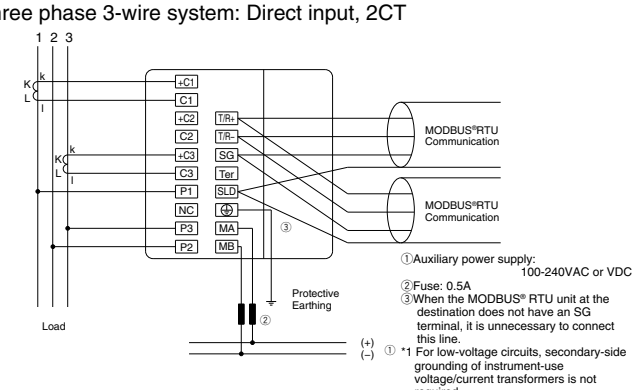
Three phase 4-wire system: Direct input



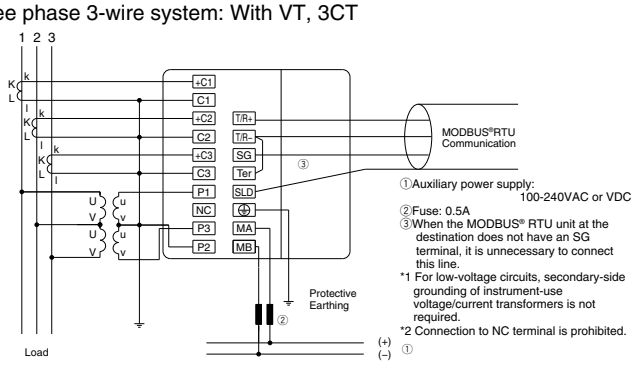

Three phase 4-wire system: With VT




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



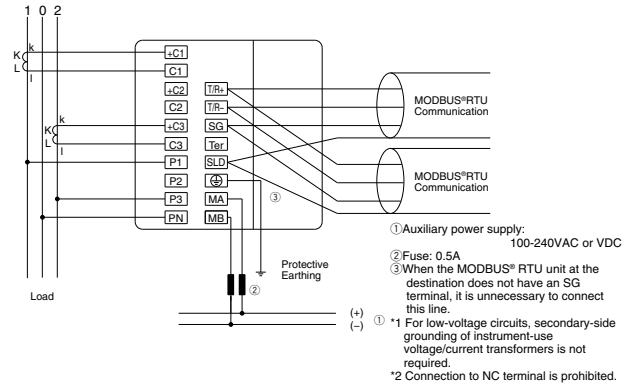

Three phase 3-wire system: With VT, 3CT



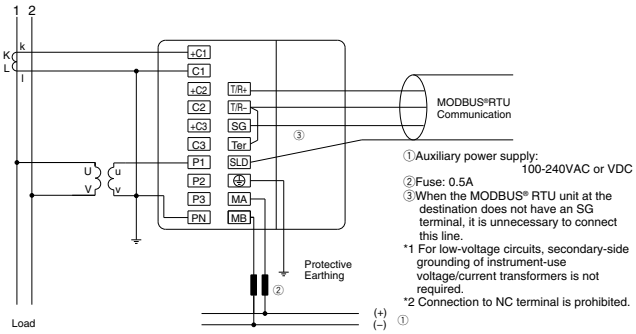
# External Dimensions/Installation/Connections

## Wiring Diagrams (Continued)

Single phase 3-wire system



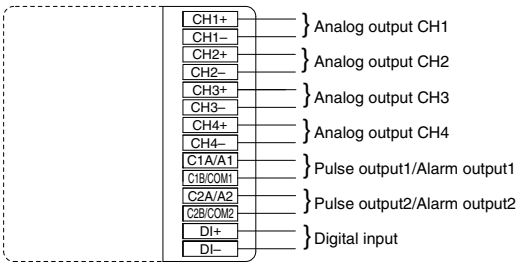

Single phase 2-wire system: With VT



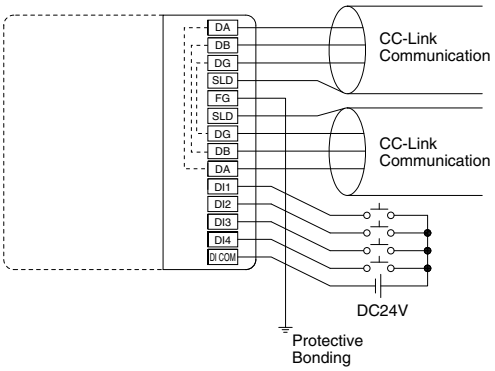

**Note**

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. Use terminal resistance (120Ω) for devices at both ends of the MODBUS® RTU communication transmission line. These meters can be terminated at 120Ω by short-circuiting the “T-” and “Ter” terminals.
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.

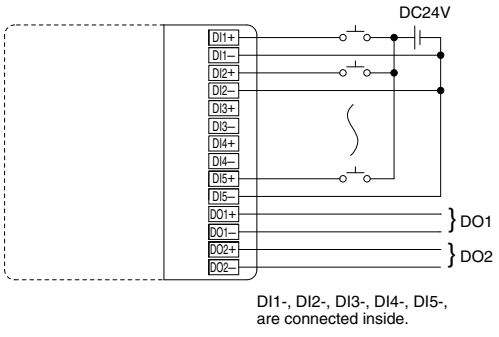
Optional Plug-in Module: ME-4210-SS96



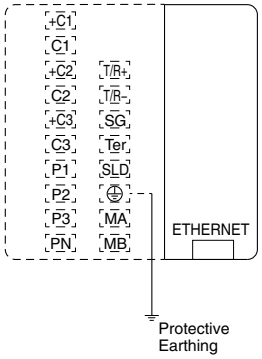

Optional Plug-in Module: ME-0040C-SS96



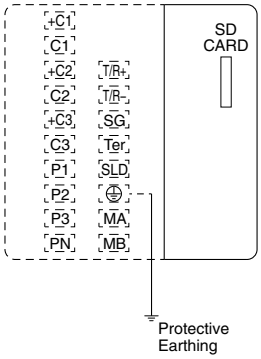

Optional Plug-in Module: ME-0052-SS96




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




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



## Wiring Diagrams (Continued)

**Note**

1. 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 under 600V/600A | More than 30cm |
| Other power lines | More than 60cm |

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-SS96, 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 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.
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.
   Ground the terminal before use.
7. 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).
8. 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.
9. 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.
   (1) 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.
   (2) 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.
10. Do not connect any terminal or RJ45 connector in the live state.
11. 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.

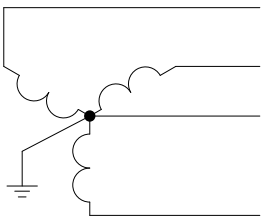


Fig. 1. Three phase 4-wire (star)

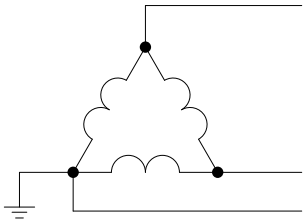


Fig. 2. Three phase 3-wire (delta)

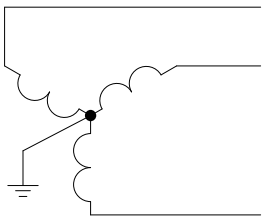


Fig. 3. Three phase 3-wire (star)

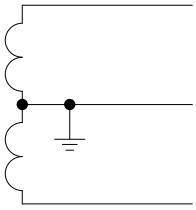


Fig. 4. Single phase 3-wire

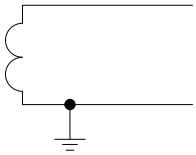


Fig. 5. Single phase 2-wire (delta)

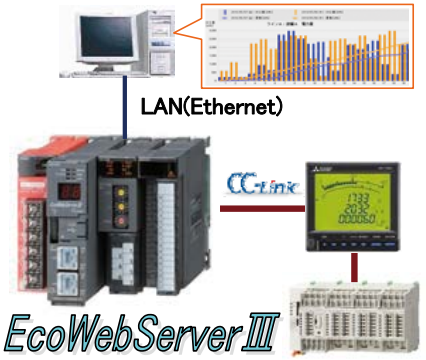
Fig. 6. Single phase 2-wire (star)

# Related Products

## ■EcoWebServerIII

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

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




### 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.

◇PLC data can also be sent to EcoWebServerIII by Ethernet.
◇Data of various sites can be browsed in the head office by utilizing the internal network.

## ■ME110SS

Mitsubishi Electronic Indicating Instrument Super-S Series
Highly functional and easy-to-use series supporting the realization of various instrument monitoring systems and energy-saving measurement monitoring systems

### Common-use Models

Two phase wiring system (Three phase 3-wire and Three phase 4-wire systems) were required previously, but user needs can now be met with a single unit.

### Enhanced Visibility

Wide-angle-view LCD with top and bottom tiers integrated for total freedom in installation. Crystal-clear display makes text even easier to read when viewed from the front.
A high-brightness backlight is provided, and its brightness can be adjusted in five stages.

### Operating Time, $CO_2$ Conversion, Alarm Display Functions

Functions that enable load operating time measurement, conversion to CO2 emissions and backlight blinking at the time of an alarm are incorporated.


## ■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

Energy Measuring Unit
EcoMonitorPlus

### 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 Ior method
* Ior: 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.

## ■EcoMonitorLight

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

A two-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.).

Energy Measuring Unit
EcoMonitorLight


### 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.

# 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 -5~55°C • Daily average temperature over 35°C • Relative humidity over 85% or presence of condensation • 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 sunlight • 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 use • 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 power supply | | 100~240VAC (±15%) 50-60Hz<br>100~240VDC (–30%, +15%) |
| Instrument ratings | Voltage | Three phase, 4-wire: Max. 277/480VAC<br>Three phase, 3-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC<br>Single phase, 3-wire: Max. 220/440VAC<br>Single phase, 2-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC |
| | Current | 5A/1A |
| | Frequency | 50-60Hz (dual use) |

## 3 Connections

See pages 26~28 of this catalog for information regarding connections.

| | |
|---|---|
| ⚠ CAUTION | • To ensure safety, connections are to be performed by an electrical engineer qualified in wiring.<br>• 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.<br>• 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.<br>• Use electrical wire sizes compatible with the rated current. Use of unsuitable sizes may cause heat generation, which may lead to a fire.<br>• 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.<br>• 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) |

## 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.

## 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~+75°C • Daily average temperature of more than 35°C • Relative humidity exceeding 85% 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.

| ⚠ CAUTION | • 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.

# ELECTRONIC MULTI-MEASURING INSTRUMENT

## Service Network

| Country/Region | Corporation Name | Address | Telephone |
|---|---|---|---|
| Australia | Mitsubishi Electric Australia Pty. Ltd. | 348 Victoria Road, Rydalmere, N.S.W. 2116, Australia | +61-2-9684-7777 |
| Bangladesh | PROGRESSIVE TRADING CORPORATION | HAQUE TOWER,2ND FLOOR,610/11,JUBILEE ROAD, CHITTAGONG, BANGLADESH | +880-31-624307 |
| | ELECTRO MECH AUTOMATION& ENGINEERING LTD. | SHATABDI CENTER, 12TH FLOOR, SUITES - 12-B, 292, INNER CIRCULAR ROAD, FAKIRA POOL, MOTIJHEEL, DHAKA-1000, BANGLADESH | +88-02-7192826 |
| Belarus | Tehnikon | Oktyabrskaya 19, Off. 705, BY-220030 Minsk, Belarus | +375 (0)17 / 210 46 26 |
| Belgium | Koning & Hartman B.V. | Woluwelaan 31, BE-1800 Vilvoorde, Belgium | +32 (0)2 / 2570240 |
| Brazil | Mitsubishi Electric Do Brasil Comercio E Servicos Ltda. | Av. Adelino Cardana, 293 -21 and. - Bethaville, 06401-147, Barueri/SP - Brasil | +55-11-4689-3000 |
| Cambodia | DHINIMEX CO.,LTD | #245, St. Tep Phan, Phnom Penh, Cambodia | +855-23-997-725 |
| Chile | Rhona S.A. | Vte. Agua Santa 4211 Casilla 30-D (P.O. Box) Vina del Mar, Chile | +56-32-2-320-600 |
| China | Mitsubishi Electric Automation (China) Ltd. | Mitsubishi Electric Automation Building, No.1386 Hongqiao Road, Shanghai,200336 | +86-21-2322-3030 |
| | Mitsubishi Electric Automation (China) Ltd. North China Branch | 9/F, Office Tower1 Henderson Centre 18 Jianguomennei Dajie DongCheng district BeiJing 100005 | +86-10-6518-8830 |
| | Mitsubishi Electric Automation (China) Ltd. NorthEast China Branch | Room2302,President Building Tower C,No.69 Heping North Avenue, Heping District,Shenyang,110003 | +86-24-2259-8830 |
| | Mitsubishi Electric Automation (China) Ltd. South China Branch | Room 2512~2516, Great China International Exchange Square, Jintian Rd.S., Futian District, Shenzhen, 518034 | +86-755-2399-8272 |
| | Mitsubishi Electric Automation (China) Ltd. South China Branch | Room 1609, North Tower, The Hub Center, No.1068, Xing Gang East Road, Haizhu District, GuangZhou, China 510335 | +86-20-8923-6730 |
| | Mitsubishi Electric Automation (China) Ltd. SouthWest China Branch | 1501,1502,1503,15F,Guang-hua Centre,Block C,NO.98 Guang Hua North 3th Road Chengdu,610000 | +86-28-8446-8030 |
| | Mitsubishi Electric Automation (Hong Kong) Ltd. | 20/F, Cityplaza One, 1111 king's Road, Taikoo shing, Hong Kong | +852-2510-0555 |
| Colombia | Proelectrico Representaciones S.A. | Carrera 42 # 75-367 Bod 109 Itagui Colombia | +57-4-4441284 |
| Czech Republic | AUTOCONT CONTROL SYSTEMS S.R.O | Technologická 374/6, CZ-708 00 Ostrava - Pustkovec | +420 595 691 150 |
| Denmark | BEIJER ELECTRONICS A/S | LYKKEGARDSVEJ 17, DK-4000 ROSKILDE | +45 (0)46/ 75 76 66 |
| Egypt | Cairo Electrical Group | 9, Rostoum St. Garden City P.O. Box 165-11516 Maglis El-Shaab,Cairo - Egypt | +20-2-27961337 |
| France | Mitsubishi Electric Europe B.V. | 25, Boulevard des Bouvets, F-92741 Nanterre Cedex | +33 (0) 1 / 55 68 55 68 |
| Germany | Mitsubishi Electric Europe B.V. | Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany | +49 (2102) 4860 |
| Greece | KALAMARAKIS - SAPOUNAS S.A. | IONIAS & NEROMILOU STR., CHAMOMILOS ACHARNES, ATHENS, 13678 Greece | +30-2102 406000 |
| | UTECO | 5, MAVROGENOUS STR., 18542 PIRAEUS, Greece | +30-211-1206-900 |
| Hungary | Meltrade Ltd. | Fertő utca 14. HU-1107 Budapest, Hungary | +36 (0)1-431-9726 |
| India | Mitsubishi Electric India Private Limited | 2nd Floor, Tower A&B, Cyber Greens, DLF Cyber City, DLF Phase-III, Gurgaon - 122 022 Haryana, India | +91-124-4630300 |
| Indonesia | PT.Mitsubishi Electric Indonesia | Gedung Jaya 8th floor, JL.MH. Thamrin No.12 Jakarta Pusat 10340, Indonesia | +62-21-3192-6461 |
| | P. T. Sahabat Indonesia | P.O.Box 5045 Kawasan Industri Pergudangan, Jakarta, Indonesia | +62-(0)21-6610651-9 |
| Ireland | Mitsubishi Electric Europe B.V. | Westgate Business Park, Ballymount, IRL-Dublin 24, Ireland | +353 (0)1-4198800 |
| Israel | Gino Industries Ltd. | 26, Ophir Street IL-32235 Haifa, Israel | +972 (0)4-867-0656 |
| Italy | Mitsubishi Electric Europe B.V. | Viale Colleoni 7, I-20041 Agrate Brianza (MI), Italy | +39 039-60531 |
| Kazakhstan | Kazpromavtomatika | ul. Zhambyla 28, KAZ - 100017 Karaganda | +7-7212-501000 |
| Korea | Mitsubishi Electric Automation Korea Co., Ltd | 9F Gangseo Hangang xi-tower, 401 Yangcheon-ro, Gangseo-gu, Seoul 07528 Korea | +82-2-3660-9572 |
| Laos | AROUNKIT CORPORATION IMPORT- EXPORT SOLE CO.,LTD | SAPHANMO VILLAGE. SAYSETHA DISTRICT, VIENTIANE CAPITAL, LAOS | +856-20-415899 |
| Lebanon | Comptoir d'Electricite Generale-Liban | Cebaco Center - Block A Autostrade Dora, P.O. Box 11-2597 Beirut - Lebanon | +961-1-240445 |
| Lithuania | Rifas UAB | Tinklu 29A, LT-5300 Panevezys, Lithuania | +370 (0)45-582-728 |
| Malaysia | Mittric Sdn Bhd | No. 5 Jalan Pemberita U1/49, Temasya Industrial Park, Glenmarie 40150 Shah Alam,Selangor, Malaysia | +603-5569-3748 |
| Malta | ALFATRADE LTD | 99 PAOLA HILL, PAOLA PLA 1702, Malta | +356 (0)21-697-816 |
| Maroco | SCHIELE MAROC | KM 7,2 NOUVELLE ROUTE DE RABAT AIN SEBAA, 20600 Casablanca, Maroco | +212 661 45 15 96 |
| Mexico | Mitsubishi Electric Automation, Inc. | Mariano Escobedo 69, Col. Zona Industrial, Tlalnepantla, MEX - 54030 - MX | +55-3067-7500 |
| Myanmar | Peace Myanmar Electric Co.,Ltd. | NO137/139 Botahtaung Pagoda Road, Botahtaung Town Ship 11161,Yangon,Myanmar | +95-(0)1-202589 |
| Nepal | Watt&Volt House | KHA 2-65,Volt House Dillibazar Post Box:2108,Kathmandu,Nepal | +977-1-4411330 |
| Netherlands | Imtech Marine & Offshore B.V. | Sluisjesdijk 155, NL-3087 AG Rotterdam, Netherlands | +31 (0)10-487-19 11 |
| North America | Mitsubishi Electric Automation, Inc. | 500 Corporate Woods Parkway, Vernon Hills, IL 60061 USA | +847-478-2100 |
| Norway | Scanelec AS | Leirvikasen 43B, NO-5179 Godvik, Norway | +47 (0)55-506000 |
| Middle East Arab Countries & Cyprus | Comptoir d'Electricite Generale-International-S.A.L. | Cebaco Center - Block A Autostrade Dora P.O. Box 11-1314 Beirut - Lebanon | +961-1-240430 |
| Pakistan | Prince Electric Co. | 2-P GULBERG II, LAHORE, 54600, PAKISTAN | +92-42-575232, 5753373 |
| | AL-KAMAL GROUP | OFFICE NO.7&8, 1ST FLOOR, BARKAT ALI KHAN CENTER, 101, CIRCULAR ROAD, LAHORE. PAKISTAN | +92-42-37631632 |
| Philippines | Edison Electric Integrated, Inc. | 24th Fl. Galleria Corporate Center, Edsa Cr. Ortigas Ave., Quezon City Metro Manila, Philippines | +63-(0)2-634-8691 |
| Poland | Mitsubishi Electric Europe B.V. Polish Branch | Krakowska 50, 32-083 Balice, Poland | +48 (0) 12 630 47 00 |
| Republic of Moldova | Intehsis SRL | bld. Traian 23/1, MD-2060 Kishinev, Moldova | +373 (0)22-66-4242 |
| Romania | Sirius Trading & Services SRL | RO-060841 Bucuresti, Sector 6 Aleea Lacul Morii Nr. 3 | +40-(0)21-430-40-06 |
| Russia | Mitsubishi Electric Europe B.V. Moscow Branch | 52, bld. 3 Kosmodamianskaya Nab. 115054, Moscow, Russia | +7 495 721-2070 |
| Saudi Arabia | Center of Electrical Goods | Al-Shuwayer St. Side way of Salahuddin Al-Ayoubi St. P.O. Box 15955 Riyadh 11454 - Saudi Arabia | +966-1-4770149 |
| Singapore | Mitsubishi Electric Asia Pte. Ltd. | 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943 | +65-6473-2308 |
| Slovakia | PROCONT, Presov | Kupelna 1/, SK - 08001 Presov, Slovakia | +421 (0)51 - 7580 611 |
| | SIMAP | Jana Derku 1671, SK - 91101 Trencin, Slovakia | + 421 (0)32 743 04 72 |
| Slovenia | Inea RBT d.o.o. | Stegne 11, SI-1000 Ljubljana, Slovenia | +386 (0)1-513-8116 |
| South Africa | CBI-electric: low voltage | Private Bag 2016, ZA-1600 Isando Gauteng, South Africa | +27-(0)11-9282000 |
| Spain | Mitsubishi Electric Europe B.V. Spanish Branch | Carretera de Rubí 76-80, E-08190 Sant Cugat del Vallés (Barcelona), Spain | +34 (0)93-565-3131 |
| Sweden | Euro Energy Components AB | Järnvägsgatan 36, S-434 24 Kungsbacka, Sweden | +46 (0)300-690040 |
| Switzerland | TriElec AG | Muehlentalstrasse 136, CH-8201 Schaffhausen | +41-(0)52-6258425 |
| Taiwan | Setsuyo Enterprise Co., Ltd | 5th Fl., No.105, Wu Kung 3rd, Wu-Ku Hsiang, Taipei, Taiwan, R.O.C. | +886-(0)2-2298-8889 |
| Thailand | United Trading & Import Co., Ltd. | 77/12 Bamrungmuang Road,Klong Mahanak Pomprab Bangkok Thailand | +66-223-4220-3 |
| Tunisia | MOTRA Electric | 3, Résidence Imen, Avenue des Martyrs Mourouj III, 2074 - El Mourouj III Ben Arous, Tunisia | +216-71 474 599 |
| Turkey | GTS | Bayraktar Bulvarı Nutuk Sok. No:5, Posta Kutusu34384, TR-34775 Yukarı Dudullu-Uemraniye, Istanbul, Turkey | +90 (0)216 526 3990 |
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| Uruguay | Fierro Vignoli S.A. | Avda. Uruguay 1274 Montevideo Uruguay | +598-2-902-0808 |
| Venezuela | Adesco S.A. | Calle 7 La Urbina Edificio Los Robles Locales C y D Planta Baja, Caracas - Venezuela | +58-212-241-9952 |
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**Safety Tips:** Be sure to read the instruction manual fully before using this product.

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