ELECTRONIC MULTI-MEASURING INSTRUMENT
MODEL
ME96SS
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.

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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.
Highly appreciated ME96SS Series Electronic Multi-Measuring Instruments have been remodeled, and ME96 Super-S Series with enhanced measuring functions and network capability has been released.

This new series has improved measuring accuracy; even the economy model 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 will be helpful in realizing more effective measurement monitoring systems and energy-saving measurement monitoring.

### Optional plug-in modules

**Major features**

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

**Remarks**

MODBUS® RTU communication function provided as standard

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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.

<table>
<thead>
<tr>
<th>Model name</th>
<th>Transmission/Option specifications</th>
<th>Main measurement items</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME96SSHA-MB</td>
<td>MODBUS® RTU communication (High-performance class)</td>
<td>A, DA, V, Hz = ±0.1%</td>
</tr>
<tr>
<td></td>
<td>Plug-in module (options)</td>
<td>W, var, VA, PF = ±0.2%</td>
</tr>
<tr>
<td></td>
<td>• Analog/Pulse/Contact output/input</td>
<td>Wh = class 0.5S (IEC62053-22)</td>
</tr>
<tr>
<td></td>
<td>• CC-Link communication</td>
<td>varh = class 1S (IEC62053-24)</td>
</tr>
<tr>
<td></td>
<td>• Digital input/output (for MODBUS® RTU communication)</td>
<td>Harmonics = 31st-deg (max)</td>
</tr>
<tr>
<td></td>
<td>• Backup (on SD card)</td>
<td>Rolling demand = W, var, VA</td>
</tr>
<tr>
<td>ME96SSRA-MB</td>
<td>MODBUS® RTU communication (Standard class)</td>
<td>A, DA, V = ±0.2%</td>
</tr>
<tr>
<td></td>
<td>Plug-in module (options)</td>
<td>W, var, VA, PF = ±0.5%</td>
</tr>
<tr>
<td></td>
<td>• Analog/Pulse/Contact output/input</td>
<td>Wh = class 0.5S (IEC62053-22)</td>
</tr>
<tr>
<td></td>
<td>• CC-Link communication</td>
<td>varh = class 15 (IEC62053-24)</td>
</tr>
<tr>
<td></td>
<td>• Digital input/output (for MODBUS® RTU communication)</td>
<td>Harmonics = 19th-deg (max)</td>
</tr>
<tr>
<td></td>
<td>• MODBUS® TCP communication</td>
<td>Rolling demand = W, var, VA</td>
</tr>
<tr>
<td>ME96SSEA-MB</td>
<td>MODBUS® RTU communication (Economy class)</td>
<td>A, DA, V = ±0.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hz = ±0.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W, PF = ±0.5%</td>
</tr>
<tr>
<td>Optional Plug-in Modules</td>
<td></td>
<td>Wh = class 0.5S (IEC62053-22)</td>
</tr>
<tr>
<td>Model name</td>
<td>Analog output</td>
<td>Pulse/Alarm output</td>
</tr>
<tr>
<td>ME-4210-SS96</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>ME-0040C-SS96</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ME-0052-SS96</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ME-0000BU-SS96</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ME-0000MT-SS96</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

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

Optional Module ME-0052-SS96

- Contact output
- Pulse output
- Analog output

CSV file data

Digital unit signal can be latched for over 30ms, and there is no need for external latch circuits

Optimum transmission system for remote monitoring using Mitsubishi PLC

This is helpful in wiring and space saving.

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

Can remotely monitor upper/lower limit alarm by contact output (max. 2 points)

Applicable to analog output, pulse output and alarm output with the aid of the optional module ME-4210-SS96.

Harmonics voltage RMS value at 4 to 20mA output (max. 4 outputs)

Select output from pulse widths of 0.125, 0.5 or 1s

Resistance load 600 or less

No-voltage a contact point

VA curves

Circuit Breaker Status Signal, etc.

Abnormal Signal (Temperature)

Abnormal Signal (Earth Leakage)

Abnormal Signal (Facility)

PLC

Switch / Hub

No-voltage a contact point

RS485/USB converter

Central monitor

USB

RS485 (MODBUS®RTU)

ME-0052-SS96

Optional unit

Tripping

Closing

AL

PAL

TAL

Turning on/off breaker, etc.

<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)
Optional Plug-in Module cannot be used with ME96SSEA-MB.

### 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.

### 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).

#### 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.

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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 item can be displayed by a bar graph. With bar graph display, one can grasp 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)
### 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.
Password Function

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Password-protected Item</th>
<th>No.</th>
<th>Password-protected Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shift to the setting mode</td>
<td>5</td>
<td>Adjust the time limit of rolling demand</td>
</tr>
<tr>
<td>2</td>
<td>Reset the max./min. values</td>
<td>6</td>
<td>Reset the peak value of rolling demand</td>
</tr>
<tr>
<td>3</td>
<td>Reset the value of active energy, reactive energy and apparent energy</td>
<td>7</td>
<td>Reset the value of operating time</td>
</tr>
<tr>
<td>4</td>
<td>Reset the value of periodic active energy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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).

(Period 1)

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

<Rolling demand calculation>
Rolling demand is calculated when the sub-interval has been completed.

<Rolling demand display>
When an interval has been completed, the rolling demand displayed is the newest time limit value.

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

<Rolling demand calculation>
Rolling demand is calculated when the sub-interval has been completed.

<Rolling demand display>
When an interval has been completed, the rolling demand displayed is the newest time limit value.

Rolling Demand Function

Rolling demand is the estimated power consumption in a specified period (interval). For the block interval demand, select the duration (interval) of the block to be used for demand calculation.

1. Rolling block
   Use rolling block to set the interval and sub-intervals from 1~60min (1min intervals). Rolling demand is calculated and updated at the end of each sub-interval.

2. Fixed block
   Use fixed block to set the interval from 1~60min (1min intervals). Rolling demand is calculated and updated at the end of each interval.
   (For fixed block, use the same time limits both of interval and sub-interval).
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

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

(2) Alarm/Contact Output Operation Test

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

<table>
<thead>
<tr>
<th>Status</th>
<th>Display</th>
<th>Output terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>ON</td>
<td>Open</td>
</tr>
<tr>
<td>No alarm</td>
<td>OFF</td>
<td>Closed</td>
</tr>
</tbody>
</table>

(3) Analog Output Operation Test

1. Display the output items.
2. Press the + or - button to change the analog output.

Note: Default value is 0%.

(4) Pulse Output Operation Test

Press the Reset button one time to output one pulse.

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

Standards

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

<table>
<thead>
<tr>
<th>Model name</th>
<th>ME96SSHA-MB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase wire</strong></td>
<td>Three phase 4-wire, Three phase 3-wire (3CT, 2CT), Single phase 3-wire, Single phase 2-wire (common use)</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>5AAC, 1AAC (common use)</td>
</tr>
<tr>
<td>Voltage</td>
<td>Three phase 4-wire: 277/480VAC (max), Star connections: 440VAC (max) Single phase 3-wire: 220VAC (max), Star connections: 440VAC (max)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50-60Hz (common use)</td>
</tr>
</tbody>
</table>

**Measurement items and accuracy**

<table>
<thead>
<tr>
<th>Measurement items</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (A)</td>
<td>A1, A2, A3, AN, Aują</td>
</tr>
<tr>
<td>Current demand (DA)</td>
<td>DA1, DA2, DA3, DAN, DA água</td>
</tr>
<tr>
<td>Voltage</td>
<td>V12, V23, V31, V água (L-L) V1N, V2N, V3N, V água (L-N)</td>
</tr>
<tr>
<td>Active power (W)</td>
<td>W1, W2, W3, W água</td>
</tr>
<tr>
<td>Reactive power (var)</td>
<td>var1, var2, var3, I var</td>
</tr>
<tr>
<td>Apparent power (VA)</td>
<td>VA1, VA2, VA3, V água</td>
</tr>
<tr>
<td>Power factor (PF)</td>
<td>PF1, PF2, PF3, Σ PF</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>Hz</td>
</tr>
<tr>
<td>Active energy (Wh)</td>
<td>Imported, Exported</td>
</tr>
<tr>
<td>Reactive energy (varh)</td>
<td>Imported lead, lag Exported lead, lag</td>
</tr>
<tr>
<td>Apparent energy (Vah)</td>
<td>—</td>
</tr>
<tr>
<td>Harmonic current (HI)</td>
<td>Total, 1st to 31st degree (odd number degree only)</td>
</tr>
<tr>
<td>Harmonic voltage (HV)</td>
<td>Total, 1st to 31st degree (odd number degree only)</td>
</tr>
<tr>
<td>Rolling demand (DW)</td>
<td>Rolling block, fixed block</td>
</tr>
<tr>
<td>Rolling demand, reactive power (DVar)</td>
<td>Rolling block, fixed block</td>
</tr>
<tr>
<td>Rolling demand, apparent power (DVA)</td>
<td>Rolling block, fixed block</td>
</tr>
<tr>
<td>Periodic Active energy (Wh)</td>
<td>Periodic active energy 1, 2</td>
</tr>
<tr>
<td>Operating time</td>
<td>Operating time 1, 2 (Reference)</td>
</tr>
<tr>
<td>Analog output response time</td>
<td>2s or less (Hi, HV: 10s or less)</td>
</tr>
</tbody>
</table>

**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 Wh, varh, VAh: 9 digits (6 or 12 possible) Harmonic distortion ratio, content ratio: 3 digits Harmonic RMS: 4 digits 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 ME-0040C-SS96 ME-0000MT-SS96 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 to +55°C (average operating temperature: 35°C or less per day) |

**Operating humidity**

| 0–85% RH (non condensing) |

**Storage temperature**

| -25 to +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.
2. Harmonic measurements where distortion ratio (content rate) is 100% or more may exceed ±1.0%.
3. Harmonic current cannot be measured without voltage input.
### Specifications

**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
<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>SAAC, 1AAC (common use)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50-60Hz (common use)</td>
</tr>
</tbody>
</table>

#### Measurement Items and Accuracy

<table>
<thead>
<tr>
<th>Measurement Items and Accuracy</th>
<th>Measurement</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement items</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current (A)</td>
<td>A1, A2, A3, AN, AAVG</td>
<td>±0.2%</td>
</tr>
<tr>
<td>Current demand (DA)</td>
<td>DA1, DA2, DA3, DAN, DAVG</td>
<td>±0.2%</td>
</tr>
<tr>
<td>Voltage</td>
<td>V12, V23, V31, VAVG (L-L) V1N, V2N, V3N, VAVG (L-N)</td>
<td>±0.2%</td>
</tr>
<tr>
<td>Active power (W)</td>
<td>W1, W2, W3, Σ W</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Reactive power (var)</td>
<td>var1, var2, var3, Σ var</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Apparent power (VA)</td>
<td>VA1, VA2, VA3, Σ VA</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Power factor (PF)</td>
<td>PF1, PF2, PF3, Σ PF</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>Hz</td>
<td>±0.1%</td>
</tr>
<tr>
<td>Active energy (Wh)</td>
<td>Imported, Exported</td>
<td></td>
</tr>
<tr>
<td>Reactive energy (varh)</td>
<td>Imported lead, lag</td>
<td></td>
</tr>
<tr>
<td>Apparent energy (Vah)</td>
<td>—</td>
<td>±2.0%</td>
</tr>
<tr>
<td>Harmonic current (Hi)</td>
<td>Total, 1st to 19th degree (odd number degree only)</td>
<td>±1.0%</td>
</tr>
<tr>
<td>Harmonic voltage (HV)</td>
<td>Total, 1st to 19th degree (odd number degree only)</td>
<td>±1.0%</td>
</tr>
<tr>
<td>Rolling demand (DW)</td>
<td>Rolling block, fixed block</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Rolling demand, reactive power (Dvar)</td>
<td>Rolling block, fixed block</td>
<td>±1.0%</td>
</tr>
<tr>
<td>Rolling demand, apparent power (DVA)</td>
<td>Rolling block, fixed block</td>
<td>±1.0%</td>
</tr>
<tr>
<td>Periodic Active energy (Wh)</td>
<td>Periodic active energy 1, 2</td>
<td>class 0.5S (IEC62053-22)</td>
</tr>
<tr>
<td>Operating time</td>
<td>Operating time 1, 2</td>
<td>(Reference)</td>
</tr>
</tbody>
</table>

**Analog output response time**: 2s or less (Hi, HV. 10s or less)

**Measuring method**
- Demand value: DA: Thermal type calculation, DW, Dvar, DVA: Rolling demand calculation

**Indicators**
- LCD with LED backlight

**Display**
- No. of display digits and segments: 6 digits each at upper, middle, and lower line
- Digital display: A, DA, V, W, var, VA, PF, DW, Dvar, DVA: 4 digits, Hz: 3 digits, Wh, varh: 9 digits (6 or 12 possible)
- Harmonic distortion ratio, content ratio: 3 digits, Harmonic RMS: 4 digits, 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
- ME-0040C-SS96
- ME-0000MT-SS96
- 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) x 96 (W) x 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.
2. Harmonic measurements where distortion ratio (content rate) is 100% or more may exceed ±1.0%.
3. Harmonic current cannot be measured without voltage input.
# Specifications

## ME96SSEA-MB

<table>
<thead>
<tr>
<th>Model name</th>
<th>ME96SSEA-MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase wire</td>
<td>Three phase 4-wire, Three phase 3-wire, Single phase 3-wire, Single phase 2-wire (common use)</td>
</tr>
</tbody>
</table>

### Rating

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>Three phase 4-wire: 277/480VAC (max) Star connections: 440VAC (max)</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>Three phase 3-wire: Delta connections: 220VAC (max) Star connections: 440VAC (max)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50-60Hz (common use)</td>
</tr>
</tbody>
</table>

### Measurement items and accuracy

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current (A)</strong></td>
<td>A1, A2, A3, AN, A&lt;sub&gt;Avg&lt;/sub&gt; ±0.5%</td>
</tr>
<tr>
<td><strong>Current demand (DA)</strong></td>
<td>DA1, DA2, DA3, DAN, DA&lt;sub&gt;Avg&lt;/sub&gt; ±0.5%</td>
</tr>
<tr>
<td><strong>Voltage (V)</strong></td>
<td>V12, V23, V31, V&lt;sub&gt;Avg&lt;/sub&gt; (L-L) V1N, V2N, V3N, V&lt;sub&gt;Avg&lt;/sub&gt; (L-N) ±0.5%</td>
</tr>
<tr>
<td><strong>Active power (W)</strong></td>
<td>W1, W2, W3, ΣW ±0.5%</td>
</tr>
<tr>
<td><strong>Reactive power (var)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Apparent power (VA)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Power factor (PF)</strong></td>
<td>PF1, PF2, PF3, ΣPF ±0.5%</td>
</tr>
<tr>
<td><strong>Frequency (Hz)</strong></td>
<td>Hz ±0.2%</td>
</tr>
<tr>
<td><strong>Active energy (Wh)</strong></td>
<td>Receiving class 0.5S (IEC62053-22)</td>
</tr>
<tr>
<td><strong>Reactive energy (varh)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>APPARENT ENERGY (VA)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Power factor (PF)</strong></td>
<td>PF1, PF2, PF3, ΣPF ±0.5%</td>
</tr>
<tr>
<td><strong>Operating time</strong></td>
<td>Operating time 1, 2 (Reference)</td>
</tr>
<tr>
<td><strong>Harmonic current (HI)</strong></td>
<td>Total ±2.0%</td>
</tr>
<tr>
<td><strong>Harmonic voltage (HV)</strong></td>
<td>Total ±2.0%</td>
</tr>
<tr>
<td><strong>Rolling demand (DW)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Rolling demand, reactive power (Dvar)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Rolling demand, apparent power (DVA)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Periodic Active energy (Wh)</strong></td>
<td>—</td>
</tr>
</tbody>
</table>

### Measuring method

- Demand value: DA: Thermal type calculation

### Display

- **Indicator**: LCD with LED backlight
- **No. of display digits and segments**: 6 digits each at upper, middle, and lower line
- **Digital display**: A, DA, V, W, PF: 4 digits Hz: 3 digits Wh: 9 digits (6 or 12 possible) Relative harmonic content: 3 digits 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

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiated Emission</td>
<td>EN61326-1/CISPR 11, FCC Part15 Subpart B Class A</td>
</tr>
<tr>
<td>Conducted Emission</td>
<td>EN61326-1/CISPR 11, FCC Part15 Subpart B Class A</td>
</tr>
<tr>
<td>Harmonics Measurement</td>
<td>EN61000-3-2</td>
</tr>
<tr>
<td>Flicker Meter Measurement</td>
<td>EN61000-3-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immunity</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge</td>
<td>EN61326-1/EN61000-4-2</td>
</tr>
<tr>
<td>Magnetic field immunity</td>
<td></td>
</tr>
<tr>
<td>Electrical Fast Transient</td>
<td>EN61326-1/EN61000-4-3</td>
</tr>
<tr>
<td>Surge Immunity</td>
<td>EN61326-1/EN61000-4-5</td>
</tr>
<tr>
<td>Conducted Disturbances</td>
<td>EN61326-1/EN61000-4-6</td>
</tr>
<tr>
<td>Magnetic Field Immunity</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips and Short</td>
<td>EN61326-1/EN61000-4-8</td>
</tr>
<tr>
<td>Interruptions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>CE, as per EN61010-1</td>
</tr>
<tr>
<td>U.S. and Canada</td>
<td>cRUus as per UL61010-1, IEC61010-1</td>
</tr>
<tr>
<td>Installation Category</td>
<td>III</td>
</tr>
<tr>
<td>Measuring Category</td>
<td>III</td>
</tr>
<tr>
<td>Pollution Degree</td>
<td>2</td>
</tr>
</tbody>
</table>

### MODBUS® RTU Communication Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>RS-485 2-wire half-duplex transmission</td>
</tr>
<tr>
<td>Protocol</td>
<td>RTU (binary data transfer)</td>
</tr>
<tr>
<td>Transmission method</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Connection type</td>
<td>Multi-point bus</td>
</tr>
<tr>
<td>Baud rate</td>
<td>2400, 4800, 9600, 19200, 38400bps</td>
</tr>
<tr>
<td>Data bit</td>
<td>8</td>
</tr>
<tr>
<td>Stop bit</td>
<td>1, 2</td>
</tr>
<tr>
<td>Parity</td>
<td>ODD, EVEN, NONE</td>
</tr>
<tr>
<td>Address</td>
<td>1 to 255 (0: for broadcast mode)</td>
</tr>
<tr>
<td>Distance</td>
<td>1,200m (max)</td>
</tr>
<tr>
<td>Max. connectable units</td>
<td>31 units</td>
</tr>
<tr>
<td>Terminal Resistance</td>
<td>120Ω 1/2W</td>
</tr>
<tr>
<td>Recommended Cable</td>
<td>Shielded twisted-pair AWG24 to 1/4</td>
</tr>
</tbody>
</table>

- 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

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

- 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, 1.15 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 110Ω ±5% (1/2W product) when using dedicated CC-Link cables or 130Ω ±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)...LENI010334
  - Electronic Multi-Measuring Instrument programming manual (CC-Link) (For ver. 2 remote device station)...LENI130391

### Input/Output Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Optional Plug-in Module type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output</td>
<td>4-20mA (0-600Ω)</td>
<td>ME-4210-SS96</td>
</tr>
<tr>
<td>Pulse/Alarm output</td>
<td>No-voltage &quot;a&quot; contact Capacity: 35VDC, 0.1A</td>
<td>ME-4210-SS96</td>
</tr>
<tr>
<td>Digital input</td>
<td>19-39VDC 7mA or less</td>
<td>ME-4210-SS96, ME-0040C-SS96, ME-0052-SS96</td>
</tr>
<tr>
<td>Digital output</td>
<td>No-voltage a contact Capacity: 35VDC, 0.2A</td>
<td>ME-0052-SS96</td>
</tr>
</tbody>
</table>

- For more information on data, please refer to the following document.
### Specifications

#### MODBUS® TCP Communication Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>1 port (10BASE-T/100BASE-TX)</td>
</tr>
<tr>
<td>Transmission method</td>
<td>Base band</td>
</tr>
<tr>
<td>Number of stages connected in cascade</td>
<td>Max. 4 stages (10BASE-T), max. 2 stages (100BASE-TX) (when repeater hub is used)</td>
</tr>
<tr>
<td>Max. distance between nodes</td>
<td>200m</td>
</tr>
<tr>
<td>Max. segment length</td>
<td>100m</td>
</tr>
<tr>
<td>Connector applicable to external wiring</td>
<td>RJ45</td>
</tr>
<tr>
<td>cable meeting IEEE802.3 10BASE-T standard</td>
<td>(Unshielded twisted pair cable (UTP cable), category 3 or higher)</td>
</tr>
<tr>
<td>cable meeting IEEE802.3 100BASE-TX standard</td>
<td>(Shielded twisted pair cable (STP cable), category 5 or higher)</td>
</tr>
<tr>
<td>Protocol</td>
<td>MODBUS® TCP (port No.500)</td>
</tr>
<tr>
<td>Max. number of connections</td>
<td>4</td>
</tr>
<tr>
<td>Support functions</td>
<td>Auto-negotiation function (automatic recognition of 10BASE-T/100BASE-TX)</td>
</tr>
<tr>
<td></td>
<td>Auto-MDIX function (automatic recognition of straight cable/cross cable)</td>
</tr>
</tbody>
</table>

*For more information on data, please refer to the following document.*

Electronic Multi-Measuring Instrument ME series MODBUS® Interface specifications...LMS-0492

#### Logging Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging mode</td>
<td>Automatic updating by overwriting (not provided with a function to automatically start according to the start time setting)</td>
</tr>
<tr>
<td>kinds of logging data</td>
<td>Detailed data</td>
</tr>
<tr>
<td></td>
<td>Measurement data is stored at the specified “detailed data logging interval” (1 min, 5 min, 10 min, 15 min or 30 min). Note: The data will be output as a detailed data file. Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output.</td>
</tr>
<tr>
<td></td>
<td>1-hour data</td>
</tr>
<tr>
<td></td>
<td>Measurement data is stored at a one-hour interval. Note: The data will be output as a one-hour data file or a one-day data file. Note: As the integrated values, not the difference values, but the values displayed on the multi indicating instrument will be output.</td>
</tr>
<tr>
<td>number of logging elements</td>
<td>Detailed data</td>
</tr>
<tr>
<td></td>
<td>Max. 6 elements</td>
</tr>
<tr>
<td></td>
<td>1-hour data</td>
</tr>
<tr>
<td></td>
<td>Max. 6 elements</td>
</tr>
<tr>
<td>internal memory logging period</td>
<td>Detailed data</td>
</tr>
<tr>
<td></td>
<td>Detailed data logging interval: 1 min for 2 days</td>
</tr>
<tr>
<td></td>
<td>Detailed data logging interval: 5 min for 10 days</td>
</tr>
<tr>
<td></td>
<td>Detailed data logging interval: 10 min for 20 days</td>
</tr>
<tr>
<td></td>
<td>Detailed data logging interval: 15 min for 30 days</td>
</tr>
<tr>
<td></td>
<td>Detailed data logging interval: 30 min for 60 days</td>
</tr>
<tr>
<td>1-hour data</td>
<td>400 days (about 13 months)</td>
</tr>
<tr>
<td>sd memory card (2GB) logging period</td>
<td>10 years or more</td>
</tr>
<tr>
<td>system log data</td>
<td>1200 records</td>
</tr>
<tr>
<td>logging data / system log data output format</td>
<td>CSV format (ASCII code)</td>
</tr>
<tr>
<td>power failure compensation</td>
<td>Backup by built-in lithium battery</td>
</tr>
<tr>
<td></td>
<td>Total power interruption backup time: 5 years (at daily average temperature of 35°C or less) (The life of the lithium battery is 10 years (at a daily average temperature of 35°C or less).) The battery cannot be replaced by the customer. Please consider updating the module.</td>
</tr>
<tr>
<td>set values logging ID, logging elements and detailed data logging interval</td>
<td>Stored in FRAM (non-volatile memory)</td>
</tr>
<tr>
<td></td>
<td>Note: The data will not be deleted even if power interruption is caused by battery voltage drop (BAT. LED is on).</td>
</tr>
<tr>
<td>logging data and system log data</td>
<td>Stored in SRAM (volatile memory)</td>
</tr>
<tr>
<td></td>
<td>Note: The data will be deleted if power interruption is caused by battery voltage drop (BAT. LED is on).</td>
</tr>
<tr>
<td>clock operation</td>
<td>Note: The clock operation will stop if power interruption is caused by battery voltage drop (BAT. LED is on). After power restoration, the clock operation will start from 00:00 on Jan. 1, 2016.</td>
</tr>
<tr>
<td>clock accuracy</td>
<td>1 min / month</td>
</tr>
<tr>
<td>output data storage medium</td>
<td>SD memory card (SD or SDHC)</td>
</tr>
</tbody>
</table>
| 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
Specifications

Operating Instructions

PHASE

Set-up menu 6

14

Setting value confirmation menu 9

§

Button Functions

» LCD Functions

‡

» Button Functions

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

Notes 2. Item settings vary depending on the model.

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

Entry setting value

Mode

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

Basic functions

Set up setting items such as primary voltage and current, and choose and indicate setting items

Special functions

Push for 2s

Manual display change ➔ Cyclic display change

Manual phase change ➔ Cyclic phase change

Push for 2s

Zoom display of Wh, varh etc

Push for 2s

Reset all the Max/Min values

Push for 2s

Fast forward or fast return values when setting

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)

Press for 2s

Reset Wh, varh, Vah values to zero by holding down the buttons for 2 sec

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.
Operating Instructions

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.

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

1. Set the phase/wire system according to the number of measurement circuits targeted.
   - 3P4: 3-phase, 4-wire system
   - 3P3, 2D: 3-phase, 3-wire system (2CT)
   - 3P3, 3C: 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

2. Set 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

3. Set VT
   - In the case of direct measurements (without VT)
   - To select no, press yES and see (1) below.
   - To select yES, press no and see (2) below.

(1) VT/Direct voltage
   - 63.5/110V, 110/190V, 110/220V

(2) Set-up menu 2: MODBUS® RTU Communication settings

   Communication address
   - Possible address settings: 1~255
   - Set the MODBUS® RTU communication baud rate.
     - 9600bps, 4800bps, 2400bps, 19.2kbps, 38.4kbps
   - To finish set-up
     - Using the + or - button.
     - To save the settings.
     - Then press the SET button to display the End screen.

Adjust the set-up menu No. to “1”.
Adjust the set-up menu No. to “2”.
Adjust the set-up menu No. to “3”.

Operating Instructions

1. VT/Direct voltage

(a) Three phase 4-wire setting (phase voltage)
   - 63.5V
   - 100V
   - 110V
   - 120V

(b) Three phase 3-wire (2CT, 3CT) or Single phase 2-wire setting (line voltage)
   - 100V
   - 110V
   - 220V

2. When the End screen is displayed, settings can be saved for each set-up menu No. To do so, press the button for 2s. Press the button to display the items to be set, and the button to set.

3. To access setting mode, press and hold the button and button down at the same time.

4. Display pattern

5. Set-up menu

   - Display order and position
   - Other settings required to display data
   - Can be displayed with this setting only

6. Frequency

   - 50Hz
   - 60Hz

   Notes: Frequency scale on bar graph display will also change. Note2: Analog output scale will also change.

7. Rolling demand time limit

   (1) Interval time limit
   - Setting range
   - Setting interval
   - 1 ~ 60 (min)
   - 1 min

   (2) Sub-interval time limit
   - Setting range
   - Setting interval
   - 1 ~ 60 (min)
   - 1 min

8. Demand current time limit

   - Settings
   - Setting range
   - Setting range
   - 1 ~ 15 ~ 60 (min)
   - 1min

Note: To continue to set-up using the or button.

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

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.

Adjust the set-up menu No. to “2”.

1. MODBUS® RTU communication address

   - Possible address settings: 1 ~ 255

2. Set MODBUS® RTU communication baud rate.

   - 2400bps
   - 4800bps
   - 9600bps
   - 19.2kbps
   - 38.4kbps

Notes:
1. Frequency scale on bar graph display will also change.
2. Analog output scale will also change.

To finish set-up, press the or button to display the End screen, then press the button to save the settings.
Operating Instructions

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.

1. Select communication system
   - CC : CC-Link communication
   - Mb. rtu : MODBUS® RTU communication

2. Set the CC-Link communication station number.
   Possible station number settings: 1~64

3. Set the CC-Link communication speed.
   - 156kbps
   - 625kbps
   - 2.5Mbps
   - 5Mbps
   - 10Mbps

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

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

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 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.

1. Select MODBUS® TCP communication or MODBUS® RTU communication.
   - Mb.tcp : MODBUS® TCP communication
   - Mb.rtu : MODBUS® RTU communication

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

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

(Non-use) (Use)

Allowable IP addresses:
000.000.000.000 ~ 192.168.3.10 ~ 255.255.255.255

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

Set 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

If 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.)

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 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.

1. Select 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 MODBUS® RTU communication address on page 16.

2. Set the IP address of MODBUS® TCP communication.
   - Allowable IP addresses: 0.0.0.0 ~ 192.168.3.10 ~ 255.255.255.255

3. Set the sub-net mask of MODBUS® TCP communication.
   - Select one of the sub-net masks shown in the following table.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>128.0.0.0</td>
<td>(9)</td>
<td>255.128.0.0</td>
</tr>
<tr>
<td>(2)</td>
<td>192.0.0.0</td>
<td>(10)</td>
<td>255.192.0.0</td>
</tr>
<tr>
<td>(3)</td>
<td>224.0.0.0</td>
<td>(11)</td>
<td>255.224.0.0</td>
</tr>
<tr>
<td>(4)</td>
<td>240.0.0.0</td>
<td>(12)</td>
<td>255.240.0.0</td>
</tr>
<tr>
<td>(5)</td>
<td>248.0.0.0</td>
<td>(13)</td>
<td>255.248.0.0</td>
</tr>
<tr>
<td>(6)</td>
<td>252.0.0.0</td>
<td>(14)</td>
<td>255.252.0.0</td>
</tr>
<tr>
<td>(7)</td>
<td>254.0.0.0</td>
<td>(15)</td>
<td>255.254.0.0</td>
</tr>
<tr>
<td>(8)</td>
<td>255.0.0.0</td>
<td>(16)</td>
<td>255.255.0.0</td>
</tr>
</tbody>
</table>

4. Determine whether or not to use the default gateway of MODBUS® TCP communication.
   - off (Non-use)  on (Use)

5. Set the default gateway of MODBUS® TCP communication.
   - When the default gateway is not used, this window is not displayed.
   - Allowable default gateways: 0.0.0.0 ~ 127.0.0.1 ~ 255.255.255.255

6. If 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.

   - To finish set-up
     - Press the [ائق] or [ achter] button to display the End screen, then press the [셋] button to save settings.

Select another set-up menu or end set-up.
Set-up menu 3: Display settings (max. scale, active energy, harmonics, etc.)

1. Set the maximum current scale value on the bar graph.
   (1) Maximum current scale value
   - SP: CT primary current value
   - (special primary current value)
   - 0 steps (100%: instrument rating)
   - 10 steps (approx. 40%)

2. Set 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%)

3. Set 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%)

4. Set the maximum reactive power scale value on the bar graph.
   (ME96SSHA-MB, ME96SSRA-MB only).
   (1) Power unit
   - 12 steps (approx. 100%)
   - ± 0 steps (100%: instrument rating)
   - - 18 steps (approx. 20%)

5. Set the power factor scale on the bar graph.
   - 0.5 ~ 1 ~ 0.5
   - 0 ~ 1 ~ 0

6. Set 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).

**Example display screens:**

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.

Notes:
1. The same measurement items can be set for all channels.
2. Measurement items not included in the selected display pattern can also be chosen.
3. Measurement items included in the selected display pattern can only be positive/negative.
4. Underlined specifications are factory default settings of measurement items allocated to each channel.
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.

---

**Set-up menu**
- Adjust the set-up menu No. to “3”.
- Set the maximum reactive power scale value on the bar graph.
  - (ME96SSHA-MB, ME96SSRA-MB only).
- Set the maximum current scale value on the bar graph.
  - (positive-only or positive/negative scale) (The rolling demand must be set only for ME96SSHA-MB and ME96SSRA-MB).
- Set the maximum voltage scale value on the bar graph.
  - Maximum scale value.
- Set 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).
- Set the power factor scale on the bar graph.
- Set 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).
Operating Instructions

5. Reactive power scale
- Measure power consumption
- Set the power factor scale on the bar graph.
- Set-up menu

(2) Positive-only or Positive/Negative

(1) Maximum scale value
- Set the maximum power/rolling demand scale value on the bar graph, and select positive-only scale or maximum scale value.

(1) Maximum current scale value
- Set the maximum current scale value on the bar graph.

Adjust the set-up menu No. to “3.”

Combinations III, IV => Suitable for measurements in facilities equipped with in-house generators and generally for capacitor loads where the power factor is close to zero.

The reactive power scale can only be positive/negative.

<Example display screens>

Note 1. The same measurement items can be set for all channels.
Note 2. Measurement items not included in the selected display pattern can also be chosen.
Note 3. Channels set to “on” will have minimum output (4mA). Additionally, set-up will proceed to the next channel.
Note 4. Underlined specifications are factory default settings of measurement items allocated to each channel.
Note 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.

(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
---|---
Demand A | SP primary current value set to set-up menu 1.4.1 primary current setting
V | +10 steps (approx. 250%)\(^\downarrow\)
| ±0 steps (100%: standard max. scale value)\(\uparrow\)
| –18 steps (approx. 20%)\(\downarrow\)
W | +3 steps (approx. 120%)\(\downarrow\)
| ±0 steps (100%: instrument rating)\(\uparrow\)
| –18 steps (approx. 20%)\(\downarrow\)
PF | –0.5~0.5\(\downarrow\)

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

Output item | Setting range
---|---
Demand A | +3 steps (approx. 120%)\(\downarrow\)
| ±0 steps (100%: instrument rating)\(\uparrow\)
| –10 steps (approx. 40%)\(\downarrow\)
W | Positive-only \(\downarrow\) Positive/Negative \(\uparrow\)

Notes:
- Channels set to “on” will have minimum output (4mA). Additionally, set-up will proceed to the next channel.
- Underlined specifications are factory default settings of measurement items allocated to each channel.
- 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.

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.

Adjust the set-up menu No. to “6.”

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

When 3-phase 4-wire system has been selected

- **Three phase 4-wire**
  - Demand A1
  - Demand A2
  - Demand A3
  - Demand AN
  - Demand A
  - Demand AV
  - Demand AN
  - Harmonic A1
  - Harmonic A2
  - Harmonic A3
  - Harmonic AN
  - Harmonic AV
  - Harmonic AN

- **Effective value**
  - Demand A1
  - Demand A2
  - Demand A3
  - Demand AN
  - Demand A
  - Demand AV
  - Demand AN
  - Harmonic A1
  - Harmonic A2
  - Harmonic A3
  - Harmonic AN
  - Harmonic AV
  - Harmonic AN

Notes:
- The same measurement items can be set for all channels.
- Measurement items not included in the selected display pattern can also be chosen.
- Channels set to “on” will have minimum output (4mA). Additionally, set-up will proceed to the next channel.
- Underlined specifications are factory default settings of measurement items allocated to each channel.
- 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.
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.*

1. Set 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.

2. Clear the data stored in the optional logging unit.
   - **Clear:** (Clear)
   - *Not Clear*
   - *Yes*
   - When the pattern is set to LP00, any logging elements can be selected.
   - For the details of LP00 setting, see the instruction manual.

3. Set 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.

4. Set 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* ~ *60min* ~ *1hour*

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

**Notes:**
- If the analog output of all channel output items is set to “non,” the setting procedure is the same as that of Analog output CH2~4.
- *Upper limit for analog output (same for all channels):*

<table>
<thead>
<tr>
<th>Setting</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[off] (no limit)</td>
<td>Output to +5% of upper limit and -5% of lower limit (with respect to span value)</td>
</tr>
<tr>
<td>on (limit)</td>
<td>Output to +1% of upper limit and -1% of lower limit (with respect to span value)</td>
</tr>
</tbody>
</table>

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

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.

Maximum/Minimum Display Values
Press the [MAXMIN] button to change to the maximum and minimum values of the display screen. Press it again to return to the current value display screen.

Reset Maximum/Minimum Values
Press the [RESET] button for 2s to reset the maximum/minimum values of the measurement items displayed. The maximum/minimum values will become the current values.
Press the [RESET] and [ ] buttons simultaneously for 2s to reset all maximum/minimum values. The maximum/minimum values will become the current values.

Displaying Active energy/Reactive energy/Apparent energy

Changing Phases
Press [PHASE], the current phase and the voltage phase switches over.

Maximum/Minimum Value display screens
Example of switching between changing current value display and maximum/minimum value display screens.

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).

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

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

Example of changing display (Three phase 4-wire system; display pattern: P01; no additional screens)
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 Cancel
The alarm can be reset automatically or manually. The alarm recovery method varies according to the reset method setting.

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).

Changing the Harmonic Degree Display
Press the ▼ or ▲ button to change the harmonic degree.

Degree | Harmonic current (%) | THD current (%) | Harmonic voltage (%)
-------|---------------------|-----------------|-------------------
0th    | 0                  | 0               | 0                 
1st    | 0                  | 0               | 0                 
3rd    | 0                  | 0               | 0                 
5th    | 0                  | 0               | 0                 
7th    | 0                  | 0               | 0                 
9th    | 0                  | 0               | 0                 
11th   | 0                  | 0               | 0                 
13th   | 0                  | 0               | 0                 
15th   | 0                  | 0               | 0                 
17th   | 0                  | 0               | 0                 
19th   | 0                  | 0               | 0                 
21st   | 0                  | 0               | 0                 
23rd   | 0                  | 0               | 0                 
25th   | 0                  | 0               | 0                 
27th   | 0                  | 0               | 0                 
29th   | 0                  | 0               | 0                 
31st   | 0                  | 0               | 0                 
3rd-31st | 0                | 0              | 0                 

* Only flashes if the phase that caused the alarm is being displayed.
### 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 | 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 |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Operating time | –    | –    | –    | –    | –    | –    | –    | –    | –    | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. |
| Di Do | –    | –    | –    | –    | –    | –    | –    | –    | –    | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. |

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

| Display pattern | 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 |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Operating time | –    | –    | –    | –    | –    | –    | –    | –    | –    | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. | Wh exp. |
### 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 3-wire)

<table>
<thead>
<tr>
<th>Display pattern</th>
<th>Screen set based on display pattern</th>
<th>Additional screens (set in set-up menu Nos. 3, 7 and 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P02</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P03</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P04</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P05</td>
<td>Wh</td>
<td>Wh</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Display pattern</th>
<th>Screen set based on display pattern</th>
<th>Additional screens (set in set-up menu Nos. 3, 7 and 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P02</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P03</td>
<td>Wh</td>
<td>Wh</td>
</tr>
<tr>
<td>P04</td>
<td>Wh</td>
<td>Wh</td>
</tr>
</tbody>
</table>

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Operating Instructions

Display pattern (digital display)

<table>
<thead>
<tr>
<th>Display pattern</th>
<th>Screen set based on display pattern</th>
<th>No.1</th>
<th>No.2</th>
<th>No.3</th>
<th>No.4</th>
<th>No.5</th>
<th>No.6</th>
<th>No.7</th>
<th>No.8</th>
<th>No.9</th>
<th>No.10</th>
<th>No.11</th>
<th>No.12</th>
<th>No.13</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td>Upper A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Middle W</td>
<td>W</td>
<td>W</td>
<td>PF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower V</td>
<td>PF</td>
<td>V</td>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P02</td>
<td>Upper A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<td>A</td>
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<tr>
<td></td>
<td>Middle Wh</td>
<td>Wh</td>
<td>Wh</td>
<td>Wh</td>
<td>Wh</td>
<td>AN</td>
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<td></td>
<td>Lower Wh</td>
<td>Wh</td>
<td>Wh</td>
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<td>AN</td>
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<td></td>
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</tr>
<tr>
<td>P03</td>
<td>Upper A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<tr>
<td></td>
<td>Middle V</td>
<td>V</td>
<td>V</td>
<td>A</td>
<td></td>
<td></td>
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</table>

Screen set based on display pattern

<table>
<thead>
<tr>
<th>No.1</th>
<th>No.2</th>
<th>No.3</th>
<th>No.4</th>
<th>No.5</th>
<th>No.6</th>
<th>No.7</th>
<th>No.8</th>
<th>No.9</th>
<th>No.10</th>
<th>No.11</th>
<th>No.12</th>
<th>No.13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>Middle</td>
<td>W</td>
<td>W</td>
<td>PF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>V</td>
<td>PF</td>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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Additional screens (set in set-up menu Nos.3 and 8)

<table>
<thead>
<tr>
<th>No.1</th>
<th>No.2</th>
<th>No.3</th>
<th>No.4</th>
<th>No.5</th>
<th>No.6</th>
<th>No.7</th>
<th>No.8</th>
<th>No.9</th>
<th>No.10</th>
<th>No.11</th>
<th>No.12</th>
<th>No.13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>Middle</td>
<td>W</td>
<td>W</td>
<td>PF</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Lower</td>
<td>V</td>
<td>PF</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Phase/Wire Displays

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

<table>
<thead>
<tr>
<th>Top phase display</th>
<th>Phase/Wire settings</th>
<th>1P2W</th>
<th>1P3W(1N2)</th>
<th>1P3W(1N3)</th>
<th>3P3W</th>
</tr>
</thead>
<tbody>
<tr>
<td>current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>None</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>N</td>
<td>N</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>None</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>None</td>
<td>1N</td>
<td>1N</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>None</td>
<td>2N</td>
<td>3N</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>None</td>
<td>12</td>
<td>13</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>
### External Dimensions/Installation/Connections

#### Dimensions

**ME96SSHA-MB, ME96SSRA-MB**

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

**ME96SSEA-MB**

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

4. **Installing Optional Plug-in Module**
   - When installing the optional plug-in module onto the basic device, install according to the following procedure.
     - 1. Remove the optional cover.
     - 2. Attach the optional unit to the main unit.

---

### Note

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

Main unit mounting screws: M3

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.

<table>
<thead>
<tr>
<th>Part</th>
<th>Screw type</th>
<th>Wire specifications</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product main body</td>
<td>M3</td>
<td>OD of 6 mm or less, for screw M3</td>
<td>0.6 to 0.8 N·m</td>
</tr>
<tr>
<td>voltage input, current input</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and MODBUS® RTU communication terminals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional unit terminal</td>
<td>Screwless</td>
<td>Single wire and stranded wire: AWG24 to 14 (Rod terminal can be used together with stranded wire.) Wire stripping length: 10 to 11 mm</td>
<td></td>
</tr>
<tr>
<td>(ME-0052-SS96, ME-0040C-SS96, ME-4210-SS96)</td>
<td></td>
<td>Use of a bar terminal is not allowed.</td>
<td></td>
</tr>
</tbody>
</table>

2. **Wiring**

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

3. **Confirmations**

   After wiring, make sure the following:
   - All wiring is connected
   - There is no mistake in wiring

Note

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**
Figure 1: Single phase 3-wire system

Figure 2: Single phase 2-wire system

Figure 3: Single phase 2-wire (delta)

Figure 4: Single phase 3-wire system

Figure 5: Single phase 2-wire (star)

Figure 6: Single phase 2-wire system: With VT

---

### Wiring Diagrams (Continued)

#### Single phase 3-wire system

- **Optional Plug-in Module:** ME-4210-SS96
  - Analog output CH1
  - Analog output CH2
  - Analog output CH3
  - Analog output CH4
  - Pulse output1/Alarm output1
  - Pulse output2/Alarm output2
  - Digital input

- **Optional Plug-in Module:** ME-0040C-SS96
  - CC-Link Communication
  - Protective Bonding
  - DC24V

- **Optional Plug-in Module:** ME-0052-SS96
  - DC24V
  - DO1
  - DO2
  - D11, D12, D13, D14, D15, are connected inside.

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

- **Optional Plug-in Module:** ME-0000BU-SS96
  - SD CARD

---

### 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 ( grounded) 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.

---

1. Auxiliary power supply: 100-240VAC or VDC
2. Fuse: 0.5A
3. When the MODBUS® RTU unit at the destination does not have an SG terminal, it is unnecessary to connect the SG terminal.
4. For low-voltage circuits, secondary-side grounding of instrument-use voltage/current transformers is not required.
5. Connection to NC terminal is prohibited.
6. CC-Link transmission lines are small signal circuits: separate from strong electrical circuits by a distance of 10cm or more, or at least 30cm or more if laid in parallel over a long distance.
7. Insufficient grounding may cause erroneous operation.
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 line. Normal data transmission cannot be guaranteed if used at the same time.
9. Connection to NC terminal is prohibited.
10. Do not connect any terminal or RJ45 connector in the live state.

---

1. Auxiliary power supply: 100-240VAC or VDC
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9. Connection to NC terminal is prohibited.
10. Do not connect any terminal or RJ45 connector in the live state.
Wiring Diagrams (Continued)

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.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power lines under 600V/600A</td>
<td>More than 30cm</td>
</tr>
<tr>
<td>Other power lines</td>
<td>More than 60cm</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Phase/Wire</th>
<th>Connection</th>
<th>Rated voltage</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three phase 4-wire</td>
<td>Star</td>
<td>Max. 277VAC (L-N)/480VAC(L-L)</td>
<td>Figure 1</td>
</tr>
<tr>
<td>Three phase 3-wire</td>
<td>Delta</td>
<td>Max. 220VAC (L-L)</td>
<td>Figure 2</td>
</tr>
<tr>
<td></td>
<td>Star</td>
<td>Max. 440VAC (L-L)</td>
<td>Figure 3</td>
</tr>
<tr>
<td>Single phase 3-wire</td>
<td>–</td>
<td>Max. 220VAC (L-L)</td>
<td>Figure 4</td>
</tr>
<tr>
<td>Single phase 2-wire*</td>
<td>Delta</td>
<td>Max. 220VAC (L-L)</td>
<td>Figure 5</td>
</tr>
<tr>
<td></td>
<td>Star</td>
<td>Max. 440VAC (L-L)</td>
<td>Figure 6</td>
</tr>
</tbody>
</table>

* 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.
**Related Products**

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

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

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

**Automatic Transmission of Data Collected, Mail Notifications and Contact Output**
Users are notified of changes in energy, facilities, etc. via e-mail and alarms. Energy management targets and status monitoring of entire factories and buildings help ensure that problems onsite are detected without fail.

- 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, CO₂ 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.

**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.

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**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.).

**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

<table>
<thead>
<tr>
<th>Auxiliary power supply</th>
<th>Instrument ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>100~240VAC (+15%)</td>
<td>Voltage</td>
</tr>
<tr>
<td>100~240VDC (−30%, +15%)</td>
<td>Three phase, 4-wire: Max. 277/480VAC</td>
</tr>
<tr>
<td></td>
<td>Three phase, 3-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC</td>
</tr>
<tr>
<td></td>
<td>Single phase, 3-wire: Max. 220/440VAC</td>
</tr>
<tr>
<td></td>
<td>Single phase, 2-wire: Delta connection: Max. 220VAC, Star connection: Max. 440VAC</td>
</tr>
<tr>
<td></td>
<td>Current</td>
</tr>
<tr>
<td></td>
<td>5A/1A</td>
</tr>
<tr>
<td></td>
<td>Frequency</td>
</tr>
<tr>
<td></td>
<td>50-60Hz (dual use)</td>
</tr>
</tbody>
</table>

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

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:
  1. Check for damage to the product
  2. Check for display malfunctions (e.g., does not respond to input)
  3. Check for loose installation or terminal block wire connections
  4. Check 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.

\[
\text{\includegraphics[width=0.5\textwidth]{symbol.png}}
\]

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.

\[
\text{\includegraphics[width=0.5\textwidth]{caution.png}}
\]

- 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.
Safety Tips: Be sure to read the instruction manual fully before using this product.

Precautions Before Use

- Please consult with a Mitsubishi Electric representative when considering the application of products presented in this catalogue with machinery or systems designed for specialized use such as nuclear power, electrical power, aerospace/outer space, medical, or passenger transportation vehicles.
- Mitsubishi Electric Corporation shall not be liable, to the customer or equipment user, for:
  1) Any damage found not to be attributable to a Mitsubishi Electric product.
  2) The loss of opportunity or profits for the customer or user caused by any fault in a Mitsubishi Electric product.
  3) Damage, secondary damage or accident compensation resulting from special factors regardless of whether or not such factors could be predicted by Mitsubishi Electric.
  4) Damage to products of other companies and/or guarantees relating to other services.