One Meter Works for Both
Energy Saving and Power Quality Surveillance

High accuracy: 0.2 %*
Harmonic measurement*
Simple demand management*
Unbalanced measurement*

*Advanced type
0.2 % accuracy, Advanced type debuted!

Multi-function power meter featuring a simple demand management and power quality surveillance function in addition to the energy saving

KW9M series

KW9M Advanced type
- Demand management (compliant with the IEC standard)
- Harmonic measurement
- Total Harmonic Distortion (THD) measurement
- Unbalanced current and voltage measurement

KW9M Standard type
- Energy Saving
  - * Free of charge software KW Watcher

* Current and voltage measurement accuracy of the advanced type.
  Active power: Class 0.5S (IEC62053-22)

Energy Saving
(Standard type)

Demand Management and Power Quality Surveillance
(Advanced type)

Fields

Energy-saving through demand management (compliant with the IEC standard)
- Power station
- Infrastructure (Freeway, railway station · facility, etc)
- Public facilities

Demand Management and Power Quality Surveillance
(Advanced type)

Fields

Energy-saving through demand management (compliant with the IEC standard)
- Power station
- Infrastructure (Freeway, railway station · facility, etc)
- Public facilities

Applications

Energy-saving through demand management (compliant with the IEC standard)
- Surveillance and improving power quality
- Preventive maintenance of power equipment

...
Useful Functions

Multi-Function Power Meter
Eco-POWER METER® KW9M SERIES

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Function 1

Demand measuring function compliant with IEC61557-12 effective for energy saving

* 30-min demand method is also selectable for use in Japan.

IEC demand (Sliding block interval and Fixed block interval)

Users set the time span for demand calculation to an arbitrary value between 1 to 60 minutes (in increments of one minute). The average power demand within the set span is calculated at the end of the span. [The demand values of active, reactive, apparent, active (export), and reactive (export) power are calculated.]

- Sliding block interval method
  The next time span starts "n" minutes later. (Value "n" is arbitrarily set by users.)

- Fixed block interval method
  The next time span starts after completion of the current span.

System configuration

Watt-hour meter
Pulse measurement
Pulse detector

On-screen display and more intense flashing

Alarm output (Pulse output)
KW9M Advanced type

RS485

For onsite surveillance
- Light up an alarm lamp
- When demand exceeds limit value, alarm signals by a buzzer, graded flashing lights, etc.

For remote surveillance
- ON/OFF demand status is informed through RS485 communication

* Also ready for CT inputs (electric power measurement)

Function 2

Harmonic measurement (Advanced type)

Inverter equipment and fluorescent lighting fixtures are harmonic sources and can have adverse effects on precision equipment, thereby causing it to malfunction.

Fundamental wave
4th
3rd

THD measurement
Install a harmonic filter for protection

Freeze

OK

Inverter equipment

Harmonic generation

Motor equipment

Unbalanced voltage measurement

Adjust the load at each phase to eliminate between phases unbalance

OK

Unbalanced

Motor equipment

Balanced

Losses due to heat generation
Halved life

Function 3

Improvement of between phases unbalance (Advanced type)

If there is an unbalanced load due to a V-connected transformer or a heater, a voltage imbalance occurs between phases, and the motor torque becomes insufficient, causing a rise in heat or reduction in product life.

S
R
T

Balanced

Unbalanced
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Feature 1
Large-screen LCD with backlight clearly displays the electric power of each phases and their total on one screen.

Feature 2
Capable of displaying small currents of 1 mA or above. This allows for the monitoring of standby power consumption, which helps energy saving.

Feature 3
Capable of simultaneously measuring up to three circuits in a single phase two-wire system of same power supply. The advanced type is also capable of N-phase measurement and electric leakage detection using the fourth CT.

Feature 4
Equipped with input and output terminals (Advanced type).

Feature 5
Various log functions available (Advanced type)

<table>
<thead>
<tr>
<th>Item</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement max. value for each month</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Measurement min. value for each month</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>(with time stamp)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. demand value (active power, reactive power, apparent power, export active power, export reactive power) (with time stamp)*</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Voltage</td>
<td>Up to 10</td>
<td>Up to 10</td>
</tr>
<tr>
<td>Frequency</td>
<td>Up to 10</td>
<td>Up to 10</td>
</tr>
<tr>
<td>Unbalanced current</td>
<td>Up to 10</td>
<td>Up to 10</td>
</tr>
<tr>
<td>Unbalanced voltage</td>
<td>Up to 10</td>
<td>Up to 10</td>
</tr>
<tr>
<td>Power quality* (with time stamp for happening date and period)</td>
<td>Up to 10</td>
<td>Up to 10</td>
</tr>
<tr>
<td>Voltage interruption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under current</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Time stamps and power quality data can be confirmed via communication. They are not displayed.

Feature 6
Data can be made visualization by connecting the meter to DLL* and logging the data. Alarms can be e-mailed to mobile phones or other equipment.

* DLL is the abbreviation for Data Logger Light.

Feature 7
You can measure power with a direct connection to an already-installed large-capacity general-purpose CT (secondary side 1 A / 5 A type).

The measuring accuracy of the Eco-POWER METER® does not take the CT error into account. Other Eco-POWER METER® series (except AKW8115) need to use two CTs for measurement. KW9M is ready for direct input from only one CT, allowing higher accuracy measurements than with other Eco-POWER METER® series.
**Application Example**

Multi-Function Power Meter

Eco-POWER METER® KW9M SERIES

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**Example of a comprehensive solution for the entire factory**

1F Factory area
- Distribution board (for power system)
- Control panel
- Production equipment (large size)
- Motor pump, Blower and Fan heater

2F Office area
- Distribution board (for lighting system)
- Motor pump, Blower and Fan heater

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**Free visualization software for supporting energy management**

Power consumption analysis enhances equipment operation efficiency.

KW Watcher can be downloaded, free of charge, from our website. *You can also check the required operating environments.

Free software to create graphs from data collected by DLL for energy management

- Cumulative bar charts by equipment and pie charts
- Comparison graphs by time and equipment
- Numeric display function
- Auto graph updating function

*KW Watcher* cannot simultaneously display values of three phases in graphs. (Up to two graphs for comparison can be displayed.)
Multi-Function Power Meter
Eco-POWER METER® KW9M SERIES

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Specifications

[Box: ORDER GUIDE]

■ OVERVIEW OF FUNCTIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active power</td>
<td>Each phase and Total (Import, Export)</td>
<td>—</td>
</tr>
<tr>
<td>Reactive power</td>
<td>Each phase and Total (Import, Export)</td>
<td>—</td>
</tr>
<tr>
<td>Apparent power</td>
<td>Each phase</td>
<td>—</td>
</tr>
<tr>
<td>Power demand</td>
<td>—</td>
<td>IEC61557-12 demand</td>
</tr>
<tr>
<td>Active electric energy</td>
<td>Each phase and Total (Import, Export)</td>
<td>—</td>
</tr>
<tr>
<td>Apparent electric energy</td>
<td>Each phase and Total</td>
<td>—</td>
</tr>
<tr>
<td>Current</td>
<td>—</td>
<td>Total (except N-phase)</td>
</tr>
<tr>
<td>Unbalanced current</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Current harmonics</td>
<td>—</td>
<td>Each phase (2nd to 31st harmonics)</td>
</tr>
<tr>
<td>Current demand</td>
<td>—</td>
<td>Each phase current demand</td>
</tr>
<tr>
<td>Voltage</td>
<td>Line voltage (each line and average), Phase voltage (each phase and average)</td>
<td>—</td>
</tr>
<tr>
<td>Unbalanced voltage</td>
<td>—</td>
<td>Total</td>
</tr>
<tr>
<td>Voltage THD</td>
<td>—</td>
<td>Line and Phase voltage</td>
</tr>
<tr>
<td>Voltage harmonics</td>
<td>—</td>
<td>Line and Phase voltage (2nd to 31st harmonics)</td>
</tr>
<tr>
<td>Power factor</td>
<td>Each phase and Average</td>
<td>—</td>
</tr>
<tr>
<td>Frequency</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Pulse count (integral pulse)</td>
<td>—</td>
<td>2 points</td>
</tr>
<tr>
<td>Temperature</td>
<td>Ambient temperature</td>
<td>—</td>
</tr>
<tr>
<td>Calendar</td>
<td>Internal clock</td>
<td>—</td>
</tr>
</tbody>
</table>

■ MEASUREMENT ITEMS

By Type

- **Instantaneous power**
  - Active power: kW, Reactive power: kVAR, Apparent power: kVA
- **Integral power (import)**
  - Active: kW, Reactive: kVAR, Apparent: kVA
  - Minimum: 0.000 to 99999, Maximum: 100000
- **Integral power for each time zone (4-zones, import)**
  - Active: kW, Reactive: kVAR, Apparent: kVA
  - Minimum: 0.000 to 9999999.9, Maximum: 100000000
- **Integral power (export)**
  - Active: kW, Reactive: kVAR, Apparent: kVA
  - Minimum: 0.000 to 9999999.9, Maximum: 100000000
- **Current**
  - A: Standard: 0.000 to 9000.0
  - A: Advanced: 0.000 to 99999
  - Minimum: 0.000, Maximum: 99999.9
- **Voltage (Phase and line voltage)**
  - Minimum: 0.000 to 99999, Maximum: 99999.9
- **Power factor**
  - Minimum: 0.000 to 1.000, Maximum: 99999
- **Frequency**
  - Minimum: 0.000 to 99.99, Maximum: 9999999.9
- **Pulse count value**
  - Minimum: 0.000 to 999999999, Maximum: 1000000000
- **Power conversion value**
  - Total: 0.000 to 999999999, Minimum: 0.000, Maximum: 999999999
- **Temperature**
  - Maximum: 0.000 to 100.0
- **Calendar**
  - January 1, 2000 to December 31, 2099

Note: "Display data range" is the range to be able to indicate with the main unit display, it is not a range that can be measured.

■ MEASUREMENT ITEMS

Power quality (Only advanced type)

- **Unbalanced current**
  - Minimum: 0.000 to 99999, Maximum: 100000
- **Unbalanced voltage**
  - Minimum: 0.000 to 99999, Maximum: 100000
- **Current THD (total harmonic distortion)**
  - Minimum: 0.000 to 400.00, Maximum: 999999.9
- **Voltage THD (total harmonic distortion)**
  - Minimum: 0.000 to 400.00, Maximum: 999999.9
- **Voltage harmonics (2nd to 31st)**
  - Phase: Minimum: 0.000 to 400.00, Maximum: 999999.9
  - Line: Minimum: 0.000 to 400.00, Maximum: 999999.9

Demand measurement (Only advanced type)

- **Present demand**
  - Active kW, Reactive kVAR, Apparent kVA

■ MAIN UNIT SPECIFICATIONS

- **Type**
  - Standard
  - Advanced
- **Supply voltage range**
  - 85 to 264 V AC
  - 100 to 300 V DC
- **Rated frequency**
  - 50/60 Hz
- **Nominal power consumption**
  - 5 VA approx. (240 V AC at 25 °C 77 °F)
  - 7 VA approx. (240 V AC at 25 °C 77 °F)
- **Inrush current**
  - 30 A or less (240 V AC/DC at 25 °C 77 °F)
- **Allowable momentary power-off time**
  - 10 ms
- **Ambient temperature**
  - Accuracy guarantee: −10 to +55 °C (14 to 131 °F)
  - Operation: −25 to +55 °C (−14 to 131 °F)
- **Ambient humidity**
  - 30 to 85 % RH (20 °C 68 °F) non-condensing
- **Breakdown voltage (initial)**
  - Between the insulated circuits: 1300 V ± 5 %
  - Between the insulated circuits: 960 V ± 5 %
- **Breakdown voltage (final)**
  - Between the insulated circuits: 1300 V ± 5 %
  - Between the insulated circuits: 960 V ± 5 %
- **Insulation resistance (initial)**
  - Between the insulated circuits: 100 MΩ or more
- **Vibration resistance**
  - 10 to 150 Hz (7.5 minutes/cycle)
  - Single amplitude: 0.075 mm 0.0030 in (1 h on 3 axes)
- **Shock resistance**
  - Minimum: 294 m/s² (10 g)
  - (after passing 48-hour, at 23 °C 73.4 °F)
- **Display method**
  - LCD with backlight
- **Display updating time**
  - 100 ms
- **Power failure memory method (when power OFF)**
  - Internal memory (overwrite 10% or more)
- **Degree of protection**
  - Freq.: IP51, Back: IP20
  - From January 1, 2000 00:00:00 to December 31, 2099 23:59:59
  - About 1 month (back-up by secondary battery) (after passing 48-hour, at 23 °C 73.4 °F)
- **Sea level altitude**
  - Under 2,000 m 6,562 ft
- **Pollution degree**
  - II
- **Dimensions WH/D**
  - 96 x 96 x 56 mm 3.78 x 3.78 x 2.20 in
  - 96 x 96 x 68 mm 3.78 x 3.78 x 2.68 in
- **Weight**
  - 450 g approx.
  - 480 g approx. (with secondary battery)
Specifications

■ MEASUREMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured data</td>
<td>AC sine</td>
<td></td>
</tr>
<tr>
<td>Phase/Wire system</td>
<td>Single-phase two-wire (IP2), max. 3-circuit, Single-phase three-wire (IP3), Three-phase three-wire (IP3) and Three-phase four-wire (IP4) (Common)</td>
<td></td>
</tr>
<tr>
<td>Applicable power system</td>
<td>100 V system, 200 V system and 400 V system</td>
<td></td>
</tr>
<tr>
<td>Measured frequency</td>
<td>50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Sampling rate</td>
<td>1.024 MHz (1 μs approx.)</td>
<td>1.024 MHz (1 μs approx.)</td>
</tr>
<tr>
<td>Voltage</td>
<td>100 ms</td>
<td>100 ms</td>
</tr>
<tr>
<td>Impedance</td>
<td>2 MD or more (L-N: V1/V2/V3/Vn)</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.2 VA approx.</td>
<td>(L-N: V1/V2/V3/Vn)</td>
</tr>
<tr>
<td>Resolution</td>
<td>±0.1%</td>
<td></td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>0.5 %</td>
<td>0.2 % for 2-phase voltage of IP3W, 3-1 voltage of IP3MP, 3-1 voltage of IP3W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.2 VA approx.</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>±0.5 % for 2-phase voltage of IP3W (with CT)</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>±1.0 % for 2-3 (N), phase of 3IP2W (with CT)</td>
<td>±0.5 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.2 VA approx.</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>±0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>±1.0 %</td>
<td>±0.5 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Power</td>
<td>±0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Voltage</td>
<td>±0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>±5.0°C ±41°F (after ambient temperature correction with setting mode)</td>
<td>±5.0°C ±41°F (after ambient temperature correction with setting mode)</td>
</tr>
<tr>
<td>Power</td>
<td>±0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Voltage</td>
<td>±0.5 %</td>
<td>±0.2 % for pulse of 3IP2W, and line voltage of IP3W.</td>
</tr>
<tr>
<td>Accuracy (Note 1)</td>
<td>±10 W/3,600 sec x 1 pulse/sec = 0.0027</td>
<td>±10 W/3,600 sec x 1 pulse/sec = 0.0027</td>
</tr>
</tbody>
</table>

Note: 1) If the pulse output unit is set to output one pulse or more per second, the Eco-POWER METER® cannot correctly output pulses.
2) If the pulse output OFF time is set too short, count errors by connected counters, PLCs (Programmable Logic Controllers) may occur.

■ OUTPUT SPECIFICATIONS Only Advanced type

<table>
<thead>
<tr>
<th>Number of output point</th>
<th>2 points</th>
<th>*Insulate between output terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation method</td>
<td>PhoxMODS relay</td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>1a</td>
<td></td>
</tr>
<tr>
<td>Output capacity</td>
<td>100 mA, 30 V AC/DC</td>
<td></td>
</tr>
<tr>
<td>Output mode (O/TOUT2)</td>
<td>Pulse by integral power</td>
<td>Output by alarm or events</td>
</tr>
<tr>
<td>Pulse output by integral power</td>
<td>0.0001 kWh / 0.001 kWh / 0.1 kWh / 1 kWh / 10 kWh / 100 kWh</td>
<td></td>
</tr>
<tr>
<td>Alarm output</td>
<td>Stand-by power alarm / Under voltage alarm / Over voltage alarm / Power interruption alarm / Under current alarm / Over current alarm / Active power alarm / Reactive power alarm / Apparent power alarm / Power factor alarm / Over voltage alarm / Voltage harmonic alarm / Current harmonic alarm / Voltage THD alarm / Current THD alarm / Unbalanced voltage alarm / Unbalanced current alarm / Power demand alarm / Current demand alarm / Counter output / Level output / Event output</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Self-reset (according to the setting)</td>
<td>Manual-reset</td>
</tr>
</tbody>
</table>

■ DEMAND MONITOR AND CONTROL SPECIFICATIONS Only Advanced type

<table>
<thead>
<tr>
<th>Demand type</th>
<th>Peak demand</th>
<th>Sliding block interval demand</th>
<th>Fixed block interval demand</th>
<th>Current demand</th>
<th>30-min demand</th>
<th>Demand monitor input type</th>
<th>Current transformer (CT) input</th>
<th>Integral pulse input (only 35-min demand)</th>
<th>(set with setting mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand measurement item</td>
<td>Present demand, Estimated demand (only 35-min demand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand calculate method (Note)</td>
<td>Additional method / Average method</td>
<td>set with setting mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand data update cycle</td>
<td>1 min.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand target value</td>
<td>Ratio of estimated demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saved data</td>
<td>Max. demand, 30 min. (fixed)</td>
<td>Max. demand, 35 min. (fixed)</td>
<td>Max. demand, 12 months (30 min.)</td>
<td>Max. demand</td>
<td>Max. demand</td>
<td>Max. demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time span synchronized method</td>
<td>Clock synchronized (Pulse input to IN1)</td>
<td>(set with setting mode)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal common input</td>
<td>IN1 (common to pulse input)</td>
<td>IN2 (common to pulse input)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse input condition</td>
<td>Pulse width</td>
<td>0 ms or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage / current</td>
<td>5 V DC / 10 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal common</td>
<td>Common (IN2: common to pulse input)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse input condition (IN2)</td>
<td>Pulse width</td>
<td>0 ms or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage / current</td>
<td>5 V DC / 10 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal common</td>
<td>Common (IN2: common to pulse input)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse input condition (IN2)</td>
<td>Pulse width</td>
<td>0 ms or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage / current</td>
<td>5 V DC / 10 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal common</td>
<td>Common (IN2: common to pulse input)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The time span can be arbitrarily set only for sliding block interval demand and fixed block interval demand.

■ COMMUNICATION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Interface</th>
<th>Conforming to RS485</th>
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<tbody>
<tr>
<td>Communication method</td>
<td>Half-duplex</td>
</tr>
<tr>
<td>Synchronous system</td>
<td>Synchronous communication method</td>
</tr>
<tr>
<td>Isolation status</td>
<td>Isolated with the internal circuits</td>
</tr>
<tr>
<td>Protocol</td>
<td>MEWTOCO MODBUS (RTU), DL/T645-2007 (Note 1) (select with setting mode)</td>
</tr>
<tr>
<td>Number of connected unit</td>
<td>99 (max.) (Note 2)</td>
</tr>
<tr>
<td>Transmission distance</td>
<td>1,200 m (Note 3)</td>
</tr>
<tr>
<td>Transmission speed</td>
<td>38,400, 19,200, 9,600, 4,800, 2,400, 1,200 bps (select with setting mode)</td>
</tr>
</tbody>
</table>

Note: 1) MEWTOCO is the protocol for PLC from Panasonic. DL/T645 is the China power meter standard. Only DL/T645-2007 is supported.
2) For RS485 converter on the computer side, we recommend SI-35 and SI-35USB (from LINE EYE Co., Ltd.) or when using 31-35, SI-35USB or PLC from our company (which can be connected up to 99 units), up to 99 can be connected. In case using this system with the other devices, up to setting mode, and transmission speed may be different according to using transmission line.
Multi-Function Power Meter

Eco-POWER METER® KW9M SERIES

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**Terminal wiring**

- **Be sure to wire correctly according to the terminal arrangement and wiring diagrams.**
- **Do not open the secondary side of CT while the primary side current is energized. Do not remove the terminal block while the primary side current of CT is energized. These actions may result in electric shock or CT breakdown.**
- **Do not turn on the power supply or input until all wiring is completed.**

**Specifications of terminal block A/B**

- **Screw size:** M2.0
- **Tightening torque:** 0.4 to 0.5 Nm

**Specifications of terminal block C**

- **Screw size:** M2.0
- **Tightening torque:** 0.2 to 0.25 Nm

**Recommended fuse:**

- **Time-lag fuse**
- **Rated current:** 2 A
- **Recommended breaker:** 3 to 15 A

---

**Panel mounting**

1) Remove the mounting clips from the unit.
2) Insert the unit from the front of the panel.
3) Install the mounting clips at the both side of the case and secure in place with the screws. (Tightening torque: 0.2 to 0.3 N m)

---

**Terminal arrangement**

- **Terminal block A (upper) 10P**
  - Functions:
    - L+: N-
    - AUX
    - Power supply
  - Terminal block C (middle) 8P (Only Advanced type)
    - OUT1 COM1 OUT2 COM2 IN1+ IN1- IN2+ IN2-
  - Terminal block B (lower) 8P
    - CT1 K CT2 K CT3 K CT1+ L CT2+ L CT3+ L CTn K
    - Measured current input

---

**Wiring diagrams**

- **Single-phase two-wire system**
- **Three-phase three-wire system**
- **Three-phase four-wire system**

---

**Dimensions**

(Unit: mm in)

- **Terminal block A (upper) 10P**
  - **Terminal number:**
    - 1 2 3 4 5 6 7 8 9 10
  - **Functions:**
    - L+: N-
    - AUX
    - Power supply
- **Terminal block B (lower) 8P**
  - **Terminal number:**
    - 1 2 3 4 5 6 7 8
  - **Functions:**
    - Measured current input

---

**Panel cut-out**

- **Dimensions:**
  - **Terminal block A:**
    - 3.622 ±0.020
  - **Terminal block B:**
    - 9.02 ±0.5
  - **Terminal block C:**
    - 3.583 ±0.016

---

**Mounting**

- **Panel cut-out**
  - **Dimensions:**
    - **Terminal block A:**
      - 3.622 ±0.020
    - **Terminal block B:**
      - 9.02 ±0.5
    - **Terminal block C:**
      - 3.583 ±0.016

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Please contact ............