

### FEATURES

- In addition to simple measurement of voltage, current, power and integrated electrical power, etc., output of alarm signal is possible using the “alarm setting”.
- 50 mm thickness
- Both screw and DIN rail installation (easy installation).
- Switchable between electrical power and electricity charge usage.
- Display of calculated CO<sub>2</sub> value possible.

#### Only AKW1111

- Direct input with 400 VAC system
- Three-phase four-wire system
- Power factor and frequency measurement
- Simultaneous power/pulse measurement

Compliance with RoHS Directive

## PRODUCT TYPES

### ■ Main unit

Product name	Phase and wire system	Operating power supply	Measured voltage input	Terminal type	Model number
KW1M Eco-POWER METER Standard type	Single-phase two-wire system Single-phase three-wire system Three-phase three-wire system Three-phase four-wire system*1	100 to 240 VAC, 50/60 Hz	100/200 VAC	Screw terminal (M3.5 “+/-” screw)*2 (M3 “+/-” screw)	AKW1110
	100/200/400 VAC (Select with setting mode)		AKW1111		

Notes: \*1. Three-phase four-wire system: for AKW1111 only

\*2. The M3.5 “+/-” screws are only for the operation voltage and voltage input terminals (P0, P1, P2, and P3) of AKW1111.

### ■ Dedicated current transformer (CT)

Rated primary current	Model number
5A/50A (common)	AKW4801C
100A	AKW4802C
250A	AKW4803C
400A	AKW4804C

Please order in accordance with the type of power distribution system you will be measuring.  
(Even if you will be using a secondary 5A CT, you will need an AKW4801C.)

### ■ Options

Product name	Descriptions	Model number
Mounting rail	Rail for holding DIN rail terminal socket	AT8-DLA1
Fastening plate	Plate for holding DIN rail	ATA4806
Mounting frame	Used for mounting in a panel	AKW1822

### ■ Tool and Software

Product name	Descriptions	Remark
KW Monitor*1 (Data collection software for Eco-POWER METER)	For parameter settings, editing of measurement values, and monitoring, etc.	You can download from our website (free of charge)*2
KW Watcher (Electric power monitoring software)	Please use in situations where Web Datalogger Unit (DLU)/Data Logger Light (DLL) and Eco-POWER METER are used together. For easy “visualization” of data collected in DLU or DLL	

Notes: \*1. KW Monitor only uses MEWTOCOL. You cannot use MODBUS (RTU) type.

\*2. Customer registration is required to download data.

### ■ Other tool

Product name	Descriptions	Remark
KW1M Eco-POWER METER User's manual (pdf)	Detailed explanation of Eco-POWER METER usage	You can download from our website (free of charge)*2



KW1M-H  
(SD card type)

### FEATURES

- In addition to simple measurement of voltage, current, power and integrated electrical power, etc., output of alarm signal is possible using the “alarm setting”.
- 50 mm thickness
- Both screw and DIN rail installation (easy installation).
- Switchable between electrical power and electricity charge usage.
- Display of calculated CO<sub>2</sub> value possible.
- Internal memory (Read by SD card)
- Built-in battery (for clock and log data backup)
- Addition of measurement items
  - Power factor, frequency, and pulse counter
  - Integrated electrical power by month/day/hour
  - Calendar timer function

Compliance with RoHS Directive

## PRODUCT TYPES

### ■ Main unit

Product name	Phase and wire system	Operating power supply	Measured voltage input	Terminal type	Model number
KW1M-H Eco-POWER METER SD card type	Single-phase two-wire system Single-phase three-wire system Three-phase three-wire system Three-phase four-wire system	100 to 240 VAC, 50/60 Hz	100/200/400 VAC (Select with setting mode)	Screw terminal (M3 “+/-” screw)	AKW1121

### ■ Dedicated current transformer (CT)

Rated primary current	Model number
5A/50A (common)	AKW4801C
100A	AKW4802C
250A	AKW4803C
400A	AKW4804C

Please order in accordance with the type of power distribution system you will be measuring.  
(Even if you will be using a secondary 5A CT, you will need an AKW4801C.)

### ■ Options

Product name	Descriptions	Model number
Mounting rail	Rail for holding DIN rail terminal socket	AT8-DLA1
Fastening plate	Plate for holding DIN rail	ATA4806
Backup battery	Used for memory backup function or clock function	AFPG804
Mounting frame	Used for mounting in a panel	AKW1822

### ■ Tool and Software

Product name	Descriptions	Remark
KW Monitor*1 (Data collection software for Eco-POWER METER)	For parameter settings, editing of measurement values, and monitoring, etc.	You can download from our website (free of charge)*2
KW View (Power display tool)	For KW1M-H You can then display the data as a graph by Eco-POWER METER data (electric power only). (1 hour units fixed)	
KW Watcher (Electric power monitoring software)	Please use in situations where Web Datalogger Unit (DLU)/Data Logger Light (DLL) and Eco-POWER METER are used together. For easy “visualization” of data collected in DLU or DLL	

Notes: \*1. KW Monitor only uses MEWTOCOL. You cannot use MODBUS (RTU) type.

\*2. Customer registration is required to download data.

### ■ Other tool

Product name	Descriptions	Remark
KW1M-H Eco-POWER METER User's manual (pdf)	Detailed explanation of Eco-POWER METER usage	You can download from our website (free of charge)*2

# KW1M/KW1M-H Eco-POWER METER (AKW1)

## MEASUREMENT ITEMS

Item		Unit	Data displayed range
Instantaneous electric power (Active)		kW	0.00 to 9999.99
Integrated electric power (Active)		kWh/MWh	0.00 to 9999.99kWh 0.00 to 9999999.99kWh (When 9-digit display)
Current	R current	A	0.0 to 6000.0
	S current* <sup>1</sup>	A	0.0 to 6000.0
	T current	A	0.0 to 6000.0
Voltage	R (RS) voltage	V	0.0 to 9999.9
	S (RT) voltage* <sup>1</sup>	V	0.0 to 9999.9
	T (TS) voltage	V	0.0 to 9999.9
Electricity charge* <sup>2</sup>		—	0.00 to 999999
Converted CO <sub>2</sub> value		kg-CO <sub>2</sub>	0.00 to 999999
Power factor* <sup>1</sup>		—	0.0 to 1.00 (Identify leading phase “—” or lagging phase) (Only in range of phase angle $\theta = -90^\circ$ to $+90^\circ$ )
Frequency* <sup>1</sup>		Hz	47.5 to 63.0
Hour meter	ON time	h (Hour)	0.0 to 99999.9
	OFF time	h (Hour)	0.0 to 99999.9
Pulse counter* <sup>1</sup>		—	0 to 999999

\*1. For AKW1110, AKW1121 only

\*2. Eco-POWER METER is designed chiefly for managing energy saving. It is not intended to be used for billing.

## SPECIFICATIONS

### ■ Main unit

Item	Specifications	
Rated operating voltage	100 to 240V AC	
Rated frequency	50/60Hz common	
Rated power consumption	AKW1110: 6 VA (240V AC at 25°C) / AKW1111, AKW1121: 8 VA (240V AC at 25°C)	
Allowable operating voltage range	85 to 264V AC (85% to 110% of rated operating voltage)	
Allowable momentary power-off time	10ms	
Ambient temperature	-10 to +50°C (-25°C to +70°C at storage)	
Ambient humidity	30 to 85%RH (at 20°C non-condensing)	
Breakdown voltage (initial)	Between the isolated circuits: 2000V for 1min	<ul style="list-style-type: none"> <li>• Outer edge (case) – all terminals</li> <li>• Insulated circuit</li> <li>- Operating power supply terminals – Analog input terminals*<sup>1</sup></li> <li>- Operating power supply terminals – Pulse input terminals*<sup>1</sup></li> <li>- RS485 – All other terminals</li> <li>- Pulse output terminals – All other terminals</li> </ul>
Insulation resistance (initial)	Between the isolated circuits: 100M $\Omega$ or more (measured with 500V DC)	
Vibration resistance	10 to 55Hz (1cycle/min) single amplitude: 0.375mm (1h on 3 axes)	
Shock resistance	Min. 294m/s <sup>2</sup> (5 times on 3 axes)	
Display method	LCD with backlight Upper section: Green, 4-digit, 16-segment, Letter height: 6.5 mm Lower section: Amber, 6-digit, 7-segment, Letter height: 7.5 mm	
Power failure memory method	EEP-ROM (more than 100,000 overwrite)	
Size	75 × 90 × 50 mm	
Weight	AKW1110 and AKW1111: approx. 170g, AKW1121: approx. 180g (without battery)	

\*1. Analog input terminals: No.3 to No.6 (for AKW1111), No.4 to No.6 (for AKW1110 and AKW1121)

Pulse input terminals: No.12 and No.13 (for AKW1111)

No Connection terminal (N.C.) is internally connected to the analog input circuit.

# KW1M/KW1M-H Eco-POWER METER (AKW1)

## ■ Power input specifications

Item		Specifications	
		AKW1110	AKW1111 and AKW1121
Phase and wire system		Single-phase two-wire, Single-phase three-wire, Three-phase three-wire (common)	Single-phase two-wire, Single-phase three-wire, Three-phase three-wire, Three-phase four-wire (common)
Input voltage	Rating	Single-phase two-wire: 0 to 220V AC (Line voltage) Single-phase three-wire: 0 to 110V AC (Phase voltage) Three-phase three-wire: 0 to 220V AC (Line voltage)	Single-phase two-wire: 0 to 440V AC (Line voltage) Single-phase three-wire: 0 to 220V AC (Phase voltage) Three-phase three-wire: 0 to 440V AC (Line voltage) Three-phase four-wire: 0 to 254V AC (Phase voltage)
	Allowable measurement voltage	Up to 120% of rated input voltage Single-phase two-wire: 0 to 264V AC (Line voltage) Single-phase three-wire: 0 to 132V AC (Phase voltage) Three-phase three-wire: 0 to 264V AC (Line voltage)	Single-phase two-wire: 0 to 528V AC (Line voltage) Single-phase three-wire: 0 to 264V AC (Phase voltage) Three-phase three-wire: 0 to 528V AC (Line voltage) Three-phase four-wire: 0 to 300V AC (Phase voltage)
	VT ratio	1.00 to 99.99 (Set with setting mode) *A Voltage transformer (VT) is required when measuring loads that exceed the rated input voltage (AKW1110 is 200 VAC and AKW1111 and AKW1121 are 440 VAC). (Please use a commercially available VT with rated secondary measurement voltage of 110 V.)	
Input current	Primary side rating	<In case using dedicated CT> 5 A/50 A/100 A/250 A/400 A (Select with setting mode) <In case using commercial CT with secondary side 5A> 1 to 4000 A (Set with setting mode) *Use a commercial CT with secondary side current of 5A when measure 400A or more. *Accuracy coverage: 10 to 100% of rated current of CT	
Special functions	Cut-off current	1.0 to 50.0%F.S. (Select with setting mode)	
	Cut-off voltage	Within 5% of rated voltage (within voltage value sought by rated voltage × 0.05 × VT ratio) (fixed)	
	Current threshold for hour meter	1.0 to 100.0%F.S.	
Accuracy (without error in CT and VT)	Indication accuracy	Instantaneous electric power Integrated electric power Voltage Current Electricity charge Calculated CO <sub>2</sub> value	±2.5% F.S. +1 digit (at 20°C, rated input, rated frequency, power factor 1) *Accuracy coverage: 10 to 100% of rated current of CT
		Hour meter	±0.01%+1digit (at 20°C), Monthly accuracy: ±260 sec. (for your reference) (In case power on start or current energizing: ±0.01%+1s+1 digit, at 20°C)
	Temperature characteristics	±1.5% F.S. /10°C +1 digit (Range of -10 to 50°C for rated input, power factor 1)	
	Frequency characteristics	±1.5% F.S. +1 digit (Frequency change±5% based on rated frequency, for rated input, power factor 1)	

## ■ Pulse input specifications (For AKW1111 and AKW1121)

Item		Specifications
Input mode		Addition (Fixed)
Max. counting speed		2kHz/30Hz (Select with setting mode)
Pulse input		Min. input signal width: 0.25ms (When 2kHz selected)/16.7ms (When 30Hz selected), ON : OFF ratio = 1 : 1
Input signal (at 20°C)		Contact/No contact (open collector) • Impedance when shorted: Max. 1kΩ • Residual voltage when shorted: Max. 2V • Impedance when open: Min. 100kΩ
Output mode		HOLD (Over count)
Pre-scale setting	Decimal point	Setting possible up to 3 digits after decimal point
	Range	0.001 to 100.000 (Select with setting mode)

## ■ Pulse output (transistor output) specifications

Item		Specifications
Number of output point		1 point
Insulation method		Optical coupler
Output type		Open collector
Output capacity		100mA 30V DC
Pulse width		Approx. 100ms
ON state voltage drop		1.5V or less
OFF state leakage current		100μA or less
Pulse output unit (Select with setting mode)	AKW1110	0.001/0.01/0.1/1/10/100 kWh/Power alarm (AL-P)/Current alarm (AL-C)
	AKW1111 and AKW1121	0.001/0.01/0.1/1/10/100 kWh/Power alarm (AL-P)/Current alarm (AL-C)/Standby power alarm (AL-S)/Counter (Cnt)

\* We recommend the setting of minimum unit for pulse output for measurement shown as below.

Output pulse: 4 pulse or less per 1sec.

Calculation method: (Pulse output unit: value of PL-P) > (Max. measured power [kW]) / (3600 [s] × 4 [pulse/s])

Note 1: Count errors may occur if pulse output unit is set so that 4 or more pulses are output per 1 second.

Note 2: The connected counter or PLC may cause count errors if the OFF time of the pulse output unit is short.

# KW1M/KW1M-H Eco-POWER METER (AKW1)

## ■ Communication specifications

Item		Specifications
Interface		Conforming to RS485
Protocol		MEWTOCOL/MODBUS (RTU) (selectable with setting mode)
Isolation status		Isolated with the internal circuit
Number of connected units		99 (max.)*2, *3
Transmission distance		1200m*1
Transmission speed		38400/19200/9600/4800/2400 bps (selectable with setting mode)
Transmission format	Data length	8bit/7bit (selectable with setting mode)*4
	Parity	Not available/Odd number/Even number (selectable with setting mode)
	Stop bit	1 bit (fixed)
Communication method		Half-duplex
Synchronous system		Synchronous communication method
Ending resistance		Approx. 120Ω (built-in)

\*1. Please check with the actual devices when some commercial devices with RS485 interface are connected. The number of connected devices, transmission distance, transmission speed may be different according to using transmission line.

\*2. For RS485 converter on the computer side, we recommend SI-35 and SI-35USB (from LINE EYE Co., Ltd.).

\*3. When using SI-35, SI-35USB or our PLC (which can be connected up to 99 units), up to 99 Eco-POWER METER can be connected. In case using this system with the other devices, up to 31 Eco-POWER METER can be connected.

\*4. With MODBUS (RTU) protocol, it works only with data length (8bit/7bit).

\* Modbus Protocol is a communications protocol developed for PLCs by Modicon Inc.

\*For RS485 communication and recommended cable, please refer to "PRECAUTIONS IN USING Eco-POWER METER".

## ■ Memory specifications of main unit (KW1M-H only)

Item		Specifications
File type 1 (instantaneous value)*5	Save cycle	60 min. (on the hour) (fixed)
	Save data	Instantaneous value: Integrated electric power, Instantaneous electric power, Current, Voltage, Power factor, Frequency, Pulse count value
	Save data amount	24 records per file (max. approx. 1.5 years worth of data)
File type 2 (difference value)*5	Save cycle	60 min. (on the hour) (fixed)
	Save data	Difference value: Integrated electric power, Pulse count value
	Save data amount	24 records per file (max. approx. 1.5 years worth of data)
File type 3 (instantaneous value detail)*5	Save cycle	Select among 1 min, 5 min, 10 min, 15 min, 30 min, or 60 min.
		Saved timing: When 1 min is selected: starts immediately after power is turned on When 5 min is selected: 00, 05, 10, 15, 20, 25, 30... min after the hour When 10 min is selected: 00, 10, 20, 30, 40, 50 min after the hour When 15 min is selected: 00, 15, 30, 45 min after the hour When 60 min is selected: 00 min after the hour
	Save data	Integrated electric power, Instantaneous electric power, Current, Voltage, Power factor, Frequency, Pulse count value
	Save data amount	Max. 7,200 records, Approx. 5 days (when save cycle is 1 min.)
Main unit display		Integrated electric power by month (latest data covering 1.5 year period)/Integrated electric power by day (latest data covering 1 month period)/Integrated electric power by hour (latest data covering 24 hours period)
Calendar timer function		Time accuracy; monthly accuracy: $\pm 240$ sec. (at $-10^{\circ}\text{C}$ )/monthly accuracy: $\pm 70$ sec. (at $25^{\circ}\text{C}$ )/monthly accuracy: $\pm 240$ sec. (at $50^{\circ}\text{C}$ )
Content of battery backup/Battery life*6		Time measurement and log data retained/Approx. 2 years (at ambient temperature $25^{\circ}\text{C}$ ) (During discontinuity)

\*5. In file types 1, 2, and 3, whether or not writing on SD card is conducted can be selected by each respective setting mode.

\*6. When the remaining battery level is low, the "BATT" display flashes. Replace the battery according to the battery replacement procedure. In addition, when the temperature of the main unit is high, the battery life decreases.

## ■ External memory specifications <SD card slot> (KW1M-H only)

Item	Specifications
Support media	SD card*7
Supported format standards	Compliant with SD and SDHC standards*8

\*7. Operation verified maker: Panasonic Corporation  
(SD/SDHC memory card: 2 GB, 4 GB, 8 GB)

\*8. To format SD cards, please download and use the formatting software available on the Panasonic website.  
[Panasonic website → Customer support → SD/SDHC card page → Software download list] [http://panasonic.jp/support/sd\\_w/download](http://panasonic.jp/support/sd_w/download)  
The file system on a SD card that was formatted using standard PC software does not comply with the SD card standard.

# KW1M/KW1M-H Eco-POWER METER (AKW1)

## DIMENSIONS (mm inch)

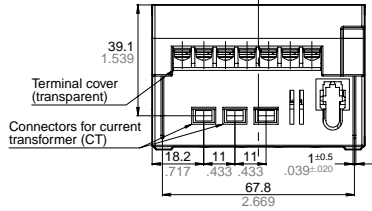
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://panasonic-electric-works.net/ac>

### CAD Data

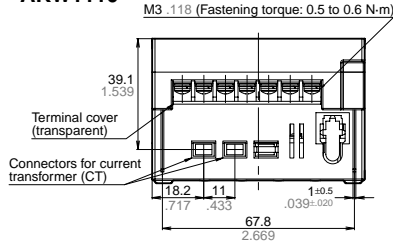
KW1M Standard type: AKW1110 and AKW1111  
KW1M-H SD card type: AKW1121

Tolerance:  $\pm 1.0 \pm 0.039$

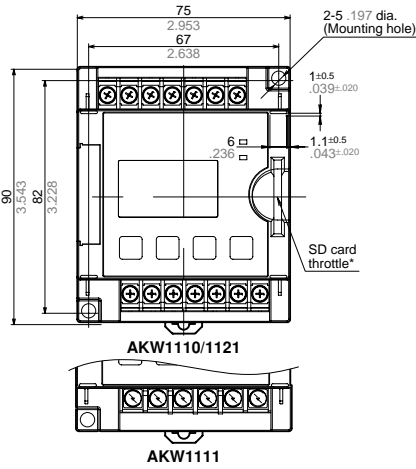
#### • AKW1111/AKW1121



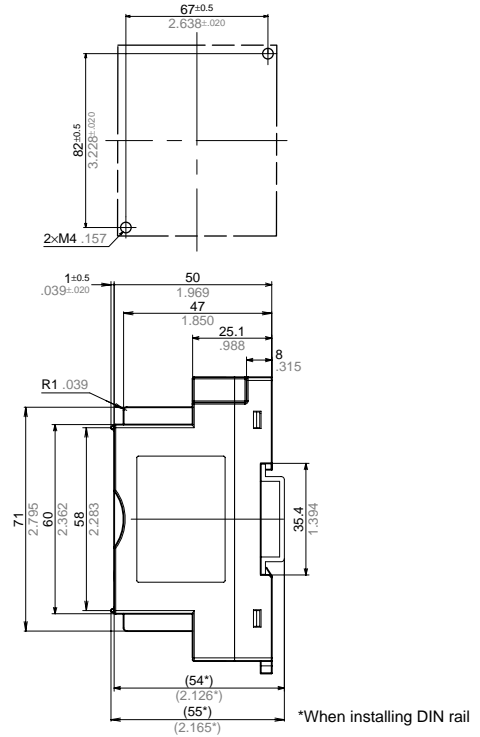
#### • AKW1110



\*SD card throttle only applies to SD card type KW1M-H.



#### Mounting hole dimensions (1:2)



## TERMINAL ARRANGEMENT AND WIRING DIAGRAMS

### ■ Terminal wiring

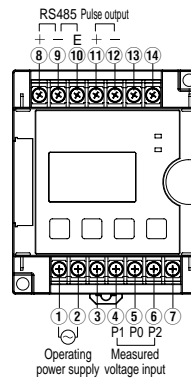
Be sure to wire correctly according to the terminal arrangement and wiring diagrams. After completing wiring, be sure to attach the terminal cover for safety reasons.

### ■ Terminal arrangement

#### • AKW1110

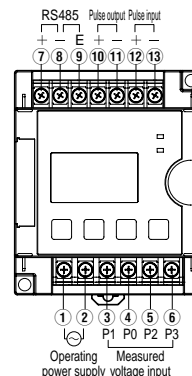
Function	Terminal No.	Function
Operating power supply	L (1)	(8) +
	N (2)	(9) -
	N.C. (3)	(10) E
Measured voltage input	P1 (4)	(11) +
	P0 (5)	(12) -
	P2 (6)	(13)*1
N.C.	(7)*1	(14)*1

\*1. (7), (13) and (14) terminals are connected internal to analog input circuit. Please do not use for wiring with daisy chain.



#### • AKW1111

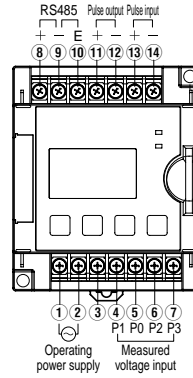
Function	Screw	Terminal No.	Screw	Function
Operating power supply	L	(1)	(7)	+
	N	(2)	(8)	-
Measured voltage input	P1	(3)	(9)	E
	P0	(4)	(10)	+
	P2	(5)	(11)	-
	P3	(6)	(12)	+
			(13)	-



# KW1M/KW1M-H Eco-POWER METER (AKW1)

## • AKW1121

Function	Terminal No.	Function
Operating power supply	L ①	RS485
	N ②	
N.C.	③	⑩ E
Measured voltage input	P1 ④	⑪ +
	P0 ⑤	⑫ -
	P2 ⑥	⑬ +
	P3 ⑦	⑭ -



## ⚠ The input voltage to each terminal is as follows. (AKW1111)

Terminal	Phase and wire system	Between terminals	Input voltage
			AKW1111
Operating power supply	Single-phase two-wire	①-②	100 to 240VAC (100-240V~) (Line voltage)
	Single-phase two-wire	③-④	0 to 440VAC (0-440V~) (Line voltage)
Measured voltage input	Single-phase three-wire	③-④-⑤	0 to 220VAC (0-220V~: 3W) (Phase voltage)
	Three-phase three-wire	③-④-⑤	0 to 440VAC (0-440V 3~) (Line voltage)
	Three-phase four-wire	③-④-⑤-⑥	0 to 254VAC (0-254V 3N~) (Phase voltage)

## ⚠ The input voltage to each terminal is as follows. (AKW1110 and AKW1121)

Terminal	Phase and wire system	Between terminals	Input voltage	
			AKW1110	AKW1121
Operating power supply	Single-phase two-wire	①-②	100 to 240VAC (100-240V~) (Line voltage)	
	Single-phase two-wire	④-⑤	0 to 220VAC (0-220V~) (Line voltage)	0 to 440VAC (0-440V~) (Line voltage)
Measured voltage input	Single-phase three-wire	④-⑤-⑥	0 to 110VAC (0-110V~: 3W) (Phase voltage)	0 to 220VAC (0-220V~: 3W) (Phase voltage)
	Three-phase three-wire	④-⑤-⑥	0 to 220VAC (0-220V 3~) (Line voltage)	0 to 440VAC (0-440V 3~) (Line voltage)
	Three-phase four-wire	④-⑤-⑥-⑦	—	0 to 254VAC (0-254V 3N~) (Phase voltage)

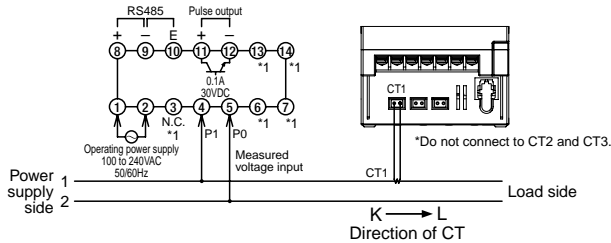
## ■ Wiring diagrams

### • AKW1110

#### Measure load of 100 to 200VAC system

##### • Single-phase two-wire system

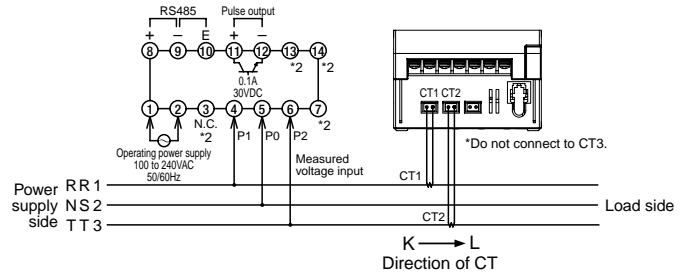
\*One CT is required.



\*1. Do not wire to ③, ⑥, ⑦, ⑬, ⑭ terminal. They are connected internal.

##### • Single-phase three-wire system/Three-phase three-wire system

\*Two CTs are required.

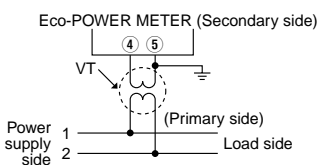


\*2. Do not wire to ③, ⑦, ⑬, ⑭ terminal. They are connected internal.

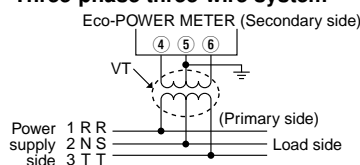
### When measuring a load with exceed rated input voltage

The voltage transformer (VT) is required when you measure a load with exceed rated input voltage (220 V AC system). Use commercial VT, those secondary rating is 110 V.

##### • Single-phase two-wire system



##### • Single-phase three-wire system/ Three-phase three-wire system



\*Grounding the secondary side of voltage transformer (VT) and current transformer (CT) is not necessary with low voltage circuit.

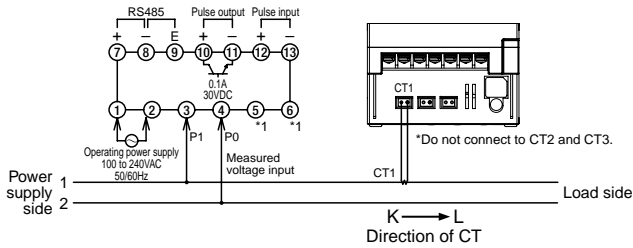
# KW1M/KW1M-H Eco-POWER METER (AKW1)

## • AKW1111

### Measure load of 100 to 200 VAC and 400 VAC system

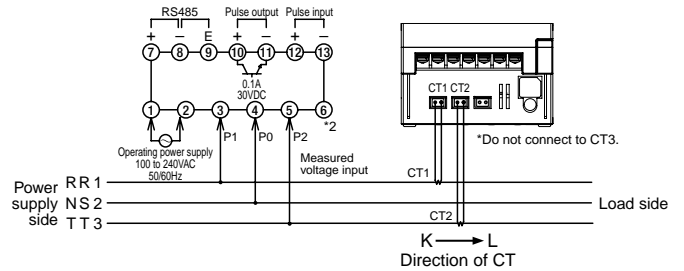
#### • Single-phase two-wire system

\*One CT is required.



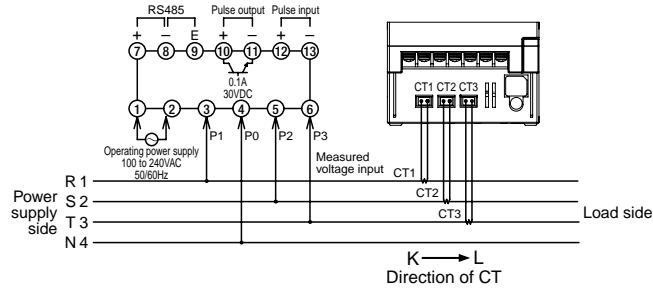
#### • Single-phase three-wire system/Three-phase three-wire system

\*Two CTs are required.



#### • Three-phase four-wire system

\*Three CTs are required.

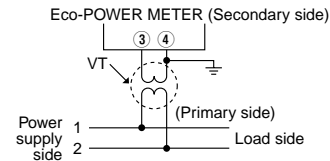


\*1. Do not wire to ⑤, ⑥ terminal. They are connected internal.  
\*2. Do not wire to ⑥ terminal. They are connected internal.

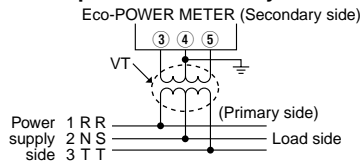
### When measuring a load with exceed rated input voltage

The voltage transformer (VT) is required when you measure a load with exceed rated input voltage (440 V AC system). Use commercial VT, those secondary rating is 110 V.

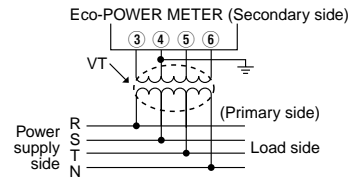
#### • Single-phase two-wire system



#### • Single-phase three-wire system/ Three-phase three-wire system



#### • Three-phase four-wire system



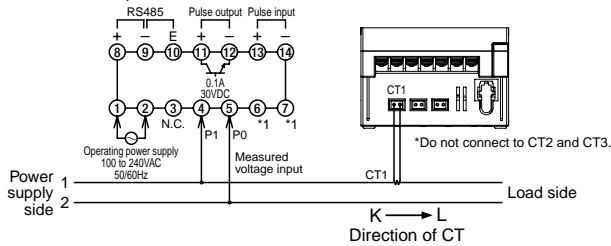
\*Grounding the secondary side of voltage transformer (VT) and current transformer (CT) is not necessary with low voltage circuit.

## • AKW1121

### Measure load of 100 to 200 VAC and 400 VAC system

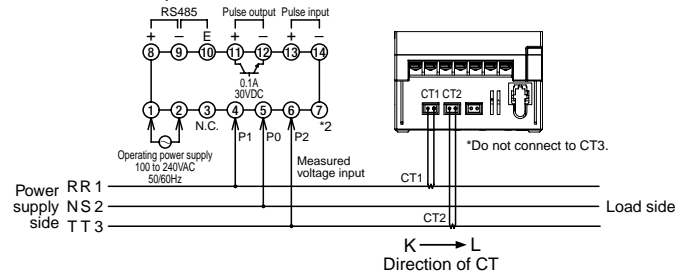
#### • Single-phase two-wire system

\*One CT is required.



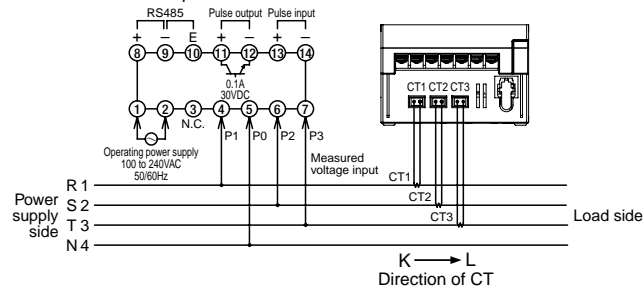
#### • Single-phase three-wire system/Three-phase three-wire system

\*Two CTs are required.



#### • Three-phase four-wire system

\*Three CTs are required.



\*1. Do not wire to ⑥, ⑦ terminal. They are connected internal.  
\*2. Do not wire to ⑦ terminal. They are connected internal.

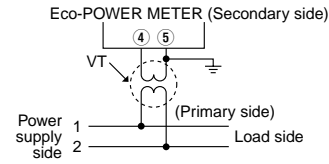


# KW1M/KW1M-H Eco-POWER METER (AKW1)

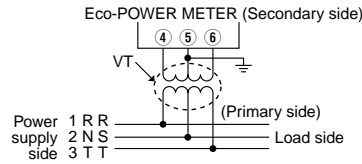
## When measuring a load with exceed rated input voltage

The voltage transformer (VT) is required when you measure a load with exceed rated input voltage (440 V AC system). Use commercial VT, those secondary rating is 110 V.

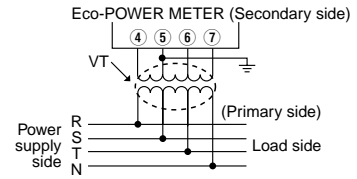
### • Single-phase two-wire system



### • Single-phase three-wire system/ Three-phase three-wire system



### • Three-phase four-wire system

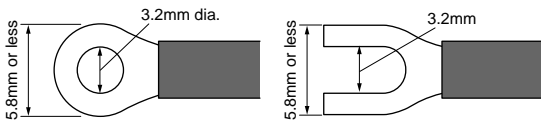


\*Grounding the secondary side of voltage transformer (VT) and current transformer (CT) is not necessary with low voltage circuit.

## ■ Caution for Wiring

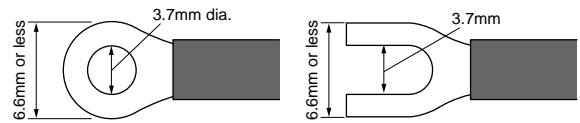
### • M3 screw: AKW1110 and AKW1121

(1) Terminal fastening torque should be 0.5 to 0.6N·m. In case of using a crimping terminal, use it with insulating sleeve applicable to M3 screw. (Refer to the below.)



### • M3.5 screw: AKW1111

(1) Terminal fastening torque should be approx. 1.0 N·m. In case of using a crimping terminal, with insulating sleeve applicable to M3.5 screw. (Refer to the below.)



(2) To protect the device, it is necessary to install power switch and circuit breaker in operating power supply circuit. And this has no built-in power switch, circuit breaker or fuse for measured voltage input parts. Therefore it is necessary to install them in the circuit near main unit.

(3) We recommend a wire with the cross section of 0.75 to 1.25 mm<sup>2</sup> for operating power supply line and measured voltage input line.

(4) Use fire resistant electrical wire (UL electrical wire, etc.)

## CAUTIONS FOR SAFETY

Please use correctly only after you have thoroughly read "User's Manual, Instruction Manual, and Catalog".