Panasonic® Installation instructions

KW2M-A Eco-POWER METER Main Unit

Read these instructions carefully for proper installation.
After installation, keep it in a safe place for reference when required.

For User's manual

You can download the user's manual from our website.
http://panasonic.net/id/pidsx/global

1. Before use

- Eco-POWER METER is designed chiefly to manage saving energy. It is neither intended nor can it be legally used for billing.
- Eco-POWER METER is designed to be used installing in a control panel.
- Please use Eco-POWER METER according to the specification described. Otherwise, it may malfunction or cause fire and an electric shock.
  - ・Connect Eco-POWER METER to the power supply in compliance with the rating.
  - ・Refer to the wiring diagram to ensure proper wiring for the power supply, input and output.
  - ・Use an electric wire applicable to the rated current.
  - ・Do not perform wiring or installation with a live line. It may also lead to circuit burnout or fire by way of the secondary CT side opening.
- Do not connect voltage input, current input, pulse input wires parallel to high-voltage or power cables and avoid using the same conduit. Use shielded wires as short as possible.
- Do not turn on the power supply or input until all wiring is completed.
- Do not use at secondary side circuit of inverter. It might cause exothermic heat or damage.
- If additional noise effects power supply line, voltage input line, current input line, incorrect measurements may result.
- Installation and wiring must be performed by expert personnel for electrical work or electric piping.
- Please wipe dirt of the main unit with soft cloth etc.When thinner is used, the unit might deform or be discolored.
- Do not add an excess power to the display. It might break the inner liquid crystal.

■For your safety, make sure to satisfy the following conditions.
- Overvoltage category:Ⅲ, Pollution degree 2
- Indoor use
- An ambient temperature of -10 to 50℃
- An ambient non-condensing humidity of 30 to 85%RH (at 20℃)
- Altitude of 2000m or less

■Do not use in the following environments.
- Where it will be exposed to direct sunlight
- Where inflammable or corrosive gas might be produced
- Where it will be exposed to excessive airborne dust or metal particles
- Where it will be exposed to water, oil or chemicals
- Where direct vibration or shock might be transmitted
- Where the place near high-voltage cable, power line or machineries which occurs the big switching serge.

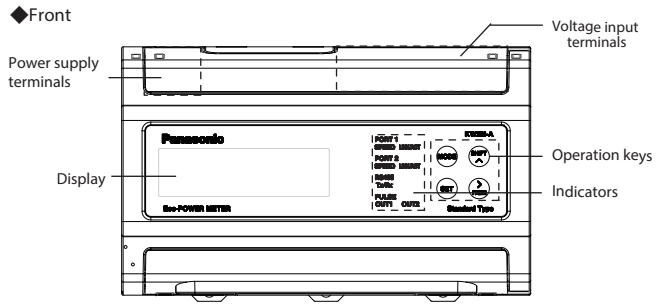
■Pursuant to the directive 768/2008/EC

Manufacturer : Panasonic Industrial Devices SUNX Co.,Ltd.
2431-1 Ushiyama-cho, Kasugai-shi, Aichi, 486-0901, Japan
Importer : Panasonic Electric Works Europe AG
Robert-Koch-Strasse 100, 85521 Ottobrunn, Germany
Contact for CE: Panasonic Marketing Europe GmbH Panasonic Testing Center
Winsbergring 15, 22525 Hamburg, Germany

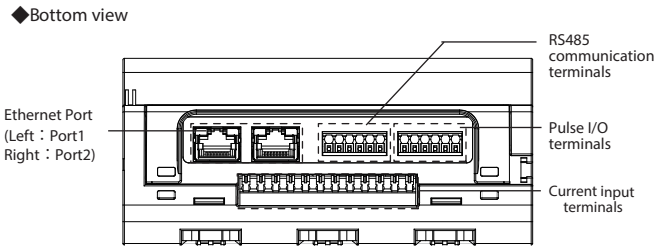
■This product has been developed / produced for industrial use only.

2. Parts Name

◆Front



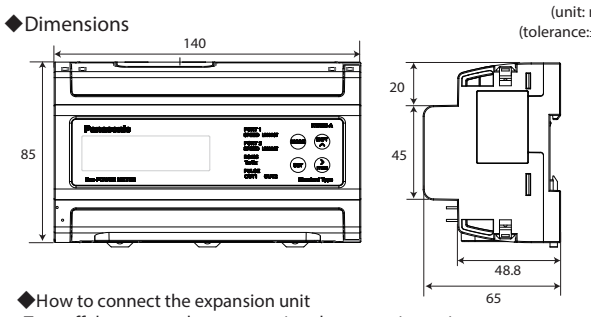
◆Bottom view



3. How to Mount

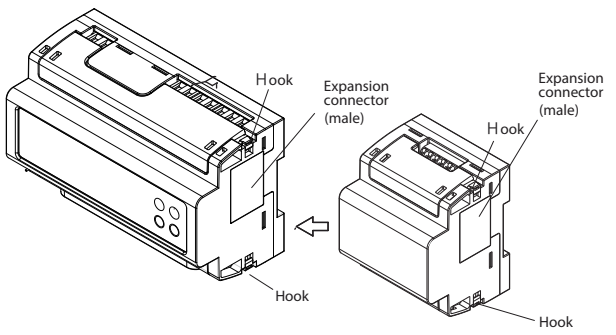
◆Dimensions

(unit: mm)
(tolerance:±1.0)



◆How to connect the expansion unit
- ·Turn off the power when connecting the expansion units.
- · Peel off connector label on the side before connecting.
- · (Do not peel off connector labels when not connecting.)
- · It expands by connecting each male connector to female connector on the each side.
- · After connecting, push the hooks into the unit to fix the expansion units.
- · Up to 3 expansion units can be connected per one main unit.

Caution) Communication will be stopped or the measurement data will be lost when the units are removed or connected with the power on.



4. Wiring

- Be sure to wire correctly according to the wiring diagrams.
- For supply voltage fuse protection, always protect the device with an IEC approved or UL listed CLASS CC 2A fuse. For the protecting the voltage measuring inputs, always protect the device with an IEC approved or UL listed 10A fuse, circuit breaker or applementary protector. This product has no built-in power switch, circuit breaker or fuse. Therefore it is necessary to install them in the circuit near this unit.
- Do not turn on the power supply or input until all wiring is completed.
- Never open the secondary circuit of CT under applying current to load, never remove the terminal block under applying current to load, it will cause electric shock or breakdown CT.

◆Terminal arrangement

Power supply terminals

Terminal number	1	2
Functions	L +	N —
	Power supply	

Voltage input terminals

Terminal number	1	2	3	4	5	6	7
Functions	V1	NC	V2	NC	V3	NC	Vn
	Measured Voltage	NC	Measured Voltage	NC	Measured Voltage	NC	Measured Voltage

⚠ The input voltage to each terminal is as follows.

Current input terminals

Terminal number	1	2	3	4	5	6	7	8	9	10	11	12
Functions	k	ℓ	k	ℓ	k	ℓ	k	ℓ	k	ℓ	k	ℓ
	CH1(CT1)		CH1(CT2)		CH1(CT3)		CH2(CT1)		CH2(CT2)		CH2(CT3)	
	Measured current(CH1)						Measured current(CH2)					

RS485 communication terminals

Terminal number	1	2	3	4	5	6
Functions	+	+	—	—	END	END

Pulse I/O terminals

Terminal number	1	2	3	4	5	6
Functions	+	—	+	—	+	—
	Pulse input		Pulse output(CH1)		Pulse output(CH2)	

⚠ The input voltage to each terminal is as follows.

Terminal	Phase and wire system	Terminal No.	Input voltage
Power supply	Single-phase two-wire	1 - 2	100～240VAC ［100～240V∿］
Measured voltage input	Single-phase two-wire	1 - 7	0～690VAC ［0～690V ∿］
	Single-phase three-wire	1 - 5 - 7	
	Three-phase three-wire	1 - 5 - 7	
	Three-phase four-wire	1 - 3 - 5 - 7	

◆Applicable wire (Crimp-type terminal is recommended.) ・Stripping length: 7 to 8mm
- ・Power supply/Measured voltage
  Screw type:M3
  Tightening torque: 0.5 to 0.6N・m
  Sectional area: single /stranded wire 0.13 to 6mm2(AWG26 to 12)
- ・for 2pcs.
  single/stranded wire 2pcs.×0.5 to 2.5mm2 (AWG20 to 12)
- ・Measured current (CT input)
  Push IN type
  Sectional area: single /stranded wire 0.13 to 1.5mm2(AWG24 to 16)
  * Use applicable wire according to the measured current.
- ・RS485 communication
  Push IN type
  Sectional area: single /stranded wire 0.13 to 1.5mm2(AWG24 to 16)
  * Use shielded wire for RS485 communication.
- ・Output/Input
  Push IN type
  Sectional area: single /stranded wire 0.13 to 1.5mm2(AWG24 to 16)

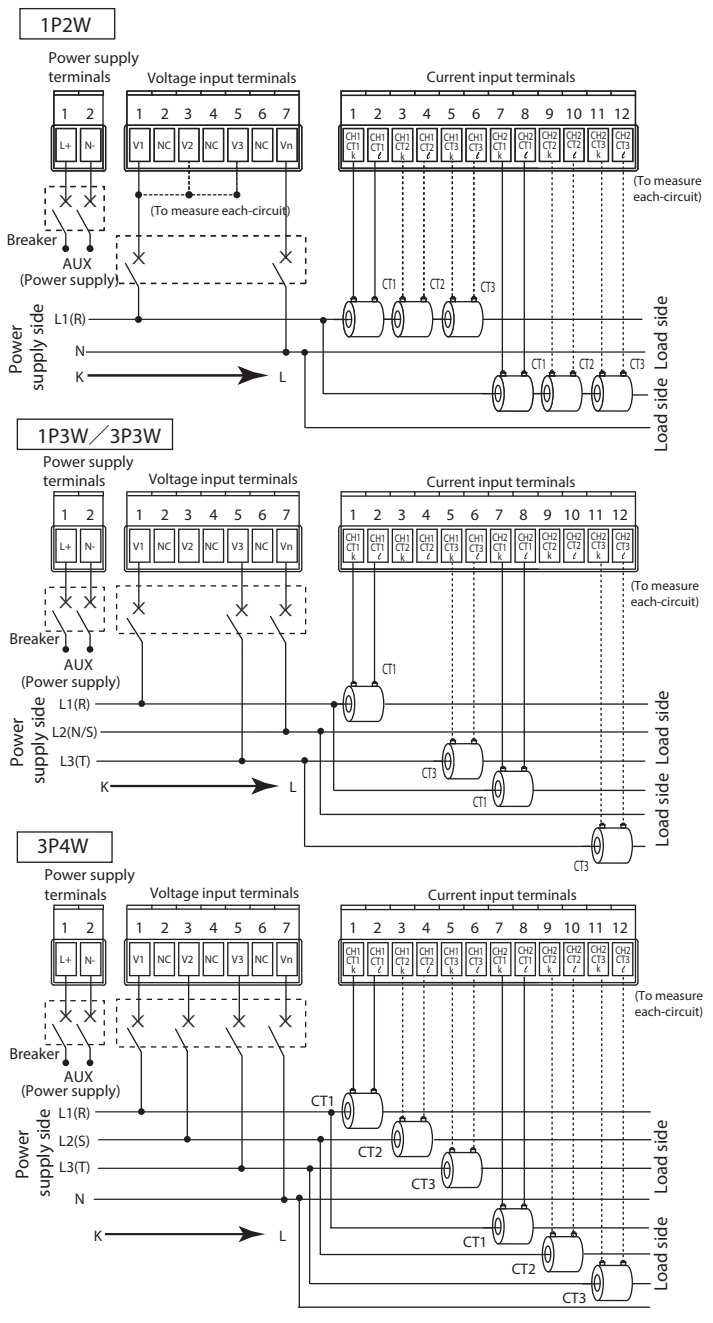
◆Applicable ferrules (by Weidmuller)

Wire size		0.75mm²	1.25mm²	2mm² ※
For 1pc.	Name	H0.75/14D GR	H1.5/14D SW	H2.5/15D BL
	Part number	9019040000	9019120000	9019160000
For 2pcs. ※	Name	H0.75/14D ZH GR	H1.5/16D ZH SW	
	Part number	9037410000	9037470000	

5. Wiring Diagram

- ・Recommended breaker: 3 -15A (IEC approved or UL listed)
- ・Recommended fuse: Time-lag fuse Rated current 2A (IEC approved or UL listed)

1P2W

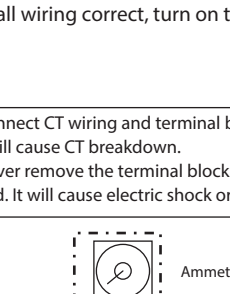


1P3W／3P3W

3P4W

⚠ Vn terminal should be connected to N-phase which is grounded.

◆When using VT(voltage transformer)



6. How to attach Current Transformer

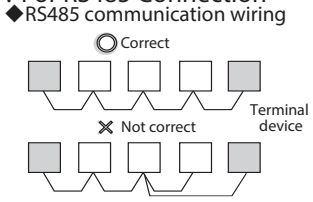
- ・Use CT that the secondary side current is 5A or 1A.
- ・One CT is needed when measuring 1-circuit of 1P2W. Two CTs are needed when measuring 1P3W/3P3W (4 CTs for 2-circuit). Three CTs are needed when measuring 3P4W (6 CTs for 2-circuit). Using all CTs for one unit should be the same.
- ・Use the applicable wire, or it might cause a breakdown, burnout or electric shock.
- ・When connecting CT, connect the secondary side to the terminal of the main unit first, and after that wire the primary side to a load electric wire. Incorrect order might cause an electric shock or break CT.
- ・The CT has polarity. Wire correctly according to the K and L marks. Wrong direction can’ t measure correctly.
- ・If there is some distortion by harmonic or waveform, it may not measure correctly. Please check with the actual system before adopts it.
- ・Separate the wiring (strong electric part) of the measured voltage input terminal (operating power supply terminal) from the CT cable. It may not satisfy the accuracy due to noise.

◆How to connect CT

(1) Power off the measured devices.
(2) Install applicable CT.
(3) Connect CT to the terminal block.
(4) After confirm all wiring correct, turn on the power of the load and KW2M-A.

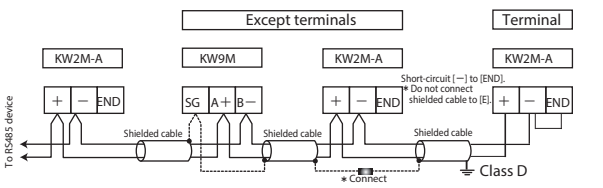
7. For RS485 Connection

◆RS485 communication wiring



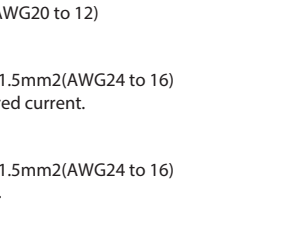
Connect terminating resistors to the both end of the communication line including a upper device.
Short terminal between [-] and [END] of Eco-POWER METER connected the end of RS485 line.

◆Connection of KW2M-A （2-wire） and KW9M （3-wire）



8. For Input Connection

◆Pulse input
- ・Contact input
  Use highly reliable metal plated contacts. Since the contact’s bounce time leads directly to error in the count value, use contacts with as short a bounce time as possible. In general, select 30 Hz for max. counting speed.
- ・Non-contact input (Transistor input)
  Connect with an open collector.
  Use the transistor with the following specifications.
  V_{CEO}=20V min. I_C=20mA min. I_{CBO}=6μA max.
  Use transistors with a residual voltage of less than 2V when the transistor is ON.



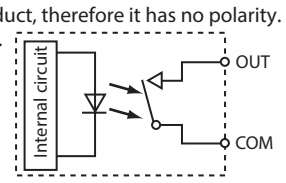
* Short-circuit impedance should be less than 1kΩ.
Open-circuit impedance should be more than 100kΩ.
Leak current in shorted is about 10mA.

- ・Input wiring
  Please wire up as short as possible by using a shielded wire or a metallic electric wire tube individually.

9. For Output Connection

◆PhotoMOS relay output
- ・PhotoMOS relay is mounted in this product, therefore it has no polarity.
- ・Wire up to 100m for output connection.

Output (rated capacity 30V AC/DC, 0.1A)



10. About Open Source Software

This product uses software including open source software.
For open source software, refer to following URL.
https://www3.panasonic.biz/ac/e/fasys/information/kw2m_license/index.jsp

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