

Panasonic

ideas for life

KW4M Eco-POWER METER

Simple Wattmeter

On the lookout for wasted electricity in buildings and plants



(DIN48x48 size)

For maintenance and control in applications involving energy saving and environmental protection

Integrated electrical energy

Voltage

Current

Electricity charge

Keeping a watchful eye.

Large display for increased visibility

Expanded basic functions

1 model supports 4 compact CTs

Supports 400 V AC power measurement *When using external voltage transformer

Eco-3 Brothers



Eco-COUNT METER



Eco-POWER METER



Eco-HOUR METER

KW4M Eco-POWER METER
ARCT1B256E '05.6

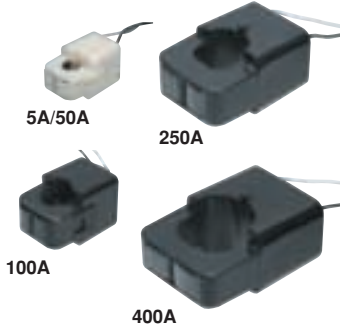
New

On the lookout for wasted electricity! KW4M Eco-POWER METER Features and Specifications

FEATURES



Dedicated CT



Supports 4 types of dedicated CT sensors to cover wide measuring range

Covers a wide measuring range with support for 4 types of CT (current transformer: sold separately). Also supports 5 A CT of secondary current input.
*4 types of dedicated CT: 5 A/50 A, 100 A, 250 A, and 400 A

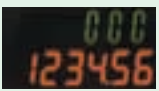
Support for 400 V AC power measurement

Capable of 100 V to 400 V AC power measurement.
(If 240 V AC or higher, use with external voltage transformer.)

Basic functions expanded for easier operation

- Instantaneous electrical power display is possible in addition to integrated electrical energy.
- For all power supplies each phase voltage and current display are possible.
- Built-in hour meter function.
- Ability to display an integrated measured power range of up to 9999.99 MWh.

Precise power surveillance is possible by being able to display down to two decimal places. Also, the display can be expanded from a 6-digit to a 9-digit display, making it possible to display up to 9999999.99 kW.



(9-digit display shown.)

- Built-in pulse input function (cannot be used when measuring power).

CT is 1/3 the size of our previous models to save space and install more easily.

A compact CT (current transformer) is used that is approximately 1/3 the size of previous models.

Easily connects to PLC

An RS485 communications port comes standard. Up to 99 units can be connected to a PLC (when using our recommended model).
Using MEWTOCOL as the protocol, it is easy to connect to a DLU (Web Datalogger Unit).

Easy operation with shortcut key



Letters are easy to read with 16-segment LCD

Instantaneous electrical power/Integrated electrical energy

Since "Instantaneous electrical power" can be displayed, you can instantly verify the power being used at the current time.

Current (L1/L2)

Voltage (1-2/2-3)

Electricity charge (yen/dollar/euro/yuan)
Charge display supports four currencies: yen, dollar, euro, and yuan.

Load time (ON/OFF)

Since an hour meter function is built in, you can measure the power-on time that is over or under the control current.

Count value/Preset value

A counter function is built in. By using this "pulse input", surveillance other than the electrical power is possible of the integrated energy in the air or a gas.

PRODUCT TYPES

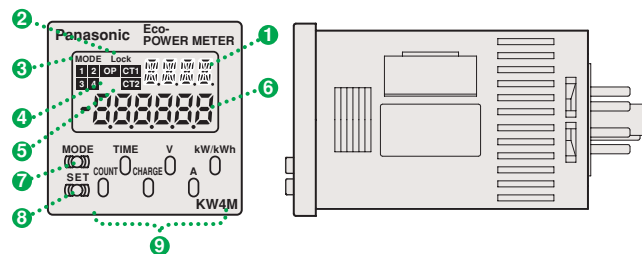
Main unit

Phase and wire system	Rated input	Current transformer	Terminal type	Part No.
Single-phase two-wire system	100 to 120/ 200 to 240V AC	Dedicated CT type (5 A/50 A/100 A/ 250 A/400 A)	Screw terminal	AKW5111
Single-phase three-wire system			11-pins	AKW5211
Three-phase three-wire system				

Dedicated current transformer (CT)

Rated primary current	Part No.
5A/50A	AKW4801
100A	AKW4802
250A	AKW4803
400A	AKW4804

PART NAME



- Mode indicator (16-segment LCD)**
- Lock indicator** Illuminates when locked.
- Mode indicator** Illuminates when setting a mode.
- Output indicator** Illuminates during pulse output.
- CT direction** Illuminates when the CT direction is correct and a current flows that exceeds the set current value.
- Value display (7-segment)** Displays the integrated power, momentary power, current, voltage, electricity charge, hour meter time, count, and all settings.
- MODE key** Used to move between different modes.
- SET key** Used to make settings.
- Select key** Changes the item displayed.
Used to move between modes.

SPECIFICATIONS

Measurement items

Item	Unit	Data range
Instantaneous electrical power	kW	0.00 to 9999.99
Integrated electrical energy	kWh	0.00 to 9999.99kWh to 10.00MWh to 9999.99MWh
	MWh	9-digit display: 0.00 to 9999999.99kWh
Current	L1 (CT1) phase current	A
	L2 (CT2) phase current	A
Voltage	Voltage between 1-2	V
	Voltage between 2-3	V
Electricity charge *1	Yen	JPY
	Dollars	\$
	Euros	EUR
	Yuan	CNY
Hour meter	ON time	h (Hour)
	OFF time	h (Hour)
Pulse input	Count	0 to 999999

*1: Electricity charge is designed chiefly for managing energy saving. It is not intended to be used for billing.

Main unit

Rated operating voltage	100 to 120/200 to 240V AC
Rated frequency	50/60 Hz common
Rated power consumption	8VA
Allowable operating voltage range	85 to 132/170 to 264V AC (85% to 110% of rated operating voltage)
Allowable power off time	10ms
Ambient temperature	-10°C to +50°C (Storage temperature: -25°C to +70°C -13°F to 158°F)
Ambient humidity	30 to 85%RH (at 20°C non-condensing)
Display method	With Backlight 6-digit, 7-segment LCD for settings and 4-digit, 16-segment LCD for modes. Upper display: green, Lower display: amber
Power failure memory method	E2P-ROM (Over 100,000 overwrites)
Protective construction	IP66 (front panel with rubber gasket) Note: Waterproofing (IP66) will be lost in continuous (permanently attached) installations.
Mass	For 11-pin type: approx. 130 g, For Screw terminal type: approx. 140 g

Communication

Interface	Conforming to RS485
Protocol	MEWTOCOL
Number of connected units	Max. 99 units
Transmission distance	Max. 1,200m

Pulse input

Input mode	Addition (fixed)
Max. counting speed	2 kHz/30 Hz (selectable by mode)
Pulse input	Min. input signal width: 0.25 ms (when 2 kHz selected)/16.7 ms (when 30 Hz selected) ON : OFF ratio = 1 : 1
Input signal	Contact/No contact (open collector) • Impedance when shorted: 1 kΩ • Residual voltage when shorted: Max. 2 V • Impedance when open: 100 kΩ
Output mode	HOLD (over count)
Number of digits	6 digits display (0 to 999999) (selectable by mode)

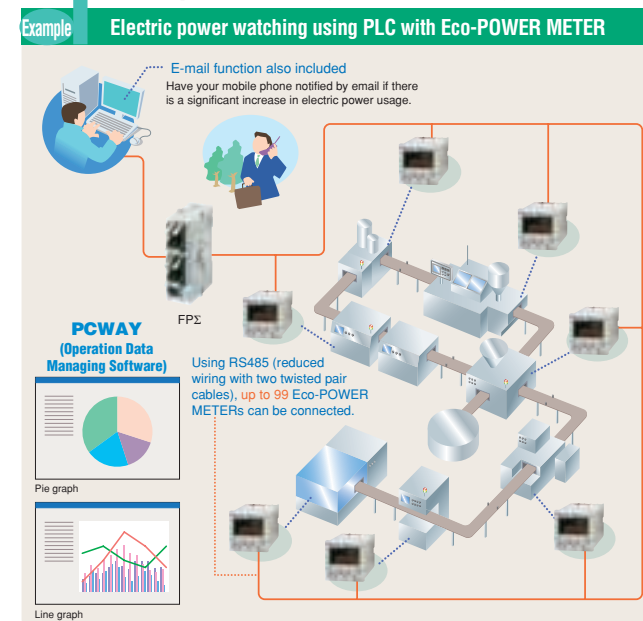
Pulse output (transistor output)

Number of output points	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	100 μA or less
Pulse output	When measuring power 0.001/0.01/0.1/1/10/100 kWh/Alarm (selectable by mode)
unit *2	When measuring pulse input HOLD (over count)

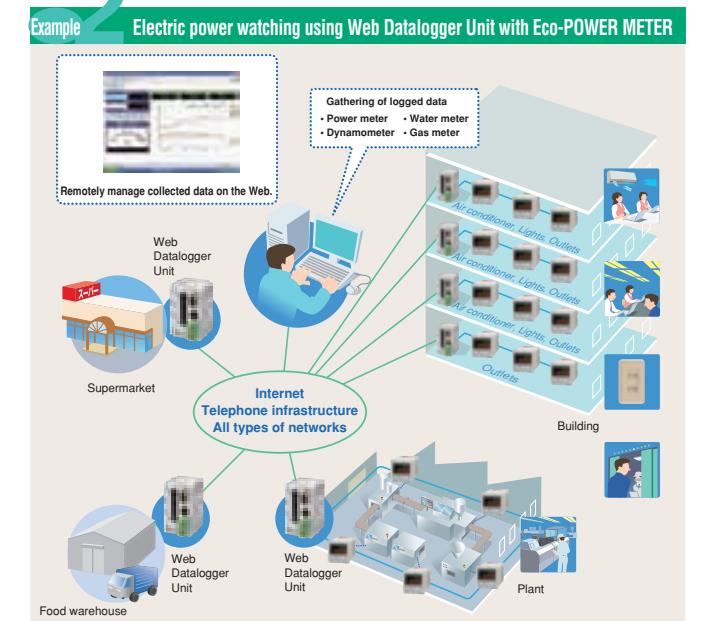
*2 Power and pulse input are not possible at the same time.

System configuration examples

Example 1 Electric power watching in manufacturing lines

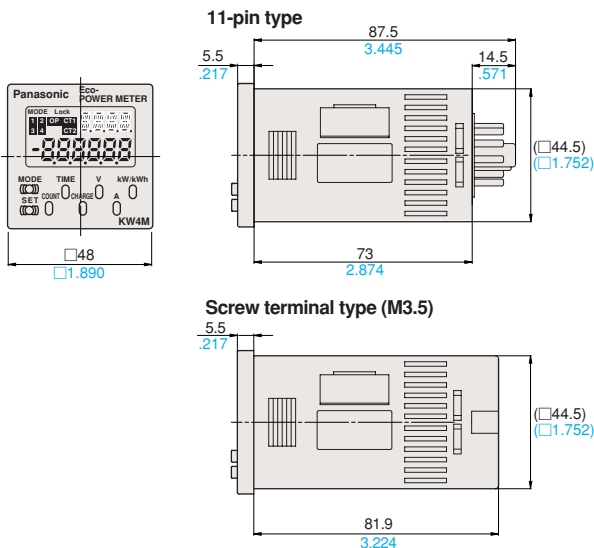


Example 2 Electric power data collection and remote watching of plants and buildings



KW4M Eco-POWER METER

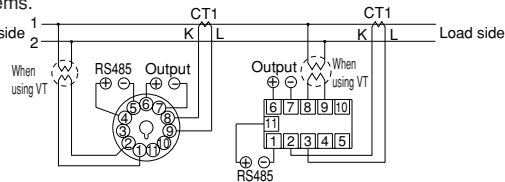
■ **Dimensions** (mm / inch) General tolerance: ±1.0 ±.039



■ Terminal Layouts and Wiring Diagrams

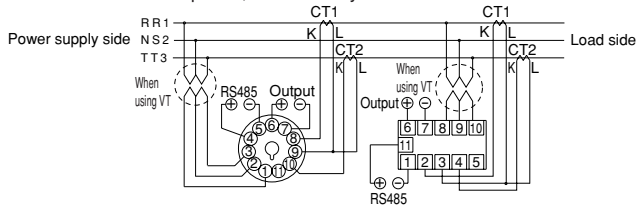
● Single-phase, two-wire connection

*One current transformer (CT) is required for measurement with single-phase, two-wire systems.



● Single-phase, three-wire and three-phase, three-wire connections

*Two current transformers (CT) are required for measurement with single-phase, three-wire and three-phase, three-wire systems.



● Terminal layouts

No.	11-pin type	Screw terminal type
1	1, R, R	RS-485 (-)
2	2, N, S	CT1 (K)/IN
3	3, T, T	CT1 (L), CT2 (L)
4	RS-485 (+)	CT2 (K)
5	RS-485 (-)	0V
6	Pulse output (+)	Pulse output (+)
7	Pulse output (-)	Pulse output (-)
8	CT1 (K)/IN	1, R, R
9	CT1 (L), CT2 (L)	2, N, S
10	CT2 (K)	3, T, T
11	0V	RS-485 (+)

- For correct usage, please read "Installation Instructions" thoroughly before using.
- For details, specifications and handling, please refer to the KW4M Eco-POWER METER user's manual.
- The user's manual can be downloaded from <http://www.nais-e.com/download/index.html>.

KW4S Eco-POWER METER

1. Electricity meter that acts like an industrial component (DIN size: 48×48)

Eco-POWER METER is both compact and inexpensively priced. It is easy to install on your existing equipment and machinery.

2. Digitally display integrated electrical energy and electricity charges

You can digitally display integrated electrical energy, voltage, current, and electricity charges. This is handy for managing energy-saving.

3. Log and track data of integrated electrical energy usage

It is easy to load the power usage pulse output into a PLC or counter.

4. Centrally manage integrated electrical energy, voltage, and current

Adopts the RS485 for communication specification. This allows you to log data (integrated electrical energy, voltage, and current) from up to 99 units on a PC and PLC.



Dedicated CT



Eco-POWER METER

● Product types

Product name	Phase and wire system	Rated input	Current transformer	Terminal type	Part No.
Eco-POWER METER main unit	Single-phase two-wire system	100 to 120/ 200 to 240V AC	Dedicated CT type	Screw terminal	AKW4111
				11-pin	AKW4211
	Single-phase three-wire system Three-phase three-wire system		Commercial CT type (Rated secondary current: 1 A)	Screw terminal	AKW4121
				11-pin	AKW4221
Dedicated current transformer (CT)	Only used for AKW4111, AKW4211				AKW4801
Data collection software for Eco-POWER METER					AKW4805

- Please refer to "Eco-3 Brothers (ARCT1B226E)" catalog.

These materials are printed on ECF pulp.
These materials are printed with earth-friendly vegetable-based (soybean oil) ink.



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Panasonic

ideas for life

Eco-POWER METER

Simple Watt-Hour Meter **KW4S**

On the lookout for wasted electricity!

Now even more powerful
with communication function
and easy PLC connection!



Air conditioner



Lights



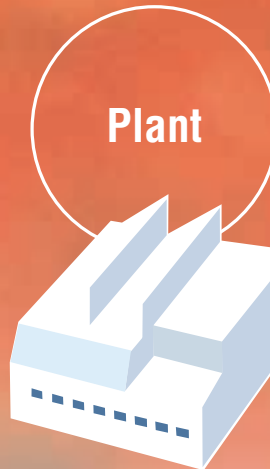
Building



PC



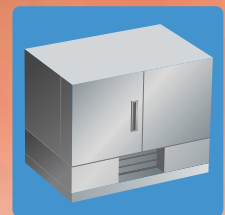
Elevator



Plant



Line process



Constant-temperature oven

For maintenance and control in applications involving energy saving and environmental protection

Integrated electrical energy

Voltage

Current

Electricity charge

Keeping a watchful eye.

Eco-3 Brothers



Eco-COUNT METER



Eco-POWER METER



Eco-HOUR METER

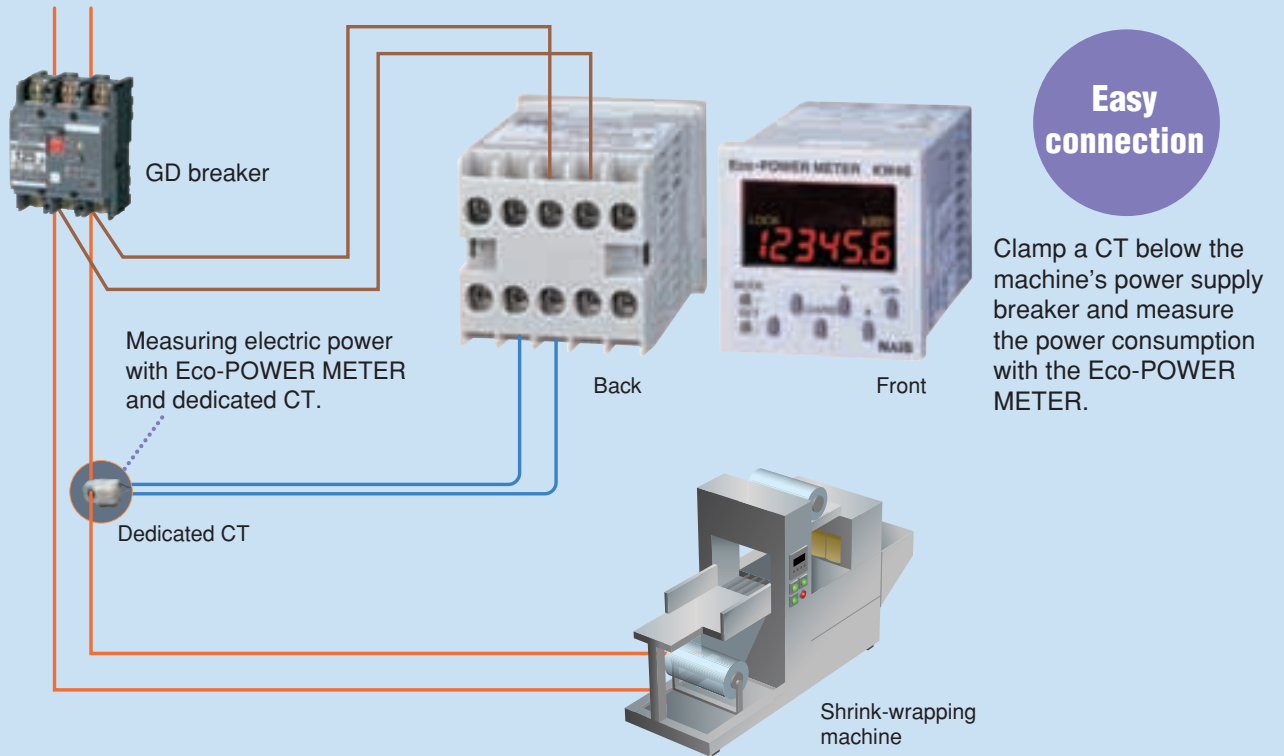
Eco-POWER METER **KW4S**
ARCT1B247E '05.1

New

1
Example

Electric power measurement for individual equipment and machines

Measure electric power easily with Eco-POWER METER.

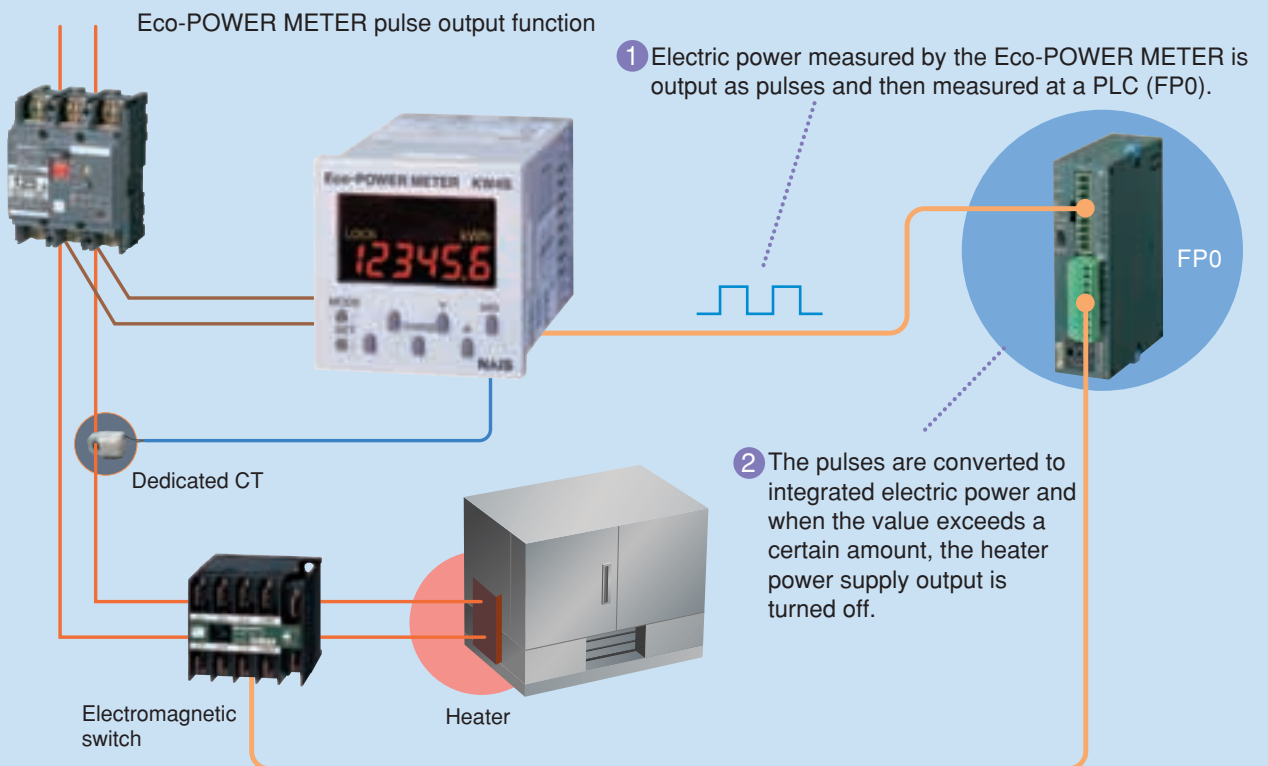


• Please see the catalog (BBCT1B146N) for details about the GD breaker.

2
Example

Alarm output when heater is ready for replacement

Easy systemization



• Please see the catalog (BBCT1B135) for details about the electromagnet switch.

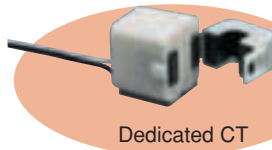
Always on the lookout for wasted electricity, Eco-POWER METER is there to assist in the energy-saving activities of all customers.

Configuration Examples

(Alone and as system)

1. Standalone measurement

Eco-POWER METER



Dedicated CT



4. Gathering data with PLC

2. Data management with PLC

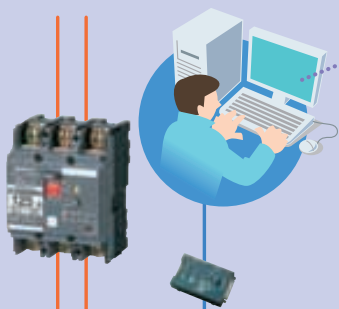
Pulse output

5. Managing data with Web Datalogger Unit

3. Data management with computer (Using data collection software)

3 Example Gathering power consumption data from each manufacturing machine

Automatic gathering of electrical power

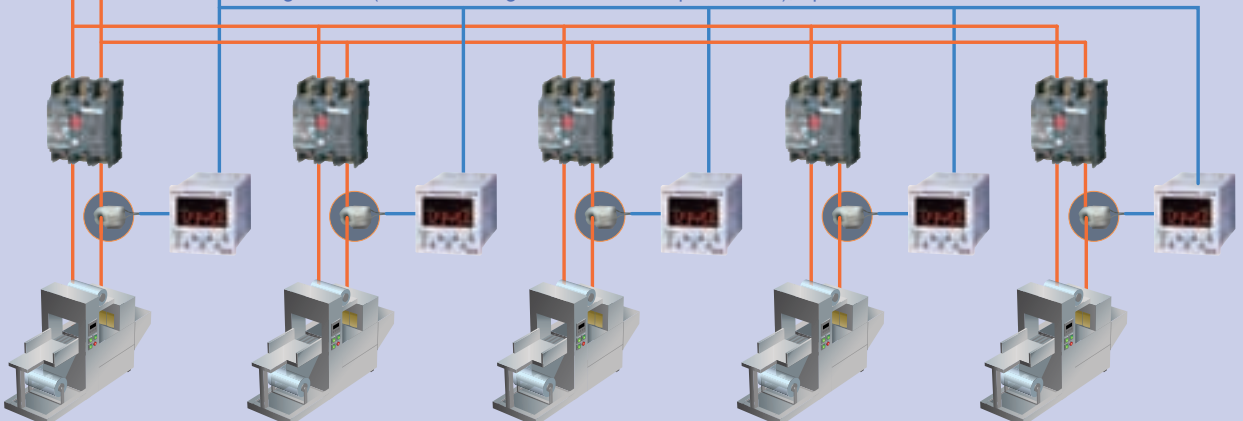


1 Data from each machine is collected using the Eco-POWER METER dedicated data collection software (AKW4805) and then saved as a CSV file.

2 Using spreadsheet software such as Excel, data can be freely edited (turned into graphs) and saved. Daily and monthly reports can be created.

Using RS485 (reduced wiring with two twisted pair cables), up to 31 Eco-POWER METERS can be connected.

Shrink-wrapping machine

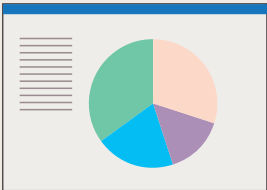


4 Electric power watching in manufacturing lines

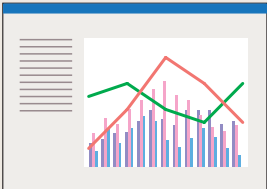
Example 4 Electric power watching using PLC with Eco-POWER METER



PCWAY
(Operation Data Managing Software)



Pie graph



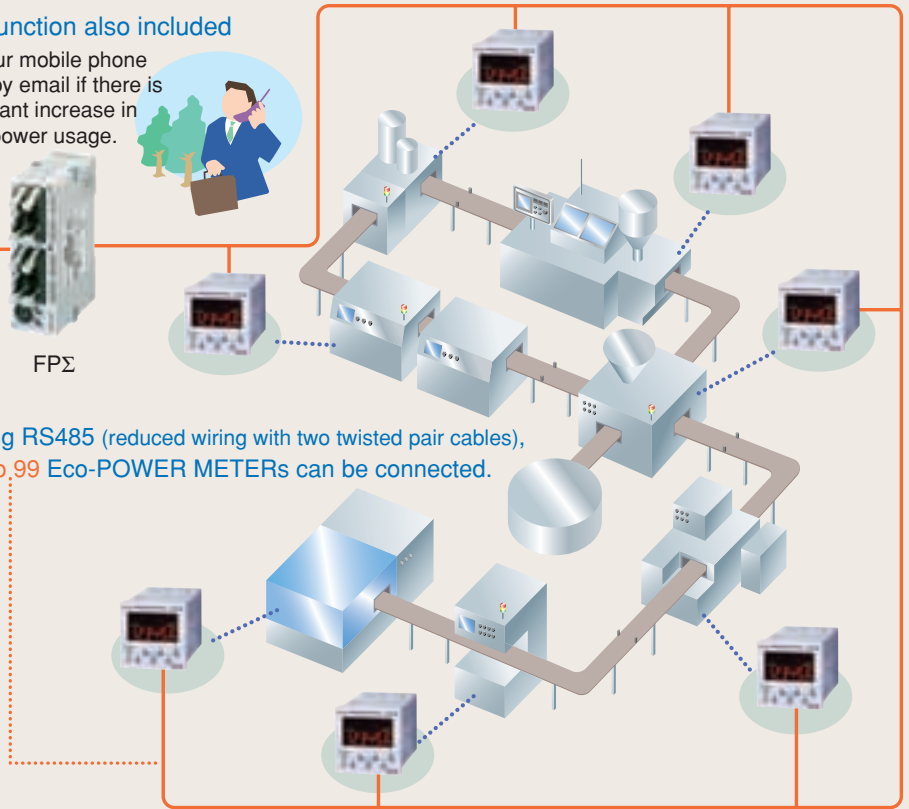
Line graph

Email function also included
Have your mobile phone notified by email if there is a significant increase in electric power usage.



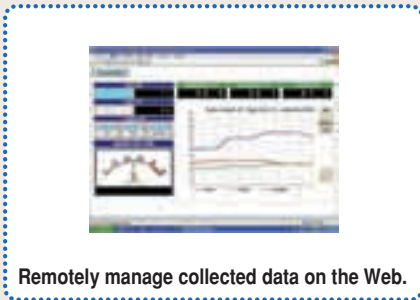
FPΣ

Using RS485 (reduced wiring with two twisted pair cables), up to 99 Eco-POWER METERS can be connected.



5 Electric power data collection and remote watching of plants and buildings

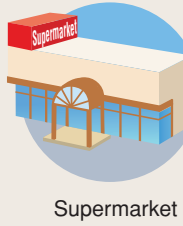
Example 5 Electric power watching using Web Datalogger Unit with Eco-POWER METER



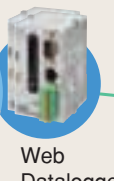
Remotely manage collected data on the Web.

- Gathering of logged data
- Power meter
 - Water meter
 - Dynamometer
 - Gas meter

Internet
Telephone infrastructure
All types of networks



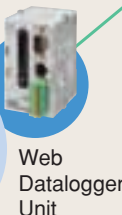
Supermarket



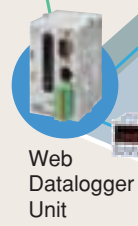
Web Datalogger Unit



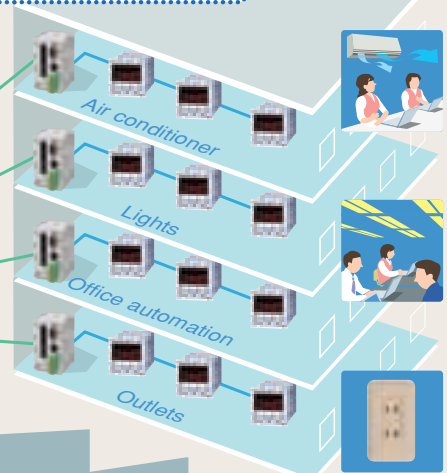
Food warehouse



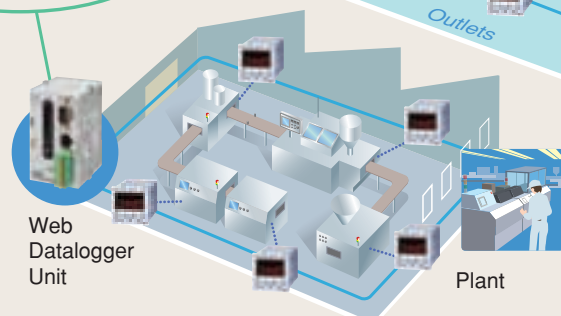
Web Datalogger Unit



Web Datalogger Unit

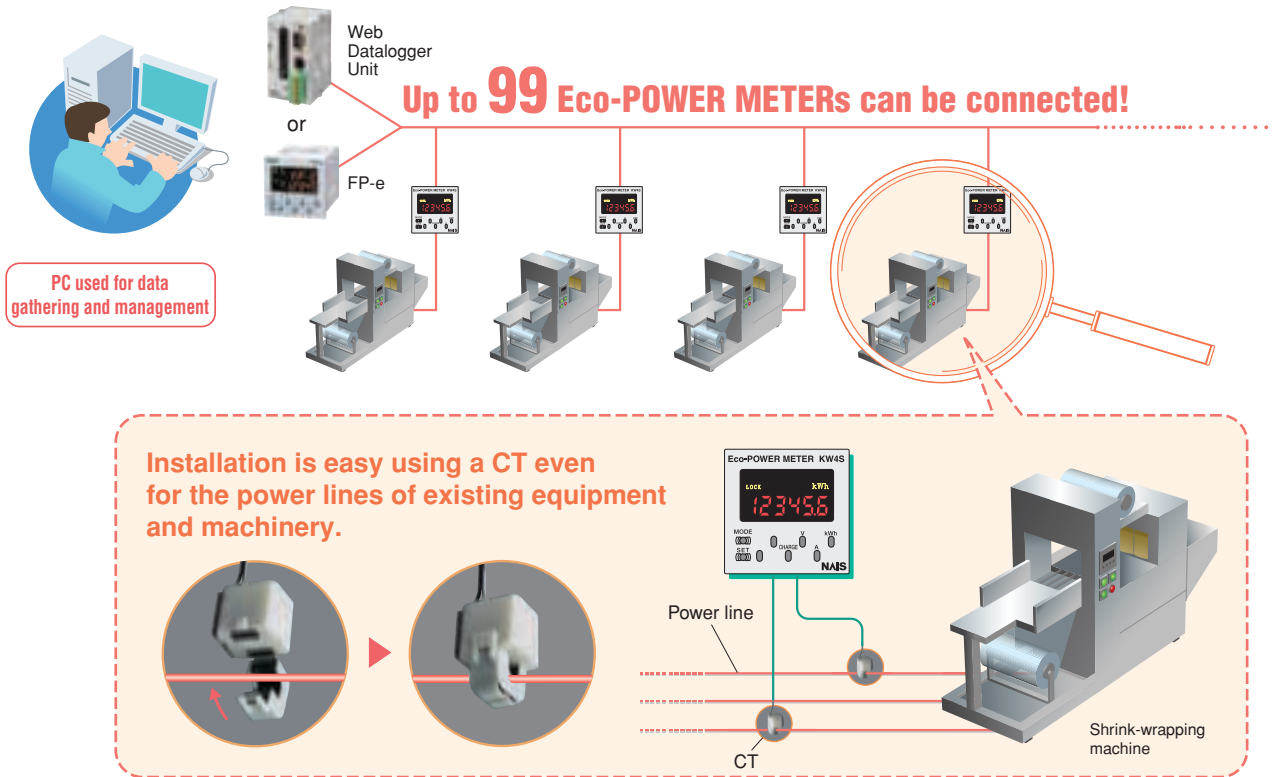


Building



Plant

System Diagram

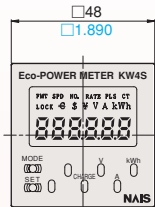


- Please see the catalog (ARCT1E208E) for details on the Web Datalogger Unit.
- Please see the "FP series Programmable Controllers" catalog (ARCT1B230E) for details on the FP-e and FP0 PLC.

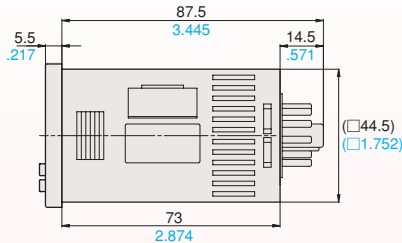
Dimensions

● Eco-POWER METER KW4S

(Display: Integrated electrical energy, Voltage, Current and Electricity charge)

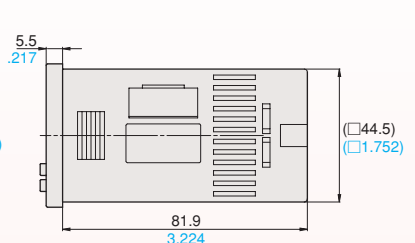


1) Pin type



2) Screw terminal type

mm inch



Types and Specifications

● Types

		Current	Changes
Features added	Communication protocol	Only dedicated protocol	Dedicated protocol and MEWTOCOL
	Station number setting	1 to 31	1 to 99 (Note)
Change	Communication format setting	Setting start → Communication format change	Setting start → Protocol switch (dedicated or MEWTOCOL) → Communication format change
	Instruction Manual	—	Above content and communication procedure added.

Note: You must use 1 to 31 when selecting the dedicated protocol (Eco-POWER METER data collection software: AKW4805).

● Communication specifications

Interface	Conforming to RS485	
Protocol	Our method	
Isolation status	Isolated with internal circuit	
No. of connected units	99 units*	
Transmission distance	1,200m	
Transmission speed (Baud rate)	2,400, 4,800, 9,600, 19,200 bps (In each setting mode, settings can be made with front panel keys.)	
Transmission data format	Data length	7-bit/8-bit (In each setting mode, settings can be made with front panel keys.)
	Parity	Not available/Odd/Even (In each setting mode, settings can be made with front panel keys.)
	Stop bit	1 bit (Fix)
Communication method	Half duplex	
Synchronous method	Start-stop synchronous method	
Terminating resistor	Approx. 120Ω (internal)	

● MEWTOCOL-COM commands

The Eco-POWER METER supports five commands.

RD: Data area read command

WD: Data area write command

MD: Monitor data save and save reset command

MG: Monitor execute command

RT: Status read command

*We recommend the SI-35 of Lineeye Co., Ltd., for the RS485 converter on the PC side. (When using SI-35, FP2-CB485 (for FP2-MCU), FPΣ (COM3 and COM4) or FP-e, the maximum number you can connect is 99. When using with devices other than these, the maximum number will be limited to 31.)

KW4S Eco-POWER METER

1. Electricity meter that acts like an industrial component (DIN size: 48x48)

Eco-POWER METER is both compact and inexpensively priced. It is easy to install on your existing equipment and machinery.

2. Digitally display integrated electrical energy and electricity charges

You can digitally display integrated electrical energy, voltage, current, and electricity charges. This is handy for managing energy-saving.

3. Log and track data of integrated electrical energy usage

It is easy to load the power usage pulse output into a PLC or counter.

4. Centrally manage integrated electrical energy, voltage, and current

Adopts the RS485 for communication specification. This allows you to log data (integrated electrical energy, voltage, and current) from up to 99 units on a PC and PLC.



Dedicated CT



Eco-POWER METER

●Product types

Product name	Phase and wire system	Rated input	Current transformer	Terminal type	Part No.
Eco-POWER METER Main unit	Single-phase two-wire system Single-phase three-wire system Three-phase three-wire system	100 to 120/ 200 to 240V AC	Dedicated CT type	Screw terminal	AKW4111
				11-pins	AKW4211
	Commercial CT type		Screw terminal	AKW4121	
			11-pins	AKW4221	
Dedicated current transformer (CT)	Only used for AKW4111, AKW4211				AKW4801
Data collection software for Eco-POWER METER					AKW4805

KC2S Eco-COUNT METER/KE2S Eco-HOUR METER

1. Easy to install on existing machinery

Just attach the dedicated CT to your existing cables. There is no need to install any additional cabling.

2. Built-in battery

The built-in battery allows the units to be installed anywhere.

3. Economically priced

4. Compact size doesn't take up space (DIN 24 x 48)

Easy to install even in cramped spaces.

5. Two installation methods available (Separate models)

Two installation methods are available: The extremely easy-to-use one-touch installation, and the installation frame installation, used for timers/counters (protective construction IP66). Select the installation type that suits the location.

6. Letter's height is 8.7 mm

A large LCD panel is used, with a highly legible 8.7 mm letter's height.

7. Conform to CE marking (EMC directive)



Eco-COUNT METER



Eco-HOUR METER

●Product types

KC2S Eco-COUNT METER

Product Name	Installation type	Front reset	Measurement count range	Part No.
Eco-COUNT METER main unit*1	Installation frame type*2	Available	0 to 99999999	AKC2421
	One-touch installation type			AKC2621
Intermediate power cable*3				AKE2811

KE2S Eco-HOUR METER

Product Name	Installation type	Front reset	Measurement count range	Part No.
Eco-HOUR METER main unit*1	Installation frame type*2	Available	0 to 99999.9h	AKE2421
	One-touch installation type			AKE2621
Intermediate power cable*3				AKE2811

Notes: 1. Eco-HOUR METER (AKE2421/AKE2621) is a product package consisting of the main unit, an exclusive use current transformer (CT), and trunk cable.
2. Only the installation frame installation type includes rubber gasket and installation frame.
3. The maximum allowable current of the intermediate power cable is 15 A.