Panasonic
ideas for life

POWER-ON COUNTER
POWER-ON HOUR METER

KC2S Eco-COUNT METER
KE2S Eco-HOUR METER

Eco-COUNT METER and Eco-HOUR METER are ideal for maintenance of your facilities and machinery.



Eco-COUNT METER



Eco-HOUR METER



Dedicated CT

FEATURES

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)

Compliance with RoHS Directive

PRODUCT TYPES

1. 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

Notes: 1. Eco-COUNT METER (AKC2421/AKC2621) is a product package consisting of the main unit, a dedicated 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.

2. KE2S Eco-HOUR METER

Product Name	Installation type	Front reset	Measurement time 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 type includes rubber gasket and installation frame.
3. The maximum allowable current of the intermediate power cable is 15 A.

SPECIFICATIONS

Item		Specifications	
Product name		Eco-COUNT METER (Power-on Counter)	Eco-HOUR METER (Power-on Hour Meter)
Part No.		AKC2421/AKC2621	AKE2421/AKE2621
No. of digits		8 digits	6 digits
External power supply		Not required (built-in battery)	
Counting max. speed		2Hz (CT through current minimum power-up time: 250ms, ON:OFF =1:1)	—
Time accuracy		—	±100ppm (25°C)
Measurement range		0 to 99999999 counts	0 to 99999.9h
Detection sensitivity (through current)		Counting start: 0.5A to 80A (50/60Hz)*1	Timing start: 0.5A to 80A (50/60Hz)*1
		Counting stop: 0.2A (50/60Hz) or less	Timing stop: 0.2A (50/60Hz) or less
Reset input	Min. input signal width	100ms	
	Input method (signal)	• Non voltage input using contacts or open collector connection • Input impedance, When shorted: Max.10kΩ, When open: Min.750kΩ • Residual voltage: Max. 0.5V	
Display method		7-segment LCD	
Breakdown voltage (initial)		Between live and dead metal parts: 1,000V AC for 1 minute.	
Insulation resistance (initial)		Between live and dead metal parts: Min. 100MΩ (measured at 500 V DC)	
Protective construction*2		IEC Standard IP66 (only front panel with rubber gasket)	
Vibration resistance (Functional)		10 to 55 Hz: 1 cycle/min., signal amplitude of 0.15mm .006inch (10 min. on 3 axes)	
Vibration resistance (Destructive)		10 to 55 Hz: 1 cycle/min., signal amplitude of 0.375mm .015inch (1 hr. on 3 axes)	
Shock resistance (Functional)		Min. 98m 321.522ft/s² (4 times on 3 axes)	
Shock resistance (Destructive)		Min. 294m 964.567ft/s² (5 times on 3 axes)	
Operating temperature		–10 to +50°C +14 to +122°F (without frost or dew)	
Storage temperature		–25 to +65°C –13 to +149°F (without frost or dew)	
Ambient humidity		35 to 85% RH (at 20°C non-condensing)	
Battery life*3		7 years (at 25°C 77°F)	10 years (at 25°C 77°F)
Mass (weight)		Approx. 110g (Dedicated CT included)	Approx. 105g (Dedicated CT included)

Notes: 1. Maximum cable diameter is 10 mm.
2. See page 13, "NOTES 4. Waterproofing Construction" for details about the protective construction (IP66).
3. Battery life is calculated based on the above conditions.
This is not a guarantee of actual battery life.
Please use this as a guide for replacing the battery only.
The actual battery life may be shortened, depending on the utilization environment of the main unit.

All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

2. Dedicated CT

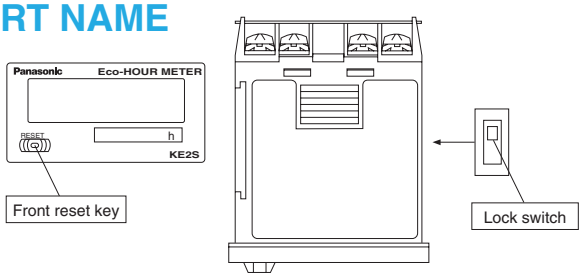
Item	Specification
Diameter of conductor to be measured	10 dia. (max.)
Breakdown voltage (Initial value)	1,000 Vrms AC for 1min: Between core and output connector terminal
Insulation resistance (Initial value)	Min. 100MΩ: Between core and output terminal (at 500V DC)
Allowable number of detachments/attachments	Approx. 100 times
Vibration resistance (Functional)	10 to 55 Hz: 1 cycle/ min single amplitude of 0.15 mm .006 inch (10 min on 3 axes)
Vibration resistance (Destructive)	10 to 55 Hz: 1 cycle/ min single amplitude of 0.375 mm .015 inch (1 h on 3 axes)
Shock resistance (Functional)	Min. 98 m 321.522 ft./s² (4 times on 3 axes)
Shock resistance (Destructive)	Min. 294 m 964.567 ft./s² (5 times on 3 axes)
Operating temperature range	–10°C to +50°C +14°F to 122°F (Without frost or dew)
Storage temperature	–20°C to +60°C –4°F to 140°F (Without frost or dew)
Mass (Weight)	Approx. 55g 1.94oz (trunk cable included)
Ambient humidity	35 to 80% R.H. (at 20°C non-condensing)

Note: For Eco-COUNT METER and Eco-HOUR METER, this CT is supplied together.

APPLICABLE STANDARDS

EMC	(EMI) EN61000-6-4	
	Radiated emission electric field strength	EN55011 Group 1 Class A
	Noise terminal voltage	EN55011 Group 1 Class A
	(EMS) EN61000-6-2	
	Static discharge immunity	EN61000-4-2 4 kV contact
	RF electromagnetic field immunity	EN61000-4-3 10 V/m AM (80 MHz to 1 GHz)
	EFT/B immunity	EN61000-4-4 1 kV (Signal line)
	Conductivity noise immunity	EN61000-4-6 10 V/m AM (0.15 MHz to 80 MHz)
	Power frequency electric field immunity	EN61000-4-8 30 A/m (50Hz)

PART NAME



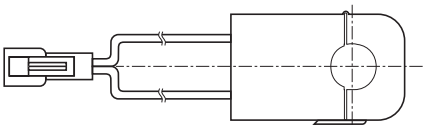
Lock switch (Mark on the unit 1)	(Terminal block side) ↕ (LCD side)	OFF* ↕ ON

Notes: 1. * Factory setting.
2. Make the switch setting before installing to panel.
3. Common to Eco-COUNT METER and Eco-HOUR METER.

1. Main unit

1) Front reset key
This key resets the count value of Eco-COUNT METER and elapsed time of Eco-HOUR METER.
It does not work when the lock switch is ON.
Note that frequent operation may shorten battery life.
2) Lock switch (Refer to chart on left)
Ineffective the front reset key
Note: LCD side is ON (reset ineffective); terminal block side is OFF (reset effective)

2. Dedicated CT



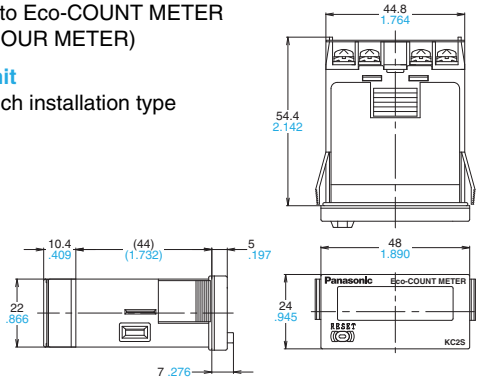
DIMENSIONS

mm inch General tolerance: ±1.0 ±.039

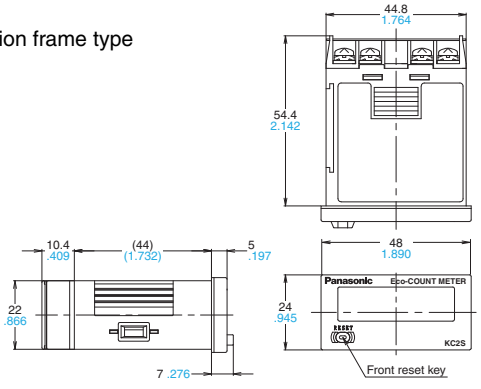
(Common to Eco-COUNT METER and Eco-HOUR METER)

1. Main unit

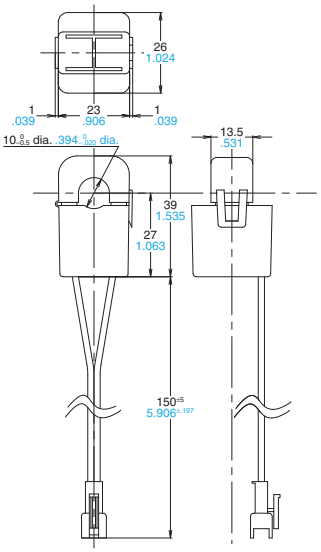
1) One touch installation type



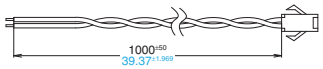
2) Installation frame type



2. Dedicated CT



3. Trunk Cable



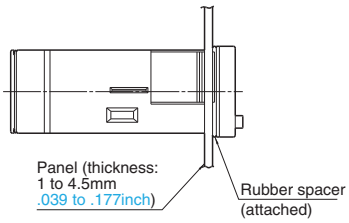
Note: The trunk cable connects the main unit and dedicated CT.
It is included with the main unit.

All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

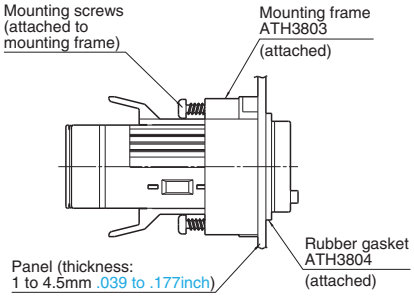
INSTALLATION

1. Panel installation

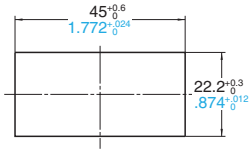
1) One-touch installation type



2) Installation frame type



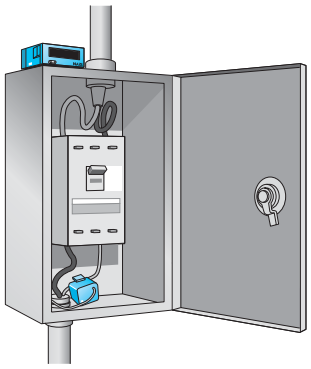
3) Panel cut-out dimensions



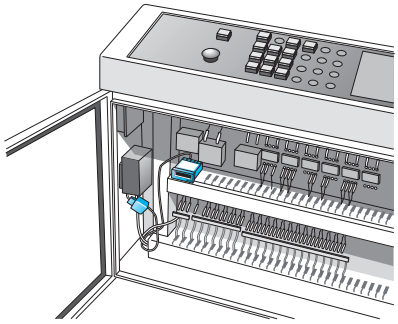
Note: When installing to a 4.5mm .177 thick panel, remove the rubber spacer first.

1. Panel installation

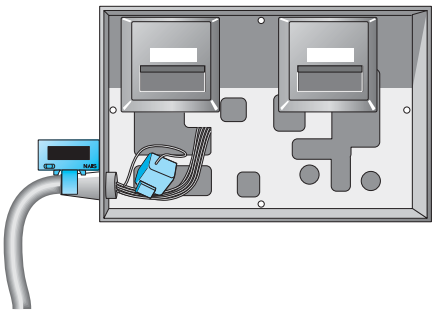
1) Installation using plastic magnet
Attach the unit to the equipment case.



2) Installation via double-sided tape
Use this method in places where a plastic magnet cannot be used or where installation strength is insufficient.



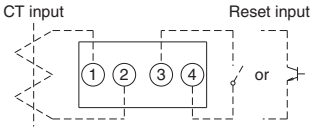
3) Installation via clamp
Clamp to one of the cables inside the equipment, etc.



Note: Take careful note of the precautions for use in the catalog or user's manual before using an Eco-COUNT METER or Eco-HOUR METER installed by one of the methods described above.

3. Terminal layout and wiring diagrams

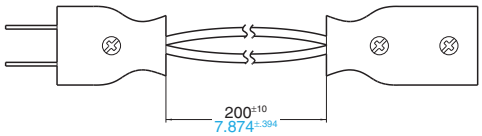
(Common to Eco-COUNT METER and Eco-HOUR METER)



Notes: 1. Terminal ② and ④ are connected inside.
2. The CT does not have polarity

OPTIONS

• Intermediate power cable (AKE2811)



Note: We recommend using an intermediate power cable when attaching the dedicated CT to a non-"Y" split power cable

EXPLANATION OF OPERATION

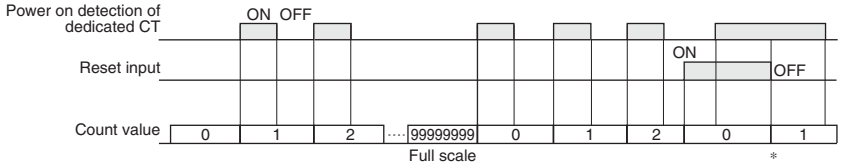
KC2S Eco-COUNT METER

1. The number of power-ons is counted by sending through current through the dedicated CT.

2. When the number of power ons (measured value) reaches the full scale, it reverts to 0, and starts counting again from 0.

3. When the reset terminal input is set to on, the display will read "0". This does not count during reset input.

4. Use the reset key on the front of the unit to reset manually. The display will be blank while the reset key is being pressed.

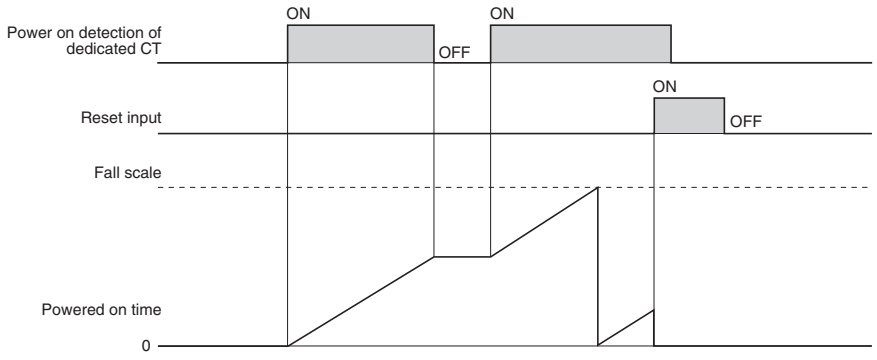


Note: * If reset input is shut off while CT through current is on, the count will be set to 1.

All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

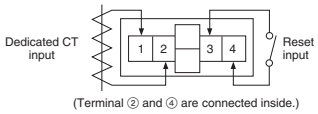
KE2S Eco-HOUR METER

1. The power-on time is measured when the dedicated CT detects a through current.
2. When the elapsed time (number of hours measured) reaches the full scale, the display reverts to 0, and starts timing again from 0.
3. When the reset input is set to on, the display will read "0". This does not time during reset input.
4. Use the reset key on the front of the unit to reset manually. The display will be blank while the reset key is being pressed.



RESET INPUT (Common to Eco-COUNT METER and Eco-HOUR METER)

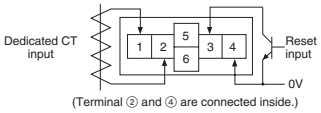
1. Contact input



(Terminal ② and ④ are connected inside.)

2. Transistor input

(NPN transistor)



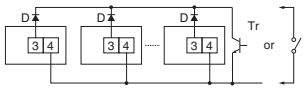
(Terminal ② and ④ are connected inside.)

Notes: 1. When using contact input, since current flow is small from reset input terminal ③, please use relays and switches with high contact reliabillity.
2. When using transistor input, use the following as a guide for which transistors (Tr) to use for inputting.
(Collector withstand voltage ≧ 50V, leakage current < 1μA)

NOTES

1. Main unit

1) Reset input
(1) Never apply voltage to reset input. This can cause damage to the internal elements.
(2) Since the current flow is very small from reset input terminal ③, please use relays and switches with high contact reliabillity.
When inputting a reset by a transistor's open collector use a transistor for small signals in which I_{CBO} is 1μA or less and always input with no voltage.
(3) When wiring, try to keep all the input lines to the reset inputs as short as possible and avoid running them together with high voltage and power transmission lines or in a power conduit.
Note that power cable floating capacitance in excess of 500 pF (10m on 2 mm² parallel cables) could cause malfunctions. Take particular care of inter-cable capacitance when using shielded cables.
2) How to reset multiple panel installation type units all at once.



Notes: 1. Use the following as a guide for choosing transistors used for input (Tr).
Leakage current < 1μA
2. Use as small a diode (D) as possible in the forward voltage so that the voltage between terminals 3 and 4 during reset input meets the standard value (0.5V).
(At IF = 20μA, forward voltage 0.1 V or less.)

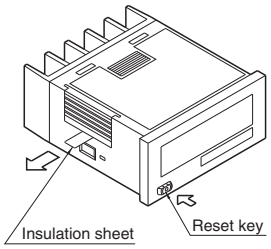
2. Dedicated CT

1) Measured power is AC (50 Hz/60 Hz).
Will not function when used with DC power.
2) When clamping to the power cable to be measured, clamp only one of the live wires.
3) Avoid usage that bends the lead wire.
4) When clamping, make sure that no dust or other foreign matter intercedes between the clamp and contact. Foreign matter could impact detection sensitivity.

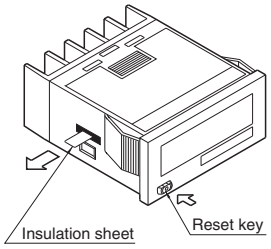
3. Insulation sheet

Before using, please pull and remove the insulation sheet in the direction of the arrow.
In consideration that the product might be stored for long periods without being used, an insulation sheet is inserted before shipping. Remove the insulation sheet and press the front reset key.

• Installation frame type

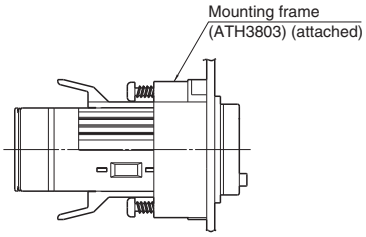


• One-touch installation type



4. Waterproof construction

The operation part is constructed to prevent water from entering the unit and a rubber gasket is provided to prevent water from entering the gap between the unit and the panel cutout.
There must be sufficient pressure applied to the rubber gasket to prevent water from entering.
Be sure to use the mounting screws when using the mounting frame (ATH3803).
Attaching the one-touch installation type to a panel will not waterproof the panel surface.



5. Do not use in the following environments

1) In places where the temperature changes drastically.
2) In places where humidity is high and there is the possibillity of dew. (When dew forms the display may vanish and other display errors may occur.)

All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.

6. Cautions regarding battery replacement

1) Remove wiring before replacing the battery. You may be electrocuted if you come into contact to a part where high voltage is applied.
2) Make sure you are not carrying a static electric charge when replacing the battery.
3) Battery replacement procedure

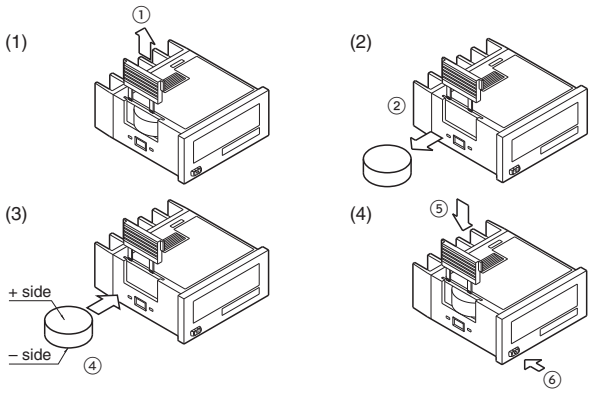
• Installation frame type

(1) Remove the battery cover ① from the case.
(2) Remove the battery ② from the side of the case.
The battery will come loose if you put the battery side face down and lightly shake the unit.
(3) Before inserting wipe clean the surface of the battery.
Insert the battery ④ with the + and – sides in the proper position.
(4) After replacing the battery return the battery cover ⑤ to the case. Verify that the hook of the battery cover is properly engaged.
Before using press the reset key ⑥ on the front.

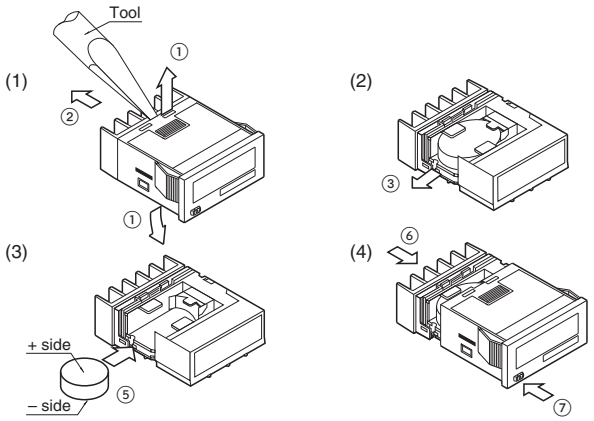
• One-touch installation type

(1) Using a tool remove the up/down hook of the case ①.
Pull the unit ② away from the case.
(2) Remove the battery ③ from the side of the unit. Do not touch the display or other parts.
(3) Before inserting wipe clean the surface of the battery.
Insert the battery ⑤ with the + and – sides in the proper position.
(4) After replacing the batery return the unit ⑥ to the case. Verify that the hook of the case has properly engaged.
Before using press the reset key ⑦ on the front.

• Installation frame type



• One-touch installation type



All Rights Reserved © COPYRIGHT Panasonic Electric Works Co., Ltd.