

## ECO POWER-METER

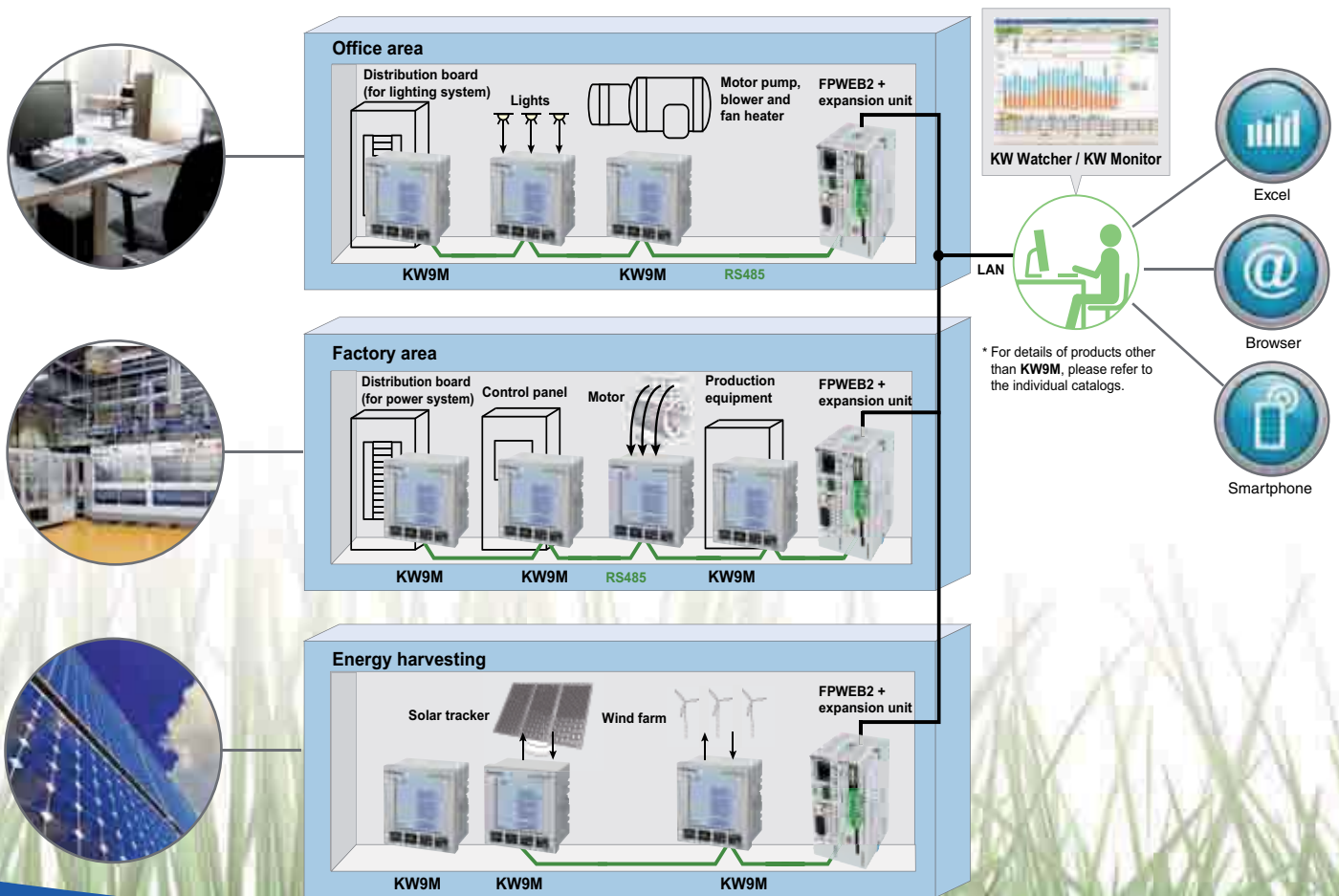
### KW9M



# Multi function type developed by adding a power surveillance function to a simple power meter



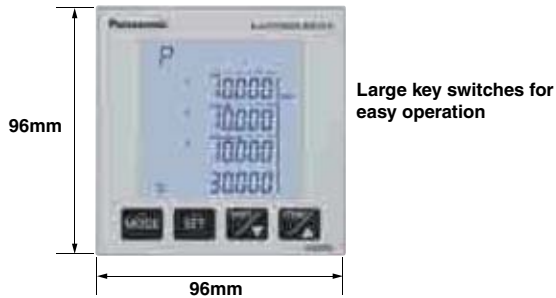
## Application examples



# Features

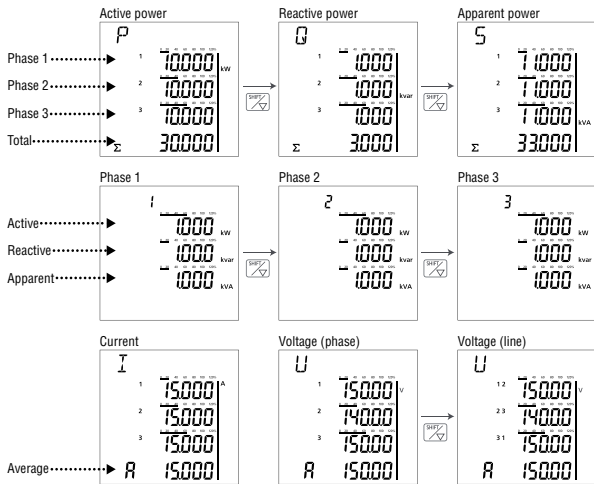
## Feature 1

- Large-screen LCD with backlight clearly displays values in four lines
- High accuracy! Instantaneous active power: 1%, Class 1 (IEC62053-21)  
Display updating time: 0.1 sec



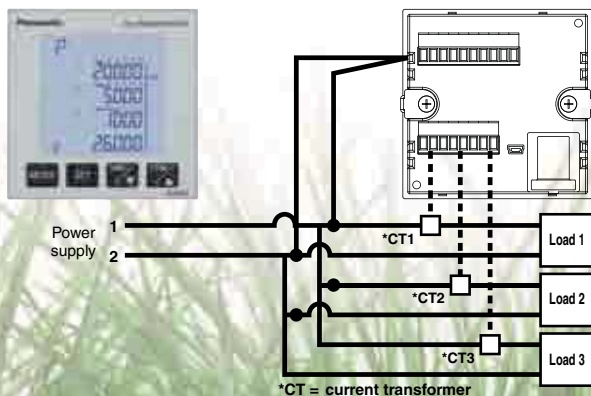
## Feature 2

- The total and individual power values of each phase are displayed on one screen, enabling you to check the phase balance at a glance. The data is useful for power quality checks and power factor improvements.
- Capable of displaying voltages, currents, electric power (active, reactive, apparent) and power factor



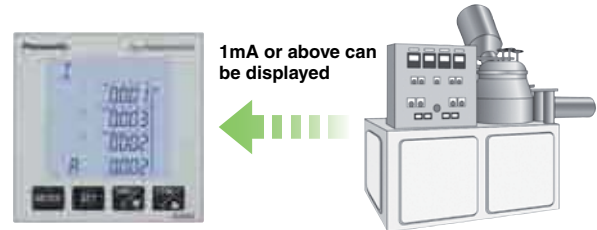
## Feature 3

- Panel-mount type capable of multi-circuit measurement
- Capable of simultaneously measuring up to three circuits in a single phase, two-wire system of same power supply



## Feature 4

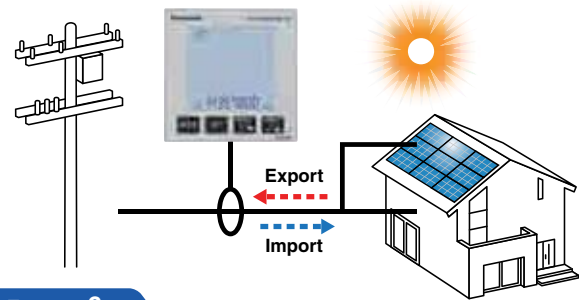
- Capable of displaying currents as low as 1mA
- This allows standby power consumption to be monitored, which helps save energy



\* Capable of measuring 0.1% or higher of the rating on the secondary side of the CT.

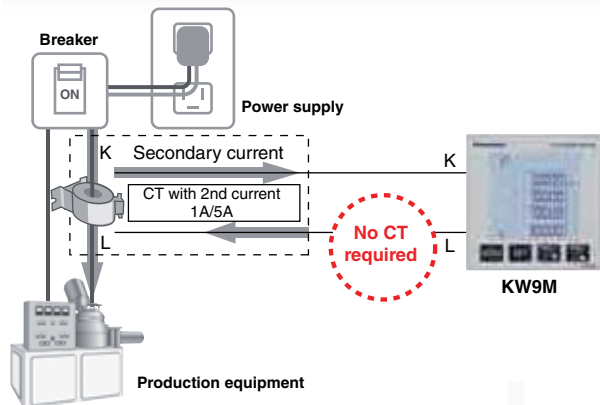
## Feature 5

- Regenerative power can also be measured by one KW9M Eco-POWER METER. Bidirectional integrated electric energy of each circuit can be measured.



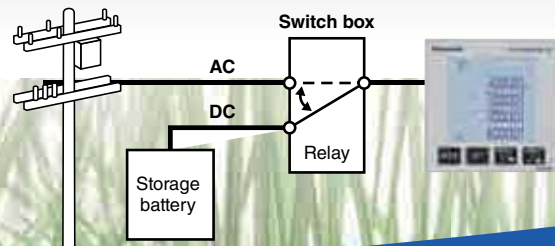
## Feature 6

- Measuring power using large-capacity general-purpose CT (secondary side current 1A/5A)



## Feature 7

- Compatible with AC/DC operating power supply





# Specifications

## Order guide

Product name	Phase and wire system	Measurement voltage	Input measurement current <sup>1)</sup>	Part no.
KW9M Eco-POWER METER Standard type	1-phase, 2-wire system 1-phase, 3-wire system 3-phase, 3-wire system 3-phase, 4-wire system (common)	0 to 500VAC	1 to 4000A	<b>AKW91110</b>

<sup>1)</sup> The dedicated current transformer (CT) cannot be used. Please use a general-purpose CT with a secondary side 1A/5A.

## Measurement items

Item	Unit	Data display range
Electric energy (import)	Active	kWh
	Reactive	kvarh
	Apparent	kVAh
Electric energy (export)	Active	kWh
	Reactive	kvarh
Instantaneous electric power	Active	kW
	Reactive	kvar
	Apparent	kVA
Current	A	0.000 to 8000.0 <sup>1)</sup>
Voltage	V	0.00 to 99,999 <sup>1)</sup>
Power factor		-1.000 to 0.000 to 1.000 (Fixed, 3 decimal places)
Frequency	Hz	0.00 to 99.99 (Fixed, 2 decimal places) <sup>1)</sup>
Conversion value		0.000 to 9,999,999.9
Temperature	°C	-100.0 to 0.0 to 100.0 (Fixed, 1 decimal place) <sup>1)</sup>

<sup>1)</sup> "Display data range" indicates the numerical display range; it does not indicate the range that can be measured.

## Main unit specifications

Item	Specifications
Supply voltage	AC 85 to 264V
	DC 100 to 300V
Rated frequency	50/60Hz
Nominal power consumption	5VA approx. (240VAC at 25°C)
	3W approx. (240VDC at 25°C)
Allowable momentary power-off time	10ms
Ambient temperature	Accuracy guarantee: -10 to +55°C
	Operation: -25 to +55°C
	Storage: -25 to +70°C
Ambient humidity	30 to 85% RH (at 20°C) non-condensing
Display method	LCD with backlight
Measurement speed	Sampling rate 1.024 MHz (1.0µs approx.)
	Data update time 100ms
Power failure memory	Internal memory (overwrite 10 <sup>10</sup> or more) Saved data: setting and measurement values
Dimensions W/H/D	96 x 96 x 56mm (without terminal block)
	96 x 96 x 68mm (with terminal block)
Weight	450g approx.

## Measurement specifications

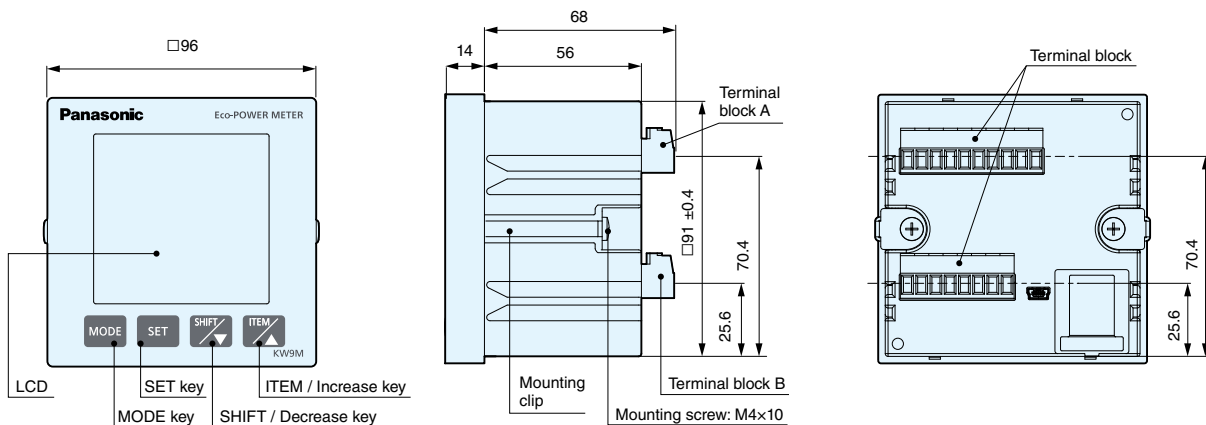
Item	Description	
Voltage	1P2W L-L 0 to 500VAC	
	1P3W L-L 0 to 500VAC	
		L-N 0 to 250VAC
	3P3W L-L 0 to 500VAC	
	3P4W L-L 0 to 500VAC	
		L-N 0 to 289VAC
	Impedance	2MΩ or more (L-N; V1/V2/V3-Vn)
	Resolution	0.01V
	Accuracy <sup>2)</sup>	0.5% 1.0% for 3-1 voltage of 1P3W, 3P3W and line voltage of 3P4W
	VT ratio	1.00 to 600.00 (set with setting mode) Voltage transformer (VT) is required when you measure a load with voltage over rated voltage.
Current	Input current (with CT) Primary current 4000A or less Secondary current 1A or 5A (set with setting mode)	
	Max. current	10A (200% of the rating)
	Overload capacity	1000% of the rating for 3s
	Resolution	0.001A
	Accuracy <sup>2)</sup>	0.5% 1.0% for 2 (N) - phase of 1P3W and 2 (S) - phase of 3P3W
Power	Accuracy <sup>2)</sup> 1.0% Active power class 1 (IEC 62053-21) Reactive power class 2 (IEC 62053-23)	
	Temperature Accuracy	±5.0°C (after ambient temp. correction with setting mode) Passing 2 hours or more after energized

<sup>2)</sup> Indicates measurement from 0.1% of the CT secondary current, without considering errors resulting from current transformers (CT) and voltage transformers (VT)

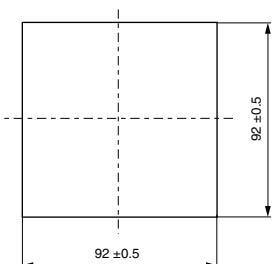
## Communication

Item	RS485	USB (Full Speed)
Protocol	MEWTOCOL/Modbus (RTU) (selectable)	MEWTOCOL
Max. number of stations	99	1
Transmission speed	38,400 / 19,200 / 9600 / 4800 / 2400 / 1200bps (selected with setting mode)	

# Dimensions



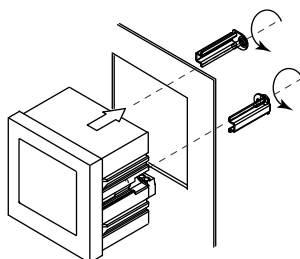
## Panel cut-out



When mounting several units adjacent to each other, keep at least 130mm of space on all sides measured from the center of the unit.

## Panel mounting

- 1) Remove the mounting clips from the unit.
- 2) Insert the unit from the front of the panel.
- 3) Attach the mounting clips at the both side of the case and secure in place with the screws.
  - Applicable panel thickness: 1 to 5mm

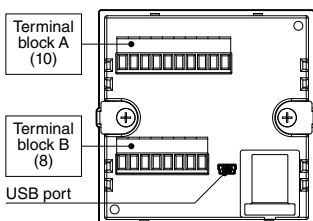


# Terminal arrangement and wiring diagrams

## Terminal wiring

- 1) Be sure to wire correctly according to the terminal arrangement and wiring diagrams.
- 2) Please connect a fuse or a breaker to power supply part for safety reasons, to protect the device and ease of maintenance. 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 this unit.
- 3) Do not turn on the power supply or input until all wiring is completed.

## Rear view



## Applies to terminal blocks A, B:

- Screw size: M2.5  
Tightening torque: 0.4 to 0.5 N·m  
Applicable wire: (Crimp-type terminal is recommended.)
- Single wire 0.13 to 4mm<sup>2</sup> (AWG26 to 12)
  - Stranded wire 0.2 to 4mm<sup>2</sup> (AWG24 to 12)
- When 2 wires share 1 terminal  
Single wire / Stranded wire 2 pcs.  
0.5 to 2.1mm<sup>2</sup> (AWG20 to 14)
- Stripping length: 7 to 8mm

## Terminal arrangement

### Terminal block A (upper) 10P

Terminal number	1	2	3	4	5	6	7	8	9	10
Functions	L+	N-	V1	V2	V3	Vn	NC	SG	A+	B-
	AUX (Power supply)		Measured voltage input			—		RS485		

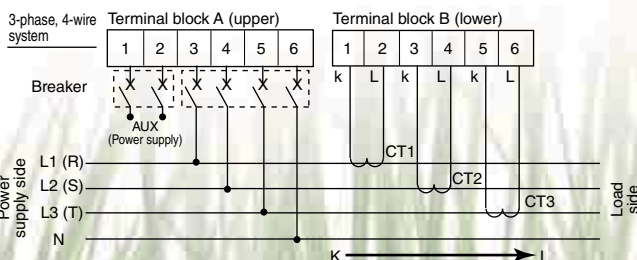
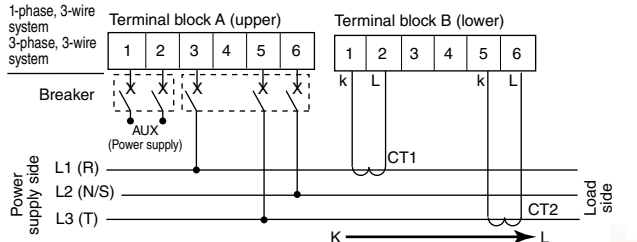
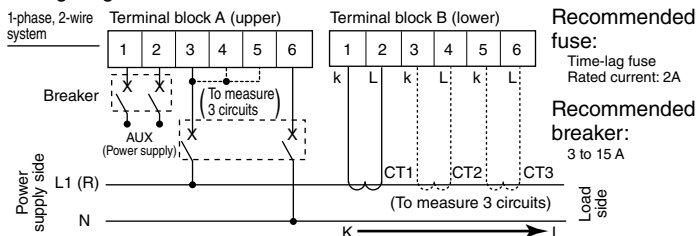
### Terminal block B (lower) 8P

Terminal number	1	2	3	4	5	6	7	8
Functions	*CT1 K	*CT1 L	*CT2 K	*CT2 L	*CT3 K	*CT3 L	NC	NC
	Measured current input						—	

\*CT = current transformer

## Wiring diagrams

(CT = current transformer)



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