Panasonic
ideas for life

Saving energy has never been so easy: Panasonic Eco-POWER METERS!

AUDIN - 8, avenue de la malle - 51370 Saint Brice Courcelles - Tel : 03.26.04.20.21 - Fax : 03.26.04.28.20 - Web : http: www.audin.fr - Email : info@audin.fr

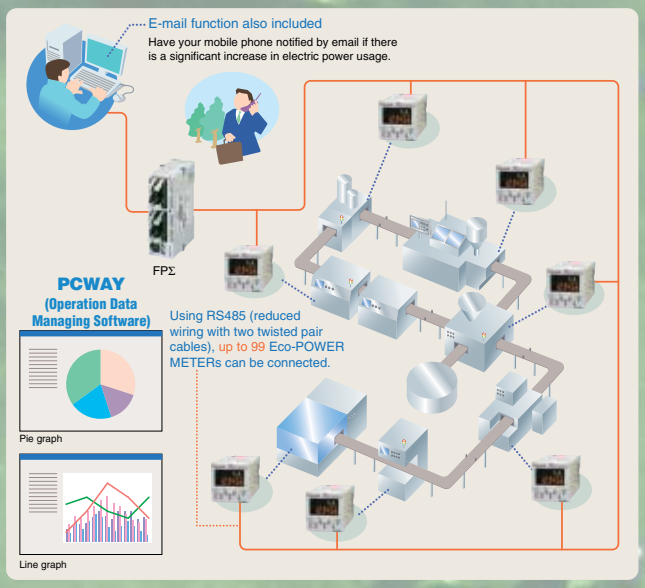
Measure, log and display

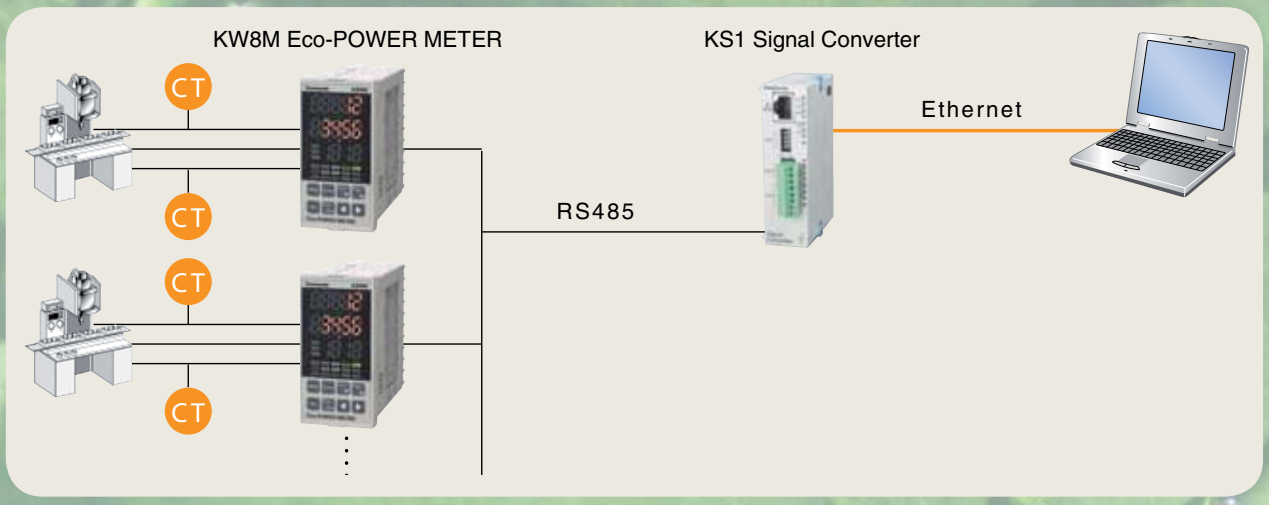
Panasonic is committed to preserving the environment. Impending climate change, soaring energy costs and uncontrolled energy consumption demand that each and everyone of us to take responsibility.

With our Eco-POWER METER series, you can visualize and analyze your consumption data and thereby uncover ways to save energy.

With an energy management system from Panasonic, you can manage your energy needs professionally and help reduce global CO_2 emissions.

Eco-POWER METERS can easily be distributed throughout the factory and linked to a central PC or PLC for monitoring, logging and analyzing of measured data.





Every Eco-POWER METER is equipped with an RS485 interface for easy and cost-efficient networking.
KS1 Signal Converters allow integration into any Ethernet network.

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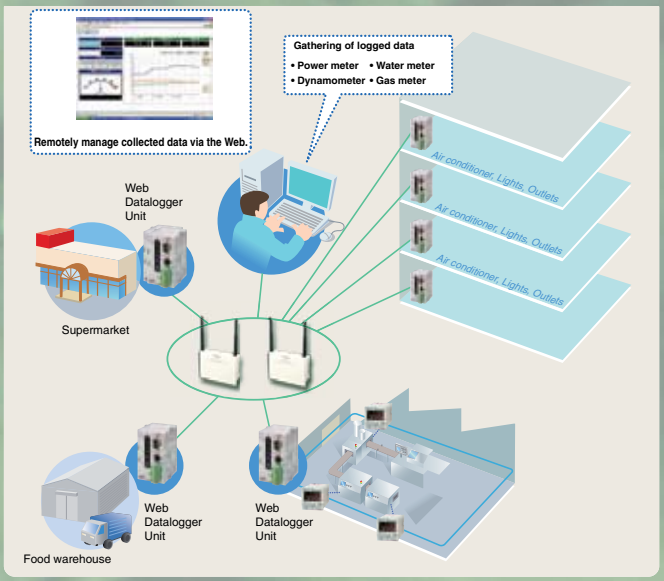
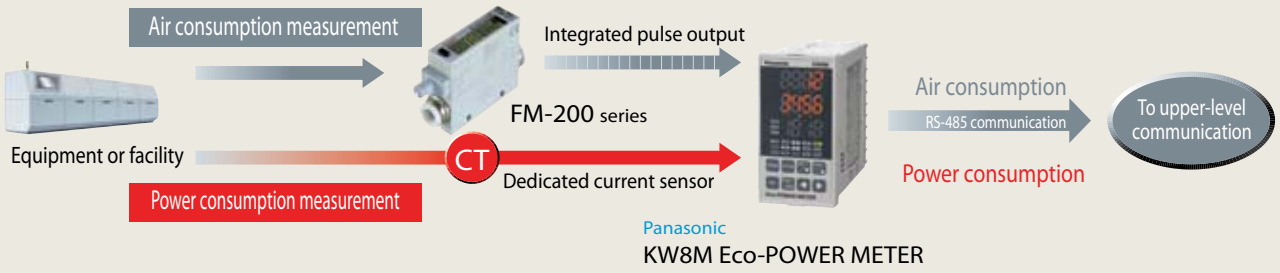
Save energy – protect the environment



- Control and manage your energy needs
- Eliminate wasted electricity
- Save costs
- Collect and log data
- Protect the environment

Panasonic's KR20 Wireless Unit allows you to access data remotely, and you can store data using the Panasonic Web Data Logger Unit.



The SUNX Digital Flow Sensor FM-200 allows you to save energy and costs in other ways, e.g. by measuring how much air is consumed in industrial processes. You can even connect the FM-200's pulse output to the Eco-POWER METER's pulse input to measure air consumption and power use simultaneously.

Panasonic Eco-POWER METERS suitable for every purpose! Contact your local sales office for details!

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KW7M Eco-POWER METER

All functions needed for power measurement now in a DIN type

- Save space and install more easily
- Can be installed in control panels
- Supports DIN specification (22.5 mm) and is thinnest DIN rail mounting with a display in industry (based on our investigation)
- Installable on DIN rail
- Can be used with compact dedicated Current Transformer (CT)
- Power measurement function
- Instantaneous electrical power display
- Integrated electrical energy display
- Voltage/current display for each phase
- Multiple inputs
- Also supports 5 A CT of secondary current input
- Support for 400 V AC
- Supports networking
- An RS485 communications port comes standard
- Comes with MEWTOCOL/Modbus (RTU)
- Pulse output is standard function

Main unit

Phase and wire system	Rated input	Current transformer	Part no.
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 (5A, 50A (common)/ 100A/250A/400A)	AKW7111

Rated primary current	Part no.
5A/50A	AKW4801C
100A	AKW4802C
250A	AKW4803C
400A	AKW4804C

Measurement items

Item		Unit	Data range
Instantaneous electrical power		kW	0.00 to 999999.99
Integrated electrical energy		kWh	0.00 to 999999.99 to 1000000.0 to 9999999.9
Current	L1 (CT1) phase current	A	0.0 to 999.9 to 1000 to 6000
	L2 (CT2) phase current	A	0.0 to 999.9 to 1000 to 6000
Voltage	Voltage between 1-2	V	0.0 to 999.9 to 1000 to 9999
	Voltage between 2-3	V	0.0 to 999.9 to 1000 to 9999
Electricity charge*			0.00 to 999999.99 to 1000000.0 to 9999999.9 to 10000000 to 99999999

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

Rated operating voltage	100 to 120/200 to 240V AC
Rated frequency	50/60Hz common
Rated power consumption	6VA
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 +14°F to +122°F (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	7-segment LED
Power failure memory method	EEP-ROM (Over 100,000 overwrites)

Communication

Interface	Conforming to RS485
Protocol	MEWTOCOL/Modbus (RTU)
Number of connected units	Max. 99 units

Main unit

Input voltage	Rating	Single-phase two-wire system: 100 to 120/200 to 240V AC (common use) Single-phase three-wire system: 100 to 120V AC Three-phase three-wire system: 200 to 240V AC
	Allowable measuring voltage	85% to 110% of rated operating voltage
	VT ratio	1.00 to 99.99 (External voltage transformer (VT) is required.)
	Max. displayed voltage	9999V
Input current	Rating of primary side	• 5A/50A/100A/250A/400A (when using dedicated CT) • 1 to 4000A (when using secondary 5A CT)
	CT ratio	1 to 4000/5A (Can be set in setting mode.) (Supported when dedicated CT used in 2-step configuration.)
	Max. displayed current	6000A (When 400A or higher, use commercial CT with 5A rated secondary current.)
Accuracy (Not including CT error) (Not including VT error)	Basic accuracy	Instantaneous electrical power, Integrated electrical energy, voltage, current and electricity charge ±2.5% F.S. ±1 digit (at 20°C rated input, rated frequency, power factor: 1), Guarantee accuracy range: 10 to 100% of a rated current of each CT
	Temperature characteristics	±1.5% F.S./10°C ±1 digit (for –10 to 50°C range, rated input and power factor: 1)
	Frequency characteristics	±1.5% F.S. ±1 digit (for ±5% frequency change, rated input and power factor: 1)

Please read the installation instructions before using to ensure correct usage.
For details, specifications and handling, please read the KW7M Eco-POWER METER User's Manual.
You can download the user's manual from http://www.panasonic-electric-works.com

KW4M Eco-POWER METER

On the lookout for wasted electricity in buildings and plants

- For maintenance and control in applications involving energy saving and environmental protection
- Large display for increased visibility
- Expanded basic functions
- 1 model supports 4 compact CTs
  Supports 400V AC power measurement

New transmission speed: 38,400bps

Main unit

Phase and wire system	Rated input	Current transformer	Terminal type	Communication protocol	Model no.
Single-phase two-wire system Single-phase three-wire system Three-phase three-wire system	• 100 to 120V/ 200 to 240V AC • 100 to 120V AC • 200 to 240V AC	Dedicated CT type (5 A/50 A/100 A/ 250 A/400 A)	Screw terminal	MEWTOCOL	AKW5111
				Modbus (RTU)	NEW AKW5112
			11-pins	MEWTOCOL	AKW5211
				Modbus (RTU)	NEW AKW5212

*Modbus is a communication protocol developed for PLCs by Modicon Inc.

Measurement items

Item			Unit	Data range	
Instantaneous electrical power			kW	0.00 to 9999.99	
Integrated electrical energy			kWh MWh	0.00 to 9999.99kWh to 10.00MWh to 9999.99MWh 9-digit display: 0.00 to 9999999.99kWh	
Current	L1 (CT1) phase current		A	0.0 to 999.9 (MEWTOCOL type)	0.0 to 6000.0 (Modbus type)
	L2 (CT2) phase current		A	0.0 to 999.9 (MEWTOCOL type)	0.0 to 6000.0 (Modbus type)
Voltage	Voltage between 1-2		V	0.0 to 9999.9	
	Voltage between 2-3		V	0.0 to 9999.9	
Conversion value	Electricity charge*1	Yen	JPY	0 to 999999	
		Dollars	$	0 to 9999.99	
		Euros	EUR	0 to 9999.99	
		NEW Yuan	CNY	0 to 9999.99	
		No unit	CHG	0 to 9999.99	
	Carbon dioxide		CO2	0 to 9999.99	
Hour meter	ON time		h (Hour)	0.0 to 99999.9	
	OFF time		h (Hour)	0.0 to 99999.9	
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	50/60Hz 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 +14°F to +122°F (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	EEP-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. 130g, For screw terminal type: approx. 140g

Communication

Interface	Conforming to RS485
Protocol	MEWTOCOL/Modbus (depending on part no.)
Number of connected units	Max. 99 units
Data length	8-bit/7-bit (Can be select in setting mode) (MEWTOCOL type)
	8-bit (Fix) (Modbus type)

Pulse input

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

Pulse 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 unit *2	When measuring power	0.001/0.01/0.1/1/10/100 kWh/Alarm (selectable by mode)
	When measuring pulse input	HOLD (over count)

When mea*2 Power and pulse input are not possible at the same time.suring pul

KW8M Eco-POWER METER

Features of AKW8111

- Direct measurement of 400V power loads
- Three-phase, four-wire system compatibility
- Improved measurement function
  Instantaneous electrical power
  Integrated electrical power
  Voltage and current measurement for each phase
  Frequency
  Power factor
- Simultaneous power and pulse measurement
- Supports networking (up to 99 units can be connected)
  RS485, MEWTOCOL/Modbus (RTU)*
- KW8M series has CE marking

Features of AKW8111H

- Includes all the features of AKW8111
- Built- in memory
  Log data can be saved to memory of main unit
- Built-in battery (for memory backup)
  Protects log data and time measurements against power failures
- Optional functions (3 items) added
  Each integrated electric power by month, day and hour
  Arbitrary integrated active electrical power
  Calendar timer function

Main unit

Phase and wire system	Operating power supply	Measured voltage input	Measured current input	Current transformer	Terminal type	Log function	Part no.
Single-phase two-wire system	100 to 240V AC 50/60Hz	• 400V AC • 100/200V AC	5A, 100A, 250A, 400A	Dedicated CT type [5A, 50A (common)/ 100A/250A/400A]	Screw terminal (M3 "+" screw)	Not available	AKW8111
Single-phase three-wire system							
Three-phase three-wire system						Available	AKW8111H
Three-phase four-wire system							

Measurement items

Item		Unit	Data range
Integrated electrical power	Active power	kWh	0.00 to 9999999.9
	Reactive power	kvarh	0.00 to 9999999.9
	Apparent power	kVAh	0.00 to 9999999.9
Instantaneous electrical power	Active power	kW	0.00 to 999999.99
	Reactive power	kvar	0.00 to 999999.99
	Apparent power	kVA	0.00 to 999999.99
Voltage	CT1 phase current	A	0.0 to 6000
	CT2 phase current	A	0.0 to 6000
	CT3 phase current	A	0.0 to 6000
	Voltage between P1 and P0	V	0.0 to 9999
	Voltage between P2 and P0	V	0.0 to 9999
	Voltage between P3 and P0	V	0.0 to 9999
Electricity charge*		—	0.00 to 99999999
Power factor	Display	—	0.00 to 1.00
	Communication	—	-1.00 to 0.00 to 1.00
Frequency		Hz	47.5 to 63.0
Hour meter	ON time	Time	0.0 to 99999.9
	OFF time		
Pulse counter		—	0 to 99999999

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

Input mode	Addition (fixed)
Max. counting speed	2kHz/30Hz (selectable by mode)
Pulse input	Min. input signal width: 0.25ms (when 2kHz selected)/ 16.7ms (when 30Hz selected), ON : OFF ratio = 1 : 1
Input signal	Contact/No contact (open collector) • Impedance when shorted: 1k • Residual voltage when shorted: Max. 2V • Impedance when open: 100k
Output mode	HOLD (over count)
Number of digits	8 digit (0 to 99999999)

Number of output point	1 point
Insulation method	Optical coupler
Output type	Open collector
Output capacity	100mA 30VDC
Pulse width	Approx. 100ms
ON stage voltage drop	1.5V or less
OFF stage voltage drop	100μA
Pulse output unit	0.001/0.01/0.1/1/10/100KWh Alarm (AL-P)/Counter(CNT) (selectable with setting mode)

Specifications

Rated operating voltage	100 to 240V AC	
Rated frequency	50/60Hz common	
Rated power consumption	8VA	
Inrush current	30A or less (200V AC at 25°C)	
Allowable operating voltage range	85 to 264V AC (85% to 110% of rated operating voltage)	
Allowable power off time	10ms	
Ambient temperature	–10°C to +50°C +14°F to +122°F (Storage temperature: –25°C to +70°C –13°F to +158°F)	
Ambient humidity	30 to 85%RH (at 20°C non-condensing)	
Breakdown voltage (initial)	Between the isolated circuits: 2000V for 1min Note: Cut-off current: 10mA However protective varisator excluded	• Outer edge (case) <-> All terminals • Insulated Circuit • GND <-> All other terminals • Operation power supply terminals <-> Analog input terminals* • Operating power supply terminals <-> Pulse input terminal • RS485 <-> All other terminals • Pulse output terminals <-> All other terminals
Insulation resistance (initial)	Between the isolated circuits: 1000M or more (measured at 500V DC)	
Vibration resistance	10 to 55Hz (1cycle/min) single amplitude: 0.375mm (1H on 3 axes)	
Shock resistance	Min. 294m/s² (5 times on 3 axes)	
Display method	8-digit, 7-segment LCD	
Power failure memory method	EEP-ROM (Over 100,000 overwrites)	
Size	48 x 96 x 98.5mm	
Weight	AKW8111: approx. 235g	AKW8111H: approx. 250g

Input specifications

Measured voltage input	Rating	Single-phase two-wire system: 0 to 440V AC (phase voltage) Single-phase three-wire system: 0 to 220V AC (line voltage) Three-phase three-wire system: 0 to 440V AC (phase voltage) Three-phase four-wire system: 0 to 254V AC (line voltage)
	Allowable Allowable measuring voltage	85% to 120% of rated input voltage Single-phase two-wire system: 0 to 528V AC (phase voltage) Single-phase three-wire system: 0 to 264V AC (line voltage) Three-phase three-wire system: 0 to 528V AC (phase voltage) Three-phase four-wire system: 0 to 300V AC (line voltage)
	VT ratio	1.00 to 99.99 (set with setting mode) *Voltage transformer (VT) is required when measuring 440V or higher (secondary side: 440V/220 V or less).
Measured current input	Primary side rating	5A/50A/100A/250A/400A (in case using dedicated CT) (select with setting mode) 1 to 4000 A (set with setting mode) *Use a commercial CT with secondary side rated current of 5A when measuring 400A or more. *Accuracy coverage: 10 to 100% of a rated current of CT
Special functions	Cut-off current	1.00 to 50.0% (select with setting mode)
	Current threshold for hour meter	1.00 to 100.0% (select with setting mode)
Accuracy (Without error in CT and VT)	Power (Active/Reactive/Apparent), Instantaneous electrical power (Active/Reactive/Apparent), Voltage, Current, Electricity charge	±2.5% F.S. ±1 digit (at 20°C rated input, rated frequency, power factor: 1) *Guarantee accuracy range: 10 to 100% of a rated current of each CT
	Hour meter	±0.01%±1 digit (at 20°C) (In case power on start or current energizing: ±0.01%±1st±1 digit)
	Temperature characteristics Frequency characteristics	±1.5% F.S./10°C ±1 digit (for 10 to 50°C range, rated input and power factor: 1) ±1.5% F.S. ±1 digit (for ±5% frequency change, rated input and power factor: 1)

Communication specifications

Interfaces / Protocol		Conforming to RS485 / MEWTOCOL/Modbus(RTU)
Isolation status		Isolated with the internal circuit
Number of connected units		99 (max.)
Transmission distance / Transmission speed		1200m (max.)*1 / 19,200/9600/2400bps (selectable with setting mode)
Transmission format	Data length	8bit/7bit (selectable with setting mode)
	Parity	Not available / Old number / Even number (selectable with setting mode)
	Stop bit	1bit (fixed)
Communication method / Synchronos system		Half-duplex / Synchronous communication method
Ending resistance		Approx. 120 (built-in)

Optional specifications (AKW8111H only)

Log function Memory of main unit	Automatic logging	Save cycle	60 min.
		Save data	Integrated active power, integrated reactive power, integrated apparent power
		Save data amount	Max. 2232 records *3 months
		Display	Integrated electric power by month, integrated electric power by day, integrated electric power by hour
	Selected logging	Save cycle	1, 5, 10, 15, 30, 60min.
		Save data	integrated active power, integrated reactive power, integrated apparent power, instanteous voltage, instanteous current, pulse count value
		Save data amount	Max. 2160 records *1.5 days (when save frequency is 1 min.)
Calendar time function (Time accuracy)			monthly accuracy: 240sec. (at -10°C), 70sec. (at 25°C), 240sec (at 50°C)
Arbitrary integrated active power			Integrated active power in arbitrary time, display range: 0.00 to 9999999.9kWh
Content of batterie backup			Time measurement and log data retained
Battery life			About 5 years (at ambient temperature 25°C)

Current Transformers

5A/50A

100A

250A

400A

Part no.		AKW4801 / AKW4801C	AKW4802 / AKW4802C	AKW4803 / AKW4803C	AKW4804 / AKW4804C
Primary side rated current		5A / 50A	100A	250A	400A
Secondary side rated current		1.67mA / 16.7mA	33.3mA	125mA	200mA
Winding (Turn)		3000	3000	2000	2000
Ratio error		±2.0%F.S.			
Hole diameter (mm)		ø10	ø16	ø24	ø36
Breakdown voltage (initial)		AC 1000V/1min (Between through hole and output lead wire)		AC 1000V/1min (Between through hole and output lead wire)	
Insulation resistance (initial)		Min. 100MΩ (at DC500V) (Between through hole and output lead wire)			
Vibration resistance	Functional	10~55Hz (1 cycle/minute) single amplitude of 0.15mm (10min on X, Y and Z axes)			
	Destructive	10~55Hz (1 cycle/minute) single amplitude of 0.375mm (1h on X, Y and Z axes)			
Shock resistance	Functional	Min. 98m/s² (4 times on X, Y and Z axes)			
	Destructive	Min. 294m/s² (5 times on X, Y and Z axes)			
Output protection level		±7.5V with clamp element		±3.0V with clamp element	
Permissable clamping frequency		Approx. 100 times			
Ambient temperature		-10 to +50°C (without frost and non-condensing)			
Storage temperature		-20 to +50°C (without frost and non-condensing)			
Ambient humidity		35~80RH (at 20°C non-condensing)			
Weight (with relay cable)		Approx. 50g	Approx. 80g	Approx. 200g	Approx. 300g

Note: Dedicated current transformers (CT), AKW4801, 4801C, 4802, 4802C, 4803, 4803C, 4804, 4804C are dedicated for low voltage under 440V. They cannot be used for high voltage circuit. When measuring high voltage circuit make a 2-step construction by combining of a commercial CT of secondary side current 5A for high voltage and the dedicated CT for 5A (AKW4801C). All „C“ versions are only suitable for KW7M.

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