

# Clamp-on Power Meter

## CLAMP-ON POWER METER CW240

**CW240 manage :**

**Electric power consumption analysis (energy-saving/ISO14001), harmonic analysis, and power quality control**

Power wastage discovery/improvement and power supply quality control begin with the CW240

**NEW**



### Energy-saving support equipment

#### Simultaneous measurement of power, harmonics, voltage fluctuations and waveforms

Electric power (instantaneous values, electric energy, and demand), harmonics, voltage fluctuations (dip, swell, and instantaneous power failure) and waveform scan all be measured simultaneously.

#### Supports a range of connections

The CW240 supports four single-phase two-wire systems, two single-phase three-wire systems and even SCOTT connections.

#### Wide measurement range

The CW240 supports currents ranging from 200.0 mA to 3000 A and voltages up to 1000 V.

#### Leakage current measurement

Uses 2A current clamp probes. External magnetic field effect is 0.002 A or less.

#### External memory

Can generate a screen hard copy.  
Can save data with an instantaneous value from one cycle (one waveform).

#### The large LCD

The CW240 can display vector diagrams of connections or waveforms of instantaneous values in addition to measured values.



# Electric power analysis and power supply quality control in a single unit!

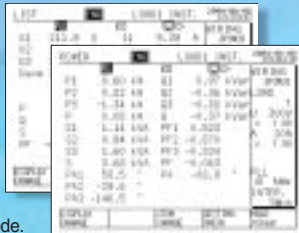
## Power analysis

Power wastage can be discovered through detailed data collection

### Electric energy measurement

Saves one-cycle data

The CW240 displays instantaneous values for each of the elements measured. In addition to the voltage, current and electric power of each phase, the CW240 can measure power factors, frequencies, phase angles and reactive/ apparent power. The CW240 also displays the average, maximum and minimum values of each measured value. As a standard feature, data can be saved in the memory in units of one second. Instantaneous values can be saved in one cycle (waveform) in the short time mode.



### Electric energy measurement

The first step for power control

Electric energy (integrated value) are measured or calculated at the configured time (from the start of integration till the end). Measurement elements are active, regenerative and reactive power quantities (Lead/Lag). Cycles for saving data can be set from 1 second to 60 minutes.



### Demand measurement

As a standard for reviewing contract demand

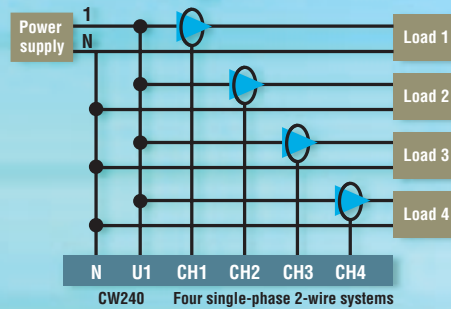
The CW240 displays the maximum power demand and the time it occurs. The demand time limit can be set from 1 second.

- Demand power (= average electric power value during the demand time limit)
- Demand time limit (= length of time that is set to obtain average electric power : usually 30 minutes)



## Simultaneous measurement of loads in four systems

Loads of four single-phase 2-wire systems can be measured simultaneously with the loads of two single-phase/3-phase 3-wire systems (common to voltage). Current clamp probe/range can be set for each system.

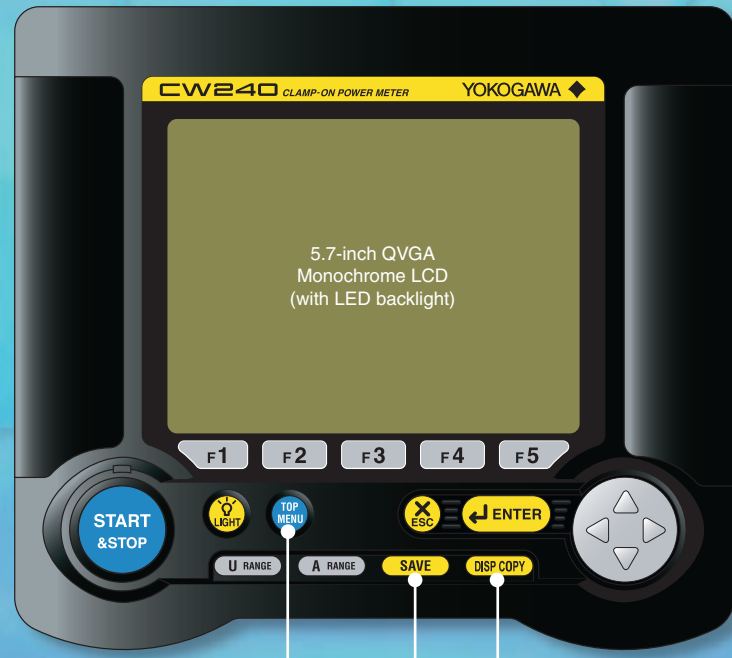


Current input

- Prevention of current clamp probe H/L reverse connections
- Prevention of voltage cable connections



RS-232 connector External control input/output Analog input/output terminal (optional)



Return to the "Top Menu." Instantaneous values are saved. A hard copy of the displayed window is generated.

## Fully equipped with convenient functions!

### Simultaneous measurement of leakage current in four channels

External magnetic field effect is 0.002 A or less.

Yokogawa's proprietary technology has achieved a magnetic field impact amount of 30 ppm even in adjacent power lines. The use of the 2A Current Clamp Probe (96036) makes it possible to measure a range starting from a minimum of 200.0 mA.



Current clamp probe (96036)

### Analog input/output

Not just power data alone.

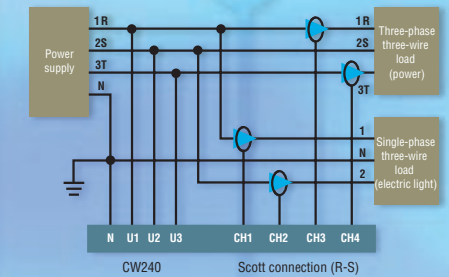
The analog input/output function (output: four channels, input: two channels) makes it possible to save temperature or illuminance analog data simultaneously with power data. The input range is 100 mV/1 V/5 V. Output is  $\pm 1$  VDC. (The analog input/output is optional.)



Digital illuminance meter (51001)

### Scott connections can be measured with a single machine!

Scott connections (also called "different capacity load" or "V-connected three-phase four-wire"), can supply electric power to lights (single-phase three-wire) and power (three-phase three-wire) using two transformers and four wires, thus streamlining facilities. Recently, they are also being used as a regular power supply in order to reduce facility costs. It is expected that they will be used increasingly in the future.

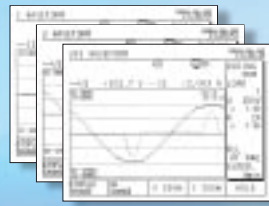


### A large amount of data can be saved

Use of an external memory card makes it possible to save a large amount of data. Data can be saved in units of one waveform (Note that memory of one second or less is in the binary format). The CW240 can support memory cards of up to 512 MB (memory cards purchased from Yokogawa should be used for the CW240). In addition, the CW240 has a 1MB internal memory to back up memory cards.

### Waveform display

Waveforms of one cycle can be displayed. You can select voltage and current displays, or voltage or current of each phase. In addition, the vertical axis can be zoomed up to 20 times so that waveforms can be displayed in greater detail.



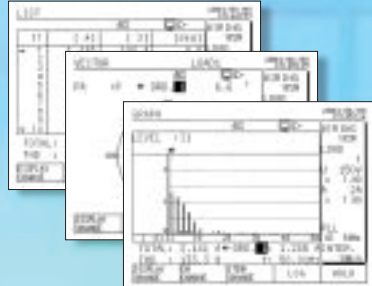
## Power supply quality control

Discover abnormality in power supply lines!

### Harmonic measurement

The CW240 can display each item/order for harmonics from the 1st to the 50th harmonic in numerical values, graphs and vectors. As well as the level/content/phase angle of each harmonic for each voltage/current/electric power, the CW240 can display aggregate values (total of voltage, current and electric power values for up to the 50th harmonic) and aggregate harmonic distortion factors (THD-F and THD-R) of power/current.

- THD-F : Distortion factor for the fundamental wave,
- THD-R : Distortion factor for all rms values



### Voltage fluctuation measurement

The CW240 can be used for monitoring voltage fluctuations (dip, swell and instantaneous power failure). The CW240 saves the dates and times when fluctuations occur, channels where they occur, periods from occurrence to termination, and rms values of the voltages where they occur. The CW240 can save up to 100 data.



### Failures in power supply lines

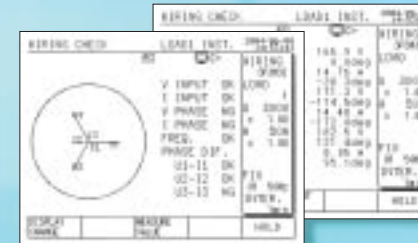
Phenomenon	Failure
<b>Harmonics</b>	<b>Phenomenon :</b> This failure frequently occurs, for example, in devices or equipment which use power supplies such as inverters or thyristers. It is caused by distorted waveforms. <b>Failure :</b> The harmonic failure may cause the equipment to malfunction or may overheat leading power factor capacitors or serial reactors.
<b>Voltage dip (sag, voltage drop)</b>	<b>Phenomenon :</b> A voltage drop (voltage sag) occurs for a short time due to the occurrence of a large inrush current on loads, for example, when a motor is started. <b>Failure :</b> Decrease of power supply voltage may cause a device to stop or reset its operations.
<b>Voltage swell (Voltage increase)</b>	<b>Phenomenon :</b> Voltage increases instantaneously, for example, when lightning occurs or when a power line with a heavy load is opened or closed. <b>Failure :</b> Increase of power supply voltage may cause a device to damage its power supply or reset its operations.
<b>Instantaneous power failure (Instantaneous failure of power supply)</b>	<b>Phenomenon :</b> Power supply is stopped instantaneously, or for a short/long time, for example, when a problem occurs in the power supply (suspension of power supply due to lightning, etc.) or due to the trip of a breaker caused by short circuits in the power supply, etc.

## Do you worry about incorrect measurements?

No need to worry any more! Connections and settings can be checked reliably and easily.

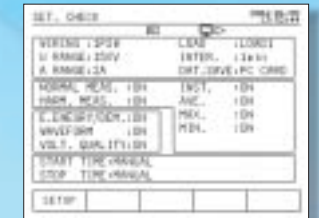
### Connection check function

You can check any wrong connections before measurement. You can check wrong connections, reverse connections in current clamps or phase sequences in vector display diagrams.



### Setting check function

You can check measurement settings in one window. You can prevent mistakes in voltage range settings, current clamp selections and data storage, etc., so that you can avoid loss of data.



## The CW240 is supported in many ways:

### Power supply backup

Besides the AC Adaptor, you can use a NiMH Battery Pack (94004) or alkaline batteries (six AA batteries). The CW240 continues to operate even if the power supply stops.

### Versatile current clamp probes

Available sizes are from 18 mm to 170 mm (flexible). The CW240 supports a wide range from 200.0 mA to 3000 A. Current clamp probes are designed to prevent reverse connections.

### Multi-lingual support

The CW240 supports English and Japanese. German, French, Spanish and Italian languages will be added soon.



## ● CW240 suffix and option code

Model number and suffix code				
Model (Part No.)	Suffix code	Option code	Description	
CW240	-D		Power Cord : UL/CSA Standard	
	-F		Power Cord : VDE Standard	
	-R		Power Cord : SAA Standard	
	-S		Power Cord : BS Standard	
		/DA		Analog input/output function
		/C1		Clamp-on Probe for 20/200A (2pcs/set)
		/C2		Clamp-on Probe for 20/200A (4pcs/set)
		/C3		Clamp-on Probe for 500A (2pcs/set)
		/C4		Clamp-on Probe for 500A (4pcs/set)
		/C5		Clamp-on Probe for 700A (2pcs/set)
		/C6		Clamp-on Probe for 700A (4pcs/set)
		/C7		Clamp-on Probe for 50A (2pcs/set)
		/C8		Clamp-on Probe for 50A (4pcs/set)
		/C9		Clamp-on Probe for 2A (2pcs/set)
		/C10		Clamp-on Probe for 2A (4pcs/set)
		/C11		Clamp-on Probe for 3000A (2pcs/set)
		/C12		Clamp-on Probe for 3000A (4pcs/set)
		/C13		Clamp-on Probe for 3000A(Flexible Type) (2pcs/set)
		/C14		Clamp-on Probe for 3000A(Flexible Type) (4pcs/set)
	/PM1		NiMH battery pack(94004) and carrying case(93020)	

Optional Accessories		
Name	Model (Part No.)	Description
Clamp-on Probe	96030	For 20/200A
	96031	For 500A
	96032	For 700A
	96033	For 50A
	96034	For 3000A
	96035	For 3000A (Flexible Type)
	96036	For 2A
Carrying Case	93020	
NiMH Battery Pack	94004	
AC Adaptor for Clamp-on Probe Model 96035	A1020UP	For AC 100V
	A1022UP	For AC 120V
	B9108WB	For AC 220-240V
Memory Card (32MB)	97031	CompactFlash Memory Card(32MB) and PC Card Adapter
Memory Card (64MB)	97032	CompactFlash Memory Card(64MB) and PC Card Adapter
Memory Card (128MB)	97033	CompactFlash Memory Card(128MB) and PC Card Adapter
Memory Card (256MB)	97034	CompactFlash Memory Card(256MB) and PC Card Adapter
Memory Card (512MB)	97035	CompactFlash Memory Card(512MB) and PC Card Adapter
Protective cover	91022	4pcs/set
Printer	97010	
AC Adaptor	94006	Power Supply: 200-240V AC
	94007	Power Supply: 100-120V AC
Thermal Paper	97080	For Printer, 10 rolls/set
Voltage Probe	91007	4pcs/set

### Standard accessories comes with main unit

91007 Voltage probes, AC adapter x1, AA size alkaline battery x6, ToolBox240(CD-ROM)x1, User's Manual x1/CD-ROM version x1, Quick Manual x1/CD-ROM version x1, Communication function manual(CD-ROM) x1

## ● Clamp-on Probes (Separate Purchase)

Model	96036	96033	96030	96031	96032	96034	96035
Diameter of measurable conductor	φ 40mm	φ 18mm	φ 30mm	φ 30mm	φ 65mm	65×100mm	φ 170mm
Measuring range	AC 2A	AC 50A	AC 200A	AC 500A	AC 700A	AC 1000/2000/3000A	AC 300/3000A
Output voltage	AC 50mV	AC 500mV	AC 500mV	AC 500mV	AC 250mV	AC 500mV	AC 500mV
Accuracy (May vary by input)	± 0.5% of rdg	± 0.5% of rdg	± 0.5% of rdg	± 0.5% of rdg	± 1.0% of rdg	± 1.0% of rdg	± 1.0% of rdg
Amplitude	± 0.01mV	± 0.1mV	± 0.1mV	± 0.1mV	± 0.2mV		
Phase	± 2.0°	± 1.0°	± 0.5°	± 1.0°	± 1.0°	± 1.0°	± 1.0°
Frequency range	20Hz to 5kHz	20Hz to 20kHz	20Hz to 20kHz	20Hz to 5kHz	45Hz to 66Hz	30Hz to 1.5kHz	AC 500mV
Maximum Operating circuit voltage	AC 50V	AC 300V	AC 600V	AC 600V	AC 600V	AC 600V	AC 1000V(pri)
External Dimensions	70×120×25mm	52×106×25mm	73×130×30mm	73×130×30mm	100×172.5×32mm	120×310×48mm	140×64×28mm
Weight	Approx. 300g	Approx. 220g	Approx. 300g	Approx. 300g	Approx. 500g	Approx. 1.390g	Approx. 470g

\*Use 9V battery cell  
Can be drive by AC adaptor  
(Separate purchase)

\*For your measurement, separately need to purchase clamp-on probes.

## ● Related Products



CW120/CW121

- Long term power monitoring
- Compact and light weight body
- Support 3P4W system, CAT III 600V
- Various communication functions

Maintenance and long term monitoring of the power consumption in switch board and electric facilities.



Power monitors/POWERCERT

- UPM100
- For centralize management
- UZ005/PR201
- For site management
- Large display

**YOKOGAWA**   
Yokogawa M&C Corporation

World Wide Web site at  
<http://www.yokogawa.com/MCC>

### ▲ NOTICE

- Before using the product, read the instruction manual carefully to ensure proper and safe operation.

YOKOGAWA M&C CORPORATION International Sales Dept. 2-9-32 Nakacho, Musashino-shi, Tokyo, 180-8750 Japan  
Phone: +81-422-52-3530 Facsimile: +81-422-55-8954

YOKOGAWA CORPORATION OF AMERICA (U.S.A.)  
YOKOGAWA EUROPE B. V. (THE NETHERLANDS)  
YOKOGAWA ENGINEERING ASIA PTE. LTD. (SINGAPORE)  
YOKOGAWA AMERICA DO SUL LTDA (BRAZIL)  
YOKOGAWA MEASURING INSTRUMENTS KOREA CORPORATION (KOREA)  
YOKOGAWA AUSTRALIA PTY. LTD. (AUSTRALIA)  
YOKOGAWA INDIA LTD. (INDIA)  
YOKOGAWA MIDDLE EAST E.C. (BAHRAIN)  
LTD. YOKOGAWA ELECTRIC (RUSSIAN FEDERATION)

Phone: +1-770-253-7000  
Phone: +31-334-64-1611  
Phone: +65-6241-9933  
Phone: +55-11-5681-2400  
Phone: +82-2-551-0660  
Phone: +61-2-9805-0699  
Phone: +91-80-2227-1513  
Phone: +973-358100  
Phone: +7-095-737-7868

Facsimile: +1-770-251-2088  
Facsimile: +31-334-64-1610  
Facsimile: +65-6241-2606  
Facsimile: +55-11-5681-1274/4434  
Facsimile: +82-2-551-0665  
Facsimile: +61-2-9888-1844  
Facsimile: +91-80-2227-4270  
Facsimile: +973-336100  
Facsimile: +7-095-737-7869

Represented by: