

# 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

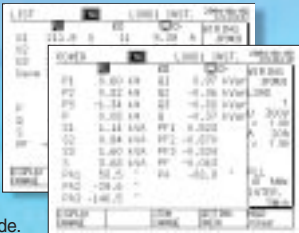
Electric energy (integrated value) are measured or calculated at the configured time (from the start of integration till the end). Measurement elements are active, regenerative and reactive power quantities (Lead/Lag). Cycles for saving data can be set from 1 second to 60 minutes.

### Demand measurement

As a standard for reviewing contract demand

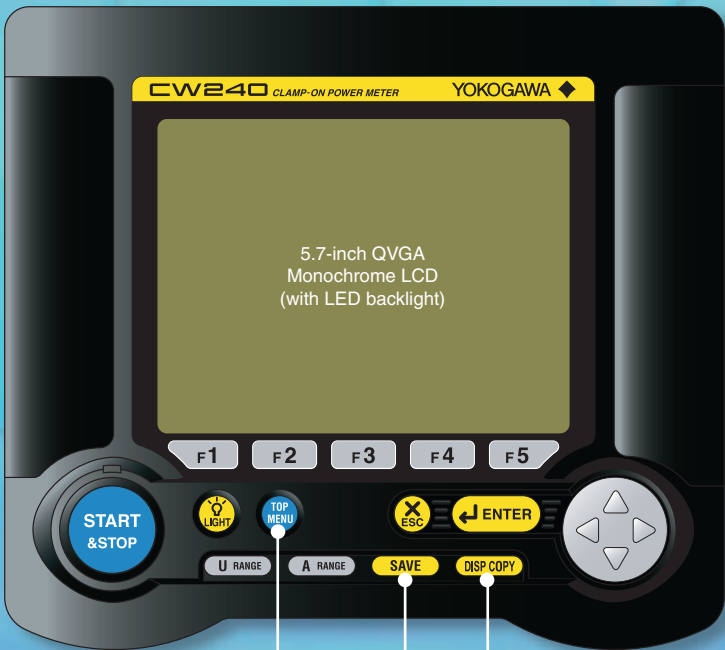
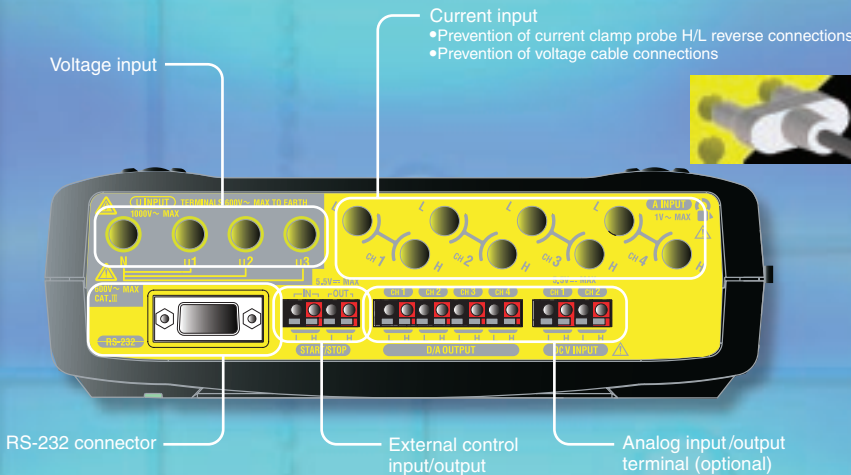
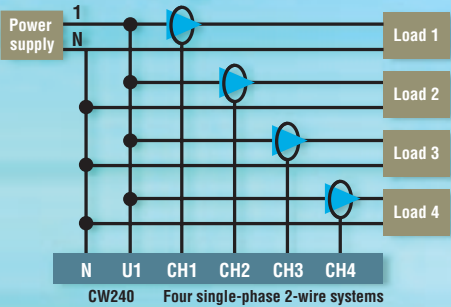
The CW240 displays the maximum power demand and the time it occurs. The demand time limit can be set from 1 second.

- 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.



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 200.0mA.



Current clamp probe (96036)

### Analog input/output

Not just power data alone.

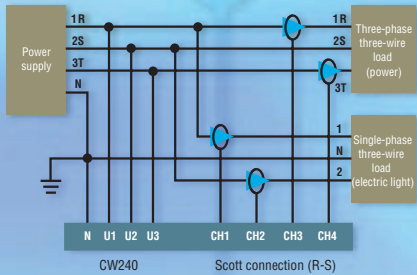
The analog input/output function (output: four channels, input: two channels) makes it possible to save temperature or illuminance analog data simultaneously with power data. The input range is 100 mV/1 V/5 V. Output is  $\pm 1$  VDC. (The analog input/output is optional.)



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.

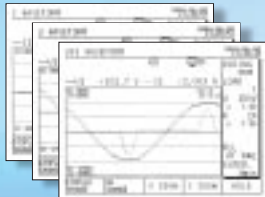


### A large amount of data can be saved

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

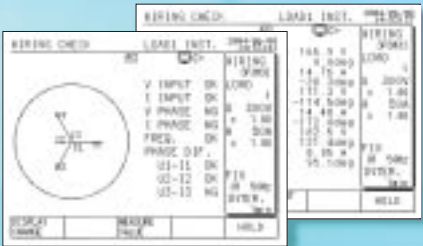
|                                                                            |                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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.

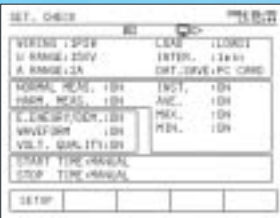
### Connection check function

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)                            |
| Carrying Case                             | 93020            | For 2A                                               |
| 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  | ø 40mm                                                                             | ø 18mm                                                                             | ø 30mm                                                                             | ø 30mm                                                                             | ø 65mm                                                                               | 65×100mm                                                                             | ø 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                                                                             | 10Hz to 20kHz                                                                        |
| 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                                                                         |

\*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.

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