

User's Manual CL220
Clamp-on Tester

IM CL220

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■ Precautions for Safe Use of the Instrument

When handling the instrument, ALWAYS observe all of the cautionary notes on safety given below. Yokogawa Meters & Instruments Corporation is not at all liable for damage resulting from misuse of this product by the user that is contrary to these cautionary notes. Various symbols are used on the instrument and in this manual to ensure the product is used safely and to protect operators and property from possible hazards or damage. The following safety symbols are used where appropriate. Read the explanations carefully and familiarize yourself with the symbols before reading the text.

The instrument and this manual use the following safety symbols:

- Danger! Handle with Care.**
This symbol indicates that the operator must refer to an explanation in the User's Manual in order to avoid the risk of personal injury or death and/or damage to the instrument.
- Double Insulation**
This symbol indicates double insulation.
- AC Voltage/Current**
This symbol indicates AC voltage or current.
- DC Voltage/Current**
This symbol indicates DC voltage or current.
- AC/DC Voltage/Current**
This symbol indicates AC/DC voltage or current.
- Ground**
This symbol indicates ground (earth)
- Indicates that this instrument can clamp on bare conductors when measuring a voltage corresponding to the applicable Measurement category, which is marked next to this symbol.

WARNING
Indicates that there is a possibility of serious personal injury or loss of life if the operating procedure is not followed correctly and describes the precautions for avoiding such injury or loss of life.

CAUTION
Indicates that there is a possibility of serious personal injury or damage to the instrument if the operating procedure is not followed correctly and describes the precautions for avoiding such injury or damage.

NOTE
Draws attention to information essential for understanding the operation and features.

WARNING

- Never make measurement on a circuit above 300V AC/DC.
- Do not use the instrument in an atmosphere where any flammable or explosive gas is present.
- Do not attempt to make measurement in the presence of flammable gasses, fumes, vapor or dust. Otherwise, the use of the instrument may cause sparking, which can lead to an explosion.
- Avoid using the instrument if it has been exposed to rain or moisture or if your hands are wet.
- Do not exceed the maximum allowable input of any measurement range.
- Never open the battery compartment cover when making measurement.
- Do not use the instrument if there is any damage to the casing or when the casing is removed.
- Do not install substitute parts or make any modification to the instrument. Return the instrument to Yokogawa Meters & Instruments or your distributor for repair or re-calibration.
- Always switch off the instrument before opening the battery compartment cover for battery replacement.

WARNING

To avoid damage to the instrument or electric shock! The restrictions on the maximum voltage level for which the CL220 testers can be used, depend on the measurement categories specified by the safety standards. These category specifications are formulated to protect operators against transient impulse voltage in power lines.

Function	Maximum Allowable Input
~ A, - - - A	MEASUREMENT CATEGORY III
	300Arms AC/300A DC Measuring circuit voltage : 300Vrms AC/300V DC

O(None, Other)
Other circuits that are not directly connected to MEAINS. Measurement category II (CAT.II)
Local level, appliance, portable equipment etc., with smaller transient over-voltages than CAT.III.
Measurement category III (CAT.III):
Distribution level, fixed installation, with smaller transient over-voltages than CAT.IV.

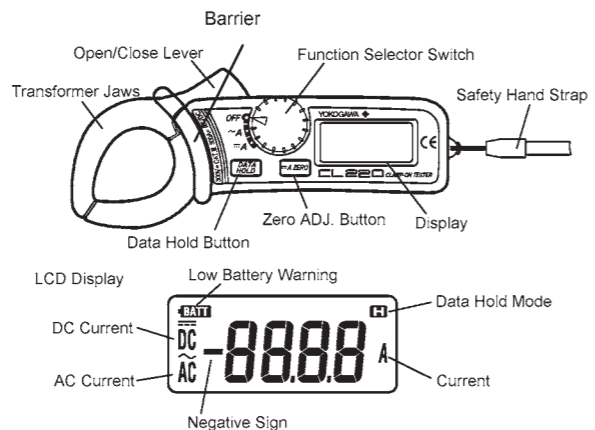
CAUTION

- Be sure to set the Function Selector switch to the "OFF" position after use. When the instrument will not be in use for a long period of time, Place it in storage after removing the battery.
- Use a damp cloth and detergent for cleaning the instrument. Do not use abrasives or solvents.

NOTE

- Radiation immunity affects the accuracy of CL220 testers under the conditions specified in EN 61000-4-3.
- If equipment generating strong electromagnetic interference is located nearby, the testers may malfunction.

1. Instrument Layout



Barrier : It is a part providing protection against electrical shock and ensuring the minimum required air and creep age distances.

2. Measurement

2.1 Preparation for Measurement

CAUTION

- The jaw section is a delicate, precision sensor. Do not subject the jaw to unreasonably strong shock, vibration, or force when using it.
- If dust gets into the tops of the jaws, remove it immediately. Do not close the jaws when dust is trapped in its joints as the sensor may break.
- Please check that the Function Selector switch is set to the desired position before measurement.

2.2 DC Current Measurement

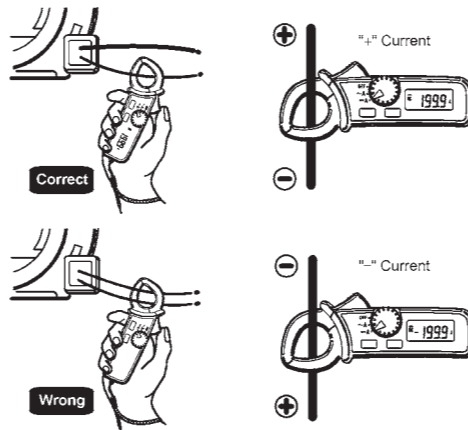
WARNING

Do not make measurement on a circuit above 300V DC. This may cause shock hazard or damage to the instrument or equipment under test.
Keep your fingers and hands behind the barrier during measurement.

- (1) Set the Function Selector switch to the "---A" position. "DC" should be shown on the upper left corner of the display.
- (2) With the transformer jaws closed and without clamping them onto the conductor, press the button for about one second to zero adjust the display.
- (3) Press the open/close lever to open the transformer jaws and clamp them onto the conductor under test, then take the reading on the display. The most accurate reading will be obtained by keeping the conductor at the center of the transformer jaws.

NOTE

- During current measurement, keep the transformer jaws fully closed. Otherwise, accurate measurement cannot be made. The maximum measurable conductor size is approx. 24mm in diameter.
- When the current flows from the upside (the display side) to the underside of the instrument, the polarity of the reading is positive and vice versa. (See the figure at the below light)



2.3 AC Current Measurement

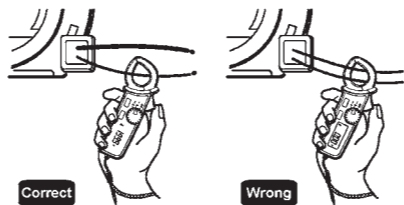
WARNING

Never use the instrument on a circuit above 300V AC. This may cause electrical shock hazard and damage to the instrument or the circuit under test.
Keep your fingers and hands behind the barrier during measurement.

- (1) Set the Function Selector switch to the "~A" position. "AC" should be shown on the upper left corner of the display.
- (2) Press the open/close lever to open the transformer jaws and clamp them onto a single conductor and take the reading on the display. The most accurate reading will be obtained by keeping the conductor at the center of the transformer jaws.

NOTE

- During current measurement, keep the transformer jaws fully closed. Otherwise, accurate measurements cannot be taken. Maximum conductor size is 24mm in diameter.
- Zero adjustment is not necessary in AC current measurement. There is no polarity in the reading either.



3. Other Functions

3.1 Sleep Function

This is a function to prevent the instrument from being left powered on in order to conserve battery life. This function causes the instrument to enter the Sleep (powered-down) mode about 30 minutes after the last switch or button operation.

To exit the Sleep mode, turn the Function Selector switch back to "OFF", then to any other position, or press any button.

The current is consumed a little in the Sleep mode.

NOTE
If the instrument in the Data Hold mode goes into "sleep", the Data Hold function will remain effective when the instrument is powered on again.

3.2 Data Hold Function

This is a function used to freeze the measured value on the display. Press the button to freeze the reading. The reading will be held regardless of subsequent variation in input. "H" is shown on the upper right corner of the display while the instrument is in the Data Hold mode.

To exit the Data Hold mode, press the button again.

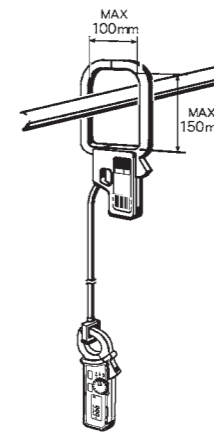
NOTE
If the instrument in the Data Hold mode goes into "sleep", the Data Hold function will remain effective when the instrument is powered on again.

3.3 Optional Accessories

Clamp Adapter Model 99025 (For AC current measurement only)

Clamp Adapter Model 99025 is designed to increase the measuring capability of a clamp meter. With the use of the Clamp Adapter, you can not only extend current range over 3000A, but also clamp on a large bus-bar or conductor.

- (1) Set the Function Selector switch to the "~A" position.
- (2) As shown in the figure below, clamp Model CL220 onto the pickup coil of Model 99025.
- (3) Clamp Model 99025 onto the bus-bar or conductor under test.
- (4) Take the reading on Model CL220 and multiply it by 10.



NOTE
For the detailed specification, refer to the Clamp Adapter User's Manual.

4. Battery Replacement

WARNING

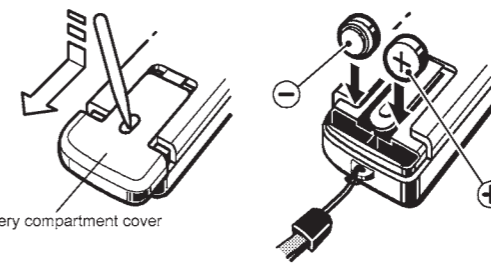
To avoid electric shock hazard, never try to replace batteries during measurement.

CAUTION

- Do not mix new and old batteries.
- Make sure to install battery in correct polarity as indicated in battery compartment.

If the battery voltage becomes too low for the instrument to operate normally, "BAT" is shown on the display. Then, replace the battery. Note that when the battery is completely exhausted, the display blanks without "BAT" shown.

- (1) Set the Function Selector switch to the "OFF" position.
- (2) Press in the hole on the battery compartment cover with the tip of a pointed object, then slide open the cover.
- (3) Replace the battery observing correct polarity. Use two new LR44 or SR44 batteries.
- (4) Slide the battery compartment cover back in place.



5. Specifications

■ Instrument Specifications

• Measuring Ranges and Accuracy (at 23±5°C, relative humidity up to 85%)

DC Current --- (Auto-ranging)

Range	Measuring Range	Accuracy
40A	0 to ±40.00A	±1.0% rdg ±4dgt
300A	±20.0 to ±200.0A	±1.5% rdg ±4dgt
	±200.0 to ±300.0A	±3.0% rdg

AC Current ~ (Auto-ranging)

Range	Measuring Range	Accuracy
40A	0 to 40.00A	±1.0% rdg ±4dgt (50/60Hz) ±2.5% rdg ±4dgt (20Hz to 1kHz)
	20.0 to 200.0A	±1.5% rdg ±4dgt (50/60Hz) ±2.5% rdg ±4dgt (20Hz to 1kHz)
300A	200.0 to 300.0A	±3.5% rdg (50/60Hz) ±4.0% rdg (20Hz to 1kHz)

■ General Specifications

- Operating System : Dual integration
- Measurement Function : AC current, DC current
- Display : Liquid crystal display with maximum counts of 4000
- Overrange Indication : "OL" is shown on the display
- Response Time : Approx. 2 seconds.
- Sample Rate : Approx. 2.5 times per second.
- Temperature and Humidity for Guaranteed Accuracy : 23°C ±5°C, relative humidity up to 85% without condensation
- Operating Temperature and Humidity : 0 to 40°C, relative humidity up to 85% without condensation
- Storage Temperature and Humidity : -20 to 60°C, relative humidity up to 85% without condensation
- Effect of conductor position : Within ±2.0%rdg ±5dgt of indicated value at the center to a 10 mm-dia conductor, at every part inside the jaws
- Effect of external magnetic field : 1A or less in AC or DC magnetic field of 400 A/m
- Power Source : Tow LR-44 or SR-44 (3V DC) batteries
- Battery Life : Approx. 11 hours (continuous)
- Current Consumption : Approx. 9mA
- Sleep function : Automatically powered down in approx. 5 minutes after the last switch operation (power consumption : approx. 20µA)
- Withstanding Voltage : 4240V AC for 5 sec. between housing case and metal part of jaws
- Insulation Resistance : 10MΩ or greater at 1000V between housing case and metal part of jaws
- Conductor Size : Approx. 24mm diameter max.
- Dimensions : Approx. 59(W) x 147(H) x 25(D) mm
- Weight : Approx. 100g (batteries included)
- Safety Standard: EN 61010-1
EN 61010-2-032
(300V AC/DC CAT. III, Pollution degree2, indoor use)
- EMC Standard: EN 61326, EN 55022
- Radiation immunity: EN61000-4-3
- Environmental standard: EN 50581
- Accessories : LR-44 battery 2
Carrying case Model 93033 1
User's Manual 1
- Optional Accessories : Clamp adapter Model 99025

6. Calibration and After-sales Service

Should any failure occur while you are using the tester, follow the instructions given below. If the tester still fails to operate correctly and needs repair, contact the vendor from whom you purchased the instrument or the nearest Yokogawa Meters & Instruments sales office.

- Turn off the POWER switch once, then turn it back on again.
- If the tester does not turn on, replace the battery with a new one.

Calibration
It is recommended that the instrument be calibrated once every year.

Waste Electrical and Electronic Equipment (WEEE), Directive

(This directive is valid only in the EU.)

This product complies with the WEEE directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category
With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product. When disposing products in the EU, contact your local Yokogawa Europe B.V. office.
Do not dispose in domestic household waste.

