

User's Manual

CL320 Leakage Clamp-on Tester

IM CL320

Thank you for purchasing our Leakage Clamp-on Tester.

The following manuals is provided. Please read all manuals.  
IM CL-S03: For standard (CL Series)  
IM 00C01C01-01Z1: Safety manual (European languages)

Contact information of Yokogawa offices worldwide is provided on the following sheet.  
PIM 113-01Z2: Inquiries  
List of worldwide contacts

Store this manual in an easily accessible place for quick reference.

■ Precautions for Safe Use of the Instrument

This product is designed to be used by a person with specialized knowledge. When operating the instrument, be sure to observe the cautionary notes given below to ensure correct and safe use of the instrument.

If you use the instrument in any way other than as instructed in this manual, the instrument's protective measures may be impaired.

This manual is an essential part of the product; keep it a safe place for future reference.

YOKOGAWA is by no means liable for any damage resulting from use of the instrument in contradiction to these cautionary notes.

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.
- This symbol indicates double insulation.
- ~

This symbol indicates AC voltage or current.
- ⏚

This symbol indicates ground (earth).
- ⚡

This symbol indicates that this instrument designed to be applied around or removed from HAZARDOUS LIVE conductors provided if the RATED circuit-to-earth voltage does not exceed the value indicated in the measurement category.

**⚠ 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 of damage to the instrument if the operating procedure is not followed correctly and describes the precautions for avoiding such injury or damage.

**NOTE**

Calls attention to information that is important for the proper operation of the instrument.

**⚠ WARNING**

- Never make measurement on a circuit above 300 VAC.
- Do not use the instrument in an atmosphere where any flammable or explosive gas is present.
- The transformer jaws are made of metal and their tips are not insulated.  
Be especially careful about the hazard of possible shorting where the equipment under test has exposed metal parts.
- 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.
- The barrier is there to protect you from touching the HAZARDOUS LIVE conductor.  
Be careful not to reach the barrier when using the instrument.
- Safety protectors such as rubber-insulated gloves should be worn to prevent electrical shock when using the instrument.
- Never open the battery compartment cover when making measurement.
- Always switch off the instrument before opening the battery compartment cover for battery replacement.
- Do not use the instrument if the case is damaged or not attached. Do not attempt to repair/modify the product yourself, as doing so is extremely dangerous.  
Should an abnormality or failure in the product be found, contact the vendor from which you purchased the product.

Function	Maximum Allowable Input
	Measurement Category III (CAT III)
	200 ArmsAC Measuring circuit voltage : 300 VrmsAC

The CL320 is designed for measurement category III.  
Do not use the CL320 for measurements in locations that fall under measurement category IV.

O (None, Other)	applies to measurement of circuits that are not directly connected to a main power supply.
CAT II	applies to measurement of circuits that are connected to low-voltage installations.
CAT III	applies to measurement of facility circuits.
CAT IV	applies to measurement of power source circuits for low-voltage installations.

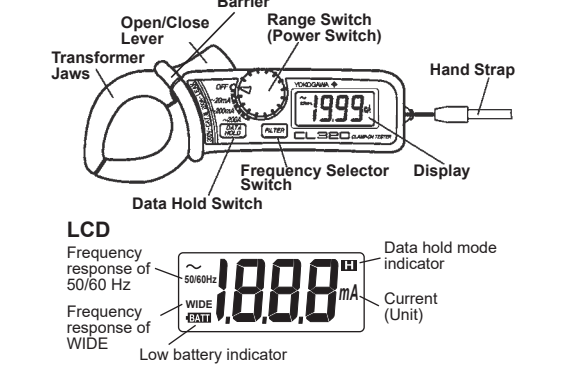
**⚠ CAUTION**

- Be sure to set the range 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.

**⚠ CAUTION**

Using this instrument is limited to under residential, commercial and light-industrial environment. This instrument may not be able to measure accurately if it is near other equipment generating strong electromagnetic interference or a strong magnetic field caused by large current.

1. Instrument Layout



2. Measurement

2.1 Preparation for Measurement

**⚠ WARNING**

Never use the instrument on a circuit above 300 VAC.

**⚠ CAUTION**

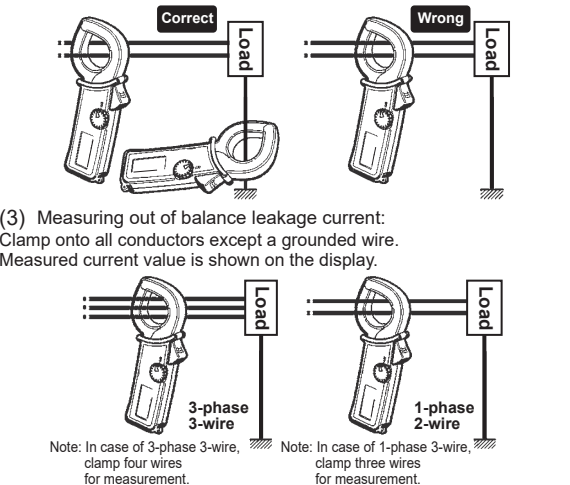
- The jaw section is a delicate, precision sensor. Do not subject the jaw to unreasonably strong shock, vibration, or force when using it.
- If dust gets into the tops of the jaws, remove it immediately. Do not close the jaws when dust is trapped in its joints as the sensor may break.
- Please check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

**NOTE**

- During current measurement, keep the transformer jaws fully closed. Otherwise, accurate measurements cannot be taken. Maximum conductor size is 24 mm in diameter.
- When measuring large current, the transformer jaws may buzz. This has no effect on the instrument's performance or safety.

2.2 AC Current Measurement

- (1) Set the range switch to the desired position.  
Current to measure should be within the selected measuring range.
- (2) Normal measurement:  
Press the open/close lever to open the transformer jaws and close them over one conductor only. Measured current value is shown on the display. Earth leakage current or small current that flows through a grounded wire can also be measured by this method.



2.3 How to Use Frequency Selector Switch

When high frequency from such equipment as inverters are present in the circuit under test, the instrument measures AC current of not only 50 Hz or 60 Hz of fundamental frequency but also of these high frequencies and harmonics. To eliminate the effect of such high frequency noise and measure AC current of 50 Hz or 60 Hz fundamental frequency, a "high-cut" filter circuit in incorporated into the instrument which works when "50/60 Hz" frequency response is selected with the frequency selector switch. Cut-off frequency of "high-cut" filter is about 100 Hz with attenuation characteristic of approx. -24 dB/octave\*.

\*: Characteristic of -24 dB/octave means that signal magnitude declines to about one sixteenth of that at the initial frequency when frequency doubles.

The frequency selector switch has the following two positions.

- WIDE (40 Hz or more)

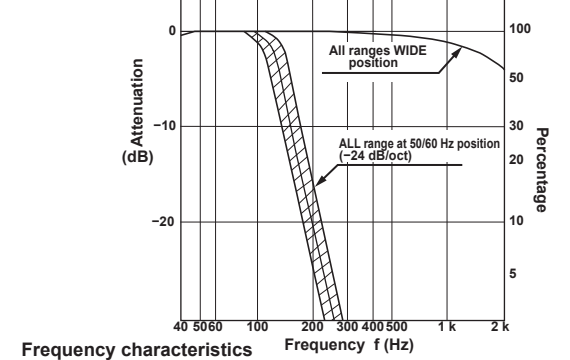
Permits measurement of currents of fundamental frequencies as well as currents of high frequencies generated by such equipment as inverters.

- 50/60 Hz (40 Hz to approx. 100 Hz)

Filters out high frequency currents and measure current of fundamental frequency only.

When the ***FILTER*** switch is pressed, "50/60 Hz" mark is shown on the left side of the display.

When the ***FILTER*** switch is pressed again, frequency response is switched to WIDE with "WIDE" mark shown on the display.



Recently there has been increased use of power though inverters, switching regulator, etc. When the high frequency noise from such appliances leaks or flows into the ground through capacitors not filtering completely, the earth leakage breaker may trip even though there is no "actual" leakage. In such a case, the instrument does not give leakage current reading if "50/60 Hz" frequency response is selected. Take care readings with the 50/60 Hz and WIDE frequency responses respectively to make effective use of the frequency selector switch.

3. Other Functions

3.1 Auto-Power-Off Function

This is a function to prevent the instrument from being left powered on and conserve battery power.

The instrument automatically turns off about 10 minutes after the last switch operation.

To return to the normal mode, turn the range switch to OFF, then to the desired position.

**3.2 Data Hold Function**

This is function to freeze the reading on the display.

When the ***DATA HOLD*** switch is pressed once, the current reading is held even though current under test varies.

***H*** mark is shown on the upper right corner of the display.

To exit the data hold mode, press the ***DATA HOLD*** switch again.

**NOTE**

When the auto-power-off function works while instrument is in the data hold mode, data hold is cancelled.

3.3 Optional Accessories

Clamp Adapter Model 99025  
(For AC current measurement only)

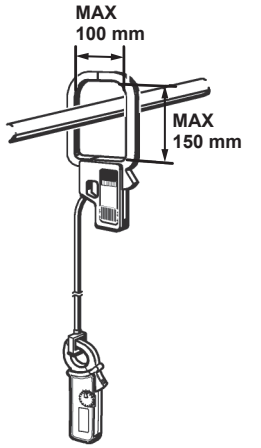
**NOTE**

Model 99025 has been discontinued.

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 2000 A, but also clamp on a large bus-bar or conductor.

- (1) Set the range switch to the desired position.
- (2) As shown in the figure right, clamp CL320 onto the pickup coil of the 99025.
- (3) The 99025 onto the bus-bar or conductor under test.
- (4) Take the reading on the CL320 and multiply it by 10.



4. Battery Replacement

**⚠ WARNING**

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

**⚠ CAUTION**

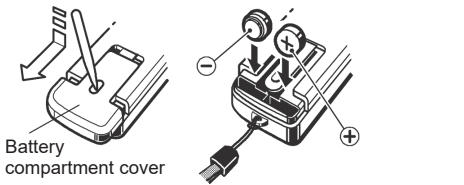
- Do not mix new and old batteries.
- Make sure to install battery in correct polarity as indicated in battery compartment.

If the battery voltage becomes too low for the instrument to operate normally, ***BATT*** is shown on the display.

Then, replace the battery.

Note that when the battery is completely exhausted, the display blanks without ***BATT*** shown.

- (1) Set the range 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 75%)

Range	Measuring Range	Accuracy	
		Frequency Selector Switch	
		WIDE position	50/60 Hz position
20 mA	0 to 19.99 mA	±2.0% rdg ± 4 dgt (50/60 Hz)	±3.0% rdg ± 5 dgt (50/60 Hz)
200 mA	0 to 199.9 mA	±5.0% rdg ± 6 dgt (40 to 400 Hz)	
200 A	0 to 100.0 A	±5.0% rdg ± 4 dgt (50/60 Hz)	±5.0% rdg ± 5 dgt (50/60 Hz)
	100.1 to 199.9 A	±5.0% rdg ± 4 dgt (50/60 Hz)	

■ General Specifications

- Operating System: Dual integration
- Measurement Function: AC current
- Display: Liquid crystal display (LCD) with maximum counts of 1999
- Overrange Indication: "1" flashes on the highest digit
- Response Time: Approx. 2 seconds
- Sample Rate: Approx. 2 times per second
- Temperature and Humidity for Guaranteed Accuracy: 23°C ± 5°C, relative humidity up to 75% without condensation
- Operating Temperature and Humidity: 0 to 40°C, relative humidity up to 85% without condensation
- Storage Temperature and Humidity: -10 to 50°C, relative humidity up to 75% without condensation
- Effect of conductor position: The difference between maximum and minimum values to a 10 mm-dia conductor, at every part inside the jaws; Within 5 dgt for 0 to 50 A Within 2% for 50 to 200 A

- Effect of external magnetic field: 10 mA or less in proximity to a 14.5 mm-dia conductor carrying 100 A
- Effect of residual current: 10 mA or less when clamping on two 10 mm-dia conductors, each carrying supply or return 50 AAC current

- Power Source: Tow LR44 or SR44 batteries
- Battery Life: Approx. 15 hours (continuous)
- Current Consumption: Approx. 5 mA
- Auto-power-off function: Turns power off approx. 10 minutes after the last switch operation

- Withstanding Voltage: 4240 VAC for 5 sec. between electrical circuit and housing case or metal part of jaws

- Insulation Resistance: 10 MΩ or greater at 1000 V between electrical circuit and housing case or metal part of jaws

- Conductor Size: Approx. 24 mm diameter max.
- Dimensions: Approx. 60 (W) × 149 (H) × 26 (D) mm
- Weight: Approx. 120 g (batteries included)
- Safety Standards: EN 61010-1, EN 61010-2-032 Measurement category III 300 VAC

(Indoor use, operating altitude 2000 m or less, pollution degree 2)

- EMC Standards: EN 61326-1 Class B Table 1, EN 61326-2-2, EN 55011 Class B Group 1 EMC Regulatory Arrangement in Australia and New Zealand Korea Electromagnetic Conformity Standard ( 한국 전자파적합기준 )
- Environmental standard: EU RoHS Directive compliant

For conformity to environmental regulations and/or standards other than EU, contact your nearest YOKOGAWA office (PIM113-01Z2).

- Accessories: LR44 battery. . . . . 2 Carrying case (Model 93033). . . . 1 User's Manual. . . . . 1

6. Calibration and After-sales Service

Should any failure occur while you are using the tester, follow the instructions given below.

If the instrument still fails to operate correctly and needs repair, or calibration contact the vendor from whom you purchased the instrument or the nearest YOKOGAWA dealer.

- 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.

7. Regulations and Sales in Various Countries and Regions

**Waste Electrical and Electronic Equipment (WEEE)**  
(EU WEEE Directive valid only in the EEA\* and UK WEEE Regulation in the UK)

This product complies with the WEEE marking requirement.

 This marking indicates that you must not discard this electrical/electronic product in domestic household waste. When disposing of products in the EEA or UK, contact your local Yokogawa office in the EEA or UK respectively.

(\*EEA: European Economic Area)

**Batteries and Waste Batteries**

Batteries and waste batteries are described in IM CL-S04-EN.

**Authorized Representative in the EEA**

Yokogawa Europe B.V. is the authorized representative of Yokogawa Test & Measurement Corporation for this product in the EEA.

To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.

# User's Manual

## CL Series Clamp-on Tester For Standard

Supplement

This paper supplements the User's Manual of Clamp-on Testers (except for Model CL420).

CL Series: CL120, CL150, CL155, CL220, CL250, CL255,  
CL320, CL340, CL345, CL360

This document contains explanations for standard.

### Manual of the CL Series

The following manuals are provided as manuals for the CL Series (except for Model CL420).  
Read them along with this manual.

Manual Title	Manual No.	
	IM 00C01C01-01Z1	Safety manual (European languages)
CL Series	IM CL-S03	For Standard (this manual)
CL Series	IM CL-S04-EN	Disposing the Battery (EU Battery Directive) For Model: CL150, CL155, CL220, CL250, CL255, CL320, CL340, CL345, CL360
CL120 and CL235	IM CL120-S01-EN	Disposing the Battery (EU Battery Directive) For Mode: CL120
CL Series	IM CROHS-CL	Document for China For Mode: CL120, CL220, CL320, CL340, CL345, CL360
CL Series	IM CL-93Z2	Document for Korea

Contact information of Yokogawa offices worldwide is provided on the following sheet.

Document No.		
PIM 113-01Z2	Inquiries	List of worldwide contacts

### Precautions for Safe Use of the Instrument

This product is designed to be used by a person with specialized knowledge.  
The general safety precautions described herein must be observed during all phases of operation.  
If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired.  
This document and the user's manual of clamp-on tester are an essential part of the product; keep it a safe place for future reference.  
YOKOGAWA assumes no liability for the customer's failure to comply with these requirements.

**YOKOGAWA** ◆

IM CL-S03  
12th Edition: Oct. 2023 (YMI)

横河計測株式会社  
Yokogawa Test & Measurement Corporation

### ⚠ WARNING

- The instrument is a current measurement instrument.  
Do not use this instrument for any other purpose.
- Be careful not to make the device (conductor) under test short-circuit with metal part of the jaws or test leads.

### ⚠ CAUTION

- The use of this instrument is limited to residential, commercial, and light-industrial environments.  
This instrument may not be able to measure accurately if it is near other equipment generating strong electromagnetic interference or a strong magnetic field caused by large current.
- To verify the instrument's functionality, check that the measured value is update after turning on the power. If the measured value is not updated, the reading will be incorrect and may lead to possible electrical shock or personal injury.

### Measurement Category of the Test leads

### ⚠ WARNING

- When you use the test leads, attach or remove the caps according to the measurement category.
- If the signal cable of the test leads is torn and the inner metal is exposed or if a color different from the outer sheath appears, stop using the cable immediately.

With Caps\*: 1000V 10A CAT III/600V 10A CAT IV

Without Caps\*: 1000V 10A CAT II/600V 10A CAT II

Model: 98072 \*Caps of Test leads



When the test lead (98072) is used\*1: Model CL150, CL155, CL250, CL255

### ■ General Specifications

#### Safety Standards

All models: EN 61010-1, EN IEC 61010-2-032

Models that use test leads\*1: EN 61010-031

Indoor use, operating altitude 2000 m or less, pollution degree 2

#### EMC Standards

EN 61326-1 Class B Table 1, EN 61326-2-2

EN 55011 Class B Group 1

Group 1: Equipment that does not intentionally generate or use radio-frequency (RF) energy

EMC Regulatory Arrangement in Australia and New Zealand

Korea Electromagnetic Conformity Standard ( 한국 전자파적합성기준 )

Environmental standards EU RoHS Directive compliant

For conformity to environmental regulations and/or standards other than EU, contact your nearest YOKOGAWA office (PIM113-01Z2).

### Authorized Representative in the EEA

Authorized Representative in the EEA Yokogawa Europe B.V. is the authorized representative of Yokogawa Test & Measurement Corporation for this product in the EEA.

(EEA: European Economic Area)

To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.

Clamp-on Tester



Model: CL150, CL155  
CL220, CL250, CL255  
CL320, CL340, CL345, CL360

How to Replace and Dispose the Batteries

Batteries and Waste Batteries

(EU Battery Directive/Regulation valid only in the EEA\* and UK Battery Regulation in the UK)

Batteries are included in this product.  
When you remove batteries from this product and dispose them,  
discard them in accordance with domestic law concerning disposal.  
Take a right action on waste batteries, because the collection systems in the EEA and UK on  
waste batteries are regulated. (\*EEA: European Economic Area)

CL150, CL155 CL250, CL255, CL340, CL345, CL360	CL220, CL320
Battery type: Manganese dry cell  Pb	Battery type: Alkaline cell 
<b>Criterion value (weight percent):</b> Lead (Pb) 0.004%	

Notice:

This marking indicates they shall be sorted out and collected as ordained in the EU battery Directive/Regulation and UK battery Regulation.  
The chemical symbol beneath the marking means relevant chemical substance is contained more than criterion value in battery.

How to remove batteries safely:

For further details, see “Battery Replacement” in the User's Manual.