User's Manual

CL340 Leakage Clamp-on Tester

IM CI 340

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.



Danger! Handle with Care.

IM CL340 10th Edition Yokogawa Test & Measurement Corporation October 2021 (YMI)

The instrument and this manual use the following safety symbols:



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



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

! 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.

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.



- 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 tip of the transformer jaw is constructed so that it will not short the equipment under test, but when measuring an uninsulated conductor, be careful not to short the EUT with the transformer jaw.
- · 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.

Measurement category

•	wedsurement category		
	Function	Maximum Allowable Input	
		Measurement Category III (CAT III)	
	\sim A	400 ArmsAC	
	· • A	Measuring circuit voltage : 300 VrmsAC	

The CL340 is designed for measurement category III. Do not use the CL340 for measurements in locations that fall under measurement category IV.

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



- 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.
- · When measuring current is 300 A or more (400 Hz or more), be sure to stop measurement within 5 minutes. Otherwise, transformer jaws may heat to cause a fire or deformation of molded parts, which will degrade insulation



A CAUTION

- The jaw section is a delicate, precision sensor. Do not subject the jaw to unreasonably strong shock, vibration,
- 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
- Please check that the range switch is set to the desired position before measurement.

NOTE

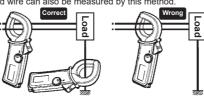
- · During current measurement, keep the transformer jaws fully closed. Otherwise, accurate measurements cannot be taken. Maximum conductor size is 40 mm in diameter.
- When measuring large current, the transformer jaws may buzz. This has no effect on the instrument's performance or safety.

2.2 AC Current Measurement

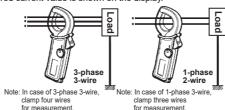
- (1) Set the range switch to the desired position.
- Current to measure should be within the selected measuring range

(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



(3) Measuring out of balance leakage current: Clamp onto all conductors except a grounded wire. Measured current value is shown on the display.



2.3 How to Use Frequency Selector Button

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 "highcut" filter circuit in incorporated into the instrument which works when "50/60 Hz" frequency response is selected with the frequency selector button. Cut-off frequency of "high-cut" filter is about 160 Hz with attenuation characteristic of approx. -24 dB/octave

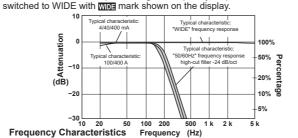
*: Characteristic of -24 dB/octave means that signal magnitude declines to about one sixteenth of that at the initial frequency when frequency doubles.

The frequency selector button has the following two positions. · WIDE (20 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 (20 Hz to approx. 160 Hz)

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

When the FILTER button is pressed, 6017 mark is shown on the left side When the FILTER button is pressed again, frequency response is



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 button.

2.4 Peak Current Measurement

- (1) Set the range switch to the desired position Current to measure should be within the selected measuring range
- (2) Select WIDE or 60Hz within the FILTER button.
- (3) With the transformer jaws clamped on to the conductor under test, press the PEAK button to set the instrument to the peak measurement mode. P is shown on the display.
- (4) The display read $1/\sqrt{2}$ of the peak current value. Therefore an rms reading is shown when current of sinusoidal waveform is measured.
- (5) After peak measurement, press the [FEAK] button to return to the normal measurement mode

When leakage current is measured in the peak measurement mode, the reading may change if the transformer jaws are opened and closed. Please read the display with the conductor under test clamped, otherwise, after fixing the display by using the data hold function, please remove the instrument from the conductor to be measured and read the display.

To measure the peak current again, please release the data hold, and return the instrument to the normal measurement mode once with the PEAK button, then set in the peak measurement mode.

3. Other Functions

3.1 Auto-Power-Off Function

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.

the data hold button pressed. About 3 seconds after powering on the instrument, "P.OFF" is shown on the display.

To enable the auto-power-off function, turn on the instrument without pressing the data hold button. NOTE

When the [DATA] button 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 [PATA] button again. NOTE

When the auto-power-off function works while the 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.

a large bus-bar or conductor.

- (2) As shown in the figure right, clamp CL340 onto the pickup coil of the 99025.
- (3) The 99025 onto the bus-bar or conductor under test.
- (4) Take the reading on the CL340 and multiply it by 10.

4. Battery Replacement

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

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

- (1) Set the range switch to the "OFF" position
- (2) Unscrew and remove the battery compartment on the bottom of the
- (3) Replace the battery observing correct polarity.
- (4) Re-place and screw the battery compartment cover

NOTE

For use for a long period of time, use alkaline batteries

5. Specifications

■ Instrument Specifications

(at 23 ± 5°C, relative humidity up to 85%) AC Current \sim

Range	Measuring Range	Accuracy (frequency range)
40 mA	0 to 39.99 mA	±1.0% rdg ± 5 dgt (50/60 Hz)
400 mA	0 to 399.9 mA	2.5% rdg ± 10 dgt (20 Hz to 400 Hz)
400 A	0 to 399.9 A	0 to 350.0 A ±1.0% rdg ± 5 dgt (50/60 Hz) ±2.5% rdg ± 10 dgt (40 Hz to 1 kHz) 399.9 A or less ±2.0% rdg (50/60 Hz) ±5.0% rdg (40 Hz to 1 kHz)

Accuracy-guaranteed frequency range at 50/60 Hz mode is 50/60 Hz. When measuring current which pulse element is superposed, differences of

Counts equal to or less than 5 counts are corrected to zero. The max indicator at the 40 mA/400 mA range is 6000 counts.
 Minute current may exist while zero is displayed at 400 A/400 mA range. Measurement should be made also at a lower range.

■ General Specifications

· Display:

position

· Weight:

EMC standards:

magnetic field:

 Operating System: Sequential comparison

• Measurement Function: AC current

LCD with max. reading of 3999 (400 A range), 6000 (40/400 mA range)

· Overrange Indication: "OL" is shown on the display

 Response Time: Approx. 2 seconds · Sample Rate: Approx. 2.5 times per second

 Temperature and 23°C ± 5°C, relative humidity up to 85% Humidity for Guaranteed without condensation

Accuracy: Operating Temperature 0 to 40°C, relative humidity up to 85%

and Humidity: without condensation -20 to 60°C, relative humidity up to 85% Storage Temperature

and Humidity: without condensation · Effect of conductor 40/400 mA range: Within ±5 dgt

at every part inside the jaws 400 A range, 0 to 250 A: Within ±5% rdg ± 5 dgt

at every part inside the jaws 10 mA or less in proximity to a 15 mm-dia · Effect of external

conductor carrying 100 A • Effect of residual current: 12 mA or less when clamping on two

10 mm-dia conductors, each carrying supply or return 100 AAC current

· Power Source: Tow R03 (UM-4) batteries

· Battery Life: Approx. 40 hours (continuous) Current Consumption: Approx. 13 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

· Insulation Resistance: $10~\text{M}\Omega$ or greater at 1000~V between electrical circuit and housing case or metal

part of jaws · Conductor Size: Approx. 40 mm diameter max. Dimensions Approx. 81 (W) × 185 (H) × 40 (D) mm

Approx. 270 g (batteries included) EN 61010-1, EN 61010-2-032 · Safety standards:

Measurement category III 300 VAC (Indoor use, operating altitude 2000 m or less, pollution degree 2)

EN 61326-1 Class B Table 1, EN 61326-2-2 FN 55011 Class B. Group 1 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) Accessories:

Carrying case (Model 93033).... 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

To contact Yokogawa Europe B.V., see the separate list of worldwide contacts PIM 113-0172



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

Disabling Auto-Power-Off Function: To disable the auto-power-off function, power on the instrument with

The auto-power-off function is disabled in the peak measurement mode.

3.2 Data Hold Function

This is function to freeze the reading on the display.

MAX

100 mm

MAX

Battery Compartment Cover

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 3000 A, but also clamp on

- (1) Set the range switch to the \sim 400 A position.

!\ WARNING To avoid electric shock hazard, never try to replace batteries during

- compartment.

blanks without BATT shown

- instrument
- Use two new R03 (UM-4) batteries.

Measuring Ranges and Accuracy

the indicated value may be caused between ranges, if the peak value exceeds the measurement range to a large extent. In this case, the reading at the bigger range should be taken as a right value.

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

Precautions for Safe Use of the Instrument

Inquiries

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.

List of worldwide contacts

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 Test & Measurement Corporation

Document No.

PIM 113-01Z2

IM CL-S03

12th Edition: Oct. 2023 (YMI)

⚠ 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

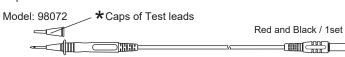
- The use of this instrument is limited to residential, commercial, and light-industrial environments. This instrument may not be able to measure accurately if it is near other equipment generating strong electromagnetic interference or a strong magnetic field caused by large current.
- To verify the 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



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.

User's Manual

CL Series Clamp-on Tester

Disposing the Battery

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	Battery type: Alkaline cell
Criterion value (weight percent): 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.



IM CL-S04-EN

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