User's Manual

Models 30032A
Leakage Clamp-on Tester

Store this manual in a safe place for future reference.

YOKOGAWA
Yokogawa Meters & Instruments Corporation

IM 30032A-E
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Safety precautions

Various symbols are used on the instrument and throughout this manual to ensure safe use of the product and to protect against 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.

WARNING Indicates a hazard that may result in the loss of life or serious injury of the user unless the described instruction is abided by.

CAUTION Indicates a hazard that may result in an injury to the user and/or physical damage to the product or other equipment unless the described instruction is abided by.

The following safety symbols are used on the instrument and in this manual:

Danger! Handle with Care
This symbol indicates that the operator must refer to an explanation in the instruction manual in order to avoid the risk of injury or death of personnel or damage to the instrument.

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 dose not exceed the value indicated in the measurement category.

Double Insulation
This symbol indicates double insulation.

Alternating Current
This symbol indicates AC voltage/current.

Direct Current
This symbol indicates DC voltage/current.

Earth TERMINAL
This symbol indicates ground.

WARNING

■ Strictly observe the following cautionary notes in order to avoid the risk of injury or death of personnel or damage to the instrument due to hazards such as electrical shock.

- Do not use the instrument if there is any damage to the casing, battery cover, display and labels or when the casing is removed.
- Barrier is for to avoid touching the conductor.
  Be careful not to across the Barrier when using the instrument.
- Disconnect the instrument from the measurable conductors under test before opening the casing to replace the battery.
- Safety protectors such as rubber-insulated gloves should be worn to prevent electrical shock when using the instrument.
- Avoid using the instrument if it has been exposed to rain or moisture or if your hands are wet.
- Do not use the instrument in an atmosphere where any flammable or explosive gas is present.

WARNING

Measurement Category of Model 30032A

Measurement category (CAT.)	Maximum Allowable Input
III	62 Arms (The RATED circuit-to-earth voltage: 300 Vrms AC) Do not apply input exceeding this value. Otherwise, it will not only damage the tester, but also pose a risk of damage to the human body. For safety standards, refer to the specifications.

CAUTION

- Do not use the instrument near noise-emitting equipment or where there may be sudden changes in temperature. Otherwise, the instrument may produce an unstable readings or errors.
- Do not wipe the instrument using an organic solvent such as benzine or paint thinner. Otherwise, the front panel may be damaged or discolored. When cleaning the instrument, use a dry cloth.
- Do not leave the tester exposed to direct sunlight or in a hot and humid location such as the inside of a car, for any prolonged length of time.
- If the instrument will not be used for long periods, remove the battery.

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.

Components

1) Jaw Section
Is a precision sensor for detecting currents.

2) Open/Close Lever
Opens and closes the jaws.

3) Display
Shows the measured value (digital reading or bar graph), unit, function and low-battery symbol (▬), etc.

4) mA/A Selector Switch
Selects the unit of AC current (either "mA" or "A") to be measured.

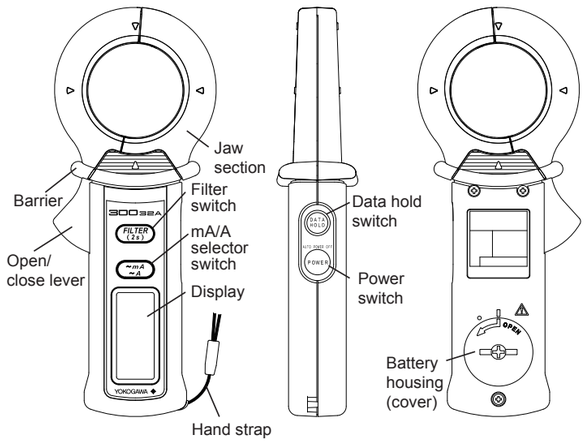
5) Data Hold Switch
Retains the measured data. If you press this switch, the D-H symbol appears and the data is retained. If you press this switch once again, data holding is canceled (the D-H symbol disappears).

6) Power Switch
Turns on the power to the instrument.

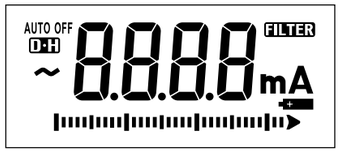
7) Filter Switch
Turns on/off the filter. Press the FILTER switch for more than 2 sec. When the filter is on (used), FILTER appears.

8) Battery Housing (Battery cover)
Contains the battery.

9) Barrier
Prevents contact with the wires.



Display (LCD)



AUTO POWER OFF Function

■ When the AUTO POWER OFF Function is Used

- AUTO OFF appears.
- The instrument automatically turns off 10 minutes after the last switch operation. A buzzer starts to beep 15 seconds before the automatic power-off.
- Pressing any switch after the beep restarts the auto power-off function.

■ When the AUTO POWER OFF Function is not Used
(Cancellation of the AUTO POWER OFF Function)

- Turn off the power.
- With the DATA HOLD switch held down, press the POWER switch for more than 2 sec. to turn on the power.
  This causes the buzzer to sound, canceling the AUTO POWER OFF function (the AUTO OFF display goes off).
  If the instrument is used with the AUTO POWER OFF function cancelled, take care not to let the battery run down.

■ Recovering the AUTO POWER OFF Function

- Turn off the power.
- Turn on the power. This enables the AUTO POWER OFF function to recover. (AUTO OFF appears.)

Measuring Instructions

■ Before measurement

a) Examine the casing, battery cover, display, and labels of the instrument for abnormalities.
b) Make sure that the battery cover is firmly closed.

■ AC Current Measurement (unit: mA/A)

a) Press the POWER switch to turn on the power.
b) Squeeze the open/close lever to open the jaws. Insert a wire from the measurable conductors under test through the jaws, making sure the tops of the jaws are tightly shut.
c) When the reading stabilizes, read the value. If you have difficulties in reading the value, use the DATA HOLD function.
d) When measuring Load Current, press the mA/A switch to change to A range.
e) When you have finished measurement, press the POWER switch to turn off the tester.

CAUTION

- The correct measured values are not displayed if the jaws do not fit precisely. Make sure that they are shut tightly.

■ Using the DATA HOLD switch

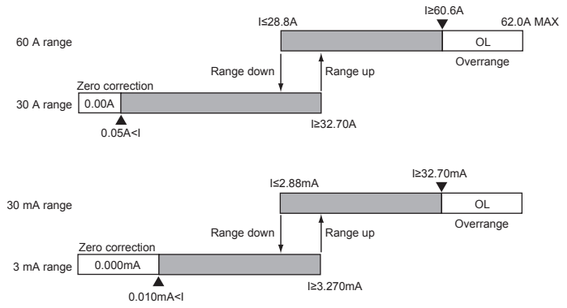
Pressing the DATA HOLD switch retains the measured data and displays D-H. The mA/A selector switch and the FILTER switch cannot be used in this situation. The only switches that can be used are the DATA HOLD switch (to cancel data holding) and the POWER switch.

Range Selection

■ Range Selection

Switching between the 3 mA and 30 mA ranges and between the 30 A and 60 A ranges is performed by auto-ranging (automatic). For switching between the 3/30 mA and 30/60 A ranges, the range must be switched using the mA/A selector switch.

■ Measurement Ranges



Battery Replacement

■ Battery Voltage

If the battery runs down and its voltage falls below the operating voltage (effective range), the ▬ symbol appears in the LCD display; promptly replace the battery with a new one.
(Battery: CR2032, 1 pc.)

CAUTION

- The specified accuracy is assured when the battery voltage is in the effective range.
  If the ▬ symbol is displayed, promptly replace the battery.
- If the power does not come on even after pressing the POWER switch, the battery voltage may have fallen too low. Replace the battery with a new one.

■ Replacing the Battery

⚠ CAUTION

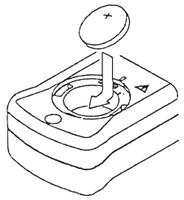
- Before replacing the battery, always disconnect the tester from the measurable conductor under test because there is a risk of electrical shock. After replacement, close the battery cover securely and conduct measurements.
- Use the specified lithium battery (CR2032).

To replace the battery:

a) Press the POWER switch to turn off the power.
b) Turn the battery cover on the backside of the instrument in the direction of the arrow using a coin, etc.
c) Remove the cover and the battery.
d) Insert a new battery, making sure that the polarities are correct.
e) Close the cover back in place by turning it in the reverse direction of the arrow.

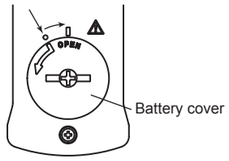
Inserting a Battery

Insert the battery being careful that the polarities are correct.



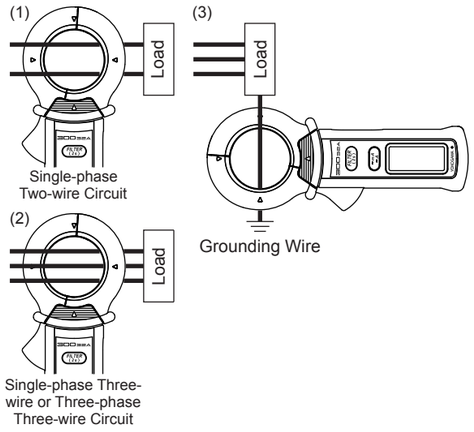
Closing the Battery Cover

Close the battery cover, aligning the arrow's tail with the dot and then turn clockwise.

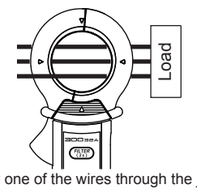


Examples of Measurement

■ Examples of Leakage Current Measurement



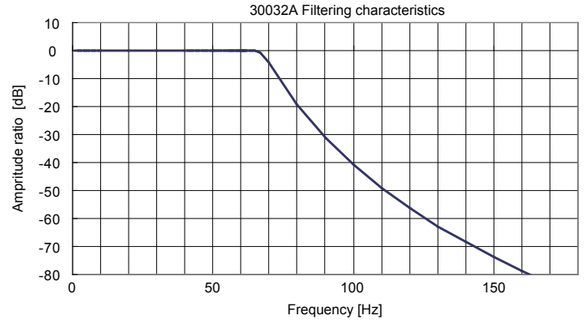
■ Example of Load Current Measurement



Insert only one of the wires through the jaws.

Filtering Function

The instrument has a function for turning the filter on (use)/off. Press the FILTER switch for more than 2 sec. to turn it on/off (default: ON). When the filter is on, the FILTER symbol appears.
When the FILTER switch is turned on, the sharp filter is enabled. This filter attenuates 2nd-order and higher harmonic currents and measures only the fundamental harmonics. See the Filtering Characteristics below.



■ To Ensure Accurate Measurement

The maximum input current of the harmonic components in the 3 mA and 30 mA ranges is 150 mA.
If the input exceeds 150 mA, the correct value is not displayed. In some cases, "0L" does not appear and an error becomes larger or readings do not change.
Therefore, follow the procedure below to check if the current under measurement including 2nd-order and higher harmonic components exceeds 150 mA.

Checking procedure:

1. Press the mA/A selector switch to choose the 30 A range.
2. Press the FILTER switch to select FILTER OFF and conduct measurement.
3. Check that the measured value (reading) in the 30 A range is 0.15 A* or less.
4. When the measured value is 0.15 A or less, switch the range to 3 mA/30 mA and conduct measurement.

*: The accuracy of the 30 A range is 1.0% of reading +5 digits (0.05A < I ≤ 50 A).
Five digits are equivalent to 0.05 A; when checking the current, also consider the accuracy.

Specifications (30032A)

■ Specifications

Condition: temperature and humidity
23 ˚C ±5 ˚C, 80% RH or less
Frequency: **50 Hz ±1.0 Hz, 60 Hz ±1.0 Hz**
Battery voltage: Within the effective range

AC current measurement

Accuracy: ± (% of reading + digits)
Filter function OFF

Range	Resolution	Accuracy	Maximum Allowable Current
3 mA	0.001 mA	0.010 < I ≤ 32.70 mA: 1.0%+5	3.270 mA
30 mA	0.01 mA		32.70 mA
30 A	0.01 A	0.05 < I ≤ 50.0 A: 1.0% +5	32.70 A
60 A	0.1 A	50.0 < I ≤ 60.6 A: 5.0% +5	60.6 A

Filter function ON

Range	Resolution	Accuracy	Maximum Allowable Current
3 mA	0.001 mA	0.010 < I ≤ 32.70 mA: 1.5 %+5	3.270 mA
30 mA	0.01 mA		32.70 mA
30 A	0.01 A	0.05 < I ≤ 50.0 A: 1.5%+5	32.70 A
60 A	0.1 A	50.0 <I ≤ 60.6 A: 5.5% +5	60.6 A

Note: Input current of 2nd-order and higher harmonics
: 150 mA rms maximum in the 3 mA/30 mA range
: 62 A rms maximum in the 30 A/60 A range

Filter specifications

(3 mA and 30 mA ranges and 30 A and 60 A ranges)
Amplitude ratio at 100 Hz: -38 dB (1.26%) or less (typical: -41 dB)
Amplitude ratio at 120 Hz: -53 dB (0.22%) or less (typical: -56 dB)

Zero correction

3 mA range: Displays 0.000 mA (zero) when 0.010 mA < I
30 A range: Displays 0.00 A (zero) when 0.05 A < I

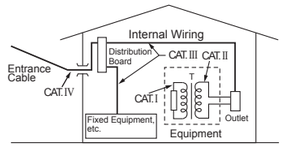
■ General Specifications

- Method: Mean-value detection and rms-value calibration
- Display (LCD): Digital reading ..... 3200 counts
  Bar graph ..... 32 segments
  "OL" over-range indication
  low-battery symbol
  D-H data hold symbol
  "AUTO OFF" auto power off indication
  FILTER filter ON
- Sampling: Digital reading ..... 2 times/sec
  Bar graph ..... 12 times/sec
- Range: 3 mA, 30 mA, 30 A, 60 A
- Range selection: Automatic (between 3 mA and 30 mA ranges and between 30 A and 60 A ranges)
  Manual (between 3 mA and 30 mA ranges and between 30 A and 60 A ranges)
- Additional functions:
  Data hold and Auto power-off
- Operating temperature and humidity range:
  0 to 50°C, with a maximum humidity of 80% RH or less (no condensation)
- Storage temperature and humidity range:
  -20 to 60°C, with humidity range is 20 to 70%RH (no condensation)
- Temperature coefficient:
  The following values must be added in the temperature range of either 0 to 18°C or 28 to 50°C.
  0 ≤ I ≤ 50.0A: ± **(0.08% of reading/˚C + 0.5 digits/˚C)**
  50.0 < I ≤ 60.6A: ± **(0.3% of reading/˚C + 0.5 digits/˚C)**
- Effect of external magnetic fields:
  0.0005% typical value (in terms of the magnitude of current in adjacent wires)
- Diameter of measurable conductors: Ø 40 mm (Maximum)
- The RATED circuit-to-earth voltage: 300 Vrms or less
- Withstanding voltage: 3.7 kV AC for one minute (Tested between the cores of the jaw section and the case)
- Power consumption: 6mW maximum
- Automatic power-off: Automatically turns of the power approx. 10 minutes after the last switch operation. (The alarm buzzer begins beeping 15 seconds before power-off.)
- Power supply: CR2032 lithium battery 1
- Battery life: Approx. 90 hours (of continuous operation)
- Dimensions: Approx. 70 (W) x 178 (H) x 25 (D) (mm), excluding protrusions
- Weight: Approx. 200 g (including the battery)
- Accessories: Battery (housed in the instrument)..... 1
  RB057 soft carrying case..... 1
  User's manual
- Safety standards: Complaint with EN 61010-1, EN 61010-2-032
  Measurement category III
  (The RATED circuit-to-earth voltage: 300 Vrms AC)
  Pollution degree2
  Environmental conditions:
  Operating altitude: 2000 m max. above sea level; indoor use
- EMC standards: EN 55011, EN 61326-1 (Class B, Group 1)
- Effect of radiation immunity:
  Accuracy range of reading (Rated accuracy +4.0% of each range) for the strength of a radio-frequency electromagnetic field of 3v/m.

⚠ WARNING

Measurement Category (CAT.)

Measurement category		Description	Remarks
I	CAT.I	For measurements performed on circuits not directly connected to MAINS.	
II	CAT.II	For measurements performed on circuits directly connected to the low-voltage installation.	Appliances,portable equipments,etc.
III	CAT.III	For measurements performed in the building installation.	Distribution board, circuit breaker,etc.
IV	CAT.IV	For measurements performed at the source of the low-voltage installation.	Overhead wire, cable systems,etc.



Disposing the Product

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This Product complies with the WEEE Directive (2002/96/EC) marking requirement. The affixed product label (see below) 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 Annex 1, this product is classified as a "Monitoring and Control instrumentation" product.

To return unwanted products within the EU area, contact your local Yokogawa Europe B.V. office.
Do not dispose in domestic household waste.



"Measures for Administration of the Pollution Control of Electronic Information Products" of the People's Republic of China

The following are the provisions of "Measures for Administration of the Pollution Control of Electronic Information Products" of the People's Republic of China.
They are applicable only in the People's Republic of China.

产品中有毒有害物质或元素的名称及含量

部件名称	有毒有害物质					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr (VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
电流探头（夹子）	×	×	×	×	○	○

○：表示该部件的所有均质材料中的有毒有害物质的含量均在 SJ/T11363-2006 标准中所规定的限量以下。
×：表示该部件中至少有一种均质材料中的有毒有害物质或元素的含量超过 SJ/T11363-2006 标准所规定的限量要求。

环保使用期限：



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