

Io/Ior CLAMP LEAKER

MODEL 340IRV

INSTRUCTION MANUAL

Thank you very much for selecting our Non-Contact Io/Ior clamp leaker model 340IRV.

This model is complex instrument and employ a very reliable mechanical/electronic design.

Before you use your new instrument, read this instruction manual completely and familiarize yourself thoroughly with all functions and keep this instruction manual carefully to take out whenever you need.

MULTI MEASURING INSTRUMENTS CO.,LTD.
Akihabara Murai Bldg., 7F, 1-26 Kanda Sakuma-cho,
Chiyoda-ku, Tokyo, 101-0025 Japan
TEL : 81-3-3251-7016 FAX : 81-3-3253-4278
Home Page : <http://www.multimic.com/>
E-mail : multi@multimic.com

- To use this instrument safely, read this "SAFETY SUMMARY" carefully and apply the instrument correctly.
- The CAUTIONs and WARNINGs which appear on the following pages are stated to prevent the operator & other people from the dangers and their properties from the damages beforehand.

△ **WARNING** : This symbol indicates the contents "Possibilities of the death or the serious wound can be supposed" caused from mis-operations.

△ **CAUTION** : This symbol indicates the contents "Possibilities of the injury or only the material damage can be supposed" caused from mis-operations.

△ **WARNING**

POSSIBLE ELECTRICAL SHOCK

- This instrument is for the use of low voltage circuit.
- Do not make measurements of power lines carrying more than AC 600V.
Before use, check and confirm the voltage of circuit to be measured.
- Apply only the coated cables and do not clamp the bare cables.

POSSIBLE ELECTRICAL SHOCK OR ACCIDENT

- Do not handle the instrument in the rain, at humid place, with a drop of water and or with wet hands.
- Do not use the instrument if the CT or CT case are damaged and if the battery cover is off, do not operate this instrument.
- Do not give the shock to tip of CT.
- Do not disassemble this instrument.
- Replace the batteries after took off test probe, etc. from the circuit.

SPECIFICATIONS

1. CURRENT DETECTION ZCT

Inside diameter	: Φ 40mm
Method	: Split core type ZCT
Withstanding voltage	: AC 2200V/1 minute between CT core and grip

2. MEASURING PART

Measuring function	: Line current (I), Leakage current (Io), Resistive leakage current (Ior)
Measuring method	: Clamp CT (in case of Ior, based on voltage standard)
Range Selection	: by Rotary Switch
Measuring range	: I = 0~60A, Io/Ior = 0~10mA/100mA (auto range)
Input frequency range	: 45~65Hz (by switch for 50/60Hz)
AC current detection	: Dual integration mode
AD conversion	: Successive approximation method
Display	: LCD, max.9999 reading with annunciator
Data hold indication	: "DH" mark on LCD
Sampling rate	: 2 times/sec.
Overrange indication	: "OL" mark on LCD
Low battery indication	: "B" mark on LCD
Auto power off	: approx.. 10 minutes after power on. To power on again, set range switch once off and power on again.

Circuit voltage	: less than AC 600V (isolated wire) (Voltage input for I _{or} measurement is max. AC 250V)
Operating temperature	: 0~50°C, < 85%RH (without condensation)
Storage temperature	: -10~60°C, < 80%RH (without condensation)
Withstanding voltage	: AC 2000V/1 minute between CT part and grip
Consumption current	: 10mA (approx. 80h for continuous use)
Power supply	: AAA size alkaline battery, LR03 × 3
Dimension/Weight	: 44(W) × 197(H) × 24(D)mm, approx. 210g
Accessories	: Soft Case/2, Non-contact Voltage Sensor/1, Batteries/3, Instruction Manual/1

Accuracy (23°C±5°C, less than 85%RH)

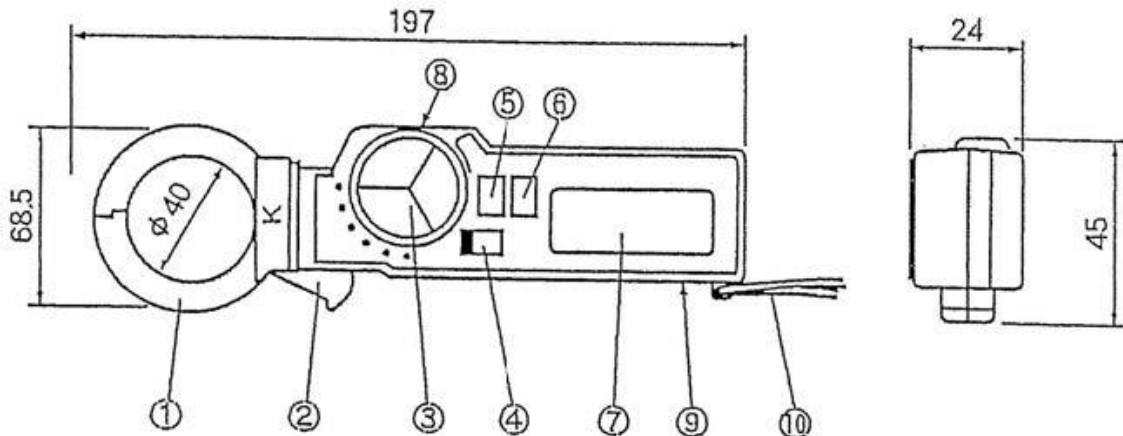
Line current (I), Leakage current (I_o),
Resistive leakage current (I_{or})

Range		Resolution	Accuracy	
I	60A	0.01A	0 ~ 49.99A	±1.0%rdg±10dgt
			50A ~ 59.99A	±3.0%rdg±10dgt
I _o	10mA	0.001mA	0 ~ 9.999mA	±1.0%rdg±10dgt
	100mA	0.01mA	10mA ~ 99.99mA	±1.0%rdg±10dgt
I _{or}	10mA	0.001mA	0 ~ 9.999mA	±3.0%rdg±20dgt
	100mA	0.01mA	10mA ~ 99.99mA	±2.5%rdg±20dgt

- ※ The conductor must be located at the center of CT.
- ※ AC current detection : Dual integration mode
- ※ The accuracy of I_{or} is based on the phase angle with 0° between the voltage and current at the standard voltage of AC100V in case of single phase. In case of 3P/3W, it is based on the phase angle with 300° between the voltage and current at the standard voltage of AC200V at Δwiring.
- ※ For I_{or} measurement, select 50 or 60Hz by frequency select switch.
- ※ When measuring I_{or}, use Non-contact Voltage Sensor (PS-30) exclusively at any time.

OPERATION

[Dimension and Panel Function]



- ① Clamp CT : Sensor for detecting current and clamp method.
- ② Open/Close Lever : CT will open by pushing this lever to inside.
- ③ Range Switch : For power on/off and select $\sim A$ (I_o range) and I_{or} range.
By auto power off function, the power will be off approx. 10 minutes after power on. In this case, once set the range switch to OFF and set again to ON.
- ④ Frequency Switch : Select 50Hz or 60Hz according to the circuit to be measured.
- ⑤ D-HOLD : By pressing one time, DH (Data Hold) on LCD and it will be released by pressing one more time.
- ⑥ 1 Φ /3 Φ select Switch : According to the wiring system to be measured, set 1 Φ (single phase) or 3 Φ (3 phase). By setting the range switch ③ from OFF to I_{or}, it becomes 1 Φ automatically and by pressing this switch once, it becomes 3 Φ with 「 Δ 」 mark on the display. By pressing this switch once again, 3 Φ becomes 1 Φ .
- ⑦ Display : Digital display for measured value with annunciators and battery condition.
- ⑧ Input Terminal : Input terminal for exclusive Non-contact voltage sensor, when measuring I_{or}.
※ In case of 1 Φ , connect the red terminal to V and the black one to N.
In case of 3 Φ , connect the red terminal to R phase and the black one to T phase.
- ⑨ Battery Compartment (On the reverse side) : Batteries are installed.
- ⑩ Hand Strap : During measurement, avoid to fall down the instrument by using this strap.

REPLACEMENT OF BATTERIES

⚠ WARNING

POSSIBLE ELECTRICAL SHOCK OR ACCIDENT

- Do not replace the batteries under the conditions of measuring current or voltage
- Do not operate the instrument with battery cover off.

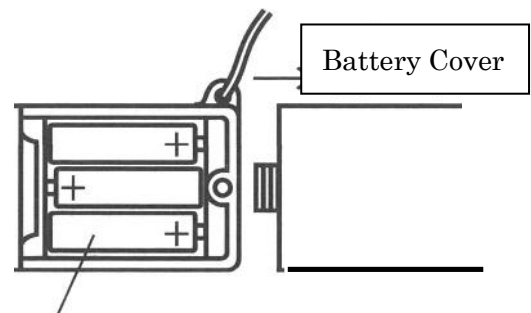
⚠ CAUTION

When not using the instrument for a long period, remove the batteries and keep separately. The batteries may leak and may cause damage to the instrument.

- 「B」 sign will appear on the display when batteries are exhausted and get less than operation voltage. Replace to new batteries immediately.
- Do not use the batteries mixed new one and once used and or different kind ones.

[How to replace the batteries]

- Remove the screw fixing battery cover at the bottom of rear case by + driver and slide & remove the battery cover to the direction of arrow mark.
- Pick up the exhausted batteries.
- Confirm the polarities and put the new batteries.
- Replace the battery cover to the original position and fix screw by driver.



Battery (LR-03) x 3

[Measuring Method]

For the safety operation keep and pay attention to the cautions and warnings stated in this manual.

△ WARNING

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Do not make measurements of power lines carrying more than AC 600V.
Before use, check and confirm the voltage of circuit to be measured.

POSSIBLE ELECTRICAL SHOCK OR ACCIDENT

- Do not handle the instrument in the rain, at humid place, with a drop of water and or with wet hands.
- Do not use the instrument if the CT or CT case are damaged and if something is wrong with the CT cables.
- Do not use the instrument, leaving the battery cover off.

POSSIBLE ELECTRICAL SHOCK, BURNED OR IGNITION ACCIDENT

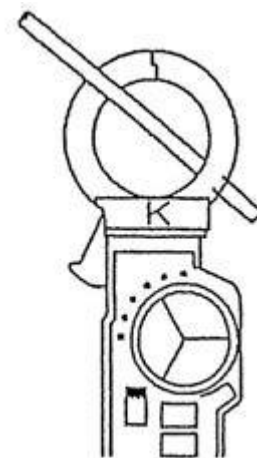
- If excessive current is applied to the CT, the instrument will be heated and damaged. Do not apply more than AC 60Arms to the CT part.
- Do not apply more than AC100V to the voltage input terminals.
- For voltage input, use the exclusive Non-contact Voltage Sensor (PS-30) at any time. Direct voltage input may cause the damage to instrument.

※ Note : At Ior range, the display may not become “0” in case of the input ”0” but it is not defect or abnormal.

(1) Line Current Measurement

- 1) Set the range switch from OFF to 1000mA (display on).
- 2) Open clamp jaw and clamp CT to the conductor to be measured and close CT completely.
- 3) Select the most suitable range by range switch and read the displayed value.
(In the place where hardly can read the display, use data hold function).

Note : The power will become automatically off approx. 10 minutes after the final operation of range switch due to auto power off function.



(2) Leakage Current Measurement

- 1) Measurement at grounding line
Do the same method as for line current measurement.
- 2) Measurement for other circuit except for grounding line
The operations are the same as for line current but clamp CT to 2 wires en bloc in case of single phase and 3 wires en bloc in case of 3 phase.

(3) Resistive Leakage Current Measurement (I_{or})

ATTENTION FOR I_{or} MEASUREMENT

- * The max. measurable I_{or} value is 150mA. In case that I_{or} value is exceeding 150mA, the displayed value is not reliable.
- * For voltage input, always use the exclusive Non-contact voltage input sensor.
- * For voltage input of 3P/3W, connect the red terminal to R phase and the black one to T phase. (Measuring mode becomes 3Φ and 「△」 mark lightens on the display). In case of 1P/3W, connect the red terminal to V and the black one to N. The voltage input in single phase is AC 100V.
- * For accurate measurement of I_{or}, clamp CT to the correct direction, as the instrument is checking the phase angles of current and voltage.
- * In case that the voltage cannot be inputted correctly, the display of instrument becomes blinking. Also, it may take several seconds to determine the most appropriate range in case, as I_{or} range is auto.
- * Do not touch the plug insertion part of non-contact voltage sensor directly during measurement. There might be a case that the measured values become unstable and or abnormal.
- * The exclusive non-contact voltage sensor takes phase angle through the electrostatic capacity of coated cables to be measured. If this non-contact sensor is not gripped firmly with coated cables, the measured values may become unstable and abnormal by noise in the fields. Also, the clip cannot be gripped firmly in case that coated cables themselves are bending. Apply the clip to straight section of cables as much as possible.

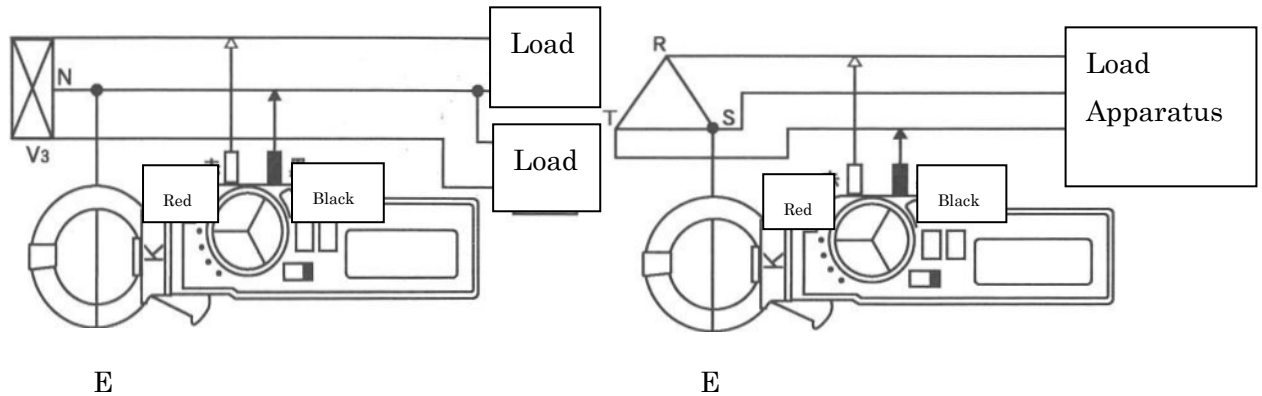
△ WARNING

- Definitely, do not apply the voltage more than AC 100V to the terminal, as the internal circuit may burn not.

(Wiring Method)

In case of 1Phase/3Wires

In case of 3Phase/3Wires



- 1) Set the range switch ③ from OFF to Ior 10mA/100mA (display will blink).
 - 2) Set the frequency switch ④ to the frequency to be measured.
 - 3) Select the wiring of circuit by 1 Φ /3 Φ select switch ⑥.
 - 4) Insert the exclusive non-contact sensor (PS-30) to the voltage input terminals, complying with the same colors.
 - 5) Input the voltage according to the above drawing. In case that voltage cannot be inputted correctly, the display becomes blinking.
 - 6) Clamp the CT to the direction of grounding line. The range will be changed to the most appropriate range automatically. (The biggest Ior value which can measure Ior is 150mA).
 - 7) Read the displayed value.
- ※ Use data hold function, where hardly can read the display.

⚠ WARNING

POSSIBLE ELECTRICAL SHOCK

- As the exclusive non-contact sensor is consumption article, confirm if it has no damage on the insulated coating before measurement. When an abnormality is once found, stop the use and repair or replace to new one.

POSSIBLE BURNING · WOUND

- Apply this non-contact sensor to the coated wires definitely and never connect with bare electric wires.

REPAIR SERVICE

When requesting for repair service, please bring the instrument directly to the dealer where you bought.

When mailing the instrument, always pack it in its original or equivalent packing materials to avoid any damage during the transportation and also put together with documents showing your name, address, phone number and defect point.

WARRANTY

This instrument is sent out from our factory after the sufficient internal inspections but if you find any defect due to the fault in our workmanship or the original parts, Please contact the dealer where you bought the instrument.

The warranty period is 12 months from the date of purchase and the instrument shall be repaired at free of charge, provided that we judge the cause of defect is obviously resulted from our responsibility.

GURANTEE REGULATIONS

1. This instrument is warranted for the operation under normal use for 12 months from the date of purchase.
2. This warranty does not cover the following defects:
 - a. Defect caused from the improper use and operation.
 - b. Defect caused from the use, operation and storage beyond the original specifications, designs and conditions.
 - c. Defect caused from the renovations or repairs done by someone else than us or our representatives.
 - d. Defect not caused from our responsibilities.