

EAGLOTEST

S642

**EARTH LEAKAGE
CLAMP METER**



CATALOG

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SECTION 1

Safety Warnings

Thank you for purchasing our Leakage Clamp Meter.

- Make sure to read this user manual carefully and strictly abide by the safety rules and precautions listed in this manual.
- Warning! This equipment must be used by a skillfully trained, certified/licensed, and evaluated person.
- The operator must fully understand the user manual and be proficient in operating the instrument before performing the field test.
- Before using, make sure that the instrument and accessories are in good condition without damage to insulation or disconnecting wires.
- The voltage of the tested leads cannot exceed 600V.
- The maximum outer diameter of the conducting wires is $\Phi 42\text{mm}$.
- The test leads must be removed from the conducting wires before they can be pulled out of the instrument, and the input jack cannot be touched to avoid electric shock
- Do not use it in a strong electromagnetic environment, so as not to affect the normal operation of the instrument.
- Make sure that the connecting plug of the test lead is firmly inserted into the terminal.
- The current clamp is strictly protected from falling, and the jaw surface must be kept smooth, and completely closed.
- This instrument is mainly used for secondary circuit and low voltage loop detection, pay attention to the measurement range.
- After an operation, make sure to clean the jaw surface with a soft cloth and lubricant instead of rough objects or corrosive agents.

SECTION 1

- Do not use the instrument in hazardous atmospheres with high temperatures and humidity. Do not store it under direct sunlight or in condensed fields.
- During operation, if the metal is exposed due to the breakage of the casing or test leads, stop using the instrument.
- The meter can be automatically shut down.
- If the meter is not used for a long time, please remove the battery.
- Only authorized personnel can disassemble, repair the instrument, and conduct regular maintenance.
- Prohibit using the meter if there is any damage to the meter or other spare parts.
- Stop using the instrument immediately in case of any danger will be caused by continuing to use it. Please securely pack the equipment and send it to an authorized organization for disposal.

SECTION 2

Introduction

The S642 Earth Leakage Clamp is designed to detect, record, and measure earth leakage currents with a resolution down to 0.01mA. However, the capabilities of the S642 extend to measuring currents of up to 300A AC, making it a highly versatile instrument capable of taking current measurements in a wide variety of situations and applications.

The typical application for the earth leakage clamp meter would be the measurement of earth leakage current in a circuit where the RCD or GFCI repeatedly trips out. The measured result will help to identify whether an excessive leakage current is causing the RCD or GFCI to trip, or if the RCD or GFCI itself is faulty.

SECTION 3

Technical Specification

Function	AC leakage current, AC voltage, phase and frequency, in single-phase 380V/220V power systems
Power	AAA alkaline batteries LR03, continuously up to 25 hours.
Measurement Range	AC Voltage: 0.00V ~ 600V
	AC Current: 0.00mA ~ 300A
	Phase: 1° ~ 360°
	Frequency: 35.0Hz ~ 65.0Hz
Resolution	Voltage: AC 0.01V
	Current: AC 0.01mA
	Phase: 1°
	Frequency: 0.1Hz
Size of the Jaw	φ42mm
Accuracy (under normal situations)	Voltage: $\pm 2\% \text{rdg} \pm 5 \text{dgt}$
	Current: $\pm 2\% \text{rdg} \pm 5 \text{dgt}$
	Phase: $\pm 6^\circ$
	Specified phase conditions: voltage $\geq 10\text{V}$ and current $\geq 10\text{mA}$. Make sure the accuracy of the measurement, the voltage

SECTION 3

	cannot be lower than 10V and current not lower than 10mA.
Size of the Meter	W: 78 × L: 203 × H: 33mm
Working Humidity and Temperature	-10℃ ~ 40℃; below 80%Rh
Storage Humidity and Temperature	-10℃ ~ 60℃; below 70%Rh
Automatic shutdown	Automatically shutdown with 15 minutes of inactivity
Function Switch	Press Mode Button to switch to display test phase, active power, voltage, current, voltage frequency
Data Storage	99 sets, the symbol of FULL indicates the storage is full.
Data Retention	Press Hold Button to keep the date and press it again to cancel
Data Query	Press Read Button to enter Data Query, and press the up and down arrows to browse all the stored data.
OL	Over measurement range
Weight	Meter: 260g; Total weight: 590g
Safety Regulation	IEC61010-1 CAT III 1000V, IEC61010-031, IEC61326, Pollution degree II

SECTION 4

Structure



SECTION 5

Operation

5.1 Basic Operation

On/off

Press the  button to turn on the instrument, then it displays the test page, if it is black and cannot be turned on, which indicates that the battery voltage may be insufficient, please replace the battery. The instrument will turn off automatically after 15 minutes of idle. Press the  button again to continue to operate.

MODE Button

Press the MODE Button to switch to various measurements, including current, voltage, phase, frequency, and power measurement.

Hold Button

Press the HOLD Button to keep and automatically number the stored data, then press it again to cancel. When the data is held, the meter indicates the "DH" symbol and automatically stores the number of up to 99 sets of data.

Read Button

Press the Read Button to view the data, and it starts from the first set of data. Press the up and down arrow to scroll through the stored data, and press the POWER button to exit; hold the MODE button for more than 3 seconds to delete all stored data. Please operate with caution because it cannot be restored after deletion.

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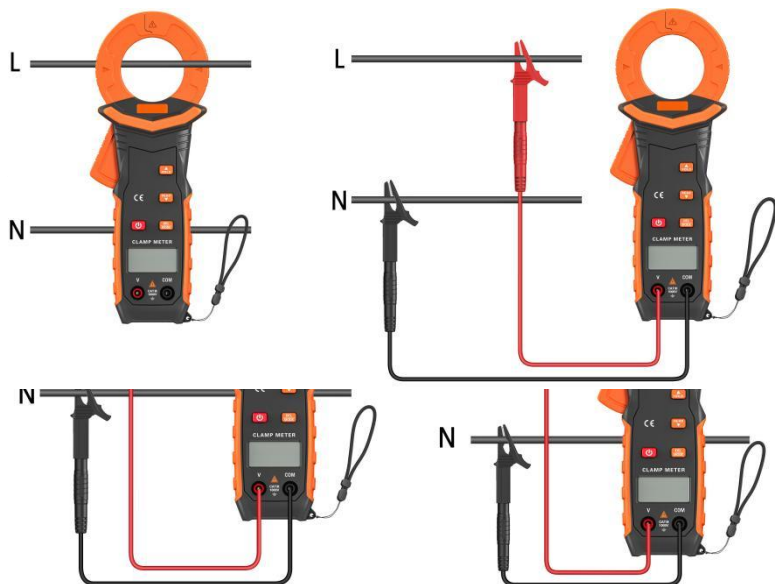
5.2 Test

Warning	Warning! This meter must be used by suitably trained, certified/ licensed, and evaluated persons. The operator must strictly abide by the safety rules, otherwise, there is a danger of electric shock, personal injury, or equipment damage.
	Warning! The meter cannot be used to measure circuits over 600V, otherwise, there is a danger of electric shock, personal injury, or equipment damage.

- Clamp the jaws on the circuit under test, and observe the reading, if the meter displays the "OL" symbol, it means that the current under test exceeds the upper limit of the meter;
- When measuring, the iron core should be close to the center point of the clamp, if the measuring iron core is in different positions of the clamp, there will be a deviation of current when measuring the low-end current.
- When testing single-phase or three-phase four-wire voltage, the neutral wire is connected to the COM terminal(the voltage input) of the instrument, and the live wire is connected to the V terminal. When testing the three-phase three-wire voltage, the COM terminal is connected to phase A, and the V terminal is connected to Phase B or C.

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Below setup for current, voltage, and phase



Single Phase Current, Voltage, and Power
Measurement

3-phase 4-wire, U_a Voltage and Current
Measurement

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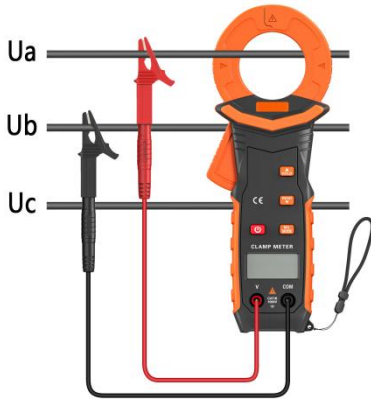
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S642
Earth Leakage Clamp Meter

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SECTION 5



3-Phase 3-Wire System, U_{ab} Voltage,
 I_a Current, and Power Measurement



3-Phase 3-Wire System, U_{cb} Voltage,
 I_a Current, and Power Measurement

The phase and phase sequence relationship between the 3-phase 4-wire I_a , I_b , and I_c can be judged by testing the phases of the three-phase four-wire U_a - I_a , U_a - I_b , and U_a - I_c or by testing the phases of the 3-phase 4-wire U_a - I_a , U_b - I_a , and U_c - I_a .

Similarly, the phase and phase sequence relationship between the 3-phase 3-wire I_a , I_b , and I_c can be judged by testing the phases of the 3-phase 3-wire U_{cb} - I_a , U_{cb} - I_b , U_{cb} - I_c , and U_{cb} - I_c , or by testing the phases of the 3-phase 3-wire U_{ab} - I_a and U_{cb} - I_a .

There are many methods for judging the current, voltage phase, and phase sequence of the 3-phase 4-wire and 3-phase 3-wire. When testing, pay attention to different wiring methods to avoid wrong connections.

The phase and phase sequence relationship between the 3-phase 4-wire I_a , I_b , and I_c can be judged by testing the phases of the three-phase four-wire U_a - I_a , I_b , and I_c .

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Ua-Ib, and Ua-Ic or by testing the phases of the 3-phase 4-wire Ua-Ia, Ub-Ia, and Uc-Ia.

Similarly, the phase and phase sequence relationship between the 3-phase 3-wire Ia, Ib, and Ic can be judged by testing the phases of the 3-phase 3-wire Ucb-Ia, Ucb-Ib, Ucb-Ic, and Ucb-Ic, or by testing the phases of the 3-phase 3-wire Uab-Ia and Ucb-Ia.

There are many methods for judging the current, voltage phase, and phase sequence of the 3-phase 4-wire and 3-phase 3-wire. When testing, pay attention to different wiring methods to avoid wrong connections.

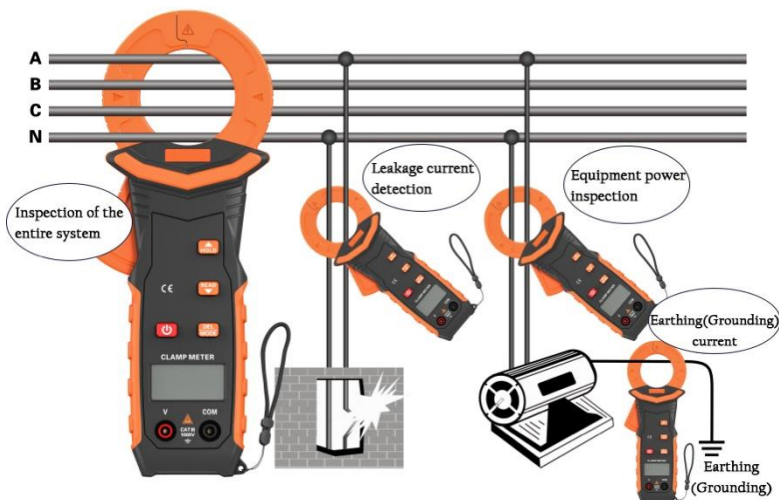
3-Phase 4-Wire System (balanced load)			
Phase Sequence	Phase Angle	Phase Sequence	Phase Angle
Ua-Ub	120°	Ia-Ib	120°
Ub-Uc	120°	Ib-Ic	120°
Uc-Ua	120°	Ic-Ia	120°
Ua-Uc	240°	Ia-Ic	240°

3-Phase 3-Wire System (balanced load)			
Phase Sequence	Phase Angle	Phase Sequence	Phase Angle
Uab-Ucb	300°	Ia-Ic	240°
Uab-Ia	30°	Ucb-Ic	330°

Leakage Current Measurement Wiring Diagram

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	Clamp the live wire and neutral wire together to measure the leakage current of the electrical equipment. (2 lines)
	Clamp the ground wire to measure the leakage current of the ground wire of the electrical equipment. (1 line)
	Clamp the main line to measure the total current of the main line. (1 line)
	Clamp the 3-phase and 3-wire together to measure the leakage current of the 3-phase and 3-wire. (3 lines)
	Clamp the 3-phase and 4-wire together to measure the leakage current of the 3-phase and 4-wire. (4 lines)



SECTION 6

Battery Management

- When the battery voltage is low, the low battery voltage symbol will be displayed to remind you to replace the battery.
- If replacing the battery, firstly make sure the meter is off, loosen the screws of the battery cover, open the battery cover, and replace it with a new battery. Pay attention to the battery specification and polarity, cover the battery cover, and Press the POWER button to see if it can be turned on normally. If not, please repeat the operation according to step 2.
- If the user cannot replace the battery, please contact Eaglotest.

Warning	If the meter is not used for a long time, please remove the battery.
	Warning! Do not test if the battery cover is not properly secured, otherwise, it will be dangerous.
	When replacing the battery, please pay attention to the polarity of the battery, otherwise the meter may be damaged.

SECTION 7

Packing List

Instrument	1
Instrument Bag	1
Voltage Test Leads	2
Batteries AAA LR03	2
Cloth Bag	1
Manual, Warranty, and Quality Certificate	1

Note:

- We are not responsible for other damages caused by the use of this product.
- The contents of this user manual do not justify the use of the product for special purpose.
- The Company reserves the right to modify the contents of the user manual. In the case of modification, no further notice will be given.
- n.

SALES OFFICE

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