

LEAKAGE CLAMP TESTER FOR ARRESTER

ALCL – 40H

INSTRUCTION MANUAL

Thank you very much for selecting our model ALCL-40H
Leakage Clamp Tester for Arrester.

Before use the instrument, read this instruction manual
completely and familiarize yourself thoroughly with all
functions.

Keep this instruction manual carefully to take out
whenever you need.

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SAFETY SUMMARY

observe by all means

- 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.

○ OPERATION ENVIRONMENT

△ CAUTION

- Do not use or storage this instrument under the condition of direct rays of the sun. High temperature & humidity and or condensation, as it may cause the deformation and or the isolation defect of the instrument.
- Do not use this instrument in the environment influenced by acids, alkalis, organic solutions, corrosive gas, etc.
- Do not use or storage this instrument where the mechanical vibration can be directly transmitted, as it may cause defect of the instrument.
- Do not use this instrument nearby the appliances which generate strong magnetic field and or electric field, as it may cause mis-movement of the instrument.
- This instrument does not have the water / dust-proof structure. Do not use this instrument in the environment with a lot of dust and drops of water, as it may cause defect of the instrument.

○ OPERATION CONDITION & CONNECTION

△ 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 500V.
Before use, check and confirm the voltage of circuit to be measured.
- Apply only the coated cables and do not clamp 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 something is wrong with the CT cables.
- If excessive current is applied to the CT, the instrument will be heated and damaged. Use the CT according to the rating current.

1. GENERAL

- This leakage clamp tester model ALCL-40H mainly measures quite low & sensitive leakage current very accurately.
- At $300\ \mu\text{A}$ range, the minimum resolution is $0.1\ \mu\text{A}$.
- Using ultra accurate CT which is hardly influenced by external magnetic field.
- Voltage output terminal for oscilloscope, etc. to see the wave form.

2. SPECIFICATIONS

- (1) Measuring Function : Leakage Current, Harmonic Current (Dominant & Third)
- (2) Measuring Method : CT Clamp-on Method
- (3) Measuring Range : $0\text{-}300\ \mu\text{A}/3\text{mA}/30\text{mA}$ (3 range manual)
- (4) Input Frequency : $45\text{-}60\text{Hz}$ (Dominant Wave Frequency)
- (5) AC Conversion : RMS Detection Method
- (6) A/D Conversion : Double Integration Method
- (7) Display : 3200 count max., LCD
- (8) Voltage Output : 300mV full scale for each range
- (9) Sampling Rate : 2 times/second
- (10) Over Indication : "OL" on the display
- (11) Low Battery Indication : "B" sign on the display
- (12) Data Hold Function : "DH" sign on the display
- (13) Auto Power Off : Approx. 10 minutes after power on
- (14) Max. Jaw Opening : $\phi\ 37\text{mm}$
- (15) Power Supply : 9V Alkaline Battery (6LR61)
- (16) Power Consumption : Approx. 20mW
- (17) Operating Circuit Voltage : Less than 500V AC
- (18) Operating Temperature : $0\sim 40^\circ\text{C}$, less than $80\%\text{RH}$, w/o condensation
- (19) Storage Temperature : $-10\sim 60^\circ\text{C}$, less than $70\%\text{RH}$, w/o condensation
- (20) Dimensions/Weight : Unit: $95(\text{W})\times 160(\text{H})\times 34(\text{D})\text{mm}$, 260gs
CT: $135(\text{W})\times 166(\text{H})\times 61(\text{D})\text{mm}$, 1000gs
- (21) Accessories : Battery 6LR61x1, CT
Carrying Case, Instruction Manual
BNC Connector (Option)

Accuracy ($23^\circ\text{C} \pm 5^\circ\text{C}$, less than $80\%\text{RH}$)

(1) AC Current

Range	Resolution	Accuracy($45\sim 65\text{Hz}$)	Max.Applicable Current
$300\ \mu\text{A}$	$100\text{nA}(0.1\ \mu\text{A})$	$1.2\% \pm 8\text{digit}$	40A rms
3mA	$1\ \mu\text{A}(0.001\text{mA})$		
30mA	$10\ \mu\text{A}(0.01\text{mA})$		

AC Conversion : RMS Detection Method

Crest Factor : < 3 ($0\sim 50\%$ of the range)

< 2 ($50\sim 100\%$ of the range)

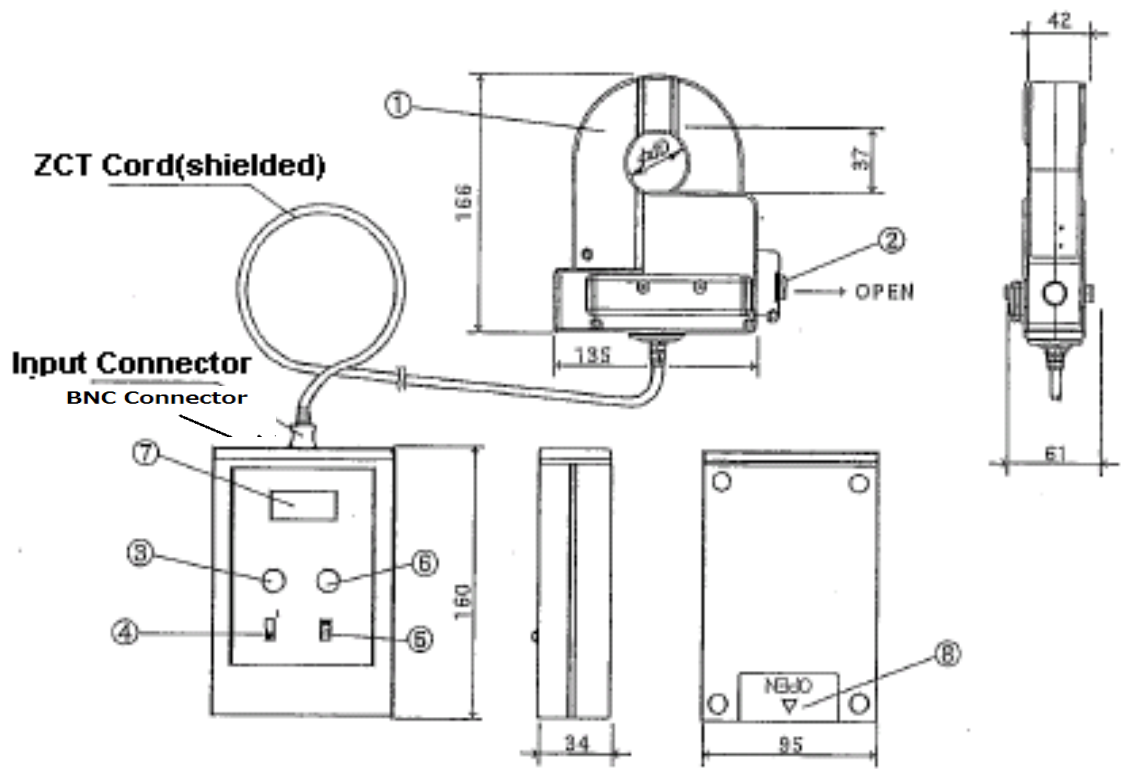
(2) Harmonic Current (Dominant Current, 3rd Harmonic Current)

Detection Method : Automatic Tuned Filter

Min. Dominant Current Input : more than 3% of each range

Accuracy : $(1\% \pm 5\text{digit}) \pm (\text{AC Current Accuracy})$

3. NAME OF PART & EXPLANATION



- ①Clamp CT : Sensor for detection of current.
- ②Handle for CT Open/Close : Manual operation
- ③Power On/Off Switch : By push one time, power will be "on" and by push again, power will be "off". (Power will be "off" automatically after 10 minutes.)
- ④Range Switch : Manual range switch to change 300 μ A, 3mA & 30mA.
- ⑤Mode Switch : Switch for selecting fundamental, dominant or 3rd harmonic current.
- ⑥Data Hold Switch : By push one time, "DH" sign will be displayed on LCD and
- ⑦LCD Display : Display of measured values and battery condition.
- ⑧Battery Cover : By removing this part, can replace the batteries.

4. OPERATION PROCEDURE

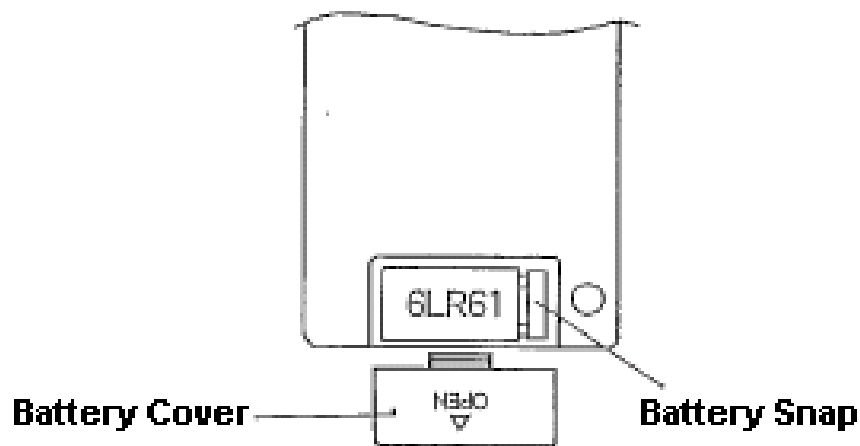
4-1 Change of Batteries

Confirm that the power is "OFF".

Remove the battery cover and take out the old battery.

Put new batteries into the case, not to mistake the polarity.

Replace the battery cover.



- Due to the auto power off function, a part of circuit is working and the battery is consuming even when no display. Keep the battery removed in case of not using this instrument.

△ WARNING


It may cause electric shock.

- After removed the battery cover, absolutely replace it again.
Do not use the instrument, keeping the battery cover off.
- Do not replace the batteries with clamping CT to the electric conductors.

△ CAUTION

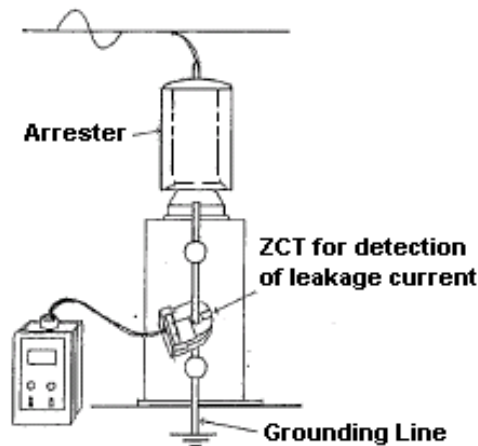
It may cause damage to the instrument.

- In case of not using the instrument for a long period, keep it without batteries installed. It may cause liquid leakage of batteries and may cause the damage to the instrument.

- When the batteries get exhausted and voltage is getting below than the operation Voltage, 「」 sign will appear on the display.
Change the batteries without delay.

4-2 Measurement

- ① Insert the plug of ZCT to the position "CT INPUT" of the instrument body.
- ② Set power switch "ON".
- ③ Set mode switch to "RMS" position.
- ④ Clamp CT to the conductor to be measured.
- ⑤ Set the range switch to the suitable range by checking the displayed values.
- ⑥ Read the displayed values.
- ⑦ Change the mode switch to "1st H" and "3rd H" and read the displayed values, if necessary.



Note

- In case of low current value, it takes a time to get the stable displayed value.
- Cannot measure the harmonic current, unless it contains the fundamental composition (50/60Hz) more than 3%.
- The range setting must be done at "RMS" mode. In case of harmonic mode, it may cause an error of accuracy.
- According to the auto power off function, the power will get off approx. 10 minutes after power on.

△CAUTION

It may cause failure

- Do not have any shock to the CT, as it is very sensitive.
- Do not apply the current to CT more than the max. allowable, as this instrument is only for the use for grounding line.

※ Leakage Current Measurement, except for Grounding Lines

The operation method is the same as for the grounding lines but clamp CT to the two wires in a lump in case of single phase and to the three wires in case of three phase.

(This instrument had been developed for the arrester and the max. measuring current is up to 30mA).

5. 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.

6. 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.

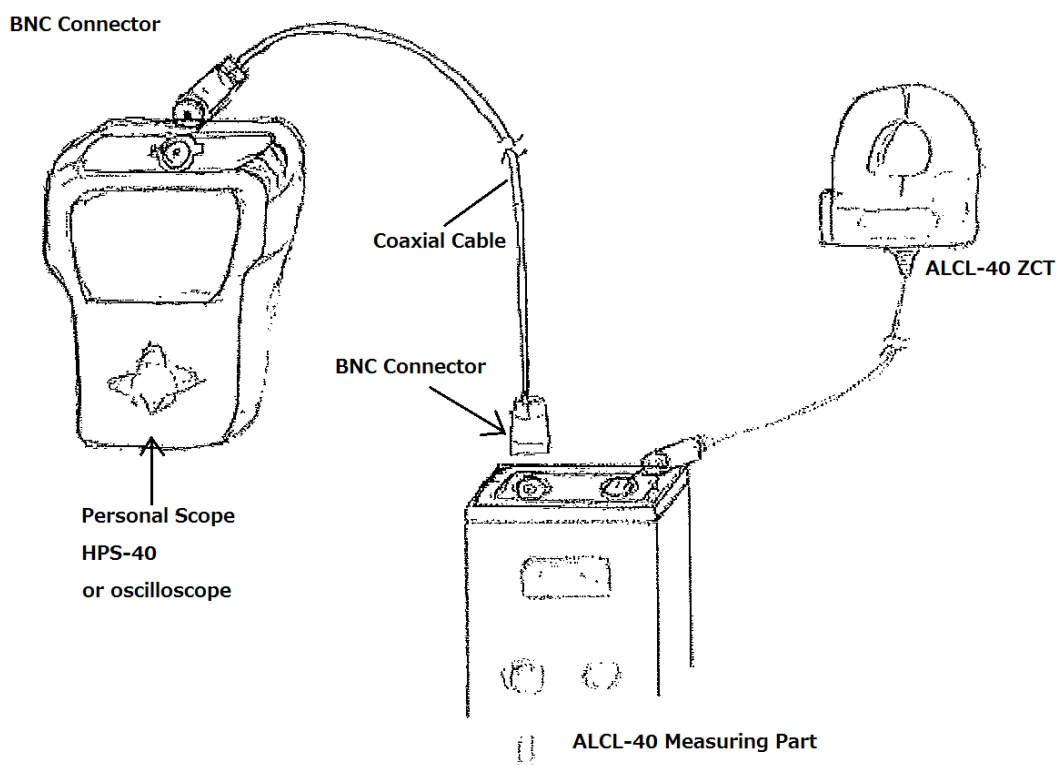
The warranty period is 12 months from the date of purchase and the instrument shall be repaired at free of charge, provided that we judge the cause of defect is obviously resulted from our responsibility.

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.

Appendix

1) Drawing of ALCL-40H Measuring Part connected with the voltage output terminal



2) Additional Accessory: BNC Connector

3) Voltage Output Waveform (Range)		Accuracy
30mA	300mV	2%
3mA	300mV	2%
300μA	300mV	2%