

MODEL 8141 MODEL 8142 MODEL 8143

LEAKAGE CLAMP SENSOR

LEAKAGE CLAMP SENSOR Series

MODEL 8141 / 8142 / 8143

KYORITSU ELECTRICAL INSTRUMENTS WORKS, LTD., TOKYO, JAPAN

1. SAFETY WARNINGS

This instrument has been designed and tested according to IEC Publication 61010: Safety Requirements for Electronic Measuring Apparatus. This instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and to retain it in safe condition. Therefore, read through these operating instructions before starting using the instrument.

⚠ WARNING

- Read through and understand instructions contained in this manual before starting to use the instrument.
 - Save and keep the manual at hand to enable quick reference whenever necessary.
 - Be sure to use the instrument only in its intended applications and to follow measurement procedures described in the manual.
 - Be sure to understand and follow all safety instructions contained in the manual.
- Not following the above instructions may cause injury, instrument damage and/or damage to equipment under test.

The symbol ⚠ indicated on the instrument means that the user must refer to related parts of the manual for safe operation of the instrument. Be sure to carefully read the instructions following each ⚠ symbol in this manual.

- ⚠ **DANGER** is reserved for conditions and actions that are likely to cause serious or fatal injury.
- ⚠ **WARNING** is reserved for conditions and actions that can cause serious or fatal injury.
- ⚠ **CAUTION** is reserved for conditions and actions that can cause minor injury or instrument damage.

⚠ DANGER

- Never make measurement on a circuit having potential of 300VAC or greater.
- Do not attempt to make measurement in the presence of flammable gasses. Otherwise, the use of the instrument may cause sparking, which leads to an explosion.
- The transformer jaws are made of metal and their tips are not completely insulated. Be especially careful about the possible shorting where the equipment under test has exposed metal parts.
- Never attempt to use the instrument if its surface or your hand is wet.
- Do not exceed the maximum allowable input of any measurement range.

⚠ WARNING

- Never attempt to make any measurement, if any abnormal conditions are noted, such as broken case, cracked test leads and exposed metal parts.
- Do not install substitute parts or make any modification to the instrument. Return the instrument to Kyoritsu or your distributor for repair or re-calibration.

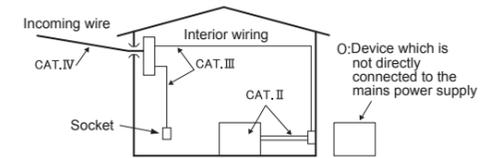
⚠ CAUTION

- Not to step on or pinch the cord, or it may damage the jacket of cord.
- The output connector shall be removed or connected while the measured conductor are not being clamped. Otherwise, it may cause a trouble.
- Do not expose the instrument to the direct sun, extreme temperatures or dew fall.
- Not to give shocks, such as vibration or drop, which may damage the instrument.
- Use a damp cloth and detergent for cleaning the instrument. Do not use abrasives or solvents.

○ Measurement Category:

To ensure safe operation of measuring instruments, IEC 61010 establishes safety standards for various electrical environments, categorized as 0 to CAT IV, and called measurement categories. Higher-numbered categories correspond to electrical environments with greater momentary energy, so a measuring instrument designed for CAT III environments can endure greater momentary energy than one designed for CAT II.

- 0 : Circuits which are not directly connected to the mains power supply.
- CAT II : Electrical circuits of equipment connected to an AC electrical outlet by a power cord.
- CAT III : Primary electrical circuits of the equipment connected directly to the distribution panel, and feeders from the distribution panel to outlets.
- CAT IV : The circuit from the service drop to the service entrance, and to the power meter and primary over-current protection device (distribution panel).



2. FEATURES

- Clamp sensor for AC leakage current measurement.
- Designed to safety standard IEC 61010- 2- 032: over- voltage CAT.III,300V and pollution degree 2.

3. SPECIFICATIONS

Rated current AC1000mA

Output voltage AC0~100mV (AC100mV/1000mA)

Measuring ranges and accuracy

Measuring Range	Accuracy (Frequency range)
0~1000mA	±1.0% rdg±0.1mV(50/60Hz) ±2.0% rdg±0.1mV(40~1kHz)

Temperature and Humidity Ranges(guaranteed accuracy):

23°C±5°C ,relative humidity 85% or less (without condensation)

Operating Temperature and Humidity Ranges:

0~50°C ,relative humidity 85% or less (without condensation)

Storage Temperature and Humidity Ranges

-20~60°C ,relative humidity 85% or less (without condensation)

Maximum permissible input

M-8141:100A continuous(50/60Hz)
M-8142:200A continuous(50/60Hz)
M-8143:500A continuous(50/60Hz)

※ Above values are the limit values that only permitted at wrong operation of the instrument, and the outputs are out of guaranteed accuracy.

Output impedance

M-8141:Approx.180Ω
M-8142:Approx.200Ω
M-8143:Approx.120Ω

Location for use Altitude up to 2000m, Indoors

Safety Standard IEC 61010- 1,IEC 61010- 2- 032 over- voltage CAT.III,300V,pollution degree 2
IEC 61326-1 (EMC), EN 50581(RoHS)

Withstand Voltage 3470Vrms (50/60Hz) for 5 sec. between Jaw and enclosure between Jaw and output connector between enclosure and output connector

Insulation Resistance 50MΩ or greater at 1000V between Jaw and enclosure between Jaw and output connector between enclosure and output connector

DISTRIBUTOR

Conductor Size M-8141:Approx.24mm in diameter max.
M-8142:Approx.40mm in diameter max.
M-8143:Approx.68mm in diameter max.

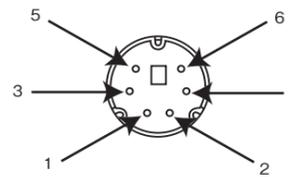
Dimensions M-8141:100(L)x60(W)x26(D)mm (excluding protrusions)
M-8142:128(L)x81(W)x36(D)mm (excluding protrusions)
M-8143:186(L)x129(W)x53(D)mm (excluding protrusions)

Cable length Approx. 2m

Output connector MINI DIN 6PIN Weight
M-8141:Approx.150g
M-8142:Approx.240g
M-8143:Approx.490g

Accessories Carrying case
Instruction manual

5. DIN Plug pin assignment



3: GND pin
5: Output signal pin
pin1,2,4 and 6:No use

※Above figure shows the pin assignment seeing the Clamp sensor from output terminal part. The figure of the pin assignment of connection terminal is symmetrical to above figure.

6. OPERATING INSTRUCTIONS

⚠ DANGER

- In order to avoid possible shock hazard, never make measurement on circuits having a potential of 300VAC or greater.
- The transformer jaws are made of metal and their tips are not completely insulated. Be especially careful about the possible shorting where the equipment under test has exposed metal parts.

⚠ CAUTION

- Take sufficient care to not to apply shock, vibration or excessive force to the jaw tips. Otherwise, precisely adjusted the jaw tips will be damaged.
- When a foreign substance is stuck in the jaw tips or they cannot properly engage, the transformer jaws do not fully close. In such a case, do not release the trigger abruptly or attempt to close the transformer jaws by applying external force. Make sure that the transformer jaws close by themselves after removing the foreign substance or making them free to move.
- Max. diameter of measured object: Φ24mm for M8141, Φ40mm for M8142, Φ68mm for M8143. Accurate measurement cannot be made on a conductor larger than this, because the transformer jaws cannot fully close.
- When removing the cable from the instrument, grasp the output connector, not the cable, to avoid damaging the cable.
- When measuring current which pulse element is superposed, differences of 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. Sensitive transformer jaws are used for Leakage clamp meter. Because of the characteristics of transformer jaws, which can be opened and closed, it is impossible to eliminate the interference of external magnetic field completely. If there is a presence of strong magnetic field, use the instrument at a distance as far as possible from it.

Following are the typical things generating magnetic field.

- Conductor fed large current
- Motor
- Equipment which has magnet
- Integrating wattmeter

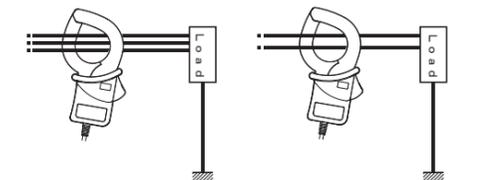
- Keep your fingers and hands behind the barrier during measurement.

6-1 Measuring method

- (1) Connect the output connector to the terminal of the instrument.
- (2) Press the trigger to open the transformer jaws and close them over measured conductor.
- (3) Make sure that the jaw tips are fully closed.

6-2 Leakage Current Measurement

- (1) Measuring out of balance leakage current (See Fig.1): Clamp onto all conductors except a grounded wire.
- (2) Measuring earth leakage current (See Fig.2): Clamp onto a grounded wire.



3- phase 3- wire system (In 4- wire system with neutral, clamp onto all 4 wires)
Single- phase 2- wire system (In 3- wire system with neutral, clamp onto all 3 wires)

Fig.1 Measuring out of balance leakage current

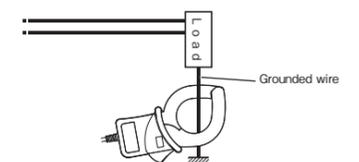
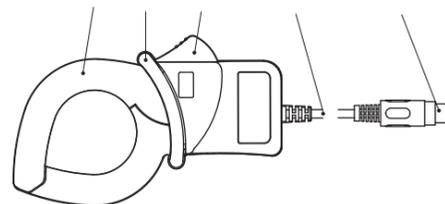


Fig.2 Measuring earth leakage current

4. INSTRUMENT LAYOUT

Transform Jaws Barrier Trigger Cable Output connector



Barrier: It is a part providing protection against electrical shock and ensuring the minimum required air and creepage distances.

Kyoritsu reserves the rights to change specifications or designs described in this manual without notice and without obligations.

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