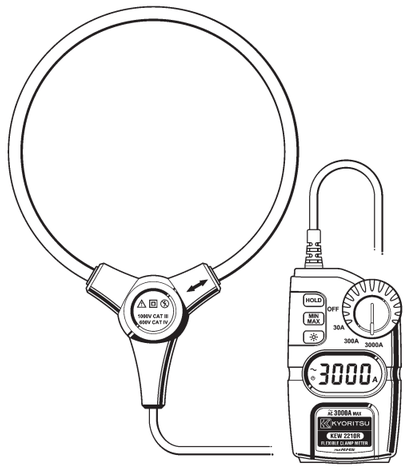
INSTRUCTION MANUAL



FLEXIBLE CLAMP METER

KEW 2210R

KYORITSU ELECTRICAL INSTRUMENTS WORKS, LTD.

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1. Safety Warnings

This instrument has been designed, manufactured and tested according to IEC 61010: Safety requirements for Electronic measuring apparatus, and delivered in the best condition after passed the inspection. This instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and retain it in safe condition. Therefore, read through these operating instructions before using the instrument.

⚠ WARNING

- Read through and understand the instructions contained in this manual before starting to use the instrument.
- Keep the manual at hand to enable quick reference whenever necessary.
- The instrument is to be used only in its intended applications.
- Understand and follow all the safety instructions contained in the manual.

It is essential that the above instructions are adhered to. Failure to follow the above instructions may impair the protection provided by the instrument, and may cause injury, instrument damage and/or damage to the equipment under test.

The symbol ⚠ indicated on the instrument means that the user must refer to the related parts in the manual for safe operation of the instrument. It is essential to read the instructions wherever the symbol ⚠ appears in the 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 injury or instrument damage.

⚠ DANGER

- Never make measurement on a circuit in the following categories;
  Measurement category IV(CAT IV):over 600V
  Measurement category III(CAT III):over 1000V
- Do not attempt to make measurement in the presence of flammable gasses. Otherwise, the use of the instrument may cause sparking, which can lead to an explosion.
- Never attempt to use the instrument if its surface or your hand is wet.
- Do not exceed the maximum allowable input of any measuring ranges.
- Never open the Battery compartment cover during a measurement.
- To avoid getting electrical shock by touching the equipment under test or its surroundings, be sure to wear insulated protective gears.
- Never attempt to make any measurements if the instrument has any structural abnormalities, such as a crack, or if the cover is not securely attached.
- The instrument should be used only in its intended applications or conditions. Otherwise, safety functions equipped with the instrument do not work, and instrument damage or serious personal injury may be caused.

⚠ WARNING

- Never attempt to make measurement if any abnormal conditions, such as broken case and exposed metal parts are found on the instrument or cables.
- Verify proper operation on a known source before starting to use the instrument or taking action as a result of the indication of the instrument.
- Do not install substitute parts or make any modifications to the instrument. Return the instrument to your local KYORITSU distributor for repair or re-calibration in case of suspected faulty operation.
- Do not try to replace the batteries if the surface of the instrument is wet.
- Ensure that the Clamp sensor is disconnected from the object under test, and that the instrument is powered off when opening the Battery compartment cover for battery replacement.

⚠ CAUTION

- This instrument is designed for residential, commercial or light industry applications. Accurate results may not be obtained if equipments generating strong electromagnetic interferences or strong magnetic fields due to large currents exist in the neighborhood.
- Set the Function switch to the appropriate position before starting measurement.
- This instrument isn't water proofed. Keep away from water.
- Be sure to power off the instrument after use. Remove the batteries if the instrument is to be stored and will not be in use for a long period.
- Do not expose the instrument to direct sunlight, high temperatures, humidity or dew.
- Use a damp cloth with water or neutral detergent for cleaning the instrument. Do not use abrasives or solvents.

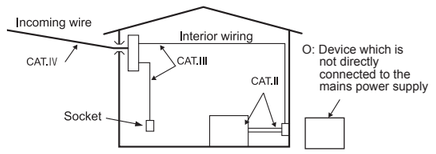
- Marks listed below are used on this instrument.

⚠	User must refer to the explanations in the instruction manual.
⧈	Instrument with double or reinforced insulation.
	Must wear insulated gears such as a pair of rubber gloves when connecting / disconnecting the sensor to / from live conductors.
~	AC
	Crossed-out wheel bin symbol (according to WEEE Directive: 2002/96/EC) indicating that this electrical product may not be treated as household waste, but that it must be collected and treated separately.

- Measurement categories(Over-voltage categories)

To ensure safe operation of measuring instruments, IEC 61010 establishes safety standards for various electrical environments, categorized as O 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.

O : 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 overcurrent protection device (distribution panel).



2. Features

- Flexible and light weight Sensor with air core coil
- Wide measuring ranges up to 3000A (30A/ 300A/ 3000A)
- True-RMS readings
- Data hold function
- MIN MAX function
- Auto-power-off function
- Designed to meet the following safety standard:
  IEC 61010-1 (CAT III 1000V / CAT IV 600V Pollution degree 2)

3. Specification

- Measuring range and accuracy(23ºC±5ºC, RH 80% or less)
  AC current

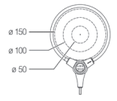
Range	Display range	Accuracy guaranteed range	Accuracy
30A	0.00 - 31.49A	1.50 - 30.00A	±3%rdg±5dgt (45 – 500Hz) (At the center of the circle formed by the flexible sensor.)
300A	0.0 - 314.9A	15.0 - 300.0A	
3000A	0 - 3149A	150 - 3000A	

Crest factor (CF): Full scale CF < 1.6, half scale CF < 3.2.
Effective input crest values are √2 times of the max values of each range.

- Influence of Conductor position

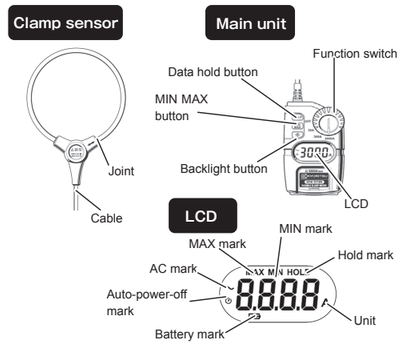
Measurement accuracy is guaranteed when the measured object is placed at the center of the clamp sensor.
The following errors should be considered and added to the accuracy depending on the distance from the center position.

Distance from the center	Errors to be considered
Radius 25 mm (ø50)	±1.0%
Radius 50 mm (ø100)	±2.0%
Radius 75 mm (ø150)	±3.0%



Applicable standards	IEC61010-1, IEC61010-2-030 CAT III 1000V / CAT IV 600V Pollution degree 2 IEC61010-2-032 , IEC61326-1(EMC) IEC60529 IP40
Display	Liquid crystal display Maximum reading:3149
Refresh rate	Approx. 2 times per second
Location for use	In-door use, altitude 2000m or less
Operating temperature & humidity	0 to +50℃ RH80% or less (no condensation)
Storage temperature & humidity	-10 to +60℃ RH70% or less (no condensation)
Power source	Size AAA battery x 2 pcs (The use of alkaline LR03 is recommended.)
Battery life	Approx. 120 hours continuous (with Backlight off)
Low battery warning	"⇨" appears when the battery voltage drops to 2.3V or less
Auto-power-off	Power off function operates in 15 min. after the last switch operation.
Overload Protection	AC 5000A for 10 sec.
Temperature coefficients	Add 0.1 x specified accuracy/ ºC (above 28ºC or below 18ºC)
Withstand voltage	AC8200V for 5 sec (between clamp sensor and enclosure)
Insulation resistance	100MΩ or more/ 1000V (between clamp sensor and enclosure)
Conductor size	Max. Φ150mm
Dimension	120(L)x70(W)x26(H)mm
Weight	Approx. 300g (including batteries)
Cable length	Approx. 1.8m(between clamp sensor and main unit)
Accessory	Carrying case MODEL9174 x 1 pce Size AAA battery x 2 pcs Instruction manual x 1 pce

4. Instrument layout



5. Getting started

(1) Checking battery voltage
Set the Function switch to any position other than the OFF position. When the indications on the display are clearly legible and the "⇨" mark is not on, the battery voltage is OK.
If the display is blank or "⇨" mark is on, replace the batteries according to Section 8: Battery Replacement.

⚠ CAUTION

- When the instrument is left powered on, the Auto-power-off function automatically shuts the power off; the display will be blank even if the Function switch is set to any positions other than the OFF position in this state.
  To power on the instrument, rotate the Function switch or press any of the buttons. If the display is still blank, the batteries are exhausted.
  Replace the batteries with the new ones.

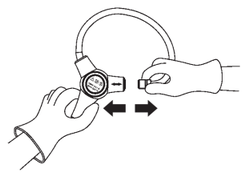
(2) Checking Function switch position
Set the Function switch to the appropriate range according to the measurement purpose. Confirm that the Data hold function is not activating.

6. Operating instructions

⚠ DANGER

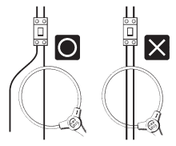
- Never make measurement on a circuit in the following categories;
  CAT IV over 600V
  CAT III over 1000V
- Never open the Battery compartment cover while making measurement.
- To avoid getting electrical shock by touching the equipment under test or its surroundings, be sure to wear insulated protective gears.

(1) Disconnect the Joint connector according to the illustration to the right.



(2) Clamp onto one conductor under the test, and re-connect the Joint connector. Hold the conductor at the center of the Clamp sensor.
(3) Confirm that the Joint connector on the Clamp sensor is firmly connected.

Note
- Jointed part of the Clamp sensor may be disconnected if excessive force is applied to.
- Clamp onto one conductor only; measurements cannot be made when clamping single-phase (2-wire) or three-phase (3-wire) at the same time.



7. Other functions

7-1 Auto-power-off function
This function is to prevent the battery from being exhausted by the instrument being unintentionally left on.
The instrument automatically shifts to the power-off state about 15 min after the last Function switch or other switch operation.
To exit from the Auto-power-off status, press any button or set the Function switch to the OFF position once, and then set it to the desired range.
"⏲" mark is displayed on the LCD when the Auto-power-off function is enabled.

[To cancel the Auto-power-off function]
To cancel the Auto-power-off function, hold down the Data hold button and turn the Function switch from OFF position to any other position.
While this function is disabled, "⏲" mark is not displayed on the LCD.

[To enable the Auto-power-off function again]
Turn the Function switch to the OFF, and then set it to any position.

7-2 Data hold function
This is a function to hold measured values on the display.
Press the Data hold button once to hold the current reading. In this data hold state, the reading is held even if input varies. The **"HOLD"** mark appears on the LCD. To exit the data hold state, press the button again.

7-3 Backlight function
Press the Backlight button and turn on/ off the LCD backlight. The backlight is automatically turned off in 30 sec.

7-4 MIN MAX function
Displayed values can be toggled in the following sequence by pressing the "MIN MAX" button.

Maximum value ("**MAX**" appears) - Minimum value ("**MIN**" appears) – Present measured value ("**MAX MIN**" blinks) - Maximum value ("**MAX**" appears) -.....

To disable this function, hold down the MIN MAX button at least 2 sec or rotate the Function switch.

8. Battery Replacement

⚠ DANGER

- Do not try to replace the batteries if the surface of the instrument is wet.
- Ensure that the Clamp sensor is disconnected from the object under test, and that the instrument is powered off when opening the Battery compartment cover for battery replacement.
- Never open the Battery compartment cover while making measurement.

⚠ CAUTION

- Do not mix new and old batteries or mix different types of batteries.
- Install batteries in correct polarity as marked inside.

Replace batteries with the new ones when the empty battery mark "⇨" is displayed on the LCD. The LCD does not show anything, even the empty battery mark, when the batteries are completely exhausted.

[How to replace batteries]
(1) Power off the instrument.
(2) Loosen the screw at the backside of the instrument and remove the Battery compartment cover.
(3) Remove all the old batteries and install new ones, two size AAA batteries, in correct polarity. The use of alkaline battery (LR03) is recommended.
(4) Reattach the Battery compartment cover and tighten the screw.

