



## DIGITAL MULTIMETER WITH AC/DC CLAMP SENSOR KEW MATE 2000/2001



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 using the instrument.
- Save and keep the manual handy 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.

Failure to follow the above instructions may cause injury, damage to the instrument 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.

⚠ **CAUTION** is reserved for conditions and actions that can cause minor injury or instrument damage.

Following symbols are used on the instrument and in the instruction manual. Attention should be paid to each symbol to ensure your safety. Refer to the instructions in the manual.

⚠ This symbol is marked where the user must refer to the instruction manual so as not to cause personal injury or instrument damage.

□ Indicates an instrument with double or reinforced insulation.

⌚ Indicates that this instrument can clamp on bare conductors when measuring a voltage corresponding to the applicable Measurement category, which is marked next to this symbol.

⌚ Indicates AC (Alternating Current).

⌚ Indicates DC (Direct Current).

#### ⚠ DANGER

- Never make measurement on circuits with a maximum voltage difference of 600VAC/DC or greater between conductors (300VAC/DC or greater between a conductor and ground).
- 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.
- Never attempt to use the instrument if its surface or your hand is wet.
- Do not exceed the maximum allowable input of measuring ranges.
- Never open the battery compartment cover while making measurement.
- Never try to make measurement if any abnormal conditions, such as broken transformer jaws or case is noted.
- The instrument is to be used only in its intended applications or conditions. Otherwise, safety functions equipped with the instrument doesn't work, and instrument damage or serious personal injury may be caused.

#### ⚠ WARNING

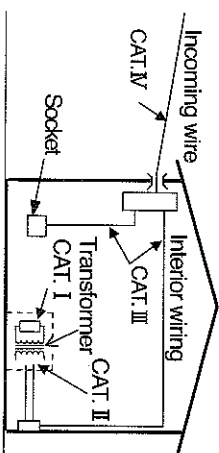
- Never attempt to make any measurement, if any abnormal conditions are noted, such as broken case, cracked test leads and exposed metal parts.
- Do not turn the Function Selector Switch while the test leads are connected to the circuit under test.
- Do not install substitute parts or make any modification to the instrument. Return the instrument to Kyoritsu or your distributor for repair or re-calibration.
- Do not try to replace the batteries if the surface of the instrument is wet.
- Always disconnect the clamp sensor and the test leads from the circuit under test and switch off the instrument before opening the battery compartment cover for battery replacement.

#### ⚠ CAUTION

- Make sure that the Function Selector Switch is set to an appropriate position before making measurement.
- Always make sure to place the test leads in the test lead holder before making current measurement.
- Do not expose the instrument to the direct sun, extreme temperatures or dew fall.
- Be sure to set the Function Selector Switch to the "OFF" position after use. When the instrument will not be used for a long period of time, place it in storage after removing the batteries.
- Use a damp cloth and detergent for cleaning the instrument. Do not use abrasives or solvents.

#### ○ Measurement categories (Over-voltage categories)

Measurement categories (Over-voltage categories) IEC61010 establishes safety standards for safe operation of measuring instruments. IEC61010 establishes safety standards for measuring instruments. CAT I, CAT II, CAT III and CAT IV are the 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. CAT I: Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device. CAT II: Primary 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 the service entrance, and to the power meter and primary over-current protection devices (distribution panel).



### 2. FEATURES

- Permits AC/DC current measurement up to 50A using a clamp sensor that comes standard with the instrument.
- Clamp sensor for ease of use in crowded cable areas and other tight places.
- Turns current measurement with an open current-clamp sensor that does not require the user to make any special operations by the user.
- Buzzer for easy continuity checking.
- LCD with a 3400 count full scale bar graph.
- Shock absorbing holster for ease of storage.
- Designed to international safety standard IEC61010-1: over-voltage category CAT. III, 300V and pollution degree 2.

### 3. SPECIFICATIONS

#### ● Measuring Ranges and Accuracy (at 23°C ±5°C, relative humidity/75% or less)

AC Current ~A	Measuring Range	Accuracy
MODEL 2000	0-60.0A	±2.0%rdg±5dgt(50/60Hz)
8001	100A	±2.0%rdg±5dgt(50/60Hz)

#### DC Current ~mA

Measuring Range	Accuracy
MODEL 2000	0-±60.0A
2001	0-±100.0A

#### AC Voltage ~V Input Impedance: 10MΩ

Range	Measuring Range	Accuracy
3.4V	0-600V	±1.5%rdg±5dgt(50-400Hz)
34V	(Auto-ranging)	
340V		
600V		

#### DC Voltage ~V Input Impedance: 10MΩ

Range	Measuring Range	Accuracy
340mV	0-±600V	±1.5%rdg±4dgt
3.4V	(Auto-ranging)	
34V		
340V		
600V		

#### Resistance Ω / kΩ

Range	Measuring Range	Accuracy
340Ω	±1.0%rdg±3dgt	
3.4kΩ	Buzzer beeps below 30±10Ω	
34kΩ	(Continuity buzzer works on 340Ω range)	
340kΩ	±1.5%rdg±5dgt	
3.4MΩ	±1.5%rdg±5dgt	

#### Frequency Hz

Range	Measuring Range	Accuracy
0-3.399kHz	±0.1%rdg±1dgt	
3.4kHz-10kHz	(Auto-ranging)	
0-3.399kHz	±0.1%rdg±1dgt	
3.4kHz-33.99kHz	(Auto-ranging)	
34kHz-300kHz		

● Electromagnetic Compatibility (EMC)  
 RF field ≤ 1 V/m  
 AC/DC voltage category CAT II, 600V, pollution degree 2  
 IEC 61010-2-031  
 IEC 61010-2-032  
 IEC 61326 (EMC)  
 Dual integration  
 Liquid crystal display with maximum reading of 3399  
 as well as units and range points of 33  
 bar graph (LCD range only)  
 Shifts to the next higher range when bar graph  
 increases to 33 points  
 Shifts to the next lower range when bar graph  
 decreases to 3 points  
 Numeric reading: about 400ms  
 bar graph: about 20ms

#### ● Safety Standard

IEC 61010-1  
 over-voltage category CAT II, 600V, pollution degree 2  
 IEC 61010-2-031  
 IEC 61010-2-032  
 IEC 61326 (EMC)

#### ● Operating System

#### ● Display

#### ● Over Input Indication

#### ● Auto-ranging Operation

#### ● Sample Rate

● Location for use  
 ● Accuracy measured  
 Temperature and  
 Humidity Ranges  
 ● Operating Temperature  
 and Humidity Range  
 ● Storage Temperature  
 and Humidity Range  
 ● Source  
 ● Current Consumption  
 ● Power-save Function

Indoor use, Altitude up to 2000m  
 23°C ±5°C, relative humidity 75% or less  
 (without condensation)

0-40°C, relative humidity 85% or less  
 (without condensation)  
 -20-60°C, relative humidity 85% or less  
 (without condensation)  
 Two 1.5V/DC R03 (UM-4) batteries  
 Approx. 10mA  
 Shifts to the power-save state about 10 minutes after  
 the last switch operation  
 Approx. 10 A  
 AC/DC current ranges: MODE L2001 AC/DC 72A for  
 10 seconds  
 AC/DC current ranges: MODE L2001 AC/DC 120A for  
 10 seconds

AC/DC voltage ranges: AC/DC 720V for 10 seconds  
 Resistance ranges: AC/DC 720V for 10 seconds  
 Frequency ranges: AC/DC 720V for 10 seconds  
 AC/DC 700V for 1 minute between electrical circuit and  
 housing case  
 10MΩ or greater at 1000V between electrical circuit  
 and housing case  
 MODE L2001 Approx. 6mm diameter max.  
 MODE L2001 Approx. 10mm diameter max.  
 128(L) × 87(W) × 24(D)mm  
 MODE L2001 128(L) × 92(W) × 27(D)mm  
 MODE L2000 Approx. 210g  
 MODE L2001 Approx. 220g  
 Two R03 (UM-4) batteries  
 Instruction Manual

● Overload Protection

● Withstand Voltage

● Insulation Resistance

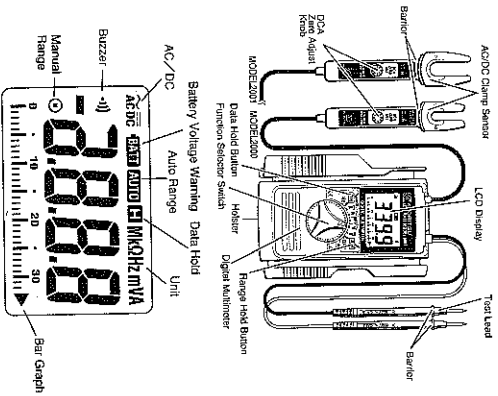
● Conductor Size

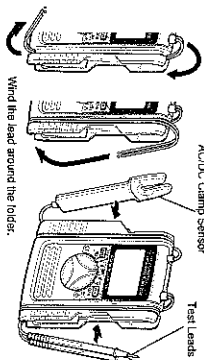
● Dimensions MODE L2000

● Weight

● Accessories

4. INSTRUMENT LAYOUT





Wrap the lead around the holder.

## 5. PREPARATIONS FOR MEASUREMENT

### (1) Checking battery voltage

Set the Function Selector Switch to any position other than the OFF position. If the marks on the display are clearly legible without symbol "BATT" showing, battery voltage is OK. If the display blanks or "BATT" is indicated, replace the batteries according to section 8: Battery Replacement.

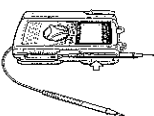
#### NOTE

When the instrument is left powered on, the auto-power-save function automatically shuts the power off. Press the Power On/Off Function Selector Switch to set to a position other than the OFF position in the state. To power on the instrument, turn the Function Selector Switch or press the Data Hold Button. If the display still blanks, the batteries are exhausted. Replace the batteries.

(2) Make sure that the Function Selector Switch is set to the appropriate range. Also make sure that data hold function is not enabled. If inappropriate range is selected, desired measurement cannot be made.

(3) Install Test Lead to the Holder on the side of body

It is possible to measure with sealing the LCD Display  
Keep Test Lead installing to the Holder.



## 6. HOW TO MAKE MEASUREMENT

### 6-1 Current Measurement

#### ⚠ DANGER

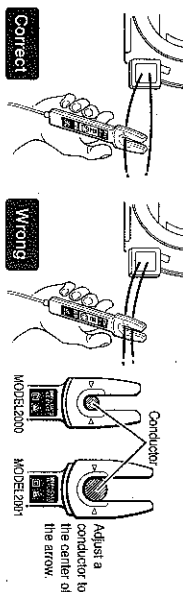
● In order to avoid possible shock hazard, never make measurement on circuits with a maximum voltage difference of 600VAC/DC or greater between conductors (300VAC/DC or greater between a conductor and ground).

● Do not make measurement with the test leads connected to the circuit under test. Never make measurement with the battery compartment cover removed.

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

#### ⚠ CAUTION

● When handling the clamp sensor, exercise caution not to apply excessive shocks or vibration to the sensor.  
● Maximum measurable conductor size is MODEL2000 6mm / MODEL2001 10mm in diameter.



MODEL2000

MODEL2001

### 6-1-1 DC Current Measurement

- (1) The Function Selector Switch to the "DC" position.
- (2) Turn the 0(Zero) ADJ knob to set the reading of the multimeter to zero. (If this zero adjustment is made incorrectly, measurement errors will result.)
- (3) Adjust one of the conductors to the center of the clamp sensor's arrow.
- (4) When the position of the conductor is not at the center of the arrow, the error occurs.

Note: Measured value is shown on the display. When the position of the conductor is not at the center of the arrow, the polarity of the reading is positive (+). Otherwise, the polarity of the reading is negative (-).

### 6-1-2 AC Current Measurement

- (1) Set the Function Selector Switch to "AC".
- (2) "AC" and "AUTO" marks are shown on the top of the LCD.
- (3) Adjust one of the conductors to the center of the clamp sensor's arrow. (When the position of the conductor is not at the center of the arrow, the error occurs.)

Note: Measured value is shown on the display. Unlike DC current measurement, zero adjustment is not necessary. There is no polarity indication either.

### 6-2 Voltage Measurement

#### ⚠ DANGER

● In order to avoid possible shock hazard, never make measurement on circuits with a maximum voltage difference of 600VAC/DC or greater between conductors (300VAC/DC or greater between a conductor and ground). Do not make measurement with the battery compartment cover removed.

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

### 6-2-1 DC Voltage Measurement

- (1) Set the Function Selector Switch to "DC".
- (2) "DC" and "AUTO" marks are shown on the top of the LCD.
- (3) Connect the red test lead to the positive (+) side of the circuit under test and the black test lead to the negative (-) side. Measured voltage value is shown on the display.

When the connection is reversed, "-" is shown on the display.

### 6-2-2 AC Voltage Measurement

- (1) Set the Function Selector Switch to "AC".
- (2) "AC" and "AUTO" marks are shown on the LCD.
- (3) Connect the test leads to the circuit under test.

Measured voltage value is shown on the display.

### 6-3 Resistance Measurement

#### ⚠ DANGER

● Never make measurement on circuits that are live.

● Never make measurement with the battery compartment cover removed.

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

- (1) Set the Function Selector Switch to " $\Omega$ ".
- (2) Check that the display shows over-range. Short the test leads and check that the buzzer beeps and the display reads zero.
- (3) Connect the test leads to the circuit under test. Measured resistance value is shown on the display. When the measured value is below about 30  $\Omega$ , the buzzer beeps.

Note: When the test leads are shorted, the display may read a small resistance value. This is the resistance of the test leads. "OL" is shown on the display. If there is an open circuit, "OL" is shown on the left side of the LCD. On the 940  $\Omega$  range, "OL" is shown on the left side of the LCD.

### 6-4 Frequency Measurement

#### ⚠ DANGER

● In order to avoid possible shock hazard, never make measurement on circuits with a maximum voltage difference of 600VAC/DC or greater between conductors (300VAC/DC or greater between a conductor and ground).

● Do not make measurement with the test leads connected to the circuit under test. Never make measurement with the battery compartment cover removed.

● Do not make current measurement with the test leads connected to the circuit under test.

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

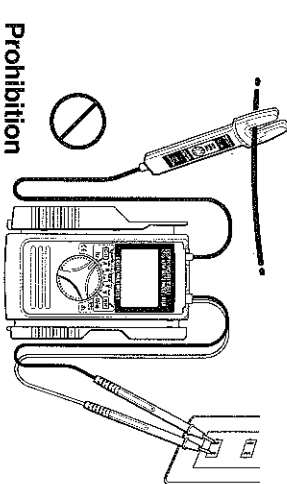
- (1) Set the Function Selector Switch to "Hz".
- (2) Measuring frequency of current: Adjust one of the conductors to the center of the clamp sensor's arrow.

Measured value is shown on the display.

Measuring frequency of voltage: Connect the test leads to the circuit under test. Measured frequency is shown on the display.

Note: Measuring range of current frequency is 0-10kHz with minimum measurable input of MODEL2000 15A(Typ)/MODEL2001 10A(Typ). Measuring range of voltage frequency is 0-300kHz with minimum measurable input of 10V(Typ).

When measuring frequency, do not attach the clamp sensor and the test leads to the circuit under test simultaneously.



## Prohibition

## 7. OTHER FUNCTIONS

### 7-1 Auto-Power-Save Function

#### NOTE

A small amount of current is consumed even in the power-save state. Make sure to set the Function Selector Switch to the OFF position when the instrument is not used.

This function helps to avoid unwanted exhaustion of the batteries because of leaving the instrument powered on and extend battery life. The instrument automatically shifts to the power-save state about 10 minutes after the last Function Selector Switch or other switch operation.  
To return to the normal state: Turn the Function Selector Switch or press the Data Hold Button twice to exit the power-save state and enable measurement functions.

## 7.2 Data Hold Function

This is a function to freeze a measured value on the display. Press the Data Hold Button once to hold the current reading in the data hold state, the reading is held even if input varies. "H" and "G" marks are shown on the LCD instead of "AUTO" mark.  
To exit the data hold state, press the Data Hold Button again.

## 7.3 Range Hold Function

The instrument defaults to auto-ranging ("AUTO" is shown on the LCD). Pressing the Range Hold Button enables manual selection among measurement ranges ("G" mark is shown on the LCD instead of "AUTO" mark). Press the Range Hold Button to select a higher range.  
To switch from manual range selection to auto-ranging, press down the Range Hold Button for about one second, or turn the Function Selector Switch to another position before setting it back to the current range.

## 8. BATTERY REPLACEMENT

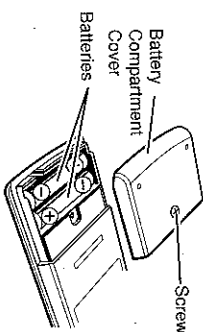
### ⚠ WARNING

● In order to avoid possible shock hazard, always disconnect the test leads from the circuit under test and set the Function Selector Switch to the OFF position before trying to replace the batteries.

### ⚠ CAUTION

● Do not mix new and old batteries.  
● Install batteries in the orientation as shown inside the battery compartment, observing correct polarity.

When the battery voltage warning mark, "BATT" is shown on the top left corner of the LCD, replace the batteries. Mark at the display blanks and "BATT" mark is not shown if the batteries are completely exhausted.  
(1) Set the Function Selector Switch to "OFF".  
(2) Remove the instrument from the holster.  
(3) Remove the battery-compartment-cover-fixing screw on the lower back of the instrument.  
(4) Replace the batteries with two new R03 (UM-4) 1.5V batteries.  
(5) Put the battery compartment cover back in place and tighten the screw.



## DISTRIBUTOR

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



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