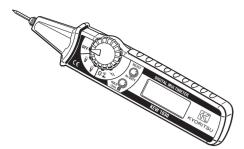
INSTRUCTION MANUAL

Thank you for purchasing our instrument KEW1030 Before using the instrument,read this manual thoroughly to obtain the maxim performance of this instrument and ensure the correct measurement.



PEN TYPE DIGITAL MULTIMETER KEW 1030

KYORITSU ELECTRICAL INSTRUMENTS WORKS, LTD.

1. Safety warnings 🖄

OThis 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 using the instrument.
 Save and keep the manual at hand to enable quick reference whenever necessary.

Save and keep time manual at nano to enable quick references whenever necessary.
 The instrument is to be used only in its intended applications.
 Understand and follow all the safety instructions contained in the manual.
 The RESPONSIBLE BODY shall be made aware that, if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

○The symbol A indicated on the instrument means that the user must refer to the related parts in the manual for safe operation of the instrument. Be sure to carefully read the instructions following each A symbol in the manual.		
	: is reserved for conditions and actions that are likely to cause serious or fatal injury.	
	: is reserved for conditions and actions that can cause serious	
	: is reserved for conditions and actions that can cause injury or instrument damage.	

 \bigcirc Please refer to following explanation of the symbols used on the instrument A User must refer to the explanations in the instruction manual

	Instrument with double or reinforced insulation
	~ AC
	DC

4-3	Method of storing the test lead
Test I	ead is stored in the rear side compartment of the instrumen
	to a standard measure data a second to a latera "



5. Functions

- Auto-ranging (AUTO)
- A function to automatically select the appropriate measurement range based on the input signal. The "AUTO" mark is displayed on the LCD while this function is activated. This function is not available in Diode check, Continuity check and Duty ratio measurements. The "AUTO" mark is not displayed.
- Hold function (
 D)
 A function to freeze the measured value on the LCD. (Not available in Frequency measurement)

The " III " mark is displayed on the LCD when the HOLD key is pressed Then the measured value is frozen. Press this key again or switch the measurement function to others to release the Hold function ● REL function (△)

A function to display the difference between the measured values (relative value) on the LCD at DCV and Capacitance functions. The "A" mark is displayed on the LCD when the HOLD key is pressed. Then the value being measured is stored. After that, the difference between the stored value and the measured value is displayed on the LCD. Press this key again or switch the measurement function to others to release the REL function

Auto-power-off function A function to turn off the instrument when 30 min. have elapsed after the Function switch is switched from OFF to the other measurement function. Press the HOLD key again or switch the measurement function to others to restore from the Auto-power-off state.

Over-range indication
 When the measured value exceeds the max. indication range, "OL" is displayed on the LCD. (This indication is not displayed at AC/DC 600V range.) This indication is not displayed while the Hold function is activated.

ORead through the following safety instructions contained in this manual before using the instrument

t on a circuit in which electrical potential to ground ove 600V exists. 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. Otherwise

you may get electrical shock. Never open the Bottom case and Battery cover during a measurement. Do not exceed the maximum allowable input of any measuring range. Never try to make measurement if any abnomal conditions, such as broken case is noted.

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

WARNING

for battery replacement.

 Never attempt to make any measurement if any abnormal conditions, such as broken case and exposed metal parts are present on the instrument or test lead.
 Do not install substitute parts or make any modification to the instrument. Return the instrument to your local Kyoritsu distributor for repair or re-calibration. • Do not turn the function switch with plugged in test leads connected to the circuit

under test. Do not try to replace the batteries if the surface of the instrument is wet Always switch off the instrument before opening the battery compartment cover

• Always set the Function switch to the appropriate position before making measurement.

• Do not expose the instrument to the direct sun, high temperatures and humidity

or aew. This instrument is designed for in-door use. It can be used under the temperature between 0°C and 40°C without impairing its safety characteristics. •This instrument doesn't have dust/water-proof construction. Do not use the instrument in dusty area or where it easily gets wet. It may lead to failure of the

• Set the Function switch to "OFF" position after use. Remove the batteries if the

instrument is to be stored and will not be in use for a long period. • Use a damp cloth and detergent for cleaning the instrument. Do not use abrasives or solvents

OMeasurement categories (Over-voltage categories)

To ensure safe operation of measuring instruments, IEC61010 establishes safety standards for various electrical environments, categorized as CAT II to CAT IV, and called measurement categories. These are defined as indicated below. 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 $\, \mathrm{I\!I}$

CAT ${\rm I\!I}\,$: 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 ribution panel, and feeders from the distribution panel to outlets

Designed to meet CAT III 600V when the cap is attached to the test lead and to meet CAT II 600V when the cap is not attached to the test lead.

2. Features

This instrument is a pen-type digital multimeter and can measure: AC/DC voltage resistance, capacitance and frequency/duty ratio. It also provides continuity check and diode check functions.

- Designed to meet the following safety standards. IEC61010-1 measurement category (CAT) III 600V
- IEC61010-031 (for hand-held Probe assemblies)
- Double molded main body and Function switch provide comfortable single handed grip
- Penlight illuminates brightly the point to be measured.
- Backlight LCD is highly visible, even in darkness.
 REL function to check the difference (DC.V/ CAP).
- Auto-power-off function to save battery
- Data hold function
- All ranges including Ohm range are protected against overload voltage of 600V. Test lead is wrapped in its rear side compartment without difficulty.
 Test pin can be covered by a unique cover mechanism for safety.

6-1 AC voltage(ACV), Frequency and DUTY ratio measurement Set the Function switch to $\widetilde{\mathbf{V}}$ position

2 Connect the Test pin and test lead to AC circuit as shown in the figure below to measure AC voltage (ACV).



B Press the SELECT key and select the Frequency range to measure a frequency In this case, the unit "Hz" is displayed on the LCD. Following measurements can be done

by pressing the SELECT key. ACV
Frequency
DUTY ratio 5000 *

Press the SELECT key and select the DUTY ratio range to measure a DUTY ratio (Pulse width/ Pulse cycle). In this case, the unit "%" is displayed on the LCD.

0500

- Note At ACV function, a few dgts may remain displayed on the LCD after removing the input.
- Connect the test lead (minus terminal) to the earth side of the circuit under test. When the circuit under test does not have the earth, any connection is allowed. • At Frequency and DUTY ratio measurement, the measurable min. input is approx.
- 1.5Vrms

6 – 2 DC voltage(DCV) measurement Set the Function switch to" $\overline{\mathbf{V}}$ "position

2 Connect the Test pin to the positive (+) side of the equipment under test and the test lead to the negative (-) side as shown in the figure below. When test lead is connected to the positive (+) side, the "-" mark is displayed on the LCD.

Specification

		t temperature & humidity: 23±5°C,	
Function	Range	Accuracy	Max. input voltage
ACV Auto-ranging(*2)	4V	± 1.3%rdg ± 5dgt (50/60Hz)	
	40V	± 1.7%rdg ± 5dgt (~ 400Hz)	_
	400V	± 1.6%rdg ± 5dgt (50/60Hz)	
	600V	± 2.0%rdg ± 5dgt (~ 400Hz)	_
	400mV		
DCV	4V	± 0.8%rdg ± 5dgt	
Auto-ranging(*2)	40V		
nuto-ranging(Z)	400V		_
	600V	± 1.0%rdg ± 5dgt	_
	400 Ω		
	4k Ω		
Ω	40k Ω	± 1.0%rdg ± 5dgt	
Auto-ranging	400k Ω		
	4M Ω		
	40M Ω	± 2.5%rdg ± 5dgt	DC 600V
Diode check/	Diode check	Test voltage:approx. 0.3V ~ 1.5V	AC 600Vrms(sin
Continuity Check	Continuity	Buzzer sounds when	AC 000 viina(ain
Continuity Check	Check	resistance is 120 Ω or less.	
	50nF	± 3.5%rdg ± 10dgt	
Capacitance Auto-ranging	500nF		
	5uF	± 3.5%rdg ± 5dgt	
	50uF		
	100uF	± 4.5%rdg ± 5dgt	_
	5Hz		
	50Hz	± 0.1%rdg ± 5dgt	
Frequency Auto-ranging	500Hz	Measurable input: 1.5Vrms or more	
	5kHz		
	50kHz	1.0 VIII 3 01 11010	
	200kHz		_
OUTY(pulsewidth/ pulse cycle)	0.1 ~ 99.9%	± 2.5%rdg ± 5dgt(Accuracy is guaranteed up to 10kHz.)	

Note:

- Following abbreviations are used in above table.
 Index is an abbreviation of "reading", and it means the indicated value at a
- dgt is an abbreviation of "digit", and it means the figure to be displayed at the rightmost digit.
- (2), the voltage function, the Auto-ranging function is released by pressing the SELECT key. To measure a voltage again, turn the Function switch to the "OFF" position once. Then set it to the Voltage function again. position once. Then set it to the Voltage function again. - 2 General specification Method of operation Display Over-range indication Range switching Range switching Range shifts to upper range:4000 counts. Samole rate Samole rate Display
 Over-range indication Range switching Range shifts to lower range:less than 360 count twice per second 0.0747 ACV/ DCV/ DC/ Capacitance $HOLD/Hz/ DUTY/ \rightarrow 1/ \cdot \vartheta/$ REL Δ (only at DCV and Capacitance ranges) Button type battery LR44(SR44)1.5V × 2 **feature** mark is displayed at 2.4V4.0.2V or less. 1.90(L) × 39(W) × 31 (Dmm Approx. 1000 (including batterines) Altitude up to 2000m, in-door use $0 \rightarrow 40^{\circ}$ C, relative humidity 85% or less (no condensation) Sample rate
 Functional construction
 Key Power source
 Low battery warning
 Dimension
 Weight
 Location for use Operating temperature & humidity range
 Storage temperature (no condensation) $-20 \sim 60^{\circ}$ C, relative humidity 85% or less Storage tempera
 & humidity range
 Accessories (no condensation) Carrying case x 1 Button type battery LR44(1.5V) x 2 Instruction manual x 1 : • IEC/EN 61010-1 Measurement category (Pollution degree 2 • IEC/EN 61010-031 : • EN 61326 Standards (Safety) egory (CAT) III 600V (EMC)
- 3 3 Electrical characteristics Temperature & 23 C ±5 C, relative humidity 85% or less humidity range (no condensation) (guaranteed accuracy)
 Supply voltage range (guaranteed accuracy) : 3.4V till the "CALL" mark is displayed
- (guaranteed
 Insulation res 10MΩ or more/ DC1000V
- 10ML0 or more/ UCTUOUV (between electrical circuit and case enclosure) AC5.55kVrms, sine wave (50/60Hz for 1 min.) (between electrical circuit and case enclosure) 720V (AC/DC) for 10 sec. at voltage function 600V (AC/DC) to 10 sec. at all functions Withstand voltage
- Overload protection
 (Over-voltage protection)
- other than voltage fun DC3.0V Rated supply voltage Approx. 4mVA (when battery voltage is 3.0V)
- Rated powe Approx.30mVA (when lights are on) Approx.80 hours (DCV measurement) Approx.15 hours (A operation; turning the light on for 10 sec. and off for 20 sec., is repeated.) Max. rated power
 Continuous opera ating

3 Press the SELECT key to conduct the Diode check.

Connect the Test pin and the test lead to the equipment under test. When following indication is confirmed, the diode is good Following measurements can be done by pressing the SELECT key. $\Omega \rightarrow$ Diode check \rightarrow Continuity check 1.Forward direction 2.Backward direction 0.530 ۵L Forward voltage is displayed. is displayed

Note

● When the forward voltage of diode is out of the range of 0.3V~1.5V measurement may not be done. (Zener diode, LED and etc.)

Press the SELECT key to conduct the Continuity check. Connect the Test pin and the test lead to the equipment under test Buzzer sounds when continuity is ok. (120 Ω or less) Resistance value of 400Ω or less is displayed on the LCD



Note

 Indicated value may not be "0" after shorting the tip of the test lead. However, this is because of the resistance of the test lead and not a failure.

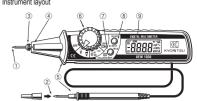
0050 "

6-4 Capacitance measurement (nF, μ F)

■ Set the Function switch to " - + " position

4. Instrument layout

4-1 Instrument lavout



- ①Test pin (input terminal (+); red) ②Test lead (input terminal (-); black) : Connected to the negative (-) side or the earth of the circuit. ③ Protective cover : Covering the Test pin for safety purpose.

④ Penlight (5) Barrier

: It is a part providing protection against electrical shock and ensuring the (6) Function switch

LIGHT : Turning on the Penlight. Set the Function switch to this position first, and then turn it to any desirable function position. Then the Penlight turned on and illuminates the test point. (Measurement cannot be performed in this

CAUTION
 Do not apply excessive force to the Test pin and the Protective cover.
 Be careful not get hurt by the tip of the Test pin when setting or releasing the Protective cover.
 Designed to made Out the D

• Designed to meet CAT III 600V when the cap is attached to the test lead and to

Use the Protective cover to cover the Test pin when carrying or storing the

Then turn it 90 degrees as shown in the figure below to match the marks on the

Method of releasing the Protective cover Pinch the tip of the Protective cover, and pull it towards the tip direction. Then turn if 90 degrees as shown in the above figure. Then the cover is stored

To avoid getting electrical shock, be sure to remove the measuring terminals from the equipment under test; set the Function switch to OFF position before replacing

Do not mix new and old batteries. Never mix the different kinds of batteries.

CAUTION
 Dispose the used batteries according to the rules, which are defined by each

②Loosen one Battery cover-fixing screw, and remove the Battery cover.
③Replace the batteries with new ones. Make sure to install batteries in correct polarity as marked inside. Always replace all two batteries with new ones at the same time.

Cleaning
 Use a cloth dipped in water or neutral detergent for cleaning the instrument.
 Do not use abrasives or solvents. Otherwise, instrument get damaged,deformed

④Put the Battery case at the original position, and fasten the screws

Make sure to install batteries in correct polarity as marked inside.
 Be sure to fasten the Battery case-fixing screws after the battery replacement.

meet CAT II 600V when the cap is not attached to the test lead.

Method of setting the Protective cover Pinch the tip of the Protective cover, and pull it towards the tip direction.

O PULL

CAT III

automatically and the Test pin (positive terminal) appears.

Continuity check

Ø AUTO

Release

switch position.)

(9) LCD indication

 OFF
 : Power off (Battery will not be wasted.)

 ▼ AC voltage (ACV) → Frequency (Hz) → DUTY(%)

 Switches by pressing the "SELECT" key.

 ▼ DC voltage (DCV) → REL Δ (relative value display)

 ▼ Switches by pressing the "SELECT" key.

HOLD key
 Freezing the indicated value.
 Turning on the LCD backlight. (Press this key at least 2 sec.)

Low battery warning

Auto-ranging

DC -

cover and on the instrument body.

7. Battery replacement

①Set the Function switch to OFF position.

O PULL

Set

batteries.

community.

4-2 Protective cover

SetLeCT key
 Switching the measurement modes. (V / Hz/ DUTY and Ω/ → /· *)
 Switching the measurement modes. (Only at DCV/ Canacitance)

Enable/ Disable the REL Δ function. (Only at DCV/ Capacitance)

When the battery voltage drops to 2.4V±0.2V or less, the "GATD" mark is displayed on the LCD.

Select any function to

Low battery warning (EALL)

Penlight Set the Function switch to "LIGHT" position to turn on the Penlight. Turn the switch to any desirable function position. (Measurement cannot be performed when the switch is in "LIGHT" position.) Turn the switch to "OFF" position to turn off the light.

ECD backlight
 The LCD backlight lights up by pressing down the HOLD key at any measurement
 function other than OFF at least 2 sec.
 Press down this key again at least 2 sec. or turn the Function switch to OFF once to
 the fight.

- Penlight and LCD backlight are not turned off automatically. Be sure to turn them off
- when they are not in use.
 When turning on/ off the LCD backlight, the " I mark is displayed on the LCD and the Hold function is activated. Press the HOLD button for a while to release the function and perform the next measurement.

6. Measurement

To prevent electrical shock to person and damage to the instrument, following instructions must be observed

- The max. rated voltage to ground is AC/DC600V. Never attempt to make measurement on a circuit in which electrical potential to the ground exceeding this
- voltage exists. The max. input voltage is DC600V/AC600Vrms (sin). Never attempt to make any the standard protonial exceeding this voltage exists. measurement on a circuit in which electrical potential exceeding this voltage exists. Do not operate the Function switch during a measurement.
 Never make a measurement with the Bottom case is removed.



- 3 Press the SELECT key to display a REL value (relative value)
 - Press this key and store the initial measured value. After that, the difference between the stored value and the measured value is displayed on the LCD. Auto-ranging function doesn't activate when this function is enabled. The first selected range will be held. The relative measurement is allowed in the following range
- Measuring range = Full scale value at a range initial value

Press this key again or switch the measurement function to others to release the REL function

· Following measurements can be done by pressing the SELECT key. DCV → REL △ (relative value) Pic Till T °, 0000 on the LCD.

6-3 Resistance (Ω) measurement, Diode/ Continuity check

Set the Function switch to" Ω "position

2 Connect the Test pin and test lead to the equipment under test as shown in the figure below





When the test lead is connected to the instrument, the lower category either of them belongs to is applied.



2 Press the SELECT key to make the indicated value to "0" before connecting the test lead to the equipment under test

	 Press the SELECT key to make the indication to 0. 	
--	---	--

Connect the Test pin and the test lead to the equipment under test as shown in the



Measuring time varies depending on the capacitance to be measured

v	1 0		
Capacitance to be measured	$<$ 4 μ F	$<$ 40 μ F	$<$ 100 μ F
Measuring time	2 sec.	7 sec.	15 sec.

DISTRIBUTOR

8. Maintenance

Kyoritsu reserves the rights to change specifications or designs desscribed in this manual without notice and without obligatio

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