Operation manual

Model: HK33D/HK33D-EN/HK33D-DE/HK33D-FR/HK33D-ES/HK33D-IT

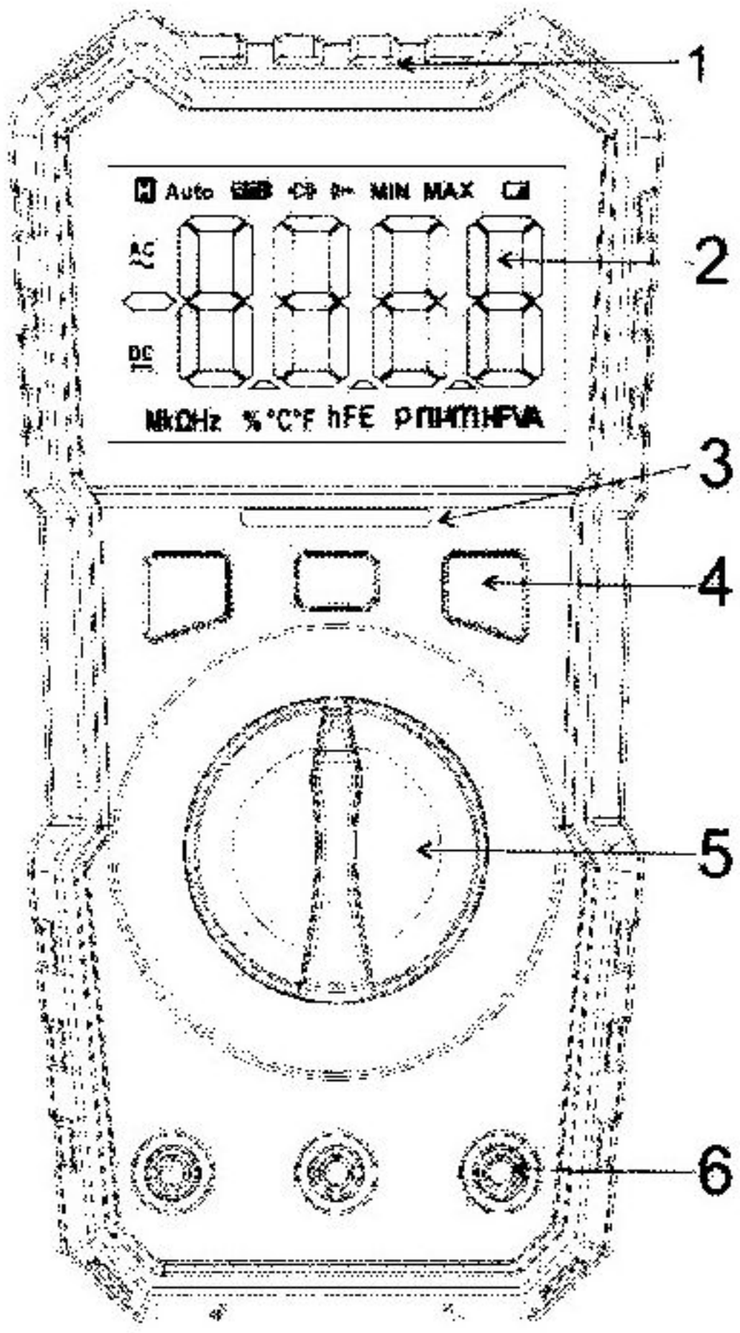
Contents

HK33D Compact Digital Multimeter
User Manual

Introduction

This multimeter has been designed as a higher stable, higher reliable, anti-fall arrest comprehensive compact size digital electronic measuring tool, which inbuilt with font height 31.5mm LCD to ensure the readings more clearly. And with excellent accurate A/D converter as the core for large scale integrated circuit to ensure this model to measure AC/DC Voltage, AC/DC current, Resistance, Diode, Transistor, Continuity, Temperature, Frequency, Duty Cycle, Capacitance, NCV and Live Wire detection. With inbuilt backlight and flashlight to realize read the values in dark environment. To fully utilize this meter, please keep this manual for reference carefully.

Panel Description



1.NCV induction position
2.LCD display: font height 31.5mm
3.NCV indicator
4.Functional button
MIN MAX REL - slight press to activate function shift, holding press to activate flash light
SEL - slight press to activate data hold function, holding press to activate back light display
☀/H - Slight press to shift MAX/MIN, holding press to exit MAX/MIN; activate or exit REL measuring mode in same method
5.Function selection rotary switch

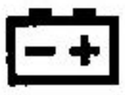
Safety Information

This multimeter has been designed according to IEC1010 concerning electronic measuring instruments with 600V CAT III and pollution 2.
⚠ This symbol indicates that the operator must refer to an explanation in the operating instruction to avoid personal injury or damage to the meter.
⚠ Grounding ⏚ High Voltage ⧈ Double insulation

Cautions:

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery or fuses.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter.

• Use great care when making measurements if the voltages are greater 30VAC RMS or 60V DC, these voltages are considered a shock hazard.
• Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
• To avoid damages to the meter, do not exceed the maximum limits of the input values shown in the specification.
• In case the device is going to be unused for an extended period of time, remove the batteries to prevent them from draining.

Maintenance
• To avoid electric shock, disconnect the test leads from any source of voltage before removing the back cover or the battery or fuse covers.
• To avoid electric shock, do not operate the meter until the battery and fuse covers are in place and fastened securely.
• To protect circuit, replace the fuse must be in same specification.
• Do not use clean the housing case of meter by using chemical solvent
Technical Specifications
• Accuracy: ± (%readings + digit), warranty period: 12 months
• Environment temperature: 18°C~28°C; humidity: ≤80%
• Maximum between voltage input and grounding: CATIII 600V
• Fuse: F500mA/250V, F10A/250V
• Battery: 1.5V AAA x 2
• Auto power off: automatically power off about 15 minutes after meter switched on
• Max display: 6000 count
• Overload display: “OL”
• Polarity display: negative “-“
• Operating temperature: 0°C-40°C
• Storage temperature: -10°C-50°C
• Low battery indication: 
• Dimension: 150x75x47mm
• Weight: about 300g (include batteries)

DC & AC Voltage

Range	Resolution	DCV Accuracy	ACV Accuracy
600mV	0.1mV	±0.5%±3	±1.0%±10
6V	1mV	±0.5%±3	±1.0%±10
60V	10mV	±0.8%±3	±1.0%±10
600V	100mV	±0.8%±5	±1.0%±10

Input impedance:10MΩ
Overload protection:600mV range at 250V DC or 250V AC RMS; other ranges at 600V DC or 600V AC RMS
Frequency range: 40Hz - 1000Hz Display: TRUE RMS

DC & AC Current

Range	Resolution	DCV Accuracy	ACV Accuracy
600μA	0.1μA	±1.0%±5	±1.8%±5
6000μA	1μA	±1.0%±5	±1.8%±5
60mA	0.01mA	±1.0%±5	±1.8%±5
600mA	0.1mA	±2.0%±5	±2.5%±5
6A	0.001A	±3.0%±5	±3.0%±5
10A	0.01A	±3.0%±5	±3.0%±5

Overload protection:fuse F500mA/250V for mA range
fuse F10A/250V for 10A range
Frequency range: 40Hz - 1000Hz Display: TRUE RMS

Resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	±1.0%±5
6kΩ	0.001kΩ	±1.0%±5
60kΩ	0.01kΩ	±1.0%±5
600kΩ	0.1kΩ	±1.0%±5
6MΩ	0.001MΩ	±1.0%±5
60MΩ	0.01MΩ	±1.2%±8

Overload protection:250V DC or 250V AC RMS

Frequency

Range	Resolution	Accuracy
10Hz	0.001Hz	±0.5%±4
100Hz	0.01Hz	
1kHz	0.1Hz	
10kHz	0.001kHz	
100kHz	0.01kHz	
1MHz	0.1kHz	
10MHz	0.001MHz	

Overload protection:
250V DC or 250V AC RMS

Capacitance

Range	Resolution	Accuracy
60nF	0.01nF	±4.0%±25
600nF	0.1nF	±4.0%±15
6μF	0.001uF	
60μF	0.01μF	
600μF	0.1μF	
6mF	0.001mF	±5%±25
60mF	0.01mF	
100mF	0.1mF	

Overload protection:
250V DC or 250V AC RMS

Diode and Continuity

Range	Description
Buzzer	Built-in buzzer will be sounded if resistance is less than 50Ω±30Ω
Diode	Display approximate forward voltage of diode

Overload protection: 250V DC or 250V AC RMS

Temperature

Unit	Range	Resoluti	Accuracy
°C	-20°C~ 0°C	1°C	±4°C
	0°C~400°C		±(2.0%+3d)
	400°C~1000°C		±(3.0%+3d)
°F	-4°F~50°F	1°F	±5°F
	50°F~750°F		±(2.0%+5d)
	750°F~1832°F		±(3.0%+5d)

Overload protection: 250V DC or 250V AC RMS

Transistor (hFE) Test

Range	Description	Test Condition
hFE	Measure NPN type or PNP type transistor, to display approx. hFE value 0 - 1000	Based current 10uA Vce is about 2.8V

Duty Cycle Test

Range	Description	Accuracy
Duty Cycle %	0.1%-99.9% Typical value Vrms=1V,f=1	±1.2%±3
	0.1%-99.9% (≥1kHz)	±2.5%±3

Overload protection: 250V DC or 250V AC RMS

Non-Contact Voltage Detection
AC Voltage range > 30V - 1000V (50Hz-60Hz)
Live Wire Recognition
AC Voltage range > 100V - 250V (50Hz-60Hz)
Operation Instruction
Tips before operation:
• Power on the meter and check the battery status, if "[−+]" displays in LCD, please change the new batteries.
• To avoid damage to the meter, do not attempt to take any voltage or current exceed the rating values.
• Before the measurement, put the rotary switch to the desired range.
Voltage Measurement
1.Insert the red test lead into "VΩmA" jack and insert black test lead into "COM" jack.
2.Set the rotary switch to voltage range and select DCV or ACV mode, touch the test lead probe tips to the circuit under test, and the voltage value will be displayed in LCD.

3.Under AC voltage mode, press "SEL" button to shift frequency measurement.

Note:

●Set the rotary switch to higher range if not known the voltage range under test, and then lower down till the best accuracy.

●To avoid electrical shock and/or damage to the instrument, do not attempt to take any voltage measurement that might exceed 600VRMS.

●It is normal situation and no effect on measurement, once at 600mV range, even without input or connect with test lead, meter shows value in LCD.

Current Measurement

1. Insert black test lead into COM jack, and insert the red test lead into "VΩ mA" jack for current measurement lower 600mA, insert the red test lead into 10A jack for current measurement between 600mA to 10A.
2. Set the rotary switch to the current range and press "SEL" key to shift DCA or ACA mode, touch the test lead probe tips to the circuit under test, and the current value will be displayed in LCD.
3. Press "SEL" button to display frequency value of current under test.

Note:

• Set the rotary switch to higher range if not known the current range under test, and then lower down till the best accuracy.

• If display "OL" for over range, set the rotary switch to higher range.

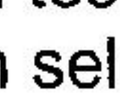
• To avoid damage to the meter, check the fuse of the meter before current measurement.

• ⚠ indicates the max current is 600mA or 10A based on jacks the red test lead to be inserted, fuse will be blown out at over-range current.

Frequency & Duty Cycle (Hz/%) Measurement

1.Insert black test lead into "COM" jack, and red test lead into "VΩmA" jack.
2.Touch the test lead probe tips to the both sides of the signal source under test, and read the value from LCD.
3.Press "SEL" button to shift frequency / duty cycle (Hz/%) mode

Diode, Capacitance, Resistance and Continuity Measurement

1.Insert black test lead into "COM" jack, and red test lead into "VΩmA" jack, the polarity of red test lead is "+".
2.Set the function selection rotary switch to"  "position, press "SEL" to proper testing mode. Place the red test lead on the anode of diode and black test lead on the cathode of diode, the meter will show values in the LCD display.

Note:

• If the measured resistance value exceeds the maximum value of the chosen range, the meter displays "OL" for over range, then need to set the rotary switch to higher. For measuring over 1MΩ high resistance, the meter may take a few seconds to stabilize the readings.

●In the open circuit, the meter display OL once measure diode, resistance and continuity; and show "0000" on capacitance test.
●To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements.
●Under continuity check, if the resistance between two points less than 50Ω ±30Ω, the inbuilt buzzer will be sounded.

Transistor (hFE) Measurement

1.Set the function rotary switch to hFE range, and insert the transistor test kit correctly.
2.Make sure the triode type is NPN or PNP, and then, insert E,B,C of triode under testing into E.B.C holes of triode seat on the panel
The meter display the approximate value of hFE, and the test condition is at based current 10uA, Vce is about 2.8V.

Temperature Measurement

1.Set the rotary switch to°C/°Frange, the value of environmental temperature shows in LCD display
2.Insert the red terminal of temperature probe (K Type) into the°C/°F jack, black terminal into COM jack, place the temperature probe tip where needed to measure.
3.Read the temperature value in LCD display.
Note:
Since cold-junction compensating circuit stalled inside meter, due to good sealing of meter, it takes long time to reach the thermal balance with the measuring environment, the meter needs to be placed in the measuring environments for a longer time to get the more accurate readings.

Non-Contact Voltage(NCV) Detection

1.Set the rotary switch to NCV/Live range and press SEL to activate NCV mode, the LCD display "EF".
2.Contact the top part of meter with the circuit under test, the audible alert signal will be sounded and LED blinked once voltage exits.
Note:
●The detection result is for reference, do not determine the voltage by NCV detection ONLY.
●Detection may interfere by socket design, insulation thickness and other variable conditions.
●The external interference sources, such as flashlight, motor, etc, may cause the wrong detection.

Live Wire Recognition(Live)

1.Set the rotary switch to NCV/Live range and press SEL to activate Live mode, the LCD display "LIVE".
2. Insert red test lead into VmA jack and place the red test lead tip to contact AC Voltage. Once meter makes alarm sound and LED blinked, the

LCD shows “LIVE”, means the line under test is live wire.

Note:

●When the circuit is in serious leakage, the red test lead even contact earth line, the buzzer of meter will be sounded.

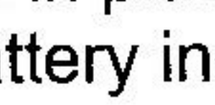
●Detection may interfere by socket design, insulation thickness and other variable conditions.

●The external interference sources, such as flashlight, motor, etc, may cause the wrong detection.

Battery and Fuse Replacement

1.To avoid electric shock, disconnect the test leads from any source of voltage before removing the back cover or the battery or fuse covers.

2.To avoid electric shock, do not operate the meter until the battery and fuse covers are in place and fastened securely.

3.Once battery indicator “  ”appears, please open the battery cover and replace the same type battery into battery holder, after that put the battery cover back in place and secure with the screws.

4.If change the fuse, gently remove the old fuse and install the new fuse into fuse holder, and ensure the fuse specification is the same as original fuse, after that, replace and secure the rear cover.