ARCTIC HAYES

COMPACT DIGITAL MULTIMETER

WITH TEMPERATURE FUNCTION

User Manual

AH113

Before using the instrument, please read this manual carefully, and save for future reference.

The instrument is designed according to the requirements of the international electrical safety standard IEC61010-1 for the safety requirements of the electronic testing instruments. The design and manufacture of instruments strictly comply with the requirements of IEC61010-1 CAT.III 600V over voltage safety standards.

Warning. 

In order to avoid possible electric shock or personal injury, please abide by the following specifications:

- Please read this manual carefully before using the instrument and pay special attention to safety warning information.
- Strictly observe the operation of this manual and use this instrument. Otherwise, the protection function of the instrument may be damaged or weakened.
- Please be careful if the measurement exceeds 30V AC true RMS, 42V AC peak or 60V DC. There may be danger of electric shock at this kind of voltage.
- By measuring the known voltage to check whether the meter work is normal, if it is not normal or damaged, do not use.

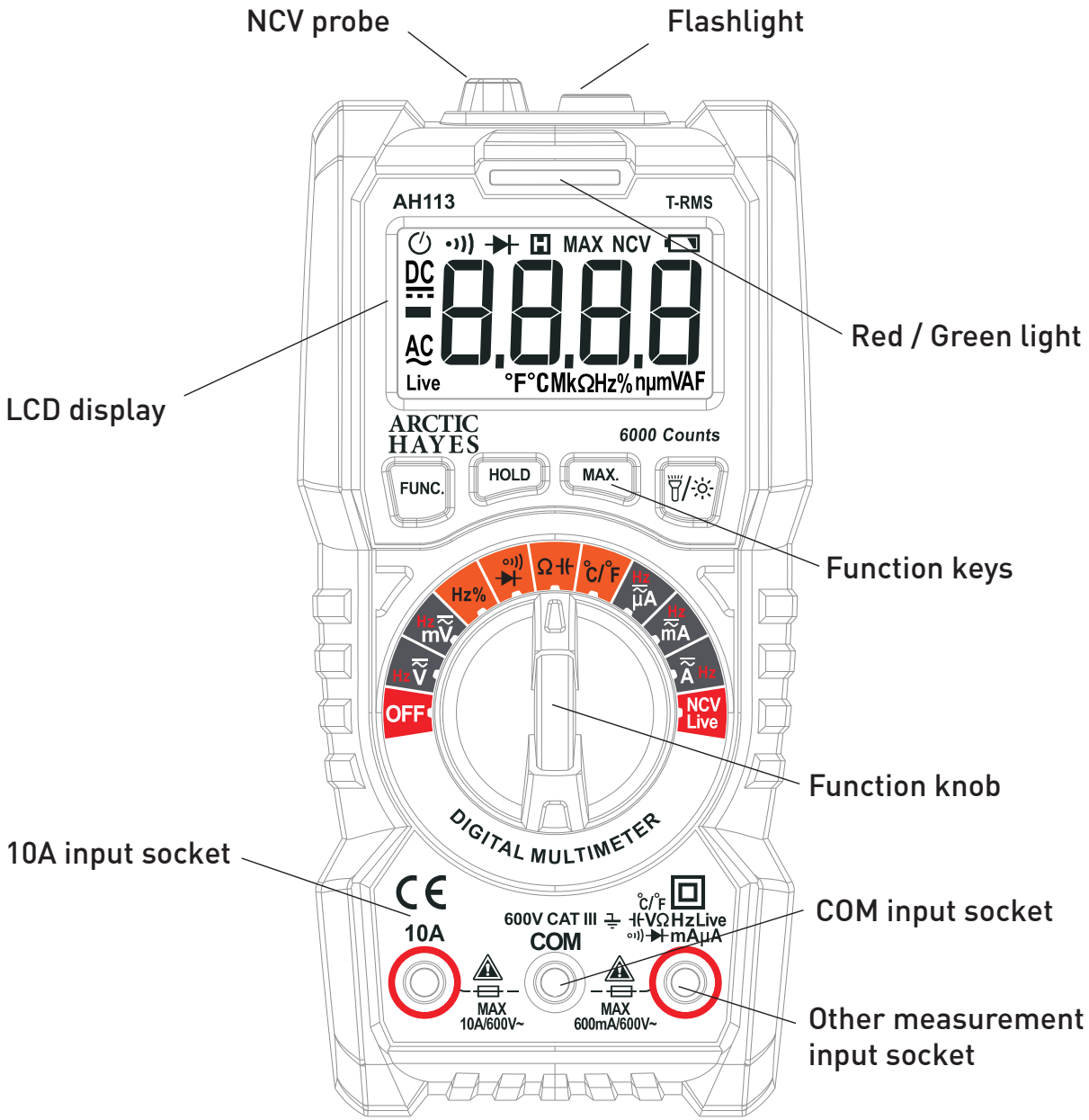
- Before using the instrument, please check whether there is any crack or plastic damage in the instrument case. If there is any damage, do not use.
- Before using the instrument, please check whether the probe is cracked or damaged. If so, please replace the same type and the same electrical specifications.
- The instrument shall be used in accordance with the specified measurement category, voltage or current rating.
- Please comply with local and national safety code. Wear personal protection equipment to prevent injury by electric shock and electric arc due to exposed hazardous live conductor.
- When the low battery indicator shows, replace the battery to prevent any measurement error.
- Do not use the instrument around explosive gas, steam or in wet environment.
- When using the probe, please put your fingers behind the finger protector of the probe.
- When measuring, please connect the ground line first, then connect the live wire; when disconnecting, please disconnect the live wire first then disconnect the zero-ground line.
- Do not use the multimeter if it is damaged or the battery cover is open.

- Only use with the supplied probes. If the probe is damaged and need contact the manufacturer. Do not use probes with a different specification.

	High Voltage Warning
	AC (Alternating current)
	DC (Direct current)
	AC or DC
	Warning, important safety signs
	Ground
	Fuse
	Equipment with double insulation/ reinforced insulation protection
	Battery under voltage

	Product complies with all relevant European laws
	The additional product label shows that do not discard this electrical/electronic product into household garbage.
CAT.II	Class II measurements are suitable for testing and measuring circuits directly connected to power points (sockets and similarities) of low voltage power installations.
CAT.III	Class III measurement is suitable for testing and measuring circuits connected to the distribution part of low voltage power supply devices in buildings.
CAT.IV	Class IV measurements are suitable for testing and measuring circuits connected to the power supply of low voltage power installations in buildings.

Physical Appearance



Height - 151mm
Width - 75mm
Depth - 46mm

Weight - 424g
(without batteries)

Specification

Environment condition of using	
CAT|||	600V
Pollution level	2
Altitude	<2000M
Working environment temperature & humidity	0~40°C (<80% RH, <10°C non condensing).
Storage environment temperature & humidity	-10~60°C (<70% RH, remove the battery).

General technical specifications	
Temperature coefficient:	0.1 x accuracy/°C (<18°C or >28°C).
MAX. Voltage between terminals and earth ground	600V
Fuse protection	mA: F600mA /600V fuse 10A: F10A / 600V fuse
Sampling rate	about 3 times/second
Display	6000 counter readout. Automatically display the unit symbols according to the shift of the measurement function.
Over range indication	Displays “OL”.
Low battery indication	when the battery voltage is lower than the normal working voltage,” ” will be displayed.
Input polarity indication	automatically display “-”.
Power requirement:	2 x 1.5V AAA batteries

Operation	
FUNC key	Where there are multiple measuring functions on the selection switch, the function button will change between the measurement functions.
Data hold	Press" HOLD" key, enter data hold mode/ cancel data hold mode.
Maximum measurement	Press" Max" key, enter Maximum measurement/cancel Maximum measurement.
Backlight	Press"  "key, turn on backlight/turn off backlight. or about 10 seconds after it will automatically shut down.
Flashlight	Press"  " key and keep more than 2 seconds to turn on the flashlight / turn off flashlight.
Auto power off	•There will be no operation in 15 minutes , The instrument will turn off automatically to save battery energy. After automatic shutdown, press any key to restore the working state of the instrument. •If you press the "FUNC." button and turn on the meter power, the automatic shutdown function will be cancelled. After turning off the meter, the meter is reopened to restore the automatic shutdown function.

Warning for all below measurements.

1. The voltage above 600V can't be measured; otherwise the instrument may be damaged.
2. Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.
3. Test the known voltage with the meter before use, confirm the instrument function is intact.

Note: when measuring AC current, press FUNC. button to see frequency and duty cycle.

DC/AC Voltage Measurement

1. Turn the knob to " Hz V " and Switching AC or DC voltage function by "FUNC." key.
2. Insert the red probe in " °C/°F VΩHzLive mAμA " socket, insert the black probe in "COM" socket.
3. Contact the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the voltage.
4. Read the measurement result on the screen.

DC/AC mV Voltage Measurement

1. Turn the knob to " Hz mV " and Switching AC or DC voltage function by "FUNC." key
2. Insert the red probe in " °C/°F VΩHzLive mAμA " socket, insert the black probe in "COM" socket.

3. Contact the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the voltage.
4. Read the measurement result on the screen.

Frequency / Duty Measurement

1. Turn the knob to “Hz%” and Switching Frequency or duty function by “FUNC.” key.
2. Insert the red probe in “ °C/°F VΩHzLive mAμA “ socket, insert the black probe in “COM” socket.
3. Contact the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the frequency of duty.
4. Read the measurement result on the screen.

DC/AC Current Measurement

1. Turn the knob to Hz μA or Hz mA or A Hz shift and Switching AC or DC voltage function by “FUNC.” key
2. Insert the red probe in “ °C/°F VΩHzLive mAμA “ socket or 10A Socket, insert the black probe in “COM” socket.
3. Disconnect the power of the tested circuit; connect the meter to the circuit under test, then turn on the circuit power supply.
4. Read the measurement result on the screen.

Warning for all below measurements.

When measuring resistance on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged, and the user may suffer an electric shock.

Resistance Measurement

1. Turn the knob to " Ω⊣⊢ " shift.
2. Insert the red probe in " °C/°F ⊣⊢VΩHzLive ◦))⊣⊢mAμA " socket, insert the black probe in "COM" socket.
3. Contact the probe to the measured circuit or resistance, measure the resistance.
4. Read the measurement result on the screen.

Capacitance Measurement

1. Turn the knob to "Ω⊣⊢" shift.
2. Insert the red probe in " °C/°F ⊣⊢VΩHzLive ◦))⊣⊢mAμA " socket, insert the black probe in "COM" socket.
3. Contact the probe to the measured circuit or Capacitance, measure the resistance.
4. Read the measurement result on the screen.

Continuity Measurement

1. Turn the knob to “  “ shift and Switch to Continuity measurement function according to “FUNC.” key.
2. Insert the red probe in “  “ socket, insert the black probe in “COM” socket.
3. Contact the probe to the measured circuit or resistance.
4. If the resistance or circuit of the measured resistance is less than 30Ω, the buzzer will on and the green indicator lights up at the same time; when the resistance is about between 30Ω to 60Ω, the red indicator lights up; the screen displays the resistance of the measured circuit.

Diode Measurement

1. Turn the knob to “  “ shift and Switch to Diode measurement function according to “FUNC.” key.
2. Insert the red probe in “  “ socket, insert the black probe in “COM” socket.
3. Touch the diode anode with the red probe, the black probe contacts the diode cathode.
4. Read the measurement result on the screen.

Warning for all below measurements.

In order to avoid possible accidents such as electric shock or personal injury, please follow the safety regulations.

NCV Test

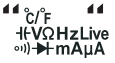
1. Turn the knob to the " NCV Live " shift, and Switch to NCV test function according to "FUNC." key. Meter will display "NCV".
2. Then NCV probe gradually approaches the detected point.
3. When the meter senses weak AC signals, the green indicator lights up, while the beeps send out slow dips.
4. When the meter senses strong AC signals, the red indicator lights up, while the beeps send out fast dips.

Live Test

1. Turn the knob to the " NCV Live " shift, and Switch to live test function according to "FUNC." key. Meter will display "LIVE".
2. Insert the red probe in " °C/°F +(-VΩHzLive A))) " socket, Then the probe contact to the test point.

3. When the meter senses weak AC signals, the green indicator lights up, while the beeps send out slow dips.
4. When the meter senses strong AC signals, the red indicator lights up, while the beeps send out fast dips.

Temperature Measurement

1. Turn the knob to the " °C / °F ".
2. Insert the black side of K Type adapter into the negative (COM) jack and the red side of K Type adapter into the positive input "  " making sure to observe the correct polarity.
3. Contact the measured object with the thermocouple probe and read the result from the display.

WARNING: 

To avoid electric shock, disconnect both test probes from any source of voltage before making a temperature measurement.

WARNING: 

To avoid electric shock always remove the thermocouple before changing to another measurement function.

Accuracy Specification

DC Voltage		
Range	Resolution	Accuracy
600mV	0.1mV	±(0.5% reading +3)
6V	0.001V	
60V	0.01V	
600V	0.1V	

AC Voltage		
Range	Resolution	Accuracy
600mV	0.1mV	±(1.0% reading +3)
6V	0.001V	
60V	0.01V	
600V	0.1V	

DC Current		
Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% reading +3)
6000μA	1μA	
600mA	0.01mA	
6A	0.001A	
10A	0.01A	

AC Current		
Range	Resolution	Accuracy
600μA	0.1μA	±(1.5% reading +3)
6000μA	1μA	
600mA	0.01mA	
6A	0.001A	
10A	0.01A	

Accuracy Specification

Resistance		
Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.0% reading +3)
6kΩ	0.001kΩ	
60kΩ	0.01kΩ	
600kΩ	0.1kΩ	
6MΩ	0.001MΩ	±(1.5% reading +3)
60MΩ	0.01MΩ	

Capacitance		
Range	Resolution	Accuracy
10nF	0.001nF	±(4.0% reading +3)
100nF	0.01nF	
1000nF	0.1nF	
10μF	0.001μF	
100μF	0.01μF	
1000μF	0.1μF	
10mF	0.001mF	±(5.0% reading +3)
100mF	0.01mF	

Diode Test		
	It displays the approximate forward voltage of the diode	Forward DC current is about 2.5mA Reverse DC voltage is about 3V Overload protection:600V

Accuracy Specification

Frequency / Duty		
Range	Resolution	Accuracy
10Hz	0.001Hz	±(1.0% reading +3)
100Hz	0.01Hz	
1000Hz	0.1Hz	
10kHz	0.001kHz	
100kHz	0.01kHz	
1000kHz	0.1kHz	
10MHz	0.001MHz	±(3.0% reading +3)
1~99%	0.1%	

Continuity Test		
	The resistance is <30, the buzzer will sound and the indicator light is green. When the resistance >30 and <60, the buzz does not ring, the indicator light is red.	Open circuit voltage is about 1V Overload protection:600V

Temperature			
Range	Resolution	Temperature	Accuracy
°C	1°C	-40°C ~1000°C	±(1.0%+3)
°F	1°F	-40°F ~1832°F	±(1.0%+3)

Thermocouple rating		
Range	Temperature	Accuracy
°C	-40°C ~200°C	±1.5°C
°F	-40°F ~392°F	±1.5°F

Battery Replacement

1. Turn off the power supply of the instrument, and remove the probe on the instrument.
2. Use screwdriver to unscrew screws fixing the battery cover, remove the battery cover.
3. Remove old batteries, replace with new batteries of the same specifications. Please note the polarity of the battery according to the positive and negative polarity marks inside of the battery cover.
4. Install the battery cover to its original position, fix and lock the battery cover with screws.

Fuse Replacement

1. Turn off the power supply of the instrument, and remove the probe on the instrument.
2. Use screwdriver to unscrew screws fixing the back cover, and remove the back cover.
3. Remove the burnt fuse, replace with new fuse of the same specifications, and ensure that the fuse is clamped in the safety clip.
4. Install the back cover, fix and lock it with screws.

Calibration

To maintain the integrity of measurements, Arctic Hayes recommends that the multimeter is calibrated annually at an approved Calibration Laboratory.

Arctic Hayes can offer this service,
please contact sales@arctic-hayes.com
or call +44(0)113 271 5245 to arrange.

Limited warranty

1 year warranty against any manufacturing defects or faulty workmanship. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination or abnormal conditions of operation or handling.

WEEE Directive 2012/19/EU At the end of the product life, dispose of the instrument & batteries in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse.
Do not burn the product.

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