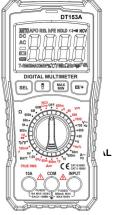
OPERATOR'S INSTRUCTION IMAGINIAL MULTIMETER

MODEL:
☑ DT153A

CAT III 600V





1. Overview

This is a new generation product redefines the performance standard for general-purpose digital multimeter. The innovative industrial design ensures the products have good impact resistance. The new LCD display layout provides a clear display for better user experience. This meter ensure safe operation in CAT III 600 V environment

2. Safe Operation Rule

2.1 Safety certification

The product complies with IEC 61010 safety standard. as well as CAT III 600V, RoHS, pollution grade 2, and double insulation standards.

2.2 Safety instructions and precautions

- Do not use the device if the device or test leads appear damaged or if you suspect that the device is not operating properly. Pay particular attention to the insulation layers.
- If the test leads are damaged, it must be replaced with one of the same type or the same electrical specification.
- When measuring, do not touch exposed wires, connectors, unused inputs,or the circuit being measured.
- When measuring the voltage higher than 60 VDC or 36 VAC rms, keep your fingers behind the finger guard on the test lead in order to prevent electric shock.
- > If the range of the voltage to be measured is unknown, the maximum range should be

- selected and then gradually decreased.
- Never input voltage and current exceeding the value listed on the device
- Before switching ranges, make sure to disconnect the test leads with the circuit to be tested. It is strictly prohibited to switch the ranges during the measurement.
- Do not use or store the device in high temperature, high humidity, flammable,explosive or strong magnetic field environments.
- Do not change the internal circuit of the device in order to avoid the damage to the device and users.
- ➤ To avoid false reading, replace the battery when the battery indicator "-±" appears.
- Use dry cloth to clean the case, do not use detergent containing solvents

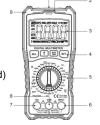
3. Electrical symbols and descriptions

3.1 Electrical symbols

A	Dangerous voltage maybe present	\triangle	Important safety information
	Double insulated	CE	Conforms to European Union directive
÷	Earth ground	4	High voltage hazard symbol
	DC (Direct Current)	~	AC (Alternating Current)
≂	DC or AC	⊞	Battery low voltage symbol
AUTO	auto range	APO	auto power off
NCV	Non-contact voltage test	°C/°F	Celsius and Fahrenheit unit
EF	Electromagnetic field symbol		Electric torch

3.2 Descriptions

- 1.NCV sensing area
- 2.Electric torch
- 3.LCD display
- 4.Function buttons
- 5.Function rotary (dial)
- 6.INPUT jack (10A excepted)
- 7.10A jack
- 8.COM jack
- 9.Holster



4 Technical specifications

Accuracy is guarantied for 1 year 23±5°C, ≤80%RH

4.1 DC voltage (Auto ranging)

4.1 DC Voltage (Auto ranging)			
Range	Resolution	Accuracy	
600mV	0.1mV	±(0.8% of rdg + 5dgts)	
6V	1mV		
60V	10mV	±(0.8% of rdg + 3dgts)	
600V	100mV		
1000V	1V	±(1.2% of rdg + 5dgts)	

Input impedance: 10MΩ

Overload protection: 1000V DC/750V AC rms

Max. Input voltage: 1000V DC

4.2 Capacitance (Auto ranging)

4.2 Capacitance (Auto ranging)		
Range	Accuracy	
10nF ~ 100mF	±(5.0% of rdg + 5dgts)	

Overload protection: 250V DC/AC rms

4.3 AC voltage (Auto ranging)

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Range	Resolution	Accuracy
6V	1mV	
60V	10mV	±(1.0% of rdg + 8dgts)
600V	100mV	
750V	1V	±(1.5% of rdg + 8dgts)

Input impedance: 10MΩ

Frequency range: 40Hz ~ 400Hz Overload protection: 750V DC/AC rms Max. input voltage: 750V AC rms

Response: True-RMS

4.4 Resistance (Auto ranging)

Range	Resolution	Accuracy
600Ω	0.1Ω	
6ΚΩ	1Ω	±(1.2% of rdg+5D)
60ΚΩ	10Ω	
600ΚΩ	100Ω	
6ΜΩ	1ΚΩ	1/1 E0/ of rdg (ED)
60ΜΩ	10ΚΩ	±(1.5% of rdg+5D)

Open circuit voltage: About 0.25V Overload protection: 250V DC/AC rms

4.5 Frequency (Auto ranging)

Range	Accuracy
10Hz-10MHz	±(1.5% of rdg + 5dgts)

Overload protection: 250V DC/AC rms

Input sensitivity>3vpp

4.6 DC current (Auto ranging)

Range	Resolution	Accuracy
60µA	0.01µA	
60mA	10µA	±(1.5% of rdg+8D)
600mA	100µA	
6A	1mA	1/20/ of ada 1 Edato)
10A	10mA	±(3% of rdg + 5dgts)

Measuring voltage drop: 200mV

4.7 AC current (Auto ranging)

Range	Resolution	Accuracy
60mA	10µA	. (4 E0/ of ada (0D)
600mA	100µA	±(1.5% of rdg+8D)
6A	1mA	±(3.0% of rdg +
10A	10mA	10dgts)

Measuring voltage drop: 200mV Frequency range: 40 to 400Hz

Response: True-RMS

4.8 Temperature

Range	Resolution	Accuracy
-40~	1°C	-40~150°C: ±(1% + 4°C)
1000°C		150~1000°C: ±(2% + 3°C)
-40~	1°F	-40~302°F: ±(5% + 4°F)
1832°F		302~1832°F:±(2.5% + 3°F)

Overload protection: 250V DC/AC rms

4.9 Duty cycle

Range	Accuracy
10%-95%	±(1.5% of rdg + 5dgts)

Overload protection: 250V DC/AC rms

4.10 Battery

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Range	Resolution	Internal resistor
9V	10mV	900Ω
1.5V	1mV	75Ω

Open circuit voltage: About 0.25V Overload protection: 250V DC/AC rms

5. Specification

- 1)The maximum voltage between the input terminal and the ground: 600Vrms
- 2)10A terminal: Fuse 10A 600V Fast fuse Φ6x30mm
- 3) Input terminal: Fuse 500mA 600V Fast fuse Φ6x30mm
- 4) Max display 5999, over range display "OL", update rate: 2~3 times/second
- 5) Back-light: Manual on/off, or auto shut off after 15 seconds.
- 6) Polarity: "-" symbol displaying on screen represent negative polarity signal.
- 7) Data hold function: "Li" symbol displays on screen when data hold function is activated
- 8) Low battery power: "-th" symbol displays on LCD when battery power is low.
- 9) Battery: size AAA 1.5V * 2
 - 10. Operating temperature: 0~40°C (32~104°F)

Storage temperature: -10~50°C (14~122°F)

Relative humidity: ≤75%RH

Operating altitude: 0 ~ 2000m

11. Dimension: 186x87x50 mm

12. Weight: about 310g (battery included and holster)

6. Button functions

SEL button: Select proper function on complex range.

button: Press the button to turn on the electric torch on the front of the meter, press the button again to turn it off.

min button: Press the key to enter the maximum and minimum measurement mode. Press the key one by one to display the maximum and minimum values in a cycle. Hold down the key for more than 2 seconds to exit the maximum and minimum measurement mode.

button: Press the key to enter or exit data hold mode. Press the key for a long time to turn on/off back-light. If no operation is performed, the back-light will automatically turn off after 15 seconds.

7. Operations

To avoid false reading, replace the battery if the battery low power symbol "-+" appears. Also pay special attention to the warning sign \(\triangle^\D\\) beside the test lead jack, indicating that the tested voltage or current must not exceed the values listed on the device.

7.1 AC/DC voltage measurement

- 1) Set the function rotary to Va or mVa range.
- 2) Insert the black test lead into the COM jack, the red test lead into the INPUT jack. Connect test leads

with the load in parallel.

⚠Notes:

- Do not measure voltage over 1000Vrms, or it may expose users to electric shock and damage the device. If the range of the voltage to be measured is unknown, select the maximum range and reduce accordingly.
 - Please pay extra attention when measuring high voltage in order to avoid electric shock.
- Before using the device, it is suggested to measure a known voltage for verification.

7.2 Resistance measurement

- 1) Set the function rotary to Ω range.
- 2) Insert the black test lead into the COM jack, the red test lead into the "INPUT" jack. Connect test leads with the resistor in parallel.

⚠Notes:

- Before measuring resistance, switch off the power supply of the circuit, and fully discharge all capacitors.
- If the resistance when probes are shorted is more than 0.5Ω, please check if test leads are loosened or damaged.
- If the resistor is open or over the range, the "OL" symbol will be displayed on the screen.
- When measuring low resistance, the test leads will produce 0.10~0.20Ω measurement error. To obtain accurate measurement, the measured value should subtract the value displayed when

- two test leads are shorted.
- When measuring high resistance above1MΩ, it is normal to take a few seconds to steady the readings. In order to quickly obtain steady data, use short test wires to measure high resistance.

7.3 Continuity test

- 1) Set the function rotary to \rightarrow range, the screen displays the •1) symbol, and the meter enters continuity test mode.
- 2) Insert the black test lead into the COM jack, the red test lead into the INPUT jack. Connect test leads with the points to be tested in parallel
- 3) If measured circuit resistance >50Ω, circuit is in open status. If measured circuit resistance ≤50Ω, is show in good conduction status, buzzer will sound.

⚠Notes:

Before testing continuity, switch off all power supplies and fully discharge all capacitors.

7.4 Diode test

- 1) Set the function rotary to $\stackrel{\checkmark}{\Rightarrow}$ range, press SEL button one time, the screen displays the symbol, and the meter enters diode test mode.
- 2) Insert the black test lead into the COM jack, the red test lead into the INPUT jack. Connect test leads with the diode in parallel
- 3) "OL" symbol appears when the diode is open or polarity is reversed. For silicon PN junction, normal value is $0.5 \sim 0.8$ V.
- 4) The mode of diode test, measuring voltage

greater than 2.5V, current greater than 1mA.

⚠Notes:

Before testing PN junction, switch off the power supply to the circuit, and fully discharge all capacitor.

7.5 Capacitance measurement

- 1) Set the function rotary to 100mF range.
- 2) Insert the black test lead into the COM jack, the red test lead into the INPUT jack. Connect test leads with the capacitor in parallel.

⚠Notes:

- If the tested capacitor is shorted or its capacity is over the specified range "OL" symbol will be displayed on the screen.
- When measuring large capacitors, it may take a few seconds to obtain steady readings.
- Before measuring capacitors (especially for high voltage capacitors), please fully discharge them.

7.6 DCA & ACA measurement

- 1) Set the function rotary to desire $\mu A \neg, mA \neg, A \neg$ range.
- 2) Insert the black test lead into the COM jack, the red test lead into the INPUT jack, connect test leads with the tested circuit in series. If you want to test the current above 600mA, the red lead should be inserted into the position of 10A jack.

MNotes:

 Before measuring, switch off the power supply of the circuit and carefully check the input terminal

- and range position.
- If the range of the measured current is unknown, select the maximum range and then reduce accordingly.
- Please replace the fuse with the same type.
- When measuring, please do not connect the test leads with any circuit in parallel. Otherwise there is a risk of damage to the device and human body.
- If the tested current is over 10A, each measurement time should be less than 10 seconds and the next test should be after 15 minutes.

7.7 Temperature measurement

- 1) Set the function rotary to °C/°F range.
- 2) Press the "SEL" button to select °C or °F mode, and the symbol °C or °F will appear as an indicator.
- 3) Insert the black plug of the K-type thermo-couple to the "COM" jack, and the red plug to the "INPUT" jack.
- 4) Carefully touch the end of the thermo-couple to the object to be measured.
- 5) Wait a moment, read the reading on the display.

⚠Notes:

 The TP01 K-type thermo-couple max. operating temperature is 250°C/482°F (or 300°C/572°F short time). The sensor supplied with the instrument is an ultra fast response naked bead thermo-couple suitable for many general purpose applications. The measuring range of the meter temperature is the widest value, the accurate measurement must be based on the suitable temperature sensor.

7.8 Frequency & Duty cycle measurement

- 1) Set the function rotary to "HZ%" range.
- 2) The range default is frequency measurement mode, connect the black test lead to the "COM" jack and the red to the "INPUT" jack, read the reading on the display.
- 3) Press the "SEL" button can to select duty cycle test mode, and the symbol "%" will appear as an indicator
- 4) The test of duty cycle is only suitable to signals not exceeding 10KHz.

7.9 Battery test

- 1) Connect the black lead to the "COM" jack and the red lead to the "INPUT" jack (note: The polarity of the red test line is positive "+").
- 2) Set the function rotary to desire BATT range based on the battery type (1.5V, 9V) to be tested.
- 3) Connect the test lead to the battery to be tested in parallel.
- 4) Read the readings on LCD. The polarity of the red test lead connection will be displayed. By measuring the discharge, the energy of the battery will be consumed, so the test time must be minimized.

Note: This test method is only used as a reference for judging battery capacity.

7.10 NCV test

- 1) Set the function rotary to Live range.
- 2) The LCD displays EF, and the meter is used to test the strength of the electromagnetic field.
- 3) When the front end of the meter is placed within 5mm of the electromagnetic field, the meter will emit a beeping sound and a symbol ----, indicating the intensity of the electromagnetic field appear. The stronger the electromagnetic field, the more rapid the beeping sound and the longer the electromagnetic field intensity banner.

Note: This meter is only used to determine the presence of an alternating electric field. Because there may be environmental electric field interference or electric field interference caused by irregular wiring layout in the test environment, this measurement method can only be used to determine the existence of dangerous voltage.

7.11 Live wire judgment

- 1) Set the function rotary to Live range.
- 2) Press "SEL" button, the "Li ill" symbol is displayed on the LCD, and the meter will enter the measure mode of live line judgment.
- 3) Connect the red lead to the INPUT jack and connect the probe reliably to the metal portion of the line, at the same time, the black lead must be plugged into the COM jack. If the buzzer emits a continuous beeping sound and the electromagnetic field intensity ---- symbol appears, the lead is

connected to the live wire.

NOTE: This function is for live line test, need professional use, Non-professionals are strictly prohibited from using .

8. Auto power off

- If you don't operate the meter for about 15 minutes, it will be auto power off, before the meter auto power off, there is a sound and light indication that the meter is about to be powered off.(1 minute before auto shutdown, 5 continuous beeps, before shutdown, 1 long beep)
- In the auto power off state, press "SEL" button, rotary range switch to turn on the meter, can cancel the auto power off function, "APO" symbol disappear from the LCD.

9. Battery and fuse replacement

- Fuse rarely need replacement and blow almost always as a result of operator error.
- If "=+" appears in display, it indicates that the battery should be replaced.
- To replace battery: remove the 1 screws in the bottom of the battery case, simply remove the old, and replace with a new one. Be careful to observe polarity.
- Remove the holster and remove the bottom cover of the meter to replace the fuse (500mA/600V or 10A/600V). Please replace the appropriate fuse according to operation manual.

10. Accessories

- Operator's instruction manual
- · Set of test leads
- Set of temperature probe
- Gift box
- 1.5V x 2, AAA size.