Model Pro40

True-RMS Digital Multimeter

USER'S MANUAL

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Statement

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Safety Statement


'**Caution**" mark refers to the condition and operation which may cause damage to the instrument or equipment.

It requires that you must be careful during the execution of the operation. If incorrectly perform the operation or do not follow the procedure, it may damage the instrument or equipment. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the caution mark.


"**Warning**" mark indicates the condition and operation which may cause danger to users.

It requires that you must pay attention during the execution of this operation. If incorrectly perform the operation or do not follow the procedure, it may result in personal injury or casualties. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the warning mark.

Safety Instructions

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 and pollution level 2.

Safety Operation Specifications

Warning

In order to avoid possible electric shock or peronal injury and other safety accidents, 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 it again.

- Before using the instrument, please check whether there is any crack or plastic damage in the instrument case. If you do, do not use it again.
- 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 (such as approved rubber gloves, masks and flame retardant clothes, etc.) to prevent being damaged by electric shock and electric arc due to exposed hazardous live conductor
- When it shows low battery indicator, please replace the battery in time in case of 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 zero line or the ground line firstly, then connect the live wire; but when disconnecting, please disconnect the live wire firstly, then disconnect the zero line and ground line.

- Before opening the outer cabinet or battery cover, please remove the probe on the instrument. Do not use the instrument in the circumstances that the instrument is taken apart or battery cover is opened.
- It only meets the safety standards when the instrument is used together with the supplied probe. If the probe is damaged and needs to replace, the probe with same model number and same electrical specifications must be used for replacement.

	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

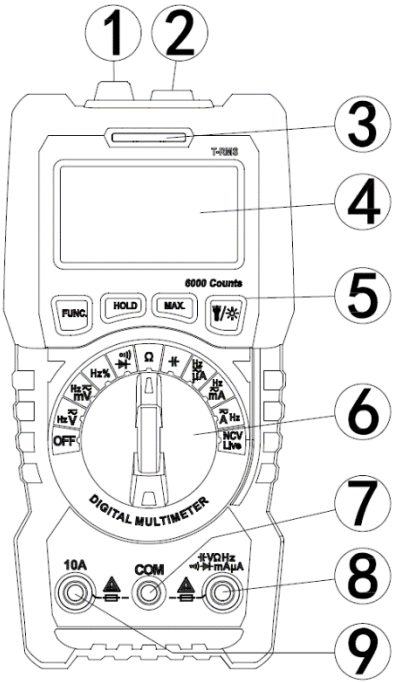
	installations in buildings.

Safety Symbols

Overview

A new generation of high performance TRMS digital multimeter. The new display and function layout show clearer and better user experience. It is the best choice for professional electricians, enthusiasts or families.

Instrument panel description



① NCV probe

② Flashlight

③ Red / green light

④ LCD display

⑤ Function keys

⑥ Function knob

⑦ COM Input socket

⑧ Other measurement input socket

⑨ 10A current Input socket

FUNC. keys

When there are multiple measuring functions on a gear, the FUNC. key switch function is adopted.

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.

Measurement operation

DC/AC voltage measurement

1) Turn the knob to "$\tilde{\overline{V}}$" and Switching AC or DC voltage function by "FUNC." key
2) Insert the red probe in "  " 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.

⚠WARNING

- **The voltage above 600V can't be measured; otherwise the instrument may be damaged.**

- **Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.**
- **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 mV measurement

1) Turn the knob to "$\widetilde{\text{mV}}$" and Switching AC or DC voltage function by "FUNC." key
2) Insert the red probe in "VΩHz 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.

⚠ WARNING

- **The voltage above 600V can't be measured; otherwise the instrument may be damaged.**
- **Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.**
- **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.

Frequency/Duty measurement

1) Turn the knob to “Hz%” and Switching Frequency or duty function by "FUNC." key
2) Insert the red probe in “ ” 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.

WARNING

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

DC/AC current measurement

1) Turn the knob to or or shift and Switching AC or DC voltage function by "FUNC." key
2) Insert the red probe in “ ” 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**

- **The voltage above 600V can’t be measured; otherwise the instrument may be damaged.**
- **Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.**
- **Test the known current 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.

Resistance measurement

1) Turn the knob to ”Ω” shift.
2) Insert the red probe in “VΩHz 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.

⚠ **WARNING**

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

may be struck by electric shocks.

Capacitance measurement

1) Turn the knob to " " shift.
2) Insert the red probe in "VΩHz 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.

WARNING

When measuring Capacitance on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be struck by electric shocks.

Continuity measurement

1) Turn the knob to shift and Switch to Continuity measurement function according to "FUNC." key.
2) Insert the red probe in "VΩHz mAμA" 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.

⚠ WARNING

When measuring Continuity on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be struck by electric shocks.

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

When measuring diode on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be

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.

⚠ WARNING

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

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 "VΩHz mAμA" 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.

⚠ WARNING

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

General Technical Specifications

- Environment condition of using:

  CAT.III 600V

  Pollution level：2

  Altitude < 2000m。

  Working environment temperature and humidity: 0~40°C (<80% RH, <10°C non condensing).

  Storage environment temperature and humidity: -10~60°C (<70% RH, remove the battery).

- Temperature coefficient:

  0.1× accuracy/°C (<18°C or >28°C).

- MAX. Voltage between terminals and earth ground：600V
- Fuse protection：

  mA： F600mA/250V fuse

  10A：F10A/250V 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: it 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.
- Dimension: 151mm x 75mm x 46mm.

Accuracy Specifications

The accuracy applies within one year after the calibration.

Reference condition: the environment temperature 18°C to 28°C, the relative humidity is no more than 80%,

accuracy: ± (% reading + word) .

DC voltage

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

Input impedance：10MΩ;

Overload protection: 600V; Maximum input voltage: 600V

AC voltage

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

Input impedance：10MΩ;

Overload protection: 600V; Maximum input voltage: 600V

Frequency Response：10Hz ~ 1kHz；TRMS

DC current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% reading+3)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
6A	0.001A	
10A	0.01A	

Overload protection: μA/mA：F600mA/250V fuse

A： F10A/250V fuse

Maximum input current：mA: 600mA； A: 10A

When measuring large current, continuous measurement should be no longer than 15 seconds

AC current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.5% reading+3)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
6A	0.001A	
10A	0.01A	

Overload protection: μA/mA：F600mA/250V fuse

A： F10A/250V fuse

Maximum input current：mA: 600mA； A: 10A

Frequency Response：10Hz ~ 1kHz；TRMS

When measuring large current, continuous measurement should be no longer than 15 seconds

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	

Overload protection: 600V;

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+5)
100mF	0.01mF	

Overload protection: 600V;

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%	

Hz/duty：

1) Range：0 ~ 10MHz

2) Voltage sensitivity：0.2~10V AC

3) Overload protection：600V;

V：

1) Range：0 ~ 100 kHz

2) Voltage sensitivity：0.5~600V AC3) 过载保护：600V;

μA、mA、A：

1) Range：0 ~ 100 kHz

2) Voltage sensitivity：≥ 1/4 Full range

3) Overload protection：μA/mA：F600mA/250V fuse；

A： F10A/250V fuse

Diode test

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

Continuity test

	functions	
	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:6000V

Maintenance

Clean

If there's dust on the terminal or the terminal is wet, it may cause measurement error. Please clean the instrument according to the steps below:

1) Switch off the power supply of the instrument, and remove the test probe.
2) Turn over the instrument and shake out the dust accumulated in the input socket. Wipe the outer cabinet with a damp cloth and mild detergent, do not use abrasive or solvent. Wipe contacts in each input socket with a clean

cotton swab soaked in alcohol.

⚠ WARNING

Please always keep the inside of the instrument clean and dry to avoid electric shock or instrument damage.

Replace Battery and Fuse

Replace Battery：

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.

⚠ WARNING

- **To prevent electric shock or personal injury caused by error reading, please replace the battery promptly when the battery power is low. Please do not make battery short circuit or reverse battery polarity to discharge the batteries.**
- **To ensure safety operation and product maintenance, when the instrument will not be used for an extended period of time, please remove the batteries to avoid any**

product damage caused by battery leakage.

Replace Fuse

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.

⚠ WARNING

To avoid possible electric shock, personal injury or instrument damage, please use the fuse with same specifications or specified specifications.