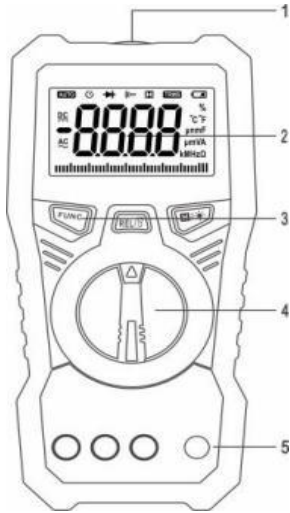
BEETECH®

# AUTO – RANGE MULTIMETER

## Model: **B - 555**


Instruction Manual

## FRONT PANEL DESCRIPTION




1) Flashlight
2) LCD Display
3) Function Keys
4) Rotary Switch
5) Input Jacks

# INTRODUCTION

Congratulations on your purchase of B-555 Digital Multimeter, which has been designed according to IEC-61010-2-032 concerning electronic measuring instruments with CAT III 1000V & CAT IV 600V and pollution control. Excellent reliability brings high efficiency and convenience to your measurement and ensures B-555 to be an ideal tool for field application, laboratories, factory, hobbyist, as well as household applications.

To fully utilize this range multimeters, please keep this manual for reference carefully.

# FEATURES

- Stable performance, with comfortable hand grip and solid housing
- Withstand 1.5 meters fall test
- Max.6000 count display with LCD size: 60x36.5mm
- Full function protection, with stand max.1000V over-voltage impact, as well as over-voltage and over-current alert.
- Large capacitance extension range with fast response
- Audio visual alert featured NCV and LIVE test
- Max ACV/DCV up to 1000V and ACA/DCA up to 20A
- Backlight and inbuilt flashlight for visibility in any conditions

## SAFETY SYMBOLS

⚠ This symbol indicates that the operator must refer to an explanation in the Operating Instruction for further information.

⏚ Earth ground

Double insulation

Danger voltage

## 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.

## BATTERY INSTALLATION

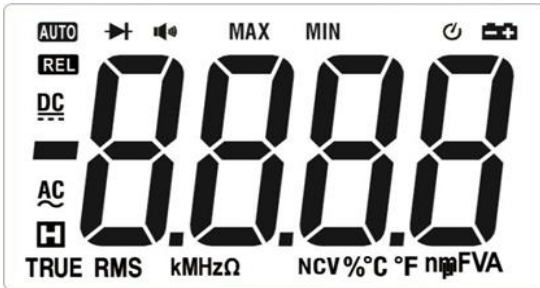
To avoid the false readings, replace the battery as soon as the battery indicator appears.

1. Turn power off and disconnect the test leads from the meter.
2. Open the rear battery cover by using a screwdriver.
3. Insert the battery into battery holder, observing the correct polarity.
4. Put the battery cover back in place, secure with the screws.

## SAFETY CAUTION

- Before the operating measurement, the meter must be warm-up for 30 seconds
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter.
- The multimeter can only be used with the equipped test leads to meet the requirements of safety standards. If the test leads need to be replaced, it must be the same electrical specification as the original test leads.
- If multimeter is operated in a noisy condition, the readings of meter might be unstable, or even with the large errors due to interference.
- Always remove the test leads before replacing the battery or fuses.
- Use great care when making measurements if the voltages are
- greater 30VAC RMS or 60V DC, these voltages are considered a shock hazard.
- To avoid damage to the meter, do not exceed the maximum limits of the input values shown in the specification.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Once "  " appears in LCD, to replace the battery for accurate readings.

## SYMBOLS OF LCD DISPLAY




## DESCRIPTION OF FUNCTIONAL KEYS

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| **H** | Data Hold | | Low Battery indication |
| | Diode Test | | Continuity Check |
| **Hz KHz MHz** | Units of frequency | **nF uF mF** | Units of Capacitance |
| Ω KΩMΩ | Units of Resistance | **uA mA A** | Units of Current |
| **DC** | Direct Current | **AC** | Alternating Current |
| **℉** | Fahrenheit | **℃** | Centigrade |
| **TRMS** | True RMS | | |

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Press this button to shift the functions among ℃/℉; Hz/%; Ω///Capacitance; DCV/ACV/Hz/%; DCA/ACA/Hz/%; NCV/LIVE. Holding presses this button to activate manual mode, hold again to return auto mode.

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Holding presses this button to activate backlight and flashlight function, holding press again to exit; slightly press to active data hold mode.

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Slightly press this button to activate relative measurement function, the meter reads the value as reference, after that the displayed values is the real measurement minus the reference value, press this button again to exit, press again to exit REL mode; Hold the Press Button to activate MAX/MIN shift, holding press again to exit MAX/MIN mode.

# TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Operating Temperature | 0-40 $^{O}$C（<80%RH） |
| Storage Temperature | -10~60 $^{O}$C（<70%RH)<br>Battery excluded |
| Max. input voltage between input socket and the earth | AC/DC 1000V |
| Measurement Principle | Double integral A/D conversion |
| Sampling rate | Approx. 3 times/sec |
| Input polarity indicator | Automatically display "–" |
| Low battery indicator | When battery is running shortly,  will appear in LCD display |
| Product size | 185(W)x88(L)x54(H)mm |
| Weight | About 355g (battery included) |
| Accuracy | ±（%readings + digit）, |
| Environmental temperature | 18℃~28℃, humidity: ≤80% |

Accessories

- User manual-1
- Test leads-1Set
- Temperature probe-1pc

## DC VOLTAGE (DCV) /AC VOLTAGE (ACV)

| Range | Resolution | DCV | ACV |
|---|---|---|---|
| 60mV | 0.01mV | ±(0.5%+3d) | ±(0.8%+3d) |
| 600mV | 0.1mV | | |
| 6V | 0.001V | | |
| 60V | 0.01V | | |
| 600V | 0.1V | | |
| 1000V | 1V | ±(1.0%+5d) | ±(1.0%+5d) |
| 10kHz | 0.001Hz-0.01 kHz | | ±(0.1%+4d) |
| 0.1-99.9% | 0.1% | | ±(2.0%+5d) |

- Input impedance: 10MΩ
- Max. input voltage: mV range250V RMS DC/AC.
- V range 1000V RMS DC/AC

## DC CURRENT (DCA) / AC CURRENT (ACA)

| Range | Resolution | DCC | ACC |
|---|---|---|---|
| 600uA | 0.1uA | ±(1.0%+3d) | ±(1.%+5d) |
| 6000uA | 1uA | | |
| 60mA | 0.01mA | | |
| 600mA | 0.1mA | | |
| 6A | 0.001A | ±(1.0%+10d) | ±(1.2%+5d) |
| 20A | 0.01A | | |
| 10kHz | 0.001Hz-0.01kHz | | ±(0.1%+4d) |
| 0.1-99.9% | 0.1% | | ±(2.0%+5d) |

Max. current：uA mA jack: 600mA/1000V fuse, 20A jack: 10A/1000V fuse

## FREQUENCY / DUTY CYCLE

| Range | Resolution | Accuracy |
|---|---|---|
| 1Hz～30MHz | 0.001Hz～0.01MHz | ±(0.1%+4d) |
| 0.1-99.9% | 0.1% | ±(2.0%+5d) |

- Overload protection: 600VDC/AC RMS

## RESISTANCE (Ω )

| Range | Resolution | Accuracy |
|---|---|---|
| 600Ω | 0.1Ω | ±（0.8%+3d） |
| 6kΩ | 0.001KΩ | |
| 60kΩ | 0.01KΩ | |
| 600kΩ | 0.1KΩ | |
| 6MΩ | 0.001MΩ | |
| 60MΩ | 0.01MΩ | ±(1.0%+5d) |

- Overload protection：600VDC/AC RMS
- Measured resistance value = displayed value – test lead circuit short value

## DIODE/CONTINUITY

| Range | Description |
|---|---|
|  | Built-in buzzers will be sounded if resistance is less than 50Ω |
|  | Display forward voltage drop of diode, opposite displays “OL” |

- Overload protection: 600VDC/AC RMS

## TEMPERATURE (TEMP)

| Range | Resolution | Accuracy |
|---|---|---|
| -20℃ ~ 0℃ | 1℃ | ±4 |
| 0℃~400℃ | | ±(1.0% + 3d) |
| 400℃~1000℃ | | ±(2.0% + 3d) |
| -4°F ~ 50°F | 1°F | ±6 |
| 50°F ~ 750°F | | ±(1.0% + 4d) |
| 750°F~1832°F | | ±(2.0% + 5d) |

## CAPACITANCE(CAP)

| Range | Resolution | Accuracy |
|---|---|---|
| 60nF | 0.01nF | ±(4.0%+25d) |
| 600nF～6uF | 0.1nF～0.001uF | ±(4.0%+15d) |
| 60uF～600uF | 0.01uF～0.1uF | |
| 6mF~60mF | 0.001mF~0.01mF | ±(5%+25d) |

- Overload protection: 300VDC or AC RMS

⚠ **Note:**

It is normal that if the small value of capacitance does not return to zero, deduct the readings during measurement for getting the accurate value.

# OPERATION INSTRUCTION

## AC/DC VOLTAGE MEASUREMENT

1. According to voltage measurement requirements, select the suitable range 
2. Set the rotary switch to the desired range based on the demands of the voltage under test.
3. Insert the black test leads into COM jack and red test lead into 
4. Touch the black test probe tip to the negative side of the circuit; touch the red test probe tip to the positive side of circuit.
5. Press  to shift mode among AC voltage, DC voltage, frequency, duty cycle.

⚠ **NOTE:**

- In small range testing, even without input or connection of test leads, the meter may display the value, that is normal and will not affect the accuracy of the measurement.
- To avoid electrical shock and/or damage to the instrument, do not attempt to take any voltage measurement  that might exceed 1000VDC/VAC RMS.

# AC/DC CURRENT MEASUREMENT

1. According to current measurement requirements, set the rotary switch to  and slightly press  to shift modes among DC current, AC current, frequency, duty cycle.
2. Set the rotary switch to desired range based on the demands of the current under test.
3. Inert the black test lead into COM jack, red test lead into μAmA jack or 20A input jack.
4. Remove the power from the circuit under the test and discharge the capacitors of the circuit.
5. Connect the black test lead to the lower voltage end of the circuit under the test and connect the red test lead to the higher voltage end of the circuit under test. (In series with the circuit to be tested)
6. Read the value in the LCD display.

⚠**NOTE:**

- According to current range and demands, insert jack to select the measuring ranges, max. current is less than 600mA in μAmA jack, and max. current is less than 20A in 20A jack.
- Never attempt to input the current more than input jack requirements to avoid damage to the meter.

## TEMPERATURE MEASUREMENT

1. Set the rotary switch to  and press  to select ℃/℉ mode.
2. LCD displays values of environmental temperature.
3. To Insert the K-type temperature probe, Plug In Red plug into the input
4. jack, insert black plug of thermocouple probe into COM jack, making sure to observe the correct polarity.
5. Read the temperature value in the LCD.

⚠**NOTE:**

- Since cold-junction compensating circuit installed inside the 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.

## RESISTANCE, DIODE, CONTINUITY MEASUREMENT

1. Set the rotary switch to  and press  to select either resistance, diode or continuity mode.
2. Insert the black test lead into COM jack and red test lead into 
3. 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.
4. Touch the test probe tips to the circuit or wire you wish to check, the max. value of resistance under check will be shown in display, if the resistance is less than 50Ω, the audible signal will be sounded.
5. Read the values in LCD display. (diode unit is “V”; continuity, resistance unit is “Ω”)

⚠**NOTE:**

- Disconnect power to the unit under test and discharge all capacitors before taking test.
- To avoid damaging the meter, do not input any voltage.

## CAPACITANCE MEASUREMENT

1. Set the rotary switch to and press FUNC to select Capacitance mode.
2. Insert the black test time into COM jack and red test lead into VΩ
3. Discharge all capacitors before testing.
4. Touch the test leads to the capacitor to be tested, black test lead connect the negative and red test lead connect the positive of capacitor.
5. Read the value in LCD display.
6. When measuring the small value capacitors, the meter may not return to zero due to interference, pres REL to clear to 0 first, and then proceed with the capacitance measurement.

⚠ **NOTE:**

- Disconnect power to the unit under test and discharge all capacitors before test.
- To avoid damaging the meter, do not input any voltage.

## FREQUENCY/DUTY CYCLE MEASUREMENT

1. Set the rotary switch to range.
2. Insert the black test lead into COM jack and red test lead into VΩ Jack.
3. Touch the test lead tips to the circuit under test.
4. Read the frequency value in the LCD display.

⚠ **NOTE:**

- Slightly press FUNC to select “Hz” or “%” mode.
- To avoid electric shock, do not apply more than 300VAC before taking measurements.

## NON-CONTACT VOLTAGE (NCV) DETECTION

1. Set the rotary switch and the LCD display “EF”
2. Approach the top part of meter with the circuit under test, the audible alert signal will be sounded and LED will blink, the LCD shows “----” icon once voltage detected.
3. The LCD shows voltage intensity, a greater number of grids appears means voltage is strong.

⚠ **NOTE:**

- The detection result is for reference only; do not determine the voltage by NCV detection ONLY.
- Detection may interfere with socket design, insulation thickness and other variable conditions.
- External interference sources, such as flashlights, motor, etc., may cause the wrong detection.
- To avoid damaging the meter, do not measure voltage under NCV range.

## BATTERY INSTALLATION

To avoid the false readings, replace the battery as soon as the battery indicator  appears.

1. Turn power off and disconnect the test leads from the meter.
2. Open the rear battery cover by using a screwdriver.
3. Insert the battery into battery holder, observing the correct polarity.
4. Put the battery cover back in place, secure with the screws.

## REPLACING THE FUSE

1. Turn power off and disconnect the test leads from the meter.
2. Remove the battery cover and the battery.
3. Remove the screws by securing the rear cover.
4. Gently remove the old fuse and install the new fuse
5. Replace and secure the rear cover, battery and battery cover.

# BEETECH WARRANTY POLICY

BEETECH Instruments are free from defects in workmanship and functioning, under normal and appropriate use and conditions, for a period of one 1 year from the original invoice date.

During the Warranty period of one year the original purchaser is warranted against the instruments purchased. During this period BEETECH will repair or replace (at its decision) the defective unit subject to verification of the defect or the malfunction (If a manufacturing defect) at Free of Cost (except shipping charges - to & from, handling charges, packing charges, insurance charges, etc., which must be incurred by the customer).

This warranty does not cover disposable batteries, or any damage caused due to abuse, neglect, accident, unauthorized opening or repair, alteration, contamination, or any other abnormal conditions of operation or handling.

Such repairs or replacements are primarily subject to verification of manufacturing defects or malfunction and proof of purchase as confirmed by inspecting the product and the original, dated, purchase invoice. Buyers are to retain purchase invoices for a minimum of one year for warranty

To summarize, warranty does not include:

1) Any condition resulting from other than ordinary and usual use for which the product was not intended.
2) Any condition resulting from incorrect or inadequate usage, application, maintenance, or care.
3) Damage resulting from misuse, incorrect application, abuse, negligence, accidents or shipping damage
4) Normal wear and tear or damage in transportation or in transit.
5) If the device has been opened, inspected, or modified by the user the warranty is void and cannot be claimed.
6) Batteries, Testing leads, and functional accessories are out of warranty policy.
7) Any defect which is not a manufacturing defect.

# CALIBRATION CERTIFICATE

**This Certificate guarantees that the product has been inspected and tested in accordance with the published specifications.**

**The instrument has been calibrated by using equipment which is calibrated to standards traceable to International and National standard.**

**(This instrument does not require further calibration until the period of one year from date of use)**