

# MASTECH®

## SERVICE

Thank you for purchasing our product!  
As our customers are our top priority and we strive for 100% satisfaction,  
we would appreciate your feedback on the product.  
Please contact us if you have any questions regarding the product.  
Our professional support team is always ready to answer  
your enquiries and provide assistance.

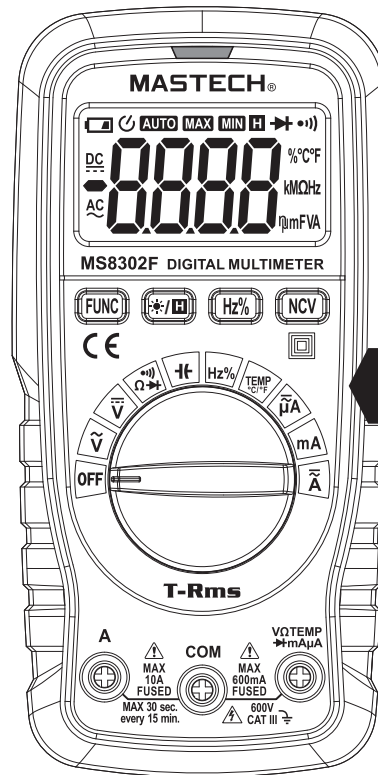
00-05-3768

# MASTECH®

## DIGITAL MULTIMETER



Intertek  
3080912



**MS8302F**


## 1. GENERAL SPECIFICATIONS

**MS8302F** is a stable, safe, reliable compact digital handheld 6000 count auto-ranging multimeter. This meter can measure AC/DC voltage, AC/DC current, resistance, capacitance, frequency, duty cycle, temperature, diodes and continuity. This meter is ideal for many situations, whether you're a professional or casual user.

- **Operating Altitude:** 2000m
- **Relative Humidity:** 75% max operating
- **Operating Temperature:** 0°C~40°C/32°F~104°F (<80% RH)
- **Storage Temperature:** -10°C~60°C/14°F~140°F (<70% RH)
- **Accuracy Temperature:** -18°C~28°C/64°F~82°F (<80% RH)
- **Temperature Coefficient:** 0.1x(specified accuracy)/°C (<18°C or >28°C)
- **Sampling Frequency:** approx. 3 times/sec.
- **Fuse Protection:**  $\mu$ A/mA input: FF 600mA H 600V  
10A input: FF 10A H 600V
- **DC/AC Voltage:** 600V
- **DC/AC Current:** 10A
- **Resistance:** 60M $\Omega$
- **Capacitance:** 60mF
- **Frequency:** 10MHz
- **Duty cycle:** 1%~99%
- **Diodes:** 3.2V DC
- **Continuity:** <50 $\Omega$
- **Temperature:** -20°C~1000°C/-4°F~1832°F
- **LCD Display:** 3 ¾ digit display (6000 counts)
- **Product Supply:** 9V battery
- **Product Size:** 150mm×74mm×48mm / 6.3"×2.9"×1.9"
- **Product Weight:** 482g / 1.06lb
- **Safety Rating:** CAT III 600V; pollution degree: II
- **Safety Standards:** IEC61010-1
- **Pollution Degree:** 2
- **Accuracy:**  $\pm$ (of reading + # of least significant digits)

## 2. ⚠ WARNINGS

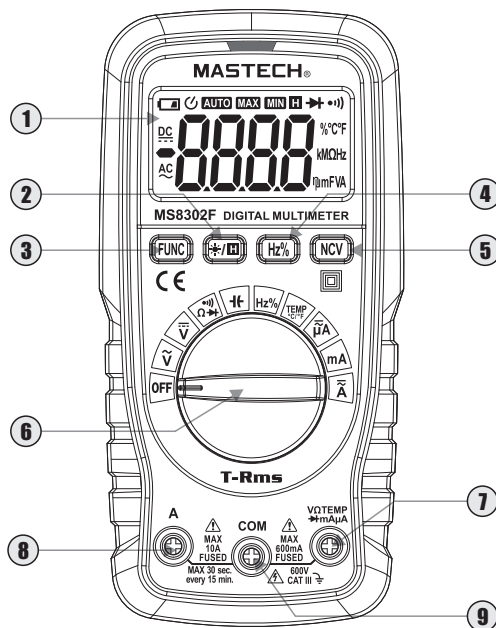
To avoid electric shock and injury or damage to the meter, observe the following safety methods:

- Check the meter before use to make sure there was no damage during transit.
- Check that the insulation on the test leads is not damaged and/or wires are not exposed.
- If any faults or abnormalities are observed, the meter should not be used and should be checked out prior to use.
- Never exceed the protection limit values indicated in specifications for each range of measurement.
- Always be careful when working voltages above 60V DC or 30V AC rms, keep fingers behind the probe barrier while measuring.
- Make sure the rotary switch is in the correct position before measurement.
- Never use the meter in an environment with explosive gas, vapor or dust.
- Always keep fingers behind probe barriers when making measurements.
- When connecting test leads to a circuit, connect the black test lead first, then the red lead. Disconnect in the opposite order.
- Turn off power and discharge all capacitors first before measuring resistance, continuity or diodes.
- Failure to follow safety guidelines could compromise the safety features of this meter.
- Do not use the meter without the battery cover in place.
- Replace the batteries as soon as the low battery symbol "  " to avoid false reading that could lead to electric shock and injury.
- Remove test leads from all circuits before opening the battery cover.

## 3. SAFETY SYMBOLS

	Important safety information		Ground
	AC(alternating current)		Double insulation protection
	DC(direct current)		Fuse
	DC/AC Voltage or Current		Compliance with EU regulations

## 4. FEATURE DETAILS



### 1.LCD Display

### 2.Hold/Backlight Button

Press “” to hold the current reading on the display. Press the button again to release the hold Hold “” to turn on the backlight. Hold the button again to manually turn off the backlight.

### 3.Function Switch Button

Press “FUNC” to switch between functions or between AC/DC current.

### 4.Frequency/Duty Cycle Button (Hz/%)

In AC voltage/current modes, press “Hz%” and the display will show the frequency measurement. Press the button again to switch to duty cycle. Press the button a third time to return to normal display. In Hz/duty cycle mode, press the “Hz%” button and the display will show the duty cycle. Press the button again to switch to the frequency measurement.

### 5.NCV Button

Press the “NCV” button down in any mode and the meter will activate the non-contact voltage detection. Hold the meter up to a voltage source and the buzzer will sound and the NCV indicator will light up if voltage is detected. Release the “NCV” button to stop NCV detection.

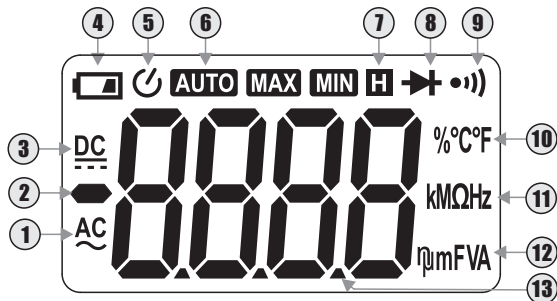
### 6.Rotary Switch

### 7.Input Jack (all measurements; current below 600mA)

### 8.A Jack (current measurements between 600mA-10A only)

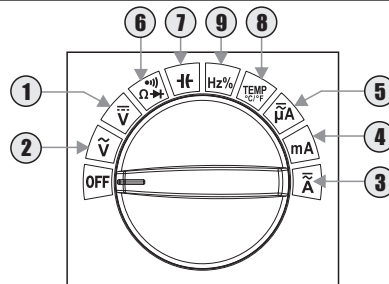
### 9.Common Jack (all measurements)

## 5. DISPLAY FUNCTION INSTRUCTIONS

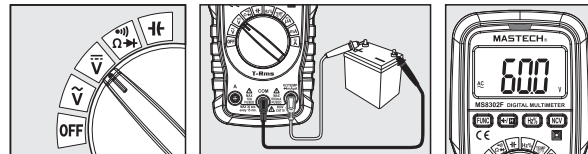


- |                          |                     |              |                           |
|--------------------------|---------------------|--------------|---------------------------|
| <b>1</b> AC              | Alternating Current | <b>10</b> %  | Duty Cycle Mode           |
| <b>2</b> DC              | Negative DC Value   | <b>10</b> °C | Temperature in Celsius    |
| <b>3</b> DC              | Direct Current      | <b>10</b> °F | Temperature in Fahrenheit |
| <b>4</b> Low Battery     |                     | <b>11</b> kΩ | Resistance                |
| <b>5</b> Auto Power Off  |                     | <b>11</b> Hz | Frequency                 |
| <b>6</b> AUTO            | Auto Range Active   | <b>12</b> μF | Capacitance               |
| <b>7</b> H               | Data Hold           | <b>12</b> μA | DC/AC Current             |
| <b>8</b> Diode Test      |                     | <b>12</b> mV | DC/AC Voltage             |
| <b>9</b> Continuity Test |                     | <b>13</b> A  | Main Display              |

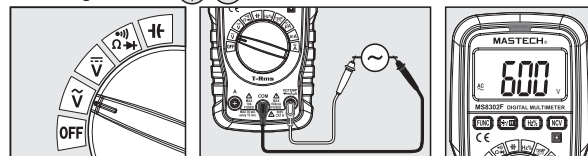
## 6. ROTARY SWITCH FUNCTION INSTRUCTIONS



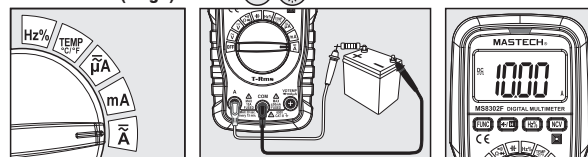
### 1. DC Voltage: <600V



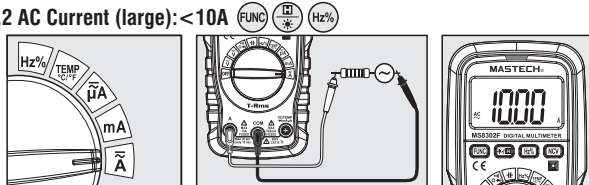
### 2. AC Voltage: <600V



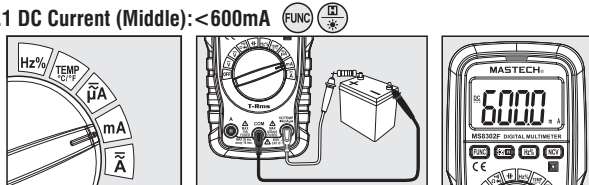
### 3.1 DC Current (large): <10A



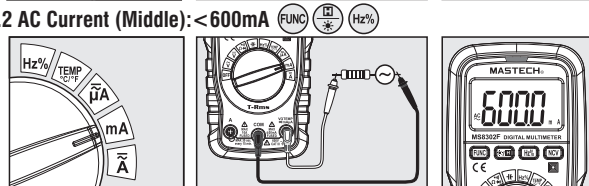
## 3.2 AC Current (large): <10A



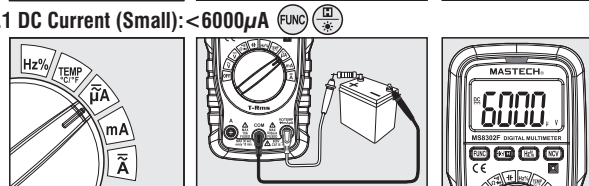
## 4.1 DC Current (Middle): <600mA



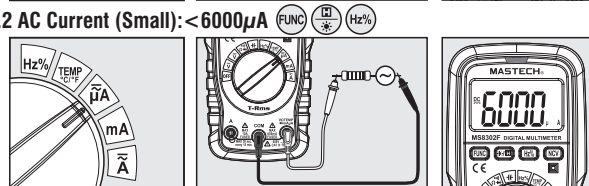
## 4.2 AC Current (Middle): <600mA



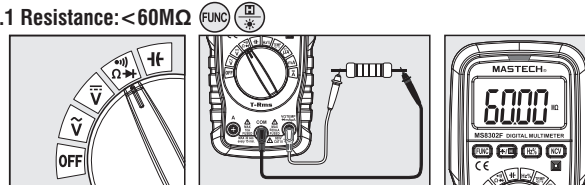
## 5.1 DC Current (Small): <6000μA



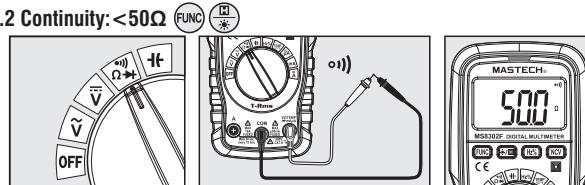
## 5.2 AC Current (Small): <6000μA



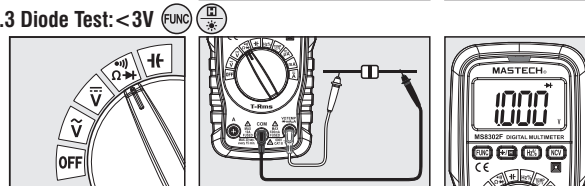
## 6.1 Resistance: <60MΩ



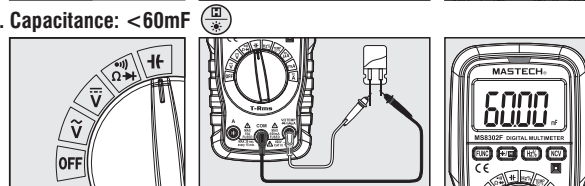
## 6.2 Continuity: <50Ω



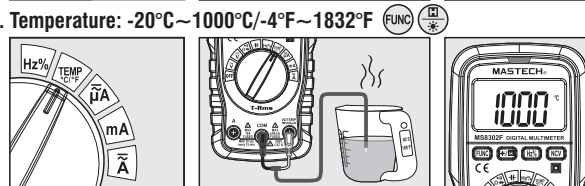
## 6.3 Diode Test: <3V



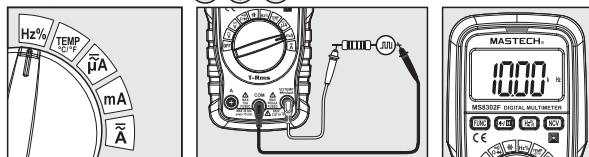
## 7. Capacitance: <60mF



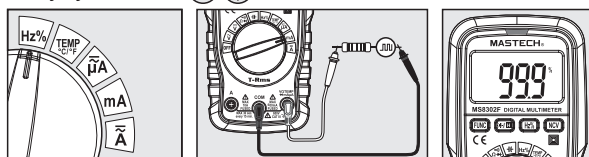
## 8. Temperature: -20°C~-1000°C/-4°F~-1832°F



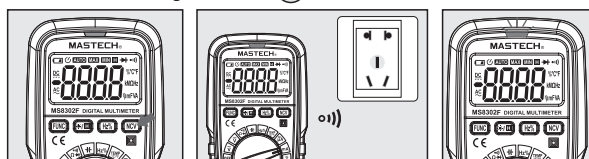
## 9.1 Frequency: <10MHz



## 9.2 Duty Cycle: <99%



## 11. Non-Contact Voltage Detector



## 7.

## ELECTRICAL SPECIFICATIONS

### DC Voltage Measurement

Range	Resolution	Accuracy
600mV	0.1mV	±(0.5% of reading + 2 digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	±(0.7% of reading + 2 digits)
600V	1V	

- Input impedance: 10MΩ
- Max. input voltage: 600V rms

### AC Voltage Measurement

Range	Resolution	Accuracy
600mV	0.1mV	±(1.0% of reading + 5 digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	
600V	1V	±(1.0% of reading + 10 digits)

- Input impedance: 10MΩ
- Max. input voltage: 600V rms
- Frequency response: 40~400Hz, calibrated to rms of sine wave (average response)

**DC Current Measurement**

Range	Resolution	Accuracy
600μA	0.1μA	±(1.0% of reading + 5 digits)
6000μA	1μA	
60mA	0.01μA	
600mA	0.1μA	
10A	10mA	±(2.0% of reading + 10 digits)

**• Overload protection:**

μA/mA input: Fuse(FF 600mA H 600V) 10A input: Fuse (FF 10A H 600V)

**• Max. input current:**

μA/mA input: 600mA rms 10A input: 10A rms

**AC Current Measurement**

Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% of reading + 5 digits)
6000μA	1μA	
60mA	0.01μA	
600mA	0.1μA	
10A	10mA	±(2.5% of reading + 10 digits)

**• Overload protection:**

μA/mA input: Fuse(FF 600mA H 600V) 10A input: Fuse (FF 10A H 600V)

**• Frequency response: 40~400Hz,**

calibrated to rms of sine wave (average response)

**• Max. input current:**

μA/mA input: 600mA rms 10A input: 10A rms

**Resistance Measurement**

Range	Resolution	Accuracy
600Ω	0.1Ω	±(0.8% of reading + 5 digits)
6kΩ	0.001kΩ	
60kΩ	0.01kΩ	
600kΩ	0.1kΩ	
6MΩ	0.001MΩ	
60MΩ	0.01MΩ	±(2.0% of reading + 5 digits)

**• Max. input voltage: 600V rms**
**Continuity Test**

Overload Protection	Open Circuit Voltage
600V RMS	Appx. 1.0V DC

**• Max. input voltage: 600V rms**
**Diode Test**

Overload Protection	Test Current	Open Circuit Voltage
600V RMS	Appx. 1mA	Appx. 3.2V DC

**• Max. input voltage: 600V rms**
**Capacitance Measurement**

Range	Resolution	Accuracy
1nF	0.001nF	±(4.0% of reading + 10 digits)
10nF	0.01nF	±(3.0% of reading + 10 digits)
100nF	0.1nF	
1μF	1nF	
10μF	10nF	
100μF	100nF	
1mF	1μF	±(4.0% of reading + 10 digits)
10mF	10μF	
100mF	10μF	

- Max. input voltage: 600V rms

Frequency (cont.) (AC voltage)		
Range	Resolution	Accuracy
99.99Hz	0.01Hz	±(1.5% of reading +5 digits)
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
>10kHz	0.01kHz	Reference only

- Signal input range:  $\geq 0.2V$  AC rms  
(voltage input will increase as frequency increases)
- Input impedance:  $10M\Omega$
- Max. input voltage: 600V rms

Frequency (AC current)		
Range	Resolution	Accuracy
99.99Hz	0.01Hz	±(1.5% of reading +5 digits)
999.9Hz	0.1Hz	
>1kHz	0.001kHz	Reference only

- Signal input range:  $\mu A$ :  $\geq 60\mu A$  rms mA:  $\geq 6mA$  rms A:  $\geq 0.6A$  rms  
(current input will increase as frequency increases)
- Max. input current: 10A rms

Frequency (Hz)		
Range	Resolution	Accuracy
9.999Hz	0.001Hz	±(1.5% of reading +5 digits)
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99KHZ	0.01kHz	
999.9KHZ	0.1KHZ	
9.999MHZ	0.001MHZ	

- Signal input range:  $\geq 2V$  AC rms (voltage input will increase as frequency increases)
- Max. input voltage: 600V rms

**Duty Cycle**

Range	Resolution	Accuracy
0.1%~99.9%	0.1%	±3.0%

- In current mode:

Signal input range:  $\mu A$ :  $\geq 60\mu A$  rms mA:  $\geq 6mA$  rms A:  $\geq 0.6A$  rms  
(current input will increase as frequency increases)

Max. input current: 10A rms

- In voltage mode:

Signal input range:  $\geq 0.6V$  AC rms

(voltage input will increase as frequency increases)

Input impedance:  $10M\Omega$

Max. input voltage: 600V rms

**Temperature Measurement**

Range	Resolution	Accuracy
-20°C~1000°C	1°C	±(2.0% of reading + 2 digits)
-4°F~1832°F	1°F	±(2.0% of reading + 4 digits)

- Overload protection: Fuse (F600mA/600V)

**Frequency (%)**

Range	Resolution	Accuracy
1 – 99%	0.1%	± 2.0%

- Signal input range:  $\geq 2V$  AC rms (voltage input will increase as frequency increases)
- Max. input voltage: 600V rms



## 8. MAINTENANCE

This section provides basic maintenance principles, including replacing batteries and fuses.

Do not attempt to repair or perform any maintenance on the meter not included in the section below unless you are qualified personnel.

## 9. CLEANING

### WARNINGS

**To prevent injury or damage to the meter, do not allow moisture inside the casing. Before opening the battery cover/case, disconnect test leads from all circuits.**


Clean the meter regularly with a damp cloth and a small amount of detergent; do not use abrasives or solvents. Dirty/wet input jacks can affect readings.

To clean input jacks:

1. Turn off the meter and remove test leads.
2. Brush off any dirt or contaminants from the input jacks.
3. Use a cotton swab with a cleaner/lubricant (i.e. WD40) to clean the input jack.
4. Use a new swab on each jack to prevent cross contamination.

## 10. REPLACING THE BATTERIES

### WARNINGS

**To avoid false reading that could lead to injury or damage to the meter, replace the batteries as soon as the “” symbol appears. Turn off the meter and remove the test leads before opening the battery cover to avoid injury or damage to the meter.**

To replace the batteries:

1. Turn off power to the meter.
2. Remove test leads from input jacks.
3. Loosen the screw on the battery cover and remove cover from meter.
4. Replace used batteries with new batteries.
5. Replace battery cover and secure to meter.

## 11. REPLACING THE FUSES

### WARNINGS

**To prevent injury or damage to the meter, turn off power to the meter and disconnect test leads from input before opening case.**

To replace the fuses:

1. Turn off power to the meter.
2. Remove test leads from input jacks.
3. Remove the 6 screws on the back case and remove back case from meter.
4. Replace blown fuse(s) with a new fuse.
5. Replace back cover and secure to meter.

## 12. DISPOSAL / RECYCLE



**Caution:** This symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal.