

Item ref: 600.100UK

MTM01

Digital Multimeter

User Manual




Please read this manual thoroughly and ensure all contents are fully understood before using the apparatus.



Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the tester or to the equipment under test, please adhere to the following guidelines:


- Before using the tester inspect the case. Do not use the tester if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity.
- Do not apply more than the rated voltage, as marked on the tester, between the terminals or between any terminal and grounding.
- The rotary switch should be in the right position and no changeover of range shall be made while measurement is conducted to prevent damage.
- When the tester is working at an effective voltage over 60V in DC or 30Vrms in AC, special care should be taken as there is danger of electric shock.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the tester in an environment of high temperature, humidity, explosive, flammable, damp or of a strong magnetic field. The performance of the tester may deteriorate after being exposed to any of these elements.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes.F
- Replace the battery as soon as the battery indicator  appears. A low battery may produce false readings that can lead to electric shock and personal injury.

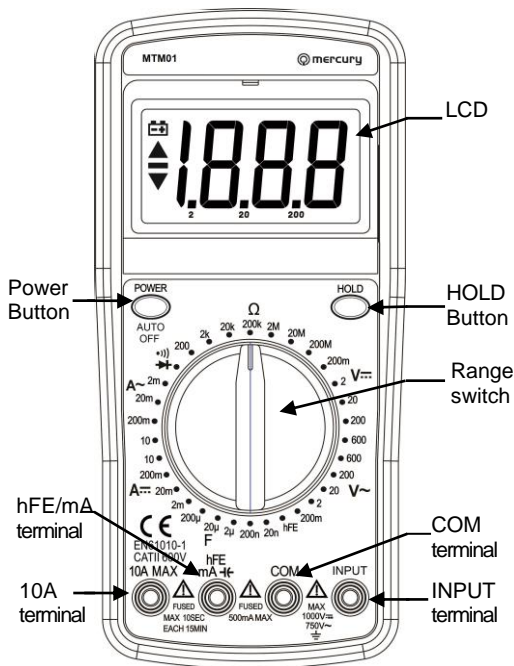
- Remove the connection between the testing leads and the circuit being tested and turn the meter power off before opening the meter case.
- The internal circuits of the meter should not be tampered with to avoid damage to the meter and possible electric shock.
- A soft cloth and mild detergent should be used to clean the surface of the tester on a regular basis. No abrasive and solvent should be used to prevent the surface of the tester from corrosion or damage.
- The tester is suitable for indoor use only.
- Turn the tester power off when it is not in use and take out the battery when not using for a long time. Check the battery regularly; replace the battery immediately if any signs of leaking appear as battery acid will damage the tester.

Accessories

- Instruction manual
- Set of test leads (red and black)
- 9V PP3 battery













General Specifications

Max display:	LCD (1999 count) 67 x 42mm
Polarity:	Automatic, indicated minus, assumed plus
Measure method:	double integral A/D switch implement
Sampling speed:	2 times per second
Over-load indication:	"1" or "OL" is displayed
Operating Environment:	0°C-40°C, at <80%RH
Storage Environment:	-10°C-50°C, at <85%RH
Power:	9Vdc (1 x PP3 battery supplied)
Low battery indication:	"  " is displayed
Dimensions:	190 x 90 x 33mm
Weight:	227g (including battery)



← Multi-function adapter

Electrical Symbols

	DC (Direct Current)
	AC (Alternating Current)
	DC or AC
	Important safety information. Refer to the manual
	Dangerous voltage may be present
	Earth ground
	Low battery
	Fuse
	Diode
	Continuity test
	Conforms to European Union directive
	Double insulated

Technical Specifications

Accuracies are guaranteed for 1 year, 23°C ± 5°C, less than 80% RH.

DC Voltage

RANGE	RESOLUTION	ACCURACY
200mV	0.1mV	±(0.5% of rdg + 3D)
2V	1mV	±(0.8% of rdg + 5D)
20V	10mV	
200V	100mV	
600V	1V	±(1.0% of rdg + 5D)

Input Impedance: 10MΩ

Overload Protection: 600V DC or 600V AC rms

Max. Input voltage: 600V DC

AC Voltage

RANGE	RESOLUTION	ACCURACY
200mV	0.1mV	$\pm(1.2\% \text{ of rdg} + 5D)$
2V	1mV	$\pm(1.0\% \text{ of rdg} + 5D)$
20V	10mV	
200V	100mV	
600V	1V	$\pm(1.2\% \text{ of rdg} + 5D)$

Input Impedance: 10M Ω



Frequency Range: 40Hz ~ 400Hz

Overload Protection: 600V DC or 600V AC rms

Response: Average, calibrated in rms of sine wave

Max. Input voltage: 600V AC rms

Audible Continuity

RANGE	DESCRIPTION	Remark
	Built-in buzzer sounds if resistance is less than $30\pm 20\Omega$	Open circuit voltage: about 2.8V
	The approximate forward voltage drop will be displayed	Open circuit voltage: about 2.8V

Overload Protection: 250V DC/AC rms

DC Current

RANGE	RESOLUTION	ACCURACY
2mA	1uA	$\pm(1.8\% \text{ of rdg} + 2D)$
20mA	10uA	
200mA	100uA	$\pm(2.0\% \text{ of rdg} + 2D)$
10A	10mA	$\pm(2.0\% \text{ of rdg} + 10D)$

Voltage Drop: 200mV

AC Current

RANGE	RESOLUTION	ACCURACY
2mA	1uA	±(2.0% of rdg + 3D)
20mA	10uA	
200mA	100uA	±(2.0% of rdg + 5D)
10A	10mA	±(2.0 of rdg + 10D)

Voltage Drop: 200mV

Frequency Range: 40Hz ~ 400Hz

Response: Average, calibrated in rms of sine wave

Resistance

RANGE	RESOLUTION	ACCURACY
200Ω	0.1Ω	±(1.0% of rdg + 10D)
2KΩ	1Ω	±(1.0% of rdg + 4D)
20kΩ	10Ω	
200kΩ	100Ω	
2MΩ	1kΩ	±(1.0% of rdg + 10D)
20MΩ	10kΩ	
200MΩ	100kΩ	

Open Circuit Voltage: about 0.5V (200MΩ range is 3V)

Capacitance

RANGE	RESOLUTION	ACCURACY
20nF	10pF	±(4.0% of rdg + 5D)
200nF	100pF	
2uF	1nF	
20uF	10nF	
200uF	100nF	

Operation Instructions

Voltage Measurement

1. Connect red test lead to "INPUT" and black lead to "COM".
2. Set RANGE switch to desired VOLTAGE position, if the voltage to be measured is not known beforehand, set switch to the highest range and reduce it until satisfactory reading is obtained.
3. Connect test leads to device or circuit being measured.
4. Turn on power of the device or circuit being measured voltage value will appear on Digital Display along with the voltage polarity.

Please note:

- In small ranges, the meter may display an unstable reading when the test leads have not been connected to the load to be measured. It is normal and will not affect the measurements.
- When the meter shows the over range symbol "1" or "OL", a higher range must be selected.
- To avoid damage to the meter, don't measure a voltage which exceeds 1000Vdc (for DC voltage measurement) or 750Vac (for AC voltage measurement).

Current Measurement

1. For reading less than 200mA connect red lead to "mA" and black lead to "COM" (for measurements between 200mA and 10A, connect red lead to "10A") ensure jacks are fully depressed.
2. Set the range switch to desired AC or DC position. If the current magnitude to be measured is not known beforehand, set the ranges switch to the highest range position and then reduce it range by range until satisfactory resolution is obtained.
3. Open the circuit to be measured and connect test leads in SERIES with the load in with current is to measure.
4. Current reading will be displayed on LCD, for DC current measurement, the polarity of the red probe will also be indicated.

Please note:

- When the display shows the over range symbol "1" or "OL", a higher range must be selected.
- In addition "10A" function is designed for intermittent use only.

Resistance Measurement

1. Connect red lead to "INPUT", black lead to "COM".
2. Set the range switch to desired Ω range.
3. If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before measurement.
4. Connect test leads to circuit being measured.
5. Read resistance value on Digital Display.

Please note:

- For resistance measurements $>1M\Omega$, the meter may take a few seconds to stabilize reading. This is normal for high-resistance measurement.
- When the input is not connected, i.e. at open circuit, the symbol "OL" will be displayed as an over range indicator.
- Before measuring in-circuit resistance, be sure that the circuit under test has all power removed and all capacitors are fully discharged.

Capacity Measurement


1. Connect the BLACK test lead to "COM" and the RED test lead to "INPUT".
2. Set the Range switch at F position. (NOTE: The polarity of the RED lead is positive "+")
3. Connect test leads across the capacitor under measure and be sure the polarity of connection is observed.

Please Note:


- To avoid damage to the Meter, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance.

- The tested capacitor should be discharged before the testing procedure. Never apply voltage to the input, or serious damage may result.

Continuity Measurement

1. Connect the BLACK test lead to "COM" and the RED test lead to "INPUT" (Note: The polarity of the red test lead is positive "+").
2. Set the range switch to  range.
3. Connect the test leads across the load to be measured.
4. If the circuit resistance is lower than about $30 \pm 20 \Omega$, the built-in buzzer will sound.

Diode Measurement

1. Connect red lead to "INPUT", black lead to "COM".
2. Set RANGE switch to "" position.
3. Connect the red test lead to the anode of the diode to be measured and black test lead to cathode.
4. The meter will show the approximate forward voltage of the diode. If the connections are reversed, "OL" will be shown on the display.


Transistor hFE Measurement

1. Set the range switch to hFE range.
2. Connect the adapter to the "COM" jack and the "hFE" jack. Don't reverse the connection.
3. Identify whether the transistor is NPN or PNP type and locate Emitter, Base and Collector lead. Insert the leads of the transistor to be tested into the proper holes of the transistor test socket of the adaptor.
4. LCD display will show the approximate hFE value.

Battery and Fuse Replacement

- 1) Battery and fuse replacement should only be done after the test leads have been disconnected and power is off.
- 2) Loosen screws with suitable screwdriver and remove case bottom.
- 3) The meter is powered by a single 9V PP3 battery. Snap the battery connector leads to the terminals of the battery and reinsert into the case top. Dress the battery leads so that they will not be pinched between the case bottom and case top.
- 4) The meter is protected by fuse:
 - A) mA: F0.5A/600V Fast, Breaking capacity is 10KA, dimensions are 20 x 5mmØ.
 - B) 10A: F10A/600V Fast, Breaking capacity is 10KA, dimensions are 20 x 5mmØ.

Replace the case bottom and reinstall the three screws. Never operate the meter unless the case bottom is fully closed.

 **EN61010-1:2010**



This product is classed as Electrical or Electronic equipment and should not be disposed with other household or commercial waste at the end of its useful life. The goods must be disposed of according to your local council guidelines.

Errors and omissions excepted.

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