

# Are you choosing the right Multimeter

1. The most important criterion for choosing a DMM is that it should be driven by your application.
2. Ensure the DMM has auto ranging facilities to avoid wrong range selection.
3. Beware of the wordings such as *“Designed to meet specification.”*
4. Ensure the DMM is designed to pass the international standards of Electrical Safety, Category standards as CAT.

Standards and Certifications that are important while choosing a DMM

- a) IEC 1010 standard (International Electro- Technical Commission) is the new safety standard for low voltage test and measurement equipment.
- b) Look out for the 'CE' symbol.
- c) Look out for Safety Category-CAT certification. CAT- III is important for working in Three-phase distribution, including single-phase industrial use and CAT-IV is important for working in Three-phase at utility connection & any outdoor conductors.
- d) Look out for EMC certification in the DMM which would certify the meter to work in inductive areas .
- e) The DMM should have IP (Ingress Protection) certifications, which would protect the meter against dust, water or any liquid. IP 54 is meant to protect the meter against dust and liquid which guarantees uninterrupted performance in a harsh condition.
- f) Look out for point to point calibration certificates approved by certified laboratory.

5. Important Safety Parameters to be looked at - while choosing a DMM  
For safety reasons, it is best to use a meter with:

- a) Fused current inputs and hence high energy fuses.
- b) Overload protection on the ohms and continuity function.
- c) Voltage range must have high input impedance – more than 10M $\Omega$
- d) mV range must have > 1000M $\Omega$  input impedance.
- e) Test leads that have independent certification, pointed leads, shrouded connectors and finger guards.

6. Other Important Features.

- a) Large display, Clear Backlit to read comfortably in dark areas.
- b) Ergonomic design to have good grip while working .
- c) Rugged body - design with high grade drop proof material to ensure it does not break /damage even if drops from a height.
- d) Availability of Warranty, Service and affordable Spare parts.

# Motwane's 'M' Series Digital Multimeter Selection Guide

BASIC FEATURES		M21C	M41	M42	M63	M65
Counts		2400	4000	4000	6000	6000
Type		average	average	Trms	Trms	Trms
Basic DC accuracy		(0.5%+3)	(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.25%+3)
MEASUREMENTS						
DC Voltage		240mV - 1000V	400mV - 1000V	400mV - 1000V	600mV - 1000V	6V - 1000V
Accuracy		(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.25%+3)
DC mV		240mV	400mV	40mV - 400mV	60mV - 600mV	x
Accuracy		(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.5%+3)	x
AC Voltage		2.4V-750V	4V - 750V	4V - 750V	6V - 750V	6V - 1000V
Accuracy		(1.0%+5)	±(1.0%+5)	±(1.0%+5)	±(1.0%+5)	±(1.0%+5)
AC mV		x	x	40mV - 400mV	60mV - 600mV	x
Accuracy		x	x	±(1%+5)	±(1%+5)	x
DC Current		24mA-10A	40mA - 20A	40mA - 20A	60mA - 20A	600µA-10A
Accuracy		(1.0%+5)	±(1.0%+5)	±(1.0%+5)	±(1.0%+5)	±(1.2%+5)
AC Current		24mA-10A	40mA - 20A	40mA - 20A	60mA - 20A	600µA-10A
Accuracy		(1.0%+5)	±(1.2%+5)	±(1.2%+5)	±(1.2%+5)	±(1.2%+5) upto 6000µA ±(1.8%+5) upto 600mA ±(2%+8) upto 10A
Resistance		240Ω-24MΩ	400Ω - 40MΩ	400Ω - 40MΩ	600Ω - 60MΩ	600Ω - 60MΩ
Accuracy		(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.5%+3)
Frequency		5Hz-5MHz	10Hz - 10MHz	10Hz - 10MHz	10Hz - 10MHz	60Hz - 60MHz
Accuracy		(0.3%+3)	±(0.1%+3)	±(0.1%+3)	±(0.1%+3)	±(0.5%+3)
Duty cycle		0.1%-99.9%	0.1% - 99.9%	0.1% - 99.9%	0.1% - 99.9%	1.0%-98.9%
Accuracy		(0.5%+20)	±(0.5%+3)	±(0.5%+3)	±(0.5%+3)	±(0.5%+30)
Capacitance		2.5nF-25µF	40nF - 4000µF	40nF - 4000µF	40nF - 4000µF	6nF-60mF
Accuracy		(5.0%+50)	±(3.0%+10)	±(3.0%+10)	±(3.0%+10)	±(3%+10)
Temperature		x	-20°C to 1200°C	x	x	x
Diode/Continuity Check		✓	✓	✓	✓	✓
POWER SUPPLY						
Battery Type		1.5V AAA size x 2	1.5 V AAA size x 2	9V (6F22)	9V (6F22)	9V (6F22)
Power Consumption		1mA	3.5mA	8mA	4mA	8mA
Display		LCD	LCD	LCD	LCD	LCD
Dual Display		x	x	x	x	✓
Analog bargraph		x	✓	✓	✓	✓
Backlit		x	✓	✓	✓	✓
ADVANCE FUNCTIONS						
Max/Min		x	✓	✓	✓	✓
Relative		✓	✓	✓	✓	✓
DATA HOLD		✓	✓	✓	✓	✓
OTHER FEATURES						
Automatic power off		✓	✓	✓	✓	✓
Low battery indication		✓	✓	✓	✓	✓
Over Load Indication		✓	✓	✓	✓	✓
Auto/manual ranging		✓	✓	✓	✓	✓
Update Rate		3 times/sec	3 times/ sec	3 times/ sec	3 times/ sec	2.8 times/ sec
Input Impedance		10MΩ	10MΩ	10MΩ	10MΩ	10MΩ
SAFETY						
Standards(CAT)		CAT II/600V	CAT III/1000V	CAT III/1000V	CAT IV/600V	CAT III/1000V
IP		x	IP 54	IP 54	IP 54	IP 54
Transient Protection		4 kV	8 kV	8 kV	8 kV	8 kV
Overload/Fuse Protection		✓	✓	✓	✓	✓
Max. Voltage between any terminal & ground		1050V DC/AC	1050V DC/AC	1050V DC/AC	1050V DC/AC	1050V DC/AC
CE Certificate		✓	✓	✓	✓	✓
CALIBRATION CERTIFICATE						
		✓	✓	✓	✓	✓
ACCESSORIES						
Standard		Pairs of test leads, Battery 1.5V x 2 (AAA or equivalent)	Pair of test leads, User manual, Battery installed & Fuses		Pair of test leads, User manual, Battery installed, Fuses & Carrying bag	
Optional		Magnet	Pair of test leads K type thermocouple	Pair of test leads, HV 40 probe	Pair of test leads, HV 40 probe	Pair of test leads, Pair of small test leads

**NOTES :** 1.The Instrument is accompanied with Test & calibration sheet, 2.Test Facilities can be provided at the factory with the available test set-ups only. 3. The Company's policy is continuous improvement of its products. We therefore reserve the Right of any deviation from illustration or specifications without notice. 4. Stated accuracies are valid from 10% of the range to 95% of the range. 5. Accuracy Specified for temperature range of 25°C ± 5°C & 55%RH ± 10%.