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Fluke Digital Multimeters

Solutions for every need



How to choose the best DMM for your job

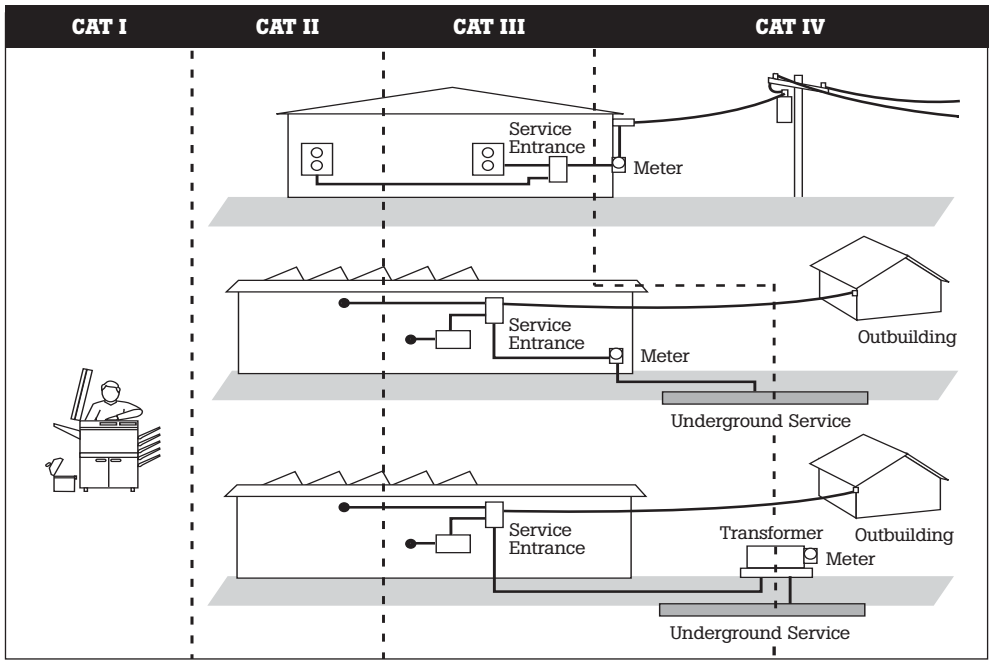
Choosing the right digital multimeter (DMM) requires thinking about what you'll be using it for. Evaluate your basic measurement needs and job requirements and then take a look at special features/functions built into many multimeters. Think about whether you need to do basic measurements, or if you need the more advanced troubleshooting options offered by special features.

Factors to consider:

- Your work environment (voltage level, types of equipment, types of measurements, applications)
- Specialty features/functions (capacitance, frequency, temperature, non-contact voltage, low impedance mode, min-max record, data logging, trending)
- Resolution and accuracy (6,000, 20,000, or 50,000 count resolution)

Safety

The increased occurrence and levels of transient overvoltages in today's power systems have given rise to more stringent safety standards for electrical measurement equipment. Transients that ride on top of power sources (mains, feeder or branch circuits) can trigger a sequence of events that may lead to serious injury. Test equipment must be designed to protect people working in this high-voltage, high-current environment.



Measurement category	In brief	Examples
CAT I	Electronic	• Protected electronic equipment • Equipment connected to (source) circuits in which measures are taken to limit transient overvoltages to an appropriately low level • Any high-voltage, low-energy source derived from a high-winding resistance transformer, such as the high-voltage section of a copier
CAT II	Appliances, PCs, and TVs	• Appliance, portable tools, and other household and similar loads • Outlet and long branch circuits • Outlets at more than 10 meters (30 feet) from CAT III source • Outlets at more that 20 meters (60 feet) from CAT IV source
CAT III	MC panels, etc.	• Equipment in fixed installations, such as switchgear and polyphase motors • Bus and feeder in industrial plants • Feeders and short branch circuits, distribution panel devices • Lighting systems in larger buildings • Heavy appliance outlets with short connections to service entrance
CAT IV	Three-phase at utility connection, any outdoor conductors	• Refers to the "origin of installation," i.e., where low-voltage connection is made to utility power • Electricity meters, primary overcurrent protection equipment • Outside and service entrance, service drop from pole to building, run between meter and panel • Overhead line to detached building, underground line to well pump

Digital Multimeter selection chart

	Best for	Applications	Recommended DMM
Advanced meters	**Advanced industrial troubleshooting, including datalogging and graphing intermittent problems**	**Logging:** For unattended monitoring of signals over time, to detect intermittent problems.	**289** 
		Graphing: View logged values graphically in the field right on the meter, without a PC.	
		Working on VSD's: Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or the motor terminals.	
		Testing motor windings or contact resistance: Allows testing of resistance up to 50 ohms with one milliohm (0.001 ohm) resolution.	
	Advanced electronic applications, including datalogging and graphing intermittent problems	**Logging:** For unattended monitoring of signals over time, characterize device performance.	**287** 
		Graphing: View logged values graphically in the field right on the meter, without a PC.	
		Monitoring two parameters at the same time: Dual display allows for monitoring of two selectable parameters.	
		Performance testing: Testing the frequency response of amplifiers and audio transmission line.	
	Industrial troubleshooting	**Working on VSD's:** Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or at the motor terminals.	**87V** 
		Industrial troubleshooting: All of the resolution and accuracy you need to solve more problems on motor drives, in-plant automation, power distribution, and electromechanical equipment.	
		Checking power quality: Capture glitches and spikes as short as 250 µs. Identify irregular signals.	
Specialty meters	**Industrial troubleshooting in explosive environments**	**Safety and compliance:** Unlike most other ATEX-certified tools, can be used both inside and outside the hazardous zone (ATEX Zones 1 & 2) without compromising performance or compliance.	**87V Ex** 
		Industrial troubleshooting: All the functionality necessary for most industrial troubleshooting jobs.	
	Automotive troubleshooting	**Troubleshoot variety of problems on conventional and hybrid vehicles:** Millisecond pulse width measurements for fuel injectors, RPM readings for both DIS and conventional ignitions with optional inductive pickup.	**88V** 
		Automotive testing: alternator diodes, duty cycle, solenoids, breaker points, wiring, switches, and more.	
	Harsh environments requiring dustproof and waterproof test equipment	**Industrial troubleshooting in indoor and outdoor harsh environments:** Dustproof, waterproof, shockproof multimeter designed to withstand the toughest environments.	**28 II/ 27 II**  New
		Working on VSD's: Take accurate voltage, current and frequency measurements on the output side of the drive at either the drive itself or at the motor terminals. (28 II only)	
	Applications where display positioning is problematic	**Remote monitoring:** View meter display up to 30 feet away from the measurement point. Observe meter real-time readings remotely.	**233**  New
		Inconvenient measurements: Remote magnetic display solves three handed problem.	
		Electrical Maintenance: All the features and functions of a conventional multimeter.	

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	Best for	Applications	Recommended DMM
General purpose meters	**Every day use requiring true-rms, accurate, rugged meter**	**Industrial troubleshooting:** Applications requiring exceptional ease-of-use, ruggedness and reliability.	**179** 
		Electrical maintenance and troubleshooting: Variety of commercial electrical troubleshooting, installation and maintenance.	
		Temperature measurements: Built-in thermometer conveniently allows you to take temperature readings without having to carry a separate instrument.	
	Every day use requiring average responding, accurate, rugged meter	**Industrial troubleshooting:** Applications requiring exceptional ease-of-use, ruggedness and reliability.	**77 IV** 
		Electrical maintenance and troubleshooting: Variety of commercial electrical troubleshooting, installation and maintenance.	
Compact meters	**Wide variety of electrical work**	**Electrical maintenance troubleshooting:** When you need to eliminate false or "ghost" voltages or perform continuity, connection or basic wiring checks.	**117** 
		Non-contact voltage detection: Integrated non-contact voltage detection simplifies many tasks.	
	HVAC troubleshooting	**Residential HVAC maintenance:** Lower voltage HVAC residential maintenance, installation and troubleshooting.	**116** 
		Temperature and microamp measurements: Troubleshooting problems with HVAC equipment and flame sensors.	
	Electronic and field service applications	**Electronic troubleshooting:** Troubleshoot a wide variety of measurement parameters, including frequency and capacitance.	**115** 
	Utility applications involving basic electrical tests	**Revenue meter tests:** Involving meter sets and reconnects, capacitor checks, detection of absence or presence of voltage, and for continuity, connections or basic wiring checks.	**113** 
		Simultaneous voltage and continuity checks: Vcheck LoZ low impedance function allows users to check voltage and continuity simultaneously.	

Meters designed for the way you work.

Models	Advanced meters			Specialty meters			
	289	287	87 V	87V EX	88V	28 II	27
Basic features							
Counts	50000	50000	20000	20000	20000	20000	600
True-rms readings	ac+dc	ac+dc	ac	ac	ac	ac	
Basic dc accuracy	0.025 %	0.025 %	0.05 %	0.05 %	0.1 %	0.05 %	0.1
Wide bandwidth	100 kHz	100 kHz	20 kHz	20 kHz	5 kHz	20 kHz	30 k
Auto/manual ranging	•/•	•/•	•/•	•/•	•/•	•/•	•/
Digits	4½	4½	4½	4½	4½	4½	3½
ATEX II 2G Eex ia IICT4 safety rating Zone 1 and Zone 2				•			
Measurements							
Voltage ac/dc	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000
Current ac/dc	10 A	10 A	10 A	10 A	10 A	10 A	10
Resistance	500 MΩ	500 MΩ	50 MΩ	50 MΩ	50 MΩ	50 MΩ	50 M
Frequency	1 MHz	1 MHz	200 kHz	200 kHz	200 kHz	200 kHz	200
Capacitance	50,000 µF	50,000 µF	10,000 µF	10,000 µF	10,000 µF	10,000 µF	10,00
Temperature	(+) 1350 °C	(+) 1350 °C	(+) 1090 °C	(+) 1090 °C	(+) 1090 °C	(+) 1090 °C	
dB	60 dB	60 dB					
Conductance	50 nS	50 nS	60 nS	60 nS	60 nS	60 nS	60
Duty cycle/pulse width	•/•	•/•	•/–	•/–	•/–	•/–	•/
Continuity/diode test	•	•	•	•	•	•	•
Motor Drive (ASD) measurements	•		•	•		•	
RPM					•		
VoltAlert™, non-contact voltage detection							
VCHEK™							
LoZ: low input impedance	•						
Lo Ohms	•						
Microamps	•	•	•	•	•	•	•
Display							
Removable wireless remote display							
Dot matrix display	•	•					
Dual display	•	•					
Analog bargraph	•	•	•	•	•	•	•
Backlight	Two level	Two level	Two level	Two level	Two level	Two level	Two l
Graphical trend display	•	•					
Diagnostics and data							
Min Max recording/with time stamp	•/•	•/•	•/–	•/–	•/–	•/–	•/
Fast Min Max	250 µs	250 µs	250 µs	250 µs	250 µs	250 µs	
Display Hold/Auto (Touch) Hold	•/•	•/•	•/•	•/•	•/•	•/•	•/
Relative reference	•	•	•	•	•	•	•
Stand alone logging	•	•					
Trend Capture	•	•					
Readings memories	10,000	10,000					
USB interface	•	•					
Other features							
Automatic selection, ac/dc volts							
Real time clock	•	•					
Overmolded case, integrated holster	•	•					
Removable holster			•	•	•	•	•
Closed case calibration	•	•	•	•	•	•	•
Separate battery/fuse access	•/•	•/•	•/–	•/–	•/–	•/–	•/
Completely sealed/watertight						•	•
Automatic power off	•	•	•	•	•	•	•
Low battery indication	•	•	•	•	•	•	•
Operating temperature range	-20 °C ,+55 °C	-20 °C ,+55 °C	-20 °C ,+55 °C	-20 °C ,+55 °C	-20 °C, +55 °C	-40 °C ,+55 °C	-40 °C ,
Warranty and electrical safety							
Warranty (years)	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime	Lifeti
Input alert	•	•	•	•	•	•	•
Dangerous voltage indication	•	•	•	•	•	•	•
IP Rating	IP 42	IP 42	IP 30	IP 44	IP 30	IP 67	IP 6
EN61010-1 CAT III	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000
EN61010-1 CAT IV	600 V	600 V	600 V	600 V	600 V	600 V	600

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		General purpose meters		Compact meters				
II	233	179	77 IV	117	116	115	114	113
00	20000	6000	6000	6000	6000	6000	6000	6000
	ac	ac		ac	ac	ac	ac	ac
%	0.25 %	0.09 %	0.3 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %
Hz								
•	•/•	•/•	•/•	•/•	•/•	•/•	•/•	•/•
½	3½	3½	3½	3½	3½	3½	3½	3½
0 V	1000 V	1000 V	1000 V	600 V	600 V	600 V	600 V	600 V
A	10 A	10 A	10 A	10 A	600 µA	10 A		
MΩ	40 MΩ	50 MΩ	50 MΩ	40 MΩ	40 MΩ	40 MΩ	40 MΩ	60 kΩ
kHz	50 kHz	100 kHz	100 kHz	50 kHz	50 kHz	50 kHz		
0 µF	10,000 µF	10,000 µF	10,000 µF	10,000 µF	10,000 µF	10,000 µF		10,000 µF
	(+) 400 °C	(+) 400 °C			(+) 400 °C			
nS								
–								
	•	•	•	•	•	•	•	•
				•				
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	•							
		•	•	•	•	•	•	•
evel	•	•	•	•	•	•	•	•
–	•/–	•/–	•/–	•/–	•/–	•/–	•/–	•/–
•	•/•	•/•	•/•	•/–	•/–	•/–	•/–	•/–
				•	•	•	•	•
	•	•	•					
				•	•	•	•	•
	•	•	•	•	•	•	•	•
–	•/–	•/–	•/–	•	•	•	•	•
	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•
+55 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C	-10 °C, +50 °C
me	Three	Lifetime	Lifetime	Three	Three	Three	Three	Three
	•	•	•	•	•	•	•	•
67				IP 42	IP 42	IP 42	IP 42	IP 42
0 V	1000 V	1000 V	1000 V	600 V	600 V	600 V	600 V	600 V
0 V	600 V	600 V	600 V					300 V

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