

Safety information for Digital Volt Meters (DVMs)

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1. Symbols used on DVMs and in manuals

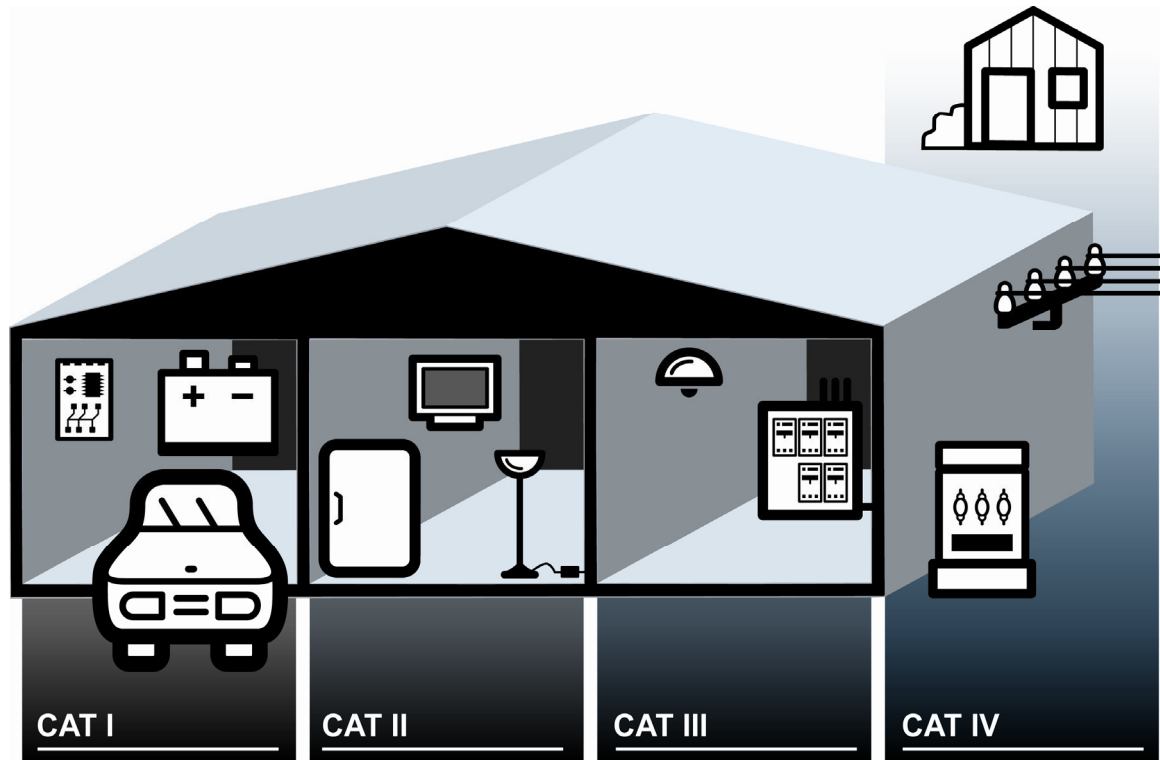
	This symbol indicates: Read instructions Not reading the instructions and manual can lead to damage, injury or death.
	This symbol indicates: Danger A hazardous condition or action that may result in injury or death
	This symbol indicates: Risk of danger/damage Risk of a hazardous condition or action that may result in damage, injury or death
	This symbol indicates: Attention; important information Ignoring this information can lead to hazardous situations.
	AC (Alternating Current)
	DC (Direct Current)
	Both AC and DC
	Double insulation (class II-protection)
	Earth
	Fuse
	Capacitor
	Diode
	Continuity

2. Overvoltage/installation categories

DVMs are categorized depending on the risk and severity of transient overvoltage that might occur at the point of test. Transients are short-lived burst of energy induced in a system, e.g. caused by lightning strike on a power line.

On high-energy circuits this leads to hazardous situations as these circuits might provide enough current to feed an arc-over resulting in a plasma breakdown or even explosion.

Higher CAT-identification refers to electrical environments with higher power and possibly higher energy transients.



A CAT I-rated meter is suitable for measurements on protected electronic circuits that are not directly connected to mains power, e.g. electronics circuits, control signals...

A CAT II-rated meter is suitable for measurements in CAT I-environments and mono-phase appliances that are connected to the mains by means of a plug and circuits in a normal domestic environment, provided that the circuit is at least 10m apart from a CAT III- or 20m apart from a CAT IV-environment. E.g. household appliances, portable tools...

A CAT III-rated meter is suitable for measurements in CAT I- and CAT II-environments, as well as for measurements on (fixed) mono- or poly-phased appliances which are at least 10m apart from of a CAT IV-environment, and for measurements in or on distribution level equipment (fuse boxes, lighting circuits, electric ovens).

A CAT IV-rated meter is suitable for measuring in CAT I-, CAT II- and CAT III-environments as well as on the primary supply level. Note that for all measurements on equipment for which the supply cables run outdoors (either overhead or underground) a CAT IV meter **must** be used.

3. Pollution degree

IEC 61010-1 specifies different types of pollution environments, for which different protective measures are necessary to ensure safety. Harsher environments require more protection, and the protection against the pollution which is to be found in a certain environment depends mainly on the insulation and the enclosure properties. The pollution degree rating of the DVM indicates in which environment the device may be used.

Pollution degree 1	No pollution or only dry, nonconductive pollution occurs. The pollution has no influence. (only to be found in hermetically sealed enclosures)
Pollution degree 2	Only nonconductive pollution occurs. Occasionally, temporary conductivity caused by condensation is to be expected.(home and office environments fall under this category)
Pollution degree 3	Conductive pollution occurs, or dry nonconductive pollution occurs that becomes conductive due to condensation that is to be expected. (industrial environments and environments exposed to outside air - but not in contact with precipitation)
Pollution degree 4	The pollution generates persistent conductivity caused by conductive dust or by rain or snow. (exposed outdoor environments and environments where high humidity levels or high concentrations of fine particles occur)

4. General



Warning - Caution

- Disconnect the test leads from the test points before changing the position of the function (rotary) switch.
- Disconnect the test leads from the test points and remove the test leads from the measuring terminals before replacing the batteries/fuses, or servicing the DVM.
- **WARNING:** To avoid electrical shock **always** disconnect the test leads prior to opening the housing. To prevent damage or injury, only use batteries and fuses with the same ratings as specified in this manual.
- Never connect a voltage source with the function (rotary) switch in Ω / $\rightarrow+$ / \bullet) / \sim μ A / \sim mA / \sim A / Hz / Hfe or $^{\circ}$ C/ $^{\circ}$ F position.
- **Caution:** risk of electroshock when measuring voltages > 36VDC, 25VAC, currents > 10mA, AC power lines with inductive loads and AC power lines with fluctuating power.
- **Avoid** body contact with ground potential (e.g. metallic terminals, output sockets, lead clamp...) while measuring. Make sure to be electrically insulated from ground during measurement.
- **Always** use the device within its specified range.
- **Only** use the included test leads. When damaged, replace them with test leads of the same type and with the same specifications.
- Calibration and repair must be performed by a qualified technician. Refer to your local dealer.
- Do not expose the DVM to extreme temperature or humidity levels.