



User Manual

Digital Multimeter PCE-DM 5



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: www.pce-instruments.com

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1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Remove the batteries if the meter will not be used for more than 60 days.
- Turn off the meter when not in use.
- When making a resistance measurement, make sure the sample does not carry any voltage.
- Make your settings before connecting the test leads.
- When measuring voltages, do not select the resistance or current measuring function.
- Do not measure current when the sample carries more than 600 V.
- Remove the test leads before changing the measurement range.
- Remove the test leads when replacing the batteries or the fuse.
- Exercise special caution when making measurements above 25VAC RMS or 35VDC to avoid electric shocks.
- Capacitors must be discharged before every measurement.
- When making a resistance measurement or diode test, make sure the sample does not carry any voltage.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.



2 Introduction

The digital multimeter PCE-DM 5 is a versatile meter. The digital multimeter can be used for a huge number of measuring tasks. Current, voltage, capacitance, frequency and resistance can be measured easily. The digital multimeter PCE-DM 5 can also be used for temperature measurements as well as diode and continuity tests.

2.1 Lieferumfang

1x multimeter PCE-DM 5

2x test leads

1x TP01 thermocouple

2x AAA battery

1x user manual

3 Specifications

3.1 Measuring parameters

Measuring function	Measurement range	Accuracy of reading (value + digits)	Resolution
AC voltage	6 V 60 V 600 V	$\pm(0.8\% + 6)$ $\pm(0.8\% + 6)$ $\pm(1.0\% + 6)$	1 mV 10 mV 100 mV
DC voltage	600 mV 6 V 60 V 600 V	$\pm(0.5\% + 4)$ $\pm(0.5\% + 4)$ $\pm(0.5\% + 4)$ $\pm(1.0\% + 4)$	0.1 mV 1 mV 10 mV 100 mV
AC current	600 μ A 6000 μ A 60 mA 600 mA 6 A 10 A	$\pm(1.5\% + 5)$ $\pm(1.5\% + 5)$ $\pm(1.5\% + 5)$ $\pm(1.5\% + 5)$ $\pm(1.5\% + 5)$ $\pm(2.0\% + 10)$	0.1 μ A 1 μ A 10 μ A 100 μ A 1 mA 10 mA
DC current	600 μ A 6000 μ A 60 mA 600 mA 6 A 10 A	$\pm(1.0\% + 5)$ $\pm(1.0\% + 5)$ $\pm(1.0\% + 5)$ $\pm(1.0\% + 5)$ $\pm(1.0\% + 5)$ $\pm(2.0\% + 5)$	0.1 μ A 1 μ A 10 μ A 100 μ A 1 mA 10 mA
Resistance measurement	600 Ω 6 k Ω 60 k Ω 600 k Ω 6 M Ω 60 M Ω	$\pm(0.8\% + 5)$ $\pm(0.8\% + 1)$ $\pm(0.8\% + 1)$ $\pm(0.8\% + 1)$ $\pm(0.8\% + 1)$ $\pm(1.2\% + 5)$	0.1 Ω 1 Ω 10 Ω 100 Ω 1 k Ω 10 k Ω

Capacitance	60 nF	$\pm(2.5 \% + 6)$	10 pF
	600 nF	$\pm(2.5 \% + 5)$	100 pF
	6 μ F	$\pm(2.5 \% + 5)$	1 nF
	60 μ F	$\pm(2.5 \% + 5)$	10 nF
	600 μ F	$\pm(5.0 \% + 8)$	100 nF
	6 mF	$\pm(5.0 \% + 8)$	1 μ F
	60 mF	$\pm(5.0 \% + 8)$	10 μ F
Frequency	10 Hz	$\pm(0.5 \% + 4)$	0.01 Hz
	100 Hz	$\pm(0.5 \% + 4)$	0.1 Hz
	1000 Hz	$\pm(0.5 \% + 4)$	1 Hz
	10 kHz	$\pm(0.5 \% + 4)$	10 Hz
	100 kHz	$\pm(0.5 \% + 4)$	100 Hz
	1 MHz	$\pm(0.5 \% + 4)$	1 kHz
	10 MHz	$\pm(0.5 \% + 4)$	10 kHz
Temperature measurement	-40 °C ... 1000 °C	$<400\text{ °C} \pm (1.0 \% + 5)$ $\geq 400\text{ °C} \pm (1.5 \% + 15)$	1 °C
	0 °F ... 1832 °F	$<750\text{ °F} \pm (1.0 \% + 5)$ $\geq 750\text{ °F} \pm (1.5 \% + 15)$	1 °F

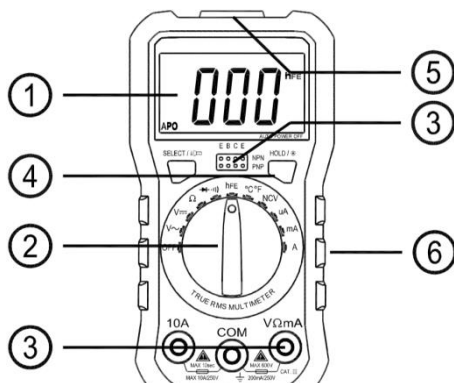
The accuracies are based on an assumed environmental temperature of 23 °C (± 5 °C) and a relative humidity of max. <75 % RH.

3.2 Further specifications

LCD	Max. value 6000 (3 % digits)
Operating conditions	0 ... 40 °C, <80 % RH
Storage conditions	-10 ... 50 °C, <80 % RH
Power supply	2 x 1.5 V AAA batteries
Dimensions (L x B x H)	140 x 72 x 37 mm
Weight	195 g

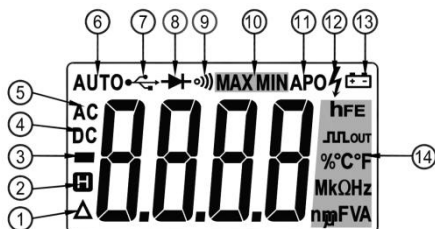
4 Device

1. Display
2. Rotary function switch
3. Interfaces
4. Keys
5. Sensor voltage detection
6. Cover





4.1 Display

1. Relativ value (REL)
2. Reading held (HOLD)
3. Negative value
4. DC voltage / DC current
5. AC voltage / current
6. Auto range
7. Not available
8. Diode test
9. Continuity test
10. Not available
11. Auto Power Off function
12. High voltage
13. Battery icon
14. Units



4.2 Rotary function switch

Select the desired measuring function or the measurement range for the current measurement with the rotary function switch.


Switch position	Function
V~	AC voltage measurement - press SELECT to choose frequency or duty cycle.
V=	DC voltage measurement
Ω	Resistance measurement
	Diode / continuity test
	Capacitance measurement
Hz	Frequency measurement - press SELECT to enter duty cycle measurement mode.
°C/°F	Temperature measurement – press SELECT to switch between degrees Centigrade and degrees Fahrenheit.
NCV	Non-contact voltage detection
μ A	DC current measurement (0 μ A ... 6000 μ A) - press SELECT to enter AC current measurement mode (0 μ A ... 6000 μ A).
mA	DC current measurement (0 mA ... 600 mA) - press SELECT to enter AC current measurement mode (0 mA ... 600 mA).
A	DC current measurement (0 A ... 10 A) - press SELECT to enter AC current measurement mode (0 A ... 10 A).

4.3 Interfaces

Interface	Function
10 A	Input for current measurement 0 ... 10 A. (at 10 A max. 10 s.).
V Ω mA	Input for voltage, resistance, diode, continuity and temperature. Current measurement 0 μ A ... 600 mA. (Max. 18 h below 600 mA)
COM	Negative interface for all measurements

4.4 Keys


SELECT/ key:

- To make a current measurement, press SELECT to switch between AC and DC current measurement. When diode or continuity test is selected by the rotary function switch, you can switch functions with the SELECT key. When making a temperature measurement, you can change the unit with the SELECT key. When "AC current" is selected with the rotary function switch, press SELECT to switch between frequency and duty cycle.
- When the meter is not used for 15 minutes, it will go to standby mode automatically. One minute before power off, a sound (repeated 5x) will signalise that the meter will turn off soon. Press any key or turn the rotary function switch to abort the switch-off.
- Press SELECT to exit standby mode. To deactivate the Auto Power Off function, press and hold the SELECT key when powering on the meter. When the meter is turned on the next time, the function will be active again.
- Torch function: Press and hold the SELECT/ key for more than 2 s to activate the torch function. Press and hold the same key again to turn off the torch.

RANGE/REL key:

- When the meter is powered on, Auto Range will be activated and "Auto" will be displayed. Press RANGE to enter Manual Range mode. Press the RANGE key repeatedly until you have reached the desired measurement range selectable for the measuring function. Press and hold the RANGE key for more than 2 s to go back to Auto Range mode.
- In the capacitance measuring function, press the REL key to view relative readings. A triangle will be displayed. Press the REL key again to leave this mode.

HOLD/Light key:

- HOLD: Press the HOLD key to hold ("freeze") the currently shown value in the display. "H" will be displayed. Press HOLD again to turn off this function.
- Light: Press and hold the HOLD key for more than 2 s to turn on the backlight. The backlight will turn off automatically after 15 s. You can also turn off the backlight earlier by pressing and holding the HOLD key again.

5 Operation

5.1 DC voltage

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select "V" = DC voltage measurement with the rotary function switch and set a resolution with the RANGE key if required.
- Touch the sample with the measuring tips. The display will show the polarity and voltage.

Notes:

- When "OL" is displayed in Manual Range mode, the measurement range must be increased.
- Do not measure any voltages above 600 V as these can damage the meter!
- Be careful when measuring high voltages. Do not touch the circuit.

5.2 AC voltage

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select "V" = AC voltage measurement with the rotary function switch and set a resolution with the RANGE key if required.
- Touch the sample with the measuring tips. The display will show the polarity and voltage.

Notes:

- When "OL" is displayed in Manual Range mode, the measurement range must be increased.
- Do not measure any voltages above 600 V as these can damage the meter!
- Be careful when measuring high voltages. Do not touch the circuit.

5.3 DC current

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack (max. 600 A) or to the 10 A input jack.
- Select " μ A", "mA" or "A" for DC current measurement with the rotary function switch and set a resolution with the RANGE key if required.
- Touch the sample with the measuring tips. The display will show the current.

Notes:

- If you are not sure what measurement range to choose, select the highest option and proceed in line with the reading.
- When "OL" is displayed in Manual Range mode, the measurement range must be increased.
- The maximum measurable current is 600 mA or 10 A – depending on the inputack the red test lead has been connected to! Higher currents destroy the fuse and can damage the meter.


5.4 AC current

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack (max. 200 mA) or to the 10 A input jack.
- Select the right measurement range for current measurement with the rotary function switch. Press the SELECT key to select current measurement and set the desired resolution with the RANGE key if required.
- Touch the sample with the measuring tips. The display will show the current.

Notes:

- If you are not sure what measurement range to choose, select the highest option and proceed in line with the reading.
- When "OL" is displayed in Manual Range mode, the measurement range must be increased.
- The maximum measurable current is 200 mA or 10 A – depending on the input jack the red test lead has been connected to! Higher currents destroy the fuse and can damage the meter.


5.5 Resistance

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select the " " position with the rotary function switch. Press the SELECT key to choose the resistance measuring function and choose a resolution with the RANGE key if required.

Notes:

- If you are not sure what measurement range to choose, select the highest option and proceed in line with the reading.
- When "OL" is displayed in Manual Range mode, the measurement range must be increased.
- Before measuring a resistance in a circuit, make sure that no voltage is present and that all capacitors are discharged.
- In resistance measuring mode, do not apply any voltage to the measuring input!

5.6 Capacitance

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select " " with the rotary function switch.
- Connect the capacitor to the meter. Observe correct polarity.

Notes:

- In capacitance measuring mode, do not apply any voltage to the measuring input!
- Before making a measurement, make sure that the capacitor is completely discharged.
- Only Auto Range mode is possible when making a capacitance measurement.

5.7 Frequency

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select "Hz" with the rotary function switch.
- Connect the meter to the signal source.
- Press the SELECT key to switch between frequency and duty cycle.

Notes:



- Only Auto Range mode is possible when making a frequency measurement.
- If the input voltage is above 10 V (AC, RMS), choose AC voltage measurement and select frequency or duty cycle.
- When you are in frequency mode, do not measure any voltages above 250 V AC/DC. Otherwise, the meter can be damaged.

5.8 Non-contact voltage detection (NCV)

Note: This measurement can be affected by lots of different external interfering sources which means that the meter will also react when it receives false signals. This function is only for orientation and should not be the only way to detect voltage

- Select "NCV" with the rotary function switch. When you come closer to a voltage or signal, the meter will display the signal strength and emit an audible alarm.

5.9 Diode and continuity test

- Connect the black plug to the COM input jack and the red plug to the V Ω mA input jack.
- Select the "" position with the rotary function switch. Press the SELECT key to choose diode or continuity.
- Forward direction measurement: Connect the red test lead to the positive side and the black test lead to the negative side of the diode. The display will show the dropping forward voltage.
- Backward direction measurement: Connect the red test lead to the negative side and the black test lead to the positive side of the diode. "OL" will be displayed.
- If you do not get the mentioned results, this means that the diode is defective.
- Press the SELECT key to choose continuity test.
- Touch two spots in the circuit with the measuring tips. When the resistance is below 50 Ω , a buzzer can be heard.
- **Note:** Do not measure voltages when the rotary function switch is in "" position. Make sure that no voltage is present in the circuit!

5.10 Temperature

- Select “°C/°F” with the rotary function switch. Press the SELECT key to select the unit.
- Connect the red plug of the thermoelectric lead to the VΩmA input jack and the black plug to the COM input jack.
- Touch the sample with the other end of the thermoelectric lead.
- Wait for the temperature value to stabilise.

Note:

- If no temperature sensor is connected, the meter will display the environmental temperature.
- Do not measure any voltages in temperature measuring mode.

6 Maintenance

6.1 Battery replacement

When the battery icon appears, replace the battery as follows:

- Loosen the screw of the battery compartment cover at the rear side of the meter.
- Open the battery compartment cover and replace the battery by a new one.
- Close the battery compartment cover and tighten the screw.

6.2 Fuse

The interfaces of the meter are secured with a fuse. When a fuse is defective, this is most likely due to misuse of the meter. The fuse may only be replaced by qualified technical staff. Before opening the case to replace a fuse, make sure that all test leads have been removed. Only replace the fuses by fuses of the same type:

Fuse 1: F10 A / 250 V

Fuse 2: F600 mA / 250 V

6.3 Cleaning

Clean the meter with a damp cotton cloth and a mild cleaning agent. Do not use any abrasives or solvents.



7 Warranty

You can read our warranty terms in our General Business Terms which you can find here: <https://www.pce-instruments.com/english/terms>.

8 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.



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