English

User Manual

Digital Multimeter PCE-HDM 7

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Contents

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.

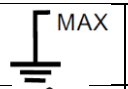
- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not use the meter during thunderstorms.
- Do not expose the device to shocks or strong vibrations. Dropping it can damage the electronic parts or the case.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet. Keep the meter dry.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Do not use chemicals, cleaning solvents or detergents.
- 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 on the meter or its test leads, do not use the device.
- Do not use the meter if it operates incorrectly. Protection may be compromised.
- Do not operate meter while Low Battery warning is on. Replace batteries immediately.
- Use only new batteries of the recommended size and type. Remove old or weak batteries to avoid leakage and damage to the meter.
- If the meter is not used for a longer period of time, remove the batteries.
- Do not use the instrument in explosive atmospheres or near explosive vapours, dust or gases.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Ensure that the test leads are fully seated in the input jacks and keep your fingers away from the metal probe tips when taking measurements.
- Before changing functions using the selector switch, always disconnect the test leads from the circuit under test.
- Use only UL listed test leads with the proper safety category rating.
- Comply with all applicable safety codes. Use approved personal protective equipment when working near live electrical circuits-particularly when there is arc-flash hazard.
- Use caution on live circuits. Voltages above 30 V AC RMS, 42 V AC peak, or 60 V DC pose a shock hazard.
- Verify functionality before using meter by measuring a known live voltage.
- Do not apply voltage or current that exceeds the meter's maximum rated input limits.
- 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.

1.1 International safety symbols

	Indicates the terminal(s) so marked must not be connected to a circuit where the voltage with respect to earth ground exceeds the maximum safety rating of the meter.
	This symbol can appear next to another symbol or connection and indicates the user must refer to the manual for important safety information.
	Indicates hazardous voltages may be present.
	Equipment is protected by double or reinforced insulation.

1.2 Input limits

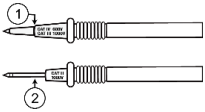
Function	**Maximum input**
Voltage AC or DC	600 V AC RMS / 600 V DC
Low Z	300 V AC RMS / 300 V DC
Current AC or DC	10 A 600 V fast acting fuse (10 A for 30 seconds max. every 15 minutes)
Resistance, continuity, diode test, capacitance, frequency, duty cycle	600 V AC RMS / 600 V DC
Temperature	300 V AC RMS or 300 V DC

1.3 Safety category ratings

Category rating	Brief description	Typical applications
Cat II	Single phase receptacles and connected loads	• Household appliances, power tools • Outlets more than 30 ft (10 m) from a Cat III source • Outlets more than 60 ft (20 m) from a Cat IV source
Cat III	Three phase circuits and single phase lighting circuits in commercial buildings	• Equipment in fixed installations such as 3-phase motors, switchgear and distribution panels • Lighting circuits in commercial buildings • Feeder lines in industrial plants • Any device or branch circuit that is close to a Cat III source

The measurement category (CAT) rating and voltage rating is determined by a combination of the meter, test probes and any accessories connected to the meter and test probes. The combination rating is the LOWEST of any individual component.

WARNING: Operation is limited to CAT II applications when the insulated tips are removed from one or both test probes. Refer to the input limits section in this manual for maximum voltage ratings.



1 – Insulated tip on

2 – Insulated tip removed

2 Specifications

Insulation	Class 2, double insulation
Case	Double molded, IP 67 waterproof and dust-proof
Diode test	Test current max. 1.5 mA, open circuit voltage 3 V typical
Continuity test	Audible signal if the resistance is approx. 50 or less
Low battery indication	“  ” is displayed
Display	4000 count LCD
Overrange indication	“OL” is displayed
Polarity	Minus symbol “-“ is displayed for negative polarity
Measurement rate	2 readings per second, nominal
Auto Power Off	After approx. 15 minutes of inactivity
Input impedance	10 MΩ AC/DC voltage
AC response	True RMS
AC bandwidth	50 … 400 Hz
Batteries	3 x 1.5 V AAA batteries
Fuse	10 A / 600 V (5 x 20 mm) fast blow
Operating conditions	0 … 40 °C / 32 … 104 °F <70 % RH
Storage conditions	-10 … 60 °C / 14 … 140 °F <80 % RH
Operating altitude	Max. 2000 m
Dimensions	147 x 68 x 50 mm
Weight	318 g
Safety	Complies with UL 61010-1 V.3 for measurement category lll 600 V, pollution degree 2

Accuracy is given at 18 … 28 °C (65 … 83 °F), ≤70 RH.

Function	Range	Resolution	Accuracy ±(% of reading + digits)
AC voltage	4.000 V	1 mV	±(1.0 % + 5)
	40.00 V	10 mV	±(1.2 % + 5)
	400.0 V	0.1 V	±(1.5 % + 5)
	600 V	1 V	

Input protection: 600 V DC or 600 V AC RMS
Input impedance: 10 M

AC Response: 50 … 60 Hz

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Low Z AC voltage	4.000 V	1 mV	±(1.5 % +5)
	40.00 V	10 mV	
	40.00 V	0.1 V	

All AC voltage ranges are specified from 5 % of range to 100 % of range
Input protection: 300 V AC RMS or 300 V DC
Input impedance: approx. 3 kΩ

AC Response: 50 … 60 Hz

Function	Range	Resolution	Accuracy ±(% of reading + digits)
DC voltage	400.0 mV	0.1 mV	±(1.0 % + 8)
	4.000 V	1 mV	±(1.0 % + 3)
	40.00 V	10 mV	
	400.0 V	0.1 V	
	600 V	1 V	±(1.2 % + 3)

Input protection: 600 V DC or 600 V AC RMS
Input impedance: 10 M

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Low Z DC voltage	400.0 mV	0.1 mV	±(1.5 % + 5)
	4.000 V	1 mV	
	40.00 V	10 mV	
	400.0 V	0.1 V	

Input protection: 300 V AC RMS or 300 V DC
Input impedance: approx. 3k

Function	Range	Resolution	Accuracy ±(% of reading + digits)
AC current	4.000 A	1 mA	±(2.5 % + 3)
	10.00 A	10 mA	

Overload protection: 10 A/600 V fuse
AC response: 50 … 60 Hz

Function	Range	Resolution	Accuracy ±(% of reading + digits)
DC current	4.000 A	1 mA	±(2.0 % + 3)
	10.00 A	10 mA	

Overload protection: 10 A/600 V fuse

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Resistance	400.0 Ω	0,1 Ω	±(1.5 % + 5)
	4.000 kΩ	1 Ω	
	40.00 kΩ	10 Ω	
	400.0 kΩ	100Ω	
	4.000 MΩ	1 kΩ	±(2.0% +10)
	40.00 MΩ	10 kΩ	

Input protection: 600 V AC RMS or 600 V DC

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Capacitance	40.00 nF	10 pF	±(5.0 % + 35)
	400.0 nF	100 pF	±(3.0 % + 5)
	4.000 µF	0.001 µF	
	40.00 µF	0.01 µF	
	400.0 µF	0.1 µF	
	4000 µF	1 µF	±(5.0 % + 5)

Input protection: 600 V AC RMS or 600 V DC

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Frequency	9.999 Hz	0.001 Hz	±(1.0 % + 5)
	99.99 Hz	0.01 Hz	
	999.9 Hz	0.1 Hz	
	9.999 kHz	1 Hz	
	99.99 kHz	10 Hz	
	999.9 kHz	100 Hz	±(1.2 % + 5)
	9.999 MHz	1 kHz	

Input protection: 600 V AC RMS or 600 V DC
Sensitivity: >8V RMS

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Duty cycle	1.0 … 99.9 %	0.1 %	±(1.2 % + 2)

Input protection: 600 V AC RMS or 600 V DC
Pulse width: 0.1 … 100 mS
Frequency range: 5Hz … 10kHz
Sensitivity: >8 V RMS

Function	Range	Resolution	Accuracy ±(% of reading + digits)
Temperature	-18 … 760 °C	0.1 °C	±(2.0 % + 5 °C)
	0 … 1400 °F	0.1 °F	±(2.0 % + 9 °F)

Input protection: 300 V AC RMS or 300 V DC

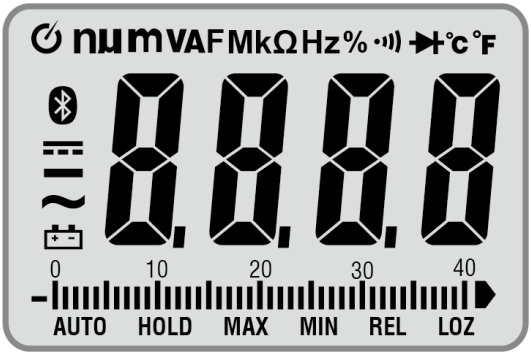
3 Device description

Meter

1- LCD
2- MAX/MIN button
3- MODE button
4- Rotary function switch
5- 10 A input jack
6- COM input jack
7- V/Ω/⏚/))) /CAP Hz%/Temp input jack
8- HOLD/Backlight button
9- Bluetooth/Flashlight button
10- Flashlight

Display

V	Volts
A	Amperes
~	Alternating current
⎓	Direct current
-	Negative reading
Hz	Hertz (frequency)
%	Percent (duty cycle)
Ω	Resistance
•))	Continuity
⊣▶	Diode test
F	Farads (capacitance)
N	Nano (10-9)
° F	Degrees Fahrenheit
° C	Degrees Centigrade
µ	Micro (10-6)
M	Milli (10-3)
k	Kilo (103)
M	Mega (106)
OL	Overload
	Auto Power Off
	Low battery
AUTO	Autoranging
HOLD	Display hold
LOZ	Low Z (impedance)
MAX/MIN	Maximum/Minimum
	Bluetooth



3.1 Delivery contents

1 x multimeter PCE-HDM 7
1 x test lead
1 x storage bag
1 x K-type thermocouple
1 x temperature adaptor
1 x user manual
2 x AAA 1.5 batteries
1 x seal

4 On / off

To switch on the device, turn the rotary switch to the desired measuring function. The meter will power on immediately. To turn off the meter, turn the rotary function switch to “OFF”. The meter will switch off automatically.

5 Measuring functions

5.1 AC/DC voltage measurements

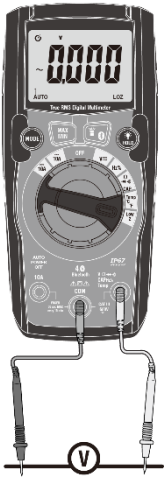
WARNING: Observe all safety precautions when working on live voltages.

1. Set the rotatory function switch to the V ⎓ position.
2. To select AC or DC voltage, press the MODE-button until the AC “~” or DC “ ⎓ ”symbol appears on the LCD.
3. Insert the black test lead into the COM input jack and the red test lead into the V input jack.
4. Touch the test lead probes to the circuit under test. If measuring DC voltage, touch the red test lead to the positive side of the circuit and the black test lead to the negative side of the circuit.
5. Read the voltage on the display.

5.2 Low Z AC/DC voltage measurements

WARNING: Observe all safety precautions when working on live voltages. Do not connect to circuits that exceed 300 V AC RMS or 300 V DC when the meter is set to Low Z.

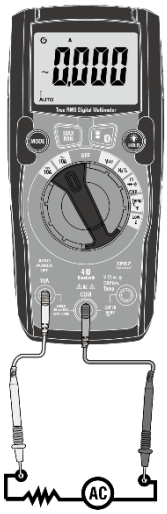
Low Z is used to check for “ghost” voltage. Ghost voltages are present when non-powered wires are in close proximity to powered wires. Capacitive coupling makes it appear that non-powered wires are connected to a real source of voltage. The Low Z setting places a load on the circuit, which greatly reduces the voltage reading when connected to ghost voltage.



1. Set the rotary function switch to the Low Z position.
2. To select AC or DC voltage, press the MODE button until the AC “~” or DC “ ⎓ ” symbol appears on the LCD.
3. Insert the black test lead into the COM input jack and the red test lead into the V input jack.
4. Touch the test leads to the circuit under test. If measuring DC voltage, touch the red test lead to the positive side of the circuit and the black test lead to the negative side of the circuit.
5. Read the voltage on the LCD.

5.3 AC current measurements

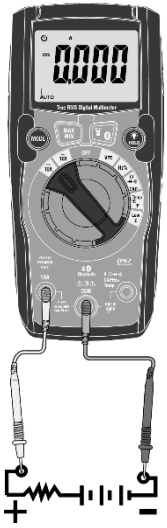
WARNINGS: Observe all safety precautions when working on live circuits. Do not measure current on circuits that exceed 600 V. Measurements in the 10 A range should be limited to 30 seconds maximum every 15 minutes.



1. Set the rotary function switch to the 10 A~ position.
2. Insert the black test lead into the COM input-jack and the red test lead into the 10 A input jack.
3. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
4. Touch the test lead probes in series with the circuit being measured.
5. Apply power to the circuit.
6. Read the current on the LCD.

5.4 DC current measurements

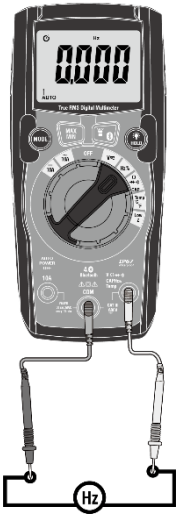
WARNINGS: Observe all safety precautions when working on live circuits. Do not measure current on circuits that exceed 600 V. Measurements in the 10 A range should be limited to 30 seconds maximum every 15 minutes.



1. Set the rotary function switch to the 10 A position.
2. Insert the black test lead into the COM input jack and the red test lead into the 10 A input jack.
3. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
4. Touch the test lead probes in series with the circuit being measured. Touch the red probe to the positive side of the circuit and touch the black probe to the negative side of the circuit.
5. Apply power to the circuit.
6. Read the current on the display.

5.5 Frequency and % duty cycle measurements

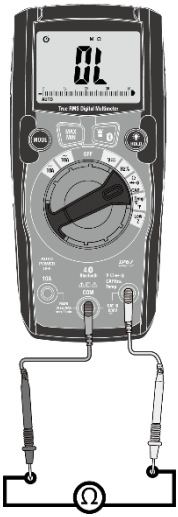
WARNING: Observe all safety precautions when working on live circuits.



1. Set the rotary function switch to the Hz % position.
2. To select Frequency or % Duty Cycle, press the MODE button until the “Hz” or “%” symbol appears on the LCD.
3. Insert the black test lead into the COM input jack and the red test lead into the V input jack.
4. Touch the test lead probes to the circuit under test.
5. Read the frequency or % duty cycle on the LCD.

5.6 Resistance measurements

WARNING: Never test resistance on a live circuit.

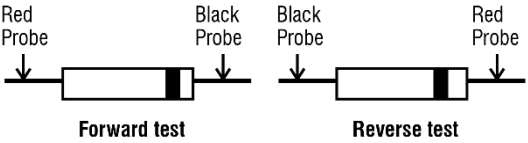


1. Set the rotary function switch to the Ω position.
2. Press the MODE button until the “Ω” symbol appears on the LCD.
3. Insert the black test lead into the COM input jack and the red test lead into the V input jack.
4. Touch the test lead probes to the component under test. If the component is installed in a circuit, it is best to disconnect one side before testing to eliminate interference with other devices.
5. Read the resistance on the display.

5.7 Diode test

WARNING: Never test diodes in a live circuit.

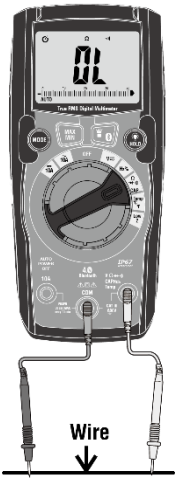
1. Set the rotary function switch to the Ω position.
2. Press the MODE button until the symbol appears on the LCD display.
3. Insert the black test lead into the COM input jack and the red test lead into the ? input jack.
4. Touch the test lead probes to the diode under test.
5. Forward voltage will indicate 0.4 to 0.7 on the display. Reverse voltage will indicate “OL”. Shorted devices will indicate near 0 and an open device will indicate “OL” in both polarities.



5.8 Continuity

WARNING: Never test continuity on a live circuit.

1. Set the rotary function switch to the Ω position.
2. Press the MODE button until the “ ” symbol appears on the display.
3. Insert the black test lead into the COM input jack and the red test lead into the Ω input jack.
4. Touch the test lead probes to the device or wire under test.
5. A beeper will sound if the resistance is approximately 50 Ω or less and the resistance value will be shown on the LCD.



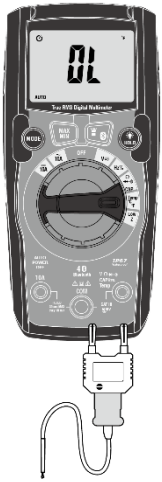
5.9 Capacitance measurements

WARNING: Safely discharge capacitors before taking capacitance measurements.

1. Set the rotary function switch to the Ω position.
2. Insert the black test lead into the COM input jack and the red test lead into the Ω input jack.
3. Press the MODE button until the “nF” symbol appears on the LCD.
4. Touch the test lead probes to the capacitor under test.
5. Read the capacitance value on the LCD. It may take up to a minute to get a stable reading on large capacitors.

5.10 Temperature measurements

WARNING: Do not touch the temperature probe to live circuits.



1. Set the rotary function switch to the °F °C position.
2. Press the MODE button to select readings in °C or °F.
3. Connect the Temperature Probe to the banana plug adaptor. Note the – and + markings on the adaptor. Connect the adaptor to the meter, making sure the – side goes into the COM input jack and the + side goes into the °F °C input jack.
4. Touch the tip of the temperature probe to the object being measured. Keep the probe touching the object until the reading stabilizes (about 30 s).
5. Read the temperature on the LCD.

6 Operation

6.1 Auto Power Off

The meter automatically turns off after 15 minutes of activity. To reset the meter after it shuts off, turn rotary function switch to the off position and then set the switch to the desired function. To disable Auto Power Off, turn the rotary function switch to the off position. Press and hold the MODE button and set the rotary function switch to the desired function. Release the MODE button when the “ ” symbol disappears from the display. Auto Power Off is now disabled. Auto Power Off will be restored when the meter is turned off and back on.

6.2 MODE button

Used to select AC or DC voltage, Hz or % duty cycle, ohms, diode Test, continuity or capacitance, and ° C and ° F.

6.3 MAX/MIN button

1. Momentarily press the MAX/MIN button to activate MAX/MIN mode. The “MAX” indicator will appear on the LCD. The meter will display and hold the maximum reading and will update when a higher “max” occurs.
2. Momentarily press the MAX/MIN button again to view the lowest reading. The “MIN” indicator will appear on the LCD display. The meter will display and hold the minimum reading and will update when a lower “min” occurs.
3. Press and hold the MAX/MIN button to end MAX/MIN mode and return to normal operation.

NOTE: MAX/MIN does not work with frequency, duty cycle, diode test, continuity and capacitance.

6.4 Bluetooth/Flashlight button

Momentarily press the Bluetooth/Flashlight button to turn the flashlight on and off. Bluetooth allows readings to be displayed and stored on mobile devices. To activate Bluetooth, press and hold the Bluetooth/Flashlight button until the “ ” symbol appears on the display. Bluetooth should be disabled when not connected to a mobile device in order to conserve battery power.

To turn off Bluetooth, press and hold the Bluetooth/Flashlight until the “ ” symbol no longer appears on the display. Use the “Meterbox Pro” app from your Android or iOS store to connect the meter to your phone..

6.5 HOLD/Backlight button

To freeze the reading on the display, momentarily press the HOLD button. “HOLD” will appear on the LCD while the reading is being held. Momentarily press the HOLD button again to return to normal operation. The backlight illuminates the LCD when the ambient light is too low to view the displayed readings. To switch on the backlight, press and hold the HOLD button until the backlight turns on. To turn it off, press and hold the HOLD button until the backlight turns off.

7 Battery and fuse replacement

Battery replacement

WARNING: To avoid electric shock, remove the test leads from the meter before removing the battery/fuse cover.

1. Lift up the tilt stand.
2. Loosen the two Phillips screws on the battery/fuse cover.
3. Remove the battery/fuse cover.
4. Replace the batteries with three AAA batteries.
5. Observe proper polarity as shown inside battery compartment.
6. Install the battery cover and tighten the screws.

WARNING: To avoid electric shock, do not operate meter until the battery/fuse cover is securely fastened to the meter.

Fuse replacement

WARNING: To avoid electric shock, remove the test leads from the meter before removing the battery/fuse cover.

1. Lift up the tilt stand.
2. Loosen the two Phillips screws on the battery/fuse cover.
3. Remove the battery/fuse cover.
4. Gently remove fuse and install new fuse into the holder.
5. Always use a UL recognized fuse of the proper size and value: 10 A/600 V (5 x 20 mm) fast blow.
6. Install the battery cover and tighten the screws.

WARNING: To avoid electric shock, do not operate meter until the battery/fuse cover is securely fastened to the meter.

8 Warranty

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

9 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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