English



User Manual

PCE-HVAC 6 Car Measuring Device

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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.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.
- Remove the batteries if the meter is not used for more than 60 days.
- Turn off the meter when not in use.
- The object to be tested must not carry any voltage when a resistance measurement is made.
- Do not use the complete measurement range.
- Before connecting the meter, make the right settings according to the test object.
- Do not make any current measurements above 600 V.
- Do not direct the lamp towards someone's eyes.

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 clamp meter PCE-HVAC 6 was developed for workers in heating, ventilation and air conditioning technology. It is the ideal clamp meter for lots of inspection and maintenance applications in these areas. The PCE-HVAC 6 is a combination of multiple gauges. With its clamp, it can measure currents up to 1000 A DC and AC. Also, voltages up to 600V AC / DC can be measured accurately. For quick and easy testing of electrical conductors, the clamp meter has a function for non-contact voltage detection.

The clamp meter can also measure resistors and capacitors. The diode test and continuity test complete the range of electrical measuring functions of the PCE-HVAC 6. As a special feature, the clamp meter has 2 measuring inputs for K-type thermocouples. With the help of these thermocouples, for example, the flow and return temperature of heating systems can be determined.

The PCE-HVAC 6 was developed for the everyday work of a service worker. The rugged plastic case withstands shocks easily. A rubber coating around the case of the PCE-HVAC 6 helps ensure that the clamp meter lies in the hand securely, even when the technician wears gloves. The display has an LED backlight which facilitates reading in dark environments.

2.1 Lieferumfang

1 x Clamp meter PCE-HVAC 6
1 x Transport bag
2 x Test leads
1 x Battery 9V block battery

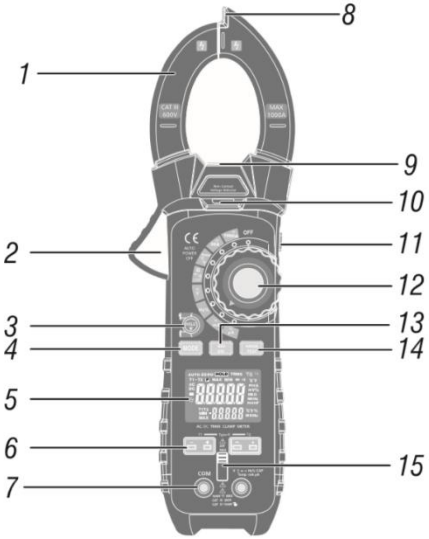
3 Technical specifications

Current measurement DC A		
Measuring range	**Resolution**	**Accuracy (of rdg.)**
500 µA	0.01 µA	± (1% + 6 digits)
5000 µA	0.1 µA	± (1% + 6 digits)
50 A	0.01A	± (2.5% + 5 digits)
1000 A	0.1 A	± (2.5% + 30 digits)
Current measurement AC A		
Measuring range	**Resolution**	**Accuracy (of rdg.)**
500 µA	0.01 µA	± (1.5% + 30 digits)
5000 µA	0.1 µA	± (1.5% + 30 digits)
50 A	0.01A	± (2.5% + 30 digits)
1000 A	0.1 A	± (2.8% + 30 digits)
Note: For AC A measurements, the specification of accuracy refers to the range of 5% to 100% of the measuring range		
Voltage measurement DC V		
Measuring range	**Resolution**	**Accuracy (of rdg.)**
500 Ω	0.01	± (1% + 9 digits)
5 kΩ	0.0001	± (1% + 5 digits)
50 kΩ	0.001	± (1% + 5 digits)
500 kΩ	0.01	± (1% + 5 digits)
5 MΩ	0.0001	± (3% + 10 digits)
50 MΩ	0.001	± (3.5% + 10 digits)

Capacitance measurement		
Measuring range	**Resolution**	**Accuracy (of rdg.))**
500 nF	0.01	± (3.5% + 40 digits)
5000 nF	0.1	± (3.5% + 10 digits)
50 µF	0.001	± (3.5% + 10 digits)
500 µF	0.01	± (3.5% + 10 digits)
5mF	0.0001	± (5% + 10 digits)
Frequency measurement		
Measuring range	**Resolution**	**Accuracy (of rdg.)**
50 Hz	0.001	± (0.3% + 2 digits)
500 Hz	0.01	± (0.3% + 2 digits)
5 kHz	0.0001	± (0.3% + 2 digits)
50 khz	0.001	± (0.3% + 2 digits)
500 kHz	0.01	± (0.3% + 2 digits)
5 Mhz	0.0001	± (0.3% + 2 digits)
10 MHz	0.001	± (0.3% + 2 digits)
Duty cycle		
Measuring range	**Resolution**	**Accuracy (of rdg.))**
5% ... 95%	0.1	± (1% + 2 digits) (from the reading)
Pulse width	100 µs ... 100 ms	
Frequency	10 Hz ... 10 kHz	
Temperature		
Measuring range	**Resolution**	**Accuracy (of rdg.))**
-100 ... 1000°C / -148 ... 1832°F	0.1	± (1% + 2.5°C / 3.5°F)
General technical data		
Conductor diameter	Max. 48 mm / 1.9 in	
Display	Two lines 50,000 digits	
Continuity test	50 ohms / <50-mA	
Diode test	0.3-mA / 2.8V DC	
Battery indicator	Battery icon when battery low	
Overrange	OL, if measuring range exceeded	
Sample rate	2 Hz	
Peak detection	>1 ms	
Thermocouple	Type K	
Fuse	500-mA ceramic quick-acting	
AC bandwidth (AC A / AC V)	50 Hz ... 400 Hz	
AC measurement	True RMS	
Operating conditions	5 ... 40°C / 41 ... 104°F, max. 80% RH at 31°C	
Storage conditions	-20 ... 60°C / -4 ... 140°F, max. 80% rh	
Power supply	9V block battery	
Automatic shutdown	After about 30 minutes	
Dimensions (W x H x D)	230 x 76 x 40 mm / 9 x 3 x 1.6 in	
Weight	315 g / <1 lb	
Safety	IEC 1010-1 (2001): EN 61010-1 (2001) CAT III 600V CAT II 1000V Degree of pollution 2	

4 System description

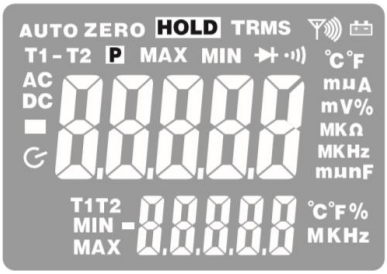
4.1 Device



1. Current clamp
2. Clamp opener
3. Backlight/HOLD key
4. MODE key
5. LCD
6. K-type thermocouple input jack
7. Test lead input jacks
8. Non-contact voltage detector
9. Lamp
10. LED indicator of NCV detector
11. Lamp/ZERO key
12. Rotary function switch
13. MAX/MIN key
14. RANGE/PEAK/thermocouple key
15. Input shutter

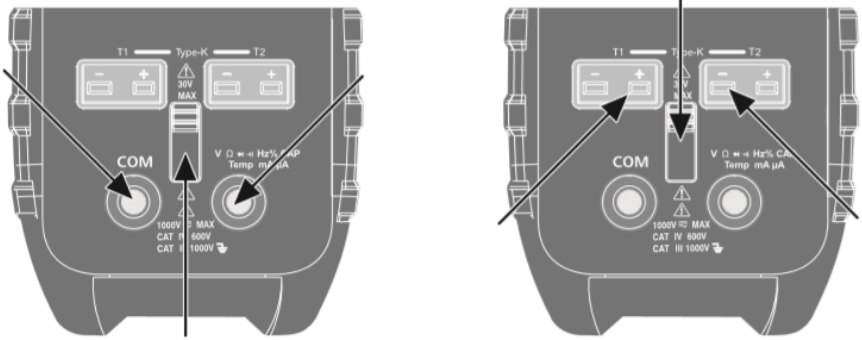
4.2 Display

HOLD	Reading held
	Auto Power Off active
AUTO	Automatic measurement range
P	Peak value held
DC	DC voltage
AC	AC voltage
MAX	Maximum reading
MIN	Minimum reading
	Low battery level
ZERO	DCA and CAP zero
mV or V	volts (voltage)
Ω	ohms (resistance)
A	amperes (current)
F	farads (capacitance)
Hz	hertz (frequency)
%	Duty cycle
°C und °F	Temperature unit
T1, T2, T1-T2	Temperature connection 1 Temperature connection 2 Temperature connection 1-2
n, m, µ, M, k	Unit prefixes
	Continuity test
	Diode test



5 Input shutter

The input shutter is a mechanical security element to prevent simultaneous connection of the thermocouples and of the test leads to avoid accidents. By moving the switch down, the input jacks for the test leads are unblocked and the jacks for the thermocouples are blocked. By moving the switch up, the input jacks for the thermocouples are unblocked and the jacks for the test leads are blocked.

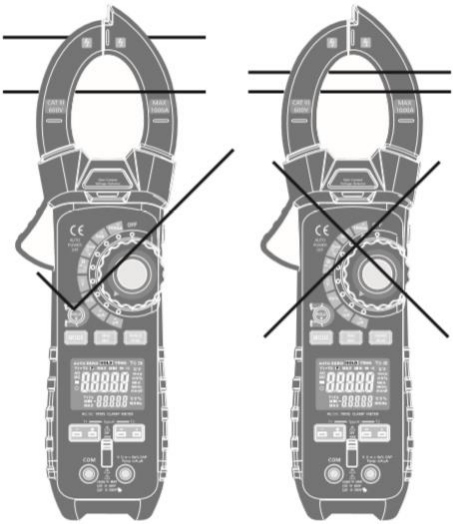


6 Non-contact voltage testing

Turn the rotary function switch to any position to switch on the meter. Now touch the test object with the measuring tip of the clamp. If the test object carries voltage, the NCV LED will glow.

7 AC/DC current measurement

To make current measurements, first remove all test leads form the meter. Then turn the rotary function switch to “1000 A“. Now press the MODE key to choose either AC or DC. Open the clamp with the clamp opener. Place the clamp around the cable to be measured (see picture) and close the clamp. If the displayed reading is below 50 A AC/DC, turn the rotary function switch to “50 A”.



7.1 Zeroing

To zero the meter, short-press the ZERO key. If you hear a beep tone, zeroing has been successful.

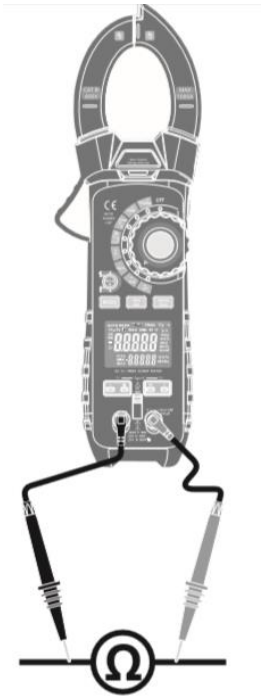
8 AC/DC voltage measurement

To make a voltage measurement, move the input shutter up to unblock the input jacks. Then turn the rotary function switch to the “V“ position. Now press the MODE key to select either DC or AC. Now connect the black test lead to the “COM“ jack and the red test lead to the red jack. The black jack is for negative connection and the red jack is for positive connection The voltage value will be displayed directly after connecting the test leads.



9 Resistance / continuity / diode / capacitance measurement

To make a resistance measurement, continuity test, diode test or capacitance measurement, move the input shutter up to unlock the input jacks. Turn the rotary function switch to “Ω“. Now press the MODE key to switch between resistance measurement, continuity test, diode test and capacitance measurement. Now connect the black test lead to the “COM“ jack and connect the red test lead to the red jack.



9.1 Continuity test

When making a continuity test, an audible signal will sound as soon as the resistance value is <50 Ω.

9.2 Diode test

To test diodes, connect the test leads to the diode now and remember or write down the displayed reading. Now swap polarity and compare the new reading to the first reading. The measurement can be evaluated as follows:
If “OL“ is displayed after both measurements, the diode is defective. If “OL“ is displayed after one measurement and typical values such as 0.400 … 1.800 V are displayed after the second measurement, this means that the diode works. If voltage readings are displayed after both measurements, this means that the diode is defective. In this case, the diode will cause a short circuit.

9.3 Capacitance measurement

A short time after connecting the test leads, a farad value will be displayed. Note that the capacitors are charged during this measurement. To avoid electric shocks, these should be discharged after the measurement where needed.

9.4 Resistance measurement

The resistance reading will be displayed immediately when the test leads have been connected.

10 Frequency measurement

To make a frequency measurement, move the input shutter up to unlock the input jacks. Turn the rotary function switch to the “Hz“ position. Now connect the black test lead to the “COM“ input jack and the red test lead to the red input jack. Now measure your test object.



11 µA DC/AC current measurement

To make a µA DC/AC power measurement, move the input shutter up to unlock the input jacks. Turn the rotary function switch to “µA“. Now connect the black test lead to the “COM“ input jack and the red test lead to the red input jack. Now measure your test object. The black jack is for negative connection and the red jack is for positive connection. Make sure the meter is connected in series to the test object.



12 K-type temperature measurement

To make a temperature measurement, move the input shutter down to unlock the input jacks. Turn the rotary function switch to “TEMP“. Now connect your K-type thermocouples to the meter, observing correct polarity. The temperature value will be displayed directly. With the MODE key, you can now switch between degrees Fahrenheit and degrees Celsius. With the RANGE key, you can select which of the connected sensors you want to be displayed. If you select “T1-T2“, the difference between the two sensors will be displayed. In the lower line of the display, you can see the sensor (T1 or T2).



13 Hold readings

To freeze the current measurement value, press the HOLD key. The display will now show the “HOLD” icon. To unfreeze the reading, press the HOLD key again. The meter will return to the current measurement.

14 MIN/MAX

Press the MIN/MAX key to start recording. The “MAX” icon will appear in the display. During MIN/MAX recording, only the highest, lowest and average value will be saved temporarily. All other readings will be lost. By pressing the MIN/MAX key, you can switch between the minimum, the maximum and the average value. Press and hold the “MIN/MAX“ key for two seconds to leave this mode and return to normal measuring mode.

15 Hold peak value

In ACA or ACV mode, press the PEAK key for two seconds to view the peak values of a waveform. To leave this mode, press the PEAK key for two seconds again.

16 Measurement range

In voltage, resistance, capacitance, frequency and µA current mode, you can select a measurement range. The standard mode is automatic mode. When this mode is on, the “AUTO“ icon will be displayed. In this mode, the meter selects the measurement range automatically. With the RANGE key, you can select a measurement range. To re-activate automatic mode, press the RANGE key for two seconds.

17 LED backlight

To activate the backlight, press the HOLD key for two seconds. The backlight is now activated. It will automatically be deactivated after 30 seconds.

18 Activate / deactivate lamp

To activate the lamp at the clamp, press the Lamp key on the right-hand side of the meter for two seconds. When the lamp is on, a dual beep tone will sound. To turn off the lamp, press the same key again for two seconds. A dual beep sound will be audible.

19 Auto Power Off

To save battery power, the meter will turn off automatically after 30 minutes. To turn off the Auto Power Off function, first turn off the meter. Press and hold the MODE key. Now turn the rotary function switch to any function to turn on the meter. Now release the MODE key. “APO d“ will now be displayed. Auto Power Off is now deactivated. To re-activate this mode, just turn off the meter.

20 Battery level indicator

When the battery level is no longer sufficient, the following icon will appear in the display: . Replace the 9 V block battery. Failure to change the battery can cause incorrect measurements or even failure of the meter. To replace the battery, open the battery compartment cover at the rear side of the meter by loosening the screw with a screwdriver. When replacing the battery, observe correct polarity and make sure that the battery compartment is properly closed after battery replacement.

21 Replace the fuse

To replace the fuse, turn off the meter and remove all test leads. Then open the battery compartment. You can now see the fuse below the battery. You can now remove the fuse and replace it by a new one. The following type of fuse should be used: 500 mA, 660 V F [SIBA 70-180-40].

22 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

23 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.

www.pce-instruments.com

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