



Multimeter PCE-HDM 20



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.
- NEVER apply voltage or current to the meter that exceeds 2. the specified maximum:

Input Protection Limits	
Function	Maximum input
V DC or V AC	1000 VDC/AC RMS
mA AC/DC	800 mA 1000 V fast acting fuse
A AC/DC	10 A 1000 V fast acting fuse
Frequency, resistance, capacitance, duty cycle, diode test, continuity	1000 VDC/AC rms
Temperature	1000 VDC/AC RMS
Surge protection	1000 VDC/AC RMS







- USE EXTREME CAUTION when working with high voltages.
- DO NOT measure voltage if the voltage on the "COM" input jack exceeds 1000 V above earth ground.
- NEVER connect the meter leads across a voltage source while the function switch is in the current, resistance, or diode mode. Doing so can damage the meter.
- ALWAYS discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
- ALWAYS turn off the power and disconnect the test leads before opening the covers to replace the fuse or batteries.
- NEVER operate the meter unless the back cover and the battery and fuse covers are in place and fastened securely.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- 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 Safety symbols

	This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the user manual to avoid personal injury or damage to the meter.
	This WARNING symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.
	This CAUTION symbol indicates a potentially hazardous situation, which if not avoided, may result in damage to the product.
	This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage with respect to earth ground exceeds (in this case) 1000 VAC or VDC.
	This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, under normal use, be subject to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.
	This symbol indicates that a device is protected throughout by double insulation or reinforced insulation.

1.2 IEC1010 overvoltage installation categories

OVERVOLTAGE CATEGORY I

Equipment of **OVERVOLTAGE CATEGORY I** is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.

Note-Examples include protected electronic circuits.

OVERVOLTAGE CATEGORY II

Equipment of **OVERVOLTAGE CATEGORY II** is energy-consuming equipment to be supplied from the fixed installation.

Note-Examples include household, office, and laboratory appliances.

OVERVOLTAGE CATEGORY III

Equipment of **OVERVOLTAGE CATEGORY III** is equipment in fixed installations.

Note-Examples include switches in the fixed installations and some equipment for industrial use with permanent connection to the fixed installation.

OVERVOLTAGE CATEGORY IV

Equipment of **OVERVOLTAGE CATEGORY IV** is for use at the origin of the installation.

Note-Examples include electricity meters and primary over-current protection equipment.

2 Device description

2.1 Meter

Front

- 1 -NCV detector area
- 2 -LCD
- 3 -Navigation/Menu buttons
- 4 -MODE button
- 5 -RANGE button
- 6 -Rotary function switch
- 7 -Positive (+) probe input jack for A (current)
- 8 -Positive (+) probe input jack for mA (current)
- 9 -COM (-) probe input jack
- 10-Positive (+) probe input jack for all inputs except A and mA
- 11-Thermal mode/Light button
- 12-Hold/Capture button












Back

- 1 -No-slip slope
- 2 -Thermal imager lens
- 3 -Lens cover
- 4 -Work light
- 5 -Laser
- 6 -Stand
- 7 -Battery cover lock



2.2 Keys

The 9 keys on the front side of the meter activate features that augment the function selected using the rotary switch, navigate menus or control power to meter circuits.

Key	Function
	Freezes the present reading in the display and allows the displayed to be saved. Also switches device back on when in Auto Power Off mode
	Switches the functions
	Manual range
	Enter (confirms menu selections)
	Switches DMM MODE and IR+DMM MODE
	Navigation keys Select menu item, adjust display contrast, scroll through information, perform data entry <div style="display: flex; flex-direction: column; gap: 5px;"> <div> select REL function</div> <div> select MAX function</div> <div> select PEAK function</div> </div>

2.3 Display

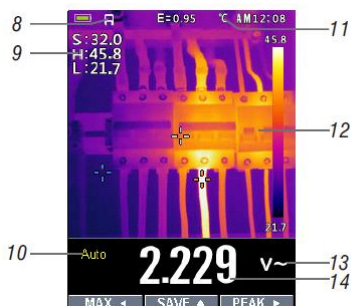
DMM Mode

1. Battery level
2. Reading
3. Automatic/Manual mode
4. Analogue bar graph
5. Functions of navigation keys
6. System time
7. Measuring unit















IR + DMM mode

8. SD card
9. Temperature reading
10. Automatic/Manual mode
11. Temperature unit
12. IR image
13. Measuring unit
14. Reading




Icons on LCD

	Voltage is over 30 V (AC or DC)		AC voltage or current
	Warning		DC voltage or current
	Flexible coils		AC+DC voltage or current
	Traditional clamps		Continuity function
	Relative		Diode function
	High Edge time		Ohms

2.4 Rotary switch

Select a primary measurement function by positioning the rotary switch to one of the icons around its perimeter. For each function, the Meter presents a standard display for that function (range, measurement units, and modifiers). Button choices made in one function do not carry over into another function.

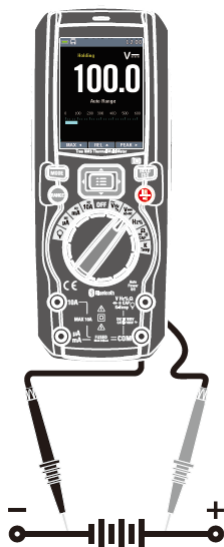
V ~	AC voltage measurements
V ≡	DC and AC+DC voltage measurements
Hz %	Frequency and duty measurements
Ω CAP → + •))	Resistance, diode test, capacitance and continuity measurements
K Temp	Temperature measurements
A	AC, DC and AC+DC amps measurements
mA	AC, DC and AC+DC milliamps measurements
μA	AC, DC and AC+DC microampere measurements up to 6,000 μA
	Flexible coils current

3 DMM Measurement and Setup

3.1 D C Voltage Measurements

CAUTION: Do not measure DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

- Set the function switch to the VDC position.
- Insert the black test lead banana plug into the negative COM jack.
- Insert the red test lead banana plug into the positive V jack.
- Read the voltage in the display.



3.2 AC+DC Voltage Measurements

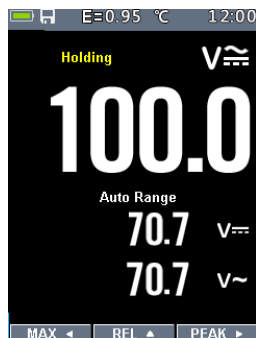
CAUTION: Do not measure DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

- Set the function switch to the VDC position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive V jack.
- Press the MODE key to switch the



V AC+DC voltage functions.

- Read the AC+DC voltage in the display.

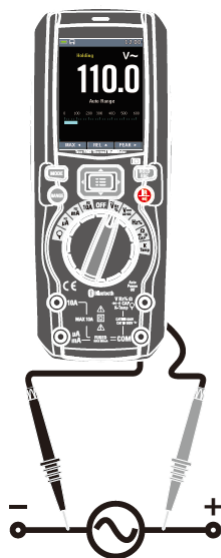


3.3 AC Voltage Measurements

WARNING: Risk of Electrocution. The probe tips may not be long enough to contact the live parts inside some 240 V outlets for appliances because the contacts are recessed deep in the outlets. As a result, the reading may show 0 volts when the outlet actually has voltage on it. Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.

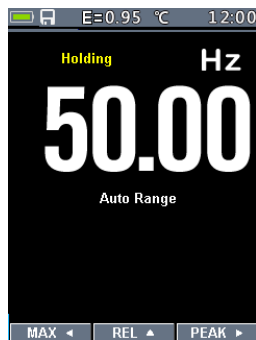
CAUTION: Do not measure AC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

- Set the function switch to the VAC position.
- Insert the black test lead banana plug into the negative COM jack. Insert red test lead banana plug into the positive V jack.
- Read the voltage in the main display.



3.4 Frequency Measurements

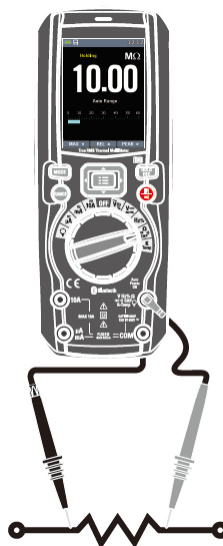
- Set the function switch to the Hz% position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive V jack.
- Read the frequency in the display.
- Press the MODE key to switch the duty functions.
- Read the duty in the display.



3.5 Resistance Measurements

⚠ To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.

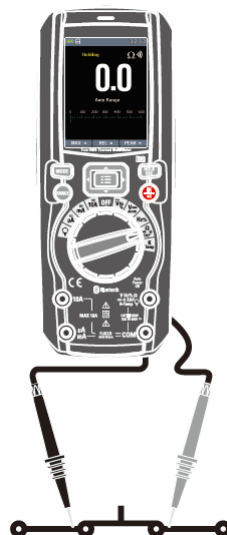
- Set the function switch to the Ω CAP \rightarrow \rightarrow position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive Ω jack.
- Read the resistance in the display.



3.6 Continuity Check

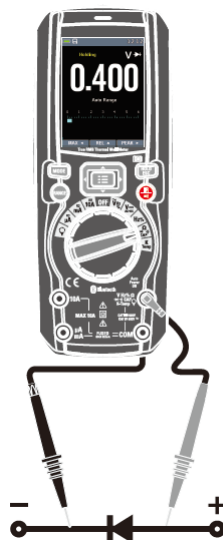
WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.

- Set the function switch to the Ω CAP \rightarrow \rightarrow position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive jack.
- Press the MODE key to switch the continuity functions.
- If the resistance is less than approx.. 50 Ω , the audible signal will sound. If the circuit is open, the display will indicate “OL”.



3.7 Diode Test

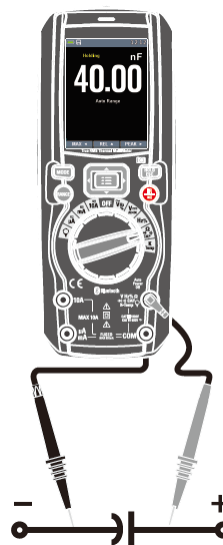
- Set the function switch to the Ω CAP \rightarrow \rightarrow position.
- Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
- Press the MODE key to switch the diode functions.
- Forward voltage will typically indicate 0.400 to 3.000 V. Reverse voltage will indicate "OL". Shorted devices will indicate near 0V and an open device will indicate "OL" in both polarities.



3.8 Capacitance Measurements

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

- Set the rotary function switch to the Ω CAP \rightarrow \rightarrow position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive V jack.
- Press the MODE key to switch the capacitance functions.
- Read the capacitance value in the display.



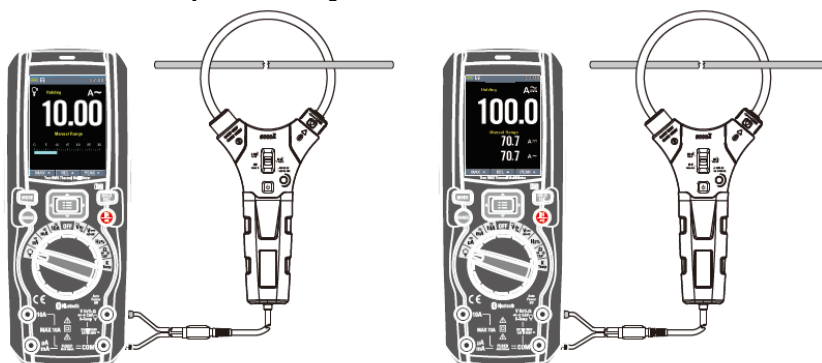
3.9 Temperature Measurements

- Set the function switch to the TEMP (°C or °F) position.
- Insert the temperature probe into the input jacks, making sure to observe the correct polarity.
- Read the temperature in the display.
- Press the MODE key to switch the Unit (°C or °F).



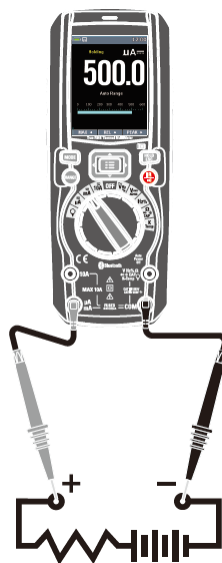
3.10 Flexible Coil Current Measurements

- Set the function switch to the flexible coil position.
- Insert the black test lead banana plug into the negative COM jack. Insert the red test lead banana plug into the positive V jack.
- Read the current in the display.
- Press the MODE key to switch the AC, DC and AC+DC current.
- Press the RANGE key to switch range: 1000mA, 10A, 30A, 40A, 100A, 300A, 400A, 1000A, 3000A.



3.11 DC Current Measurements

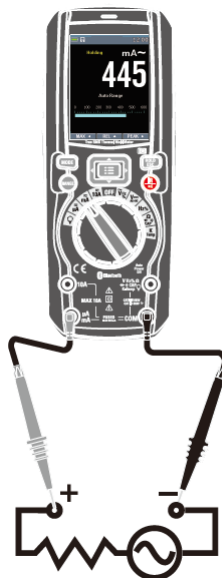
- Insert the black test lead banana plug into the negative COM jack.
- For current measurements up to 6000 μA DC, set the function switch to the μA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 600 mA DC, set the function switch to the mA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 10 A DC, set the function switch to the 10 A position and insert the red test lead banana plug into the 10 A jack.
- Press the MODE button to indicate \rightarrow on the display.
- Read the current in the display.



3.12 AC Current Measurements

CAUTION : Do not make 10 A current measurements for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

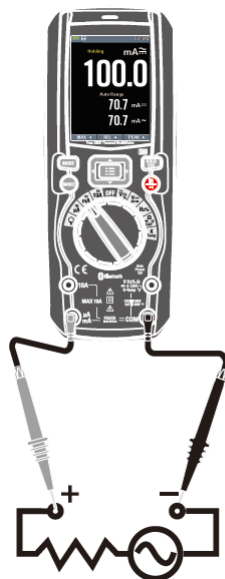
- Insert the black test lead banana plug into the negative COM jack.
- For current measurements up to 6000 μA AC, set the function switch to the yellow μA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 600 mA AC, set the function switch to the yellow mA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 10 A AC, set the function switch to the yellow 10 A position and insert the red test lead banana plug into the 10 A jack.
- Press the MODE button to indicate \sim on the display.
- Read the current in the display.



3.13 AC+DC Current Measurements

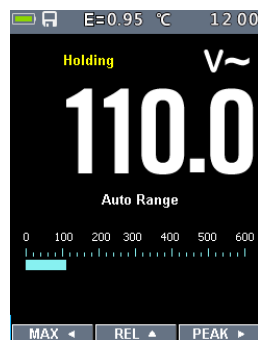
CAUTION : Do not make 10 A current measurements for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

- Insert the black test lead banana plug into the negative COM jack.
- For current measurements up to 6000 μA AC+DC, set the function switch to the yellow μA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 600 mA AC+DC, set the function switch to the yellow mA position and insert the red test lead banana plug into the $\mu\text{A}/\text{mA}$ jack.
- For current measurements up to 10 A AC+DC, set the function switch to the yellow 10 A position and insert the red test lead banana plug into the 10 A jack.
- Press the MODE button to indicate \approx on the display.
- Read the current in the display.



3.14 Using RANGE

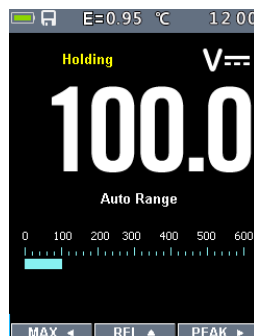
Press the RANGE key to activate the manual mode and to disable the Auto Range function. The message "Manual Range" appears on the upper left part of the display instead of "Auto Range". In manual mode, press the RANGE key to change the measurement range: the relevant decimal point will change its position. The RANGE key is not active in positions \rightarrow \rightarrow \rightarrow % Temp°C°F 10A \approx . In Auto Range mode, the instrument selects the most appropriate ratio for carrying out measurement. If a reading is higher than the maximum measurable value, the indication "O.L." appears on the display. Press and hold the RANGE key for more than 1 second to exit manual mode and restore Auto Range mode.



3.15 Hold Mode

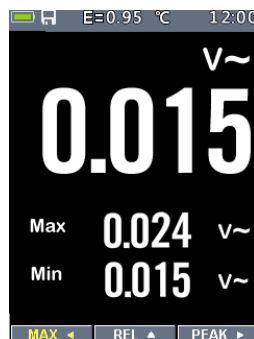
To freeze the display in any function, press the HOLD key.

To release freeze, press the HOLD key again.



3.16 Capturing Minimum and Maximum Values

The MAX MIN record mode captures minimum and maximum input values. When the input goes below the recorded minimum value or above the recorded maximum value, the multimeter beeps and records the new value. This mode is for capturing intermittent readings, recording minimum and maximum readings unattended or recording readings while equipment operation precludes watching the meter. To activate MAX MIN mode, press soft key labelled ◀. If the meter is already in MAX MIN function, pressing ◀ causes the meter to turn off MAX MIN function.



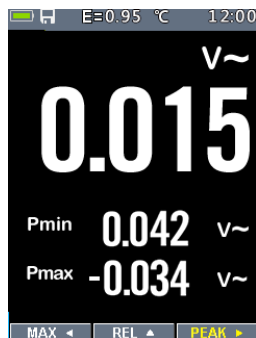
3.17 Relative Values

To activate the relative mode, press the soft key labelled ▲. If the multimeter is already in the relative function, pressing ▲ causes the meter to turn off relative mode.



3.18 Capturing Peak Values

To activate peak mode, press the soft key labelled ►. If the meter is already in the peak function, pressing ► causes the meter to turn off peak mode.



3.19 Non-Contact AC Voltage Detector (100 to 1000V AC)

WARNING: Risk of Electrocution. Before use, always test the voltage detector on a known live circuit to verify proper operation.

WARNING: Insulation type and thickness, distance from the source, and other factors may affect operation. Always verify live voltage using other methods before working on electrical circuits.

- The non-contact voltage detector operates when the meter is set to any measuring function. The detector does not operate when Auto Power Off turns the meter off or when the rotary function switch is set to the off position.
- Slowly move the detector probe closer to the conductor being tested.
- If AC voltage within the specified range is present, the indicator light will illuminate.



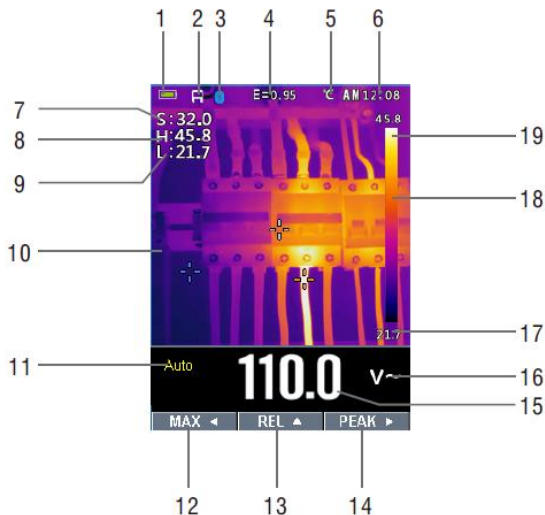
NOTES: The detector is designed with high sensitivity. Static electricity and other sources of electrical energy may randomly activate the detector. This is normal operation. The detector only activates the indicator light when AC voltage is present. It does not indicate the voltage level on the LCD.

4 Thermal imager and DMM operation

4.1 Thermal imager description

In thermal imaging and DMM mode, the user can measure a targeted surface's temperature and use the multimeter function at the same time. The measured result will display under the thermal image.

- Press the red "IR" button to open the thermal imager function. In the following picture, the thermal image is set to colour palette IRON. Select other palettes in the Menu Settings.
- Open the protective lens cover on the back of the meter.



1. Battery level
2. SD card icon - if this icon is displayed, an SD card is inserted
3. Bluetooth icon, if this icon is displayed, the Bluetooth is activated
4. Selected emissivity value - use the Thermal Settings menu to change the emissivity value
5. Temperature unit - use the Thermal Settings menu to select °C, °F or K
6. Current time
7. Centre temperature - temperature at the point the target cross aims at
8. Highest temperature spot
9. Lowest temperature spot
10. Area currently scanned by the thermal imager
11. Range icon (Auto or Manual)
12. MAX soft button function
13. REL soft button function
14. PEAK soft button function
15. DMM reading
16. Unit
17. Lowest temperature reading shown on thermal scale
18. Thermal scale - the lighter the colour, the warmer the temperature; the darker the colour, the cooler the temperature
19. Highest temperature reading shown on thermal scale

4.2 Using the thermal imager

For basic operation, follow these steps:

1. Set the function switch to any position.
2. Press the "IR" button to switch ON the thermal imager. Target the object with the thermal imager lens.
3. The display will show the temperature measurement in the upper left hand corner for the targeted area along with the currently selected emissivity value.
4. In thermal imaging mode, the laser pointer and display cross hairs can be used to assist in targeting. These tools can be switched ON or OFF in the Setting menu.
5. In Thermal imaging mode, the highest temperature will be auto marked by a red cross and the lowest temperature will be auto marked by a blue cross. This can be switched ON or OFF in the Setting menu.
6. In Thermal imaging mode, the meter continues to operate normally as a multimeter, allowing any of the electrical functions to be used.
7. Press the HOLD button to hold the thermal image frame, then press and hold the HOLD button. You will capture the screen and save a bitmap with measurement data to the SD card. The saved bitmap can be analysed later by the PC software or smartphone APPs.
8. The thermal imager's FOV (Field of view) is 21 x 21 degrees.
9. FOV is the largest area that your imager can see at a set distance.
10. The following chart lists the horizontal IFOV, vertical FOV and IFOV for lens:

Focal length	Horizontal FOV	Vertical FOV	IFOV
7.5 mm	21 °	21 °	4.53 mrad

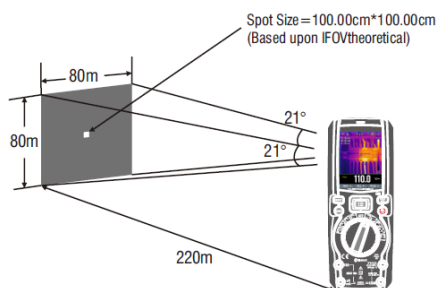
IFOV (Instantaneous Field of View) is the smallest detail within the FOV that can be detected or seen at a set distance. The unit is rad. The formula is:

$$IFOV = (\text{Pixel Size}) / (\text{Lens focal length})$$

$D:S_{\text{theoretical}} (= 1 / IFOV_{\text{theoretical}})$ is the calculated spot size based on the pixel size of the thermal imager detector array and lens focal length.

Example: If the thermal imager uses a 9 mm lens because the pixel size of the detector is $34\mu\text{m}$, horizontal FOV is 21° , vertical FOV is 21° , the IFOV is $34\mu\text{m}/7.5\text{mm} = 4.53\text{mrad}$;

$$D:S_{\text{theoretical}} (= 1 / IFOV_{\text{theoretical}}) = 220:1$$



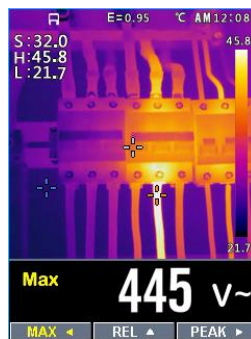
$D:S (= 1 / IFOV)$ is the spot size needed to provide an accurate temperature measure. Typically, $D:S_{\text{measure}}$ is 2 to 3 times smaller than $D:S_{\text{theoretical}}$, which means the temperature measurement area of the target need to be 2 to 3 times larger than that determined by the calculated theoretical $D:S$.

4.3 Using the multimeter with the thermal imager

On IR+DMM mode, MODE key, RANGE key, HOLD key and REL function are the same as in DMM mode.

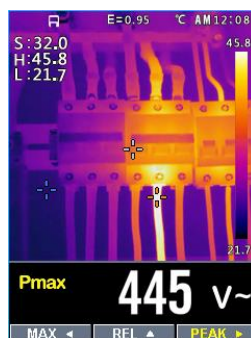
Capturing MAXMIN values on IR+DMM mode

1. To activate the maxmin mode, press the softkey labeled ◀ and display max value.
2. If the meter is already in the maxmin function, then press the ◀ key to display min value, then press the ◀ key to display current measurement value. Next press again display max value.
3. Then press and hold the ◀ key for more than 1 second to make the meter turn off maxmin.



Capturing Peak values on IR+DMM mode

1. To activate peak mode, press the softkey labelled ▶ and display Peak max value.
2. If the meter is already in peak function, then press the ▶ key to display Peak min value, then press the ▶ key to display current measurement value. Next press again display Peak max value.
3. Then press and hold the ▶ key for more than 1 second to make the meter turn off peak.



5 Settings menu


5.1 Using settings menus






- Press MENU button to open the Settings menus, as show below.



- Press UP/DOWN button to select menu item or change the value of current focus item.
- Press RIGHT/MENU button to enter the submenu or set focus on the currently selected item. Press LEFT button to return to the previous menu.
- If you want to exit the settings menus, press MODE/RANGE/HOLD/IR button or press LEFT button in root menu.

5.2 Settings details


Palette mode 

Thermal imager has five kinds of palette, such as:  ,  ,  ,  ,  ,

Press RIGHT/MENU button to select one of the display colour palettes.



5.3 Temp unit

Press RIGHT/MENU button to set focus on this option and the colour of option value will change to black  . Infocus state, use the RIGHT/MENU button to toggle °C, °F and K, use LEFT/RIGHT/MENU button to exit focus state and the colour of option value will change white

 K .

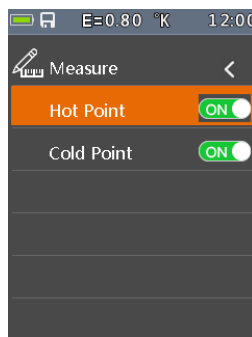


5.4 Measure

Press RIGHT/MENU button to enter measure menu.

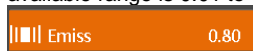
Two selections are available: HOT POINT and COLD POINT. Press RIGHT/MENU button to set currently selected item on or off.

- Hot point: This option enables the thermal imager to automatically detect the highest temperature point.
- Cold point: This option enables the thermal imager to automatically detect the lowest temperature point.



5.5 Emissivity

Press RIGHT/MENU button to set focus on this option. In focus state, use UP /DOWN button to increase or decrease emissivity value, use LEFT/RIGHT/MENU button to exit focus state. The available range is 0.01 to 0.99 in 0.01 steps.

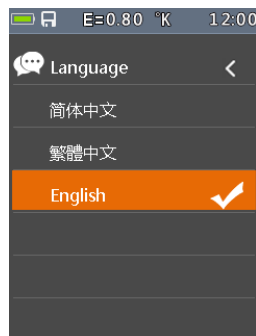




5.6 Language

Press RIGHT/MENU button to enter the language menu.

Three options are available: English , Simplified Chinese and Traditional Chinese. Use UP/DOWN button to select language and use RIGHT/MENU button to set selected language to be valid.

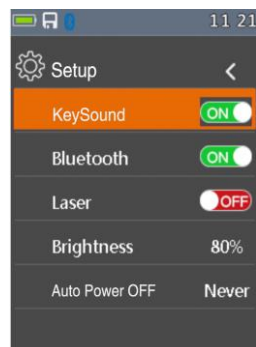


5.7 Setup

Press RIGHT/MENU button to enter Setup menu.

Five options are available: Beep, Bluetooth, Laser, Brightness and Auto Off.

- Beep: Use RIGHT/MENU button to set beep on or off.
- Bluetooth: Use RIGHT/MENU button to set Bluetooth power on or off.
- Laser: Use RIGHT/MENU button to set laser pointer on or off.
- Brightness: Press RIGHT/MENU button to set focus on this option. In focus state, use UP/DOWN button to change LCD's brightness, use LEFT/RIGHT/MENU button to exit focus state. The available brightness's range is 100% to 10% in 10% steps.
- Auto Off: Press RIGHT/MENU button to set focus on this option. In focus state, use UP/DOWN button to choose the time period after which the meter enters sleep mode.



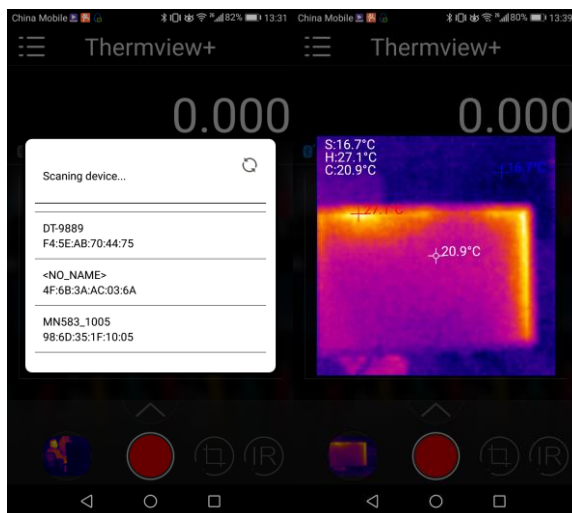
5.8 Bluetooth connect

1. Turn on the Bluetooth function on the instrument.



2. Turn on the Bluetooth of smartphone, press the icon Thermview+ and enter into the home interface.

Then press Connect Device icon on the Home interface, Bluetooth device name will appear.





3. Touch the device name listed in Bluetooth devices list to connect the device.

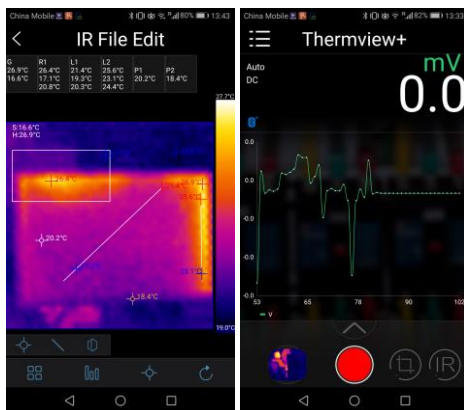
The detail information about Thermview+, please refer to Thermview+ APP help file.

Thermview+ for Android:

Please search in Google Play with keyword "Thermview+", download and run.

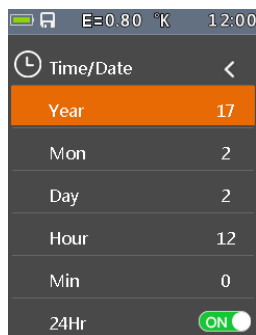
Thermview+ for iOS:

Please search in Apple store with keyword "Thermview+", download and run.



5.9 Time/date

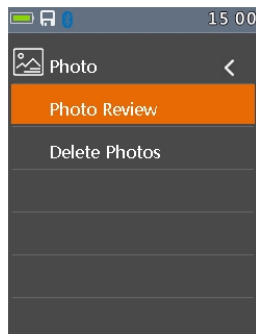
Press RIGHT/MENU button to enter time menu. In this menu, year, month, day, hour, minute and time format can be set. The changes take effect after exiting settings menus.



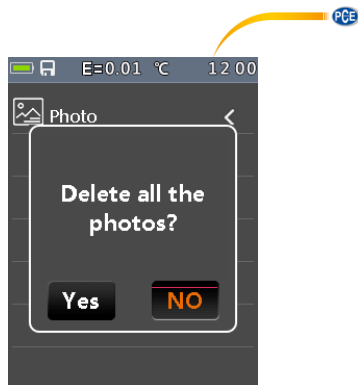
5.10 Photo

Press RIGHT/MENU button to enter photo menu.

Two options are available: Photo Review and Delete Photo.

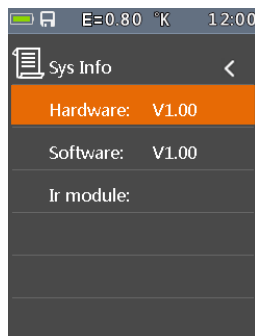


- Photo Review: Press RIGHT/MENU button to enter image browser function, and exit settings menus immediately.
- Delete Photo: After Press RIGHT/MENU button, dialogue box will be displayed as shown below. Warning: Selecting 'YES', will delete all the photos in the memory card captured by user.



5.11 Sys Info

Press RIGHT/MENU button to enter system information menu. This menu contains software's version, hardware's version and thermal imager's version.



5.12 Factory Set



When selecting Factory Set option, after pressing RIGHT/MENU button, the dialogue box will be displayed as shown below. Select 'YES' button, system parameter will be reset.



5.13 Record measurements

With a measurement on the display (Fig130), press Button key Menu to enter the instrument's general menu (Fig131). The screen is shown on the display. Press the Button ▲ or ▼ key to select Record Item. Press the Button ▶ Enter Record Menu (Fig132).

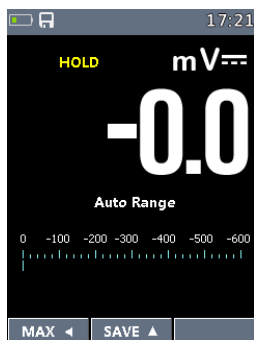


Fig130

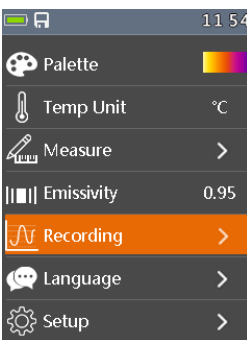


Fig131

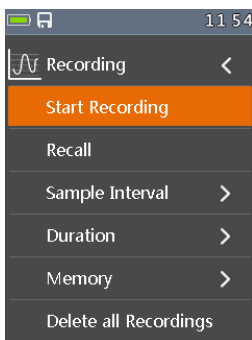


Fig132

In Record Menu, press the Button ▲ or ▼ key to select Sample Interval Item or Duration Item. Press the Button ▶ Enter Record setting. Then Press the Button ▲ or ▼ key to adjust time.
 (Fig133) Setting of sampling interval from 1s to 59min:59s.
 (Fig134) Setting of recording duration, from 1min to 9h:59min.

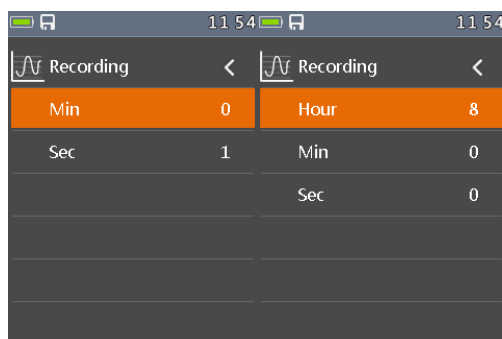


Fig133

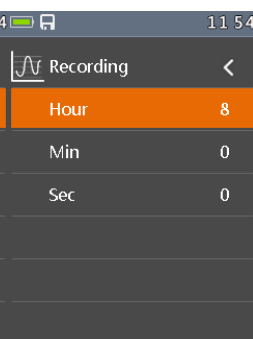


Fig134

In Record Menu. Press the Button ▲ or ▼ key to select Start record Item. Press the Button ▶ Enter Save Record measurement (Fig135). In Save Record measurement, Press the Button ▶ to stop record and press the Button ▲ Save.

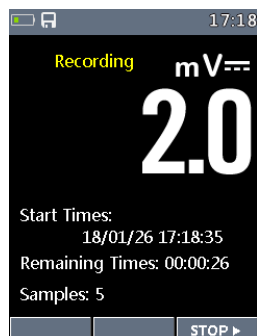


Fig 135


In Record Menu. Press the Button ▲ or ▼ key to select Review Item. Press the Button  Enter View Record measurement (Fig136).



Fig 136

Press the Button MODE key to Trend record (Fig137). And Press the Button ◀ or ▶ key to select previous record measurement or next record measurement. Also press the Button ESC key to exit view record measurement.

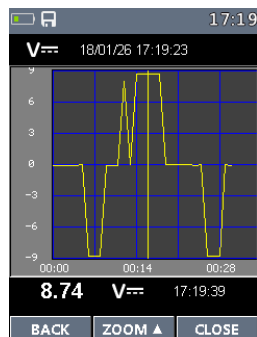


Fig137

In Record View Display and press the Button ◀ or ▶ key to move the cursor on the graph. And the Button ▲ key to activate the Zoom function of the graph (Fig138), increasing resolution (symbol "Zoom Xy" where y=max zoom dimension appears at the top of the display on the right side). You can zoom X1 for at least 10 measuring points, X2 for at least 20 measuring points, X3 for at least 40 measuring points and so on for maximum 6 zooming operations.

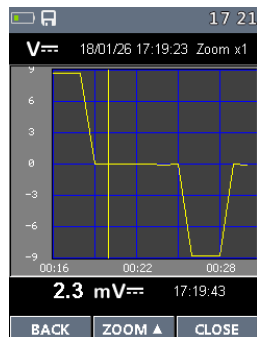


Fig138



In Record Menu, press the Button ▲ or ▼ key to select Delete all Recordings Item (Fig139). Press the Button ▶ Enter Delete Box and select Yes or No.

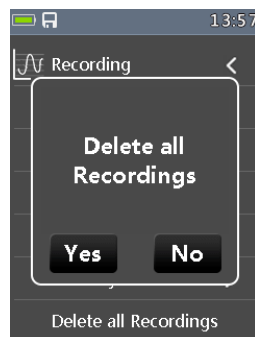


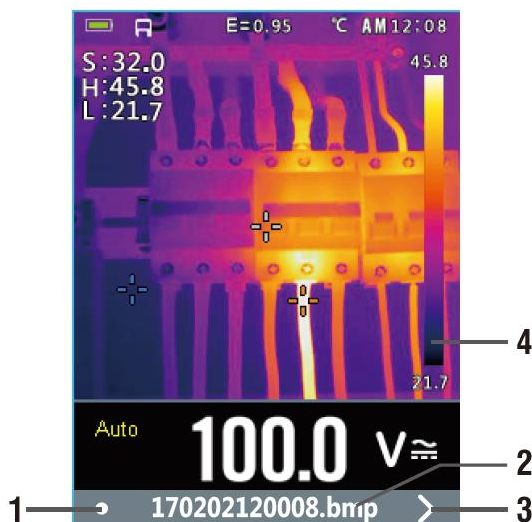
Fig 139

6 Image Browser

In Image Browser mode, the user can browse the pictures in the memory card.

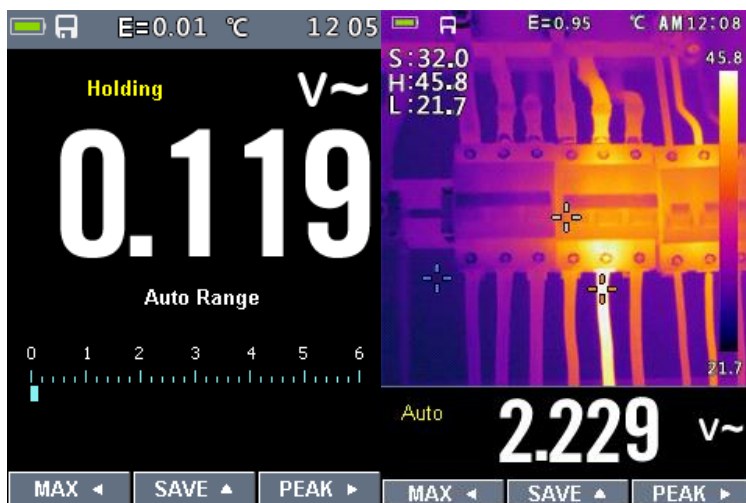
Press LEFT/RIGHT button to select previous or next picture. Press any other keys to exit Image Browser mode.

1. LEFT key instruction
2. Currently displayed picture's file name.
3. RIGHT key instruction
4. Picture display area



How to capture screen

When in DMM mode or Thermal imaging + DMM mode, use HOLD button to enter hold mode, as shown below. Then press UP button to capture screen. After saving to TF card completely, multimeter will exit hold mode.



7 Technical specifications

General technical data

Display	Colour TFT, 6000 points with status display
Conversion	TRMS
Reference standards	IEC/EN61010-1, IEC/EN61326-1
Isolation	Double
Pollution degree	2
Overload category	CAT IV 600 V, CAT III 1000 V
Battery type	1 x 7.4V Li-Ion battery, 2300-mAh
Power supply charger	100 / 240V AC, 50/60 Hz, 10V DC, 1 A
Battery level indicator	Yes
Automatic shutdown	After 15, 30 or 60 minutes of inactivity (deactivatable)
Fuses	F10A/1000V, 10 x 38 mm (Input 10 A) F800mA/1000V, 6 x 32 mm (Input mA, μ A)
Test temperature	18 ... 28°C / 64 ... 82°F
Operating conditions	5 ... 40°C / 41 ... 104°F, <80% r.H.
Storage conditions	-20 ... 60°C / -4 ... 140°F, <80% r.H.
Maximum operating height	2000 m / 2187 yd
Dimensions	175 x 85 x 55 mm / 6.9 x 3.3 x 2.1 in
Weight	540 g / 1 lb 3oz



Thermal imager

Field of view (FOV)/minimum focus distance	21° x 21° / 0.5 m
Spatial resolution (IFOV)	4.53 mrad
IR resolution	80 x 80 pixels
Thermal sensitivity/NETD	<0.1°C at +30 °C (+86 °F) / 100 mK
Image frequency	50 Hz
Focus mode	Focus free
Focal length	7.5 mm
Focal Plane Array (FPA)/Spectral range	Uncooled microbolometer / 8–14 µm
Object temperature range	–20 ... +260 °C (–4 ... +500 °F)
Accuracy	±3 °C (±5.4 °F) or ±3 % of reading (Environment temperature 10 ... 35 °C, object temperature >0 °C)

Accuracy calculated as [% reading + (num. digits*resolution)] at 18 °C ... 28 °C <75 % RH

DC voltage

Range	Resolution	Accuracy	Input impedance	Protection against overcharge
600.0 mV	0.1 mV	± (0.09 % reading + 5 digits)	>10 MΩ	1000 VDC/AC rms
6.000 V	0.001 V			
60.00 V	0.01 V			
600.0 V	0.1 V	±(0.2 % reading + 5 digits)		
1000 V	1 V			

AC TRMS Voltage

Range	Resolution	Accuracy(*)		Protection against overcharge
		(50 Hz ... 60 Hz)	(61 Hz ... 1 kHz)	
6.000 V	0.001 V	±(0.8 % reading + 5 dgt)	±(2.4 % reading + 5 dgt)	1000 VDC/AC rms
60.00 V	0.01 V			
600.0 V	0.1 V			
1000 V	1 V			

(*) Accuracy specified from 10 to 100 % of the measuring range, sine wave.

Input impedance: >9 MΩ;

Accuracy PEAK function: ±10 % rdg, PEAK response time: 1 ms

AC+ DC TRMS Voltage

Range	Resolution	Accuracy (50 Hz ... 1 kHz)	Input impedance	Protection against overcharge
6.000 V	0.001 V	±(2.4 % reading +20 dgt)	>10 MΩ	1000 VDC/AC rms
60.00 V	0.01 V			
600.0 V	0.1 V			
1000 V	1 V			

DC Current

Range	Resolution	Accuracy	Protection against overcharge
600.0 μ A	0.1 μ A	\pm (0.9 % reading + 5 digits)	Quick fuse 800 mA/1000 V
6000 μ A	1 μ A		
60.00 mA	0.01 mA		
600.0 mA	0.1 mA	\pm (0.9 % reading + 8 digits)	Quick fuse 10 A/1000 V
10.00 A	0.01 A	\pm (1.5 % reading + 8 digits)	

AC TRMS Current

Range	Resolution	Accuracy(*) (50 Hz ... 1 kHz)	Protection against overcharge
600.0 μ A	0.1 μ A	\pm (1.2 % reading + 5 digits)	Quick fuse 800 mA/1000 V
6000 μ A	1 μ A		
60.00 mA	0.01 mA		
600.0 mA	0.1 mA	\pm (1.5 % reading + 5 digits)	Quick fuse 10 A/1000 V
10.00 A	0.01 A		


(*) Accuracy specified from 5 to 100 % of the measuring range, sine wave.

Accuracy PEAK function: ± 10 % rdg , AC+DC TRMS Current: accuracy (50 Hz ... 1 kHz): \pm (3.0 % reading + 20 dgt)

Flexible coil Current

Range	Resolution	(50 Hz ... 60 Hz)	(61 Hz ... 1 kHz)	Protection against overcharge
30.00 A	0.01 A	\pm (0.8 % reading + 5 dgt)	\pm (2.4 % reading + 5 dgt)	1000 VDC/AC rms
300.0 A	0.1 A			
3000 A	1 A			

Diode test

Function	Test current	Max voltage with open circuit
	<1.5 mA	3.3 VDC

Resistance and Continuity test

Range	Resolution	Accuracy	Buzzer	Protection against overcharge
600.0 Ω	0.1 Ω	±(0.5 % reading + 10 dgt)	>50 Ω	1000 VDC/AC rms
6.000 kΩ	0.001 kΩ	±(0.5 % reading + 5 dgt)		
60.00 kΩ	0.01 kΩ			
600.0 kΩ	0.1 kΩ			
6.000 MΩ	0.001 MΩ			
60.00 MΩ	0.01 MΩ	±(2.5 % reading + 10 dgt)		



Frequency (electronic circuits)

Range	Resolution	Accuracy	Protection against overcharge
40.00 Hz ... 10 kHz	0.01 Hz ... 0.001 kHz	$\pm(0.5 \% \text{ reading})$	1000 VDC/AC rms

Sensitivity: 2 V rms

Frequency (electronic circuits)

Range	Resolution	Accuracy	Protection against overcharge
60.00 Hz	0.01 Hz	$\pm(0.09 \% \text{ rdg} + 5 \text{ digits})$	1000 VDC/AC rms
600.0 Hz	0.1 Hz		
6.000 kHz	0.001 kHz		
60.00 kHz	0.01 kHz		
600.0 kHz	0.1 kHz		
6.000 MHz	0.001 MHz		
10.00 MHz	0.01 MHz		

Sensitivity: >2 V rms (at 20 % 80 % duty cycle) and $f < 100 \text{ kHz}$;

>5 V rms (at 20 % 80 % duty cycle) and $f > 100 \text{ kHz}$

Duty Cycle

Range	Resolution	Accuracy
5.0 % ... 95.0 %	0.1 %	$\pm(1.2 \% \text{ reading} + 2 \text{ digits})$

Pulse frequency range: 40 Hz ... 10 kHz, pulse amplitude: $\pm 5 \text{ V}$ (100 μs ... 100 ms)

Capacity

Range	Resolution	Accuracy	Protection against overcharge
60.00 nF	0.01 nF	$\pm(1.5 \% \text{ reading} + 20 \text{ dgt})$	1000 VDC/AC rms
600.0 nF	0.1 nF	$\pm(1.2 \% \text{ reading} + 8 \text{ digits})$	
6.000 μF	0.001 μF	$\pm(1.5 \% \text{ reading} + 8 \text{ digits})$	
60.00 μF	0.01 μF	$\pm(1.2 \% \text{ reading} + 8 \text{ digits})$	
600.0 μF	0.1 μF	$\pm(1.5 \% \text{ reading} + 8 \text{ digits})$	
6000 μF	1 μF	$\pm(2.5 \% \text{ reading} + 20 \text{ dgt})$	

Temperature with K-type probe

Range	Resolution	Accuracy (*)	Protection against overcharge
-40.0 ... 600.0 °C	0.1 °C	±(1.5 % rdg + 3 °C)	1000 VDC/AC rms
600 ... 1000 °C	1 °C		
-40.0 ... 600.0 °F	0.1 °F	±(1.5 % rdg+ 5.4 °F)	
600 ... 1800 °F	1 °F		

(*) Instrument accuracy without probe; specified accuracy with stable environmental temperature at $\pm 1 \text{ °C}$.

For long-lasting measurements, reading increases by 2 °C.

8 Delivery contents

- 1 x multimeter PCE-HDM 20
- 2 x test lead
- 1 x K-type thermocouple
- 2 x Li-ion battery
- 1 x charger
- 1 x power plug
- 3 x attachment for power plug
- 1 x microSD card (8 GB)
- 1 x magnet
- 1 x fabric loop
- 1 x temperature adaptor
- 1 x user manual

9 Warranty

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

10 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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