



# User Manual

Industrial Borescope PCE-VE 270 Series



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](http://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.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.
- The borescope was developed for industrial use and must not be used for medical purposes.

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 Specifications

### 2.1 Technical specifications base unit

| Specification                                                      | Explanation                                                                      |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Display                                                            | IPS LC display                                                                   |
| Size                                                               | 5"                                                                               |
| Resolution                                                         | 854 x 480 pixels                                                                 |
| Highlight compensation (HLC)                                       | yes                                                                              |
| Backlight compensation (BLC)                                       | yes                                                                              |
| Display mirroring and rotation                                     | yes                                                                              |
| Zoom                                                               | 4-fold digital                                                                   |
| Freeze display                                                     | yes                                                                              |
| Menu language                                                      | German, English, French, Chinese, Spanish, Japanese, Russian, Portuguese, Korean |
| Image<br>Format<br>Resolution                                      | JPEG<br>400 x 400 pixels                                                         |
| Video<br>Format<br>Resolution                                      | MP4 H.264<br>400 x 400 pixels                                                    |
| Outputs<br>USB<br>TV                                               | USB 2 Micro<br>HDMI                                                              |
| Memory                                                             | Micro SD card (up to 32 GB)                                                      |
| Power supply<br>Rechargeable battery<br>Operating time<br>Charging | 3.7 V lithium-ion battery 5200 mAh<br>≥6 hours<br>via USB socket                 |
| Charger / plug-in mains adaptor<br>Input<br>Output                 | 110 ... 230 V AC / 0.3 A<br>5 V DC / 1 A (USB)                                   |

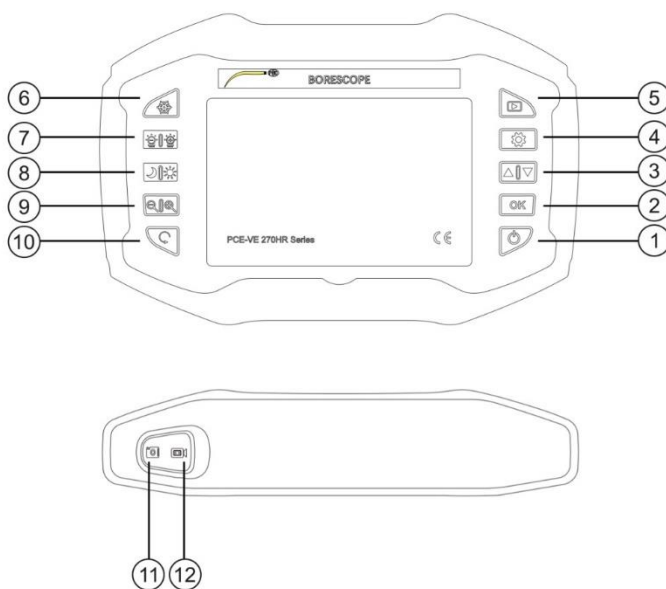
### 2.2 Technical specifications camera cable

| Specification              | Model                                          |                                                   |                                                     |
|----------------------------|------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| Model comes with<br>probe  | PCE-VE 270HR<br><b>PCE-VE 270HR-<br/>PROBE</b> | PCE-VE 270SV<br><b>PCE-VE 270HR-SV-<br/>PROBE</b> | PCE-VE 270HRS<br><b>PCE-VE 270HR-2,1-<br/>PROBE</b> |
| Diameter                   | 2.8 mm                                         | 3 mm                                              | 2.1 mm                                              |
| Length                     | 2000 mm                                        | 2000 mm                                           | 1000 mm                                             |
| Number of LEDs             | 4                                              | 2                                                 | 4                                                   |
| Viewing angle              | Frontal 0°                                     | Lateral 90°                                       | Frontal 0°                                          |
| Field of view              | 120°                                           | 120°                                              | 120°                                                |
| Depth of field             | 5 ... 50 mm                                    | 5 ... 50 mm                                       | 5 ... 50 mm                                         |
| Image sensor               | 1/18" CMOS                                     | 1/18" CMOS                                        | 1/18" CMOS                                          |
| Image sensor<br>resolution | 400 x 400 px                                   | 400 x 400 px                                      | 400 x 400 px                                        |
| HLC / BLC                  | yes                                            | yes                                               | yes                                                 |
| Protection class           | IP 67                                          | IP 67                                             | IP 67                                               |
| Temperature range          | -10 ... 50 °C                                  | -10 ... 50 °C                                     | -10 ... 50 °C                                       |

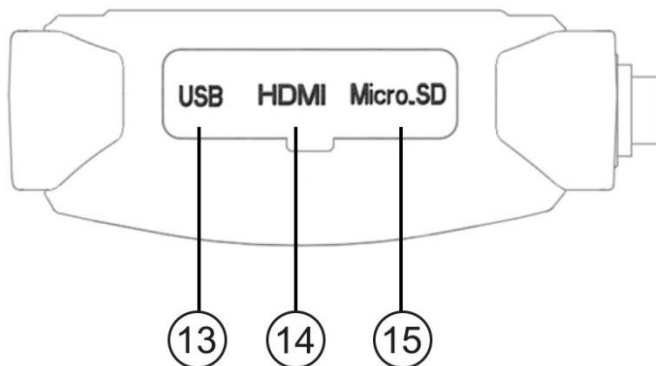
## 2.3 Delivery scope

- 1 x borescope base unit PCE-VE 270
- 1 x borescope cable depending on version
- 1 x charger
- 1 x HDMI cable
- 1 x micro USB cable
- 1 x stand
- 1 x carrying case
- 1 x user manual

## 3 System description



- |                |                                                   |
|----------------|---------------------------------------------------|
| ① On / Off     | ⑥ Freeze display                                  |
| ② OK           | ⑦ Camera LED brightness                           |
| ③ Up / Down    | ⑧ Highlight compensation / backlight compensation |
| ④ Settings     | ⑨ Zoom                                            |
| ⑤ Open memory  | ⑩ Mirror / rotate image                           |
| ⑪ Toggle image | ⑫ Toggle video                                    |



⑬ USB socket

⑮ SD card slot

⑭ HDMI socket

## 4 Preparation

- Fully charge the base unit using the plug-in mains adaptor and the USB cable.
- Insert the SD card into the card slot (if it is not inserted on delivery). To do this, push the protective rubber on the right-hand side of the unit back a little and open the cover.
- Insert the plug of the borescope cable into the socket located on the head side of the base unit (only fits in one position). Lock the borescope cable in place with the union nut.
- Switch on the unit and set the parameters language, time, date, etc. in the menu according to your requirements, as described under "Operation".

## 5 Operation

### 5.1 On / off

To switch on:

Press and hold the key ① "On / Off" for 3 seconds.

To switch off:

Press and hold the key ① "On / Off" for 3 seconds.

### 5.2 Settings

Press the key ④ "Settings".

#### 5.2.1 Language

Use the arrow keys ③ to select the option "Language".

Confirm the selection with the ② "OK" key.

Use the arrow keys ③ to select the desired language.

Confirm the selection with the ② "OK" key.

Press the key ④ "Settings" to exit setup mode.

### 5.2.2 Date & Time

Use the arrow keys ③ to select the option "Date & Time".

Confirm the selection with the ② "OK" key.

Use the arrow keys ③ to select the current year, month and day in the given order.

Confirm the respective selection with the ④ "Settings" key.

Use the arrow keys ③ to select the current hour and minute in the given order.

Confirm the respective selection with the ④ "Settings" key.

Use the arrow keys ③ to select the desired date format.

Confirm the selection with the ④ "Settings" key.

Confirm the entries with the ② "OK" key.

Press the key ④ "Settings" to exit setup mode.

### 5.2.3 Power Save

The power-saving function switches off the unit after the set inactivity time (no key pressed).

Use the arrow keys ③ to select the option "Power Save".

Confirm the selection with the "OK" key ②.

Use the arrow keys ③ to select the power-off time.

Confirm the selection with the "OK" key ②.

### 5.2.4 Date Stamp

With the "Date Stamp" function you can add a time stamp to the images.

Use the arrow keys ③ to select the option "Date Stamp".

Confirm the selection with the ② "OK" key.

Use the arrow keys ③ to select the desired format or "Off".

Confirm the selection with the ② "OK" key.

Press key ④ "Settings" to exit setup mode.

### 5.2.5 Format

With the "Format" function, you can format the SD card in the unit.

Use the arrow keys ③ to select the option "Format".

Confirm the selection with the ② "OK" key.

Use the arrow keys ③ to select "Yes" (format SD card) or "No" (do not format).

Confirm the selection with the "OK" key ②.

Press the key ④ "Settings" to exit setup mode.



### 5.2.6 Reset All

Use the "Reset All" function to reset the unit to its factory settings.

Use the arrow keys ③ to select the option "Reset All".  
Confirm the selection with the "OK" key ②.

Use the arrow keys ③ to select "Yes" or "No".  
Confirm the selection with the ② "OK" key.

Press the key ④ "Settings" to exit setup mode.

### 5.2.7 About

You can use this function to view information about the unit.

### 5.2.8 FW Update

If necessary, a new firmware can be installed via the "FW Update" function.

This may only be necessary in the event of malfunctions that cannot be remedied by resetting the instrument to factory settings. To update the firmware, insert an SD card with the corresponding file.

Use the arrow keys ③ to select the option "FW Update".  
Confirm the selection with the "OK" key ②.  
Use the arrow keys ③ to select "Yes" or "No".  
Confirm the selection with the ② "OK" key.

Press the key ④ "Settings" to exit setup mode.

## 5.3 Image settings

### 5.3.1 Colour setting

Navigate to the icon  on the right edge of the screen with the arrow keys ③.  
With the "OK" key ② you can switch between the modes colour, black and white or negative.  
The setting is adopted for image and video recordings.

### 5.3.2 Screen size

Navigate to the  icon on the right edge of the screen with the arrow keys ③.  
Press the "OK" key ② to switch between normal image and widescreen mode.  
The widescreen setting is not adopted for image and video recordings.

### 5.3.3 Gridlines

Navigate to the icon  on the right edge of the screen with the arrow keys ③.  
With the "OK" key ② you can switch between the modes without or with grid in 3 grid sizes (2 x 4, 8 x 4, 16 x 8).  
The grid setting is not adopted for image and video recordings.

### 5.3.4 White balance

Navigate to the icon  on the right edge of the screen with the arrow keys ③.  
With the "OK" key ② you can switch between the modes without or with automatic white balance.  
The setting is adopted for image and video recordings.

## 5.4 Image / video

### 5.4.1 Image

To take a picture, toggle the switch to image position ⑪.  
The images are stored on the memory card in JPEG format.

### 5.4.2 Video

To record a video, toggle the switch to video position ⑫.  
The recording time is shown on the left-hand side of the display.  
During recording, the "Freeze" key ⑥ can be used to select between colour, black and white or negative modes.  
To stop recording, toggle the switch ⑫ again.  
The videos are stored on the memory card in MP4 format.

### 5.4.3 Memory

To view the saved images and videos, go to the memory area by pressing key ⑤ "Open memory".  
Use the "image / video toggle switch" ⑪ ⑫ to open the respective memory area.  
Use the arrow keys ③ to scroll through the images / videos.  
The "OK" key ② starts or ends the video.  
Press key ⑤ "Open memory" again to exit memory view.

## 5.5 Camera setting

The status of the respective settings is shown on the left edge of the display.

### 5.5.1 Freeze image

Press key ⑥ "Freeze" to freeze the image. Press it again to cancel this mode.

### 5.5.2 LED brightness

The LEDs on the camera can be adjusted to the lighting conditions in 5 brightness levels with the ⑦ "Brightness" key.

### 5.5.3 Highlight compensation / backlight compensation

The highlight compensation / backlight compensation can be adjusted to the conditions with the key ⑧ "Backlight compensation / background light suppression".



#### 5.5.4 Zoom

The digital zoom can be adjusted in 4 steps with key ⑨ "Zoom":  
Normal, 2x, 4x, 8x

#### 5.5.5 Mirror / rotate image

With key ⑩ "Image mirroring / rotation" it is possible to mirror and / or rotate the picture.

## 6 Outputs

### 6.1 USB

The USB output ⑬ is used to transfer the saved data from the SD card to the PC.  
Mirroring the displayed image onto a PC is not possible.  
Furthermore, the USB port is needed to charge the battery.

### 6.2 HDMI

External imaging devices can be connected via the HDMI output ⑭.  
When the HDMI cable is connected, the display of the PCE-VE 270 is switched off. The display content is only transferred to the external device.

## 7 Troubleshooting

| Error                                        | Cause                                                     | Solution                                                                            |
|----------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------|
| Display remains dark after switching on      | Battery flat or in safety mode                            | Connect the mains adaptor and charge the battery                                    |
| No picture, only status icons on the display | Camera cable not connected correctly or defective         | Reconnect or replace camera cable                                                   |
| No image or video recording possible         | No or wrong SD card                                       | Insert or replace SD card                                                           |
| Display message "Please format the SD card". | SD card is not or incorrectly formatted or not compatible | Format or replace SD card                                                           |
| Instrument crashes                           | Disturbed video signal                                    | Reset: press and hold the On / Off key for 8 seconds, then switch the unit back on. |

## 8 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.

## 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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