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Manual
Vane Anemometer PCE-VA 20



Version 1.1
Date of creation: 30.07.2015
Date of last change: 19.10.2020

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1 Introduction

Thank you for purchasing a vane anemometer PCE-VA 20 from PCE Instruments.
The vane anemometer PCE-VA 20 is able to measure air volume flow, air velocity and parameters like air temperature and relative humidity. The gauge is extremely easy to handle and has a wide range of application. With the multi-point and time average function, it's possible to perform average measuring's. It is possible to add an airflow cone set (round or square), which makes the device to a multifunctional gauge with a wide range of possibilities.

2 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. There is no warranty of damages or injuries caused by non-observance of the manual.

- Don't use the device with wet hands.
- Do not use the device in areas with explosive atmospheres.
- The device may only be used in approved temperature and humidity range.
- The opening of the case should only be done by qualified personnel of the PCE Instruments.
- The instrument should never be placed with the user interface (e.g. keyboard side) on a table.
- You should not make technical changes on the device
- The appliance should only be cleaned with a damp cloth / use only pH-neutral cleaner

This user's handbook is published from PCE Instruments without any guarantee.

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

If you have any questions please contact PCE Instruments.

3 Specification

3.1 Technical specifications

Range:

Flow velocity	0.2 … 30 m/s
Volume flow	0 … 99999 m³/min
Temperature	-20 … +60 °C
Relative humidity	0.1 … 99.9 %RH
Dew point	-5 … +59.9 °C
Wet-bulb temperature	-20 … +59.9 °C

Resolution:

Flow velocity	0.1 m/s
Volume flow	0.1 (0 … 9999.9) or. 1 (10000 … 99999)
Temperature	0.1 °C
Relative humidity (RH)	0.1 %RH

Accuracy:

Flow velocity	± (1.5% of measured value + 0.3 m/s) when below 20 m/s
	± (3% of measured value + 0.3 m/s) when above 20 m/s
Temperature	+0.6 °C
Relative humidity	±3 % (at +25 °C); else: ±5 %

Technical Data:

Fan diameter	Ø 10 cm
Fan anemometer dimensions	269 x 160 x 51 mm
Airflow cone dimensions	Round cone: Ø 210 mm Square cone: 346 x 346 mm
Working conditions	0 … 50 °C, <80 %RH
Storage conditions	-10 … +50 °C, <90 %RH
Power supply	4 x AAA micro batteries

3.2 Contents of delivery

PCE-VA 20

1 x anemometer PCE-VA 20
4 x AAA batteries
1 x instruction manual
1 x carrying case

PCE-VA 20-SET

1 x anemometer PCE-VA 20
4 x AAA batteries
1 x round airflow cone
1 x square airflow cone
1 x instruction manual
1 x carrying case

4 System description



Upper display:

Air velocity, air humidity, timer and number of recordings in average mode.

Lower display:

Air temperature, volume flow, wet bulb temperature, dew point temperature

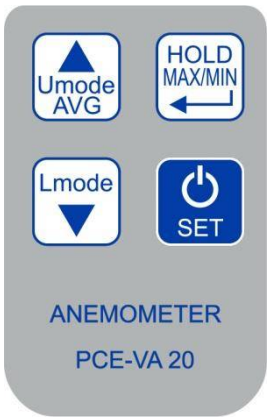
4.1 Display

Display indication	Meaning
HOLD:	Freeze the current display
AVG:	Averaging
MAX/MIN:	Highest and lowest values
	Low battery warning
m/s; fpm:	Flow velocity display units
%RH:	Relative humidity
°C und °F:	Temperature display units
CMM, CFM:	Airflow volume units
WBT:	Wet-bulb temperature
DP:	Dew point temperature
Inch2; cm2:	Area display units
	cone symbol

4.2 Buttons

The device is controlled via four buttons. The on/off-button, the HOLD/MIN/MAX-button, die up-button and the down-button:

SET	Turn the meter on and off. Long press to enter and exit the setup mode.
HOLD MAX/MIN	Freeze current reading on LCD. Long press to view MIN and MAX values. In average mode, press to record data or start timed recording. In setup mode, press to enter data settings.
Umode AVG	Switches to upper display. Long press to go into average mode. In average mode, press to average and return to normal mode. In setup mode, press to select category or increase value.
Lmode	Switches lower display. In average mode, press to view, recorded and average reading of all parameters. In setup mode. Press to select category or decrease value.



5 Measuring

5.1 Switch between measurement parameters

The anemometer shows 2 different measurement parameters at the same time. By default, these parameters are air temperature on the lower display and flow velocity on the upper display. To change the displayed parameters, use the Up and Down buttons.
By pressing Up, you can switch between flow velocity and relative air humidity on the upper display.
When pressing Down, you can switch between air temperature, volume flow, wet bulb temperature and dew point temperature on the lower display.

5.2 Volume flow measurements

Before measuring the volume flow, you have to enter the dimensions of the cross-sectional area in the setup menu (see chapter 7.1.2 for more information).
After AREA setting is completed, press the down button to switch the display to air volume flow and the measured air volume flow will be displayed on the lower LCD.

You can also measure the volume flow with an airflow cone. To do so, just attach one of the optional cones to the meter. The anemometer detects the cone automatically and shows a cone indication on the display. After that, the device will calculate the volume flow.

Note: Make sure the airflow cone is well mounted and locked tight.

5.3 Measuring relative humidity

The capacitive humidity sensor is built in the centre of the vane.
Press the Up button to show the relative air humidity on the upper display.
It is also possible to set an offset value. See chapter 7.1.3 for more information.

6 Functions

6.1 Data Hold

In normal measuring mode, press the Hold button to freeze the current reading on the LCD. A “HOLD” icon appears on the display. To unfreeze the reading, just press the press the Hold button again.

6.2 MIN/MAX

In normal measuring mode, press and hold the Hold button for 3 seconds. The display now shows the MIN value, as well as a “MIN” indication.
Press and hold the button again, to view the MAX value. The display also shows a “MAX” indication.
Press and hold the Hold button once again to return to normal measuring mode.

Note: While viewing the MIN and MAX values, you can use the Up and Down buttons to switch between the different parameters.

6.3 Averaging

6.3.1 Multi-point average

In normal measuring mode, press and hold the Up button for 2 seconds to enter multi-point average mode. (The upper display shows the record number and the lower is the measured reading)

- Press the hold-button to record readings.
- Once you are finished with recording, press the Up button to view the average value on the lower display. Also the ”AVG“ indication starts to flash.
- Press the Down button to switch between the different measurement parameters.
- By pressing the Up button again, you return to the normal measuring mode.

6.3.2 Time average

In normal measuring mode, press the Up button for 2 seconds to enter multi-point average mode. Press the Up button again to enter timed average mode. (The upper display shows the duration time in seconds. The maximum time is 19999 seconds. The lower display shows the current reading)

- Press the Hold button to start recording. The timer on the upper display starts counting.
- Press the Up button to stop and calculate the timed average. You can see the duration on the upper display and the average value on the lower display. Also the ”AVG“ indication starts to flash.
- Press the Down button to switch between the different measurement parameters.
- By pressing the Up button again, you return to the normal measuring mode.

6.4 Auto power-off function

The anemometer shuts down automatically after 20 minutes of inactivity.

Deactivate the auto power-off function

To deactivate the auto power-off function, follow these steps:
With the fan anemometer powered off, press and hold the On/Off and AVG keys simultaneously for 2 seconds.
The display now shows "n". After that, the fan anemometer switches to the normal measuring mode or the warm-up phase begins.
The auto power-off function is now deactivated. The anemometer will not shut down automatically.
To re-activate the auto power-off function, turn the fan anemometer off and back on.

7 SETUP

To enter the settings, press and hold the On/Off button for 2 seconds in normal measuring mode.
You can choose between the following settings:

P1.0: Unit selection
P2.0: AREA size
P3.0: RH offset

To switch between the settings, use the Up and Down buttons.
To exit the setup, press and hold the On/Off button again.

7.1.1 P1.0: Unit selection

When P1.0 is selected, press the Hold button to enter the unit selection. By pressing the Up or Down button, you can now switch between metric and imperial units. The units include air velocity (m/s, fpm), temp. (°C, F), volume flow (cmm, cfm) and area size (cm², inch2). After finishing the selection, press the Hold button to return to setup selection.

7.1.2 P2.0: AREA Size

In P2.0 you can set the dimensions of the cross-sectional area for volume flow measurements. Press the Hold button to enter the area setting. The lower display now shows “99999” with the first digit flashing. Press the Up button to change the selected digit and press the Down button to move to the next digit. Once you set up the area properly, press the Hold button to confirm the input and to return to the setup selection.

7.1.3 P3.0: RH offset

In P3.0 you can set a humidity offset. To do so, press the Hold button when P3.0 is selected. Now the upper display shows the flashing offset value. Press the Up button to increase the offset value and the Down button to decrease it. Once you are finished, press the Hold button again to confirm your input and to return to the setup selection.

8 Calibration

8.1 RH Calibration

The humidity calibration of this meter requires specific fixture and cannot be done by end users. Please contact the dealer for calibration service.

9 Troubleshooting

9.1 Faults

Fault	Possible cause	Remedy
It is not possible to power on the fan anemometer	On/Off key pressed too fleetingly	Press the On/Off key slightly longer
	Batteries not inserted correctly	Check correct polarity
	Battery voltage insufficient	Replace batteries

9.2 Error codes

9.2.1 Air temperature

Error code	Error	Remedial action
E02	Temperature is below measuring range	Acclimatize the fan anemometer at room temperature for 30 minutes. If E02 is still displayed, return the fan anemometer for repair.
E03	Temperature is above measuring range	Acclimatize the fan anemometer at room temperature for 30 minutes. If E02 is still displayed, return the fan anemometer for repair.
E31	Temperature sensor defective	Return the fan anemometer for repair.

9.2.2 Relative humidity

Error code	Error	Remedial action
E04	Caused by temperature error	Please refer to the errors of air temperature
E11	Calibration error	Return the fan anemometer for relative humidity calibration
E31	Humidity sensor defective	Return the fan anemometer for repair.

9.2.3 Dew point and wet-bulb temperature

Error code	Error	Remedial action
E04	Caused by temperature or humidity error	Please refer to the paragraphs above

9.2.4 Flow velocity

Error code	Error	Remedial action
E03	Flow velocity is above range	Take measurements within range If E03 is still displayed, return the fan anemometer for repair.

9.2.5 Volume Flow

Error code	Error	Remedial action
E03	Value is above display range.	Check entered tube area.
E04	Error with flow velocity	Return the fan anemometer for repair.

10 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

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