VOCOO+

CO_2-IAQ-Monitor

Monitors indoor air

www.bappu.de

EN The original operating manual is in German.

01/2025 ELK GmbH

Inhalt

1. VOCOO+

The product is a measuring device for stationary monitoring of the indoor climate and for indicative measurement of environmental characteristics at workplaces. The following measured variables can be measured: Air temperature, relative humidity, CO2 value, TVOC, CO value and particulate matter PM_1, $PM_{2.5}$, PM_{10}.

Manufactured by:

ELK Ingenieurbüro für Elektronik GmbH

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The content of these operating instructions is subject to change without notice to take account of technical progress.

Please send technical questions to: support@bappu.de

The operating instructions contain the most important information for operating the product safely. The instructions for use must always be kept close to the product and accessible at all times.

These instructions for use fulfill the requirements of the German Product Safety Act (ProdSG)

When operating the product, these instructions for use and the provisions of the product must be observed.

The contents of the instructions for use must be read, understood and followed in all respects by everyone responsible for installing and operating the product. This applies in particular to the safety instructions in chapter 1.2. Observing the safety instructions and regulations helps to prevent accidents, faults, errors and damage to property.

1.1. Symbols

The following symbols are used in these operating instructions:

This symbol indicates a risk of injury and/or danger to life and health if certain rules of conduct are disregarded.

Important instructions and information for installation, operation and maintenance.

Please observe and read the operating instructions.

1.2. Safety instructions

The following safety instructions must be observed during installation and operation:

Use personal protective equipment (PPE)

It may be necessary to wear protective clothing when installing the product.

See also the following general instructions.

1.3. General instructions

Avoid installation errors: *The product may only be installed by the operator's specialist personnel. Installation errors can lead to malfunctions!*

In general, the regulations for wearing PPE that apply at the respective place of use of the measuring device apply when using the device. ***Observe the regulations at the place of use.***

1.4. Qualification of the operating personnel

Work with and on the product may only be carried out by instructed persons of the operator with the necessary knowledge and experience.

1.5. Observe accident prevention regulations

The relevant accident prevention regulations and other generally recognized safety regulations must be observed.

1.6. Intended use

The product may only be used to measure the above-mentioned measured variables at workplaces in accordance with ArbStättV (see place of use) within the ambient conditions and permissible measuring ranges specified below. The various sensors may only be used for the intended measured variables or for measurements within the calibrated or permissible measuring range. If measurements are taken outside the calibrated measuring range, measurement results may be outside the permissible tolerance, and

if measurements are taken of unintended measured variables or outside the permissible measuring range, the sensors or even the entire product may be damaged.

The product can be used in workplaces. Workplaces are workrooms or other locations in buildings on the premises of a company, outdoor locations on the premises of a company, locations on construction sites, provided they are intended for use as workplaces.

In particular, a workplace also includes places on the premises of a company or a construction site to which employees have access in the course of their work, traffic routes, escape routes, emergency exits, warehouses, machinery and ancillary rooms, sanitary facilities, canteens, break rooms and standby rooms, first aid rooms, accommodation and facilities used for the operation of the workplace, fire extinguishing equipment, supply facilities, lighting systems, ventilation systems, signaling systems, power distribution systems, doors and gates, moving walkways, escalators, loading ramps and vertical ladders.

Any use beyond the intended use is considered improper use. The manufacturer is not liable for any resulting damage.

Intended use also includes observing and complying with all instructions in this documentation.

1.7. Technical modifications

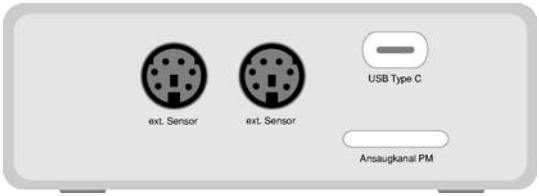
The manufacturer accepts no liability for technical modifications made by the operator or another manufacturer.

If technical modifications are made to the experimental unit by the operator or another manufacturer, this must be reconsidered from a safety point of view.

1.8. Scope of delivery

- VOCOO+ always contains a carbon dioxide sensor and a sensor for detecting volatile organic compounds (TVOC).
- USB cable for connection to a USB plug-in power supply unit
- USB plug-in power supply
- Operating instructions
- Wall bracket

1.9. Connections VOCOO+



1.10. Disposal

Please dispose of the packaging and the device when they have reached the end of their useful life. In the interests of environmental protection, do not dispose of the appliance with household waste, but dispose of it properly.

Devices, accessories and packaging must be recycled in an environmentally friendly manner. Applicable national regulations must be observed.

EU-wide: In accordance with the European Directive on Waste Electrical and Electronic Equipment and the national implementation of this directive, used electrical tools must be collected separately and recycled in an environmentally friendly manner.

1.11. Support

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1.12. Technical data and measuring ranges

Permissible operating conditions

Storage below 0°C can permanently damage the CO sensor.

Temperature: from 0°C to +40°C | Relative humidity: from 0 to 95% (non-condensing) | Deviating operating conditions of the sensors:

CO sensor: temperature from 0°C to +40°C (this also applies to storage)

Particulate matter: Temperature from -0°C to +40°C (this also applies to storage).

Reaction time or response time of the device

Update display 1/sec., data for BAPPUnow 1/min.

Measuring ranges and tolerances

Measured variable		Measuring range	tolerance	transducer	resolution
Air temperature		0...40°C	+/- 1,2°C	PT 1000 sensor	0,1°C
Relative humidity		10...90%	+/- 4% rF	PM Capacitive Humidity sensor	0,1%
CO2 (carbon dioxide)		0...10.000 ppm	+/- 75 ppm +/- 5 % m.v*	Non-dispersive infrared	1 ppm
TVOC	sensor	0…1000 ppm (Ethanol äq.)		Metal oxide	
	Indicator (output signal)	0...500			1
CO (carbon monoxide)		0...500 ppm	+/- 5 ppm +/- 10 % m.v*	Electrochemical (lifetime up to 10 years)	1 ppm
PM (particulate matter)		PM_1: 0...1000 µg/m³ $PM_{2.5}$: 0...1000 µg/m³ PM_{10}: 0...1000 µg/m³	PM_1, $PM_{2.5}$: 0...100 µg/m³ +/-15 µg/m³ 101...1000 µg/m³ +/-15 % m.v.* PM_{10}: 0...100 µg/m³ +/-30 µg/m³ 101...1000 µg/m³ +/-30 % m.v.* at 0...40 °C; 10...70 % rF	Optical	1 µg/m³

VOCOO+: l=150mm, w=92mm, d=28mm, g=200gr.
Subject to technical changes at the factory. **from measured value*

Special features for temperature measurement

The device is equipped with temperature compensation, which compensates for the device's self-heating. This means that temperature changes are recorded and displayed with a delay.

Observe the recommended installation.
Compliance with the measurement tolerances is only guaranteed if the device is installed as recommended.

Special features TVOC indicator

The total volatile organic compound (TVOC) concentration in ppb (parts per billion) is the sum of hundreds of different volatile organic compounds in indoor spaces, the composition of which is constantly changing.

The TVOC concentration of individual compounds can only be measured by complex analysis, for example by gas chromatography and mass spectrometry.

The TVOC sensor in the VOCOO+ detects the relative intensity and duration of TVOC events relative to the history in the room or at the location where the measured value is recorded, based on the average of the TVOCs present in the room in the last 24 hours, as a sum value of the detected TVOCs. Examples of the source of TVOCs:

- Harmful gases: Acetone (paints, adhesives); toluene (furniture, mattresses, building products)
- Other gases: Ethanol (alcohol, cleaners, perfume)
- Odors: hydrogen sulfide, volatile sulfur compounds; ammonia
- Smoke: benzene, nitrosamines (cigarette smoke)

The algorithm calculates the average value for the last 24 hours and assigns this to the TVOC index = 100. The measured values are converted into a TVOC index in the range from 0 to 500. Values between 100 and 500 indicate a deterioration in air quality, while values between 0 and 100 indicate an improvement.

The TVOC sensor needs approx. 3 minutes to stabilize approx. 3 minutes to stabilize.

Special features of the CO_2 measurement

The CO_2 sensor calibrates itself automatically to compensate for deviations caused by ageing of the infrared light source:

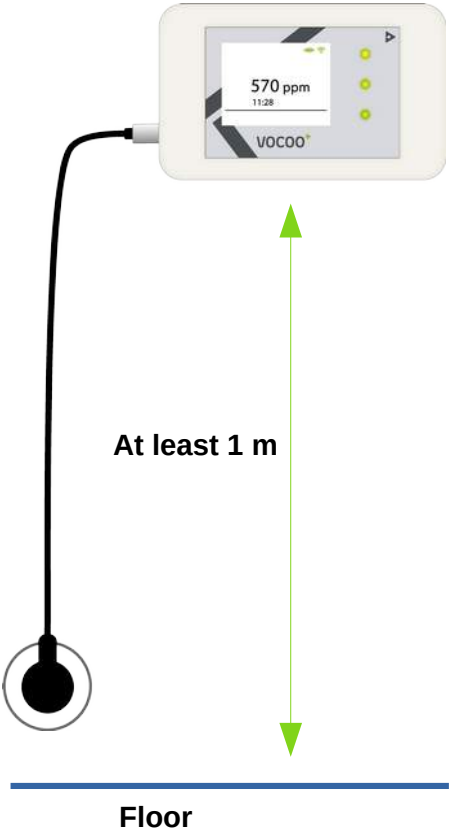
After switching on: Within the first 24 hours, the sensor stores the lowest CO_2 value (outside air) as a baseline of 450 ppm.

Regular calibration: Every 21 days, the lowest CO_2 value is recorded again and the baseline is adjusted.

Note: For the calibration to work correctly, the sensor must have regular access to outside air - especially in the first 24 hours and during the 21-day cycles.

1.13. Wall mounting

A wall bracket is supplied for wall mounting the appliance (recommended).



This must be attached to the wall using suitable screws. Ensure that there is a power socket near the wall mounting.

Then guide the device into the bracket from above.

Optimal positioning instructions: For optimum positioning of the device, we recommend either fixing it to the wall at eye level or alternatively keeping a minimum distance of 1 meter from the floor.

1.14. Connection, commissioning and power consumption

Remove the protective film from the display.

Plug the supplied USB cable into the designated USB Type C socket (see section 1.9) of VOCOO+. Then plug the other end of the cable into the supplied plug-in power supply unit. Plug the supplied plug-in power supply unit into a 230 volt (V) socket. The power consumption of the VOCOO+ is approx. 400 mA, 2 watts.

The device then starts and the measured value recording and display are immediately ready for operation. You can now read the measured values directly on the display. The 3-color evaluation traffic light also signals the critical values for the carbon dioxide content.

To transfer the measured values to the online data memory, see chapter 2.

1.15. Display resolution and display

All available measured values (see 1.8) are shown on the VOCOO+ display. The display resolution is 240 x 320 pixels.

The connection status to the local WLAN is displayed:

Not connected:  Connected: 

The connection status to the online data storage is displayed:

Not connected:  Connected: 

1.16. Ventilation light

The 3-colored LED signals the carbon dioxide content of the room air and prompts you to ventilate by changing the color.

The evaluation levels are as follows:

level	LED top	LED middle	LED bottom	value range in ppm*
1				< 750
2				750...1000
3				1000...1166
4				1166...1334
5				1334...1500
6				1500...1750
7				> 1750

* Parts per Million

2. Connection to measured value analysis software BAPPUnow

2.1. Integration into the local network

If VOCOO+ is started and no connection to a local WLAN can be established, VOCOO+ opens an open WLAN that can be accessed via a WLAN-capable end device using a browser.

The access point is deactivated again after 15 minutes without a connection being established. You must then unplug the device and restart it.

Select the WLAN network “VOCOO-Plus-SN” (SN: serial number of the device) from your mobile device.

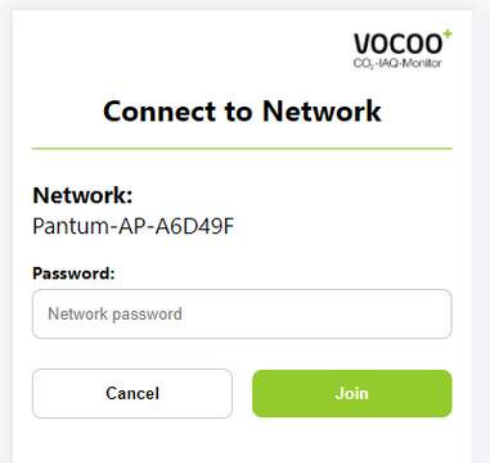
You will be prompted to enter the password (factory setting: “vocoo-plus”).

If your mobile device does not prompt you to log into the network, this address will take you to the start page of the WiFi Manager http://10.10.0.1. Enter the data in the address bar of your browser.

You will be taken to the overview page of the available networks. Select the desired network to which VOCOO+ should be registered.

Important: The network must have access to the Internet so that VOCOO+ can send measurement data to BAPPUnow.[1]

1 Available only in conjunction with a BAPPUnow license.

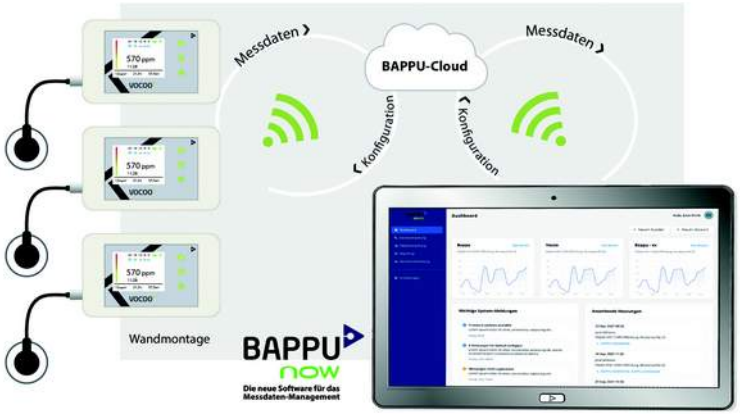


After entering the access data for the WiFi, click on “Join” to add the device to this network. As soon as the connection has been successfully established, the device's WiFi Manager can no longer be accessed at http://10.10.0.1.

The successful connection to the network is symbolized on the display of the device by  .

It is possible to access the WiFi Manager again if the configured network is not (or no longer) available or no connection has been established

If the license is valid, the connection is established and VOCOO+ logs in automatically. The successful connection to the online measurement management is symbolized by  .



3. Warranty, guarantee and care

3.1. Warranty

VOCOO+ has been produced with the greatest possible care and tested for perfect function. However, should production-related defects occur, we ask you to report these defects to us as soon as they occur within the warranty period.

Excluded from the warranty are wearing parts, easily breakable parts and damage caused by improper use or failure to observe the operating instructions. Opening the measuring device or removing or changing the serial number in the device will also invalidate any warranty claims.

3.2. Guarantee

The guarantee period is 24 months.

Claiming guarantee services does not extend the guarantee period. Repairs and adjustments made in addition to guarantee services will be charged for, as will transportation and packaging. Outside the liability prescribed by law, claims for compensation are excluded, especially for damage that does not affect the appliance.

3.3. Care of the housing

Do not use harsh cleaning agents or solvents! Clean the housing with a damp cloth (soapy water) if it is dirty.

4. Operator responsibility

The operator must inform himself about the applicable health and safety regulations and carry out a risk assessment to determine any additional hazards arising from the specific working conditions at the machine's place of use. He must implement these in the form of operating instructions for the operation of the product.

During the entire period of use of the product, the operator must check whether the operating instructions drawn up by him correspond to the current status of the regulations and, if necessary, adapt them.

The operator must clearly regulate and define the responsibilities for operation, troubleshooting, maintenance and cleaning.

The operator must ensure that all employees who handle the product have read and understood the instructions. In addition, he must instruct the personnel at regular intervals and inform them of the dangers.

The operator must provide personnel with the necessary protective equipment and issue binding instructions on wearing the required protective equipment.

The operator must have all safety equipment checked regularly for functionality and completeness.

Instruction by the operator

The operator must instruct his employees in the following areas before using the product:

- Risk assessment
- Operating instructions
- Personal protective equipment
- Area of application of the product
- Environmental conditions of the product
- Setting up, operating and cleaning the product
- Ergonomics at the workplace
- Hazards of the operating environment

EU Declaration of Conformity

Created: 08.11.2021
Revised: 09.01.2025
The original EU declaration of conformity is in German.

IAQ sensor VOCOO+ meet the requirements of Directive 2014/53/EU
according to the certificate of conformity
of the European Union

Applied standards

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
EN 55011:2009 / A1: 2010 Industrial, scientific and medical (ISM) radio-frequency equipment - Limits and methods of measurement. Group 1, Class B apparatus

EN 300 328 V2.2.2 (2019-07) Wideband transmission systems - Data transmission equipment operating in the 2,4 GHz band
EN 301 489-1 V2.2.3 (2019-11) Electromagnetic compatibility (EMC) standard for radio equipment and services - Part 1: Common technical requirements
EN 301 489-17 V3.2.2 (2019-12) Electromagnetic compatibility for radio equipment and services - Part 17: Specific conditions for broadband data transmission systems
EN 62368-1:2014+A11:2017 Audio/video, information and communication technology equipment - Part 1: Safety requirements
EN 62311:2008 Assessment of electrical and electronic equipment with respect to limitations of human exposure to electromagnetic fields (0 Hz to 300 GHz) (IEC 62311:2007, modified)

This declaration of conformity is issued under
the sole responsibility of the manufacturer:

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Konstruktion

Axel Stamm
Geschäftsführung

VOCOO+

CO_2-IAQ-Monitor

The guardian
of room air.

ELK

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