

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



Features

- Measuring the air quality, VOC equivalent to CO₂
- Measuring of humidity and temperature (optional)
- Displays VOC-Concentration (traffic lights)
- 3 Outputs 0...10 V for VOC, temperature and relative humidity
- Easy retrofit of unregulated ventilation systems possible
- In wall housing

Areas of application

- Class rooms
- Offices
- Hotel rooms
- Lecture halls
- Meeting rooms
- Living areas
- Business spaces
- Gyms
- Building automation
 - Climate recording

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



Table of contents

1.....	Preface	Fehler! Textmarke nicht definiert.
2.....	General hazard and warning notices	Fehler! Textmarke nicht definiert.
2.1.....	Notes on documentation	Fehler! Textmarke nicht definiert.
2.2.....	Safety instructions	Fehler! Textmarke nicht definiert.
3.....	General information	4
4.....	Symbols	4
5.....	Safety instructions	4
5.1.....	Disposal instructions	5
6.....	Intended use	5
7.....	Product description	5
7.1.....	Voltage output	5
7.2.....	Power supply	6
7.3.....	Switching output	6
8.....	Commissioning	6
8.1.....	Assembly	6
8.1.1.....	Assembly drawing	7
8.1.2.....	Pin assignment	7
8.2.....	Description of the LED display	8
9.....	Error messages	8
10.....	Guarantee	8
11.....	Repair and calibration service	9
12.....	Care and maintenance	9
13.....	Questions	10
14.....	Technical data	9
15.....	Order date	10

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



1. Preface

Dear customer,

Thank you for purchasing this VOC sensor. We are pleased that you have decided on a product from B+B Thermo-Technik GmbH. We hope that this product will give you many years of good service and that it will help you in your work.

You have purchased a device that was developed and produced to the latest technical standard. This product meets all requirements of the applicable European and national guidelines. Please observe these operating instructions to keep the product in this state and ensure safe operation. In the event of any unexpected malfunctions that you cannot resolve yourself, please contact one of our service points or your retailer. We always strive to provide fast, expert assistance to spare you long down times.

These operating instructions are an important part of the product. They contain important information on how to start up and handle the product.

2. General hazard and warning notices

2.1. Notes on Documentation



Please read the following notes before commissioning! The symbols used in the operating instructions aim to raise awareness of risks to safety. The symbol used cannot replace the text of the safety notice. For this reason, always read the text in full!



This symbol indicates a hazard to persons, material or the environment. Always comply with the information in the text to prevent risks.



This symbol indicates important operating information and tips that are necessary for successfully performing the work step, and that must be observed in order to achieve good working results.

2.2. Safety instructions



Please read these instructions carefully in full before starting up the device. Observe and follow the indicated safety instructions, in particular the safety instructions for devices powered by line voltage.

The product may only be used in line with its intended use as described in this manual. Any other usage is against the intended use and will result in the loss of guarantee and exemption from liability. This also applies to modifications and any other alterations made to the device.

Defective fuses may only be replaced by fuses that are identical in terms of tripping current, tripping characteristic and mechanical dimensions. Bridged fuses represent a significant safety risk and are not permitted under any circumstances.

The connection terminals can be switched with line voltage. Contact with live components poses a life-threatening risk. Assembly or maintenance work may only be carried out by trained personnel who are qualified to perform the work. Observe the applicable safety rules. Assembly and servicing may only be performed when the device is disconnected from the voltage.

The product is intended exclusively for the purpose of controlling electrical equipment that have functions relevant to safety. Even in normal operation, there is the risk of unexpected malfunctions due to a component failure or other deficiency. The user must ensure that no consequential damage can occur as the result of a malfunction or undefined switching state on the relay. This applies above all if heavy consumers like heaters or motors are being controlled.

The user must comply with the safety rules that apply to the special application. The device must be assembled in dry areas only.



Attention

Please avoid extreme mechanical and inappropriate exposure.

The device/product is not suitable for potential explosive areas and medical-technical applications.

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



3. General information

This documentation contains information that must be observed to ensure safe and efficient use of the product. Please read this documentation carefully in full and familiarize yourself with the product's operation before using it. Please keep this document to hand so that you can refer to it as needed.

4. Symbols

Illustration	Meaning	Note
	Note	Please read the following notes before using the device. The symbols used in the operating instructions aim above all to raise awareness of safety risks. The symbol used in each case cannot replace the text of the safety instruction. Therefore, always read the text in full.
	Observe the following	This symbol indicates important information and tips that are necessary for successfully performing the work step and that must be observed in order to achieve good working results

Warnings	Meaning	Warnings	Meaning
	This symbol indicates a hazard to persons, material or the environment. The information contained in the text must be observed in order to prevent risks.		Warning against electromagnetic field (BGV A8, GUV-V A8/W12)
	Warning against hot surfaces (BGV A8, GUV-V A8/W26), as well as hot liquids or media		Warning against cold (BGV A8, GUV-V A8/W17)
	Warning against hot liquids and hot media		Warning against dangerous electrical voltage (BGV A8, GUV-V A8/W08)
	Warning against substances at risk of explosion (BGV A8, GUV-V A8/W02)		Warning against explosive atmosphere (BGV A8, GUV-V A8/W21)
	Warning against moving machinery (W29)		Electronic waste
	Warning against moving components. Take protective measures against electrostatic discharges on electronic components (DIN EN 61340-5-1, 61340-5-3)		

5. Safety instructions



B+B Thermo-Technik GmbH shall assume no liability for damages that occur as a result of non-compliance with these safety instructions and the operating manual.

Any deviation from the use described in the operating manual can lead to damage or failure of the device. Non-intended use can also lead to risks such as short circuit, fire, electric shock, etc.

Preventing personal injury and damage to objects

- The measurement system may only be used by authorized personnel.



OPERATION MANUAL

VOC-probe for a comfortable indoor climate



- Do not apply a voltage to the inputs and do not allow the inputs to come into contact with voltage supplies.
- If using in commercial facilities, please observe the accident prevention regulations of the respective commercial trade association for electrical systems and equipment (e.g. BGB A1).
- The system is not approved for use in explosive atmospheres or in/on substances at risk of explosion.
- Do not use the measurement system on or in living organisms.
- Keep the measurement system away from children.
- Never store the measurement system with solvents and never use desiccants.
- Do not use the measurement system on moving components.
- Do not expose the measurement system to heavy vibrations, impacts or pressure.
- Do not use the measurement system in strong electrical or magnetic fields.
- Do not use the measurement system for medical and diagnostic purposes.
- Ensuring product safety
- Only operate the measurement system within the parameters indicated in the technical data.
- Only use the measurement system appropriately and for the intended purpose. Do not use force.
- All data concerning the temperature range relate only to the measuring range of the sensor assembly. The device can be damaged if used for longer periods of time at high or low temperatures.
- Do not open the measurement system or attempt to open it.



5.1. Disposal instructions



Please return the device to B+B Thermo-Technik GmbH after its service life.

6. Intended use

Only use the device for the purposes for which it was designed. If in doubt, please consult B+B Thermo-Technik GmbH. The fields of application detailed in the section "safety instructions" are excluded.

The VOC sensor is suitable for the precise measurement of VOC gases. Depending on the version, it can also measure relative humidity and temperature.

The product can be used in all fields of application that do not conflict with the applications that are excluded in the section "Safety instructions".

The device may never be used however in the following areas:



- areas at risk of explosion
- for diagnostic measurements in the medical sector
- in very dusty environments

7. Product description

This powerful sensor will help you find our precisely when it is time to get some fresh air into residential or commercial spaces. Installed simply in a wall-mounted housing, it measures the air quality (VOC gases), humidity and temperature. The measured value is displayed using LEDs. VOC refers to gaseous and vaporous evaporations from people, installations, walls, etc. These include hydrocarbons, alcohols, aldehydes, sulfur compounds and organic acids. The VOC sensor can be used for a range of purposes, for example in school buildings, offices, hotel rooms, lecture theaters, meeting rooms, living rooms, commercial areas, gyms, in building services and in climate recording.

7.1. Voltage output



The VOC sensor provides an output scaling of 0 - 10 V, which represents the measuring range of 450 - 2000 ppm. In the version for measuring relative humidity and temperature, a linear output scaling of 0 - 10 V is also supplied.

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



7.2. Power supply

The device is supplied with voltage exclusively via the compression fitting 14 - 27 V DC.

7.3. Switching output

A fan or window lifter can be controlled via the relay for ventilation.

8. Commissioning

8.1. Assembly

1. Take the VOC sensor from the box and remove the packaging.
2. Drill holes to mount the sensor, observing the position of the cable outlet (Fig. 1).
3. Insert the 5 mm wall plugs included in delivery into the bore holes.
4. Screw in the screws until the screw heads are 5 mm from the wall.
5. Open the sensor.
6. Feed the connection wires through the wire outlet prior to mounting.
7. Place the housing on the screws so that the LEDs are arranged on the right, then turn the housing so that it is straight.
8. Using a small Phillips screwdriver, connect the power supply, along with any relay output and the voltage signal output(s). See pin assignment, figure 2. The connection wires can be fed out from the housing directly beneath the compression fittings.



Avoid static charges and contact with electrical contacts. Electrostatic discharges can damage the device or sensor! Ensure that no electrical voltage is applied on the wires. Connect the power supply (14 - 27 V DC) to the screw terminal AN1. See pin assignment, figure 2.

9. Carefully insert the cover onto the enclosure base, so that the ventilation slots face upward and downward and the LEDs are visible on the right-hand side.

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



8.1.1. Assembly drawing

This drawing illustrates the boreholes and the wire outlet on the drilling template.

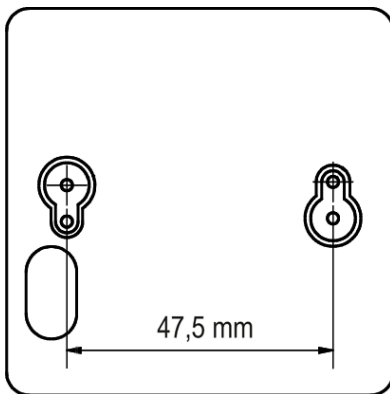


Figure 1 - Assembly drawing

9.

9.1.1. Pin assignment

Connection options for the VOC sensor:

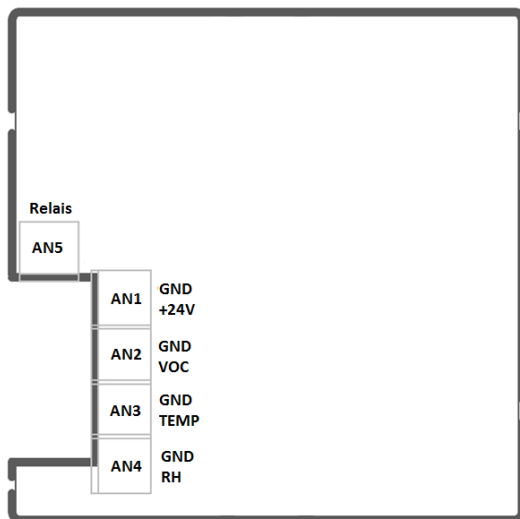


Figure 2 - Pin assignment

AN1: Power supply 24 V DC

AN2: Voltage output VOC 0 - 10 V

AN3: Voltage signal output temperature 0 - 10 V

AN4: Voltage signal output relative humidity 0 - 10 V

AN5: Switching output connection

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



Note: AN2, AN3 and AN4 not assigned on item no. 0565 0004

9.2. Description of the LED display

This section briefly describes the range in which the VOC value lies when the LED display illuminates green, yellow or red:

The first LED illuminates green when the VOC value is below 800 ppm, meaning the air quality is good.

The second LED illuminates yellow when the VOC value is between 800 and 1200 ppm, meaning the air quality is moderate.

The third LED illuminates red when the VOC value is above 1200 ppm, meaning the air quality is poor.

The bottom LED illuminates red when the device is connected to the power supply.

Each time the device is rebooted, the three LEDs will flash for approximately 5 minutes. The VOC sensor is warmed up during this time. The display will then switch to normal.

10. Error messages



Possible error message:

Green and red LEDs flash. A sensor was not recognized. Reboot the device.

Should the error not be resolved, please contact our customer service:

Tel. +49 771 8316-0 or info@bb-sensors.com.

Never repair the device yourself.

11. Guarantee

Congratulations on purchasing this premium product! The quality of our products is constantly monitored as part of our quality management system, which meets the ISO 9001 standard. Should you still have reason to complain however, we will resolve the defect for free within the guarantee period of 24 months, providing that the defect in question can be verifiably linked to us.

The guarantee service can only be provided if you inform us of the defect immediately and within the guarantee period.

Any damages that are the result of incorrect use or non-compliance with the operating instructions are excluded from the guarantee. Also excluded are defective sensors and measuring sensors, as well as calibration services.

The guarantee is also voided if the reference cell is opened. The serial number on the item label may not be altered, damaged or removed.

Repairs carried out as part of the guarantee service are at no extra cost. Any additional repairs required are billed separately, along with postage and packing.

Claims for liability or damages beyond the guarantee are excluded, provided that these are not legally mandated.

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



12. Repair and calibration service

We are pleased to offer you a range of services for your product. If you experience functional defects, simply send us the product with a quick description of the problem. Don't forget to add your telephone number for any questions we may have.

We will inform you of the costs for any repair before conducting it. This cost estimate is free of charge. Postage and packing for returning your product are billed separately on a T&M basis.

12. Care and maintenance

If the housing is dirty, carefully clean it with a damp cloth. Do not use any strong detergents or solvents. The product requires no maintenance.

13. Technical data

VOC sensor

High-performance measurement device for determining the VOC value in the room air, optionally available with sensors for relative humidity and temperature. The integrated switching output (relay) can be used to directly control a fan or window lifter.

The measurement device has an LED display with three colors (green/yellow/red).

Air quality	
Measuring range	450 - 2000 ppm (CO ² equivalent)
Accuracy	±100 ppm
Output scaling	450 - 2000 ppm at 0 - 10 V
Display	3 LEDs Green: < 800 ppm (air quality good) Yellow: 800...1200 ppm (air quality moderate) Red: > 1200 ppm (air quality poor) A fourth LED indicates whether the device is activated and whether the sensors are functioning.
Relay	250 V AC/8 A
Relay switching threshold	1200 ppm
Humidity	
Measuring range	0 - 100% RH
Accuracy	±3% RH (at 20...80% RH)
Output scaling	0 - 10 V
Ambient temperature	
Measuring range	0 - +50 °C
Accuracy	±0.5 °K (bei +20...+40 °C)
Output scaling	0 - 10 V
General	
Operating temperature	0 - +50 °C
Power supply	14 - 27 V DC
Power consumption	max. 70 mA
Dimensions	(LxWxH) 71 x 71 x 27mm
Housing	Plastic ABS, white, RAL 9010
Mounting type	Wall mounting
Protection class	IP20
CE conformity	2014/30/EU

OPERATION MANUAL

VOC-probe for a comfortable indoor climate



14. Order date

Item name	Item number	Description
VOC/humidity/temperature sensor	0565 0003	Measuring range for air quality: 450 - 2000 ppm (CO ² equivalent) Measuring range for humidity: 0 - 100% RH Measuring range for temperature: 0 - 50 °C Relay switching output
VOC sensor	0565 0004	Measuring range for air quality: 450 - 2000 ppm (CO ² equivalent) Relay switching output

15. Questions

Should you have any questions that cannot be answered in these operating instructions, please contact:

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E-mail: info@bb-sensors.com
www.bb-sensors.com

We wish you much success in measuring!

Your temperature partners,
B+B Thermo-Technik GmbH

We have carefully checked the technical information in this documentation, which aims to inform you about the product and its possible applications. This information should not be seen as a guarantee of certain properties and should be checked by the user for the intended purpose. Any third-party property rights should be respected.

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This data sheet replaces all previous editions