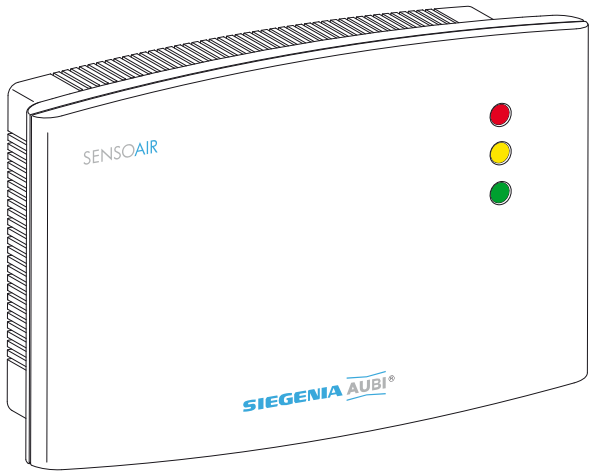
SENSOAIR

Air quality sensor for indoor use



Assembly Instructions

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SIEGENIA AUBI®

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Important notice

Read the following notice carefully prior to the first commissioning.

Appropriate Use

- Only use the unit for measurement and control in enclosed, dry and dust-free rooms.
- Maintain a room temperature of 5 °C - 40 °C.
- The unit is not suitable for use as a measuring device or as part of a gas warning device or similar safety device.
- Do not use solvents near the unit.
- Silicon vapours can have an effect on how the unit works.
- Use this unit only with original accessories from SIEGENIA-AUBI.
- Installation of the unit must always be undertaken by a specialist, in accordance with the installation and planning documentation from SIEGENIA-AUBI. The assembly instructions contained in this manual are to be adhered to (page 8, 9).
- Use the unit only in a technically perfect state. Do not make any changes on the components of the unit.
- Ensure that the air openings remain vacant and are not blocked by other equipment, furniture or objects.
- In case of defects the unit must be checked by a specialist.

Important notice

Read the following notice carefully prior to the first commissioning.

Safety information

⚠ WARNING

Exposed electrical components.
Danger of death by electrocution or fire.

▶ To avoid injury and material damage it is mandatory to observe the following instructions:

- Only insert the Europlug of the standard connecting cable into a suitable 230 V AC socket.
- If the mains connection cable for this device is damaged, it must be replaced by SIEGENIA-AUBI, their customer service department, or similar qualified personnel in order to prevent hazards.
- Should work on the 230 V AC mains power supply be necessary in order to connect the device, it may only be performed by a qualified electrician.
- An all-pole safety isolation is required when the customer lays the power cable. The fuses may need to be removed.
- Current local regulations (such as VDE 0100 in Germany) must be observed. Relevant country-specific regulations must be strictly followed for all work on the voltage supply system or house wiring system.
- Do not connect the device's control line and low voltage connections with the 230 V AC mains power supply. This can destroy all connected devices.
- Should a hard object or fluid get into the interior of the device, stop operation immediately and disconnect the device from the mains power supply.

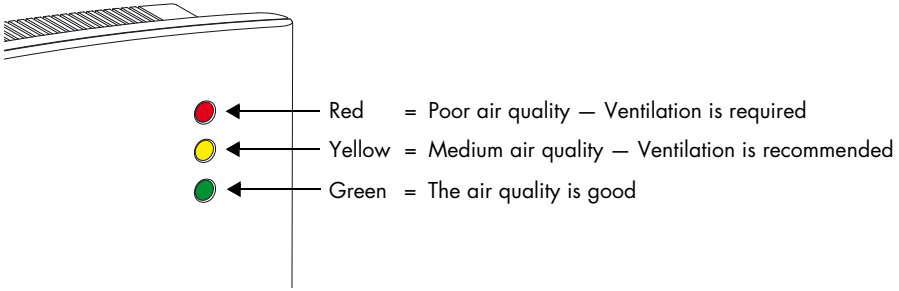
Function

Breathing clean air is an important requirement for our health and productivity, and the amount of carbon dioxide in the air is an important factor. A high concentration of this colourless and odourless gas degrades air quality, and in extreme cases, it can negatively impact your health.

Both SENSOAIR devices "basic and plus" use two sensors to measure the carbon dioxide concentration (CO_2) concentration and the level of volatile organic compounds (VOCs) in closed rooms. VOCs are volatile, organic compounds in the form of gases, such as cigarette smoke, body perspiration, kitchen odours, and the like.

SENSOAIR wave measures the carbon dioxide concentration (CO_2) with only one sensor.

The measured air quality is indicated using an LED traffic light.



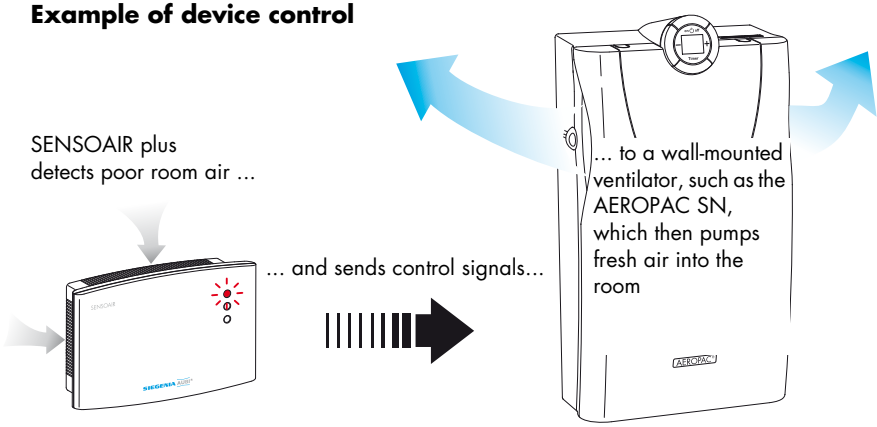
LED indicator	Ventilation
2x brief red flashes	Urgently required
1x long red flash	Urgently required
Continuously red	Required
Yellow/red	Required
Continuously yellow	Recommended
Green/yellow	Not required
Continuously green	Not required

Device description

SENSOAIR device types

Typ	Design		Mains connection		Functions	
	Table unit	Wall unit	230 V AC	24 V DC	Measure/ display	Device control
basic	✓	✓	✓	✓	CO_2 + VOC	-
plus	-	✓	✓	✓	CO_2 + VOC	by wire
wave	✓	✓	✓	✓	CO_2	by radio

Example of device control



Scope of delivery

- SENSOAIR basic
  Table-unit design with power cable:
  – 1 Assembly instructions

- SENSOAIR basic, plus, wave
  Wall-unit design without power cable:
  – 1 bag of plate screws, 4 mm x 30 mm, with dowels
  – 1 Assembly instructions

Technical data

The concentration of CO_2 and VOCs in the air is measured in parts per million (ppm). The CO_2 concentration outdoors is approx. 350 ppm. A level of above approx. 800 ppm negatively impacts our well-being.

If the CO_2 content or the VOC concentration exceeds the following values, SENSOAIR indicates this using the LED traffic light and connected devices are activated.

The concentration of CO_2 in the ambient air depends on the number of people in the room and the length of time those people have spent in the room as well as the size of the room volume and the air exchange rate. For example if there are two people in a room with a total volume of 60 m^3 and an air exchange rate of 1, a CO_2 content of 900 ppm would be reached. Without ventilation, the concentration of CO_2 would rise to 1500 ppm after two hours and increase to 2500 ppm after five hours.

CO_2 concentration in ppm		
LED indicator	**CO_2**	**Impact**
2x brief red flashes	2500	Air quality is very poor
1x long red flash	2000 and above	
Continuously red	1500	Maximum permissible value for offices and classrooms
Yellow/red	1000	Maximum permissible value for living spaces
Continuously yellow	800	Air is perceived as being poor
Green/yellow	600	Air quality is becoming worse
Continuously green	350	Clean, fresh air

VOC concentration in ppm				
LED indicator	**Ammonia**	**Ethanol**	**Hydrogen sulphide**	**Toluene**
Yellow/red	60	20	4	2
Continuously yellow	30	10	2	1
Green/yellow	15	6	1	0.08
Continuously green	10	3	0.05	0.05

Technical data

SENSOAIR basic	Measurement of CO_2 and VOC
SENSOAIR plus	Measurement of CO_2 and VOC
SENSOAIR wave	Measurement of CO_2

Measuring range of sensors	Approx. 350 - 3000 ppm (CO_2 and VOC)
Service life of sensors	Approx. 10 years
Permissible room temperature	5 °C to 40 °C
Supply voltage	230 V AC / 24 V DC (depending on the unit)
Power consumption	1.5 W
Device control (optional)	Air quality values can be adjusted with a DIP switch
Protection class	II, all-insulated
Degree of protection	IP 4X
Casing	Surface-mounted, ASA, RAL 9003 signal white
Dimensions (W x H x D)	154 mm x 98 mm x 39 mm

Installing the wall unit

Installation requirements

- Suitable location for installation:
  – Ideally, above an in-wall mounted box
  – Not in the *immediate* proximity of windows, ventilation equipment and people or animals
- On a smooth, even wall
- Maintain a temperature of 5 °C - 40 °C during installation
- During installation and before start-up, protect the device against:
  – Dirt (e.g. cover ventilation grilles when wallpapering, etc.)
  – Draught and directly exhaled air
  – Direct sunshine

Installation

⚠ WARNING

Exposed electrical components.
Danger of death by electrocution or fire.

▶ For customer-installed mains cables, safety isolation of all poles is mandatory.
If necessary the fuses have to be removed.

Installation

① Remove the casing cover (in the delivered state, the cover is not clipped on).

② Remove the pre-punched drill hole cut-outs and the power cable cut-out (depending on the unit) using a suitable tool.

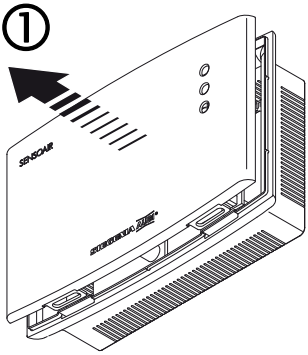
③ Pull the power cable (provided by customer) through the appropriate cable cut-out, position the housing bottom half and use as a drilling template.
Drill the holes for wall mounting.
Mount the housing bottom half using two 4 mm x 30 mm clamping screws and dowels (included).

④ **a.** Connect the 230 V AC power cable, **or**
b. Connect a power cable for 24 V DC.
You can then perform the procedures for connecting and controlling devices (see page 10 - 14).

⑤ Clip the casing cover back on prior to start-up.

Installing the wall unit

①



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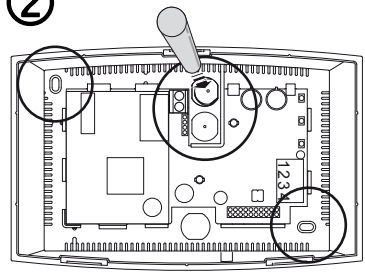

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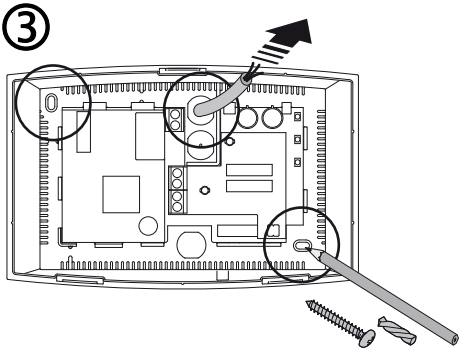
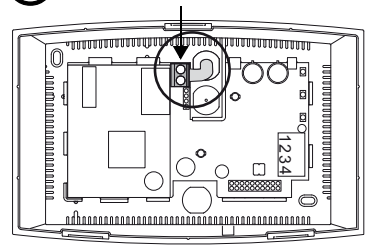


④a. 230 V AC



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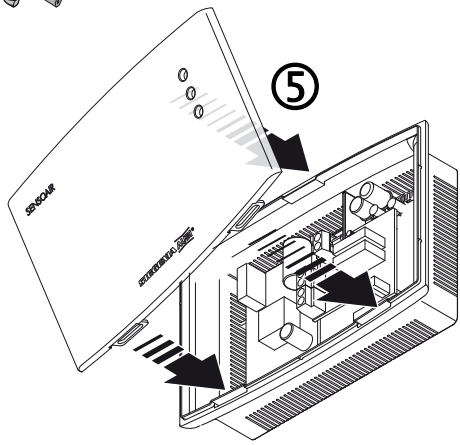
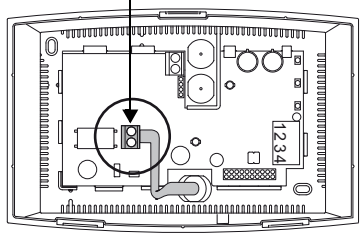


④b. 24 V DC

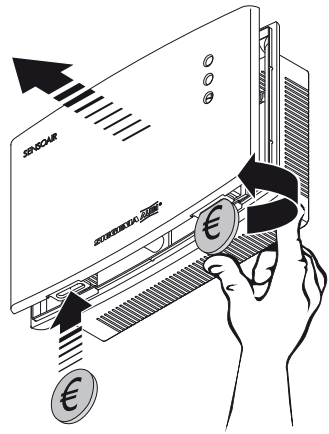


Connecting devices

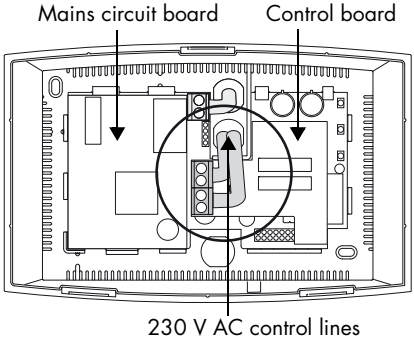
SENSOAIR plus controls connected devices (e.g. ventilators and motor-driven window drives) using 230 V AC or 24 V DC control lines.
The devices are connected to a control board.

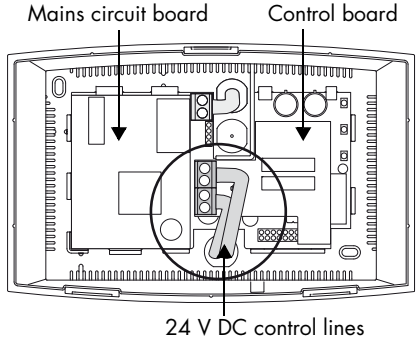
Important! Observe the wiring diagrams for device connections.

Note: If necessary, carefully open the casing cover using a suitable object (such as a coin or a screw driver).

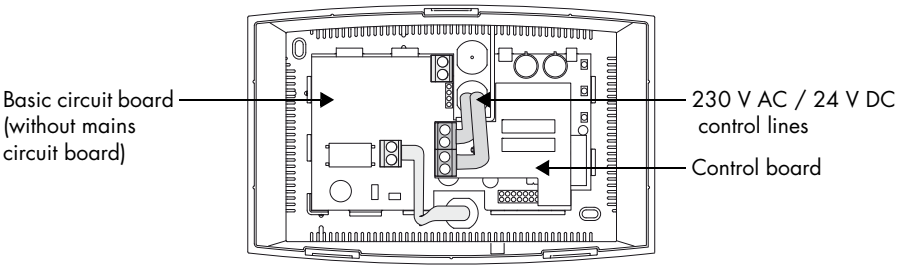


230 V AC power supply



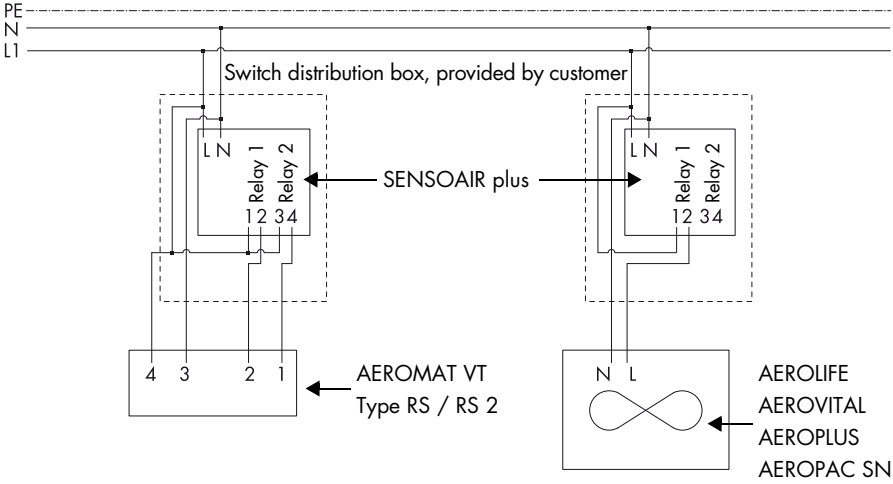


24 V DC power supply

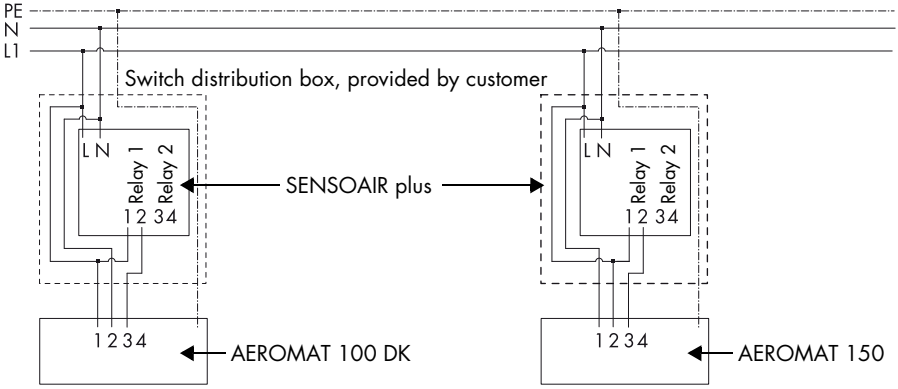


Wiring diagrams for ventilation units

SENSOAIR plus - AEROMAT VT / AEROLIFE / AEROVITAL / AEROPLUS / AEROPAC SN

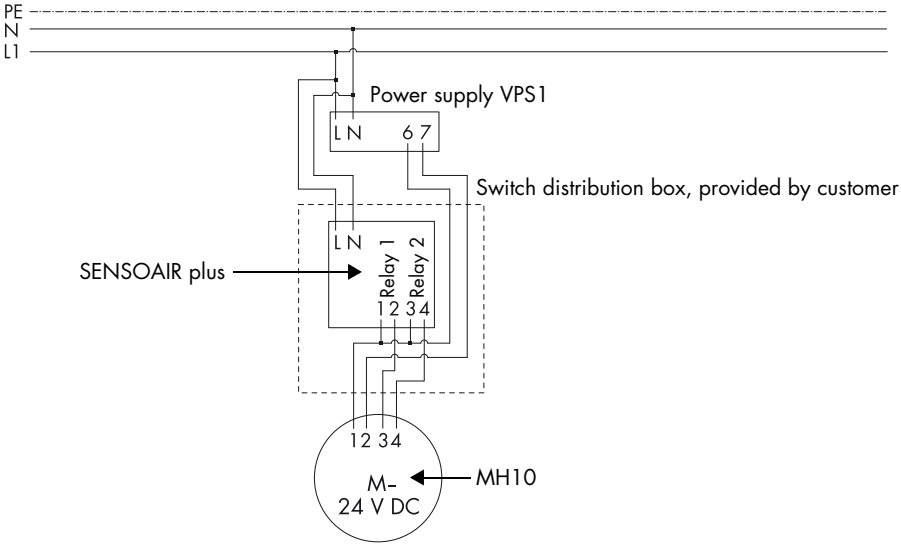


SENSOAIR plus - AEROMAT 100 DK / AEROMAT 150

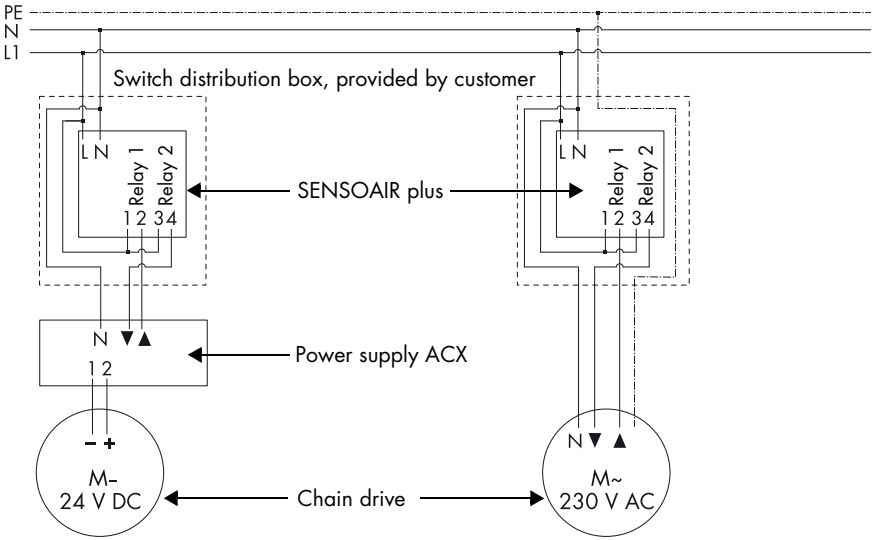


Wiring diagrams for motor-driven window drives

SENSOAIR plus - Motorised handle MH10



SENSOAIR plus - Chain drives



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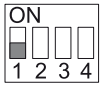
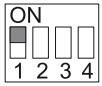
Device control

All of the devices listed below are activated/deactivated using preset air quality values (LED indicator).
The presettings are made by means of DIP switches on the basic circuit board.

DIP switch example



Switch 1: OFF



Switch 1: **ON**

Important! Do not switch on the power supply until all DIP switches have been configured (this applies to all SENSOAIR device types).

SENSOAIR plus - Ventilation devices

Fan control with blower levels	DIP switch position				Fan blower levels for LED indicator				
	1	2	3	4	Green	Green/ yellow	Yellow	Yellow /red	Red
AEROMAT VT Type RS / RS 2	OFF	OFF	OFF	OFF	Off	I	I	II	II
	ON	OFF	OFF	OFF	Off	I	II	II	II
	OFF	**ON**	OFF	OFF	I	I	II	II	II
	ON	**ON**	OFF	OFF	Off	Off	Off	I	II
AEROMAT100 Type F2 AEROMAT 150	OFF	OFF	**ON**	OFF	Off	I	I	II	II
	ON	OFF	**ON**	OFF	Off	I	II	II	II
	OFF	**ON**	**ON**	OFF	I	I	II	II	II
	ON	**ON**	**ON**	OFF	Off	Off	Off	I	II
Fan control: Blower "On" / "Off"									
AEROLIFE	OFF	OFF	OFF	**ON**	Off	On	On	On	On
AEROVITAL	**ON**	OFF	OFF	**ON**	Off	Off	On	On	On
AEROPLUS	OFF	**ON**	OFF	**ON**	Off	Off	Off	On	On
AEROPAC SN*	**ON**	**ON**	OFF	**ON**	Off	Off	Off	Off	On
AEROMAT100 Type DK (bag closing flap "Open"/ "Close")	OFF	OFF	OFF	**ON**	Close	Open	Open	Open	Open
	ON	OFF	OFF	**ON**	Close	Close	Open	Open	Open
	OFF	**ON**	OFF	**ON**	Close	Close	Close	Open	Open
	ON	**ON**	OFF	**ON**	Close	Close	Close	Close	Open

* Available from the middle of 2009

Device control

SENSOAIR plus - Motor-driven window drives

Motor-driven window drives	DIP switch position				Window position for LED indicator				
	1	2	3	4	Green	Green/ yellow	Yelllow	Yellow /red	Red
Motorised handle MH10	OFF	OFF	**ON**	**ON**	Close	Open	Open	Open	Open
	ON	OFF	**ON**	**ON**	Close	Close	Open	Open	Open
	OFF	**ON**	**ON**	**ON**	Close	Close	Close	Open	Open
	ON	**ON**	**ON**	**ON**	Close	Close	Close	Close	Open
Chain drives	OFF	OFF	OFF	**ON**	Close	Open	Open	Open	Open
	ON	OFF	OFF	**ON**	Close	Close	Open	Open	Open
	OFF	**ON**	OFF	**ON**	Close	Close	Close	Open	Open
	ON	**ON**	OFF	**ON**	Close	Close	Close	Close	Open

Function test for connected units (automatic)

1. Switch on power supply,
2. relay 1 switches on after 30 seconds,
3. relay 2 switches on after 60 seconds,
4. both relays switch off after 90 seconds and the test is complete.

SENSOAIR Start-Up

Before operating the unit for the first time, all SENSOAIR device types must be calibrated — as described below.

Requirements

- The room must be aired out well before calibrating.
- The room temperature must be between 5 °C and 40 °C.
- There should be no persons or animals in the room.

Calibration

1. Switch on the power supply – the calibration begins.
2. Both sensors are heated up and calibrated to the reference value of 350 ppm — the LED flashes green (1x long).
3. After calibration is complete (duration = 30 min.), the LED is continuously green. The device is now ready for operation.

Malfunctions

In case of a malfunction, do not open the device or try to repair it under any circumstances. To repair malfunctions, please contact your certified specialist or SIEGENIA-AUBI Service Consulting: Tel. +49 271 3931-471.

LED indicator	Description	Reason	Solution
1x long green flash every second	Function is interrupted (e.g. after a power outage)	The device is calibrating	Wait for the calibration to finish
2x short green flashes per second	The CO_2 sensor is defective	-	Contact the service department
1x short red flash per second	The VOC sensor is defective	-	Contact the service department

Cleaning

⚠ WARNING

Danger of death by electrocution or fire.

▶ To avoid injury and material damage it is mandatory to observe the following instructions:

- Before cleaning please always disconnect the power supply (never pull on the cable) to isolate the unit from the mains.
- For units with a permanent connection, switch off the all-pole mains supply line. If necessary the fuses have to be removed.
- Do not use any aggressive substances or solvent detergents for cleaning, as the unit's surface may be damaged.
- When cleaning the unit, liquid must not penetrate inside the interior part.

SENSOAIR wave Start-Up

SENSOAIR wave will be integrated in the Z-Wave wireless network.

Note: The following documentation for connecting the SENSOAIR wave to the Z-Wave wireless network is exclusively intended for trained specialists.

Inclusion / Exclusion

Press the push-button on the bottom of the unit once to include SENSOAIR wave into a Z-Wave Net or to exclude SENSOAIR wave from the Z-Wave Net.

Inclusion into an existing Z-Wave Network

The SENSOAIR wave is fully Z-wave compliant and can be operated together with 3rd party Z-wave devices. For inclusion press the button at the Z-wave device which manages the system administration (refer to the device user manual). Then include the SENSOAIR wave via the push-button.

Resetting the SENSOAIR wave to the factory setting

Press and hold the button on the bottom of the unit for 5 seconds

A short flashing yellow LED confirms the following actions:

- SENSOAIR was included in or excluded from a Z-Wave Net.
- An association was established
- The device was reset to the factory setting

Supported classes

- COMMAND_CLASS_BASIC
- COMMAND_CLASS_SENSOR_MULTILEVEL_V3
- COMMAND_CLASS_SENSOR_CONFIGURATION
- COMMAND_CLASS_CONFIGURATION
- COMMAND_CLASS_ASSOCIATION
- COMMAND_CLASS_VERSION
- COMMAND_CLASS_MANUFACTURER_SPECIFIC

Class functions

BASIC SET

- Basic Set Value = 1, if current CO_2 concentration > CO_2 trigger level
- Without an association it sends a broadcast, with an association it sends a single cast

BASIC REPORT

- Basic Report Value = CO_2 /10 in a range from 35 to 255 which corresponds to 350 - 2550 ppm
- Basic Report Value = 0 during calibration mode (30 min. after power on)

MULTILEVEL REPORT (Version 3)

- Sensor type = CO_2 (0x11)
- Precision = 0x00
- Scale = ppm (0x00)
- Sensor Value 1 (MSB) and Sensor Value 2 (LSB) = CO_2 level 350 - 3000 ppm
- In Unsolicited Report Mode A/B, the CO_2 value is sent without being requested (see Device Configuration)

SENSOR CONFIGURATION

- CO_2-Triggerlevel can be set with SENSOR_TRIGGER_LEVEL_SET within 500 - 3000 ppm
- Default-Bit: Reset Trigger Level to factory default (1000 ppm)
- Current-Bit: Set Trigger Level to the current CO_2-Level
- Sensor Type = 0x11
- Precision = 0; Scale = 0; Size = 2
- Trigger Value 1 = MSB; Trigger Value 2 = LSB

DEVICE CONFIGURATION

Use the CONFIGURATION_SET command to configure the device operating mode.

Device Configuration Value 1 (default 0x8d):

7	6	5	4	3	2	1	0
SENSOAIR LEDs				*Broadcast Multilevel Report*	*Basic Set*	*Unsolicited Multilevel Report Mode B*	*Unsolicited Multilevel Report Mode A*
0 = disabled 1 = **enabled**				0 = disabled 1 = **enabled**	0 = disabled 1 = **enabled**	0 = **disabled** 1 = enabled	0 = disabled 1 = **enabled**

Unsolicited Multilevel Report Mode A

SENSOAIR sends an unsolicited multilevel report when the CO_2 value exceeds one of the following threshold values:

600 ppm, 800 ppm, 1000 ppm, 1500 ppm, 2000 ppm, 2500 ppm

Unsolicited Multilevel Report Mode B

SENSOAIR sends the current CO_2 value (without being requested) in an interval of 5 - 65000 seconds. The interval (default setting = 30s) is configured as follows:

Device Configuration Value 1 = MSB (default 0x00)

Device Configuration Value 2 = LSB (default 0x1e)

Product Liability

Directions of use

Any inappropriate or unconventional use of the product, or failure to operate correctly will deem the product to be excluded from warranty. Any adjustment or change to the product or its components without prior authorisation by SIEGENIA-AUBI is strictly forbidden.

Warranty

A 2 year warranty is given, subject to the correct installation and use of the product, in accordance with the statutory regulations.
As part of any remedial work we are entitled to replace individual components or whole units in the installation. Consequential harm caused by a defect is excluded from the warranty – insofar as legally permissible.
Should any alterations to the product and / or to the individual components be made that have not been authorised by SIEGENIA-AUBI or have not been described here, or should the product and / or individual components be un-assembled or dismantled, the warranty shall be deemed null and void.

Exclusion of liability

The product and its component parts are subject to strict quality control. They will thus work safely and reliably when used normally.
We rule out our liability for consequential harm caused by a defect and / or for claims for damages unless we have acted wilfully or with gross negligence or respectively are responsible for injury to life, body or health. This does not affect any liability under the product liability law, irrespective of who is to blame.
Also unaffected is the liability for the culpable breach of fundamental contractual obligations; the liability in such cases however is limited to the foreseeable damage typical of the contract. There is no change to the burden of proof to the detriment of the consumer associated with the above rulings.

Declaration of conformity

CE According to the EU regulations (2002/96/EG and 2003/108/EG) and the ElectroG, SIEGENIA-AUBI products are compliant with the WEEE (Wast Electrical and Electronic Equipment).

Environmental protection

Although our products are not classed as electrical equipment, SIEGENIA-AUBI KG will continue to ensure that the requirements stated in disposal of electrical goods guidelines are met at all times and that the use of hazardous materials is eliminated as soon as possible.
Please note that in general electrical products do not belong to the household waste.

Feedback on documentation

We are always happy to receive comments and suggestions for the improvement of our documentation. Please e-mail us your comments to dokumentation@siegenia-aubi.com.

SIEGENIA AUBI
SOLUTIONS INSIDE

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Poland Tel: +48 7744 77700
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Ukraine Tel: +38 044 4637979

Please contact your approved supplier or recognized distributor:

H4035.0073EN/1