

Room sensors in the comfort zone for MP bus applications

- Nominal voltage AC/DC 24V
- Temperature measurement
- Humidity measurement
- CO<sub>2</sub> measurement
- VOC measurement
- 1 digital input
- 1 analogue input


**Type overview**

Type	Function
MS24A-R02-MPX	Temperature / CO <sub>2</sub>
MS24A-R08-MPX	Temperature / humidity / CO <sub>2</sub> / VOC

**Technical data**

<b>Electrical data</b>	Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
	Nominal voltage range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V
	Power consumption	0.5 W
	Dimensioning	1.5 VA
	Connection	Terminal block, 8 x 2.5 mm <sup>2</sup>
<b>Functional data</b>	Control	via MP-Bus
	Temperature measurement	Measuring range 0 ... 50°C, resolution 0.05°C, Time constant t63 <20 minutes, Accuracy ±0.35°C (with VOC module ±0.5°C)
	Humidity measurement	Measuring range 10 ... 90% r.h., resolution 0.1% r.h. Accuracy ±3%
	CO <sub>2</sub> measurement	Measuring range 0 ... 2000 ppm CO <sub>2</sub> , resolution 1 ppm, Long-term drift <20 ppm/a, measurement rate 15 s, Accuracy ±100 ppm
	VOC measurement	Measuring range 450 ... 65535 Integrated automatic calibration algorithm for reducing sensor drift.
	Inputs	1 digital input, AC/DC 24 V, contact rating 1 mA 1 analogue input, measuring range 0 ... 10 V, resolution 2.5 mV, no electrical isolation
	Outputs	The room sensors have no hardware outlets. The sensor values are queried and evaluated by the MP master device through the MP bus.
<b>Safety</b>	Protection class	III Safety extra-low voltage
	Degree of protection	IP30
	EMC	CE in accordance with 2004/108/EC
	Control pollution degree	2
	Ambient temperature	0 ... +50°C
	Non-operating temperature	-20 ... +60°C
	Ambient humidity	0 ... 95% r.h., non-condensating
<b>Dimensions / weight</b>	Dimensions (H x W x D)	99 x 84 x 32 mm
	Weight	Approx. 114 g

## Technical data

*(continued)*

<b>Installation</b>	Type	Surface mounting with connection from behind or below or above (knock-out inlet openings), seal cable ducts against draughts
	Position	Vertical, i.e. the ventilation slits must face upward or downward, respectively
<b>Housing colours</b>	Baseplate	NCS2005-R80B light grey (corresponds approximately to RAL 7035)
	Cover	RAL 9003 Signal white

## Safety notes



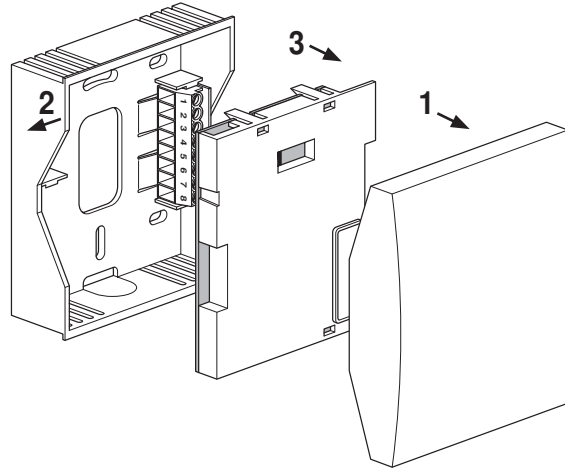
- The devices are not allowed to be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- The room sensors are not certified for safety applications (e.g. gas or smoke detection) or warnings.
- Installation and utilisation outside of the comfort zone (e.g. installation in ventilation ducts, exterior areas, garages) are not permitted.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device contains electrical and electronic components and is not permitted to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

## Product features

<b>Application</b>	Room sensors for measuring the required values or actual values situation in the room ventilation comfort zone. Typical application: requirements-oriented and energy-efficient control of ventilation and air-conditioning systems.
<b>Mode of operation</b>	The room sensors are operated on the MP bus. The measured quantities of temperature, CO <sub>2</sub> , VOC, humidity and the optionally assignable DI or AI inputs are read and evaluated by the MP master by means of MP commands. The reaction time of the MP bus (1 ... 10 s) is to be incorporated into the design of the bus application.
<b>Start-up behaviour</b>	The VOC module outputs an initial value of 450 for 15 minutes after Power On. All other sensors are ready for operation immediately after the start.
<b>Temperature measurement</b>	Resistive temperature sensor.
<b>Humidity measurement</b>	Capacitive humidity sensor.
<b>CO<sub>2</sub> measurement</b>	Dual-channel infrared absorption sensor for selective recording of the CO <sub>2</sub> concentration in the room. The air used by people is recorded through the CO <sub>2</sub> concentration and is used as a measured variable for the requirements-oriented air replacement. Application: temporary occupation spaces with a variety of uses, e.g. schools, museums, hotel rooms, events locations, offices, etc.
<b>VOC measurement</b>	Metal semiconductor sensor for recording VOCs – Volatile Organic Compounds. The VOC sensor records the entire concentration of various gases in the room ventilation, caused typically by smoking materials, food and kitchen odours, body odours, emissions from construction materials and such materials as glues, lacquers, etc. Application: cloak rooms, toilets, restaurants and applications with rapidly increasing odour loads.

## Mechanical installation

### Opening and closing the housing



#### Open the housing

1. Lift off the housing cover.
2. Pull the side panel of the housing floor outward slightly.
3. Remove the electronics module.

#### Close the housing

Electronic module: place in the floor and mount the cover.

**Sensor placement** The placement of the room sensor has a significant effect on control characteristics or room comfort, respectively. An incorrectly placed sensor will record unwanted ambient conditions, e.g. incoming heat from the sun or draught air through an open door. Open installation pipes and similar are to be sealed against draughts.

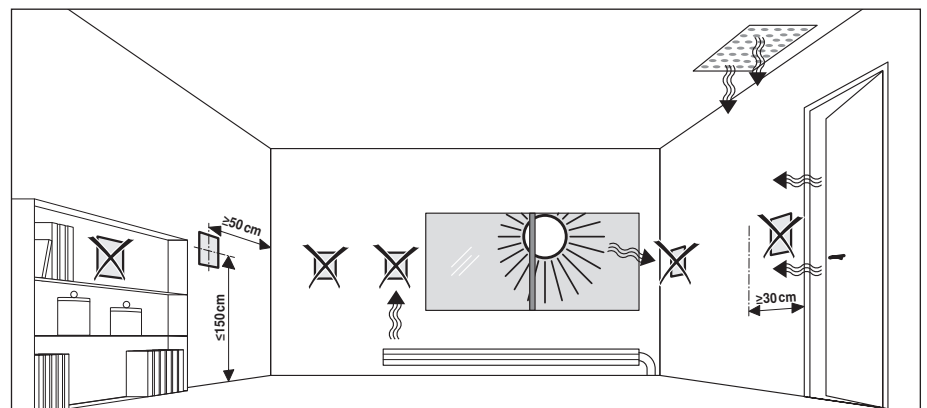
Locations to be avoided in particular

- in the vicinity of heat sources
- on exterior walls
- with exposure to sunlight or other light
- in draughts
- in the vicinity of air outlets
- with limited ventilation, e.g. caused by shelving, furniture, etc.

Ideal installation height: 1.5 m from the floor

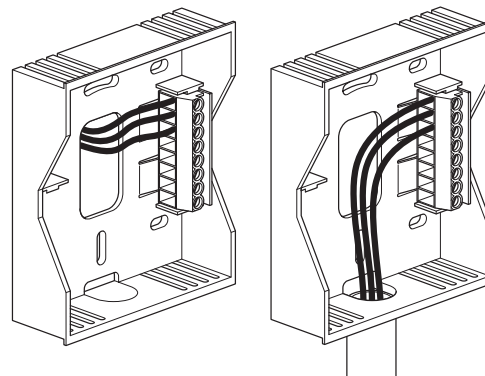
Minimum distance from

- Exterior walls: 50 cm
- Doors: 20 ... 30 cm



## Electrical installation

### Connection via flush-mounted socket with surface wiring



The underside of the housing can be mounted independently of the housing cover for pre-wiring purposes. Installation on all conventional standard flush-mounted sockets is possible.

The terminal block can be removed from the holder for connection purposes.

#### Note

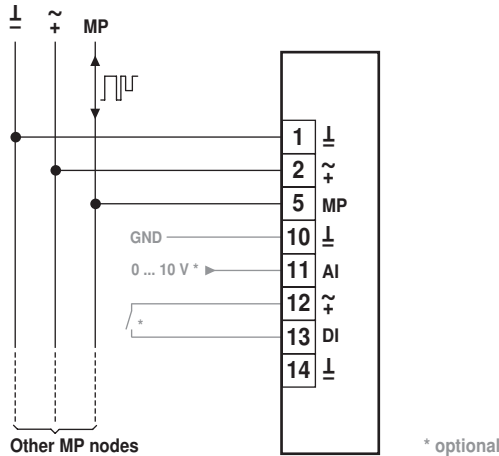
These are to be sealed, e.g. with cable mastic, in order to avoid the influences of draught air through installation pipes.

Electrical installation

(continued)

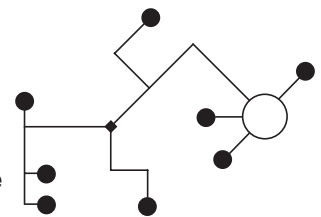
Wiring diagram

**Note**  
Connect via safety isolation transformer.

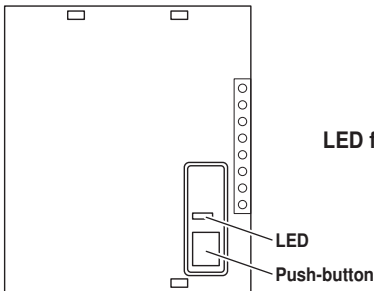


- MP-Bus Communication and supply**  
in the same 3-wire cable (terminals 1, 2 and 5)
- no shielding or twisting necessary
  - no terminating resistors required

**Power topology**  
There are no restrictions for the power topology (star, ring, tree or hybrid forms are permitted).



Commissioning



LED function

- The VOC module outputs the value of 450 for 15 minutes after Power On (see page 2).
  - Addressing with service device ZTH-GEN or BELIMO PC-Tool MFT-P.
  - The push-button for acknowledging the address is located under the cover (see page 3 «Opening the housing»).
- |                |  |
|----------------|--|
| • Off:         | No supply or wiring errors present                 |
| • Illuminated: | Supply and wiring OK                               |
| • Flickering:  | MP communication active                            |
| • Blinking:    | Depiction of MP address (command from MP master)   |
| continuous:    | No MP address set                                  |
| sporadic:      | Pulse in accordance with MP address (e.g. 5 = MP5) |

Testing and maintenance

- |                              |  |
|------------------------------|--|
| <b>Maintenance</b>           | The room sensor is maintenance-free, no calibration required.  |
| <b>Temperature sensor</b>    | Stimulation with a heat source (e.g. light bulb, breathing upon it). Beware of overheating, do not use open flame! |
| <b>Humidity sensor</b>       | Stimulation by breathing on it.  |
| <b>CO<sub>2</sub> sensor</b> | Stimulation by breathing on it. The CO <sub>2</sub> value is recalculated every 15 seconds.                        |
| <b>VOC sensor</b>            | Stimulation by breathing on it.  |

Dimensions [mm]

Dimensional drawings

