

# CRC-A-MB-24 / UG8-CRC-A-MB-24 VAV CONTROLLER

Wall or duct mounted controller for CO<sub>2</sub>, temperature and humidity (%RH).



## TECHNICAL DATA

<b>Supply voltage:</b>	24V AC/DC
<b>Power Consumption</b>	Room Sensor 10 mA (avg.) 42mA (max.) Duct Sensor 22 mA (avg.) 56 mA (max.)
<b>Outputs:</b>	
<b>Analogue Out 1:</b>	0-10V
<b>Analogue Out 2:</b>	0-10V
<b>Analogue Out 3:</b>	0-10V or PWM
<b>Analogue Out 4:</b>	PWM period 2 sec.
<b>Max load on 0-10V outputs:</b>	>5 kΩ imp.
<b>Max load on PWM:</b>	1A (24V)
<b>Digital input:</b>	1 pcs
<b>LED indications</b>	
<b>Yellow (L1), continuous light:</b>	See detailed description under "LED indications on the circuit board" in the installation instruction.
<b>Green (L2):</b>	Operation.
<b>Red (L3):</b>	See detailed description under "LED indications on the circuit board" in the installation instruction. Too low supply voltage, too high load of outputs and blink indication when changing function. Lights up continuously in service mode. Fresh air calibration (400 ppm) of CO <sub>2</sub> measurement value. Offset adjustment of temperature measurement value +/- 3°C (resolution 0.2).
<b>Screw terminals:</b>	Room Sensor 10 x 2.5 mm Duct Sensor 12 x 2.5 mm
<b>Flat-blade screwdriver:</b>	2.5 x 0.5 mm
<b>Dimensions WxHxD:</b>	Room Sensor 92x92x28,5 mm Duct Sensor 119 x 218 x 76 mm
<b>Weight:</b>	Room Sensor 105 grams Duct Sensor 370 grams
<b>Protection class:</b>	Room Sensor IP20 Duct Sensor IP65

## FEATURES

- Modbus communication, fully configurable
- 15 preset selectable functions
- Internal automatic self-calibration for CO<sub>2</sub>
- Analog and/or PWM outputs
- Easy mounting
- Normally maintenance free
- 360° Rotatable enclosure (UG8-CRC-A-MB-24)

## FUNCTION

CRC-A-MB-24 is a room controller for wall mounting and UG8-CRC-A-MB-24 is a room controller for duct installation which is used for controlling ventilation, heating, cooling and humidity.

The CO<sub>2</sub> sensor in the product is maintenance-free in normal environments thanks to the built-in self-correcting ABC algorithm. This means that our sensors have an expected lifetime of at least 15 years and do not require any additional calibration when used in normal indoor air applications.

The desired function is set via a DIP switch. There are 15 pre-programmed functions for adaption to most requirements for room control of CO<sub>2</sub>, temperature and humidity. The installation instruction shows all pre-programmed settings. Some settings are similar, but e.g. the p-band for temperature is different so as to make it easily configurable for different requirements. The digital input has different functionality depending on the selected setting, and can be activated both physically and via MODBUS. All preset functions are fully adjustable via MODBUS RTU.

To check the function of the installation/system, the respective measurement values for CO<sub>2</sub>, temperature and humidity can be simulated manually, via MODBUS.

The CRC-A-MB-24/UG8-CRC-A-MB-24 is supplied factory set in function 1 (VAV, heating and cooling control).

## Preset functions

Funct. 1-5	VAV, heating and cooling control
Funct. 6-7	Transmitter function and digital output-on/off
Funct. 8-11	VAV control with basic ventilation
Funct. 12-14	VAV, heating and cooling control
Funct. 15	Control function

## Functions 1-5

### VAV, heating and cooling control

Functions 1-5 are all usable for VAV, heating and cooling control. Analogue output 1 (0-10V) is affected by the measured values of CO<sub>2</sub>, temperature and humidity and the output voltage is controlled by the highest measurement value.

Analogue output 2 (0-10V) is only affected by CO<sub>2</sub> measurement value.

Analogue output 3 (0-10V or PWM) is only affected by temperature measurement value.

Output 4 (PWM) is affected by different measurement values, see table.

The digital input (closure) gives 10V output on analogue output 1. When the digital input is opened, an afterrun time of 10 minutes starts. The afterrun time can be changed via MODBUS.

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## Functions 6-7

### Transmitter function and digital output-on/off

These functions are mainly used if you only want to measure CO<sub>2</sub>, temperature and humidity.

Analogue output 1 (0-10V): P-band, CO<sub>2</sub> 500-1500ppm in appl. 6 and 0-2000ppm in appl. 7.

Analogue output 2 (0-10V): P-band for both functions, temperature 0-50°C.

Analogue output 3 (0-10V): P-band for both functions, humidity 0-100%RH.

Output 4 (OFF/ON): CO<sub>2</sub> 900/1000ppm in appl. 6 and 800-900ppm in appl. 7.

## Functions 8-11

### VAV control with basic ventilation

These functions have similar functions to functions 1-5, but analogue output 1 (0-10V) is locked at 20% until the digital input is closed. This provides a fixed basic ventilation until the VAV control is activated by, for example, a motion detector or timer. When digital input is opened, an afterrun time of 10 minutes starts, and then analogue output 1 returns to a locked output signal of 20%.

## Functions 12-14

### VAV, heating and cooling control

These functions have similar functions to functions 1-5, but with different P-bands.

## Function 15

### Control function

This function provides 100% output signal on all outputs when the digital input is closed. The function can be used to check the installation. No adjustment is in progress.

## USE

CRC-A-MB-24 is used for CO<sub>2</sub>, temperature and humidity control of indoor environment for wall mounting.

UG8-CRC-A-MB-24 is used for CO<sub>2</sub>, temperature and humidity control of indoor environment for duct mounting.

## INSTALLATION

CRC-A-MB-24 is installed on the wall of the room to be controlled. Avoid installation in direct sunlight or near heat or cooling sources. If it is installed over a junction box/cable pipe, these must be sealed to avoid affecting measurement results. Screws with specially adapted head size are attached.

UG8-CRC-A-MB-24 are installed on a duct where the included PST195 tube are mounted with or without mounting bracket. Hole punch  $\varnothing$  38 mm. In the case of insulated, round and small ducts, mounting bracket (UG-MB-8) are used and the holes are then  $\varnothing$  51 mm. See separate instruction

NOTE! When mounting outdoors, in cold attics, etc., the detector should be isolated from the surrounding air with e.g. UG-COVER-75, insulating box. In these cases, it should also be marked.

## MAINTENANCE

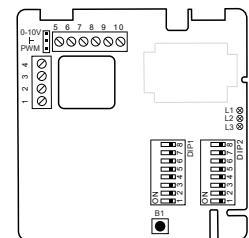
CRC-A-MB-24 and UG8-CRC-A-MB-24 are normally maintenance-free. The CO<sub>2</sub> sensor in the controller is maintenance-free in normal environments thanks to the built-in self-correcting ABC algorithm. Calibration and adjustment of CO<sub>2</sub> and temperature readings can either be performed via push button on the circuit board or via MODBUS.

## WIRING DIAGRAM

### CRC-A-MB-24

Ø 1	G+ 24V AC/DC
Ø 2	G0 24V AC/DC
Ø 3	Output 1, 0-10V+
Ø 4	Output 2, 0-10V+
Ø 5	Output 3, 0-10V+ /PWM 2-
Ø 6	Output 4, PWM 1 -
Ø 7	Digital In +
Ø 8	A+ RS485
Ø 9	B- RS485
Ø 10	GND RS485

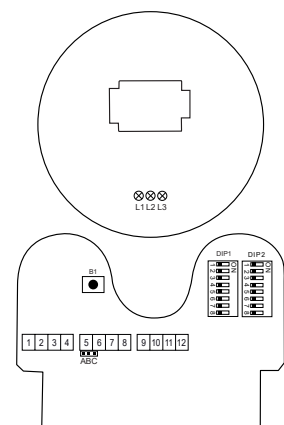
0-10V  Output 3:  
PWM  0-10V - GND=0-10V  
PWM  GND - PWM=PWM 2-



### UG8-CRC-A-MB-24

Ø 1	G+ 24V AC/DC
Ø 2	G0 24V AC/DC
Ø 3	Output 1, 0-10V+
Ø 4	Output 2, 0-10V+
Ø 5	Output 3, 0-10V+ /PWM 2-
Ø 6	Output 4, PWM 1 -
Ø 7	Digital In +
Ø 8	A+ RS485
Ø 9	B- RS485
Ø 10	GND RS485
Ø 11	G0
Ø 12	24V AC/DC

A  Output 3:  
B  A-B=0-10V  
C  B-C=PWM 2-



## ORDER EXAMPLE

Art No.	Description
CRC-A-MB-24	Controller for wall mounting
UG8-CRC-A-MB-24	Controller for duct mounting