

VAISALA

GMW90 Series Carbon Dioxide,  
 Temperature and Humidity  
 Transmitters



Features

- Measured parameters: carbon dioxide, temperature, and humidity (optional)
- Superior long-term stability with the latest-generation Vaisala CARBOCAP® sensor
- Accurate temperature and humidity measurements due to the low-power microglow infrared source
- Quick and easy installation and maintenance
- Calibrated, user-exchangeable measurement modules
- 3-point traceable CO<sub>2</sub> calibration (certification included)
- Both analog and field bus communication (Modbus® RTU)

GMW90 series transmitters are available with either a display opening or a solid front. An optional traffic light indication is also available.

GMW90 Series CARBOCAP® Carbon Dioxide, Temperature and Humidity Transmitters for HVAC are based on new measurement technology for improved reliability and stability. With the new technology the transmitter’s inspection interval is extended to five years.

Designed for demand controlled ventilation, GMW90 series transmitters measure carbon dioxide and temperature, with the option for humidity measurements. The instruments come with a calibration certificate that meets traceability and compliance requirements.

Reliability from unique  
 measurement technology

GMW90 series transmitters use advanced Micro-Electro-Mechanical System (MEMS) technology for measuring carbon dioxide. The CARBOCAP® carbon dioxide sensor’s continuous reference measurement enables reliable and accurate readings and outstanding long-term stability also in buildings with round-the-clock occupancy.

The latest-generation CARBOCAP® sensor no longer uses an incandescent light bulb, which limits sensor lifetime. This unique sensor consumes very little power compared to other sensors on the market. As a result, instrument self-heating is low and humidity and temperature can be measured correctly.

Convenient installation

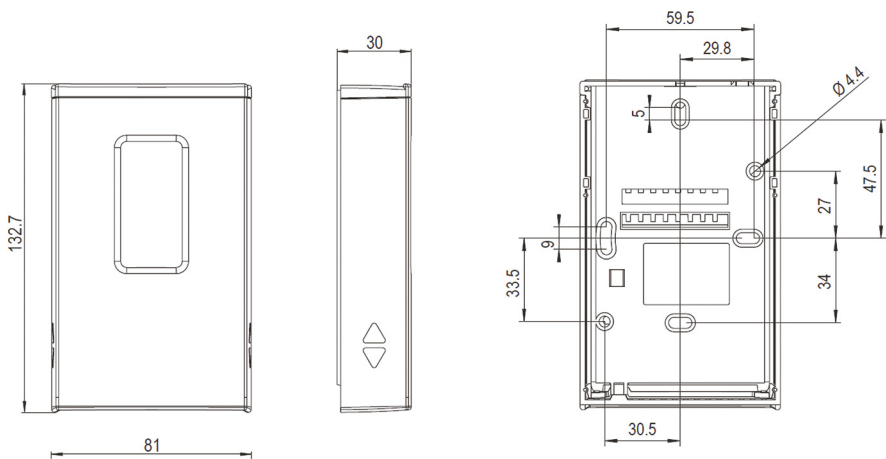
GMW90 series transmitters have been designed for quick and easy installation and maintenance. Every model includes a display for easy startup and convenient maintenance. To protect the sensor from dust and dirt during construction and installation, the units can be cabled with back-plate only. Electronics can be

snapped on later at an appropriate phase in the construction project. DIP switches make it quick and easy to configure the transmitters.

Easy calibration

Regular instrument maintenance guarantees a long product lifetime. Calibration is easiest done with the exchangeable measurement modules. Sensor traceability and measurement quality is easily maintained by snapping on a new module calibrated at Vaisala factory. The instrument can also be calibrated using a handheld meter or reference gas CO<sub>2</sub> bottle. The service interfaces are easy to reach by simply sliding the cover down. The closed cover keeps the measurement environment stable during calibration and ensures top-quality final result.

# GMW90 dimensions and models



Dimensions (in mm) of GMW90 series transmitter cover (left) and mounting base (right)

## Models

Model	Measurements	Output
GMW93	CO <sub>2</sub> +T	3-wire voltage output
GMW93D	CO <sub>2</sub> +T	3-wire voltage output, with display
GMW94	CO <sub>2</sub> +T	3-wire current output
GMW94D	CO <sub>2</sub> +T	3-wire current output, with display
GMW93R	CO <sub>2</sub> +T+RH	3-wire voltage output
GMW93RD	CO <sub>2</sub> +T+RH	3-wire voltage output, with display
GMW93RA	CO <sub>2</sub> +T+RH	3-wire voltage output, with display and CO <sub>2</sub> indicator LEDs
GMW94R	CO <sub>2</sub> +T+RH	3-wire current output
GMW94RD	CO <sub>2</sub> +T+RH	3-wire current output, with display
GMW95	CO <sub>2</sub> +T	Modbus RTU output
GMW95D	CO <sub>2</sub> +T	Modbus RTU output, with display
GMW95R	CO <sub>2</sub> +T+RH	Modbus RTU output
GMW95RD	CO <sub>2</sub> +T+RH	Modbus RTU output, with display
GMW90	CO <sub>2</sub> +T	Analog or Modbus RTU output (configurable)
GMW90R	CO <sub>2</sub> +T+RH	Analog or Modbus RTU output (configurable)

# Technical data

## Measurement performance

<b>Carbon dioxide</b>	
Measurement range	0 ... 5000 ppm
Stability in typical HVAC applications	Total accuracy at room temperature ±75 ppm at 600 and 1000 ppm incl. 5 years drift
Carbon dioxide sensor	CARBOCAP® GM10
Accuracy:	
+20 ... +30 °C (+68 ... +86 °F)	±(30 ppm + 2 % of reading)
+10 ... +20 °C, +30 ... +40 °C (+50 ... +68 °F, +86 ... +104 °F)	±(35 ppm + 2.7 % of reading)
-5 ... +10 °C, +40 ... +55 °C (+23 ... +50 °F, +104 ... +131 °F)	±(45 ppm + 3.8 % of reading)
<b>Temperature</b>	
Measurement range	-5 ... +55 °C (+23 ... +131 °F)
Temperature sensor	Digital temperature sensor
Accuracy:	
+20 ... +30 °C (+68 ... +86 °F)	±0.5 °C (±0.9 °F)
+10 ... +20 °C, +30 ... +40 °C (+50 ... +68 °F, +86 ... +104 °F)	±0.6 °C (±1.08 °F)
-5 ... +10 °C, +40 ... +55 °C (+23 ... +50 °F, +104 ... +131 °F)	±0.8 °C (± 1.44 °F)
<b>Relative humidity</b>	
Measurement range	0 ... 95 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	HUMICAP® 180R
Accuracy at temperature range +10 ... +40 °C (+50 ... +104 °F):	
0 ... 60 %RH	±2.5 %RH
60 ... 80 %RH	±3.0 %RH
80 ... 95 %RH	±4.0 %RH
Accuracy at temperature range -5 ... +10 °C, +40 ... +55 °C (+23 ... +50 °F, +104 ... +131 °F):	
0 ... 60 %RH	±3.5 %RH
60 ... 80 %RH	±4.0 %RH
80 ... 95 %RH	±5.0 %RH

1) Complies with CEC-400-2008-001-CMF

## Operating environment

Operating temperature	-5 ... +55 °C (+23 ... +131 °F)
Storage temperature	-30 ... +60 °C (-22 ... +140 °F)
Operating humidity	0 ... 95 %RH Dew point < +30 °C (+86 °F)
IP rating	IP30



Optional decorative cover blends the transmitter into your interior design.

## Inputs and outputs

Supply voltage	18 ... 35 V DC, 24 V AC ± 20% 50/60 Hz
Service port	RS-485 line for temporary service use
<b>Current output models</b>	
Outputs	0/4 ... 20 mA, 2 and 3 channel models
Loop resistance	0 ... 600 Ω
Power consumption	< 2 W
<b>Voltage output models</b>	
Outputs	0 ... 5/10 V, 2 and 3 channel models
Load resistance	10 kΩ min.
Power consumption	< 1 W
<b>Default analog scales</b>	
CO <sub>2</sub>	0 ... 2000 ppm
T	-5 ... +55 °C
RH	0 ... 100 %RH
<b>Field bus models</b>	
Power consumption	< 1.5 W
Output type	RS-485 (galvanic isolation, 1.5 kV)
RS-485 end of line termination	Enable with jumper, 120 Ω
Modbus RTU address range	0 ... 247

## Mechanical specifications

Standard housing color	White (RAL9003)
Housing material	ABS/PC, UL-V0 approved
Output connector	Screw terminals Max. wire size 2 mm <sup>2</sup> (AWG14)
Service port connector	4-pin M8
Weight	163 g (5.75 oz)

1) RAL code is only indicative with potential small variations in color shade

## Spare parts and accessories

CO <sub>2</sub> module	GM10SP
Temperature module (CO <sub>2</sub> +T models)	TM10SP
Humidity and temperature module (CO <sub>2</sub> +T+RH models)	HTM10SP
Decorative cover set (10 pcs)	236285
Connection cable for MI70	219980
USB cable for PC connection	219690
Universal AC power supply	245866

## Compliance

EU directives	EMC, RoHS
EMC compatibility	EN 61326-1, industrial environment
EMC emissions	CISPR 22 / EN 55022, Class B
Compliance marks	CE, RCM