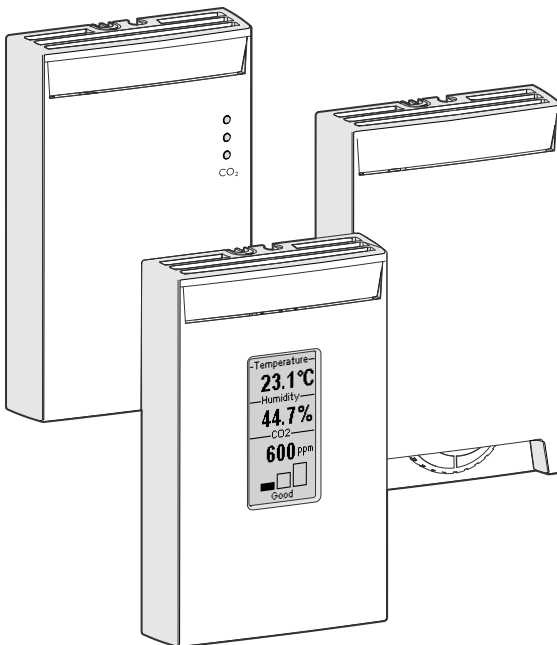


USER'S GUIDE

Vaisala CARBOCAP® Carbon Dioxide, Humidity and Temperature Transmitters GMW80 Series



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1

ABOUT THIS DOCUMENT

This document provides information for installing, operating, and maintaining GMW80 series transmitters.

Table 1 Document Versions

Document Code	Date	Description of Changes
M211748EN-D	November 2015	Added new product models: GMW84 and GMW84S.
M211748EN-C	June 2015	Updated wiring instructions for GMW83 product models.
M211748EN-B	May 2015	<ul style="list-style-type: none"> ■ Added new product models: GMW83, GMW83D, GMW83A, GMW83T, GMW83RP, GMW83DRP. ■ Updated Analog Output Overrange Behavior on page 15. ■ Updated Problem Situations on page 32.
M211748EN-A	November 2014	First version.

Table 2 Related Manuals

Document Code	Name
M211660EN	GM10 Quick Guide

Documentation Conventions



Warning alerts you to a serious hazard. If you do not read and follow instructions very carefully at this point, there is a risk of injury or even death.



Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.



Note highlights important information on using the product.

Trademarks

CARBOCAP® and INTERCAP® are registered trademarks of Vaisala Oyj.
Third-party products and names may be trademarks of their respective owners.

2

PRODUCT OVERVIEW

Introduction to GMW80 Series

Vaisala GMW80 series CARBOCAP® carbon dioxide, humidity, and temperature transmitters are wall-mount transmitters designed to fulfill the needs for CO₂ measurements in standard demand controlled ventilation applications. The CO₂ measurement is based on a new generation CARBOCAP® sensor, which uses a novel, silicon-based microchip emitter instead of an incandescent light bulb. The internal reference in the CO₂ sensor guarantees the best stability and operation also in constantly occupied buildings without frequent readjustments.

CARBOCAP® sensors give correct CO₂ measurements immediately when powered on. As they have a built-in reference measurement they do not need a lengthy learning phase before the measured values are correct. Proper operation can be verified immediately after snapping on the device cover.

All GMW80 series transmitters measure carbon dioxide (CO₂) and temperature (T), some models also include relative humidity (RH) measurement as well. Humidity measurement utilizes the Vaisala INTERCAP® sensor.

Transmitter models and their features are listed in [Transmitter Models on the next page](#).

Transmitter Models

Table 3 GMW80 Series Transmitters

Model Name	CO ₂ Output	T Output	RH Output	Display	CO ₂ LEDs	Relay	T Setpoint
GMW83	0 ... 10 V	0 ... 10 V	No	No	No	No	No
GMW83A	0 ... 10 V	0 ... 10 V	No	No	Yes	No	No
GMW83D	0 ... 10 V	0 ... 10 V	No	Yes	No	No	No
GMW83T	0 ... 10 V	0 ... 10 V	No	No	No	No	Yes
GMW83RP	0 ... 10 V	0 ... 10 V Pt1000 (passive)	0 ... 10 V	No	No	No	No
GMW83DRP	0 ... 10 V	0 ... 10 V Pt1000 (passive)	0 ... 10 V	Yes	No	No	No
GMW84	4 ... 20 mA	4 ... 20 mA	No	No	No	No	No
GMW84S	4 ... 20 mA	4 ... 20 mA	No	No	No	Yes	No
GMW86P	4 ... 20 mA 0 ... 10 V	Pt1000 (passive)	No	No	No	No	No
GMW86PT	4 ... 20 mA 0 ... 10 V	Pt1000 (passive)	No	No	No	No	Yes

Letters at the end of the model name stand for the following features:

P = Passive temperature measurement

T = Temperature setpoint potentiometer

D = Display

A = CO₂ indicator LEDs

R = Humidity measurement

S = Relay

Transmitter Parts

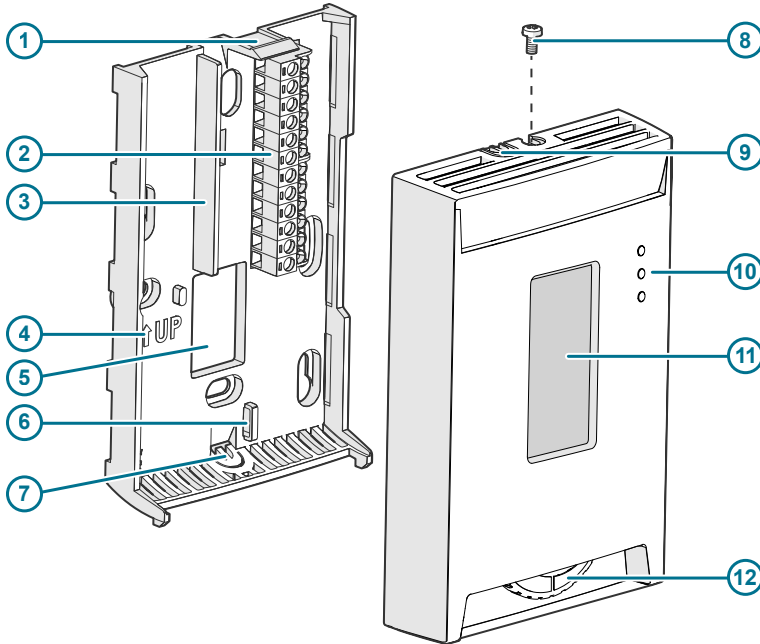


Figure 1 GMW80 Series Transmitter Parts

- 1 = Opening tab.
- 2 = Screw terminals. The wiring information is marked on the mounting base next to the terminals.
- 3 = Barrier to prevent the cable from being routed below the GM10 measurement module. The area to avoid is marked **No cable** on the mounting base.
- 4 = Orientation arrow. Should point up after mounting base has been installed.
- 5 = Opening for cable when wiring from behind (recommended).
- 6 = Place for zip tie (optional, for cable strain relief).
- 7 = Breakaway tab for routing the cable from below.
- 8 = Locking screw. Supplied with the transmitter.
- 9 = Breakaway tab for routing the cable from above.
- 10 = CO₂ level indicator LEDs (on models with letter A) or relay indicator LED (on models with letter S).
- 11 = Display (on models with letter D).
- 12 = Setpoint wheel (on models with letter T).

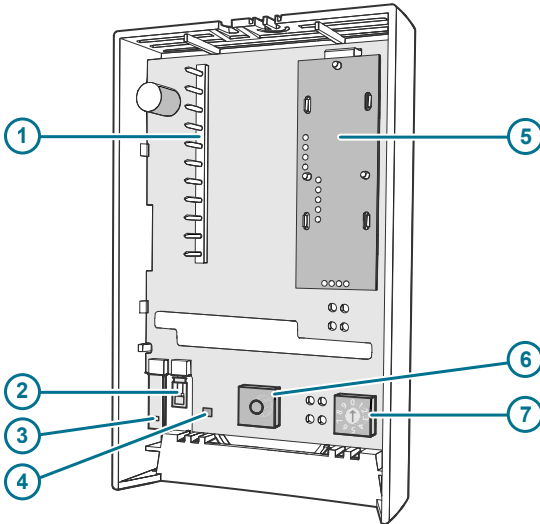


Figure 2 GMW80 Series Component Board Parts

- 1 = Pins that connect the transmitter cover to the screw terminals when the transmitter cover is in place.
- 2 = Vaisala INTERCAP® humidity sensor (on models with letter R).
- 3 = Pt1000 temperature sensor for passive temperature measurement (on models with letter P)
- 4 = Active temperature sensor.
- 5 = GM10 carbon dioxide measurement module.
- 6 = Potentiometer component (on models with letter T).
- 7 = Rotary switch for relay setpoint (on models with letter S).

Display

Startup Screens

When a GMW80 series transmitter with a display is powered on, it shows a sequence of information screens. The screens are shown for a few seconds each.

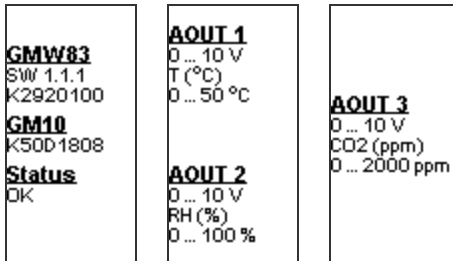


Figure 3 Example Startup Screens

The first screen shows the following information:

- Transmitter model, software version, and serial number.
- Serial number of the connected GM10 CO₂ measurement module. If the module is disconnected, no serial number is shown.
- Transmitter status: OK or ERROR. If the status is ERROR, the cause of the error will be shown on the measurement screen after the startup is completed.

The following screen(s) show the configuration of the active analog outputs:

- Output type (for example, 0 ... 10 V).
- Output parameter and unit (for example, CO₂ (ppm)).
- Output scaling (for example, 0 ... 2000 ppm).

Measurement Screen

After the startup screens the transmitter shows the measurement screen. It shows the measured parameters and an air quality indicator based on the current CO₂ level.

- **Good** air quality: 0 ... 800 ppm CO₂
- **Fair** air quality: 800 ... 1200 ppm CO₂
- **Poor** air quality: >1200 ppm CO₂

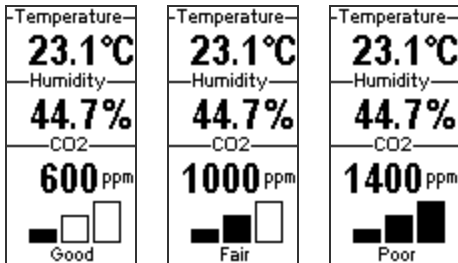


Figure 4 Example Measurement Screens

Error Messages

If there is a problem with measurement, affected readings are replaced with stars. The alarm indicator and an error message will also appear on the screen. If more than one error is active, the display will cycle through the errors, showing each error for a few seconds.

For a list of possible errors and their causes, see [Problem Situations on page 32](#).

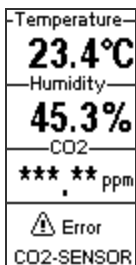


Figure 5 Example Error Message on Display

Relay

Transmitter model GMW84S has one SPST-NO relay (max. 50 VDC / 50 VAC, 500 mA) that is activated when the measured CO₂ level rises above the setpoint.

When the relay is active (contact is closed), a green LED is lit on the transmitter cover.

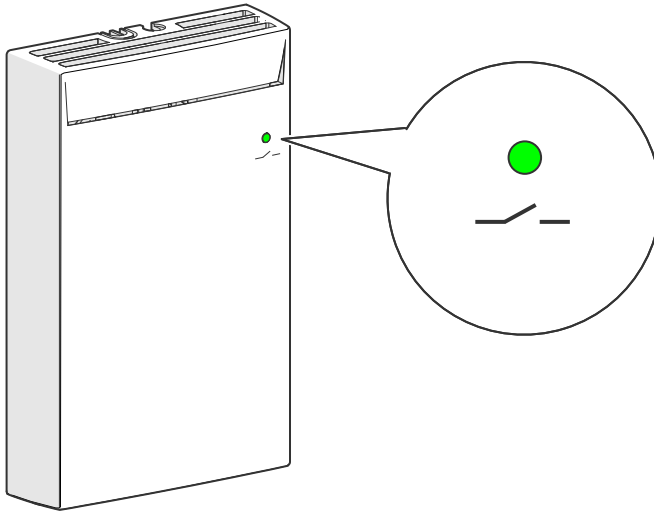


Figure 6 Relay Indicator LED on GMW84S

Relay setpoint is set using a rotary switch on the component board. Use a small flat head screwdriver to turn the switch. The switch has ten positions with pre-defined setpoints.



Figure 7 Rotary Switch

Table 4 Relay Setpoints

Switch Position	Setpoint in ppm CO ₂
0	600 ppm (default)
1	700 ppm
2	800 ppm
3	900 ppm
4	1000 ppm
5	1200 ppm
6	1400 ppm
7	1600 ppm
8	1800 ppm
9	2000 ppm

A hysteresis of 50 ppm is applied to prevent the relay from switching back and forth when the measured value is near the setpoint value. The relay is activated/deactivated when the measured CO₂ value passes the setpoint, plus/minus 50 ppm.

For example, consider a transmitter that has the relay setpoint set to 1000 ppm CO₂. As the measured CO₂ value rises, the relay is activated at 1051 ppm. The relay remains activated until the measured value falls to 949 ppm.

CO₂ Level Indicator LEDs

Transmitter model GMW83A has indicator LEDs for the measured CO₂ level on the front cover. The LEDs provide a visual indication of the measured CO₂ level to the occupant of the monitored space.

The LEDs are lit as follows:

- Red LED (top): lit between 1200 ... 2000 ppm CO₂, blinking >2000 ppm CO₂.
- Yellow LED (center): lit between 800 ... 1200 ppm CO₂.
- Green LED (bottom): lit between 0 ... 800 ppm CO₂.

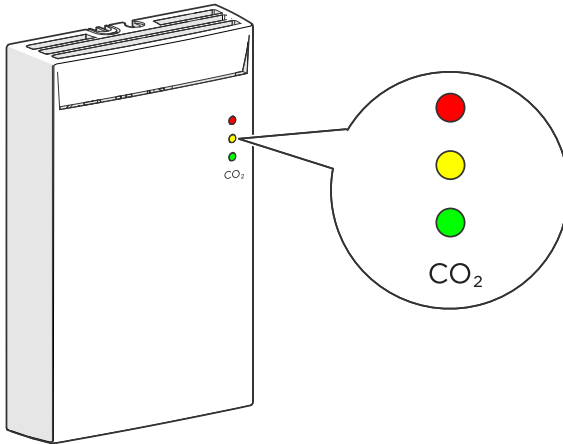
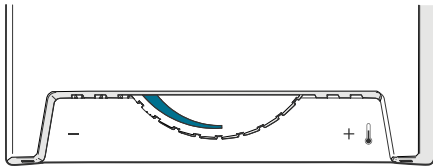


Figure 8 CO₂ Level Indicator LEDs on Model GMW83A

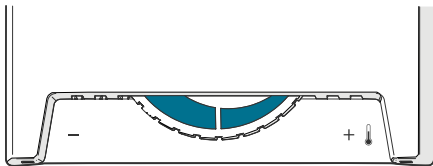
Temperature Setpoint Potentiometer

GMW80 series transmitter models with the letter T in their model name have a temperature setpoint function that gives the occupant of the monitored space a way to adjust the temperature. The setpoint function is implemented using a passive 10 k Ω linear potentiometer (variable resistor) that is mechanically actuated by a setpoint wheel on the lower part of the transmitter.

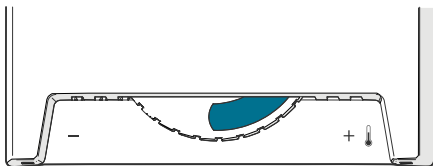
The transmitter is simply marked with plus "+" and minus "-" signs to indicate the direction of adjustment. The rotation of the wheel is mechanically limited to approximately 180 degrees, so in actual use the resistance range of the potentiometer varies between approximately 2.1 k Ω and 7.2 k Ω . The corresponding temperature change is decided on the building controller level.



Minimum: ~2.1 k Ω resistance.



Midpoint: ~4.65 k Ω resistance.



Maximum: ~7.2 k Ω resistance.

Analog Output Overage Behavior

Analog outputs of the GMW80 series transmitters have a defined behavior when the values measured by the transmitter are outside the scaled analog output range.

- At the top end of the output range, the output is clipped to the maximum value of the output. This means that even if the measured parameter rises, the value does not change anymore.
- At the low end of the output range, the output stays at the minimum value when the measured parameter falls below the scaled range.
- The output is eventually set to the error state if the measured parameter is far enough from the scaled output range. The exact limits for this behavior are parameter dependent; see the figures below.

For more information on the error state, see [Error State on page 36](#).

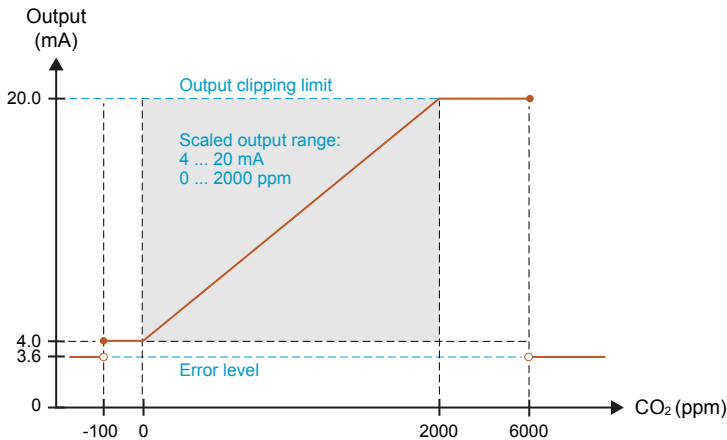


Figure 9 Overage Behavior of CO₂ Measurement with 4 ... 20 mA Output

Negative ppm values cannot physically exist but the behavior of the output is defined to account for cases where a low CO₂ reading, combined with sensor drift, could cause a negative result.

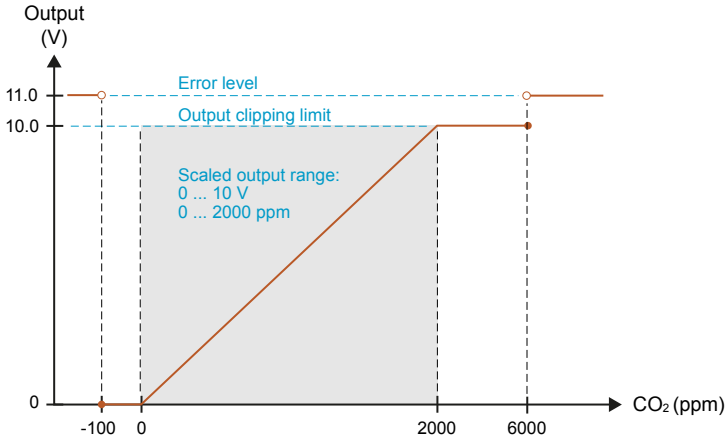


Figure 10 Overrange Behavior of CO₂ Measurement with 0 ... 10 V Output.

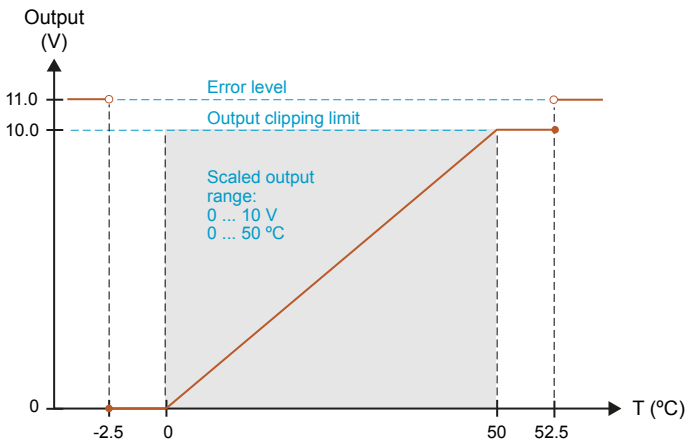


Figure 11 Overrange Behavior of Active Temperature Measurement

Passive temperature measurement (reading the Pt1000 resistor) is not affected by the overrange behavior or the error state.

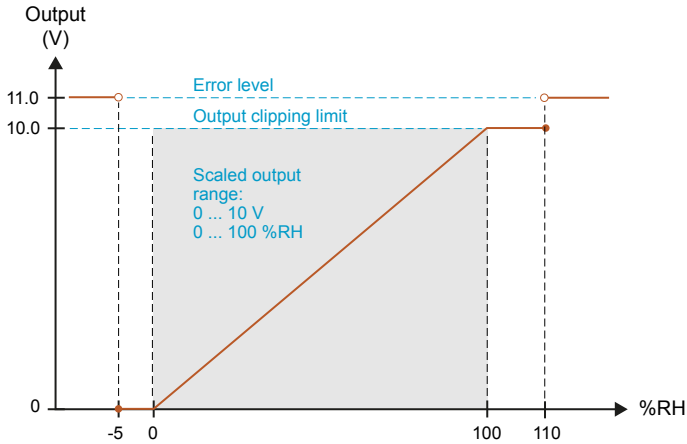


Figure 12 Overrange Behavior of Relative Humidity Measurement

The transmitter may measure humidities in excess of 100 %RH if the sensor element becomes wet due to condensation.

Safety

The GMW80 series transmitter delivered to you has been tested for safety and approved as shipped from the factory. Note the following precautions:



Connect only de-energized wires.



Do not modify the unit. Improper modification can damage the product or lead to malfunction.



Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Avoid touching exposed component contacts during installation and maintenance.

Regulatory Compliances



GMW80 series is in conformity with the following directives:

- RoHS-Directive
- EMC-Directive

The conformity is declared with using the following standards:

- EN 50581: Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
- EN 61326-1: Electrical equipment for measurement, control, and laboratory use – EMC requirements – Immunity test requirements for equipment intended to be used in an industrial electromagnetic environment.
- EN 550022: Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.

Patent Notice

The GMW80 series is protected by the following patents and their corresponding national rights:

Table 5 Applicable Patents

Patent Issued By	Patent Number
United States Patent and Trademark Office	US 5,827,438
	US 6,177,673
European Patent Office	EP0776023
	EP0922972
German Patent and Trade Mark Office	69615635
Japan Patent Office	4263285
Finnish Patent Office	112005
	105598

3

INSTALLATION

Selecting Location

Select a location that represents well the area of interest. Interior walls and columns are typically suitable locations. The installation height should be 1.2 ... 1.8 m (4 ... 6 ft).

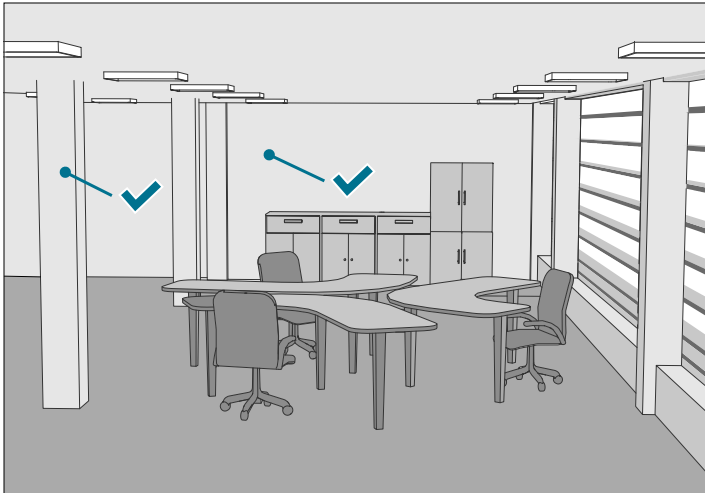


Figure 13 Examples of Good Installation Locations



Seal the cable opening when bringing a cable through the wall. The hole will supply air from outside the room into the transmitter and affect the measurement readings. For example, fresh concrete binds CO₂ and may cause low readings, especially in new buildings.

Avoid installing in the following locations:

- Near doors or windows.
- Near heat and moisture sources.
- In direct sunlight.
- In locations that are blocked by furniture.
- Close to the discharge of the supply air ducts.
- On the floor or the ceiling.
- On points that experience excessive vibration.

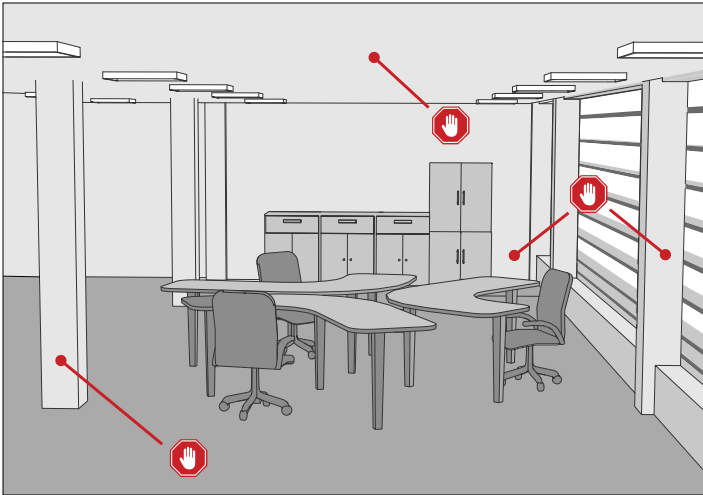


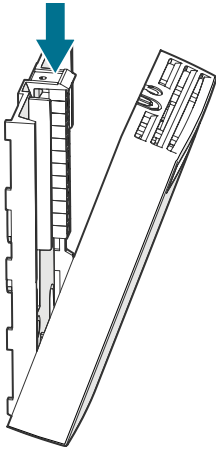
Figure 14 Examples of Unsuitable Installation Locations

Opening and Closing the Transmitter

GMW80 series transmitters are delivered from the factory with a pull tab that makes it easy to open the transmitter for installation.

To **open** the transmitter after it has been installed:

1. Loosen the locking screw if it has been installed.
2. Use a flat screwdriver to push down the tab that holds the transmitter cover and mounting base together, and pull the top of the transmitter cover away from the mounting base.



Be careful when opening the transmitter:

- Pushing down too hard can break off the opening tab.
- Inserting the screwdriver too far into the transmitter enclosure may damage transmitter components.

To **close** the transmitter:

1. Align the bottom of the transmitter cover with the bottom of the mounting base.
2. Tilt the top of the transmitter cover forward until the tab catches with an audible snap. Note that closing the transmitter starts it up if power is supplied to the screw terminals.
3. Pull on the cover gently to make sure it is properly closed and not loose.
4. Attach the locking screw if desired.

Installing the Mounting Base

The transmitters are designed to be installed on a mounting box or directly to a wall surface. To install the mounting base:

1. Make sure the orientation arrow on the mounting base points up. Proper orientation is important: air must flow through the vents on the bottom and top.
2. Use the mounting holes to attach the mounting base securely. Use at least two screws (not included). The mounting holes are suitable for the most common European, American, and Asian mounting boxes. The mounting base can be twisted on to pre-mounted screws.

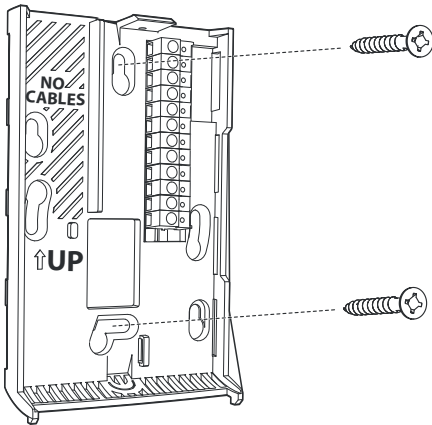


Figure 15 Installing the Mounting Base



Mounting bases are tailored to the individual transmitter at the factory. If you attach several mounting bases before connecting the transmitters, store the transmitters in their original shipping boxes, so that you can match the serial number on the mounting base to the serial number on the shipping box.

Wiring

Connect the wiring to the screw terminals on the mounting base. The terminal assignments are marked next to the screw terminals. Do not connect wiring to unmarked terminals.

Note that the analog signal ground terminal is internally connected to the power supply ground terminal.

Maximum wire size is 2 mm² (AWG14). Route the cable through the hole in the mounting base if possible.

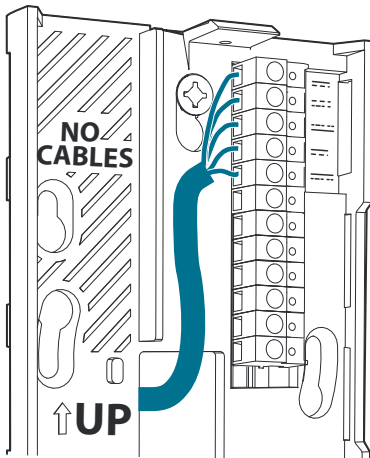


Figure 16 Routing the Cable from Behind



Connect only de-energized wires.



Do not route the cable through the area marked **NO CABLES** on the mounting base. That space is taken up by the CO₂ measurement module when the transmitter cover is attached.

You can also bring the cable to the housing from above or below, but you have to break off the small plastic tab that covers the hole on top or bottom of the housing.

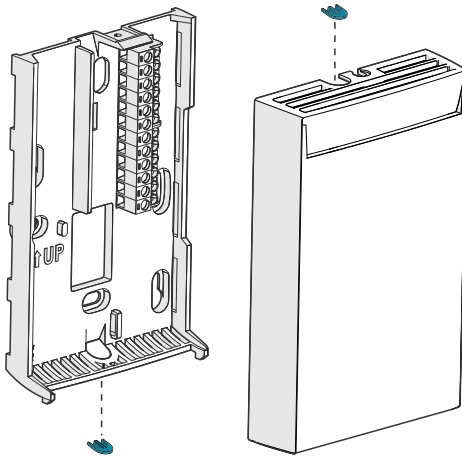


Figure 17 Locations of the Breakaway tabs

After completing the wiring, connect the transmitter body over the mounting base. Note that mounting bases are model-specific.

Wiring GMW83, GMW83D and GMW83A

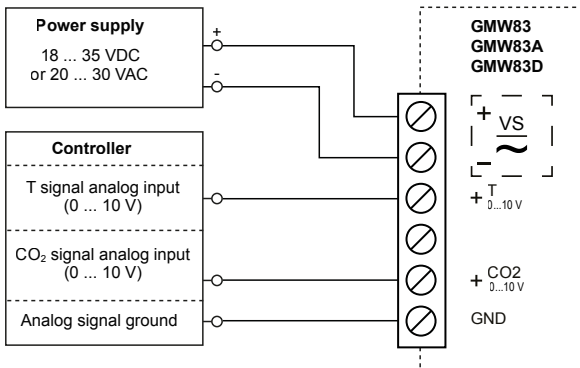


Figure 18 Wiring for GMW83, GMW83D, and GMW83A

Wiring GMW83T

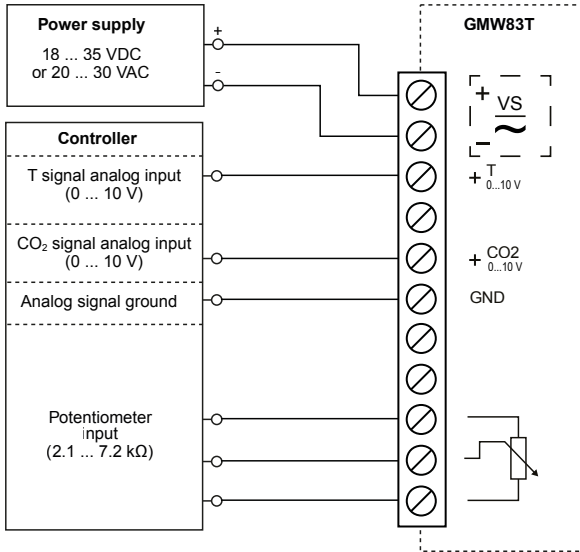


Figure 19 Wiring for GMW83T

Wiring GMW83RP and GMW83DRP

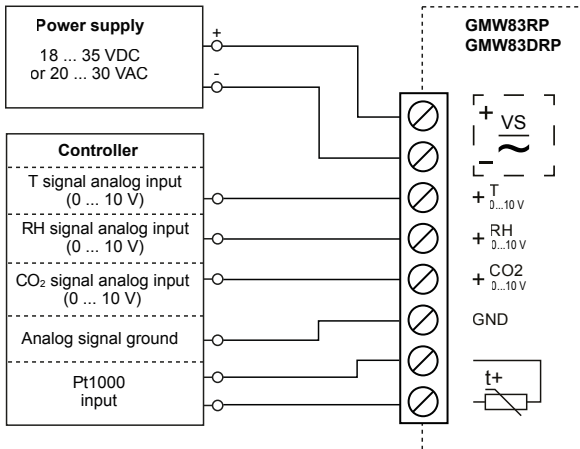


Figure 20 Wiring for GMW83RP and GMW83DRP

Wiring GMW84

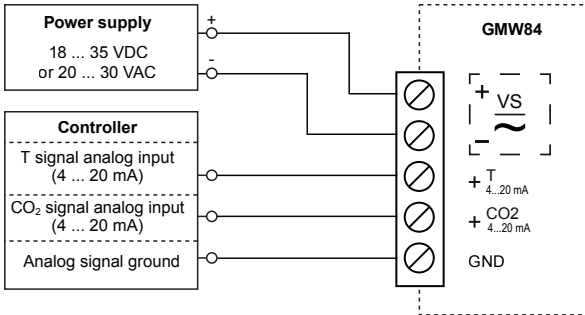


Figure 21 Wiring for GMW84

Wiring GMW84S

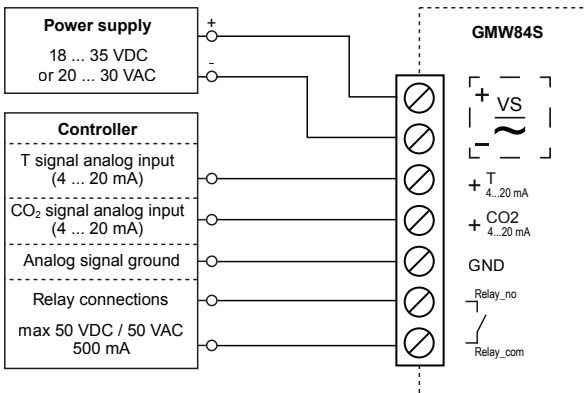


Figure 22 Wiring for GMW84S

To change the setpoint of the relay, turn the rotary switch on the component board. See [Relay on page 11](#).

Wiring GMW86P

GMW86PT has two outputs for the CO₂ signal: 4 ... 20 mA and 0 ... 10 V. You can use both outputs simultaneously but typically only one of them is needed. Note that they share a common minus terminal.

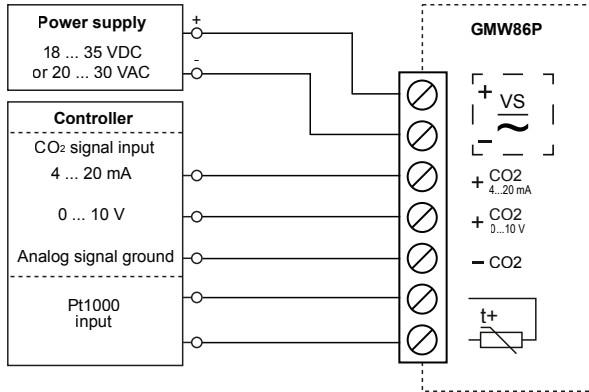


Figure 23 Wiring for GMW86P

Wiring GMW86PT

GMW86PT has two outputs for the CO₂ signal: 4 ... 20 mA and 0 ... 10 V. You can use both outputs simultaneously but typically only one of them is needed. Note that they share a common minus terminal.

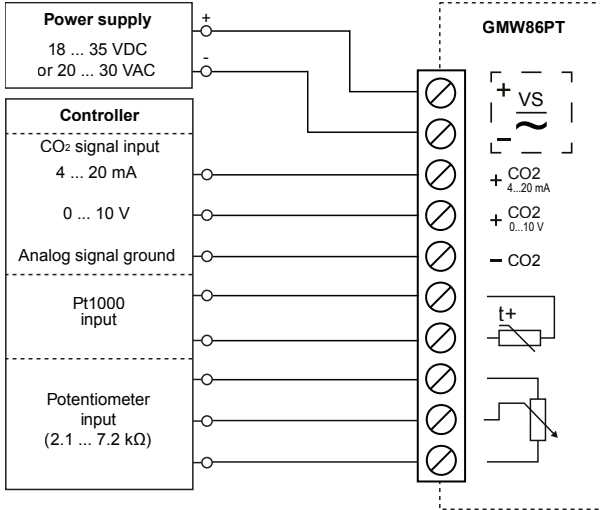


Figure 24 Wiring for GMW86PT

4

MAINTENANCE

Cleaning

The body of the transmitter can be cleaned by wiping with a moistened lint-free cloth. Do not use cleaning agents or solvents, or blow pressurized air into the transmitter housing.



If you suspect the CO₂ measurement module is dirty, do not attempt to open it. Instead, replace it with a new part. For order codes of spare parts, see [Spare Parts and Accessories on page 41](#).

Replacing the CO₂ Measurement Module (GM10)



- GM10 spare part module (Vaisala order code GM10SP80)
- Flat head screwdriver (for opening the transmitter)

1. Disconnect the transmitter body from the mounting base.
2. Locate the GM10 module on the transmitter. The module is a separate component board with a golden cuvette that contains the CARBOCAP® sensor. The module is connected to the main transmitter board with a connector, and held in place by a plastic clip on the other side. See [Figure 2 on page 8](#).
3. Disconnect the module by carefully lifting the module from the connector side.

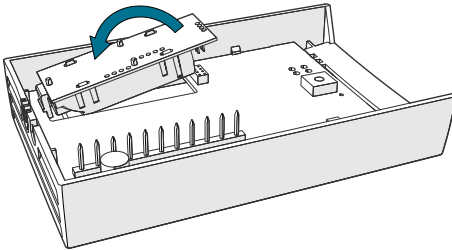


Figure 25 Disconnecting the GM10 Module

4. Take the new GM10 module and place it in the hole for the module so that the plastic clip meets the component board. Then lower the connector end of the module.
5. Push down on the module to secure the connector.
6. Reconnect the transmitter to the mounting base.
7. Check the output of the transmitter (or the display if included on the model) to verify that the CO₂ measurement is working normally and is not in the error state. For more information on the error state, see [Error State on page 36](#).

Replacing the INTERCAP® Humidity Sensor



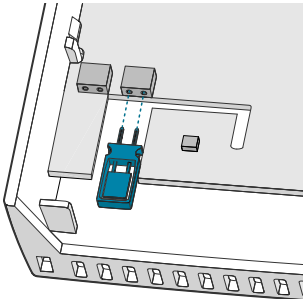
- INTERCAP® sensor (Vaisala order code 15778HM)
- Flat head screwdriver (for opening the transmitter)



To avoid contaminating or damaging the sensor:

- Handle the sensor by its plastic frame.
- Do not touch the sensor surface in the middle.
- Wear lint-free ESD gloves.

1. Disconnect the transmitter body from the mounting base.
2. Locate the INTERCAP® sensor on the component board. See [Figure 2 on page 8](#).
3. Disconnect the old INTERCAP® sensor by pulling it straight out of its socket.



4. Insert the new INTERCAP® sensor in the socket.
5. Reconnect the transmitter to the mounting base.
6. Check the output of the transmitter (or the display if included on the model) to verify that the humidity measurement is working normally and the transmitter is not in the error state. For more information on the error state, see [Error State on page 36](#).

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TROUBLESHOOTING

Problem Situations

Table 6 Possible Problem Situations and their Remedies

Problem	Possible Cause	Remedy
Analog output reading is unchanging and appears incorrect.	Transmitter has set the analog output to the error level (3.6 mA or 11 V) because the transmitter is in the error state.	Determine what has caused the error state and remove the cause. For a description of the error state and its possible causes, see Error State on page 36 .
Temperature reading is too high.	Transmitter is installed in an unsuitable location, for example, near a heat source or in sunlight.	Relocate transmitter. See Selecting Location on page 19 .
	Transmitter installed in improper orientation.	Reinstall transmitter with the arrow on the mounting base pointing up.
	Unsuitable operating environment.	Verify that the operating environment is within specified operating limits.
CO ₂ reading is too high.	Source of CO ₂ near the transmitter.	<ul style="list-style-type: none"> ■ Use a portable instrument to verify the CO₂ reading at the installation location. Avoid breathing on the instruments while checking. ■ Check for sources of CO₂ in the measured area, such as people working right next to the transmitter.
	CO ₂ measurement module must be replaced.	See Replacing the CO₂ Measurement Module (GM10) on page 30 .

Problem	Possible Cause	Remedy
CO ₂ reading is too low.	The measured area contains materials that bind CO ₂ (such as fresh concrete), producing a low-CO ₂ environment.	<ul style="list-style-type: none"> ■ Use a portable instrument to verify the CO₂ reading at the installation location. Avoid breathing on the instruments while checking. ■ Check if the transmitter is installed on a mounting box that supplies air from inside the wall into the transmitter. If yes, seal the opening that supplies the air.
	CO ₂ measurement module must be replaced.	See Replacing the CO2 Measurement Module (GM10) on page 30 .
Relay is always activated.	Relay setpoint set too low.	Adjust the relay setpoint. See Relay on page 11 .

Problem	Possible Cause	Remedy
Error Messages on Display		
Error text on display: CO ₂ -SENSOR	GM10 module disconnected.	<p>Open the transmitter and check if the GM10 module is installed securely. See Figure 2 on page 8.</p> <ul style="list-style-type: none"> ■ If the module is loose or entirely disconnected, reinstall it as instructed in Replacing the CO₂ Measurement Module (GM10) on page 30. ■ If the GM10 module appears to be installed but the problem persists, disconnect and reconnect the module carefully.
	CO ₂ measurement module must be replaced.	Replace the GM10 module with a verified working module.
	CO ₂ reading over 6000 ppm.	<ul style="list-style-type: none"> ■ Use a portable instrument to verify the CO₂ reading at the installation location. Avoid breathing on the instruments while checking. ■ Check for sources of CO₂ in the measured area, such as people working right next to the transmitter.

Problem	Possible Cause	Remedy
Error text on display: RH-SENSOR	Humidity sensor disconnected.	<p>Open the transmitter and check the condition of the humidity sensor. See Figure 2 on page 8.</p> <ul style="list-style-type: none"> ■ If the sensor is missing or damaged, replace it. See Replacing the INTERCAP® Humidity Sensor on page 31. ■ If the sensor is wet, wait for it to dry or dry it very gently with clean instrument air.
	Humidity sensor damaged.	
	Humidity sensor wet.	
Error text on display: T-SENSOR	Temperature reading is outside the scaled output range.	<ul style="list-style-type: none"> ■ Verify the ambient temperature with a portable instrument. ■ See Analog Output Overrange Behavior on page 15.
	Temperature sensor damaged.	Open the transmitter and check if the active temperature sensor on the component board has been damaged. See Figure 2 on page 8 .
Error text on display: INTERNAL	Problem with transmitter software.	<ul style="list-style-type: none"> ■ Restart the transmitter. ■ If the error persists, contact Vaisala helpdesk. See Technical Support on page 42.

Error State

If the transmitter detects a serious hardware or software error, or the measured reading is well outside the scaled range, the analog outputs are set into a defined error level instead of the measured result. The error level depends on the output type:

- For 4 ... 20 mA output, the error level is **3.6 mA**.
- For 0 ... 10 V output, the error level is **11 V**.

If the cause of the error is removed, the transmitter resumes normal operation of analog outputs. Some errors may require a reset of the transmitter to recover.

If the error state is caused by a measurement result being well outside the scaled output range, only affected channels are set to the error state. For more information, see [Analog Output Overrange Behavior on page 15](#).

Examples of situations that can cause the error state:

- The transmitter measures over 6000 ppm CO₂.
- The CO₂ measurement module (GM10) is disconnected.

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TECHNICAL DATA

Specifications

Table 7 Performance

Property	Specification
Carbon dioxide	
Measurement range	0 ... 2000 ppm
Accuracy across temperature range	
+20 ... +30 °C	±(30 ppm +3 % of reading)
+10 ... +20 °C, +30 ... +40 °C	±(35 ppm +3.7 % of reading)
+0 ... +10 °C, +40 ... 50 °C	±(40 ppm +4.8 % of reading)
Stability in typical HVAC applications	±(15 ppm + 2% of reading) over five years
Warmup time	1 min 10 min for full specification
Response time (63 %)	60 s
Carbon dioxide sensor	Vaisala CARBOCAP® GM10
Temperature	
Measurement range	0 ... 50 °C
Temperature sensor on P models for analog outputs	Pt1000 RTD Class F0.15 IEC 60751 Digital temperature sensor
Accuracy (GMW83, GMW84)	
+10 ... +30 °C	±0.5 °C
+0 ... +10 °C, +30 ... 50 °C	±1 °C
Humidity	
Measurement range	0 ... 95 %RH
Accuracy Temperature range +10 ... +30 °C	
0 ... 80 %RH	±3%RH
80 ... 95 %RH	±5%RH

Property	Specification
Temperature range 0 ... +10 °C, +30 ... +50 °C 0 ... 95%RH	±7%RH
Stability in typical HVAC applications	±2 %RH over 2 years
Product lifetime	>15 years

Table 8 Operating Environment

Property	Specification
Operating temperature range	0 ... +50 °C (+32 ... 122 °F)
Operating humidity range	0 ... 95 %RH Dewpoint <30 °C (+86 °F)
Storage temperature range Models with display	-40 ... +70°C (-40 ...158°F) -30 ... +70°C (-22 ...158°F)
Electromagnetic compliance	EN61326-1, Industrial environment

Table 9 Mechanics

Property	Specification
IP class	IP30
Housing material	ABS/PC UL-V0 approved
Housing color	White (RAL9003)
Output connector	Screw terminal
Max wire size	2 mm ² (AWG14)
Weight	
Plain and LED version	114 g
Setpoint version	120 g
Display version	124 g

Table 10 Inputs and Outputs

Property	Specification
Supply voltage	18 ... 35 VDC 24 VAC \pm 20 % 50/60 Hz
Max current consumption at 18 VDC GMW84 models Other models	70 mA 45 mA
Max power consumption at 30 VAC GMW83 models GMW86 models GMW84 models	0.7 W 1 W 1.2 W
Outputs	4 ... 20 mA and/or 0 ... 10V See Table 3 on page 6 .
Current loop resistance (4 ... 20mA)	0 ... 600 Ω
Voltage output load resistance	10 k Ω min.
CO ₂ output scale	0 ... 2000 ppm
Temperature output scale	0 ... 50 °C
Humidity output scale	0 ... 100 %RH
Passive temperature sensor (P models)	Pt1000 RTD
Temperature setpoint (T models)	10 k Ω potentiometer
Relay (S models)	1 pc, SPST-NO Max 50 VDC / 50 VAC, 500 mA
CO ₂ indicator LED levels (A model) flashing red red yellow green	>2000 ppm 1200 ... 2000 ppm 800 ... 1200 ppm <800 ppm

Dimensions

All dimensions are in millimeters (mm).

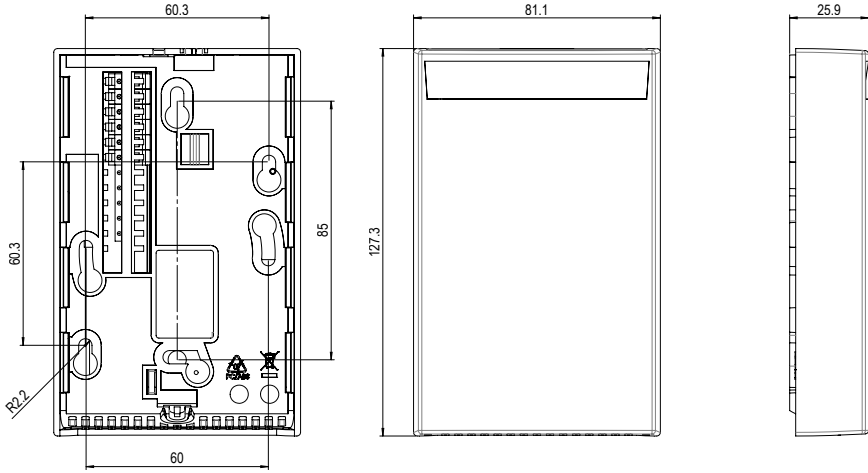


Figure 26 Dimensions for GMW83, GMW83A, GMW83RP, GMW84, GMW84S, and GMW86P

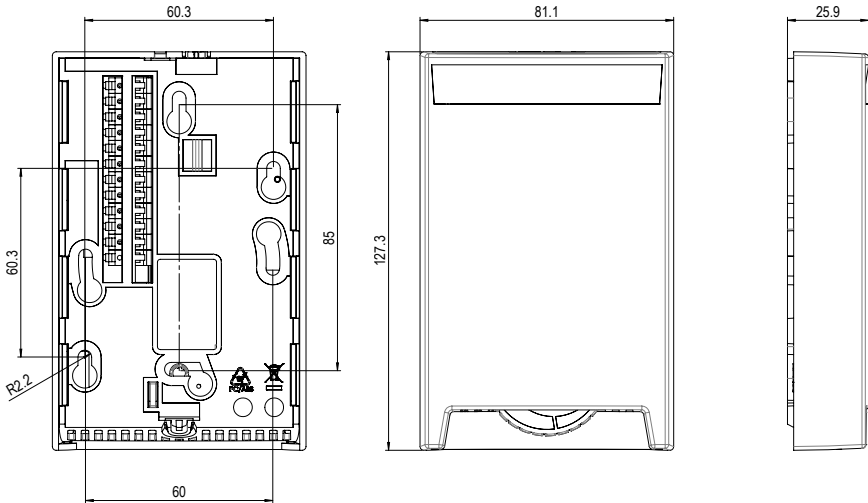


Figure 27 Dimensions for GMW86PT and GMW83T

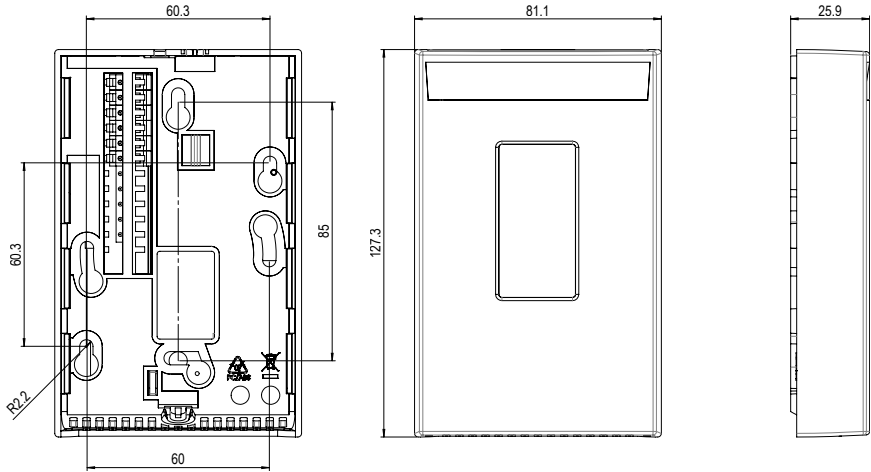


Figure 28 Dimensions for GMW83D and GMW83DRP

Spare Parts and Accessories



Information on spare parts, accessories, and calibration products is available online at www.vaisala.com and store.vaisala.com.

Table 11 Spare Parts and Accessories

Item	Order Code
CO ₂ module	GM10SP80
INTERCAP® sensor	15778HM

Technical Support

For technical questions, contact the Vaisala technical support by e-mail at helpdesk@vaisala.com. Provide at least the following supporting information:

- Name and model of the product in question
- Serial number of the product
- Name and location of the installation site
- Name and contact information of a technically competent person who can provide further information on the problem.

For contact information of Vaisala Service Centers, see www.vaisala.com/servicecenters.

Warranty

Visit our Internet pages for more information and our standard warranty terms and conditions: www.vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Recycling



Recycle all applicable material.



Dispose of the unit according to statutory regulations. Do not dispose of with regular household refuse.



www.vaisala.com

