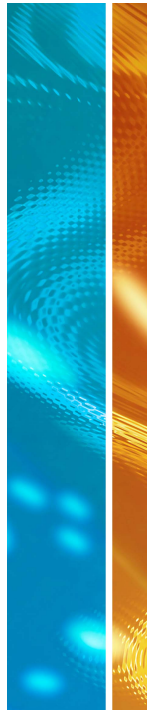


QUICK REFERENCE GUIDE



Vaisala CARBOCAP® Carbon Dioxide Module GMM111



- Compact flow aspirated CO2 measurement module
- CO2 measurement range options of 0 ... 5 %CO2, 0 ... 10 %CO2 or 0 ... 20 %CO2
- For OEM applications



GENERAL

Vaisala CARBOCAP® Carbon Dioxide Module GMM111 measures CO₂ concentrations up to 5, 10, or 20 % depending on the choice of measurement range. The module features flow-through aspiration and is intended for applications such as incubators and bioreactors. GMM111 powers up from 24 VDC/VAC and provides both voltage and current analog outputs. The module also supports digital RS485 communication.

ELECTRICAL CONNECTIONS

Make the connections according to the table below. See Figure 1 below the table for wire terminals.

| | |
|-----|-----------------------------|
| mA | Signal 4 ... 20 mA |
| V | Signal (+) 0 ... 10 V |
| 0 | Signal (-) |
| B | RS485 Signal B |
| A | RS485 Signal A |
| 0 | Power supply (-) |
| 24V | Power supply (+) 24 VDC/VAC |

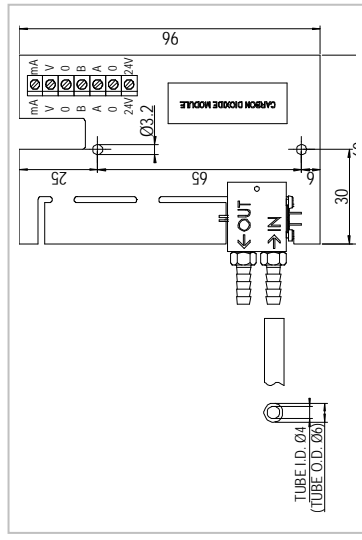


Figure 1 Module Connections and Dimensions

Powering

The module requires a nominal 24 VDC/VAC power supply maintaining a voltage of 18 ... 30 VDC or 20 ... 26 VAC for all load conditions and all mains voltages. Although the power input includes a half-wave rectifier, it is recommended to use a DC supply to avoid current peaks.

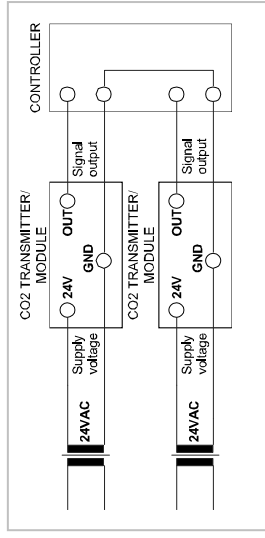
Connections to 24 VAC Power Supply

Connecting more than one module to a single 24 VAC transformer forms a common loop and increases the risk of a short-circuit. Therefore, a separate floating supply for each module is recommended (see Figure 2).

If several modules share a common transformer, the phase (~) must always be connected to the 24 V connector in each module (see Figure 3).

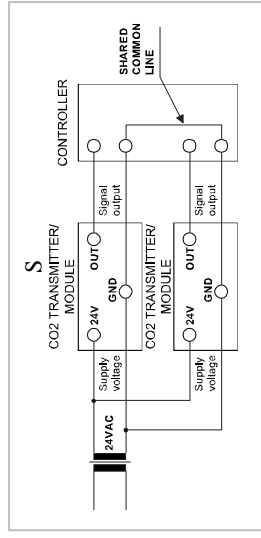
GAS SAMPLE CONSIDERATIONS

The unit has been designed for strictly non-condensing conditions. If the gas sample is drawn from humid conditions, special care must be taken to prevent condensation from occurring in the sensor. In practice this means lowering the dewpoint of the gas sample below the sensor temperature, for example by drying the sample gas.



0601-001

Figure 2 Connection of Separate AC Supplies (Recommended)



0601-002

Figure 3 Connection of Single AC supply to Several Modules

SERIAL COMMUNICATION INTERFACES

The modules support RS232 or RS485 communication. RS232 is set as factory default. The RS485 interface is selected by serial command. The communication settings for both interfaces are: 9600, N, 8, 1.

RS485 Interface

The interface is non-isolated two-wire interface with no internal bus termination. If termination is needed, use RC termination (100 Ω resistor in series with 1 nF capacitor) at both ends of the bus. See serial commands list below to activate the RS485 interface.

RS232 Interface

Use the RS232 interface for setting the operating parameters. The connection cable between PC and module (a serial COM adapter for maintenance purposes) is available from Vaisala (order code: 19040GM).

SERIAL COMMANDS

Serial commands are the same for RS232 and RS485 interface. <cr> stands for pressing ENTER.

Polling command for CO₂ measurement (ppm):

SEND <cr>

Setting the interval for the RUN (continuous output) mode:

INTV X Y <cr>
X = 0 (default) ... 255
Y = S/MIN/H

Starting the continuous mode printing:

R <cr>

Stopping the continuous mode printing:

S <cr>

Saving the parameters into the memory:

SAVE <cr>

Enabling/disabling the RS485 interface:

RS485 X <cr>
X = ON/OFF

Changing the operation mode:

SMODE X <cr>
X = STOP (default) / RUN / POLL

Giving the device address:

ADDR X <cr>
X = 0 (default) ... 99

Opening the polling line:

OPEN addr <cr>
addr = 0 (default) ... 99

Closing the polling line:

CLOSE <cr>

SERVICE, CALIBRATION AND ADJUSTMENT

This product is designed to operate its lifetime without maintenance. The modules are calibrated before shipping from the factory.

TECHNICAL DATA

| Property | Description / Value |
|---|--|
| Performance | |
| Measurement ranges | 0 ... 5 %CO ₂ , 0 ... 10 %CO ₂ or 0 ... 20 %CO ₂ |
| Measurement accuracy (incl. repeatability, non-linearity and calibration uncertainty) | ±(1.5 % of range + 3 % of reading) |
| Long-term stability | < ±1 %CO ₂ / 2 years |
| Response time | 1 min @ 0.5 l/min flow |
| Flow rate dependence of reading | no effect |
| < 1 l/min | 1 ... 10 l/min |
| Temperature dependence of reading | -0.35 % of reading / °C (typical) |
| Pressure dependence of reading | +0.15 % of reading / hPa (typical) |
| Warm-up time | 1 min, 10 min full specification |
| Product lifetime | > 10 years |
| Operating environment | |
| Operating temperature range | +5 ... +55 °C |
| Operating humidity range | 0 ... 99 %RH non-condensing |
| Operating pressure range | 700 hPa ... 1200 hPa |
| Operating gas flow range | < 10 l/min |
| Recommended gas flow range | 0.2 ... 0.8 l/min |
| Inputs and outputs | |
| Operating voltage | 24 V (±20 %) AC/DC |
| Power consumption | < 2 W |
| Outputs | |
| analog | 0 ... 10 V, 4 ... 20 mA |
| serial | RS485, 2-wire, non-isolated |
| Recommended external load current output | < 500 Ω |

| | |
|-------------------------------|---------------------------------|
| voltage output | > 1 kΩ |
| Electromagnetic compatibility | EN61326-1: Generic Environment. |
| Materials | |
| Weight | 47 g |

GUARANTEE

Vaisala issues a guarantee for the material and workmanship of this product under normal operating conditions for one (1) year from the date of delivery. Exceptional operating conditions, damage due to careless handling and misapplication will void the guarantee.

WARRANTY

For certain products Vaisala normally gives a limited one-year 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.

NOTE

This manual does not create any legally binding obligations for Vaisala towards the customer or end user. All legally binding commitments and agreements are included exclusively in the applicable supply contract or Conditions of Sale.



上海博众测量技术有限公司

Bozhi (Shanghai) measurement technology Co., Ltd.

Room 304, 228 Jiangchang 3rd Road, Shibei Industrial Park, Zhabei District, ZIP200436, Shanghai P.R.China

TEL: 0086 21 6630 8161/62/63

FAX: 0086 21 6630 8167