INTRODUCTION

Vaisala's GMD20 uses silicon based CARBOCAP$^{®}$ sensor technology providing excellent stability and reliability. The GMD20 transmitters require almost no maintenance: the recommended calibration interval is five years in HVAC and related benign applications. Transmitters are available without a display (GMD20 version) and with a display (GMD20D version).

MOUNTING

The GMD20 transmitters are truly duct mounted. The distance between the probe and the duct wall is easily adjusted by using the mounting plate. The mounting plate is fastened with four screws ST.4.2x16-C-Z/A4m DIN 7981. Note that four $\varnothing$3.2 holes on the duct surface are needed, as well as one $\varnothing$22...25 mm hole in the middle (see figure below). Insert the transmitter through the mounting plate and adjust the distance.
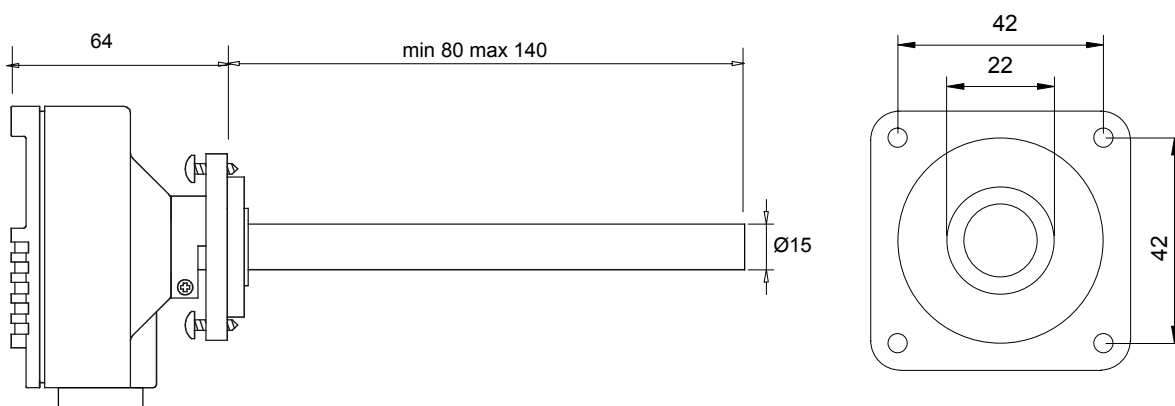

Figure 1   Dimensions of the GMD20 and the mounting plate (in mm)

ELECTRICAL CONNECTIONS

Open the transmitter cover and remove the display board if there is one installed. The cable is inserted through a rubber plug included in the package. Pierce the rubber plug with a screwdriver or a similar instrument in order to open the hole for the cable. Then insert the plug in the appropriate hole in the transmitter cover. Strip a few millimetres of the cable insulation and insert the cable carefully through the rubber plug so that you can connect the wires to the terminal block on the righthand side of the component board.

The nominal 24 V supply must be connected between terminals + and -. The analogue output is available at remaining terminals. The common wire is connected to terminal 0 and the other wire either to terminal V (voltage output) or to terminal mA (current output). The current output type is chosen with the jumper 0/4mA (see Figure 2): 4...20mA is chosen by connecting the jumper (default) and the 0...20 mA is chosen by disconnecting the jumper. If the relay output of the display board (in GMD20D) is used, connect the wires to the terminal block at the back of the display board before re-installing it. The default relay trigger point has been set to 1000 ppm and it can be changed with the optional software kit 19222GM. For further details, contact your local Vaisala representative. If an optional LonWorks interface or a relay output option is installed in the GMD20, please, refer to the corresponding manuals for details.

Note that during normal operation the green led (V10) at the lower righthand corner is blinking. In case the self-diagnostics procedure comes across some abnormality, the red led (V7) lights up (see Figure 2).
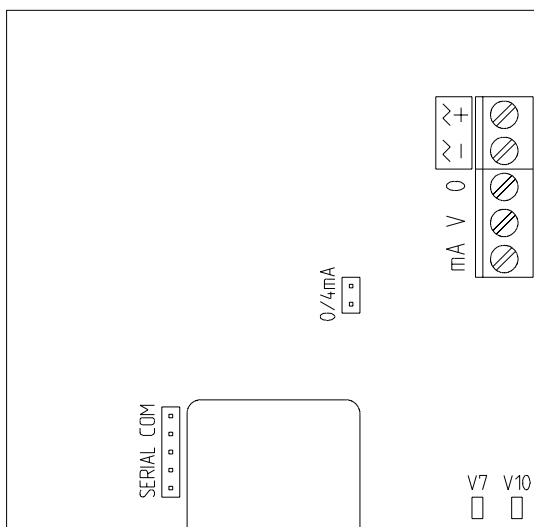

Figure 2   Electrical connections and leds V7, V10

SERVICE AND MAINTENANCE

The GMD20 transmitters have an excellent stability and require almost no maintenance. In benign environments the recommended calibration interval is five years. If the reading differs too much from the reference value during checking, the transmitter should be removed and preferably sent to Vaisala or Vaisala distributor for re-calibration. In case the user prefers to do the re-calibration himself, Vaisala's software Kit 19222GM and accurate calibration gases are needed.

If full accuracy is required, the transmitter has to be calibrated against accurate and traceable calibration gases in stable environmental conditions (temperature, pressure). Accurate calibrations are usually performed in laboratories; in these calibrations, temperature and pressure corrections have to be made. A full after sales calibration and service facility is naturally provided by Vaisala and its distributors. For further details, consult your local Vaisala representative.

POWER SUPPLY REQUIREMENTS

The GMD20 transmitter is designed to operate from a nominal 24 VAC/VDC supply. The power supply should maintain the voltage between 18...30 VDC or 20...26 VAC for all load conditions and all mains voltages. The power input includes a halfwave rectifier. To avoid current peaks, it is recommended to use a DC supply. The average transmitter current consumption is 85 mA maximum but peak currents of 170 mA may occur during normal operation.

CONNECTION TO A 24 VAC SUPPLY

The GMD20 transmitters can also be connected to a 24 VAC supply without an external rectifier. However, when more than one transmitter is connected to one 24 VAC transformer, a common loop is formed and there is an increased risk of a short-circuit. To avoid this, always use separate floating supply for each transmitter (see Figure 3A). However, if several transmitters have to share one transformer, the phase (~) must always be connected to + connector in each transmitter (see Figure 3B).
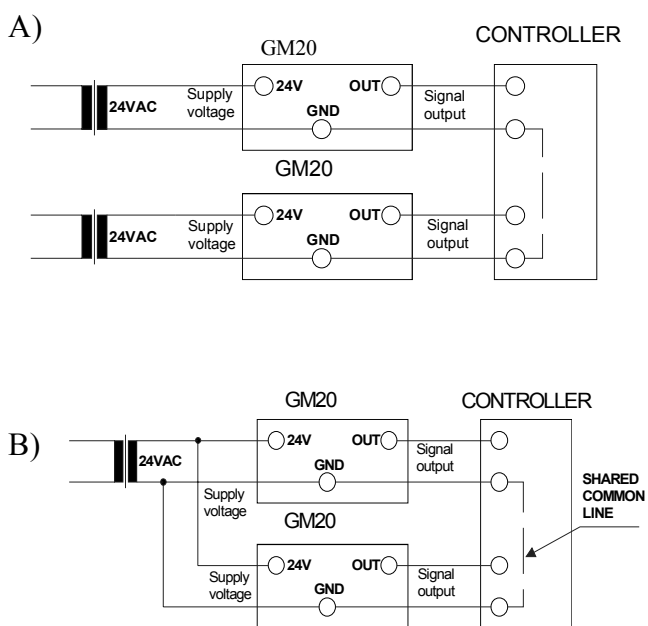

Figure 3 AC connections

TECHNICAL DATA

Carbon dioxide

Measuring range   0...2000 ppm CO_2 (nominal); with recalibration 0...5000 ppm CO_2, 0...10 000 ppm CO_2, 0...20 000 ppm CO_2

Accuracy at 20°C against
certified factory references $<\pm$[30 ppm + 2.0 % of the reading]
(including repeatability and calibration uncertainty)
Non-linearity $<\pm$1.0 %FS
Temperature dependence
of output (typical) < 0.15 %FS / °C (reference 25°C)
Long-term stability $<\pm$5 %FS / 5 years
Response time (0…63%)   1 minute

Operating conditions

Operating temperature   -5...+45 °C
Storage temperature   -20...+70 °C
Humidity range   short term 0...85 %RH (non-condensing)
Air flow range   0...10 m/s

General

Analogue outputs   0...20 mA or 4...20 mA and 0...10 V
Resolution of analog outputs 0.5 % FS
Recommended external load:
   current output   max. 500 Ω
   voltage output   min. 1kΩ
Relay contact ratings   max. 50 V 0.5 A
Power supply   nominal 24 VDC/VAC (18...30 VDC)
Power consumption < 2.5 W average
Warm-up time < 15 minutes

Mechanics

Housing material   ABS plastic
Housing classification   IP65
(electronics housing)
Weight:
GMD20   140 g
GMD20D   170 g

ACCESSORIES

Order code	Description
GMR20	Relay output option (not for the GMD20D)
GML20	LonWorks[®] interface option (not for the GMD20D)
GM35001	Calibration pipe
19222GM	Calibration software kit (incl. disk and serial COM adapter)

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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.