

Technical data sheet

**GT-VM-DD3-MB**  
**VAV transmitter**

Description

Transmitter for measuring and monitoring of volumetric flow

- Nominal voltage 24 VAC/DC
- Feedback signal (0)2...10 VDC
- Sensor 300 Pa (dynamic)
- Communication Modbus RTU



Technical data

<b>Electrical data</b>	Nominal voltage	24 VAC/DC, 50/60 Hz
	Nominal voltage range	19...29 VAC/DC
	Power consumption	0,6 W
	Wire sizing	1,3 VA
	Feedback signal	Modbus RTU / analog (0)2...10 VDC, max. 0,5 mA
	Connection	cable 1000 mm, 3 x 0,75 mm <sup>2</sup> (halogen free)
<b>Modbus</b>	Protocol	Modbus RTU
	Medium	cable 1000 mm, 2 x 0,38 mm <sup>2</sup> (halogen free) RS-485, not electrically isolated
	Number of nodes	max. 128
	Baud rates	1200 / 2400 / 4800 / 9600 / 19200 / 38400 Bd
	Byte sequence	MSB / LSB

## Technical data

<b>Modbus</b>	Byte format	1 start bit, 8 data bits, 2 stop bits, none parity 1 start bit, 8 data bits, 1 stop bit, even parity 1 start bit, 8 data bits, 1 stop bit, odd parity
	Termination	external (120 Ω)
	Response time	≤ 10 ms + delay
	Standard parameter	19200 Bd 1 start bit, 8 data bits, 1 stop bit, even parity delay 0 ms
<b>Sensor</b>	Calibration	300 Pa, height adjustment necessary (300 Pa = 1,2 in H <sub>2</sub> O), dynamic measurement principle
	Measuring range	0...300 Pa
	Burst pressure	1 bar
	Nominal value	damper manufacturer specific value V <sub>min</sub> / V <sub>btw</sub> / V <sub>max</sub> based on V <sub>nom</sub>
	Media	air 0...70°C / 5...95% r.H., non condensing
	Mounting position	independent of position
	Connection	Ultem 2200 / tube clip Ø 4-6 mm
<b>Functional data</b>	Attachment	fastening tabs on the device slot 7,5 x 5,5 mm
<b>Safety</b>	Protection class	III (safety extra-low voltage)
	Degree of protection	IP 54 (cable downwards, tube clip plugged)
	EMC	CE (2014/30/EU)
	LVD	CE (2014/35/EU)
	RoHS	CE (2011/65/EU - 2015/863/EU - 2017/2102/EU)
	Mode of operation	Typ 1 (EN 60730-1)
	Rated impulse voltage	0,8 kV (EN 60730-1)
	Control pollution degree	3 (EN 60730-1)
	Ambient temperature normal operation	0°C...+50°C
	Storage temperature	-20°C...+80°C
	Ambient humidity	5...95% r.H., non condensing (EN 60730-1)
	Maintenance	maintenance free
	<b>Dimensions / Weight</b>	Dimensions
Weight		250 g

## Functionality / Properties

### Operating mode

Connect power supply to wire 1+2 and a differential volumetric air flow is measured by the Gruner-Transmitter. The flow is displayed in m<sup>3</sup>/h or l/s and is provided a analog in % related to Vmin and Vmax. It can be used as feedback signal on wire 4. Another possibility is to use the signal as analog output (additional interface) or communicate by Modbus.

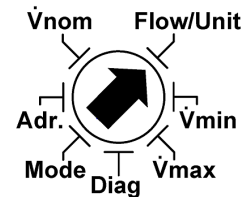
### Edit

The selector allows the changing of values. The position of the arrow shows the value set. The changes are displayed as soon as the selector is moved  $\pm 10^\circ$  from the position.



### Flow

Setting the desired actual volume flow unit in m<sup>3</sup>/h and l/s.



### Vmin

Adjust the desired flow Vmin (setpoint Y = 0 / 2 VDC).

### Vmax

Adjust the desired flow Vmax (setpoint Y = 10 VDC).

### Mode

Signal:  
0-...0-10 VDC  
2-...2-10 VDC

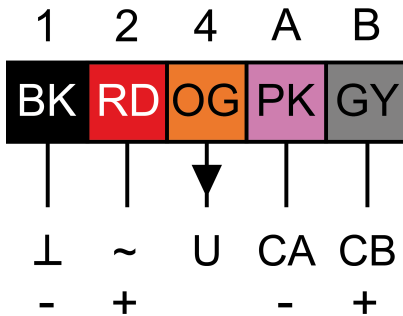
### Adr

Setting the address of the Modbus (1...247) and Modbus parameter.

### Vnom

Setting the nominal volumetric flow depending on the VAV-box.

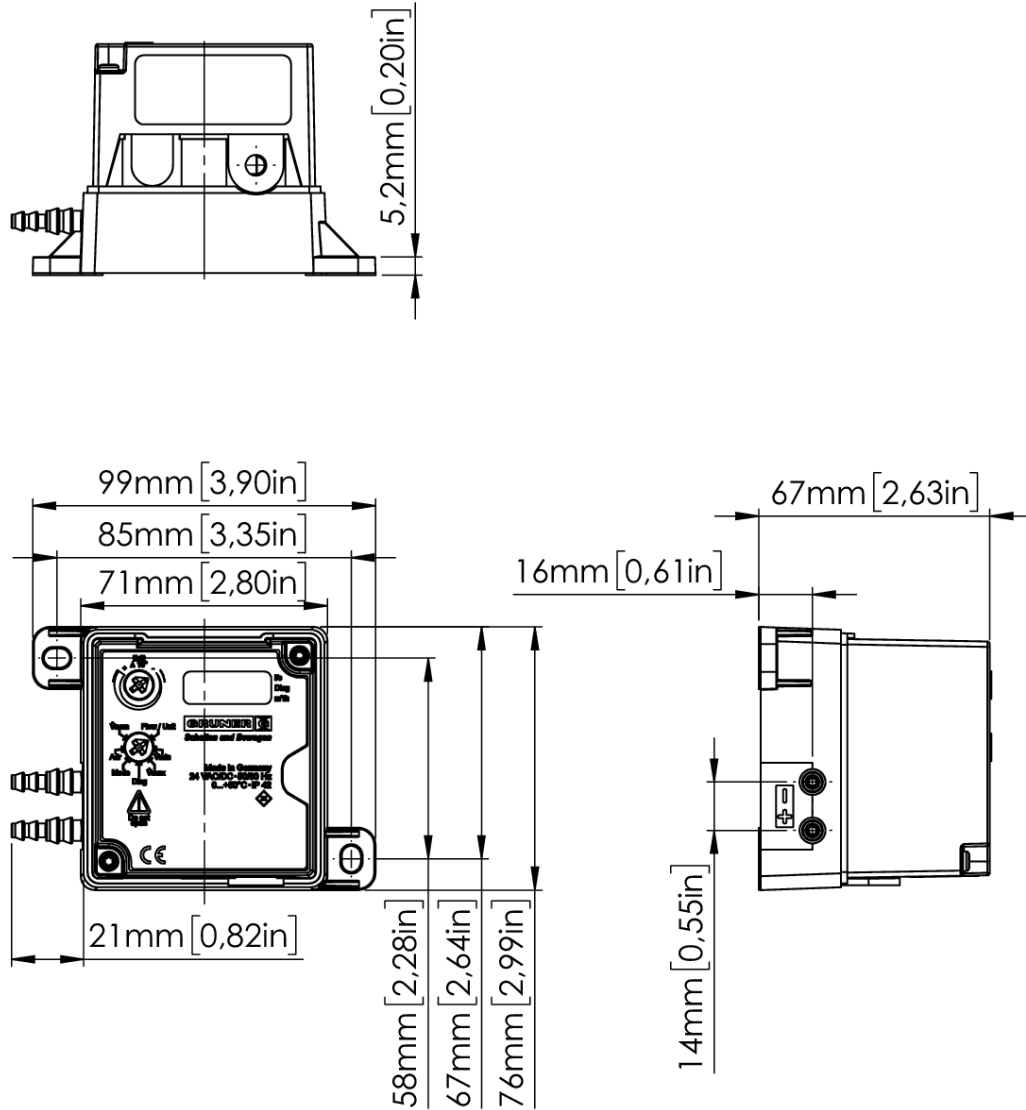
### Connector / Security Note



### Safety remarks

- Connect via safety isolation transformer!
- The device is not allowed to be used outside the specified field of application, especially in airplanes.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The device may only be opened at the manufacturer's site.
- The device is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Technical Drawing



Modbus register

No.	Register	Memory
0	<b>Setpoint 0...100.00 [%]</b>	RAM
1	<b>Override control</b>	RAM
2	<b>Command</b>	RAM
3	Actuator type	EEPROM
4	Relative position 0...100.00 [%]	RAM
5	Absolute position 0...650.00 [°][mm]	RAM
6	Relative value 0...100.00 [%]	RAM
7	Absolute value 0...65535 [m³/h][l/s][Pa]	RAM
10	<b>Feedback signal 0...10000 [mV]</b>	RAM
103	Software version	EEPROM
105	<b>Min. value 0...100.00 [%]</b>	EEPROM
106	<b>Max. value 0...100.00 [%]</b>	EEPROM
108	<b>Bus fail function</b>	EEPROM
109	<b>Timeout 0...65535 [s]</b>	EEPROM
120	<b>Min. value 0...65535 [m³/h][l/s][Pa]</b>	EEPROM
121	<b>Max. value 0...65535 [m³/h][l/s][Pa]</b>	EEPROM
122	<b>Interface mode</b>	EEPROM
130	<b>Address 1 - 247</b>	EEPROM
200	<b>Nominal value 0...300.00 [Pa]</b>	EEPROM
201	<b>Unit</b>	EEPROM
551	<b>Mode</b>	EEPROM
568	<b>Modbus settings</b>	EEPROM
569	<b>Modbus response time</b>	EEPROM

- Registers in bold can be written
- RAM registers are non-permanent
- EEPROM registers are permanent (max. 1 Mio. write cycles)

Register 1:

Override control	
0	-
1	Open
2	Close
3	Min
4	Max

Register 2:

Command	
0	-
1	Adaption drive
2	-
3	-
4	Controller reset

Modbus register

Register 3:

Actuator type	
0	No actuator
1	HVAC / water actuator
2	VAV actuator
3	Fire protection actuator
4	GUAC VAV
5	GUAC CM
6	GT

Register 108:

Bus fail function*	
0	Last setpoint (function deactivated in analog control)
1	Close by bus timeout
2	Open by bus timeout
3	Vmin by bus timeout
4	Vbtw by bus timeout
5	Vmax by bus timeout

timeout >120s  
(default setting)

\*retriggered by any read/write command to actuator's address

Register 122:

Interface mode		
Value	Signal input	Feedback signal
0	Analog (0)2...10 V	(0)2...10 V
1	Modbus via register 0	(0)2...10 V
2	Modbus via register 0	Register 10
3	Analog (0)2...10 V	Register 10

Register 201:

Unit	
0	[l/s]
1	[m³/h]
2	[Pa]
3	[in H <sub>2</sub> O]
4	[°]
5	[mm]

## Modbus register

### Register 551:

Mode	
Bit	Function
0	1 = 2-10V
1	1 = Override control Modbus
2	1 = Override control close
3	1 = Override control open
4	1 = Override control Vbtw
5	1 = Override control Vmax
6	1 = option reversal activ (change direction of rotation)
7	1 = Motor off
8	1 = Override control Vmin

### Register 568:

Modbus parameter				
Display	Value	Baudrate	Parity	Stop bits
1	0	1200	none	2
2	1	1200	even	1
3	2	1200	odd	1
4	3	2400	none	2
5	4	2400	even	1
6	5	2400	odd	1
7	6	4800	none	2
8	7	4800	even	1
9	8	4800	odd	1
10	9	9600	none	2
11	10	9600	even	1
12	11	9600	odd	1
13	12	19200	none	2
<b>14<sup>1)</sup></b>	<b>13</b>	<b>19200</b>	<b>even</b>	<b>1</b>
15	14	19200	odd	1
16	15	38400	none	2
17	16	38400	even	1
18	17	38400	odd	1
19 <sup>2)</sup>	18	1200	none	1
20 <sup>2)</sup>	19	2400	none	1
21 <sup>2)</sup>	20	4800	none	1
22 <sup>2)</sup>	21	9600	none	1
23 <sup>2)</sup>	22	19200	none	1
24 <sup>2)</sup>	23	38400	none	1

1) default setting

2) not Modbus standard, only Gruner

### Register 569:      Repsonse time: 10 ms + "delay"

"Delay": 3 ms x 0...255