HEVAC Control Agencies

HDMO-6212-51DR DUCT MOUNT
Carbon Dioxide & Temp Sensor
Modbus RTU, 0-10V or 4-20mA with LCD display and Relay output

USE :

Electronic Duct Temperature & CO_2 measurement & control, with 0-10v, 4-20ma & modbus outputs to stand alone controllers or BMS systems. Capable of direct scaled CO_2 control of EC or VSD driven fresh fan or motorised modulating damper motor for local CO_2 control.

Easy and Flexible Configuration via phone App*

- Selectable CO_2 scaling and output limiting (clipping) options

- Clear backlit Digital Display

- Test mode for on-site installation and wiring verification

- Configurable relay parameters: set-point, delay, latch, and hysteresis

- Modbus settings: ID, register address, data type, RS485 baud rate

- 2 configurable Analogue outputs & 2 relay outputs

- Automatic internal CO_2 Calibration to maintain accuracy over life time.

Technical Data

CO2

Measuring range 1	400 … 1000 ppm
Accuracy 1	±50ppm ±2.5% of reading
Measuring range 2	1000 … 2000 ppm
Accuracy 2	±50ppm ±3% of reading
Measuring range 3	2000 … 5000 ppm
Accuracy 3	±40ppm ±5% of reading
Measurement interval	5 seconds
Response time T63	typical 60 seconds
ABC algorithm, period	on/off, 7 days
Accuracy drift after five years with ABC enabled range	400 … 2000 ppm
Accuracy	±50ppm ±0.5% of reading
Field calibration points	3

Temperature

Measurement range	-10 … 60 ℃
Accuracy (including non-linearity, hysteresis, and repeatability)	typ. ±0.5℃ (15 … 35℃)
	typ. ±0.9℃ (-10 …60 ℃)
Accuracy drift[3]	< 0.03℃/year
Field calibration points	2

Analog output (two channels)

3-wire, 4-20 mA, 0-10V, 0-5 V, 1-5V

Accuracy at +25 °C	±0.1% full scale
Temperature dependence	±0.005%/°C full scale
External loads	current output RL < 400 ohm
	voltage output RL > 10k ohm

Relay output (two contacts) (option)

Contact	SPST NO, 60 VDC/VAC 700mA
Activate	High-point and Low-point with enable
Set point	-65536 … 65535
Hysteresis	0 … 9999
On/Off delay	0 … 3600 second
Latch	on/off

Display (option)

LCD	128x64 dots
Backlight color	R,G,B

RS485 output with Modus (option)

ID	1 … 247
Baud rate	200/2400/4800/9600
	19200/38400/57600/115200
RS485 data type	N81/N82/E81/E82/O81/O82
Delay	0 … 100ms
Modbus command support	03 / 04
Register 32-bit Data format	
	Big-endian or Big-endian swapped
Register address	0x0000 … 0xffff
Register data type	
16/32-bits signed/unsigned integer	
16/32-bits signed/unsigned integer x10	
16/32-bits signed/unsigned integer x100	
float 32-bit	
Temperature unit	℃ / °F

Power supply

Power supply	15-35 VDC, 24 VAC
Current consume	max. 300mA

Operating temperature

Operating temperature	-10 … 60 ℃

Mechanics

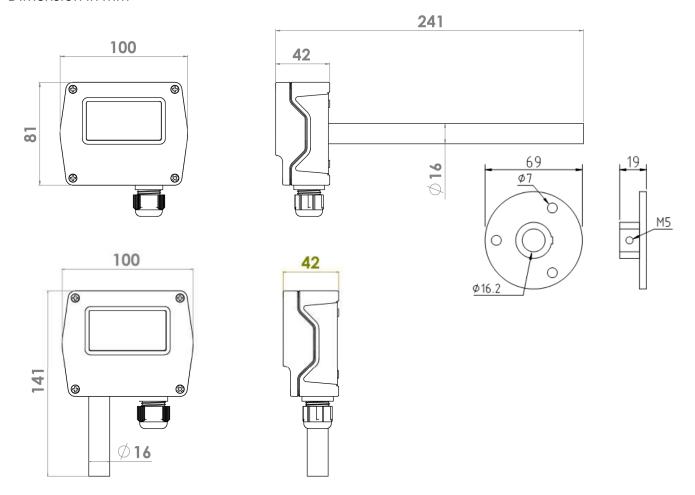|	
Housing material	PC, Polycarbonate
Probe material	Aluminum
Flange material	Aluminum
Housing classification	IP65
Cable gland	PG9 with strain relief
Cable bushing	4.5 … 8.2 mm
Terminal block	AWG 12…24
Connection	Cable gland with terminal block

Electromagnetic compatibility

Complies with EMC standard
EN61326-1, Industrial Environment

Wiring

Rel 60 VDC or VAC 700mA

V+
GND
CH1
CH2

0-10V or 4-20mA selectable

POWER SUPPLY
15-30 VDC
24 VAC ±10%

RS485

PC or PLC
RS485 D+ D-

120 ohm

Dimension

Dimension in mm

Calibration —CO_2 and Temperature Calibration

This page allows calibration of both **CO_2** and **temperature** readings.

CO2 Auto-calib setting

Force re-calibrate: Forces the device to perform an immediate calibration.
Auto-calib on/off setting: Enables or disables the CO_2 auto-calibration function.
Auto-calib reference parameter: Sets the reference value for background concentration. The default value is 400 **ppm**, with an adjustable range of 0–20000 **ppm**.

Calibrate Carbon dioxide

Available only when Auto-calib was set off.
Displays the current CO_2 concentration reading and allows manual calibration.
Select the calibration point, press Start Calibrate, and enter the standard CO_2 concentration to complete calibration.
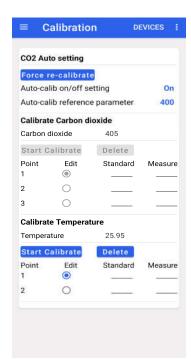Press Delete to remove the calibration point and restore factory settings.

Calibrate Temperature

Displays the current temperature reading and supports both single-point and multi-point calibration.
Select the calibration point, press Start Calibrate, and enter the reference temperature to complete calibration.
Press Delete to remove the calibration point and restore factory settings.

Analog Output (All items displayed in blue text are adjustable.)

This device provides **two output channels (CH1 and CH2)**, each of which can be configured to output either **CO_2** or **temperature** data.

The system supports **five analog output ranges** to meet various application needs:

- 4–20 mA (default range)
- 0–20 mA
- 0–10 V
- 0–5 V
- 1–5 V

Temperature output can be displayed in either **Celsius (°C)** or **Fahrenheit (°F)**.

The analog output range can be freely defined according to the desired physical quantity. For example:

When the CO_2 concentration is **0 ppm**, the output is **4 mA**;

when the concentration is **2000 ppm**, the output is **20 mA**.

Intermediate values are converted linearly between these limits.

If users prefer not to have the current or voltage reach the absolute minimum or maximum, the **Clipping limit (%)** can be adjusted to restrict the upper and lower output boundaries, expressed as a percentage.

Error output defines the output behavior in the event of a fault condition. For output modes that do not include zero (such as 4–20 mA), two error output options are available:

- **Low:** 3.8 mA
- **High:** 21 mA

Users can select the appropriate error output behavior according to their monitoring or alarm requirements.

Test mode & Test value:

When test mode is enabled, a desired test value can be set.

The device will force the output to this fixed value, allowing convenient verification during installation or system testing.

≡ Analog output	DEVICES ⋮
☑ **CH 1**	
Carbon dioxide	402
Output level	7.2
Status	Analog ON
Test mode on/off	Off
Test value	0.0
Analog range	4_20mA
Mesaurement	Carbon dioxide
Present item	ppm
Low scale	0
High scale	2000
Low clipping limit %	0
High clipping limit %	100
Error output	3.8
☑ **CH 2**	
Carbon dioxide	78.46
Output level	20.5
Status	Analog ON
Test mode on/off	Off
Test value	0.0

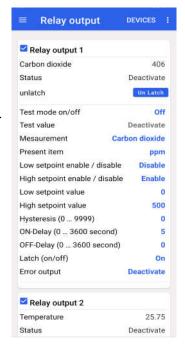# Relay Output (All items displayed in blue text are adjustable.)

This device provides **two relay outputs**, each of which can be configured to operate based on either **CO₂** or **temperature**.
Temperature display can be switched between Celsius (°C) and Fahrenheit (°F).

In the **Low / High setpoint value** fields, you can define the upper and lower trigger thresholds.

The **Low / High setpoint enable / disable** options allow you to enable or disable these threshold functions.

Hysteresis prevents frequent switching of the relay output when the measured value fluctuates near the setpoint, which could otherwise cause communication or control instability. For example, if the **Low / High setpoint** are set to 0 / 500 and **Hysteresis** is 10: When the value rises to **501**, the relay is triggered to **ON**; when it decreases to **498**, it remains **ON** because it is still within the hysteresis range. Only when it drops to **490 (500 − 10)** or below will the relay turn **OFF**. (Adjustable range: 0–9999)

ON / OFF Delay defines the signal delay time for relay switching, with a configurable range of 0–3600 seconds. This function adds a delay before sending the signal to the host system, ensuring compatibility with slower controllers that may require additional processing time.

Error output determines the relay state when an error occurs, with selectable options of Activate or Deactivate.

Latch function is used to record abnormal trigger events. When enabled, if a reading exceeds the setpoint, the relay status (**Status**) will remain **Activate** even if the value later returns to the normal range.
The state will reset to **Deactivate** only after manually pressing Un Latch.
When the latch function is disabled, the relay status (**Activate / Deactivate**) will update dynamically based on whether the current value exceeds the setpoint.

Test mode & Test value
When test mode is enabled, the relay output can be manually set to **Activate** or **Deactivate**, allowing convenient verification during installation or system testing.