

HE-DELP-XXXX CO2 ROOM SENSOR SERIES

VERSIONS WITH OPTIONAL TEMPERATURE/HUMIDITY MEASUREMENT, RELAY & LCD Modbus RTU or 4...20mA with LCD display



Features

- LCD display with capacitive buttons
- Display with ppm, RH% and °C
- Field adjustable for common setting
- ABC algorithm on/off
- Elegant design with stable quality
- Low maintenance, easy calibration

Output and measurement

- MOS-Relay for CO₂ alarm
- Support RS485 Modbus RTU
- DIP switch select 4 ... 20mA or 0 ... 10V
- CO₂ range maximum 20000 ppm
- Temperature range 0 ... 50°C
- Relative humidity range 0 ... 100%RH

Technical Drawing

Dimensions (mm)



PCB board



Connection

Output	DIP switch	Terminal block
420mA (only for CO_2)	OUT 810V	0000 010V RS485 terminator 120 ohm MA D+ 1 D+ 1 D+ 1 D+ 1 OUT 3 V+ 4 24 Vac ±10% GND 5
010V (only for CO ₂)	OUT 010V	OFF ON OUT 010V RS485 terminator 120 ohm V D- 2 V D- 2 OUT 3 V+ 4 24 Vac ±10% GND 5
RS485	OFF ON RS485 terminator 120 ohm	OUT 010V RS485 terminator 120 ohm RS485 D+ 1 D- 2 OUT 3 15 24 Vdc V+ 4 24 Vac ±10% GND 5

Note new models now also have a settable CO2 relay output rated @ 1 amp (max voltage 60v AC or DC

Technical Data

CO2

Measuring range 1 standard 400 ... 2000 ppm Accuracy 1 ±40ppm ±3% of reading Measuring range 2 extend 0 ... 10000 ppm Accuracy 2 $> \pm 40$ ppm $\pm 3\%$ of reading Measuring range 3 400 ... 20000 ppm Accuracy 3 ±200ppm ±3% of reading Pressure dependence + 1.6 % reading per kPa deviation from normal pressure Operating Principle, Non-dispersive infrared (NDIR) Measurement interval 4 seconds

Response time 2 minutes by 90% 15+ years Life expectancy ABC period 7 days

Relative Humidity

Measuring range Accuracy Long term drift¹ Response time T63²

0 ... 100 %RH ±5%RH@25°C (20 ... 80%RH) < 0.25%RH/year 8 seconds

Temperature

±0.7°C
.02°C /year
30 seconds
)

RS485 Modbus RTU output

ID	1247
Baud rate	9600/19200/38400/57600/115200
Data format	N81/N82/E81/E82/O81/O82

Analog output (one channel)

Current version 3-wire, 4 ... 20 mA Voltage version 0 ... 10 V ±0.1% full scale Accuracy of analog outputs@25°C Temperature dependence ±0.005%/°C full scale External loads current output RL < 500 ohm voltage output outputs RL > 10k ohm

¹ Typical value for operation in normal RH/T operating range. Max. value is < 0.5%RH/year. Value may be higher in environments with vaporized solvents, outgassing tapes, adhesives, packaging materials, etc.

² Time for achieving 63% of a step function, valid at 25°C and 1m/s airflow.

³ Max. value is < 0.04°C/year.

⁴ Response time depends on heat conductivity of sensor substrate.

Display with touch button (Option)

LCD	128x64 dots without backlight
Buttons	capacitive x3
RS485 setting	ID/Baud rate/Data format
CO ₂ setting	ABC on/off/period 745 days
Offset	CO ₂ ±1000 ppm
	Humidity ±10.0%RH
	Temperature ±3.0°C
CO ₂ alarm setting	High/Low en/dis 020000
	Hysteresis 09999
	Delay 03600 second
	Latch on/off

CO₂ alarm output (Option)

Туре	MOS-RELAY FormA
Capacity	0.7 60V AC&DC

9 ... 24 VDC, 24VAC±10%

15 ... 24 VDC, 24VAC±10%

Power supply

RS485 output Analog output

Power consume

RS485 output	max. 310mA
	typ. 20mA
Analog output	max. 330mA
	typ. 30mA

Mechanics

Housing material	ABS
Dimension	81.4 x 81.4 x 27.5 mm
Housing classification	IP20

Environment

Operating temperature 0 ... 50°C Operating humidity 0 ... 85%RH non condensed Storage temperature -40 ... 70°C

Electrical protection Over voltage, Inverse and short

Electromagnetic compatibility

Emission EN 61326-1:2013 CISPR11:2009+A1:2010 Group1 Class B Immunity EN 61326-1:2013 IEC 61000-4-2:2008 IEC 61000-4-3:2006+A1:2007+A2:2010 IEC 61000-4-8:2009

Modbus Register

Device information

No.	Register	Starting	Content	R/W	Register	Data Type	Value
	Address	Address					
1	40033	0x20	Model Name	R	8	ASCII	
2	40041	0x28	Serial Number	R	8	ASCII	
3	40049	0x30	Firmware version	R	8	ASCII	

RS485 parameters

No.	Register	Starting	Content	R/W	Register	Data Type	Value/Unit
	Address	Address					
1	40097	0x60	Slave ID	R/W	1	unsigned integer	1 247
2	40098	0x61	Baud rate	R/W	1	unsigned integer	0: 9600
							1: 19200
							2: 38400
							3: 57600
							4: 115200
3	40099	0x62	Data type	R/W	1	unsigned integer	0: N81
							1: N82
							2: E81
							3: E82
							4: 081
							5: 082
4	40100	0x63	Unit	R/W	1	unsigned integer	0: Metric
							1: Imperial

Output (IEEE 754 Floating Pt)

No.	Register	Starting	Content	R/W	Register	Data Type	Unit
	Address	Address					
1	41025	0x400	Temperature	R	2	Floating Pt.	°C,°F
2	41027	0x402	Relative Humidity	R	2	Floating Pt.	%RH
3	41043	0x412	CO ₂	R	2	Floating Pt.	ppm

Output (32-bit integer)

No.	Register	Starting	Content	R/W	Register	Signed	Scaling	Unit
	Address	Address	unsigned					
1	41089	0x440	TemperatureR2signed integer		1:100	°C,°F		
2	41091	0x442	Relative Humidity	ive Humidity R 2 signed integer 2		1:100	%RH	
3	41107	0x452	CO ₂	R	2	unsigned	1:100	ppm
						integer		

Ordering Guide

Model	-	Sensor	Sensor Output		CO ₂ Range		ABC		Display		
										& Ala	arm
HE DELP	-	CO ₂	1	RS485 & *Analog	3	02000 ppm	Α	On	1	No	Ν
		CO ₂ + RH +T	2			05000 ppm	В			Yes	D
						010000 ppm	С				
						020000 ppm	D				

*DIP switch select 4...20mA or 0...10V

Example

HE DELP-13A1D

Sensor: CO ₂	1
Output: RS485 & Analog	3
CO ₂ range: 02000ppm	Α
ABC: On	1
Display & Alarm: Yes	D

Accesories

SA021101 118 to 86 adapter



SA021103 86 wall mounting



TO ACCESS THE SENSORS MENU PRESS & HOLD ALL 3 VIRTUAL BUTTONS TO THE LEFT OF THE LCD

SENSOR INSTALLATION

To squeeze all this sensor technology into a modern slim line housing we have had to make some compromises on pcb arrangement and connection terminal size etc but has resulted in a very powerful modern sensor available in several versions to suit project requirements. Use of twisted pair shielded cable (earthed at the switchboard only) is highly recommended with a suggested maximum wire gauge of 0.5mm.

STEP 1.) The lid can be easily removed from sensor base by use of a small screw driver or even a finger nail plying apart the sensor housing parts in the center of the bottom side of housing.





USING A SMALL SCREW DRIVER OR FINGER NAIL PLY APART TWO HALFS OF SENSOR HOUSING HERE

STEP 2.) Before affixing sensor to wall carefully unplug the display module from the main pcb and place in a safe location.



PLACE LCD MODULE IN SAFE PLACE DURING INSTALLATION

STEP 3.) Mount the sensor base on wall (with provided screws), with field wiring entering through provided slot in the middle left of the base. Strip back the shielded cable outer sleeve and shield wires so the wiring entering the housing is of less bulk.

STEP 4.) Once mounted to wall & wired, carefully re-plugin the display module back onto the main pcb, taking care to line up the display module pins to matching main pcb pin sockets.

STEP 5.) Reattach lid & apply power. Current CO2, Temperature & Humidity values should appear . Correct values will stabilize in approximately 10 minutes,

The three capacitive virtual buttons on the LCD pcb module are used to edit values in the menu system. Menu access is gained by pressing all three buttons simultaneously.