SENSECUBE

KCD-DA

CO_2 and Temperature Controller

Our CO_2 gas sensor with NDIR Dual Wavelength type gets a small deviation unlike NDIR Single Wavelength type.

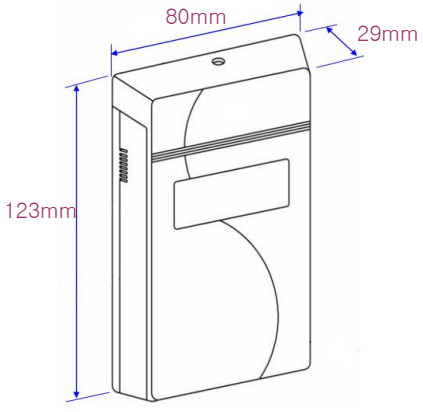
Excellent stability and accuracy
- through testing and calibration with sophisticated process and techniques

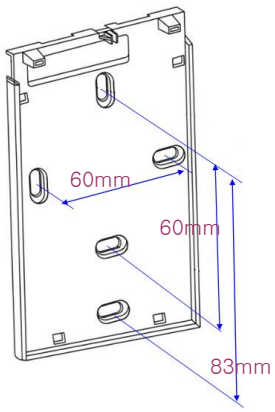
Easy application to…
Environment management system
Indoor ventilation system
Air conditioning system
Securing devices of combustors

● NDIR type uses optical property to measuring CO_2 gas.
We make up for a controller not to be affected by shock and wave(vibration).
But please consult with our engineers, if you use it under harsh environments (like construction sites).
Contact us if you have a question about installation or connection.

■ ***Detection method***
- CO_2 : Dual Wavelength NDIR
- Temperature : NTC
- Humidity(Optional) : semiconductor type

■ ***Dimensions*** (Length × Width × Height) : 123mm × 80 mm× 29 mm





※ Specifications and images may change without prior notice.

Korea Digital Co., Ltd #707 Ace twin tower 1, Guro 3-dong, Guro-gu, Seoul, South Korea
Tel: 02-2109-8883 Fax: 02-2109-8884
ideabox@empal.com www.sensecube.com

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■ *SPECIFICATIONS*

Measure -ment	Sensing Method	CO_2	Dual Wavelength NDIR
		Temperature	NTC
		Humidity	Semiconductor
	Measuring range options	CO_2	0~2,000ppm, 0~5,000ppm, 0~10,000ppm
		Temperature	-10~60℃
		Humidity	0~99% RH
	Accuracy (@25℃)	CO_2	± (4%F.S + 3% Reading)
		Temperature	±2 ℃ (Option)
		Humidity	±3 % (Option)
	Response time (63%)	CO_2	< 30 sec
		Temperature, Humidity	< 10 sec
	Measurement time interval		1.5 sec

General	Warm up time	CO_2	< 3 min
		Temperature, Humidity	< 30 sec
	Storage temperature		-40~70℃
	Temperature dependence		0.2% FS /℃

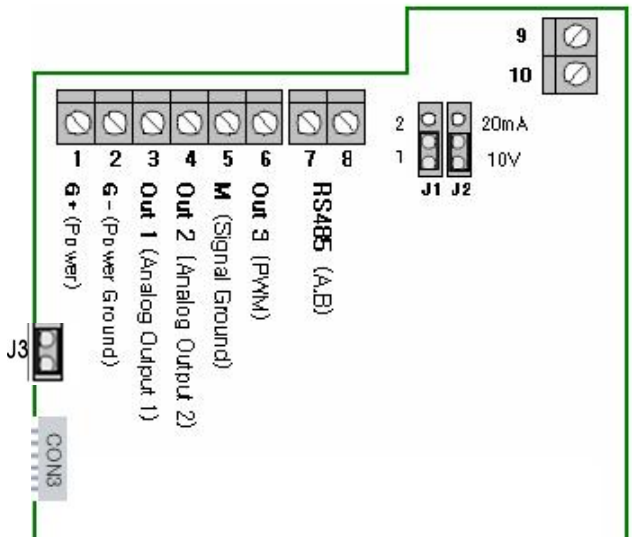
Operating Conditions	CO_2 , Humidity	Temperature	5~45℃
		Humidity	0~95%RH (Non-condensing)
	Temperature	Temperature	-10~60℃
		Humidity	0~95%RH (Non-condensing)
	Gas flow rate		0.2~1 m/sec

Electrical	Power supply	24V AC/DC (< ±20%)
	Power consumption	70mA average

Outputs	CO_2	0~10VDC or 4~20mA , RS485
	Temperature, Humidity	0~10VDC or 4~20mA

■ *Connectors*

1. Diagram



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2. Input · Output specification

Terminal		Description	Notes
1	G+	Power (+) 24 V AC/DC ±20%	System Power
2	G-	Power ground	
3	Out 1	Signal Output (+) 1	10V/20mA : 0~2000ppm(Default) Output error : FS ±2%
4	Out 2	Signal Output (+) 2	10V/20mA : 0~50℃ , Humidity 50%, VOC 1 ~ 10 Level Output error : FS ±2%
5	M	Signal Ground (-)	
6	Out 3	Open Collector ON/OFF PWM output (1004 msec interval)	ON : 1,000ppm, OFF: 800ppm 1004msec interval, 2msec Duty
7	RS485A	RS-485	
8	RS485B		
9	RLY 1,	Relay contacts	ON : 1,000ppm, OFF: 800ppm(Default)
10	RLY 2		

3. Jumper to set output way

- Jumper 1 : Select OUT1 output way (1:Voltage output, 2:Current output)
- Jumper 2 : Select OUT2 output way (1:Voltage output, 2:Current output)
- Jumper 3 : For using RS485, It have to be shorted.

※ Do not use CON3(it is for PC monitoring).
Misuse causes system malfunction and breakdown of a controller.

■ Operation

1. Buttons

- ***MENU*** : Selecting setting items (CO_2, VOC, temperature, humidity and others)
- ***UP*** : Increase set points or YES
- ***DOWN*** : Decrease set points or NO.

A LCD window shows sings as following order each time you press MENU button

No.	Initial sings	Descriptions	Sings by press ▲▼ & others
0	****ppm	Operating status	Normal or Error
1	DISP	Setting main display on LCD	▲ CO_2(Default) ▼ VOC
2	CO2ON	Setting the CO_2 concentration for relay contacts ON	1000 ppm (Default) : Relay ON Point (▲,▼: Increase/decrease 50ppm by pressing buttons)
3	CO2OF	Setting the CO_2 concentration for relay contacts OFF	800 ppm (Default) : Relay OFF Point (▲,▼: Increase/decrease 50ppm by pressing buttons)
4	OC-ON	Setting VOC Level for relay contacts ON	4 Level (Default) : Relay ON Point (▲,▼: Increase/decrease 1 level by pressing buttons)

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5	OC-OF	Setting VOC Level for relay contacts OFF	2 Level (Default) : Relay OFF Point (▲,▼: Increase/decrease 50ppm by pressing buttons)
6	T-USE	Selecting temperature sensing function (Yes / No)	YES(Default) : Measure temperature NO
7	H-USE	Selecting temperature sensing function (Yes / No)	YES(Default) : Measure humidity NO
8	RANGE	Setting maximum measuring ranges of CO2	(▲:Increase, ▼:Decrease) 0 : 2,000ppm (Default) 1 : 5,000ppm 2 : 10,000ppm
9	OUT2S	Selecting an output sensor through OUT2	(▲:Increase, ▼:Decrease) 0 : Temperature(Default) (▲:Increase, ▼:Decrease) 1 : Humidity 2 : VOC
10	R-OUT	Selecting Relay output sensor	▲ CO2 (Default) ▼ VOC
11	RTIME	Time setting for relay contact ON	(▲:Increase, ▼:Decrease) Default : 5 minutes 1min~40min setting available
12	OUT-1	Setting OUT1(CO2) output	▲ V-OUT(Default) : 0V~10V ▼ C-OUT : 4mA~20mA
13	OUT-2	Setting OUT2 output	▲ V-OUT(Default) : 0V~10V ▼ C-OUT : 4mA~20mA
14	OUT-3	Setting OUT3(CO2) output	▲ PULSE(Default) : PWM output ▼ O-C : On/Off
15	C-F	Selecting a sign of temperature (℃ / ℉)	▲ ℃ (Default) : ▼ ℉
16	CALCO	Setting calibration value of CO2	▲ : +50ppm ▼ : -50ppm
17	CALOC	Setting calibration value of VOC	▲ +1 mg/l ▼ -1 mg/l
18	CAL-T	Setting calibration value of Temperature	▲ +0.5℃ ▼ -0.5℃
19	CAL-H	Setting calibration value of Humidity	▲ +1% ▼ -1%
20	MD-ID	Setting Module ID	▲ +1 (no.1~no.32 available) ▼ -1

2. Additional information

1) If there is no input for 3 seconds after press ***MENU***, a display turns into set points. After this, if there is no input for 3 seconds too, it turns into Main display.

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2) CO2 ON, OFF setting ranges depend on Measuring ranges as follows.

Measuring ranges	CO2 ON setting ranges	CO2 OFF setting ranges
2,000ppm	200ppm ~ 2,000ppm	100ppm ~ 1,900ppm
5,000ppm	200ppm ~ 4,000ppm	100ppm ~ 3,900ppm
10,000ppm	200ppm ~ 8,000ppm	100ppm ~ 7,900ppm

* Increase/decrease 50ppm each time ▲,▼ buttons are pushed.

3) Relay & OUT3 output function

: Press UP(▲) DOWN(▼) key at the same time for 3 sec, relay contacts ON regardless of set points during certain time.

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4) If you redo 3) function, you should wait about 30 seconds –set delay interval.

3. LED

1) Power LED : Display Power ON/OFF status
2) OUT LED : Display RELAY ON/OFF status

4. Display errors

1) Errors of a temperature sensor : tHSt
(temperature sensor Short) / tHoP(temperature sensor OPEN)
2) Errors of a humidity sensor : HUSt
(humidity sensor Short), / HUoP(humidity sensor OPEN)

■ *RS485 Communication*

- ***RS-485 communication protocol***

1) Communication Mode ASYNC (UART : Universal Asynchronous Receiver Transmitter)

2) Communication data type
BAUD RATE : 9600bps
Data Bits : 8 bit
Parity Bit : no
Stop Bit : 1 bit

3) For defined communication protocol, refer to the additional documents.

Warranty and Instructions

■ *Warranty*

This product passes our strict quality control and Korea Digital will repair or replace without charge this item within 1 year after sale except for damage or break by customer's mistake.

■ *Instructions*

1. Caution: shock and moisture
1)The characters of NDIR optical system may be changed by impacts.
Don't give it heavy impacts.
And be careful not to drop this controller.
2) Don't use it where water drops and condensation can occur, too.

2. Keep operating conditions written above. If you do not, it may break down or have large errors.

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