SENSECUBE

O_2 Sensor Transmitter

(Zirconia Type) KCD-ON310

■ Features & Benefits

- Zirconium Dioxide(ZrO_2) sensing elements
- Long life, non-depleting technology
- Integral heating element
- Multiple output
  0-10Vdc, 4-20mA, RS-485
- High accuracy linear output
- Simple calibration
- Application
  - Combustion control including oil, gas and biomass boiler applications.
  - Laboratory & building air quality monitoring including confined space personnel safety.
  - Industrial process control i.e. gas mixing for welding and steel making
  - Oxygen generation systems.
  - Scientific including respiratory studies of a community or an organism, plants and animals.
  - Food and beverage packaging.
  - Applications where low oxygen (>0.5%) is key. Such as fermentation, rust and corrosion prevention.

- Notice

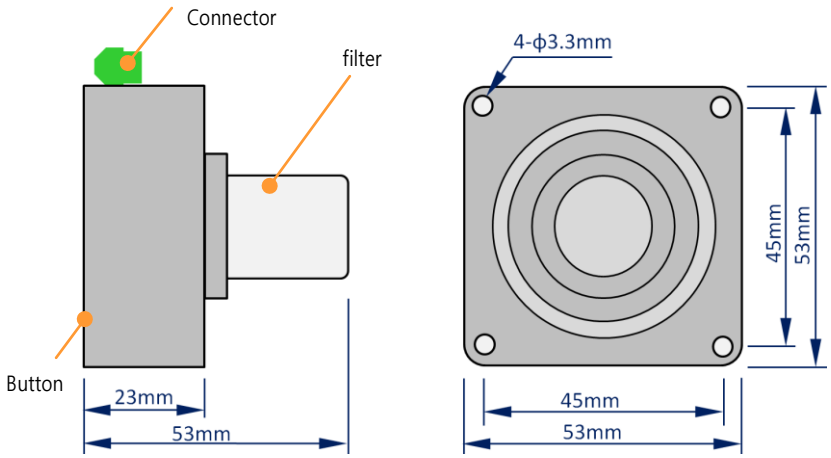
Concentration of oxygen in the atmosphere is known to be about 20.9% (20.946%), which is a dry standard. It is set to 20.7% considering the ambient and humidity conditions when calibrated by the atmospheric reference button. Any value can be set as a communication method if the correct condition of the gas for calibration can be achieved. For the setting method, please refer to separate communication protocol data.

■ Technical data

Measurement	Measurement range	0.1(1) ~ 25.0 %Vol.O_2, (Option 0.1~95%Vol)
	Measuring method	Solid electrolytes (Zirconia)
	Accuracy After Calibration(2)(3)	< ±1 % FS
	Repeatability	±1 % of measured value
General Conditions	Operating Temperature	-20 ~ 70℃
	Operating Humidity	98%RH, non condensing
	Permissible gas temperature	-10 ℃ to +50℃
	Heater Warm up time	About 3min
Interface	Calibration Button	Default (Factory calibration)
		Span (20.7%) (4)
Electrical	Power supply	12~ 24 VDC (5)
	Power consumption	5 W
	Output	4~20 mA, 0 ~10Vdc, 0~5VDC
	Communication	RS-485 (Modbus RTU)
Dimensions	Body	□53mm x 53mm
	Weight	60g

(1) Prolonged operation below 0.1%O_2 can damage the sensing element.
(2) Assuming barometric pressure remains constant.
(3) As the O2 sensor measures the partial pressure of oxygen within the measurement gas deviations in the barometric pressure from that present during calibration will cause readout errors proportional to the change.
(4) If the current concentration is known, it is possible to calibrate the current value through communication.
(5) If analog output 0 ~ 10VDC is desired, please apply more than 14VDC for power supply.

■ Outside View



Connector ①+24V ②GND ③V-Out, ④A-Out ⑤RS-485(A) ⑥RS-485(B)
Button ①Default (Factory calibration), ②Span (Calibrate current status to 20.7%)
Press and hold the button for more than 10 seconds to activate the function.

- Specifications and appearance are subject to change without notice.

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■ **Output signal of sensor by gas concentration**

Output Signal			O_2 Gas concentration (25%Vol.)			O_2 Gas concentration (100%Vol.)		
Current 4~20mA	Voltage 0~10VDC	Voltage 0~5VDC	Min. (-1%F.S)	Reference	Max. (+1%F.S)	Min. (-1%F.S)	Reference	Max. (+1%F.S)
4.0	0.0	0.0	0.00	0.0	0.30	0.00	0.0	1.00
4.3	0.2	0.1	0.30	0.5	0.80	1.00	2.0	3.00
4.6	0.4	0.2	0.80	1.0	1.30	3.00	4.0	5.00
5.0	0.6	0.3	1.30	1.5	1.80	5.00	6.0	7.00
5.3	0.8	0.4	1.80	2.0	2.30	7.00	8.0	9.00
5.6	1.0	0.5	2.30	2.5	2.80	9.00	10.0	11.00
5.9	1.2	0.6	2.80	3.0	3.30	11.00	12.0	13.00
6.2	1.4	0.7	3.30	3.5	3.80	13.00	14.0	15.00
6.6	1.6	0.8	3.80	4.0	4.30	15.00	16.0	17.00
6.9	1.8	0.9	4.30	4.5	4.80	17.00	18.0	19.00
7.2	2.0	1.0	4.80	5.0	5.30	19.00	20.0	21.00
7.5	2.2	1.1	5.30	5.5	5.80	21.00	22.0	23.00
7.8	2.4	1.2	5.80	6.0	6.30	23.00	24.0	25.00
8.2	2.6	1.3	6.30	6.5	6.80	25.00	26.0	27.00
8.5	2.8	1.4	6.80	7.0	7.30	27.00	28.0	29.00
8.8	3.0	1.5	7.30	7.5	7.80	29.00	30.0	31.00
9.1	3.2	1.6	7.80	8.0	8.30	31.00	32.0	33.00
9.4	3.4	1.7	8.30	8.5	8.80	33.00	34.0	35.00
9.8	3.6	1.8	8.80	9.0	9.30	35.00	36.0	37.00
10.1	3.8	1.9	9.30	9.5	9.80	37.00	38.0	39.00
10.4	4.0	2.0	9.80	10.0	10.30	39.00	40.0	41.00
10.7	4.2	2.1	10.30	10.5	10.80	41.00	42.0	43.00
11.0	4.4	2.2	10.80	11.0	11.30	43.00	44.0	45.00
11.4	4.6	2.3	11.30	11.5	11.80	45.00	46.0	47.00
11.7	4.8	2.4	11.80	12.0	12.30	47.00	48.0	49.00
12.0	5.0	2.5	12.30	12.5	12.80	49.00	50.0	51.00
12.3	5.2	2.6	12.80	13.0	13.30	51.00	52.0	53.00
12.6	5.4	2.7	13.30	13.5	13.80	53.00	54.0	55.00
13.0	5.6	2.8	13.80	14.0	14.30	55.00	56.0	57.00
13.3	5.8	2.9	14.30	14.5	14.80	57.00	58.0	59.00
13.6	6.0	3.0	14.80	15.0	15.30	59.00	60.0	61.00
13.9	6.2	3.1	15.30	15.5	15.80	61.00	62.0	63.00
14.2	6.4	3.2	15.80	16.0	16.30	63.00	64.0	65.00
14.6	6.6	3.3	16.30	16.5	16.80	65.00	66.0	67.00
14.9	6.8	3.4	16.80	17.0	17.30	67.00	68.0	69.00
15.2	7.0	3.5	17.30	17.5	17.80	69.00	70.0	71.00
15.5	7.2	3.6	17.80	18.0	18.30	71.00	72.0	73.00
15.8	7.4	3.7	18.30	18.5	18.80	73.00	74.0	75.00
16.2	7.6	3.8	18.80	19.0	19.30	75.00	76.0	77.00
16.5	7.8	3.9	19.30	19.5	19.80	77.00	78.0	79.00
16.8	8.0	4.0	19.80	20.0	20.30	79.00	80.0	81.00
17.1	8.2	4.1	20.30	20.5	20.80	81.00	82.0	83.00
17.4	8.4	4.2	20.80	21.0	21.30	83.00	84.0	85.00
17.8	8.6	4.3	21.30	21.5	21.80	85.00	86.0	87.00
18.1	8.8	4.4	21.80	22.0	22.30	87.00	88.0	89.00
18.4	9.0	4.5	22.30	22.5	22.80	89.00	90.0	91.00
18.7	9.2	4.6	22.80	23.0	23.30	91.00	92.0	93.00
19.0	9.4	4.7	23.30	23.5	23.80	93.00	94.0	95.00
19.4	9.6	4.8	23.80	24.0	24.30	95.00	96.0	97.00
19.7	9.8	4.9	24.30	24.5	24.80	97.00	98.0	99.00
20.0	10.0	5.0	24.80	25.0	25.00	99.00	100.0	100.00

Grey marked bottom and top areas have poor linearity of the output signal against to density. The ambient air concentration according to humidity is roughly as follows. 0%RH: 20.9%Vol., / 25%RH:20.7%Vol., / 50%RH:20.5%Vol., / 75%RH 20.3%Vol., / 100%RH: 20.1%Vol.

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