VOC Detector with Relay
Model TON-0012
User Manual

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CO2 Measurement Specialists

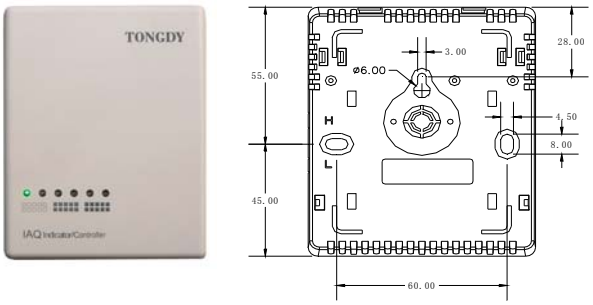
Specifications

Gas detected	Combustion gas and odorous gases within the room (smoke, body odor, timber dope and toluene emitted by other building materials), low concentration odorous gases (ammonia, H2S, CO, alcohol and natural gas)
Sensing element	Semiconductor gas sensor from Figero, Japan
Measuring range	1~30ppm
Power Supply	24VAC/VDC
Consumption	2.5 W
Load (for analog output)	>5K
Sensor query frequency	Every 1s
Warm up time	48 hours (first time), 10 minutes (operational)
Six indicator lights	1st green light on when VOC measurement≤5ppm 1st and 2nd green lights on when 5ppm＜VOC measurement≤10ppm 1st yellow light on when 10ppm＜VOC measurement≤15ppm 1st and 2nd yellow lights on when 15ppm＜VOC measurement≤20ppm 1st red light on when 20ppm＜VOC measurement≤25ppm 1st and 2nd red lights on when VOC measurement＞25ppm
Modbus interface	RS485 with 19200bps(default), 15KV antistatic protection, independent base address
Output resolution	10Bit
Relay output (Only for L101)	One dry contact output, rated switching current 2A, resistance load The IAQ level selectable to control the relay action during four IAQ levels.
Operation	0～50℃ (32～122℉) / 0～95%RH，non condensing
Storage conditions	0～50¤ (32～122¤) /5~90%RH
Net weight / Dimensions	190g /100mm×80mm×28mm
Installation standard	65mm×65mm or 2”×4” wire box
Housing	PC/ABS fireproof material /IP30 protection class
Version	V.F026

Important Information

- Always cut off power before mounting, removing, and cleaning the indicator.
- Notice the supply power voltage of the indicator is **24VAC/VDC**

Figure.2



Mounting and Wire Connection

- Follows the step 1to step 4 in Figure1 to remove the cover. First, prepare a flat head screwdriver and cut off the power. Put the screwdriver deep inside of the hole on the top of the indicator. Then slant the screwdriver and open the cover gently following steps from step 2 to step 4.
- Mount the indicator on the place where you want to detect VOC level. Do not mount it near diffuser or any steam source, in direct sunlight.
- Mount the wall plate first, there are two dimensions available (see figure 2). Place the indicator against the wall at desired location; make sure wires can be passed through the notch on the wall plate.
- Connect wires to terminal strips, (see the label on the wall plate and fig.3) Make sure wiring connection correct and secure.
- Follows steps in figure 4 to close the cover.

Figure.1
Open Cover

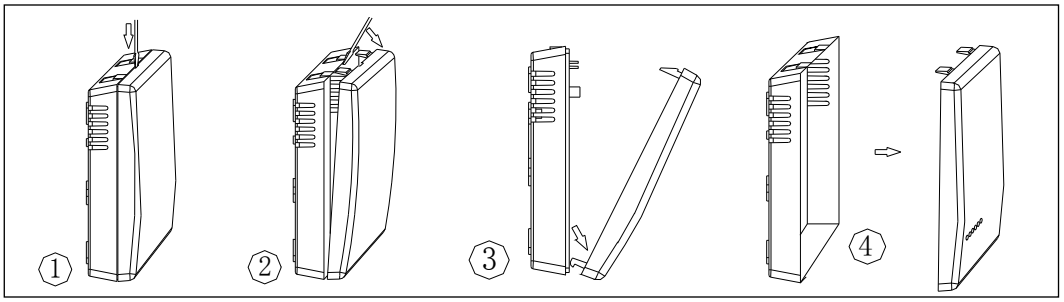


Figure.4 Close Cover

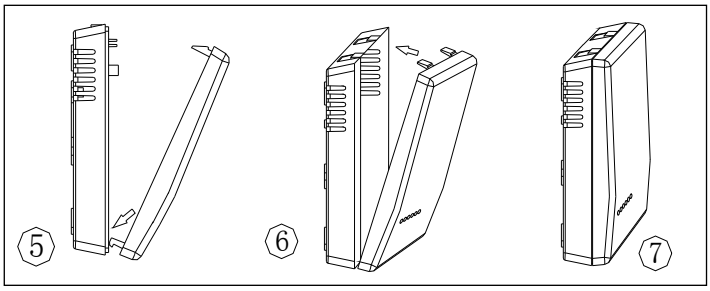
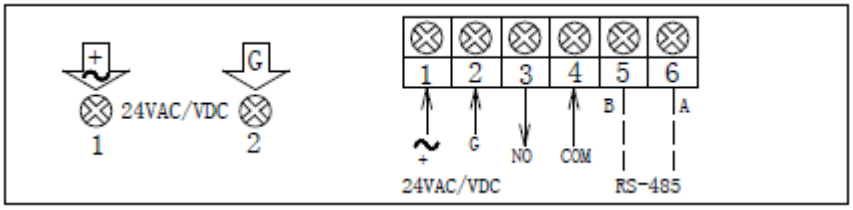


Figure.3 Wiring



Connection Terminal		Function	Electrical Data
1	G+	Power (+)	24VAC/24VDC +
2	G0	Power ground (-)	24VAC/24VDC
3	Controlled device	Relay output	<245VAC 2A switching current (resistance load)
4	Common		
5	B (RX-)	RS485	Modbus protocol, 19200bps, 15KV antistatic protection.
6	A (TX+)		

Setting VOC level to control the relay action

Open the indicator's cover, there are 2 jumpers J1 and J2 on the top of the PCB board. Now you can adjust IAQ setting level via the two jumpers as below table to control the relay action.

OFF means disconnection, ON means connection.

Jumper setup	IAQ setting level	Relay on /off
J1=OFF J2=OFF	5ppm	The relay turns on when VOC>5.5ppm and turns off when VOC<4.5ppm
J1=OFF J2=ON	10ppm	The relay turns on when VOC>10.5ppm and turns off when VOC<9.5ppm
J1=ON J2=OFF	15ppm	The relay turns on when VOC>15.5ppm and turns off when VOC<14.5ppm
J1=ON J2=ON	20ppm(Default)	The relay turns on when VOC>20.5ppm and turns off when VOC<19.5ppm

Modbus Parameters

Mode: RTU (MSB First)

Baud Rate: 1-4800 2-9600 3-14400 4-19200 5-38400 bps default: 4-19200bps

Start Bits: 1

Data Bits: 8

Stop Bits: 1 / 2 default : 1

Parity: None / Odd / Even default: None

MODBUS POLL-F2000TSM-VOC-L101C Register Map

Support Function: 2 3 4 6 16

Starting Register Decimal	Data Description	Function	Read/Write	Length	Format	Valid Response	Default
0	VOC Measurement(Float)	4	R	2	Float big-end		
2	Temperature Measurement	4	R	2	Float big-end		
4	Humidity Measurement	4	R	2	Float big-end		
6	VOC Measurement(INT16)x10	4	R	1	INT16		
7	Temperature Measurement(INT16)x10	4	R	1	INT16		
8	Humidity Measurement (INT16)	4	R	1	INT16		
0	Modbus Address	3/6	R/W	1	UINT16	1~255	1
1	Modbus Baud Rate	3/6	R/W	1	UINT16	1-4800bps 2-9600bps 3-14400bps 4-19200bps	4

						5-38400bps	
2	Modbus Parity Bit and Stop Bit	3/6	R/W	1	UINT16	1-None 1Stop Bit; 2-None 2Stop Bit; 3-Odd 1Stop Bit; 4-Even 1Stop Bit	2
6	Humidity Calibrate Object	3/6	R/W	1	UINT16	5~99	50
10	Temperature Calibrate	3/16	R/W	2	Float big-end	-3.0~3.0	0.0
38	Voc Current Calibrate Object	3/16	R/W	2	Float big-end	0.1~30.0	15.0
0	0~10v/4~20mA	2	R	1	UINT16		0
1	Relay Setpoint Choice 1	2	R	1	UINT16		0
2	Relay Setpoint Choice 2	2	R	1	UINT16		1
0	Relay	1	R	1	UINT16	0-OFF 1-ON	

Note：Scan Rate>=4000ms