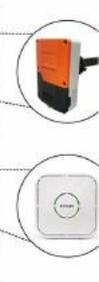
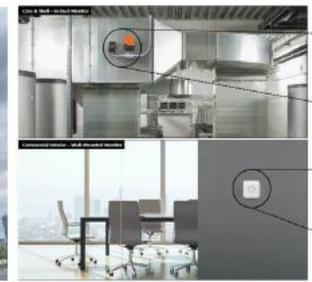


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Tongdy Sensing Technology

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**Contact:** [info@tongdy.com](mailto:info@tongdy.com)    **Phone:** +86 10 59738938 ext 8035

Sensing Empowers The Future

# About Tongdy

## Since 1999- Now

Tongdy Sensing Technology Corp. was founded in 1999, and located in Beijing China. With strong technical development and product design capabilities Tongdy has focused on research and development of air quality monitors, gas transducers and controllers of BAS, HVAC systems.

Besides providing hardware devices, we also provide air quality data and solutions based on our MyTongdy data platform.

Our projects and clients spread across more than 30 countries worldwide, with over 20 years of application experience. We had established deep cooperation relation with not only industry associations like: WGBC, RESET and WELL, but also some world top 500 companies.



**Sensing Empowers The Future**

# 2024 Tongdy Trends

## Professional Services:

Sensing monitors + Remote data platform

- data collection and analysis
- correction of gas monitors
- firmware upgrade
- hardware inspection and fault diagnose



## Special Customization Services:

- communication encryption
- customized protocols
- made-to-order complex monitors/ controllers



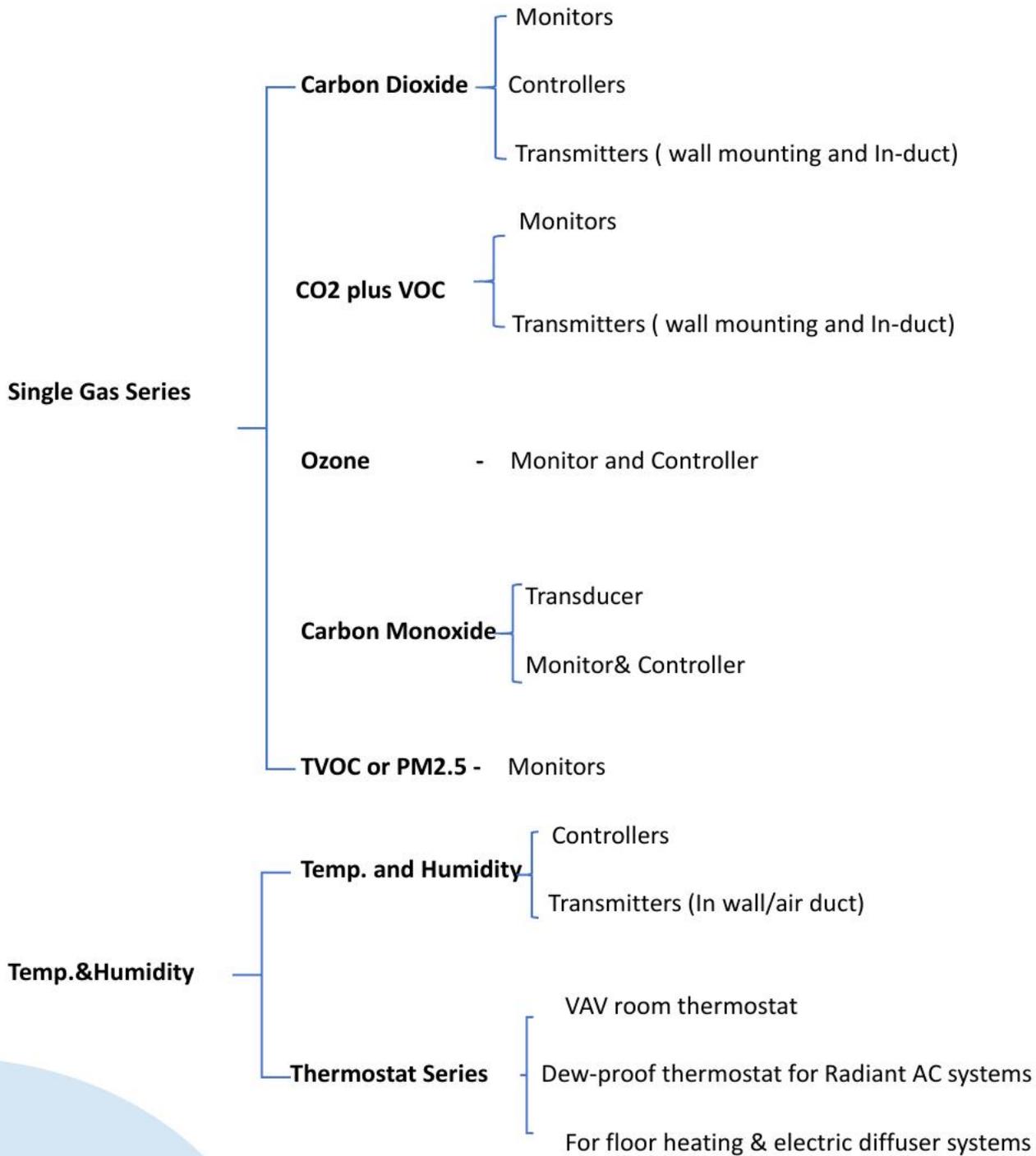
Sensing Empowers The Future

# Production Summary

## Multi-Sensor Air Quality Monitors

(RS485, RJ45, WIFI, LoraWAN, 4G)

Indoor Series      In duct Series      Outdoor Series



# Indoor Air Quality Monitor

IN COMMERCIAL GRADE



## Specification Data

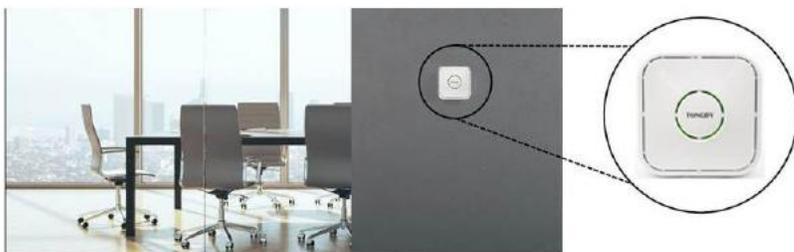


### FEATURES

- 24-hour online real-time detecting indoor air quality, upload measurement data.
- The special and core multi-sensor module is inside, which is designed for the commercial grade monitors. The whole sealed cast aluminum structure ensures the stability of detection and improves the anti-jamming capability.
- Different from other particle sensors, the PM sensor module inside MSD with a built-in large flow bearing fan, which has the control technology of automatic constant flow. It makes MSD the much higher and long-term operation stability and life, of course more accuracy.
- Providing multiple sensors such as PM2.5, PM10, CO2, TVOC, HCHO, Temperature and humidity.
- Using own patent technologies to minimize the influence from ambience temperature and humidity to the measured values.
- Two power supply selectable: 24VDC/VAC or 100~240VAC
- Communication interface is optional: Modbus RS485, WIFI, RJ45 Ethernet.
- Supply an extra RS485 for WiFi/ Ethernet type to configure or check the measurements.
- Three-color light ring indicating different level of indoor air quality. The light ring can be turned off.
- Ceiling mounting and wall mounting with the tasteful appearance in different decoration styles.
- Simple structure and installation, make easy ceiling mounting easy and convenient.
- Over 15-year experience in IAQ product design and production, abundantly applied in European and American market, mature technology, good manufacturing practice and high quality ensured.
- RESET certified as the grade B monitor for Green Building Assessment and Certification.

### APPLICATION

- Online real-time detecting indoor air quality.
- Green Building Assessment
- BAS and HVAC
- Smart Home System
- Fresh Air Controlling System
- Building Energy Saving Reconstruction and Assessment System
- Classroom, office, exhibition hall, shopping mall, other public place



## TECHNICAL SPECIFICATIONS

### General Data

Detection Parameters(max.)	PM2.5/PM10, CO2, TVOC, Temperature & RH, HCHO
Output (Optional)	. RS485 (Modbus RTU or BACnet MS/TP) . RJ45/TCP (Ethernet) with an extra RS485 interface . WiFi @2.4 GHz 802.11b/g/n with an extra RS485 interface
Operating Environment	Temperature: 0~50 °C (32 ~122°F) Humidity: 0~90%RH
Storage Conditions	0~50 °C (32 ~122°F)/ 0~90%RH (No condensation)
Power Supply	12~28VDC/18~27VAC or 100~240VAC
Overall Dimension	130mm(L)×130mm(W)×45mm (H) 7.70in(L)×6.10in(W)×2.40in(H)
Power consumption	Average 1.9w (24V) 4.5w (230V)
Material of Shell & IP Level	PC/ABS fire-proof material / IP20
Certification Standard	CE, FCC, ICES

### Temperature and Humidity Data

Sensor	High precision digital integrated temperature and humidity sensor
Measuring Range	Temperature: -20~60 °C (-4~140°F) Humidity : 0~99%RH
Output Resolution	Temperature : 0.01 °C Humidity : 0.01%RH
Accuracy	Temperature : ±0.5°C (10~40°C) Humidity : ±5.0%RH (10%~90%RH)

### PM2.5/PM10 Data

Sensor	Laser particle sensor, light scattering method
Measuring Range	PM2.5: 0~1000µg/m3 PM10: 0~1000µg/m3
Output Resolution	0.1µg /m3
Zero Point Stability	±5µg /m3
Accuracy	PM2.5: 10% of reading (1~300ug/m3) PM10: 15% of reading (0-300µg/m3)

### CO2 Data

Sensor	Non-Dispersive Infrared Detector (NDIR)
Measuring Range	0~5,000ppm
Output Resolution	1ppm
Accuracy	±50ppm +3% of the reading or ±75ppm (Whichever is bigger)

### TVOC Data

Sensor	Metal oxide gas sensor
Measuring Range	0.001~4mg/m3
Output Resolution	0.001mg/m3
Accuracy	±0.02mg/m3 +12% of reading (0.001~2mg/m3)

### HCHO Data

Sensor	Electrochemical Formaldehyde sensor
Measuring Range	0.001~0.6mg/m3
Output Resolution	0.001mg/m3
Accuracy	±0.003mg/m3+10% of reading

## MODELS GUIDE

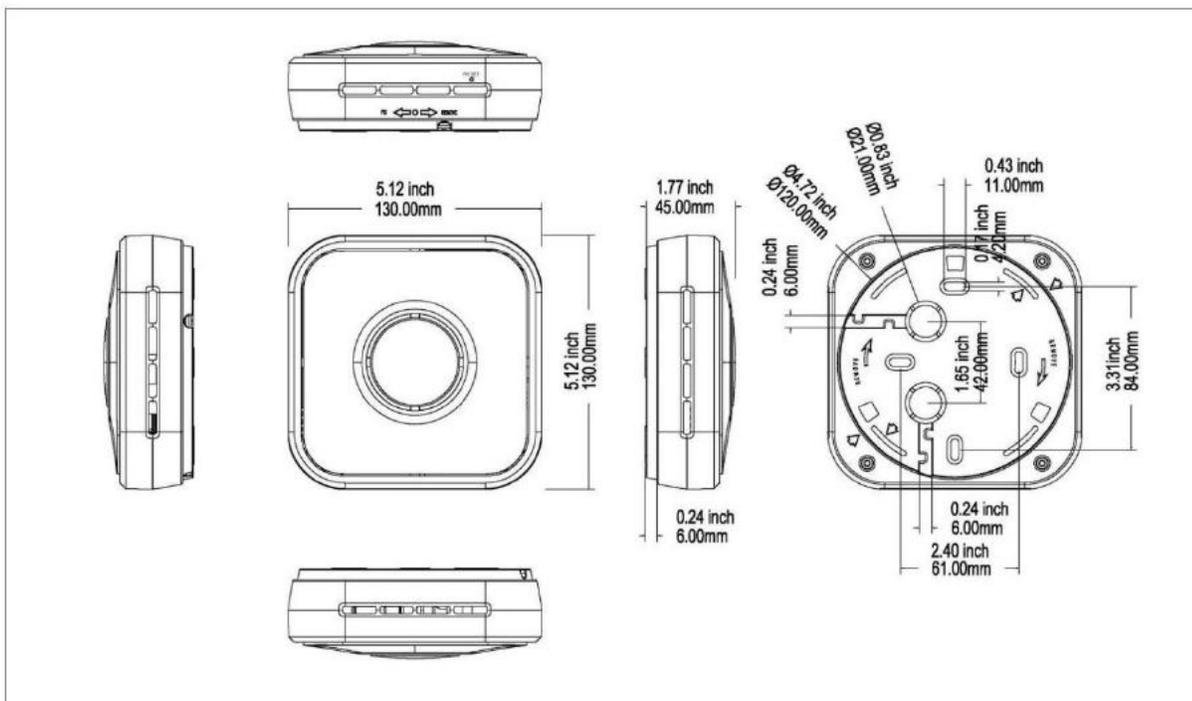
Model	PM2.5	PM10	Temp/ RH	CO2	TVOC	HCHO	Output	Extra interface
MSD-1813C	•	•	•	•			RS485 (Modbus RTU) or Postix:-BN (BACnet MS/TP)	None
MSD-1818C	•	•	•	•	•			
MSD-1819C	•	•	•	•	•	•		
MSD-1833C/D	•	•	•	•			Ethernet RJ45 (POE available)	RS485
MSD-1838C/D	•	•	•	•	•			
MSD-1839C/D	•	•	•	•	•	•		
MSD-1823C/D	•	•	•	•			WIFI	RS485
MSD-1828C/D	•	•	•	•	•			
MSD-1829C/D	•	•	•	•	•	•		

C/D power supply select: C means 12~28VDC/18~27VAC; D means 100~240VAC power supply

### Examples

Model	Communication interface	Protocol	Power Supply
MSD-1813C; MSD-1818C	RS485	Modbus RTU	24VAC/VDC
MSD-1818C-BN ; MSD-1819C-BN	RS485	BACNet MS/TP	24VAC/VDC
MSD-1829D	WIFI	MQTT	100~230VAC
MSD-1838-PoE	Ethernet RJ45	MQTT	PoE 48V

## DIMENSIONS

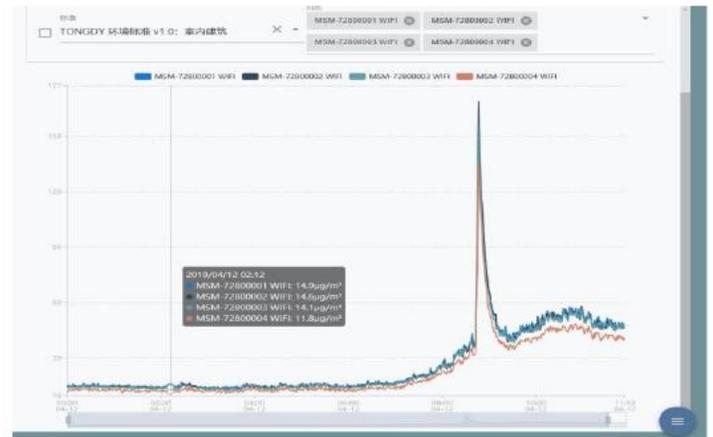


## NETWORK DIAGRAM

## DATA APPLICATIONS

Real-time gathering indoor air quality data, or upload the data to an IPC or a Cloud server. Record, read and analyze the data through a data platform. It may have computer version, as well as cellphone version and TV version.

Using the real time multi sensors data, it's possible to monitoring indoor air quality, control building ventilation system and ensure the green and healthy working spaces.



Mytongdy 数据应用

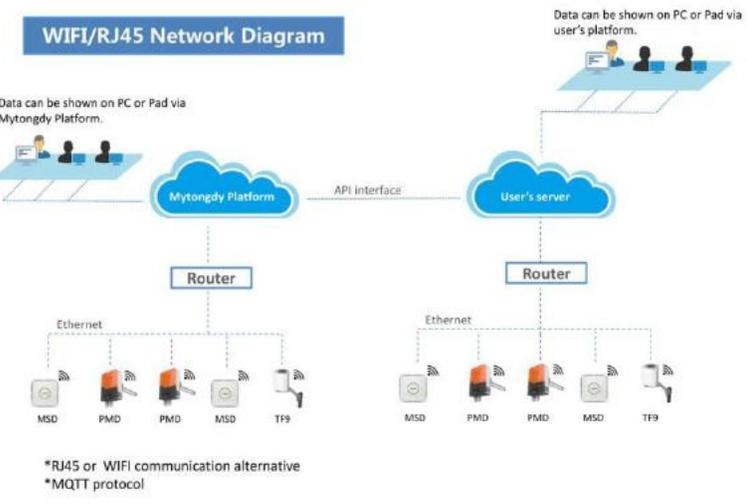
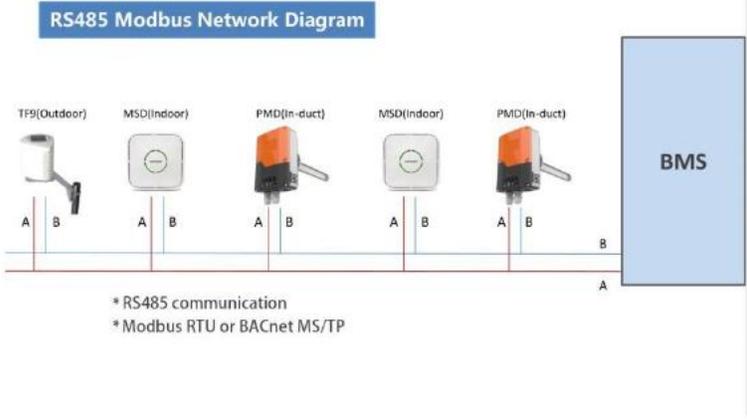
设备ID: MSD-8000019-75

设备名称: 中央空调内装系统 / RESET/设置 PM2.5-PM10

设备地址: 192.168.1.100

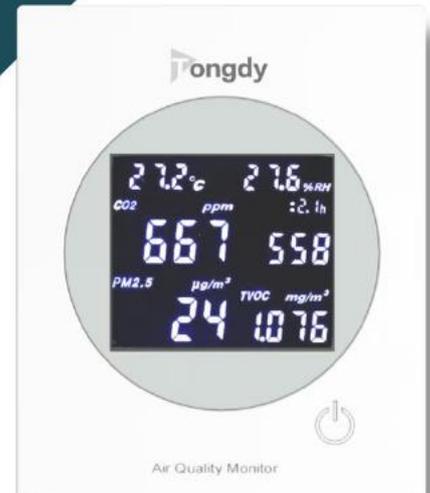
设备类型: 中央空调内装系统

日期	PM2.5 (ug/m³)	PM10 (ug/m³)	CO2 (ppm)	TVOC (ppm)	温度 (°C)	湿度 (%)	光照 (lux)
2019-03-10 00:00	100	150	1000	0.1	20.0	60	100
2019-03-10 01:00	110	160	1050	0.1	20.5	65	100
2019-03-10 02:00	120	170	1100	0.1	21.0	70	100
2019-03-10 03:00	130	180	1150	0.1	21.5	75	100
2019-03-10 04:00	140	190	1200	0.1	22.0	80	100
2019-03-10 05:00	150	200	1250	0.1	22.5	85	100
2019-03-10 06:00	160	210	1300	0.1	23.0	90	100
2019-03-10 07:00	170	220	1350	0.1	23.5	95	100
2019-03-10 08:00	180	230	1400	0.1	24.0	100	100
2019-03-10 09:00	190	240	1450	0.1	24.5	105	100
2019-03-10 10:00	200	250	1500	0.1	25.0	110	100
2019-03-10 11:00	210	260	1550	0.1	25.5	115	100
2019-03-10 12:00	220	270	1600	0.1	26.0	120	100
2019-03-10 13:00	230	280	1650	0.1	26.5	125	100
2019-03-10 14:00	240	290	1700	0.1	27.0	130	100
2019-03-10 15:00	250	300	1750	0.1	27.5	135	100
2019-03-10 16:00	260	310	1800	0.1	28.0	140	100
2019-03-10 17:00	270	320	1850	0.1	28.5	145	100
2019-03-10 18:00	280	330	1900	0.1	29.0	150	100
2019-03-10 19:00	290	340	1950	0.1	29.5	155	100
2019-03-10 20:00	300	350	2000	0.1	30.0	160	100
2019-03-10 21:00	310	360	2050	0.1	30.5	165	100
2019-03-10 22:00	320	370	2100	0.1	31.0	170	100
2019-03-10 23:00	330	380	2150	0.1	31.5	175	100



# EM21 Latest Indoor Air Quality Monitor

Tongdy focus on air quality monitoring and solution for 15 years  
Provides more project experience and reliable data  
EM21 provides up to seven sensing and in-wall or on-wall  
mount types  
EM21 has options of RS485/WiFi/Ethernet/LoraWAN  
interface and has a data-logger



# EM21- Indoor Air Quality Monitor

## In-wall and on-wall mount available

---

### Professional Design in Business B-level

Detection parameters:	PM2.5, PM10, CO2, TVOC, Temperature, Humidity Optional formaldehyde, carbon monoxide, ambient noise and light
Communication interface:	RS485, WiFi, Ethernet(RJ45), LoraWAN
Data logger	Storing sensing data with Bluetooth download Store rate from 60 seconds to 10 days.
Power supply (optional):	24VAC /VDC $\pm$ 10%, 100~240VAC, POE-48V for RJ45

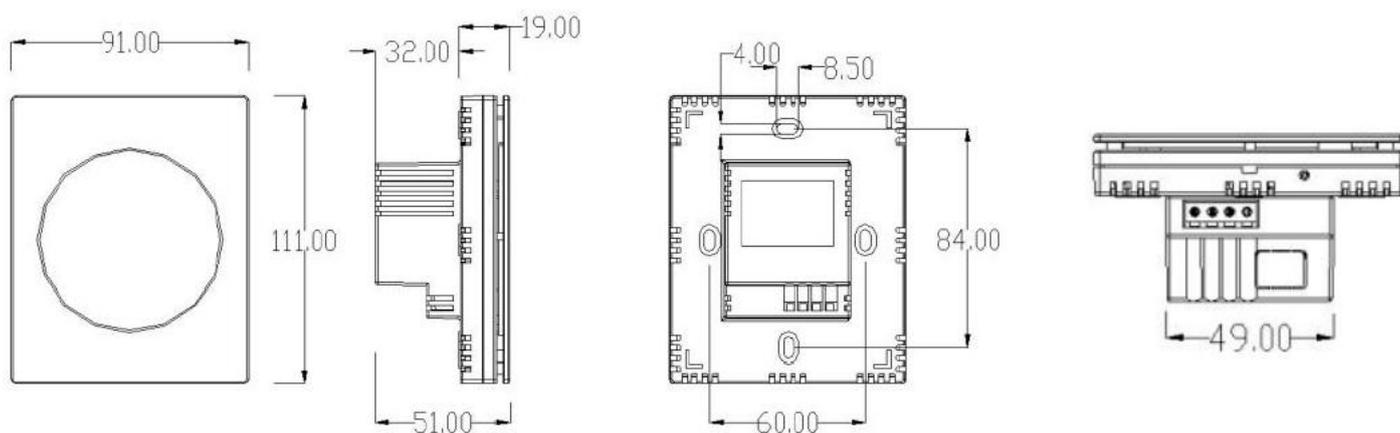
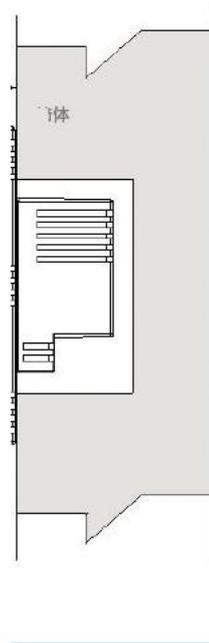
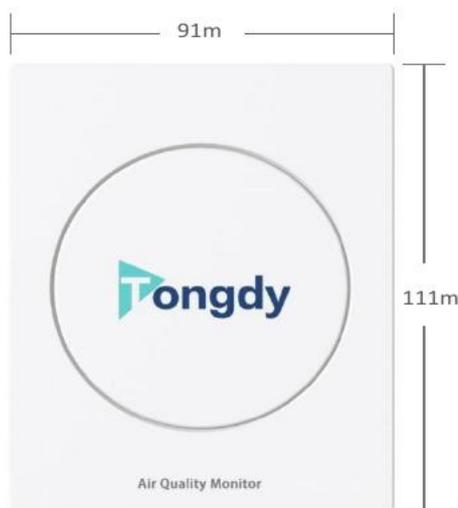


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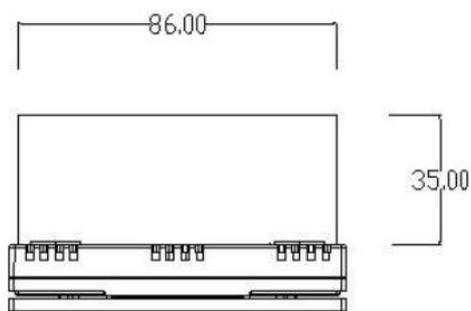
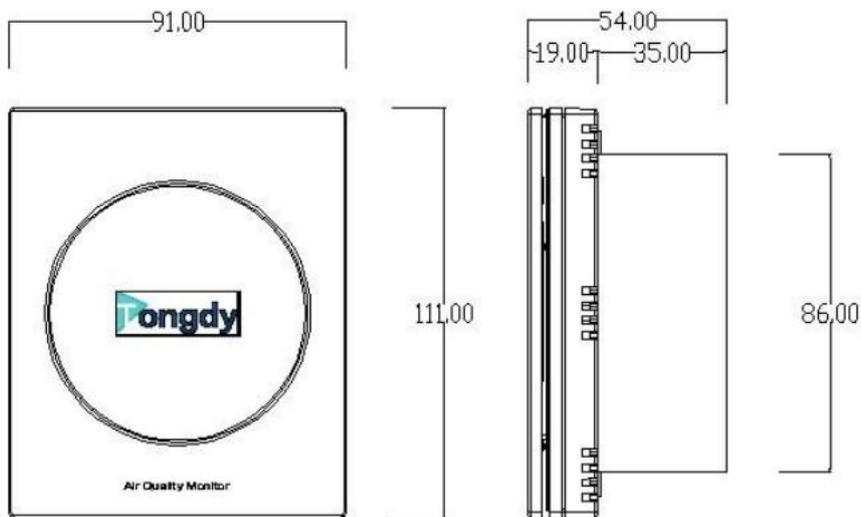
Unique base-line algorithm and data compensation principle ensures measurements reliable and accurate in different environments

# In-Wall Mounting

## Applicable to tube box of Europe, American, and China standard



## Wall mounting or desktop placement with a mounting box



4 color surface mounted tube boxes are optional

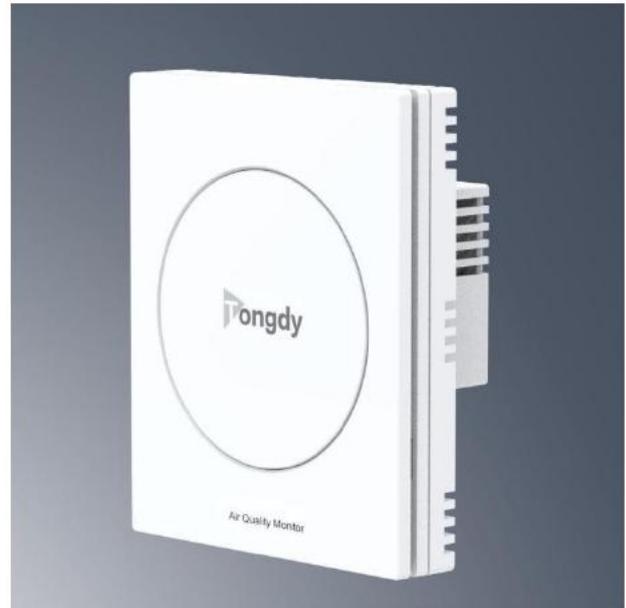


Place on the desk

## EM21 Indoor Air Quality Monitor

### -Simple and Elegant

- LED Tri-colored lights
- Visible air quality level
- Compact & simple design
- Upload real-time data to cloud service, and display history chart via a software platform



## EM21 Indoor Air Quality Monitor

### -Unique Display Design

- Show the detailed air quality on the screen
- Display the real time values and 24-hour average of PM2.5, PM10, TVOC, CO2
- Optional HCHO, CO, noise, lightness
- Turn off or turn on screen by touch button
- The brightness of screen is automatic changed according with the room lightness.



## Technology Specification

	CO2	TVOC	PM2.5	PM10
<b>Sensor</b>	NDIR	Metal oxide semiconductor	Laser particle sensor	Laser particle sensor
<b>Measuring Range</b>	400 ~ 5,000ppm	0.001~4.0mg/m3	0~1000µg /m3	0~1000µg /m3
<b>Output Resolution</b>	1ppm	0.001mg/m3	1µg/ m3	1µg/ m3
<b>Accuracy</b>	±50ppm+ 3% of reading or 75ppm	<15%	±5ug/m3+15% @1~100ug/m3	±5ug/m3+15% @1~100ug/m3

	Ambient Noise	Ambient Light	TEMP &RH
<b>Sensor</b>	Frequency: 100~10K Hz Sensitivity : -36±3 dBFS	Measurement Range: 0.96~64000 lx	High-precision digital integrated temp. and humidity sensor
<b>Measuring Range</b>	Acoustic Overload point: 130 dB SPL	Measurement Accuracy: ±20%	Temp: 0°C~60°C Humidity:0~99%RH
<b>Output Resolution</b>	Signal to Noise Ratio: 56 dB(A)	incandescent/fluorescent sensor out ratio: 1	Temp:0.01°C Humidity:0.01%RH
<b>Accuracy</b>	Noise Floor:-92 dBFS	Dark(0 lx) sensor out: 0+3 count	Temp:±0.6°C Humidity:±4.5%RH

Formaldehyde cannot be used together with noise and light

	HCHO	CO
<b>Sensor</b>	Electrochemical formaldehyde sensor	Electrochemical carbon monoxide sensor
<b>Measuring Range</b>	0.001~1.25mg/m3 (1ppb~1000ppb@20°C)	0.1~100ppm
<b>Output Resolution</b>	0.001mg/m3 (1ppb@20°C)	0.1ppm
<b>Accuracy</b>	0.003mg/m <sup>3</sup> + 10% of reading (0~0.5mg/m3) ±20ppb (0~100ppb)	±1ppm (0~10ppm)

General Specifications			
<b>Detection Parameters(max.)</b>	PM2.5 ; PM10, CO2 ; TVOC ; Temp&RH ; Ambient light One of HCHO,CO, ambient noise	<b>Data logger</b>	Data logger up to 145860 points, the storage rate from 60 sec. to 10 days. For example save 5 sensing data it can be stored 78 days/5min. rate or 156 days /10min or 468 days/30min. Download data by a BlueTooth APP which is also used for configuration.
<b>Communication</b>	A. RS485 (Modbus RTU) B. WIFI @2.4 GHz 802.11b/g/n C. RJ45 (Ethernet TCP) D. LoraWAN (Support regins: RU864, IN865, EU868, US915, AU915, KR920, AS923-1~4)	<b>Power Supply</b>	24VAC/VDC±10%,100~240VAC PoE for RJ45 interface
		<b>Shell material and IP class</b>	PC fireproof material IP30
<b>Operating Environment</b>	Temp: 0~60℃ Humidity : 0~99%RH	<b>Overall Dimension</b>	91.00mm*111.00mm*51.00mm
<b>Storage Condition</b>	0℃~50℃ 0~70%RH	<b>Installation standard</b>	Standard 86/50 pipe box (installation hole size is 60mm) American standard pipe box (installation hole size is 84mm)

# Sleepless eye on your air quality

- View real-time and historical data through RS485 or cloud-based platform such as “MyTongdy” , in computer or mobile APP
- Check out or download data to analyze your indoor air quality and identify the pollution source as frequently as you need
- Handle your indoor air quality by control the fresh air system or purification equipment automatically



# Application Places

Widely used in commercial or residential spaces



Commercial Space



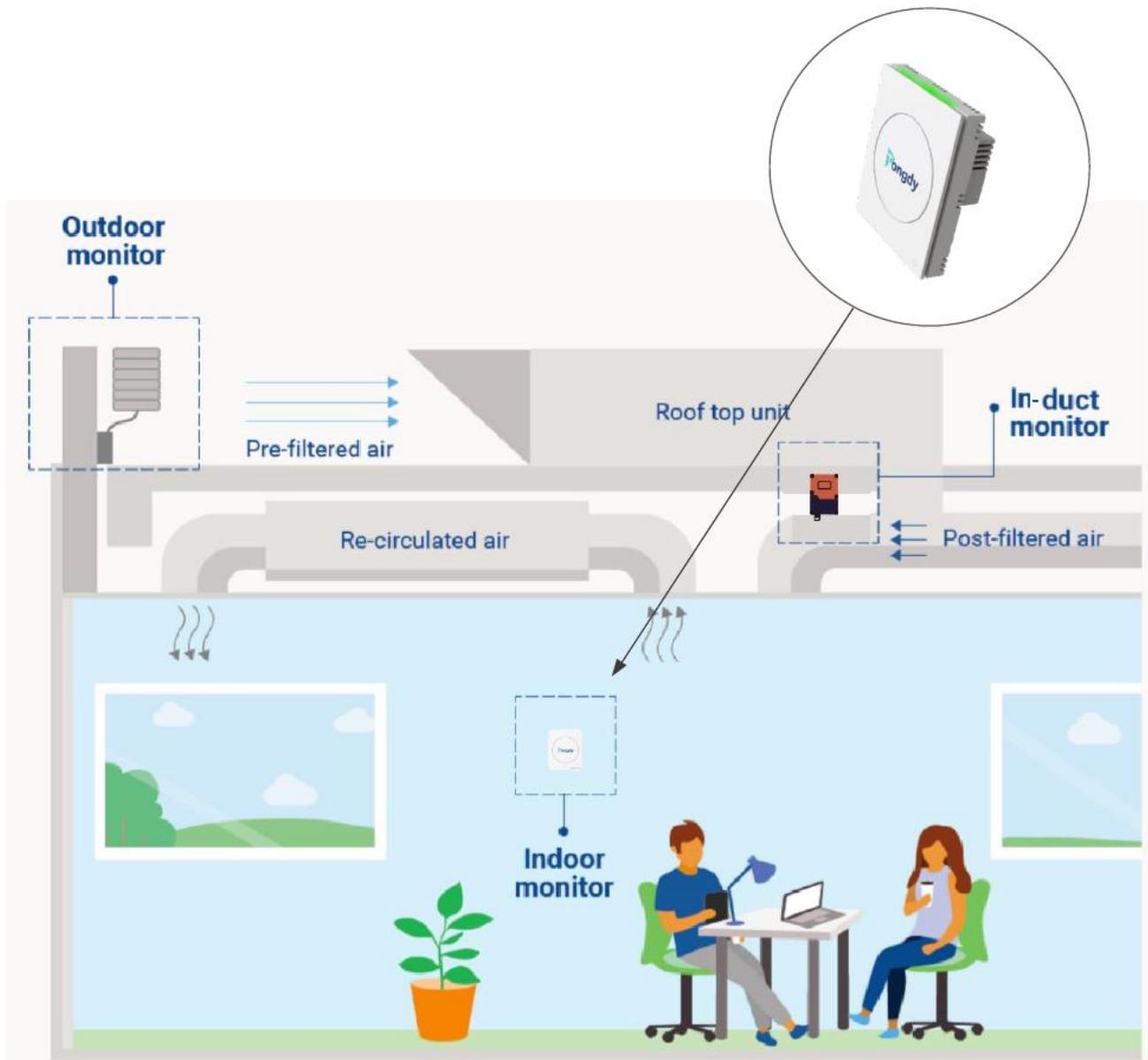
School



Residential



Hotel



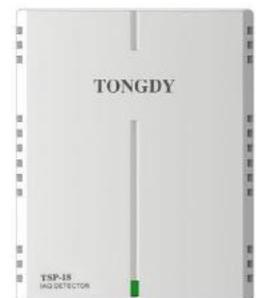
## Models Guide

No.	Model	PM2.5 PM10	CO2	Temp&RH	TVOC	HCHO	Output	Display	Power Supply
1	EM21-B/S13C	•	•	•			RS485 (Modbus RTU)	B: No display S: with display	C: 24VAC/VDC D: 100~240VAC POE: 48V
2	EM21-B/S18C	•	•	•	•				
3	EM21-B/S19C	•	•	•	•	•			
4	EM21-B/S23C/D	•	•	•			WiFi (MQTT)		
5	EM21-B/S26C/D		•	•					
6	EM21-B/S28C/D	•	•	•	•				
7	EM21-B/S29C/D	•	•	•	•	•			
8	EM21-B/S33C	•	•	•			Ethernet RJ45 (MQTT)		
9	EM21-B/S38C	•	•	•	•				
10	EM21-B/S39C	•	•	•	•	•			
11	EM21-B/S33-POE	•	•	•					
12	EM21-B/S38-POE	•	•	•	•				
13	EM21-B/S39-POE	•	•	•	•	•			
14	EM21-B/S53C/D	•	•	•			LoraWAN (CayenneLPP extension)		
15	EM21-B/S55C/D	•		•	•				
16	EM21-B/S58C/D	•	•	•	•				
17	Optional detection ambiance light and one of carbon monoxide or ambiance noise or formaldehyde. Please ask your sales for the correct model.								

# TSP-18 Indoor Air Quality Detector

—Designed for indoor air quality detection

- *Experienced in designing IAQ products for 15 years, with powerful performance guaranteed*
- *Real-time indoor air quality detection, single or combined measurement selection: PM2.5/PM10, CO2, TVOC, Temperature and RH*
- *3-color light indicates the range of the main measurement*
- *OLED display optional*
- *Suitable for schools, offices, hotels and residential projects to analyze indoor air quality, and to control ventilation systems*
- *Modbus RS485 or WiFi /RJ45communication interface*



## Features

- 7-24 hours online real-time IAQ detection
- Real-time output of PM2.5/PM10, CO2, TVOC and Temperature & humidity data, single or combined measurement selection
- A special correction algorithm inside to ensure the TVOC measurements not be affected as environmental change
- Modbus RS485 or WIFI or Ethernet interface
- 3-color lights indicates the three ranges of main measurement
- Optional OLED display IAQ measurements
- Wall mounting with 24VAC/VDC power supply
- Used in all old and new buildings
- Provides carbon monoxide and ozone detectors of TSP series for more gases detection
- Over 15 years' application experience of IAQ products in global market
- CE approved

### Applications

- Schools , hotels, offices and other public places
- Smart home systems
- Residential projects
- Air quality monitoring in other public places
- All ventilation systems

### Specifications

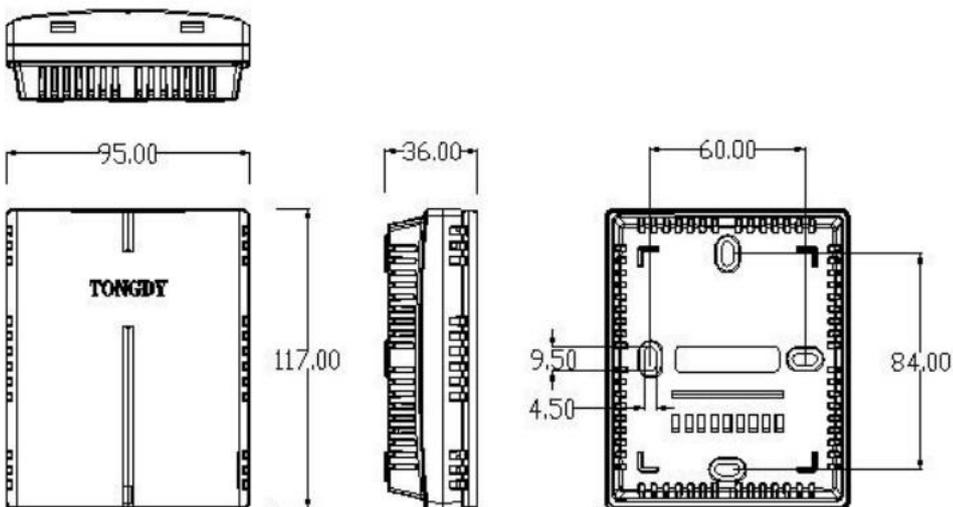
General Data	
Detection Parameter	PM2.5/PM10; CO2; TVOC; Temperature & Humidity
Output	RS485 (Modbus RTU) WIFI @2.4 GHz 802.11b/g/n RJ45 (Ethernet TCP)
Operating Environment	Temperature: -20-60°C      Humidity : 0-99%RH
Storage condition	-5°C-50°C      Humidity : 0-70%RH (No condensation)
Power supply	24VAC±10%, or 18-24VDC
Overall Dimension	94mm(L)×116.5mm(W)×36mm(H)
Material of Shell & IP Level	PC/ABS fire-proof material / IP30
Installation	Concealed installation: 65mm×65mm wire box Surface mounted: provide a mounting bracket
PM2.5/PM10 Data	
Sensor	Laser particle sensor, Light scattering method
Measuring Range	PM2.5: 0-1000ug/m3 PM10: 0-1000ug/m3
Output Resolution	1ug/m3
Accuracy	±5μg/m3+ 15% at 1-100μg/m3
CO <sub>2</sub> Data	
Sensor	Non-Dispersive Infrared Detector (NDIR)
Measuring Range	400-5000ppm
Output Resolution	1ppm
Accuracy	±50ppm + 5% at 400-2000ppm
TVOC Data	
Sensor	TVOC module
Measuring Range	1-2000ug/m3

Output Resolution	1ug/m3
Accuracy	±20ug/m3 + 15% (0-500ug/m3, 10%-80%RH @25°C)
<b>Temperature and Humidity Data</b>	
Sensor	High precision digital integrated temperature and humidity sensor
Measuring Range	Temperature : 0-60°C / Humidity : 0-99%RH
Output Resolution	Temperature : 0.01°C / Humidity : 0.01%RH
Accuracy	Temperature : ±0.8°C@25°C Humidity: ±4.5 %RH (20%-80%RH)

### Models Guide

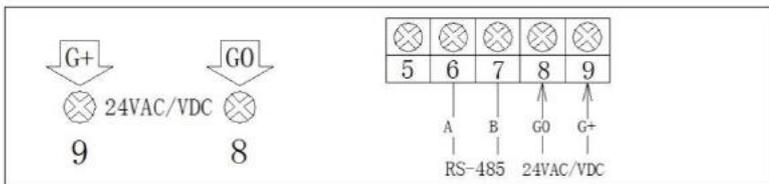
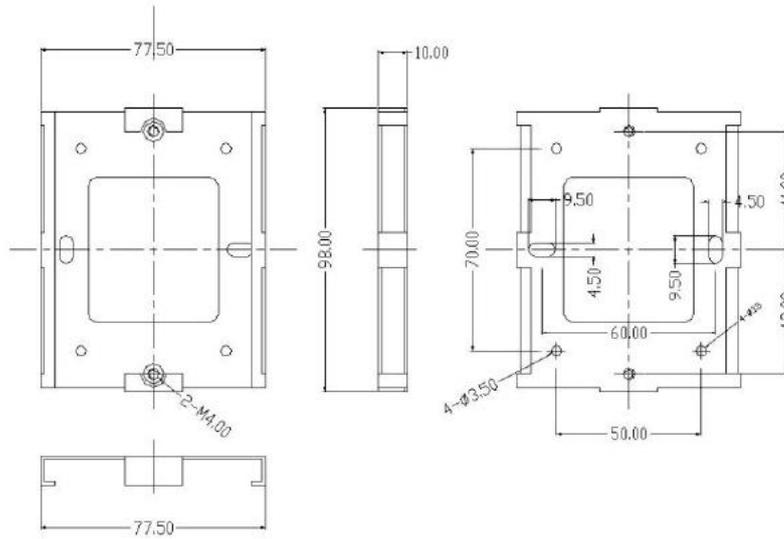
Model	PM2.5 PM10	Temp. &RH	CO2	TVOC	Interface
TSP-1811C	●	●			RS485 (Modbus RTU BACnet MS/TP)
TSP-1812C			●	●	
TSP-1813C	●	●	●		
TSP-1818C	●	●	●	●	
TSP-1821C	●	●			WIFI @2.4 GHz 802.11b/g/n (MQTT)
TSP-1822C			●	●	
TSP-1823C	●	●	●		
TSP-1828C	●	●	●	●	
TSP-1834C			●		Ethernet (MQTT)
TSP-1833C	●	●	●		
TSP-1838C	●	●	●	●	
-SL after above items	OLED display screen				

### Mounting and Wiring



TSP-18 wall mounting IAQ monitor

Installation bracket diagram (for surface mounted of TSP-18)



## MSD-09 Series



### IAQ Monitor with Flexible Combination of Multi-Sensors



#### Features

- 24-hour online monitoring of indoor air quality, providing up to 7 sensings of Flexible combination.
- PM2.5&PM10, CO2, TVOC, temperature & humidity monitoring
- Special optional two sensing of CO/HCHO/Ozone/NO2/SO2
- The above sensors modular design allows you to select different monitoring parameters for different applications
- By own-patented technology of especial the built-in compensation of measuring value of environmental temperature and humidity, ensure the accuracy and stability of measurements in different environments for a long time.
- The unique TVOC adapting calibration and data processing mode is able to monitor on-line TVOC concentration with correcting deviations and drifts of measurement
- Data logger with 145860 points and downloaded by BlueTooth
- Two power supply available:  
12~28VDC/18~27VAC or 100~240VAC.
- Four communication interfaces are available: RS485, Ethernet, WIFI,LoraWAN
- The light ring has optional three work modes.
- Wall mounting or ceiling mounting to match with a variety of decorative styles.

## Specifications

General Data	
Detection Data (Optional)	Modular design sensor, up to 7 parameters (Max.) Temperature and humidity are standard configuration. Optional parameters: PM2.5/PM10; CO2; TVOC; Optional CO or HCHO Optional Ozone / NO2 / SO2
Output	<ul style="list-style-type: none"> <li>● RS485 (Modbus RTU)</li> <li>● RJ45 / Ethernet (MQTT)</li> <li>● WiFi @2.4 GHz 802.11b/g/n (MQTT)</li> <li>● LoraWAN (CayenneLPP)</li> </ul> Support regins:RU864, IN865, EU868, US915, AU915, KR920, AS923-1~4)
Data logger (Optional)	Saved up to 145860 points and the storage rate from 60sec. to 10 day. It can be stored 78 days/5min. rate or 156 days /10min or 468 days/30min as saving 5 sensing data. Download data by a BlueTooth APP which is also used for configuration.
Operating environment	Temperature: 0~50℃ Humidity: 0~90%RH ( no condensation)
Storage environment	Temperature: -10℃~50℃ Humidity: 0~70%RH
Power supply	12~28VDC/18~27VAC or 100~240VAC
Overall dimension	130mm(L)×130mm(W)×45mm(T)
Shell material and IP grade	PC/ABS fire proof material, IP30
Certification standard (CE)	SAR: EN 62479&50663 Health Assessment RF: ETSI EN 300 328 LVD(BlueTooth): EN 61010-1 EMC: EN61326-1 EMC(wifi):ETSI EN 301 489-1 V2.2.3 (2019-11) ; ETSI EN 301 489-17 V1.2.2 (2020-09)
PM2.5/PM10 Data	
Sensor	Laser particle sensor, light scattering method
Measuring Range	PM2.5: 0~1000 $\mu\text{g}/\text{m}^3$ PM10: 0~1000 $\mu\text{g}/\text{m}^3$
Output resolution	1 $\mu\text{g}/\text{m}^3$
Accuracy	$\pm 5\mu\text{g}/\text{m}^3 + 20\%$ at 1-100 $\mu\text{g}/\text{m}^3$
CO2 Data	
Sensor	Non-dispersive Infrared Detector (NDIR), Life time and auto calibration
Measuring Range	400~5000ppm
Output resolution	1ppm
Accuracy	$\pm 50\text{ppm} + 5\%$ at 400-2000ppm
TVOC Data	
Sensor	Multi-pixel gas sensor
Measuring range	1-2000 $\mu\text{g}/\text{m}^3$
Output resolution	1 $\mu\text{g}/\text{m}^3$
Accuracy	$\pm 20\mu\text{g}/\text{m}^3 + 15\%$

Temperature and humidity Data	
Sensor	Digital integrated temperature and humidity sensor
Measuring range	Temperature: 0°C~60°C / Humidity: 0~99%RH
Output resolution	Temperature: 0.01°C / Humidity: 0.01%RH
Accuracy	Temperature: ±0.5°C (10~40°C) Humidity: ±5.0% (10%~90%RH)
CO Data	
Sensor	Electrochemical CO Sensor
Measuring Range	0.1~100ppm
Output resolution	0.1ppm
Accuracy	±1ppm at 0-10ppm
HCHO Data	
Sensor	Electrochemical formaldehyde sensor
Measuring Range	20-1000ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb
Ozone Data	
Sensor	Electrochemical ozone sensor
Measuring Range	10-500ppb
Output Resolution	1ppb
Accuracy	±10ppb at 0-100ppb
NO2 Data	
Sensor	Electrochemical sensor
Measuring Range	5-500ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb
SO2 Data	
Sensor	Electrochemical sensor
Measuring Range	5-500ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb

### Models Guide

Model.	PM2.5 PM10	CO <sub>2</sub>	TVOC	CO	O <sub>3</sub>	HCHO	NO <sub>2</sub>	SO <sub>2</sub>	Output
MSD-0913C/D	●	●							RS485 (Modbus RTU)
MSD-0916C/D	●	●	●	●					
MSD-0918C/D	●	●	●						
MSD-0919C/D	●	●	●			●			
MSD-0916Z-C/D	●	●	●	●	●				
MSD-0916N-C/D	●	●	●	●			●		

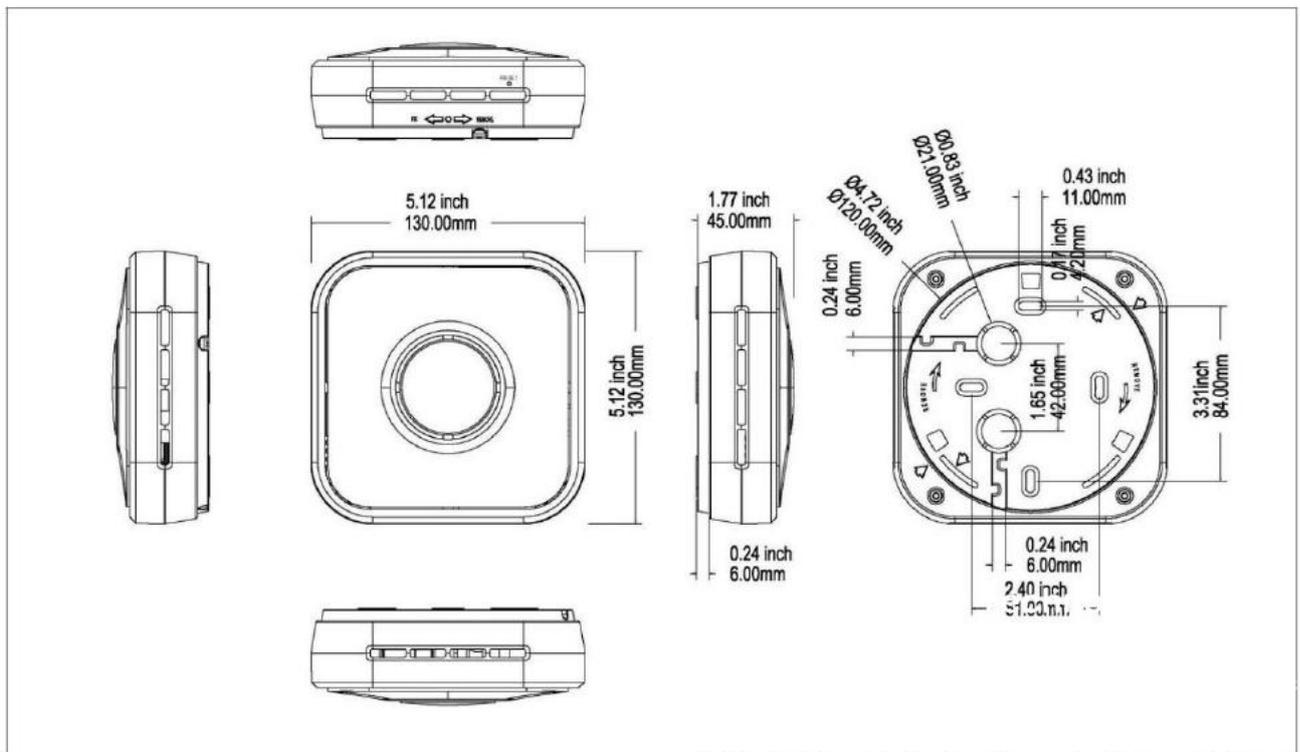
MSD-0918Z-C/D	●	●	●	●					
MSD-0923C/D	●	●							WiFi (MQTT)
MSD-0926C/D	●	●	●	●					
MSD-0928C/D	●	●	●						
MSD-0929C/D	●	●	●			●			
MSD-0926Z-C/D	●	●	●	●	●				
MSD-0928S-C/D	●	●	●					●	
MSD-0936C/D/PoE	●	●	●	●					Ethernet (MQTT)
MSD-0938C/D/PoE	●	●	●						
MSD-0939C/D/PoE	●	●	●			●			
MSD-0936Z-C/D/PoE	●	●	●	●	●				
MSD-0938N-C/D/PoE	●	●	●				●		
MSD-0953C/D	●	●							LoraWAN (CayenneLPP)
MSD-0956C/D	●	●	●	●					
MSD-0958C/D	●	●	●						
MSD-0959C/D	●	●	●			●			
MSD-0956Z-C/D	●	●	●	●	●				

Note: C-12~28VDC/18~27VAC power supply

D-100~240VAC

POE-48V PoE power supply

## Dimensions



# MSD-E

## IAQ monitor with combination of multiple gas sensors

Sensor modular and silent design, flexible combination

One monitor with three optional gas sensors

Wall mounting and two power supplies available

Design and production air quality monitoring products for 15 years



We provides hundreds of air monitoring and control products

## Features

- 24-hour real-time online monitoring of indoor air quality
- Carbon monoxide monitoring optional
- Two of following four gas sensors optional:  
formaldehyde(HCHO),  
ozone(O3),  
Nitrogen dioxide(NO2),  
sulfur dioxide(SO2)
- All above gas sensors are modular and replaceable
- Optional temperature & humidity
- Two power supply available:  
12~28VDC/18~27VAC or 100~240VAC
- Communication interface available:  
RS485 or RJ45, or WIFI
- The light ring indicates the level of indoor air quality or can be turned off. Which gas concentration could be indicated is optional .
- It could be ceiling mounted or wall mounted.

## Main Applications

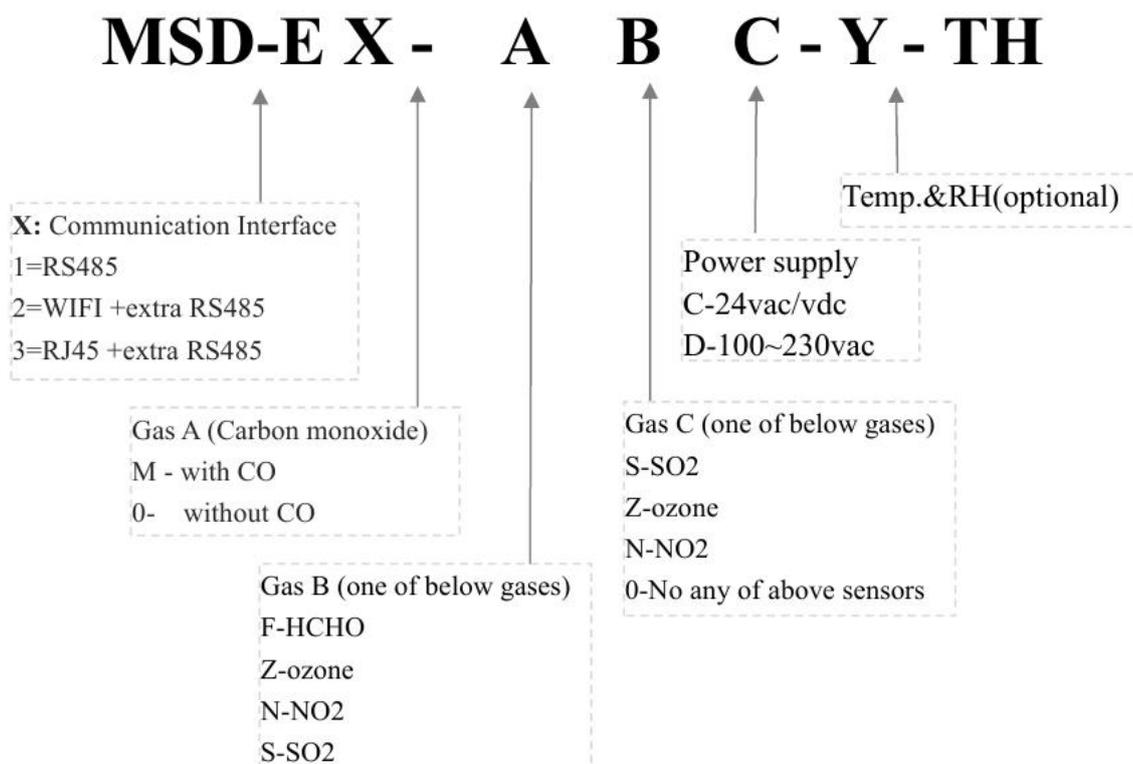
- Green buildings
- Building energy efficiency reform and evaluation system
- Comprehensive real estate projects
- Other monitoring room multiple gase
- Monitor air quality with MSD-18 and other air monitors

## Specifications

General Data	
Gas sensors	Modulargas sensor, up to three gas parameters Optional gas sensors : Carbon monoxide (CO) Two of four gas sensors: formaldehyde(HCHO), ozone(O3), Nitrogen dioxide(NO2), sulfur dioxide(SO2)
Temp. & RH (optional)	Temperature and humidity
Output	RS485/RTU (Modbus) RJ45 /Ethernet WiFi @2.4 GHz 802.11b/g/n
Operating environment	Temperature: 0~50℃ Humidity: 0~90%RH ( no condensation)
Storage environment	Temperature: -10℃~50℃ Humidity: 0~70%RH
Power supply	12~28VDC/18~27VAC or 100~240VAC
Overall dimension	130mm(L)×130mm(W)×45mm(T)
Shell material and IP grade	PC/ABS fire proof material, IP30
Certification standard	CE
CO Data	
Sensor	Electrochemical CO Sensor
Measuring Range	0.1~100ppm
Output resolution	0.1ppm
Accuracy	±1ppm at 0-10ppm

Ozone Data	
Sensor	Electrochemical ozone sensor
Measuring Range	10-500ppb
Output Resolution	1ppb
Accuracy	±10ppb at 0-200ppb
HCHO Data	
Sensor	Electrochemical formaldehyde sensor
Measuring Range	20-1000ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb
NO2 Data	
Sensor	Electrochemical sensor
Measuring Range	5-500ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb
SO2 Data	
Sensor	Electrochemical sensor
Measuring Range	5-500ppb
Output Resolution	1ppb
Accuracy	±20 ppb at 0-100 ppb
Temperature and humidity Data	
Sensor	Digital integrated temperature and humidity sensor
Measuring range	Temperature: 0°C~60°C / Humidity: 0~99%RH
Output resolution	Temperature: 0.01°C / Humidity: 0.01%RH
Accuracy	Temperature: ±0.5°C Humidity: ±5.0% (10%~90%RH)

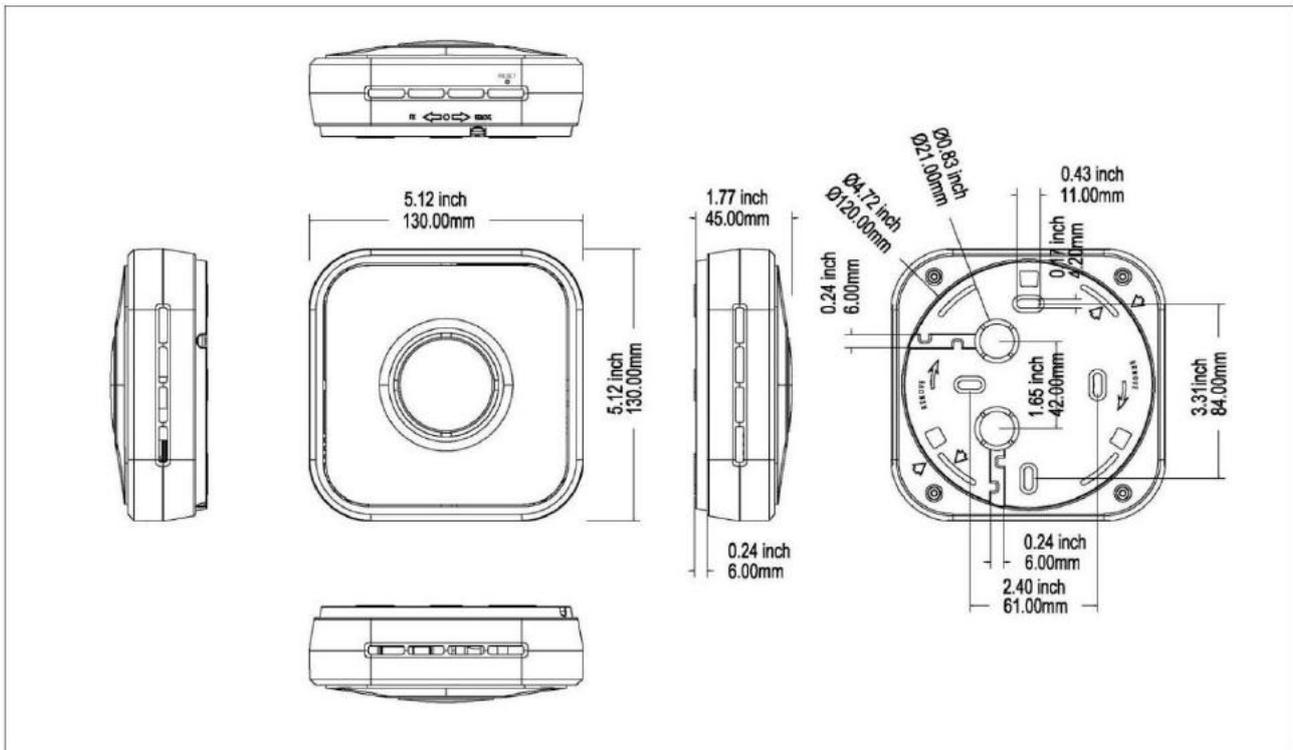
**Models Guide**



### Models Example

option	CO	O3	NO2	SO2	HCHO	Temp. &RH	Output	Power supply
MSD-E1-MFZ-C/D	●	●			●		RS485 (Modbus RTU)	C: 12~28VDC/ 18~27VAC; D: 100~240VAC
MSD-E1-0ZN-C/D		●	●					
MSD-E1-MNS-C/D-TH	●		●	●		●		
MSD-E1-MZN-C/D	●	●	●					
MSD-E2-MFZ-C/D	●	●			●		WIFI	C: 12~28VDC/ 18~27VAC; D: 100~240VAC
MSD-E2-0ZN-C/D		●	●					
MSD-E2-MNS-C/D-TH	●		●	●		●		
MSD-E2-MZN-C/D	●	●	●					
MSD-E3-MFZ-C/D	●	●			●		RJ45	C: 12~28VDC/ 18~27VAC; D: 100~240VAC
MSD-E3-MZN-C/D-TH	●	●	●			●		
MSD-E3-MZN-C/D	●	●	●					

### Dimensions



## IN-DUCT AIR QUALITY DETECTOR— PMD SERIES



### Specification Data



### FEATURES

- PMD-18 in-duct air quality detector is specially designed for monitoring multi-parameter air quality in air duct, Which is installed in wind duct or return air duct.
- Built-in a large air bearing fan, regulate the fan speed automatically, guarantee constant air volume and improve the stability and lifetime in long-term working.
- Special design of pitot tube, instead the air pump mode, adapt to a wider range of wind speeds. To have longer lifetime and no need to change the air pump frequently.
- Easy to clean filter mesh, can be disassembled and used many times.
- With temperature and humidity compensation, reduce the impact of environmental change.
- Real-time monitoring parameters: particles (PM2.5 and PM10), carbon dioxide (CO2), TVOC, air temperature and humidity, as well as optional carbon monoxide or formaldehyde,.
- Independently measure the temperature and humidity in the air duct, avoid interference from other sensors and monitoring heating.
- Provides WIFI, RJ45 Ethernet, RS485 Modbus communication interfaces selection. Provide multiple communication protocol choices.
- Connect to the data acquisition/analysis software platform to achieve data storage, data comparison and data analysis.
- Data can be read and displayed on-site with blue tooth or the operation tool.
- Working with MSD indoor air quality monitors together, comprehensively and accurately analyze the air quality. Quantitative assessment of indoor air pollution.
- Approved by CE, RESET, RoHS, FCC, REACH and ICES.

### APPLICATION

- Online real-time detecting indoor air quality.
- Green Building Assessment
- BAS and HVAC
- Smart Home System
- Fresh Air Controlling System
- Building Energy Saving Reconstruction and Assessment System
- Classroom, office, exhibition hall, shopping mall, other public place

## TECHNICAL SPECIFICATIONS

### General Data

Power Supply	12-28VDC/18-27VAC or 100-240VAC (optional)
Communication Interface:	Choose one in the following
a. RS485 RTU	9600bps (default), 15KV Antistatic Protection.
b. RJ45 (Ethernet TCP)	MQTT protocol or Modbus TCP optional With an extra RS485
c. WiFi@2.4 GHz 802.11b/g/n	MQTT protocol or Modbus TCP optional With an extra RS485
Data upload interval cycle	Average / 60 seconds
Applicable air speed of duct	2.0~15m/s
Working Condition	-20 °C-60 °C(-4 °F-140 °F)/ 0~99%RH, (No condensation)
Storage Condition	0 °C~50 °C(32 °F-122 °F) / 10~60%RH
Overall Dimension	180X125X65.5mm (7.09X4.92X2.58in)
Pitot tube size	240mm (9.45in)
Net weight	850g (1.87lb)
Shell material	PC material

### CO2 Data

Sensor	Non-Dispersive Infrared Detector (NDIR)
Measuring Range	0-2,000ppm
Output Resolution	1ppm
Accuracy	±50ppm + 3% of reading or ±75ppm (whichever is bigger)

### Particle Data

Sensor	Laser particle sensor
Measuring Range	PM2.5: 0-500ug/m3 PM10: 0-1000ug/m3
Output values	moving average/60 seconds, moving average/1 hour, moving average/24 hours
Output Resolution	0.1ug/m3
Zero Point Stability	<2.5ug/m3
Accuracy	PM2.5: 8% of reading (10%-80%RH,@25°C) PM10: 12% of reading (0-500µg/m3, 10%-80%RH,@25°C)

### Temp & Humidity Data

Sensor	Band gap material temperature sensor、Capacitive humidity sensor
Temperature range	-20°C-60°C
Relative humidity range	0-99%RH
Output Resolution	Temperature: 0.01°C humidity:0.01%RH
Accuracy	±0.5°C@5-35°C, ±3%RH (20%-80%RH)

### CO Data (Optional)

Sensor	Electrochemical CO sensor
Measuring Range	0-100ppm
Output Resolution	0.1ppm
Accuracy	±1ppm+ 5% of reading (10%-80%RH,@25°C)

### Ozone Data (Optional)

Sensor	Electrochemical ozone sensor
Measuring Range	0-2000ug/m3 (0-1000ppb)
Output Resolution	1ug/m3
Accuracy	±15ug/m3+10% of reading (10%-80%RH,@25°C)

### HCHO Data (Optional)

Sensor	Electrochemical formaldehyde sensor
Measuring Range	0.001-0.6mg/m3
Output Resolution	0.001mg/m3
Accuracy	±0.005mg/m3+5% of reading (10%-80%RH,@25°C)

### TVOC Data

Sensor	Metal oxide sensor
Measuring Range	0.001-3.50 mg/m3
Output Resolution	0.001 mg/m3
Accuracy	±0.002mg/m3+ 15% of reading (at 0.001-1.0 mg/m3 )

## MODELS GUIDE

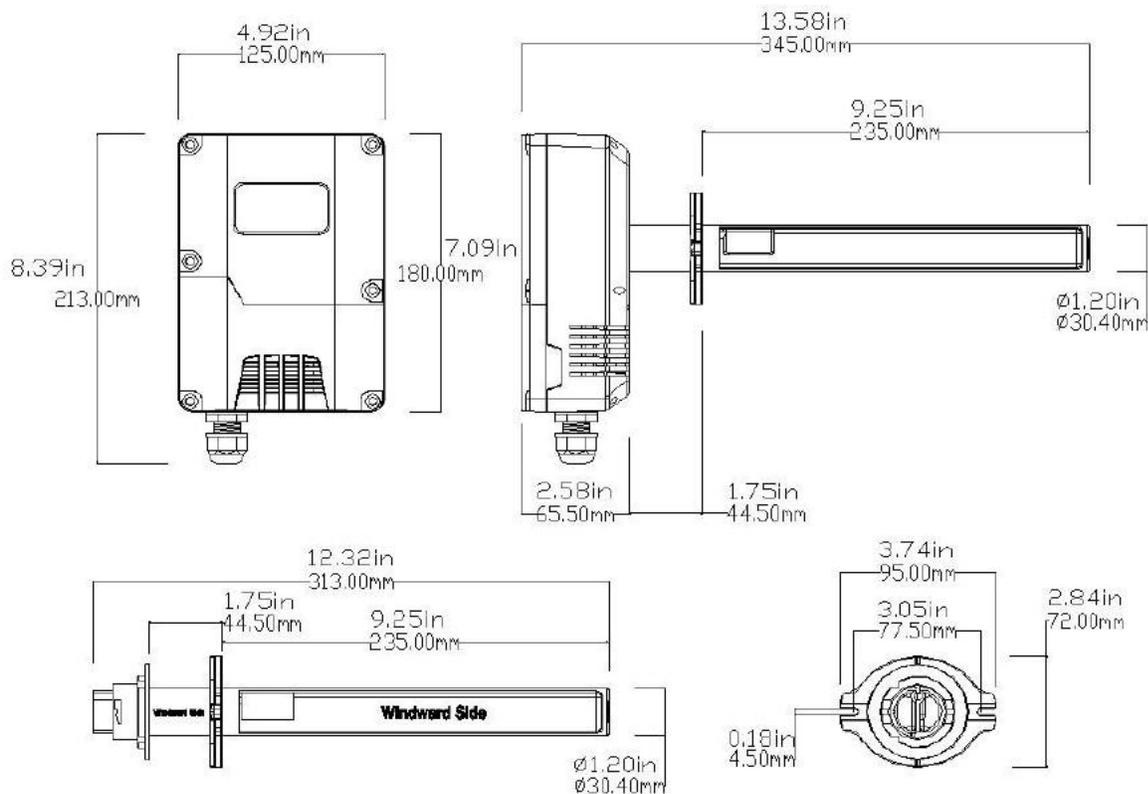
Model	PM2.5 PM10	CO2	TVOC	Temp/ RH	HCHO	CO	Communication Interface	Extend RS485 interface
PMD-1818C/D	•	•	•	•			RS485 (Modbus RTU or BACnet MS/TP)	No
PMD-1819C/D	•	•	•	•	•			
PMD-1816C/D	•	•	•	•		•		
PMD-1810C/D	•	•	•	•	•	•		
PMD-1828C/D	•	•	•	•			WiFi@2.4 GHz 802.11b/g/n	Yes
PMD-1829C/D	•	•	•	•	•			
PMD-1826C/D	•	•	•	•		•		
PMD-1820C/D	•	•	•	•	•	•		
PMD-1838C/D	•	•	•	•			RJ45 (Ethernet TCP)	Yes
PMD-1839C/D	•	•	•	•	•			
PMD-1836C/D	•	•	•	•		•		
PMD-1830C/D	•	•	•	•	•	•		

C: 24VAC/VDC power supply

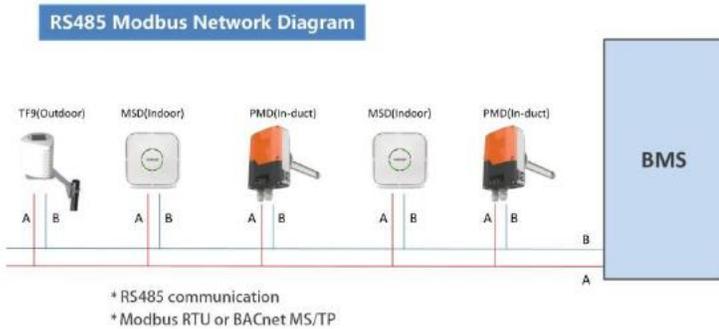
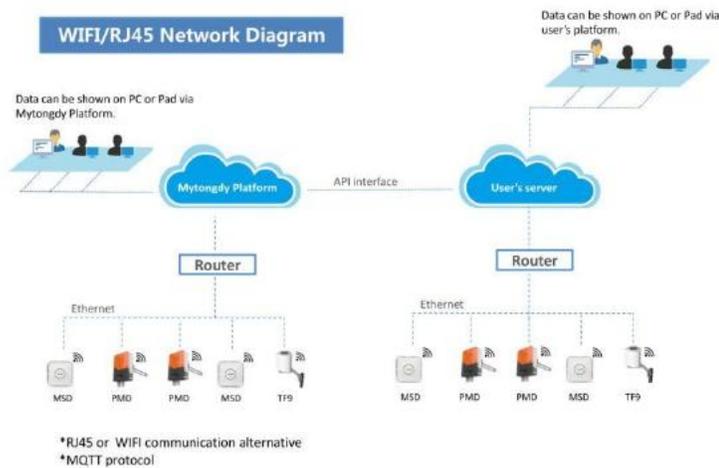
D: 100~240VAC power supply

For the model with ozone please ask your dealer or the manufacture.

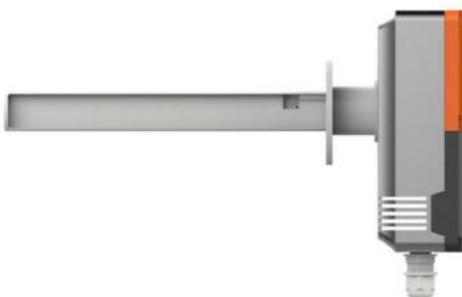
## DIMENSIONS



## NETWORK DIAGRAM

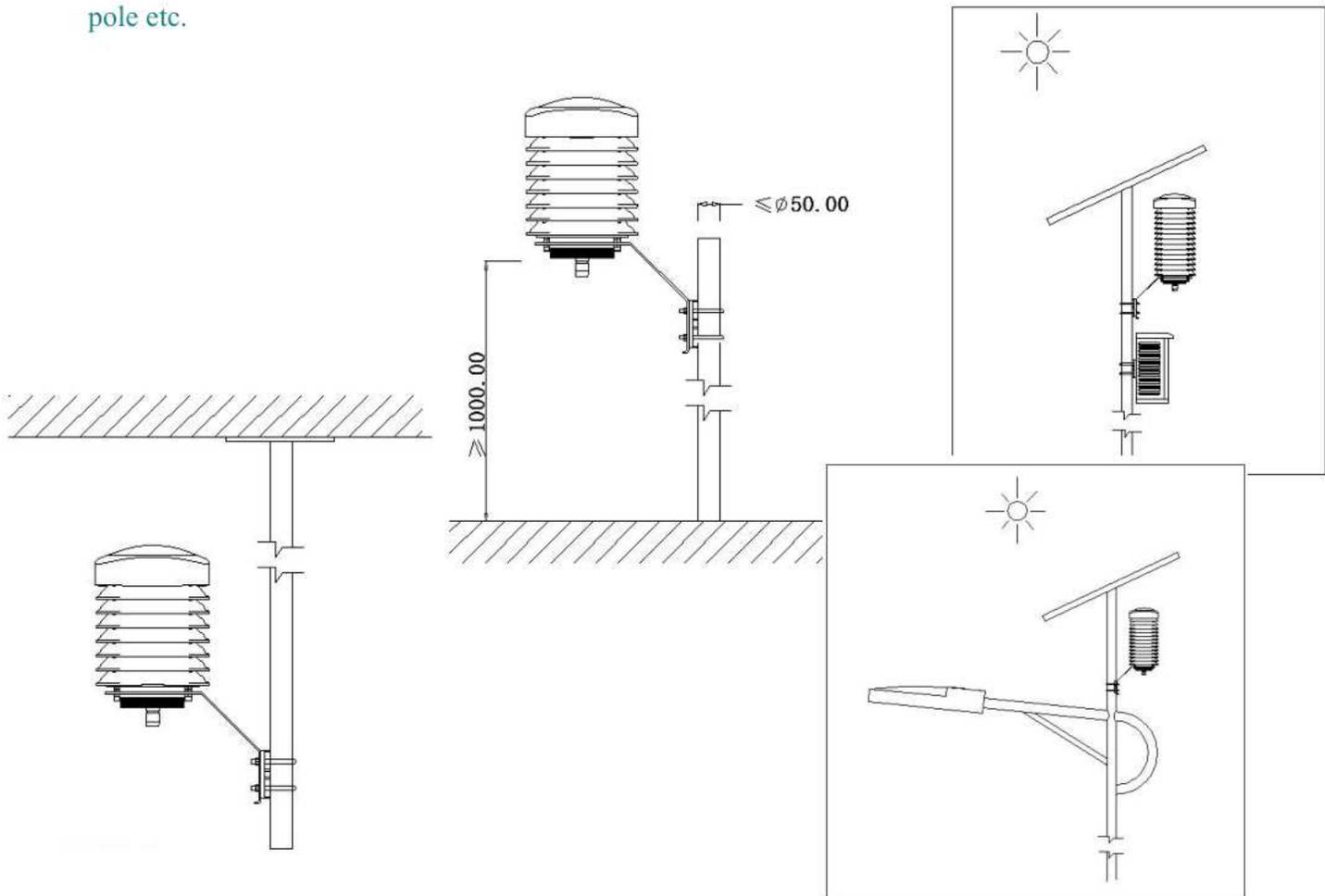


- Professional designing and manufacturing IAQ products more than 14 years, long-term exportation to global markets with powerful performances guaranteed
- Built-in commercial high-precision sensor module, with proprietary technology, long-term stable and reliable application
- Industrial grade shell and structure to satisfy different environment. Removable filter mesh for easy cleaning and reuse
- Pitot tube inlet and outlet design, instead of air pump for the long lifetime usage
- Regulate fan speed automatically to guarantee constant air volume
- Provide a variety of communication interface to select and connect a monitoring and analysis software platform, for data storage, analysis and comparison
- Optional two power supply, more convenient for installation
- RESET Certificate
- CE-Approval, FCC, ICES



## TF9 Outdoor Air Quality Monitor

- Design for real time monitoring outdoor air quality
- Rain & snow-proof, high temperature resistant design with IP53 protection class
- Up to eight parameters available for monitoring air quality in outdoor space, tunnel, underground and semi-underground
- Built-in high-precision sensing module in commercial-level for accurate measurement with high cost performance ratio.
- Optional communication interface: RS485, WiFi +extra RS485 , Ethernet + extra RS485, WiFi/Ethernet + extra RS485, or customized 4G.
- 12~24VDC powered with a 100~240VAC/ 1A power adaptor;
- Optional Solar powered with Lithium-Polymer rechargeable batter, support the monitor working at least 72 hours on a cloudy day without sunlight.
- It can be installed on the outside wall of buildings, roof of the buildings, on the ground, on the telegraph pole etc.



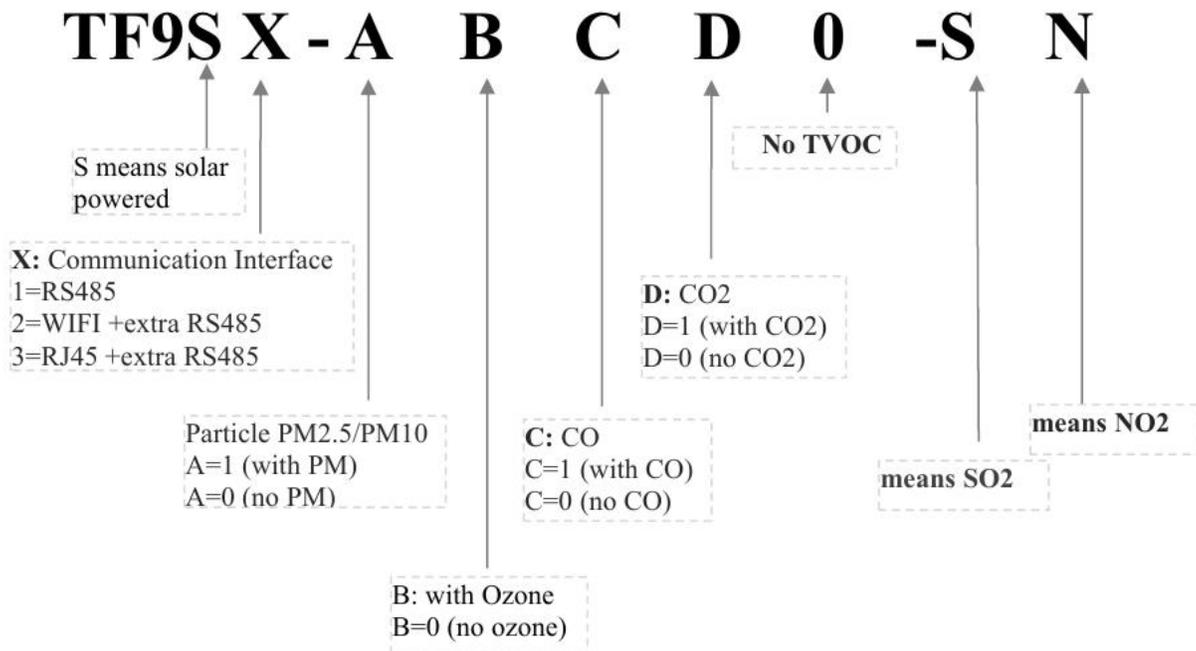
**Specifications**

<b>General Parameters</b>	
Power supply	12-24VDC (with a 100~240VAC/ 1A power adaptor)
Solar powered option (solar panel)	Monocrystalline silicon energy solar panel (with 3.2mm fully tempered glass) 120W solar panel, 18V and 6.6A
Solar powered option (Lithium battery)	18pcs Panasonic lithium battery 18650 Each typical normal capacity is 3450mAh Overcharging and discharging protection, all steel enclosure, explosion design.
Communication interface options	A. RS485, Modbus RTU/BACnet MS/TP; B. WiFi@2.4 GHz 802.11b/g/n C. RJ45 Ethernet D. 4G in area coverage: B3 (1800 MHz); B7 (2600 MHz); B20 (800 MHz);
Extra RS485 for models of WiFi/RJ45/4G	9600bps(default), 15KV Antistatic protection
Data upload interval cycle	1 minute~24 hours presetting Default: 1 minute
Output data	Moving average / 1 minutes Moving average / 1 hour Moving average / 24 hours
Working condition	-20°C~70°C / 0~99%RH
Storage condition	0°C~50°C / 10~60%RH
Maximum dimensions of the monitor (including fixed bracket)	Width: 190mm, Total width with bracket: 272mm Height: 252~441mm, Total height with bracket: 362~574 mm Depending on the monitored sensing parameters and communication interfaces
Net weight	2.35kg~3.05Kg Depending on the monitored sensing parameters and communication interfaces
Packing size/Weight	53cm X 34cm X 25cm, 3.9Kg
Shell Material	PC material
Protection grade	It is equipped with sensor inlet air filter, rain and snow-proof, temperature resistance, UV resistance aging, anti-solar radiation cover shell. IP53 protection class.
<b>Particle (PM2.5/ PM10 ) Data</b>	
Sensor	Laser particle sensor, light scattering method

Measurement range	0-1000ug/m3
Output resolution	0.1ug/m3
PM2.5 Accuracy	±5ug/m3+10% of reading (0-500ug/m3, 0%-70%RH, @ 0-40°C)
PM10 Accuracy	±10ug/m3+15% of reading (0-500ug/m3, 0%-70%RH, @ 0-40°C)
<b>Temperature and Humidity Data</b>	
Inductive component	Band gap material temperature sensor, Capacitive humidity sensor
Temperature measuring range	-20°C-80°C
Relative humidity measuring range	0-99%RH
Accuracy	±0.3°C(-20~70°C), ±3%RH (0%-70%RH)
Output resolution	Temperature: 0.01 °C      Humidity: 0.01%RH
<b>CO Data</b>	
Sensor	Electrochemical CO Sensor
Measurement range	0-200mg/m3
Output resolution	0.001mg/m3
Accuracy	±1mg/m3+5% of reading (0%-70%RH, @ 0-40°C)
<b>Ozone Data</b>	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-2000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40°C)
<b>NO2 Data</b>	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-4000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40°C)
<b>SO2 Data</b>	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-4000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40°C)
<b>TVOC Data</b>	
Sensor	Metal oxide sensor
Measuring Range	0.01-4.00mg/m3
Output resolution	0.001mg/m3

Accuracy	±0.05mg/m <sup>3</sup> +10% of reading (0-2mg/m <sup>3</sup> , 10%-80%RH,@0-40°C)
<b>Atmospheric Pressure</b>	
Sensor	MEMS Semi-conductor sensor
Measuring range	0~103425Pa
Output resolution	8 Pa
accuracy	<±48Pa

### Models Guide



### Models examples

Model	PM2.5 PM10	Ozone	CO	CO <sub>2</sub>	NO <sub>2</sub>	SO <sub>2</sub>	Communication
TF91-10110-MB TF91-10110-BN	•		•	•			RS485, Modbus RTU or RS485, BACnet MS/TP
TF93-11000	•	•					RJ45, MQTT Protocol
TF94-11100-SN	•	•	•		•	•	4G, MQTT Protocol

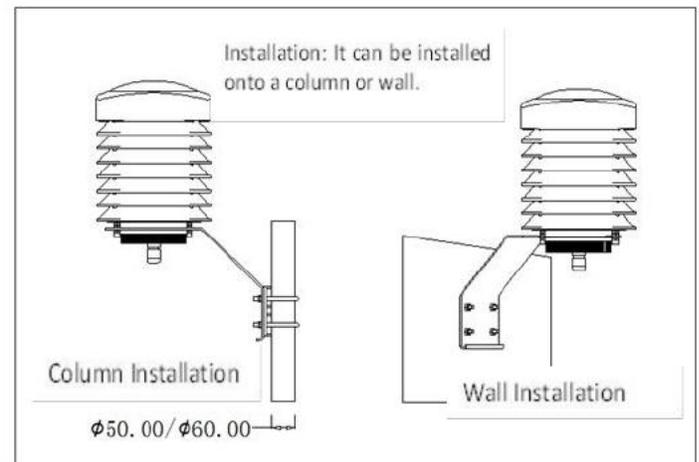
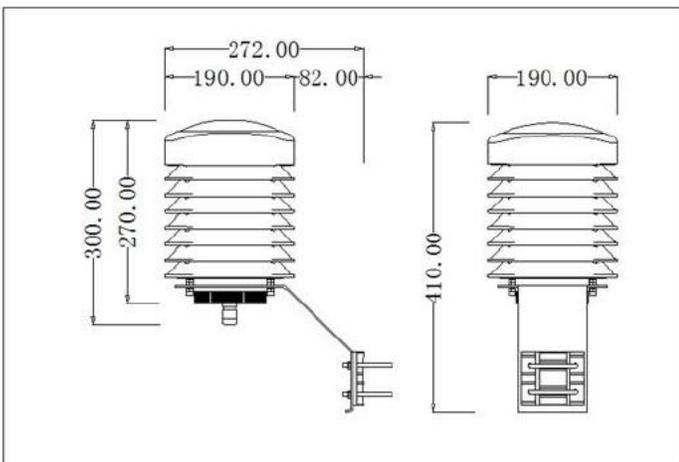
## Protocol Support

Communication protocol support

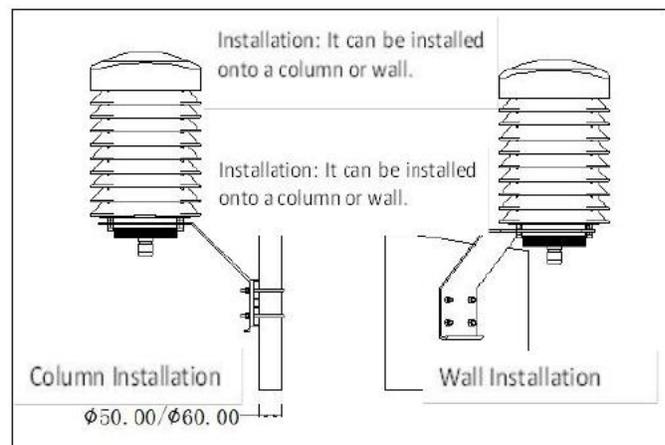
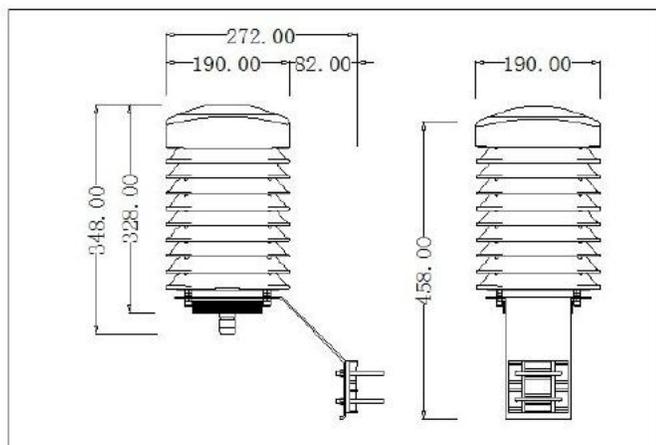
1. Modbus RTU protocol for RS485
2. BACnet MS/TP for RS485
3. MQTT protocol for WiFi, Ethernet and 4G
4. API for clients servers

## Examples of Dimension of the Monitor

- WIFI interface, RS485 interface for monitoring PM2.5/PM10, TVOC, CO, T&RH  
Overall size: width 190.00mm, height 434.00mm      Net weight: 2.65Kg



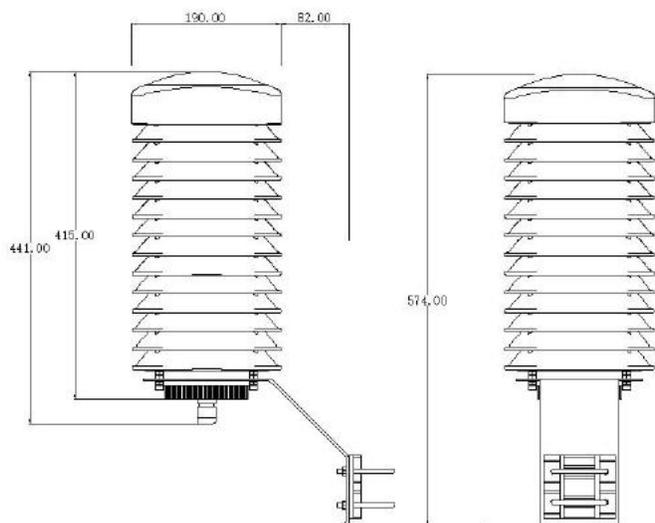
- RJ45 interface PM2.5/PM10, TVOC, CO, T&RH  
Overall Size: width 190.00mm, height: 458.00mm      Net weight: 2.8Kg



TF-9 outdoor air quality monitor in business level

- 4G interface for monitoring CO, NO2, SO2, Ozone, T&RH

Overall size: width 190.00mm, height 574.00mm Net weight: 3.05Kg



38  
39

# Carbon Dioxide Monitor



## Applications

- Carbon dioxide monitoring and alarm
- Schools, offices, hotels, meeting rooms
- Shops, restaurants, hospitals, theaters
- Other public places
- Apartments, houses
- All ventilation systems



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## Product No: G01- CO2- B3 Series

CO2 + Temperature + Humidity Monitor/Controller

- Monitoring real time carbon dioxide and temp.&RH
- Display 24-hour CO2 average and max. value is option
- 3-color backlight LCD
- Optional 1x on/off output to control a ventilator
- Modbus RS485 communication
- Three power supply available:
  - 24VAC/VDC, 100~240VAC, USB or DC power adaptor
- Wall mounting or desktop placement
- Over 100000 sales, with high-quality and perfect reputation

## Features

- Real time monitoring room carbon dioxide, temperature and humidity
- Optional display 24h average and max. CO2
- NDIR CO2 sensor with Self Calibration. It makes CO2 measurements more accurate and reliable.
- Up to 15 years lifetime of CO2 sensor
- Three-color (Green/Yellow/ Red) LCD indicates CO2 three ranges and ventilation level-optimal/moderate/poor
- Buzzer alarm available
- Optional 1xrelay output to control a ventilator and Modbus RS485 communication
- Touch button for easy operation
- 24VAC/VDC or 100~240V or USB 5V power supply
- wall mounting or desktop placement available
- High quality with the excellent performance, best choice for schools and offices
- CE-approval



## Applications

G01-CO2 monitor is used to monitor/alarm indoor CO2 concentration as well as temperature and humidity. It's installed on the wall or on the desktop

- Schools, offices, hotels, meeting rooms
- Shops, restaurants, hospitals, theaters
- Airports, train stations, other public places
- Any other public places
- Apartments, houses
- All ventilation systems

## Specifications

Power supply	100~240VAC or 24VAC/VDC wire connecting USB 5V (>1A for USB adaptor) 24 V with an adaptor
Consumption	3.5 W max. ; 2.5 W avg.
Gas detected	Carbon Dioxide (CO <sub>2</sub> )
Sensing element	Non-Dispersive Infrared Detector (NDIR)
Accuracy@25C(77 °F)	±50ppm + 3% of reading
Stability	<2% of FS over life of sensor (15 yr typical)
Calibration interval	ABC Logic Self Calibration Algorithm
CO <sub>2</sub> sensor life	15 years
Response Time	<2 minutes for 90% step change
Signal update	Every 2 seconds
Warm up time	<3 minutes (operation)
CO <sub>2</sub> measuring range	0~5,000ppm
CO <sub>2</sub> Display resolution	1ppm
3-color backlight for CO <sub>2</sub> range	Green : < 1000ppm Yellow: 1001~ 1400ppm Red: > 1400ppm
LCD Display	Real time CO <sub>2</sub> , Temp &RH Optional 24h average/max. CO <sub>2</sub>
Temperature measuring range	-20~60C(-4~ 140 °F )
Humidity measuring range	0~99% RH
Relay output (optional)	One relay output with rated switching current: 5A, resistance load
Operation conditions	-20~60C(32~ 122 °F ); 0~95%RH, non condensing
Storage conditions	0~50C(14~ 140 °F ), 5~70%RH
Dimensions/ Weight	130mm(H) ×85mm(W) ×36.5mm(D) / 200g
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Installation	Wall mounting (65mm×65mm or 2"×4"wire box) Desktop placement
Standard	CE-Approval

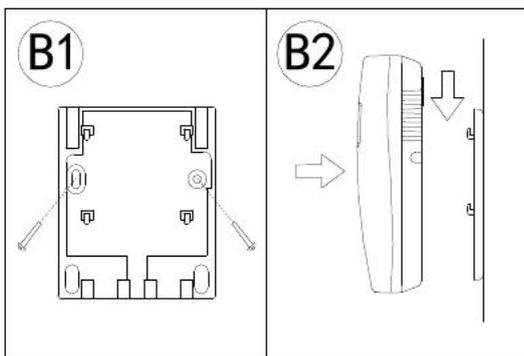
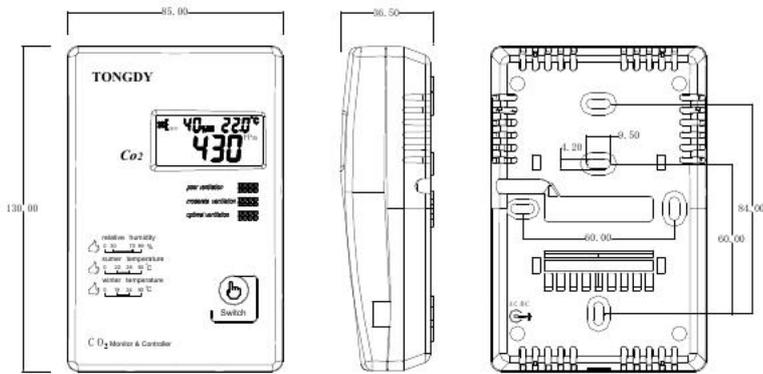


## Models Guide

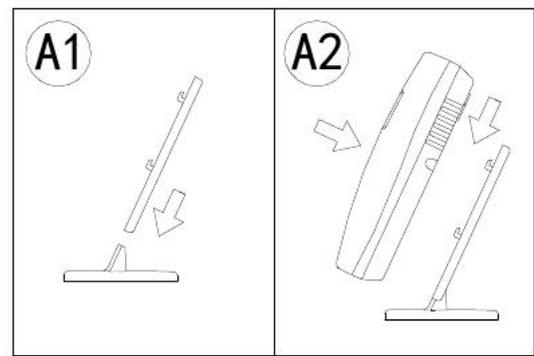
Model	Description	Display (3-color backlight)	Power Supply	Type
<b>G01-CO2-B320C</b>	CO2 monitor	CO2, Temp & RH	24VAC/VDC	Wall mounting
<b>G01-CO2-B320D</b>	CO2 monitor	CO2, Temp & RH	100~240VAC	Wall mounting
<b>G01-CO2-B320D-ML</b>	CO2 monitor	CO2, Temp & RH CO2 24h avg. and max.	100~240VAC	Wall mounting
<b>G01-CO2-B332C</b>	CO2 monitor with desktop bracket	CO2, Temp & RH	24VAC/VDC with a power adaptor	Desktop or Wall mounting
<b>G01-CO2-B332C-ML</b>	CO2 monitor with desktop bracket	CO2, Temp & RH CO2 24h avg. and max/min	24VAC/VDC with a power adaptor	Desktop or Wall mounting
<b>G01-CO2-B340C</b>	CO2 monitor/ controller, 1 on/off output;	CO2, Temp & RH	24VAC/VDC	Wall mounting
<b>G01-CO2-B340D</b>	CO2 monitor/ controller, 1 on/off output;	CO2, Temp & RH	100~240VAC	Wall mounting
<b>G01-CO2-B380C</b>	CO2 monitor/ controller, 1 on/off output; Modbus RS485 interface	CO2, Temp & RH	24VAC/VDC	Wall mounting
<b>G01-CO2-B332U</b>	CO2 monitor with a desktop bracket	CO2, Temp & RH	USB 5V with a USB adaptor cable	Desktop

Optional Accessories			
921	Wall mounted back panel	Use to paste the monitor on the wall	For the above models in wall mounting type
922	Desktop bracket	Use to place the monitor on desk	Make the above wall mounted models desktop

## Mounting and Dimensions

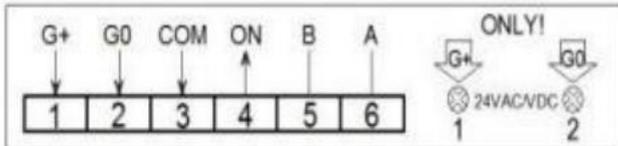
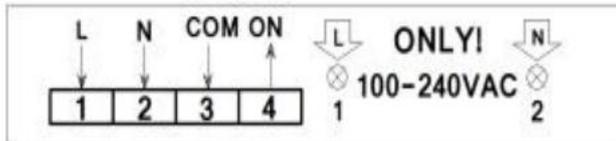


Wall mounting with a back panel (921)



Desktop with the bracket (922)

## Wiring Diagram



# CO<sub>2</sub> Monitor with Data Logger WiFi and RS485



## Applications

- Schools, offices, hotels, meeting rooms
- Shops, restaurants, hospitals, theaters, train stations, other public places
- Airports, apartments, houses
- All ventilation systems



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## Product No: G01-CO2-P

- Three-color backlight LCD indicating three CO<sub>2</sub> ranges
- Built-in data logger with up to one year data record, download via Bluetooth APP
- WiFi or RS485 interface options
- USB 5V or DC5V power supply, 24VAC/VDC power supply battery power supply is option
- 3-color backlight for three CO<sub>2</sub> ranges
- Wall mounting or portable/desktop
- Commercial level with high quality for business buildings, such as offices, schools and upscale residence

## Features

- Real time monitoring room carbon dioxide And optional temperature and humidity
- Well-known NDIR CO2 sensor with self calibration and up to 15 years lifetime
- Three-color (Green/Yellow/Red) LCD backlight indicate three CO2 ranges
- Built-in data logger, easy and safe download via Bluetooth APP
- Power supply selection: 5V USB/DC power adaptor, 24VAC/VDC, lithium battery;
- WIFI MQTT communication optional, uploading to cloud server
- RS485 is optional in Modbus RTU
- Wall mounting, portable/desktop available
- CE-approval

## Applications

- Schools, offices, hotels, meeting rooms, homes
- Shops, restaurants, hospitals, theaters, train stations, other public places
- All ventilation monitoring systems

## Specifications

Power supply	Select one as below: Power Adapter: USB 5V ( $\cong$ 1A USB adapter), or DC5V (1A). Power terminal: 24VAC/VDC Lithium battery: 1pc NCR18650B (3400mAh), can work continuously for 14 days.
Consumption	1.1W max. 0.03 W avg. (270mA@4.2Vmax. ; 7mA@4.2Vavg. )

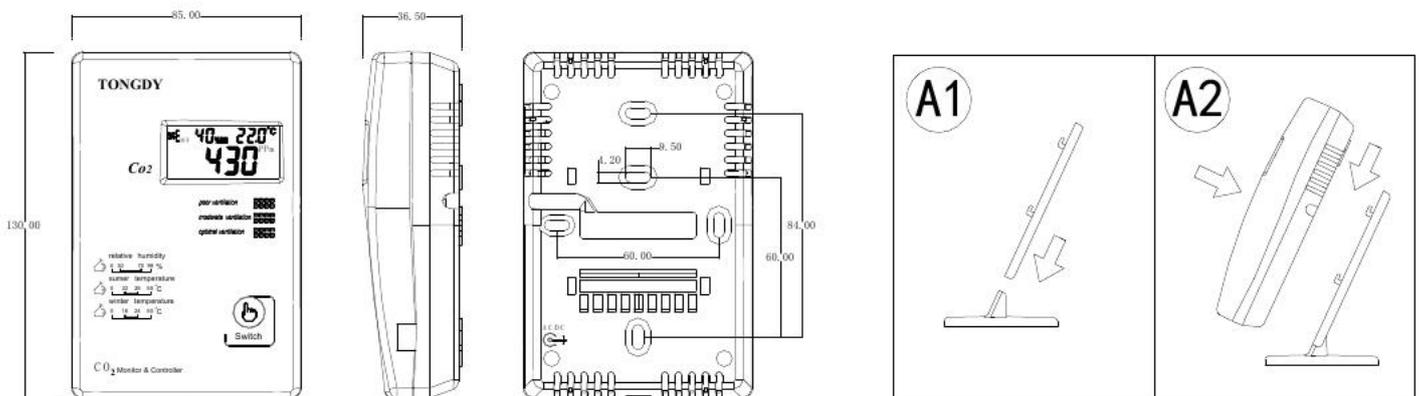
G01-CO2-P monitor with WiFi & data logger in battery power option

Gas detected	Carbon Dioxide (CO <sub>2</sub> )
Sensing element	Non-Dispersive Infrared Detector (NDIR)
Accuracy@25°C (77°F)	±50ppm + 3% of reading
Stability	<2% of FS over life of sensor (15 yr typical)
Calibration interval	ABC Logic Self Calibration Algorithm
CO <sub>2</sub> sensor life	15 years
Response Time	<2 minutes for 90% step change
Signal update	Every 2 seconds
Warm up time	<3 minutes (operation)
CO <sub>2</sub> measuring range	0~5,000ppm
CO <sub>2</sub> Display resolution	1ppm
3-color backlight or 3-LED light for CO <sub>2</sub> range	Green : <1000ppm Yellow: 1001~1400ppm Red: >1400ppm
LCD Display	Real time CO <sub>2</sub> , with Temp &RH selected
Temperature range (option)	-20~60°C
Humidity range (option)	0~99%RH
Data logger	Up to 145860 points storage 156 days data storage every 5 min. or 312 days every 10 min. for CO <sub>2</sub> 104 days data storage every 5 min. or 208 days every 10 min. For CO <sub>2</sub> plus temp.&RH Download data via BlueTooth APP
Output (option)	WiFi @2.4 GHz 802.11b/g/n MQTT protocol RS485 Modbus RTU
Storage conditions	0~50°C (32~122°F), 0~90%RH non condensing
Dimensions/ Weight	130mm(H)×85mm(W)×36.5mm(D) / 200g
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Installation	Wall mounting (65mm×65mm or 2"×4" wire box) Desktop placement with an optional desktop bracket
Standard	CE-Approval

## Models Guide

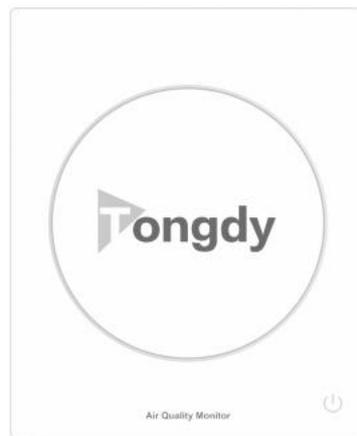
Model	Output	Power Supply	Mount
G01-CO2-P32U/D	NO	USB 5V or DC5V power supply with a USB or DC power adaptor.	Desktop Or wall mounting
G01-CO2-P30C	NO	24VAC/VDC power supply	Wall mounting
G01-CO2-P30B	NO	Lithium battery power supply	Desktop
G01-CO2-P22U/D	WIFI	USB 5V or DC5V power supply with a USB or DC power adaptor.	Desktop Or wall mounting
G01-CO2-P20C	WIFI	24VAC/VDC power supply	wall mounting
G01-CO2-P12U	RS485	USB 5V or DC5V power supply with a USB or DC power adaptor.	Wall mounting or Desktop
G01-CO2-P10C	RS485	24VAC/VDC power supply	wall mounting
-TH	This suffix is for the temperature and humidity monitoring option, suitable for the above models.		

## Mounting and Dimensions



# Carbon Dioxide Monitor

WiFi/RJ45/RS485 and Data Logger Option



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Focus on air quality monitoring more than 15 years  
Offered over ten series professional air quality monitors  
High quality monitors with applied experience in thousands of projects globally

**Product No: EM21-CO2**

## Features

- LCD display real time CO2 and 24 hours average CO2
- The brightness of LCD is easy to set or turn it off
- 3-color LED lights indicating three CO2 ranges
- 18~36VDC/20~28VAC power supply or 100~240VAC power supply
- Provide data logger with up to 156 days storage for every 5 minutes data, download data by BlueTooth
- WiFi or Ethernet or RS485 interface is optional
- In-Wall mounting

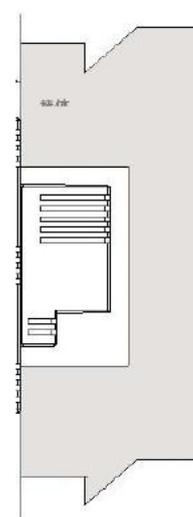
## Specifications

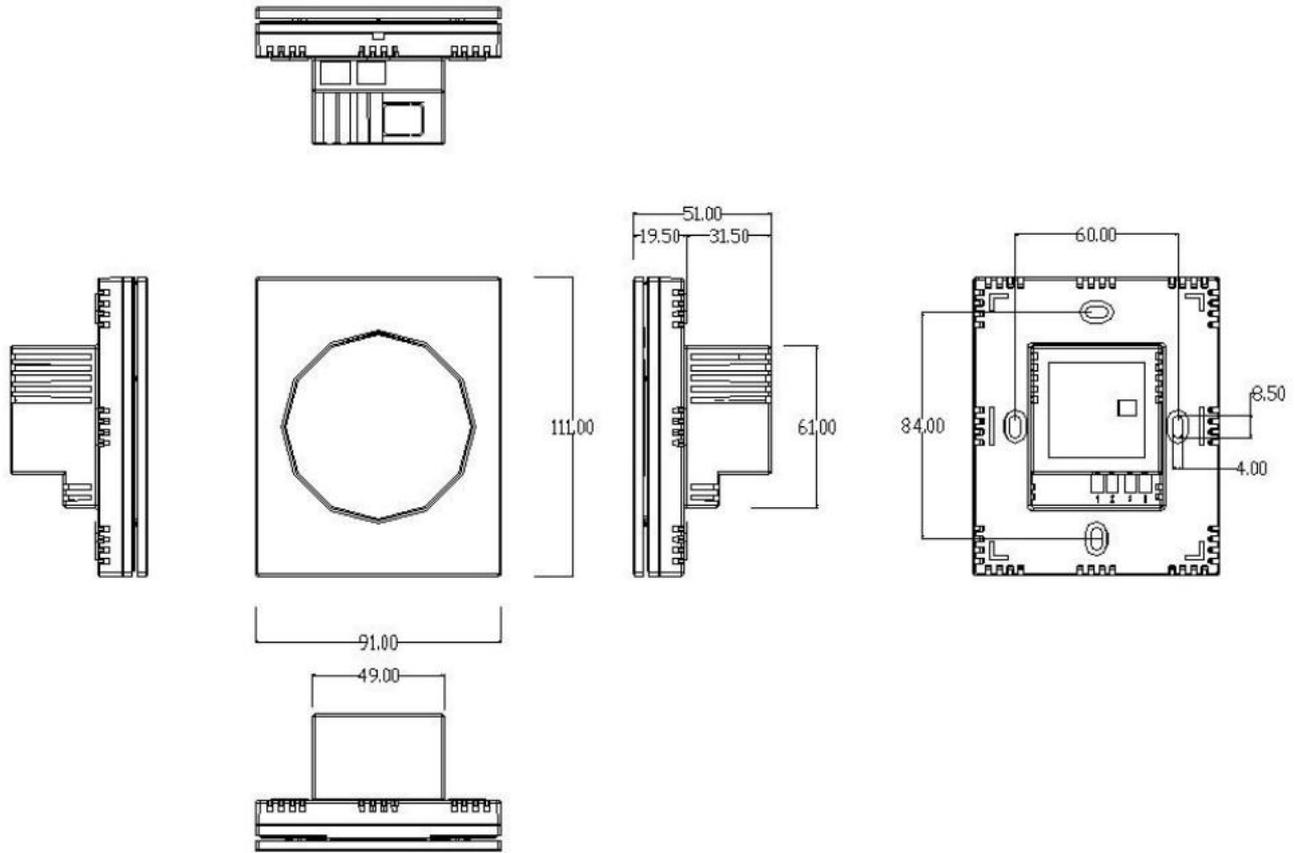
General Specifications			
Measuring parameters(max.)	CO2, Temp.&RH	Operation environment	0~60℃ 0~99%RH (non-condensing)
Output (Optional)	/RS485 (Modbus RTU/BACnet MS/TP) /WiFi @2.4GHz 802.11b/g/n (MQTT) /Ethernet RJ45(TCP) (MQTT)	Storage condition	0~50℃ 0~70%RH
		Power supply	24VAC/VDC±20% 100~240VAC
Data storage	145860 points	Overall Dimension	91.00mm*111.00mm*51.00mm
Download data via BlueTooth APP	156 days every 5 min. or 312 days every 10 min. for CO2 104 days every 5 min. or 208 days every 10 min. for CO2 plus Temp.&RH	Shell material and IP level	PC fireproof material IP30
<b>CO2</b>		<b>Temp.&amp;RH</b>	

Sensor	NDIR sensor	Digital integrated temp. and humidity sensor
Measuring Range	400~5,000ppm	-20°C~60°C 0~99%RH
Output Resolution	1ppm	0.1°C 0.1%RH
Accuracy	±50ppm+3% reading	±0.6°C ±4.0%
LCD display(option)	Real time CO2 24h Ave CO2	Real time T&RH

## Wall-Embedded Mounting

Applicable to tube box of Europe, American, and China standard





## Models Guide

No.	Model	CO2	Temp & RH	Data Logger	Output	Display	Power Supply
1	EM21-CO2-S16C/D	•	•		RS485	S-LCD display B-instead of S (No display)	C-18~36VDC/ 20~28VAC D-100~240VAC PoE-48V switch power
2	EM21-CO2-S16C/D-K	•	•	•	Modbus RTU/ BACnet MS/TP		
3	EM21-S26C/D	•	•		Wi-Fi		
4	EM21-S26C/D-K	•	•	•	(MQTT)		
5	EM21-S36C/PoE	•	•		Ethernet TCP		
6	EM21-S22C/PoE-K	•	•	•	(MQTT)		

We provide commercial air quality monitors for indoor, in-duct and outdoor  
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# Carbon Dioxide Controller



## Applications

- For BAS and HVAC systems
- VAV terminal control
- Used in all ventilation systems



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## Product No: TSP-CO2

- Integrate CO2 transmitter and controller into one unit
- Temperature and RH detection is optional
- NDIR infrared CO2 sensor with patented self calibration
- One or two analog outputs for CO2 or CO2/Temp.
- Linear output or PID control output for CO2
- LED light with 3-color mode or working mode selectable
- Modbus RS485 communication interface
- Optional OLED screen displays measurements
- One relay output with two control modes chosen
- Buzzer alarm available with a relay on/off output

## Features

- Real time measuring ambience carbon dioxide and temperature and relative humidity
- NDIR infrared CO2 sensor with Self Calibration which makes CO2 measurement more accurate and reliable.
- Up to 15 years lifetime of CO2 sensor
- Provide one or two 0~10VDC/4~20mA which can be chosen linear outputs or PID control output
- One passive relay output is optional. It can control a fan or a CO2 generator. The control mode is easily selected.
- The 3-color LED indicates three CO2 level ranges
- Optional OLED screen displays CO2/Temp/RH measurements
- Buzzer alarm available
- RS485 interface with Modbus RTU
- 24VAC/VDC power supply
- CE-approval

## Specifications

General Data			
Power supply	24VAC/VDC± 10%		
Consumption	3.5 W max. ; 2.0 W avg.		
Analog outputs	One 0~10VDC/4~20mA for CO2 measurement Two 0~10VDC/4~20mA for CO2/Temperature measurements PID control output is selectable		
Relay output	One passive relay output (max.5A) with the control mode selection (control a fan or a CO2 generator)		
RS485 interface	Modbus protocol, 4800/9600(default)/19200/38400bps; 15KV antistatic protection, independent base address.		
LED light selectable	<table border="1"> <tr> <td>3-color mode (default) Green: ≤1000ppm Orange: 1000~1400ppm Red: &gt;1400ppm Red flashing: CO2 sensor faulty</td> <td>Working light mode Green on: working Red flashing: CO2 sensor faulty</td> </tr> </table>	3-color mode (default) Green: ≤1000ppm Orange: 1000~1400ppm Red: >1400ppm Red flashing: CO2 sensor faulty	Working light mode Green on: working Red flashing: CO2 sensor faulty
3-color mode (default) Green: ≤1000ppm Orange: 1000~1400ppm Red: >1400ppm Red flashing: CO2 sensor faulty	Working light mode Green on: working Red flashing: CO2 sensor faulty		
OLED Display	Display CO2 or CO2/temp. or CO2/Temp./ RH measurements		
Operation condition	-20~60℃; 0~99%RH, non condensing		
Storage condition	0~50℃, 0~60%RH		

Net Weight / Dimensions	190g /117mm(H)×95mm(W)×36mm(D)
Installation	wall mounting with 65mm×65mm or 2"×4" wire box
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Standard	CE approval
<b>Carbon Dioxide</b>	
Sensing element	Non-Dispersive Infrared Detector (NDIR)
CO <sub>2</sub> measuring range	0~2,000ppm (default) 0~5,000ppm (selected in the advanced setup)
CO <sub>2</sub> Accuracy	±60ppm + 3% of reading or ±75ppm (whichever is greater)
Temperature dependence	0.2% FS per°C
Stability	<2% of FS over life of sensor (10 year typical)
Pressure dependence	0.13% of reading per mm Hg
Calibration	ABC Logic Self Calibration Algorithm
Response time	<2 minutes for 90% step change typical
Signal update	Every 2 seconds
Warm-up time	2 hours (first time) / 2 minutes (operation)
<b>Temperature and RH (option)</b>	
Temperature sensor (selectable)	Digital integrated temperature and humidity sensor SHT, or NTC thermistor
Measuring range	-20~60°C/-4~140F (default)      0~100%RH
Accuracy	Temp.: <±0.5°C@25°C      RH: <±3.0%RH (20%~80%RH)

## Models Guide

### TSP - CO2 - A X Y Z - T/TH - P

**A:** OLED display with buttons

D- with OLED and buttons (for Y=1)

B- no OLED and buttons

**X:** analog output

0- no analog output

1- 1x analog output (for CO2)

2- 2x analog output (for CO2 & Temp.)

**Y:** relay output

0-no relay output

1- 1x relay output

**Z:** communication interface

0- no communication interface

1-Modbus RS485 interface

**T/TH:** temperature and RH option

T- temperature detection

TH- temperature & RH detection

No T/TH suffix indicates no temperature or/and

RH detection

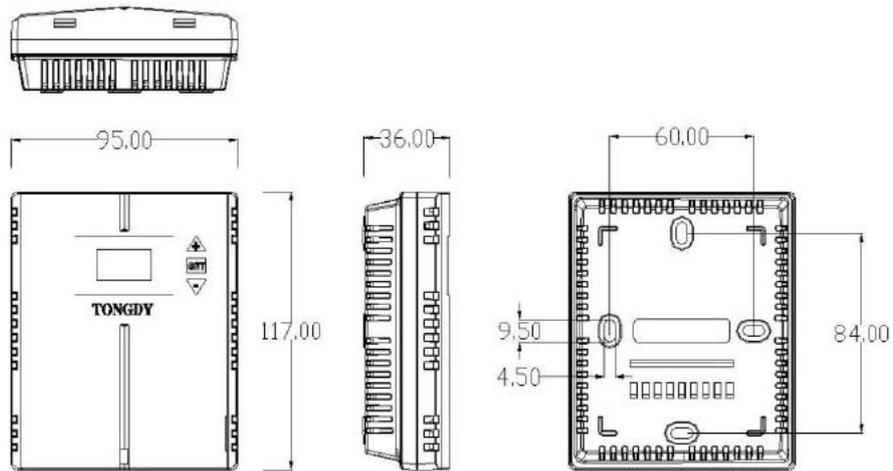
**P:** type of analog output

V- 0~10VDC output (default)

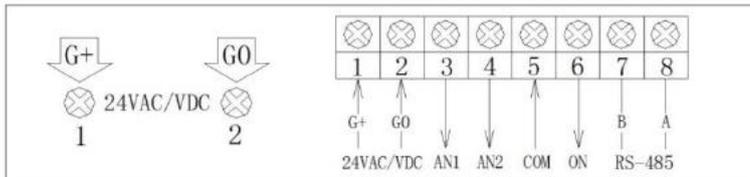
A- 4~20mA output

P- PID output

## Mounting and Dimensions



## Wiring Diagram



# Multi-function CO<sub>2</sub> Monitor/ Controller



## Product No: GX-CO2 Series

- Real time carbon dioxide monitoring
- Optional temperature and humidity or VOC's monitoring
- Up to three 0~10VDC linear outputs or optional PID control outputs
- Up to three relay outputs to control three devices
- 3-color backlight LCD display
- Optional Modbus RS485 communication
- Strong pre-set of advanced parameters for different applications, for example pre setting a fan be controlled by CO<sub>2</sub> or CO<sub>2</sub> plus temp. P-I-D values, min. /max. imitation of analog output etc.
- CE, FCC, REACH, RoHS approval

## Applications

- Ventilation systems control by CO<sub>2</sub>/ Temperature/ humidity or VOC's
- VAV room control
- CO<sub>2</sub> & Temperature or RH transmitter
- CO<sub>2</sub>&VOC's transmitter
- A strong CO<sub>2</sub> controller with relay and PID outputs and on site programming function



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## Features

- Design for monitoring and control carbon dioxide and temp. and/or humidity or VOC's
- NDIR infrared CO2 sensor with self calibration and up to 15 years lifetime, makes CO2 measurements more accurate and reliable.
- Three-color backlight of LCD indicates three CO2 ranges
- Up to three relay outputs to control three devices such as fans.
- Up to three linear 0~ 10VDC outputs or PID control outputs selectable
- Modbus RS485 communication is optional
- 24VAC/VDC or 100~240VAC power supply
- Strong pre-set of parameters for end users to meet different control requests
- As be a CO2/Temp. or VOC's transmitter and a VAV or ventilation controller.



## Specifications

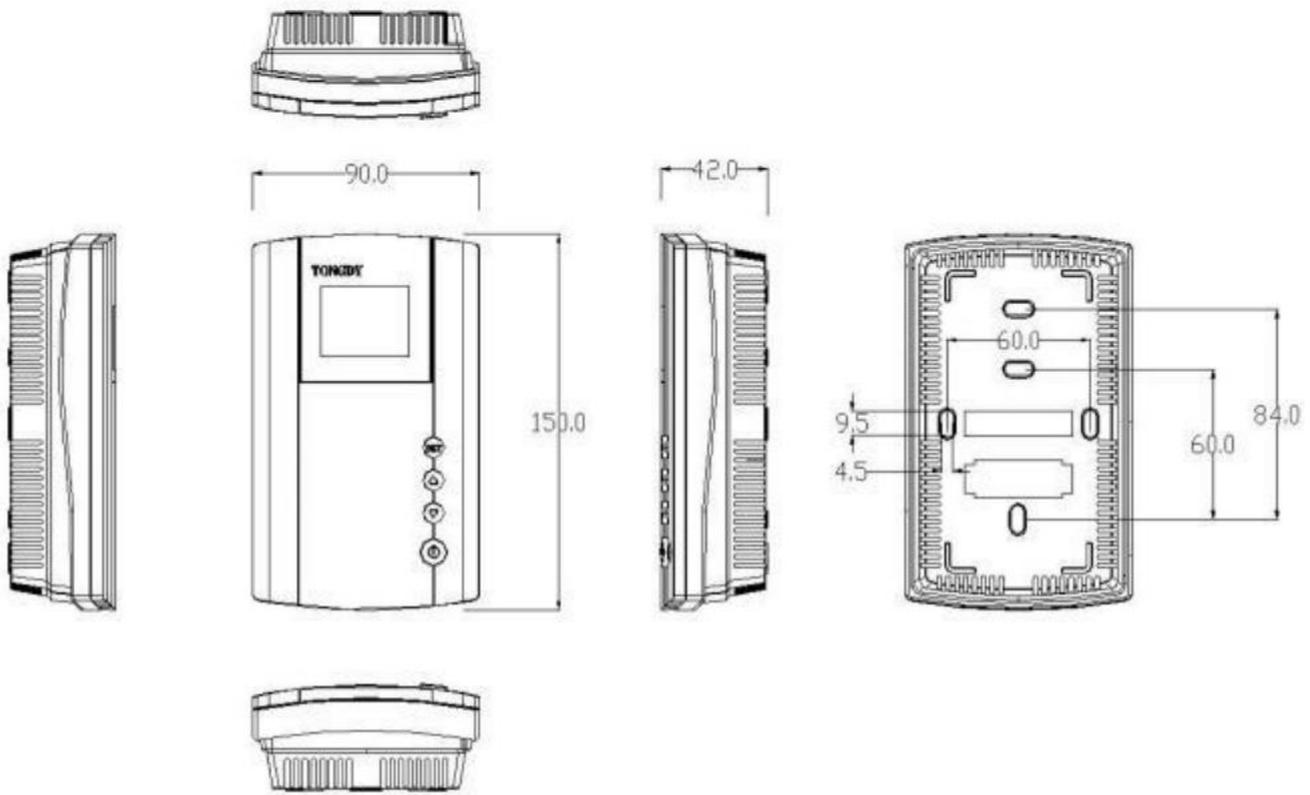
Carbon Dioxide	
Sensing element	Non-Dispersive Infrared Detector (NDIR)
CO <sub>2</sub> measuring range	0~2,000ppm (default) 0~5,000ppm (selected in the advanced setup)
CO <sub>2</sub> Accuracy @22°C (72°F)	±50ppm + 3% of reading or ±75ppm (whichever is greater)
Temperature dependence	0.2% FS per°C
Stability	<2% of FS over life of sensor (15 year typical)
Pressure dependence	0.13% of reading per mm Hg
Calibration	ABC Logic Self Calibration Algorithm
Signal update	Every 2 seconds
Warm-up time	2 hours (first time) / 2 minutes (operation)
General Data	
Power supply	24VAC/VDC or 100~240VAC(for relay outputs)
Consumption	2.5W avg., 5.5W max.
Relay output	1~3 relay outputs, max.5A/ resistive load/each for control up to three devices.

Analog output	1~3 0~ 10VDC linear outputs or PID control outputs for CO2 & temperature & RH (or VOC's)
Modbus communication	RS-485 with Modbus protocol, 15KV antistatic protection, independent base address.
Display screen	LCD displays measurements and setting /working information. 3-color backlight for three CO2 ranges. Green: <800ppm (default) Orange: 800~1200ppm (default) Red: > 1200ppm (default) The three color switch points can be set via advanced parameter setup or RS485.
Operation conditions	0~50℃; 0~95%RH, non condensing
Storage conditions	-10~60℃, 0~80%RH
Net Weight	290g
Dimensions	150mm(L)×90mm(W)×42mm(H)
Installation	wall mounting with 65mm×65mm or 2"×4" wire box
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Standard	CE-Approval

## Applications

- Ventilation systems control by CO2/Temperature or VOC's
- VAV room control
- CO2 & Temperature & RH transmitter
- CO2&VOC's transmitter
- CO2 and temperature and RH or VOC's controller for all ventilations
- Relay outputs and PID analog outputs

## Mounting & Dimensions



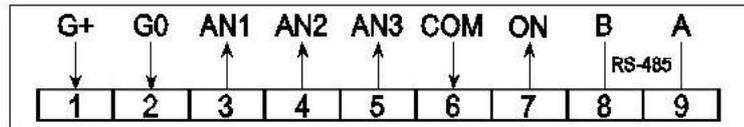
## Models Guide

Product Model	Sensors	Output			Power supply
		0~ 10V Linear or PID	On/ Off Max.5A	RS485 Modbus RTU	
GX-CT-2000C	CO2/Temp.	2	/	/	24VAC/VDC
GX-CH-2000C	CO2/Temp./RH	2	/	/	
GX-CT-2010C	CO2/Temp.	2	/	1	
GX-CH-2010C	CO2/Temp./RH	2	/	1	

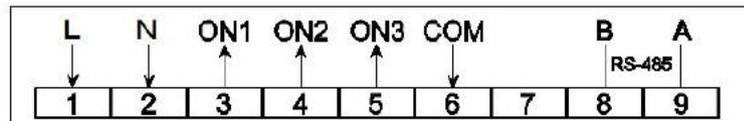
GX-CH-3010C	CO2/Temp./RH	3	/	1	
GX-MT-2010C	CO2/VOC's/Temp.	2	/	1	
GX-CT-0100C	CO2/Temp.	/	1	/	
GX-CT-1100C	CO2/Temp.	1	1	/	
GX-CT-0100D	CO2/Temp.	/	1	/	100~240VDC
GX-CT-0200D	CO2/Temp.	/	2	/	
GX-CH-0300D	CO2/Temp./RH	/	3	/	
GX-MT-0300D	CO2/VOC's/Temp./RH	/	3	/	

## Wiring Diagrams

GX-CH-3010C



GX-CH-03010D



# Carbon Dioxide Controller

-Wall mount, Duct mount & Split external probe



Wall mount



Duct mount



Split external probe

## Applications

- BAS, BMS systems
- Ventilation control systems
- HVAC systems
- Industry VAC systems
- Mushrooms, greenhouses, storage warehouses



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## Product No: TKG-CO2

### Features

- Real time carbon dioxide monitoring
- NDIR CO2 sensor with Self-Calibration and up to 15 years lifetime.
- High accuracy humidity and temperature detection option
- Providing one dry contact output with presetting the setpoint
- Modbus RS485 communication interface option
- Providing three types: Wall mount, Duct mount, Split external probe
- Replaceable filter in the probe and extendable probe length.
- Design the convenient and easier buttons for operation.
- Optional split external sensor with 2 meter cables
- CE-Approval.

## Specifications

CO <sub>2</sub> Sensor	Non-Dispersive Infrared Detector (NDIR)	
Measurement Range	0~2,000ppm (default) 0~5,000ppm (preset)	
Accuracy	±60ppm + 3% of reading @22°C(72°F)	
Stability	<2% of full scale over the life of the sensor	
Calibration	Self-calibration system	
Response Time	<5 minutes for 90% step change at low duct speed	
Non-linearity	<1% of full scale @22°C(72°F)	
Duct Air Velocity	0~450m/min	
Pressure Dependence	0.135% of reading per mm Hg	
Warm up time	2 hours (first time) 2 minutes (operation)	
Split CO <sub>2</sub> sensor	2 meter cable connection between the sensor and the controller	
Temperature & Humidity Detection&Display (optional)	Temperature	Relative Humidity
Sensing element:	Band-gap-sensor	Capacitive humidity sensor
Measuring range	-20°C~60°C	0 -100%RH
Accuracy	±0.5°C (20~40°C)	±4.5%RH (25°C, 15%-85%RH)
Display resolution	0.1°C	0.1%RH
Stability	±0.1°C per year	±1%RH per year
General Data		
Power supply	24VAC/24VDC or 100VAC~240VAC	
Consumption	1.8 W max. ; 1.0 W avg.	
LCD display	Display CO <sub>2</sub> measurement or CO <sub>2</sub> + temperature& humidity measurements	
Dry contact output (optional)	1xdry contact output for CO <sub>2</sub> Max. 8A (100~240VAC/30VDC)rated switch contact	
Modbus RS485 Interface (optional)	19200bps, 15KV antistatic protection.	
Operation conditions	0°C~50°C(32~122°F); 0~99%RH, non condensing	
Storage conditions	0~60°C(32~140°F)/ 0~80%RH	
IP class	IP40	
Standard Approval	CE-Approval	

## Models Guide

### TKG- CO2- A 0 C D Y -TH

A: the sensor installation type

- 1: wall mounted with the external adown probe sensor
- 2: duct mounted
- 3: split sensor with 2 meters cable connection
- 4: probe duct type with extended probe (209mm)

C: relay dry contact output

- 0: no dry contact output
- 1: 1xdry contact output

D: Modbus interface

- 0: no communication
- 1: Modbus RS485 interface

Y: power supply

- C: 24VDC/VAC power supply
- D: 100~240VAC power supply

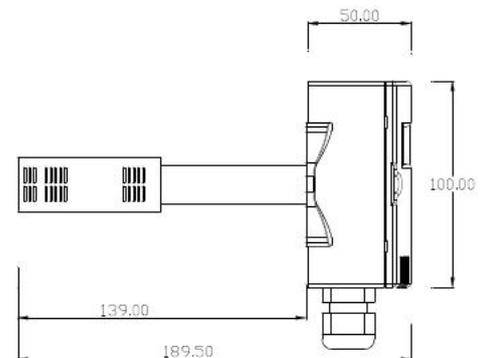
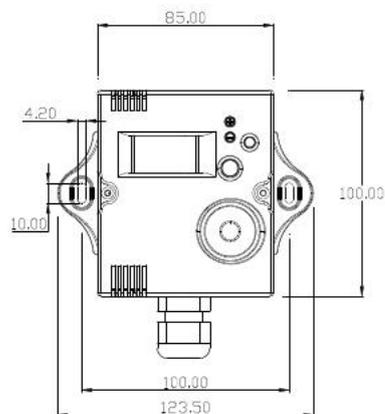
-TH temperature & RH detection and display

No "TH" indicates without temperature & RH detection and display

## Mounting

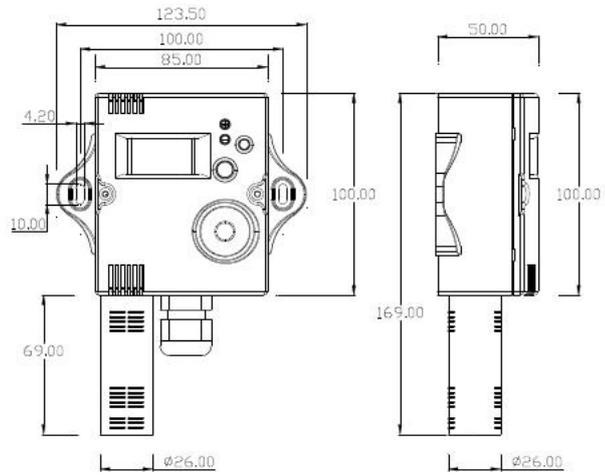
### Duct mount

Probe Length	139.00mm
(can be extended to 139+70mm)	
Probe	Diameter
Installation Holes	100.00mm



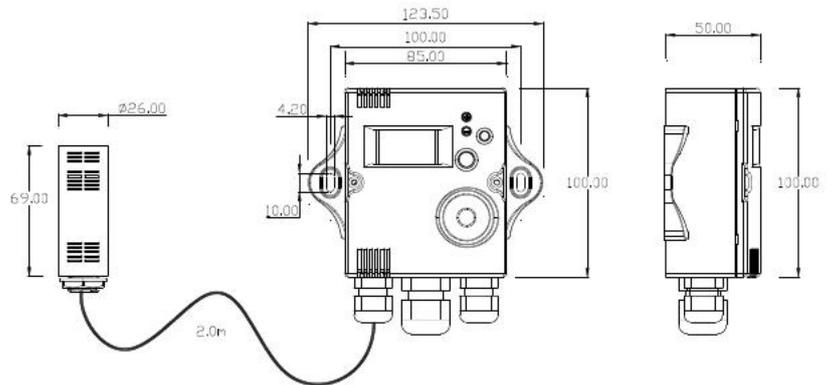
**Wall mount**

probe Length 69.00mm  
 Probe Diameter Ø26.00mm  
 Installation Holes 100.00mm

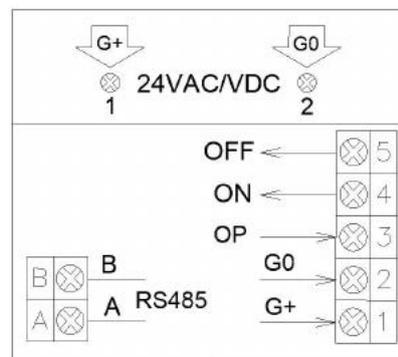
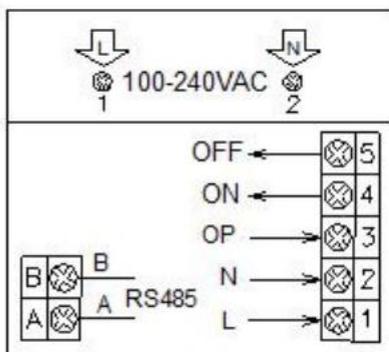


**Split sensor probe**

Connection cable Length 2.0m  
 Sensor Probe Diameter Ø26.00mm  
 Installation Holes 100.00mm



## Wiring Diagram



# Plug and Play Carbon Dioxide Controller for Greenhouse



## Applications

- Used to control CO<sub>2</sub> concentration in greenhouse and other similar applications,
- provides an max 8A relay on/off output to control a CO<sub>2</sub> generator or a fan
- For ventilation systems in greenhouse
- The CO<sub>2</sub> generator or ventilator working mode can be preset by end users



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## Product No: TKG-CO2-1010D-PP

## Features

- Design for control the CO<sub>2</sub> concentration in greenhouses or mushrooms
- NDIR infrared CO<sub>2</sub> sensor inside with Self-Calibration and up to 15 years lifetime.
- Plug & play type, very easy to connect the power and a fan or CO<sub>2</sub> generator.
- 100VAC~240VAC range power supply with European or American power plug and power connector.
- A max. 8A relay dry contact output
- A photosensitive sensor inside for auto changeover of day/night work mode
- Replaceable filter in the probe and extendable probe length.
- Design the convenient and easier buttons for operation.
- Optional split external sensor with 2 meter cables
- CE-Approval.

TKG-CO2-PP plug&play controller for greenhouses



Connect the controlled device

Connect the 100~240V power supply

European/American power plug& connector optional

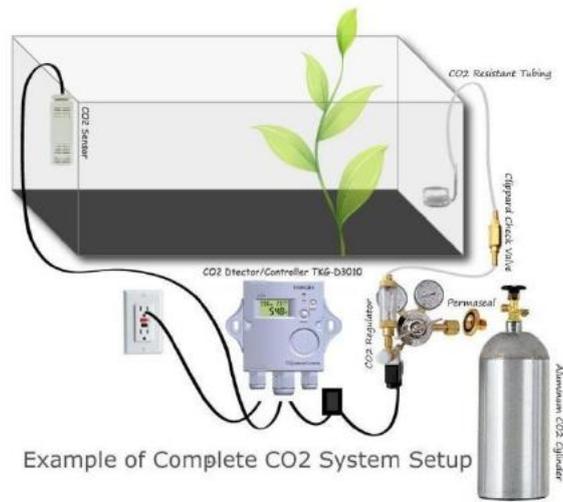
External sensor



Connect a controlled device

Connect 100~240V power supply

One application of the split controller and sensor



## Specifications

CO <sub>2</sub> Sensor	Non-Dispersive Infrared Detector (NDIR)
Measurement Range	0~2,000ppm(default) 0~5,000ppm (preset)
Accuracy	±60ppm + 3% of reading @22°C(72°F)
Stability	<2% of full scale over the life of the sensor
Calibration	Self-calibration system enable or disable
Response Time	<5 minutes for 90% step change at low duct speed
Non-linearity	<1% of full scale @22°C(72°F)
Duct Air Velocity	0~450m/min
Pressure Dependence	0.135% of reading per mm Hg
Warm up time	2 hours (first time) 2 minutes (operation)
Split CO <sub>2</sub> sensor optional	2 meter cable connection between the sensor and the controller
Power supply	100~240VAC

Consumption	1.8 W max. ; 1.0 W avg.
LCD display	Display CO <sub>2</sub> measurement
Dry contact output (optional)	1xdry contact output Max. switch current: 8A (load resistance) SPDT relay
Plug& play type	100~240VAC power supply with European or American power plug and power connector to the CO <sub>2</sub> generator
Operation conditions	0°C~60°C(32~140°F); 0~99%RH, non condensing
Storage conditions	0~50°C(32~122°F)/ 0~80%RH
IP class	IP40
Standard Approval	CE-Approval

## Models

<b>TKG-CO2-1010-PP</b>		Plug & play controller with 1x 8A relay output to control a CO <sub>2</sub> generator. 100~240VAC power supply. Photosensor inside for auto changeover of day/night mode.
<b>TKG-CO203010-PP</b>	CO <sub>2</sub> Controller with plug-&-play for greenhouse	Plug & play controller with a split external sensor in two meters. 1x 8A relay output to control a CO <sub>2</sub> generator , 100~ 240VAC power supply. Photosensor inside for auto changeover of day/night mode.
<b>TKG-CO2-1010D</b>		CO <sub>2</sub> controller with 1x 8A relay output to control a CO <sub>2</sub> generator. 100~240VAC power supply. Photosensor inside for auto changeover of day/night mode.
<b>TKG-CO2-010D</b>	CO <sub>2</sub> Controller for greenhouses	CO <sub>2</sub> controller with a split external sensor in two meters. 1x 8A relay output to control a CO <sub>2</sub> generator. 100~ 240VAC power supply. Photosensor inside for auto changeover of day/night mode.

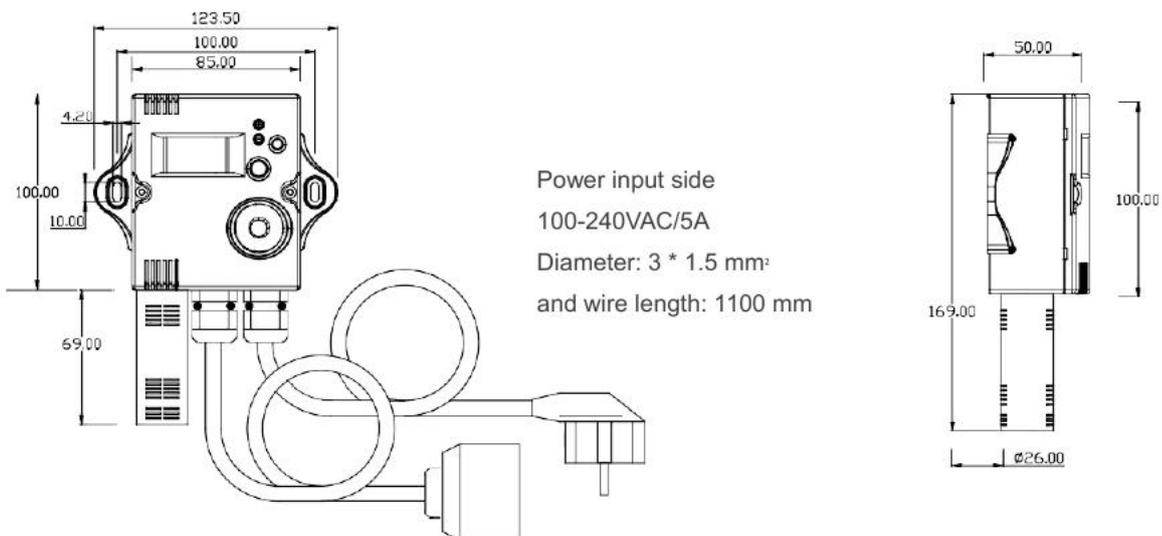
## Typical Applications

- TKG-CO2-1010D-PP Controller is used to control CO2 level in greenhouse and other similar applications, provides an max 8A relay on/off output to control a CO2 generator or a fan.
- For ventilation systems in greenhouse.
- The CO2 generator or ventilator working mode can be preset by the end users in different applications

## Dimensions Mounting

Wall mounting with plug& play

probe Length	69.00mm
Probe Diameter	Ø26.00mm
Installation Holes	100.00mm
Power cable	1100.00mm
Cable to device	700.00mm
Power plug/socket	European and American



Power input side  
100-240VAC/5A  
Diameter: 3 \* 1.5 mm²  
and wire length: 1100 mm

Control equipment side  
100-240VAC/5A  
Diameter: 3 \* 1.5 mm²  
and wire length: 700 mm

## Shipping Information

Indiv. Ctn. Dim	255mm×130mm×115mm
Master Ctn. Qty	15 units
Master Ctn. Dim	49cm(L) ×36cm(W)×42cm(H)
Master Ctn. Net Wt.	20KGS

# Carbon Dioxide Transducer



## Applications

- For BAS and HVAC systems
- CO2 detection and transmission
- 6-LED lights indicating six CO2 ranges
- Used in all ventilation



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## Product No: F2000TSM-CO2 Series

### Features

- CO2 transmitter in low cost
- NDIR infrared CO2 sensor with Self-Calibration Algorithm and up to 15 years lifetime
- Wall-mounting
- One analog output, 0~10VDC/4~20mA selectable
- Six LCD lights indicate six CO2 ranges with clear real time CO2 level
- Design for HVAC, ventilation systems, offices, schools or other public places.
- Modbus RS485 communication interface with 15KV antistatic protection

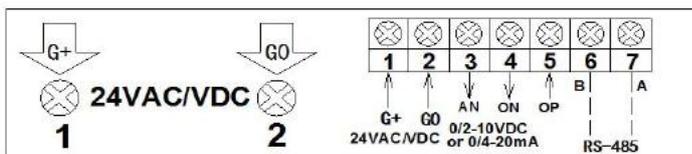
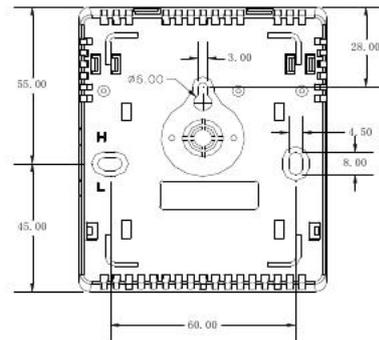
## Specifications

Gas detected	Carbon Dioxide (CO <sub>2</sub> )
Sensing element	Non-Dispersive Infrared Detector (NDIR)
Accuracy@25°C(77°F),2000ppm	±40ppm + 3% of reading or ±75ppm (whichever is greater)
Stability	<2% of FS over life of sensor (15 yr typical)
Calibration interval	ABC Logic Self Calibration System
Response time	<2 minutes for 90% step change
Warm up time	2 hours (first time) 2 minutes (operation)
CO <sub>2</sub> measuring range	0~2,000ppm OR 0~5,000ppm
Sensor life	> 10 years
Power supply	24VAC/24VDC
Consumption	1.5 W max. ; 0.8 W avg.
Analog outputs	0~10VAC or 4~20mA selectable by jumpers
Relay output	1X2A switch load Four set points selectable by jumpers
6 LED lights (just for TSM-CO2-L series) Green/Green/Yellow/Yellow/Red/Red	1 <sup>st</sup> green light on as CO <sub>2</sub> measurement≤600ppm 1 <sup>st</sup> and 2 <sup>nd</sup> green lights on as CO <sub>2</sub> measurement>600ppm and≤800ppm 1 <sup>st</sup> yellow light on as CO <sub>2</sub> measurement>800ppm and≤1,200ppm 1 <sup>st</sup> and 2 <sup>nd</sup> yellow lights on as CO <sub>2</sub> measurement>1,200ppm and≤1,400ppm 1 <sup>st</sup> red light on as CO <sub>2</sub> measurement>1,400ppm and≤1,600ppm 1 <sup>st</sup> and 2 <sup>nd</sup> red lights on as CO <sub>2</sub> measurement>1,600ppm
RS485 interface	Modbus RTU 9600/14400/19200(default), 15KV antistatic protection.
Operation conditions	0~50°C(32~122°F); 0~95%RH, non condensing
Storage conditions	0~50°C(32~122°F)
Net weight	180g
Dimensions	100mm×80mm×28mm
Installation standard	65mm×65mm or 2"×4" wire box
Approval	CE-Approval

## Models Guide

Name	Model	Description
CO2 Transmitter	F2000TSM-CO2-S100-V/A-02	1Xanalog output, CO2 range: 0~2,000ppm
	F2000TSM-CO2-S100-V/A-05	1Xanalog output, CO2 range: 0~5,000ppm
	F2000TSM-CO2-S101-V/A-02	1Xanalog output, RS485 interface (Modbus RTU).
	F2000TSM-CO2-S101-V/A-05	1Xanalog output, RS485 (Modbus RTU)
	F2000TSM-CO2-L101-N-02/05	6 lights indicate CO2 measurements range, Modbus interface
	F2000TSM-CO2-L100-V/A-02/05	6 lights indicate CO2 measurements range, 1x analog output
	F2000TSM-CO2-L101-V/A-02/05	6 lights indicate CO2 measurements range, 1x analog output, Modbus RS485 interface
Accessories	Power adaptor-E	Plug-in power adaptor, Input: 100~240VAC ; Output: DC 24V/ 240mA. European plug
	Power adaptor- A	Plug-in power adaptor, Input: 100~240VAC; Output: DC 24V 240mA. American plug

## Mounting and Wiring



# 3 in 1 Carbon Dioxide Transmitter with Temperature and RH



## Applications

- Schools, offices, hotels, airports , shopping malls....
- Building ventilation systems
- Industry ventilation systems
- BAS and commercial HVAC

## Product No: G01-CO2-B10C/30C Series

- 3 in1 transmitter of carbon dioxide and temperature and humidity
- High accuracy Temperature and humidity detection
- NDIR infrared CO2 sensor with patented self calibration
- Provide 3xanalog linear outputs for measurements
- Optional LCD display of all measurements
- RS485 interface with Modbus RTU or BACnet MS/TP
- CE-approval



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## Features

- Real time measuring ambient carbon dioxide and temperature +RH
- NDIR infrared CO2 sensor inside with special Self Calibration. It makes CO2 measurement more accurate and more reliable.
- Up to 15 years lifetime of CO2 sensor
- High accuracy temperature and humidity measurement
- Combined both humidity and temperature sensors seamlessly with the digital auto compensation
- Provide up to three analog linear outputs for measurements
- LCD is optional to display CO2 and temperature &RH measurements
- Optional RS485 in Modbus RTU or BACnet MS/TP
- End user can adjust CO2/Temp. range which correspond with the analog outputs Via Modbus, also can preset the direct proportion or inverse proportion for different applications
- 24VAC/VDC power supply
- EU standard and CE-approval

## Applications

- Schools, offices, hotels, airports , shopping malls....
- Building ventilation systems
- Industry ventilation systems
- BAS and commercial HVAC systems

## Specifications

Carbon Dioxide		
Sensing element	Non-Dispersive Infrared Detector (NDIR)	
CO <sub>2</sub> measuring range	0~2000ppm/ 0~5,000ppm optional	
CO <sub>2</sub> Accuracy @22°C (72°F)	±40ppm + 3% of reading or ±75ppm (whichever is greater)	
Temperature dependence	0.2% FS per °C	
Stability	<2% of FS over life of sensor (15 year typical)	
Pressure dependence	0.13% of reading per mm Hg	
Calibration	ABC Logic Self Calibration Algorithm	
Response time	<2 minutes for 90% step change typical	
Signal update	Every 2 seconds	
Warm-up time	2 hours (first time) / 2 minutes (operation)	
	Temperature	Humidity
Measuring range	0°C~50°C(32°F~122°F) (default)	0~100%RH
Accuracy	±0.4°C (20°C~40°C)	±3%RH (20%-80%RH)
Display resolution	0.1°C	0.1%RH
Stability	<0.04°C/year	<0.5%RH/year
General Data		
Power supply	24VAC/VDC ± 20%	
Consumption	1.8 W max. ; 1.2 W avg.	
Analog outputs	1~3 X analog outputs 0~10VDC(default) or 4~20mA (selectable by jumpers) 0~5VDC (selected at placing the order)	
RS485 communication (optional)	19200bps rate, 15KV antistatic protection, independent base address. Modbus RTU or BACnet MS/TP optional	
Operation conditions	0~50°C(32~122°F); 0~95%RH, non condensing	
Storage conditions	10~50°C(50~122°F), 20~60%RH non condensing	
Net Weight	240g	
Dimensions	130mm(H)×85mm(W)×36.5mm(D)	
Installation	wall mounting with 65mm×65mm or 2"×4"wire box	
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30	
Standard	CE-Approval	

## Models Guide

G01-CO2-B X 0 C -Y 0 Z -U 02/05 -T/TH -Txx

**X:** LCD or no LCD

- 1- Without LCD, 24VAC/VDC power supply
- 3- LCD display, 24VAC/VDC power supply

**C:** 24VAC/VDC power supply

**Y:** analog output quantity

- 3-3Xanalog outputs (for CO2, temperature, humidity)
- 2-2Xanalog outputs (for CO2, temperature)
- 1-1xanalog output (for CO2)
- 0-no analog output

**Z:** RS485 communication

- 0-no RS485
- 1- RS485 Modbus RTU
- 2- RS485 Bacnet MS/TP

**U:** type of analog output

- V- 0~10VDC (default) or 0~5VDC
- A- 4~20mA

**02/05:** CO2 range

- 02- 0~2,000ppm
- 05- 0~5,000ppm

**T/TH:** temperature option/ temperature and humidity option

**Txx:** temperature scaling

**T05:** 0°C~50°C(32°F~122°F) default (without the postfix indicates the default)

**T06:** 0°C~60°C(32°F~140°F)

**T26:** -20°C~60°C(-4°F~140°F)

## Accessory (selectable at placing the order)

**921:** back plate for wall mounting

**922:** desktop bracket



# Carbon Dioxide Transmitter/Alarm



## Product No: TS21-CO2

- Real time monitor and transmitter of air carbon dioxide and optional temperature and humidity
- NDIR infrared CO2 sensor with patented self calibration
- Up to 15 years lifetime of CO2 sensor and T&RH sensor
- One or two 0~10VDC/4~20mA linear outputs for CO2 or CO2 &Temp. or CO2&RH
- LCD display with 3-color backlight for three CO2 measured ranges
- Buzzle alarm is optopnal
- Modbus RS485 communication interface
- 24 VAC/VDC power supply
- High quality with low cost



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## Specifications

General Data	
Power supply	12~28VDC, 18~26VAC
Consumption	Average 1.8W (24V)
Analog outputs	0~10VDC or 4~20mA for CO <sub>2</sub> measurement or CO <sub>2</sub> /Temp measurements Or CO <sub>2</sub> /RH measurements
RS485 interface	Modbus protocol, 4800/9600(default)/19200/38400bps; 15KV antistatic protection, independent base address.
3-color LCD backlight	Green: ≤1000ppm (default) three CO <sub>2</sub> ranges selectable Orange: 1000~1400ppm (default) three CO <sub>2</sub> ranges selectable Red: >1400ppm (default) three CO <sub>2</sub> ranges selectable
LCD Display	Display CO <sub>2</sub> or CO <sub>2</sub> /temp. or CO <sub>2</sub> /Temp./ RH measurements
Buzzle alarm (optional)	Three CO <sub>2</sub> setpoints selectable for buzzle alarm 1200ppm 1500ppm 1800ppm Turn off buzzle alarm (default)
Operation condition	0~50°C; 0~95%RH, non condensing
Storage condition	-10~50°C, 0~70%RH
Net Weight / Dimensions	170g /116.5mm(H)×94mm(W)×34.5mm(D)
Installation	wall mounting with 65mm×65mm or 2"×4"wire box
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Standard	CE approval
Carbon Dioxide	
Sensing element	Non-Dispersive Infrared (NDIR)
CO <sub>2</sub> measuring range	0~2,000ppm (default) 0~5,000ppm (selected in purchasing)
CO <sub>2</sub> Accuracy	±40ppm + 3% of reading
Stability	<2% of FS over life of sensor (15 year typical)
Pressure dependence	0.13% of reading per mm Hg
Calibration	ABC Logic Self Calibration Algorithm
Response time	<2 minutes for 90% step change typical
Signal update	Every 2 seconds
Warm-up time	2 hours (first time) / 2 minutes (operation)

Temperature and RH (option)	
Temperature and humidity sensor	NTC thermistor for only temperature detection Digital integrated temperature and humidity sensor for Temp. &RH
Measuring range	-20~60°C/-4~140F (default)      0~100%RH
Accuracy	Temp.: $\pm 0.5^{\circ}\text{C}@25^{\circ}\text{C}$ RH: $\pm 3.0\% \text{RH}$ (20%~80%RH)

## Models Guide

TS21 - X Y 0/1 Z - V/A -02/05

**X:** sensor

- A-CO2
- B-CO2+Temp.
- C-CO2+Humi
- D-CO2+Temp.&RH

**Y:** analog output

- 0- no analog output
- 1- 1x analog output (for CO2)
- 2- 2x analog output (for CO2 & Temp.)
- 4- 2x analog output (for CO2 & Humi.)

**0:** means no buzze alarm

**1:** buzze alarm (can be turned off when it sounds)

**Z:** communication interface

- 0- no communication interface
- 1-RS485 interface (Modbus RTU)

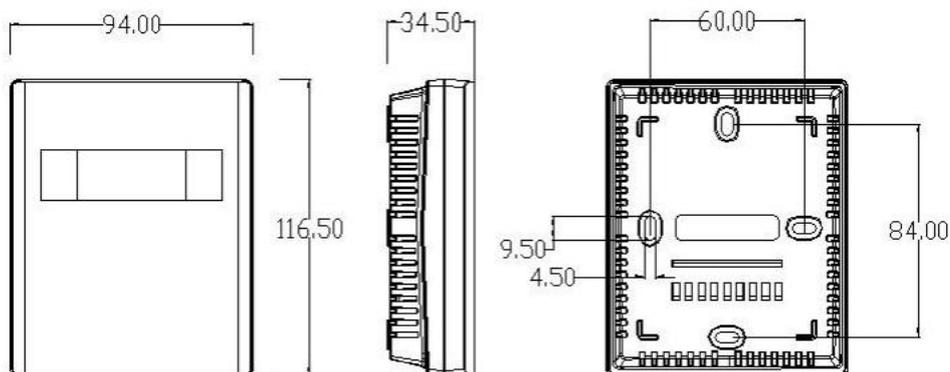
**V/A:** type of analog output

- V- 0~10VDC output (default)
- A- 4~20mA output

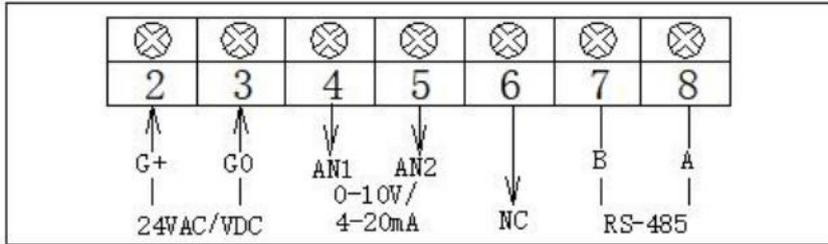
**02/05:** CO2 range

- 02: 0~2000ppm (default)
- 05: 0~5000ppm

## Mounting and Dimensions



## Wiring Diagram



# CO<sub>2</sub> In-Duct Transmitter with Temperature and RH



## Applications

- Building management systems
- HVAC systems
- All ventilation control systems



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## Product No: TG9 Series

- Real time detection carbon dioxide of the air duct
- Detection high accuracy temperature and relative humidity
- Smart sensor probe can be easily installed into any air duct
- With the water-proof and porous film around the sensor probe
- Up to 3xanalog linear outputs for measurements
- Modbus RS485 interface
- With or without LCD display
- CE-approval

## Features

- Real time detecting carbon dioxide, temperature or relative humidity in air ducts.
- NDIR infrared CO2 sensor inside with special Self Calibration and up to 15 years' lifetime. It makes CO2 measurement more accurate and reliable.
- Digital temperature & humidity sensor provides the high accuracy measurement in full range.
- Provides up to 3 analog outputs (0~10VDC or 4~20mA or 0~5VDC) for CO2 temperature and relative humidity.
- Modbus RS485 communication interface.
- The end user can adjust CO2/Temp. range which correspond with the analog outputs via Modbus, also can preset the inverse proportion liner outputs for some different applications.
- With LCD or without LCD selectable
- LCD display real-time measurements of CO2, temperature and relative humidity.
- Simple and smart design for the installation of sensor probe, which has a water-proof and porous film
- Extendable probe meets more air duct systems
- 24VAC/VDC power supply.
- EU standard and CE-approval.



## Detection Focus

### ✓ Carbon Dioxide (CO2)

Indoor CO2 level is a universal accepted parameter for the condition of indoor ventilation and air quality.

A time period can be preset from 1 to 24 hours, e.g. 5 hours, then the monitor can display CO2 average level during this period, which provides an objective and true data for the measurement of the air quality in a certain space.

- Non-dispersive infrared (NDIR) CO2 sensor with up to 15-year lifetime
- ABC self-calibration technology guarantees reliable CO2 measurement
- CO2 range: 0~2,000ppm/0~5,000ppm optional
- Rapid response, high stability and consistency

### ✓ Temperature and humidity

Combined digital temperature and humidity sensor with high accuracy and stability. It also has compensation to CO2 and air quality which makes the measurements more accurate by minimizing environmental effects.

# IAQ Monitor of CO<sub>2</sub> Plus VOCs



## Applications

- Offices, schools, gyms, hotels, exhibition halls, hospitals, air ports, and other public places
- Residential rooms
- All ventilation systems



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## Product No: G01-CO2-B5 Series

CO<sub>2</sub>+VOC's+Temperature&Humidity Monitoring

- Real time indoor air quality detection and alarm
- Monitoring carbon dioxide and VOCs (mix gases)
- Temperature and humidity detection and display
- Three-color backlit LCD for three CO<sub>2</sub> ranges
- Buzzer alarm on/off available
- 1xon/off output option to control a ventilator
- Wall mounting or desktop placement
- Convenient and practical IAQ monitor in low cost
- Excellent performance with easy operation

## Features

- Real time indoor air quality monitoring with CO2 plus VOCs as well as temp.&RH
- NDIR CO2 sensor with Self-Calibration makes the CO2 measurement more accurate and more reliable.
- Up to 15 years lifetime of CO2 sensor
- More than 5 years lifetime of semi-conductor VOCs (mix gases) sensor
- Digital temperature and humidity sensor with more than 10 years lifetime
- Three-color (green/yellow/red) LCD backlight for optimal/moderate/ poor ventilation levels .
- Buzzer alarm available or disable
- Optional 1xrelay output to control a fan
- Easy operation by the touch button
- Perfect performance in low cost for IAQ detection and monitoring
- 100~240VAC or 24VAC/VDC power supply selectable; power adaptor available;
- Desktop and wall mounting
- Application in classrooms, offices, hotels and other public rooms



## Monitoring Focus

### Carbon Dioxide (CO2)

- High quality NDIR CO<sub>2</sub> sensor with up to 15 year lifetime
- ABC self-calibration technology guarantees reliable CO<sub>2</sub> measurement
- CO<sub>2</sub> range: 0~2000ppm or 0~5000ppm
- Rapid response, high stability and consistency

### Mix Gases including VOC(VOCs or TVOC)

VOCs sensor is a mix gases sensor with high sensitivity for VOC (kinds of volatile pollutant gases) such as ammonia, toluene, formaldehyde and cigarette smoke, alcohol, H<sub>2</sub>S, and carbon monoxide. So it is very suitable to detector the general indoor air quality in real time and long term. It responds quickly to any change of the concentration of such gases.

- TVOC should display six levels but no VOC actual number.



LCD Display

- Semi-conduct mix gases sensor with 5~7 years life time
- High sensitive to volatile gases like ammonia, toluene, formaldehyde, cigarette smoke, alcohol, H2S, etc.

### Temperature and humidity

Switzerland digital temperature/humidity sensor in with high accuracy and stability. It also has compensation to CO2 and VOCs measurements.

## Specifications

Monitoring parameters	CO <sub>2</sub>	VOCs	Temperature	Relative humidity
<b>Sensor</b>	Non-Dispersive Infrared Detector (NDIR)	Semiconductor mix gases sensor	Digital combined temperature and humidity sensor	
<b>Measuring range</b>	0~5000ppm	1~30ppm	-20~60°C	0~100%RH
<b>Display Resolution</b>	1ppm	5ppm	0.1°C	0.1%RH
<b>Accuracy@25°C(77°F)</b>	±60ppm + 3% of reading	±10%	±0.5°C	±4.5%RH
<b>Life time</b>	15 years (normal)	5~7 years	10 years	
<b>Stability</b>	<2%	—	<0.04°C per year	<0.5%RH per year
<b>Calibration cycle</b>	ABC Logic Self Calibration	—	—	—
<b>Response Time</b>	<2 minutes for 90% change	<1 minute (for 10ppm hydrogen, 30ppm ethanol) <5 minute (for a cigarette) in 20m <sup>2</sup> room	<10 seconds to reach 63%	
<b>Warm up time</b>	72 hours (first time) 1 hour (operation)			
<b>Electrical Characteristics</b>				
<b>Power supply</b>	100~240VAC 12~24VAC/VDC with the power adaptor available			
<b>Consumption</b>	3.5 W max. ; 2.5 W avg.			

Display and Alarm	
LCD Display	<b>Green:</b> CO <sub>2</sub> <1000ppm (optimal air quality) VOCs: — or — — (low pollution)
	<b>Yellow:</b> CO <sub>2</sub> >1000ppm (moderate air quality) VOCs: — — — or — — — — (medium pollution)
	<b>Red:</b> CO <sub>2</sub> >1400ppm (poor air quality) VOCs: — — — — — or — — — — — — (heavy pollution)
	Two modes selectable: both CO <sub>2</sub> and VOCs over the above setpoints(default) Either CO <sub>2</sub> or VOCs over the above setpoint
Conditions of Using and Mounting	
Operation conditions	-10~50°C (14~122°F); 0~95%RH, non condensing
Storage conditions	0~50°C (32~122°F) / 5~90%RH
Weight	200g
Dimensions	130mm(L)×85mm(W)×36.5mm(H)
Installation	Desktop or wall mount (65mm×65mm or 85mmX85mm or 2"×4" wire box)
Housing IP class	PC/ABS, protection class: IP30

## Applications

The IAQ monitor is designed to monitoring room air quality including CO<sub>2</sub> and VOCs, as well as room temperature and humidity. It detects and monitors indoor IAQ level. It provides one on/off output to control a ventilator according with the CO<sub>2</sub> or VOCs measurement or according with both of them.

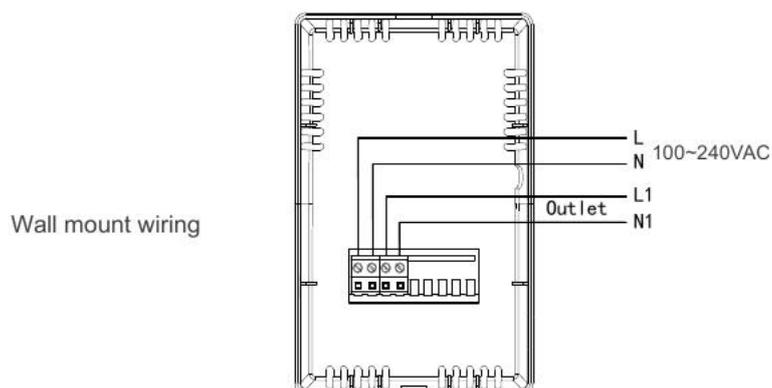
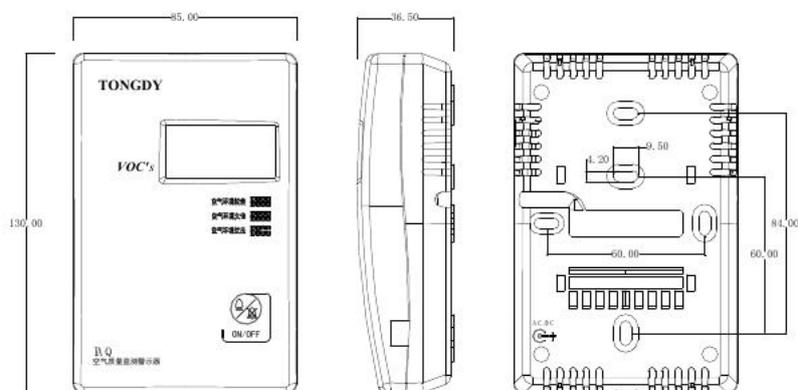
It provides both buzzer alarm and three colors backlit switching alarm.

- Hotel, exhibition hall, hospital, shop, restaurant, air port, train station, theater and other public places
- House, villa, office, meeting room, classroom and other rooms
- All ventilation systems

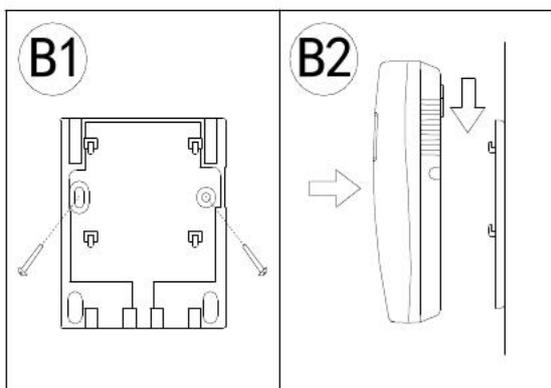
## Models Guide

Model	Name	Description	Power Supply
<b>G01-CO2-B530C</b>	CO2, VOCs, temperature and humidity monitor/alarm	Three-color backlit LCD, buzzer alarm	24VAC/VDC, with DC power socket
<b>G01-CO2-B540C</b>	CO2, VOCs, temperature and humidity monitor/controller	Three-color backlit LCD, buzzer alarm; 1 on/off output; a touch key for operation a touch-key for operation	24VAC/VDC
<b>G01-CO2-B540D</b>	CO2, VOCs, temperature and humidity monitor/controller	Three-color backlit LCD, buzzer alarm; 1 on/off output; a touch-key for operation	100~240VAC
<b>921</b>	Wall-mounting plate	Use for wall mounting. See below figure	Just for G01-CO2- B541D
<b>922</b>	Desktop Bracket	Can be used for wall mounting type to the desktop type	Just for G01-CO2- B532C
<b>870</b>	Power adaptor	input:100~240VAC output:DC24V/240mA	Just for G01-CO2-B532C

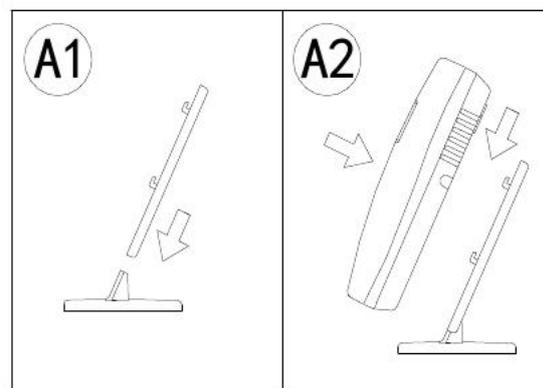
## Mounting and Dimensions



Wall mounting plate-921



Desktop bracket-921+922



# IAQ Transmitter of CO<sub>2</sub> and VOCs



## Applications

- CO<sub>2</sub> plus VOCs detection and transmitting
- Using for building ventilation systems
- Industry ventilation systems
- Public places for air quality real time detection, like offices, schools, airports, gyms



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## Product No: G01-IAQ Series

- Real time detection and transmission of carbon dioxide and air quality (TVOC)
- High accuracy temperature and relative humidity detection
- Up to 3xanalog linear outputs for measurements
- Modbus RS485 interface
- Optional LCD display
- CE-approval

## Features

- Designed for real time measuring indoor air quality including carbon dioxide, TVOC, temperature and relative humidity is optional.
- NDIR infrared CO2 sensor with Self Calibration and up to 15 years lifetime.
- Mix gases sensor with high sensitivity for VOC and cigarette.
- Integrated digital humidity and temperature sensor with high precision.
- 2 or 3 analog outputs for CO2, air quality (VOC's) and temperature or relative humidity.
- LCD or without LCD selectable, display CO2, temperature and humidity measurements as well as VOCs level.
- Modbus RS485 interface optional
- 24VAC/VDC power supply
- EU standard



## Detection Focus

### Carbon Dioxide (CO2)

- High quality NDIR CO<sub>2</sub> sensor with up to 15 year lifetime
- ABC self-calibration technology guarantees reliable CO<sub>2</sub> measurement
- CO<sub>2</sub> range: 0~2000ppm or 0~5000ppm
- Rapid response, high stability and consistency

### Mix Gases including VOC(VOCs or TVOC)

VOCs sensor is a mix gases sensor with high sensitivity for VOC (kinds of volatile pollutant gases) such as ammonia, toluene, formaldehyde and cigarette smoke, alcohol, H<sub>2</sub>S, and carbon monoxide. So it is very suitable to detector the general indoor air quality in real time and long term. It responds quickly to any change of the concentration of such gases.

- TVOC should display six levels but no VOC actual number.
- Semi-conduct mix gases sensor with 5~7 years life time
- High sensitive to volatile gases like ammonia, toluene, formaldehyde, cigarette smoke, alcohol, H<sub>2</sub>S, etc.



### Temperature and humidity

Switzerland digital temperature/humidity sensor in with high accuracy and stability. It also has compensation to CO2 and VOCs measurements .

## Applications

- CO2 plus VOCs detection and transmitting
- Building ventilation systems
- Industry ventilation systems
- Public places for air quality real time detection, like offices, scholls, airports, gyms etc.

## Specifications

Monitoring parameters	CO <sub>2</sub>	Air Quality (VOCs)	Temperature	Relative humidity
<b>Sensing element</b>	NDIR CO2 sensor	Semiconductor mix gases sensor	Integrated temperature and humidity sensor	
<b>Measuring range</b>	0~2,000ppm(default) 0~5,000ppm (selectable in the order)	1~30ppm	0~50℃ (default) -20~60℃selectable	0~100%RH
<b>Display Resolution</b>	1ppm	0.1ppm	0.1℃	0.1%RH
<b>Accuracy@25℃(77°F)</b>	±30ppm + 3% of reading	±10%	±0.5℃	±3%RH
<b>Life time</b>	15 years (normal)	5~7 years	10 years	
<b>Calibration cycle</b>	ABC Logic Self Calibration	—	—	—
<b>Response Time</b>	<2 minutes for 90% change	<1 minute (for 10ppm hydrogen, 30ppm ethanol) <5 minute (for a cigarette) in 20m <sup>2</sup> room	<10 seconds to reach 63%	

<b>Warm up time</b>	72 hours (first time) 1 hour (operation)
<b>Electrical Characteristics</b>	
<b>Power supply</b>	24VAC/VDC
<b>Consumption</b>	3.5 W max. ; 2.5 W avg.
<b>Outputs</b>	Up to three analog outputs 0~10VDC (default) or 4~20mA (selectable by jumpers) 0~ 5VDC (selected in placing order, cannot be changed)
<b>Modbus interface</b>	RS-485 with Modbus protocol, 19200bps rate, 15KV antistatic protection, independent base address.
<b>Display and Alarm</b>	
<b>LCD Display</b>	White backlit LCD display: CO2+VOC+Temperature&Humidity measurement
<b>Conditions of Using and Installation</b>	
<b>Operation conditions</b>	-20~60°C (-4~140°F); 0~95%RH, non condensing
<b>Storage conditions</b>	0~50°C (32~122°F) / 20~60%RH
<b>Weight</b>	240g
<b>Dimensions</b>	130mm(L)×85mm(W)×36.5mm(H)
<b>Installation</b>	Wall mount (65mm×65mm or 85mmX85mm or 2"×4" wire box)
<b>Housing IP class</b>	PC/ABS, protection class: IP30
<b>Standard</b>	CE-Approval

## Models Guide

G01-IAQ-B X Y C – Z 0 1 – U 02/05 – Tab

**X:** LCD or no LCD

1- basis type without LCD

3- standard type with LCD

(LCD displays real-time measurement of CO2+air quality+Temp.+RH)

**Y:** Power socket

0-without a DC power socket

3-with a DC power socket to connect a power adaptor

**C:** 24VAC/VDC power supply

**Z:** analog output

3-3Xlinear analog outputs for CO2+air quality +Temp.(default)/RH (selectable by jumpers)

2-2Xlinear analog outputs for CO2+air quality

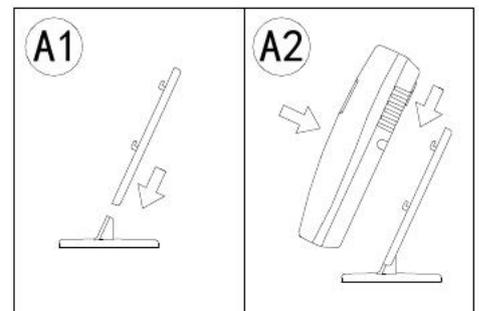
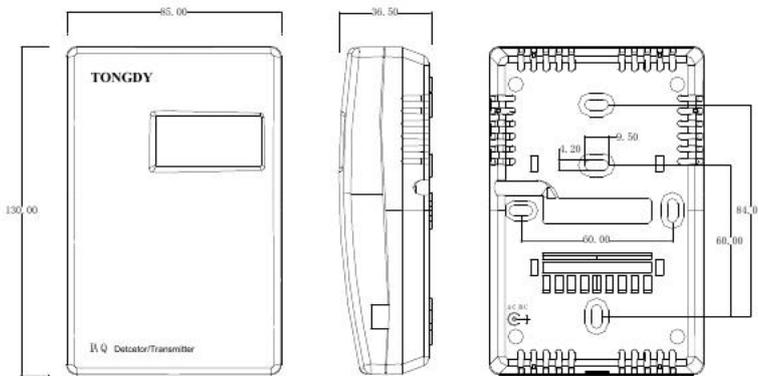
0-no analog output

- U:** analog output type
  - A-** 4~20mA
  - V-** 0~10VDC (default)
  - V05-** 0~5VDC
- 02/05:** CO2 range
  - 02-** 0~2000ppm
  - 05-** 0~5000ppm
- Tab:** temperature scaling
  - T05-** 0~50°C (default)
  - T06-** 0~60°C
  - T26-** -20°C~60°C

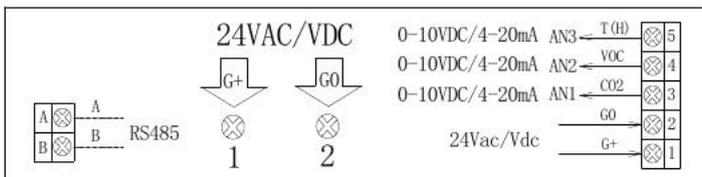
**Accessory** (selectable at placing order)

- 921:** back plate for wall mounting
- 922:** desktop bracket

**Mounting and Wiring**



921+922-Desktop bracket



# In-Duct Transmitter of CO<sub>2</sub> and VOCs



## Applications

- BAS systems
- Ventilation control system
- Green buildings
- HVAC systems



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## Product No: TG9-XX82

- Real time detection in-duct air quality (carbon dioxide and VOCs) as well as detection air temperature and relative humidity
- Smart sensor probe with extendable probe may be easily installed into any air duct
- With the water-proof and porous film around the sensor probe
- Up to 3 analog linear outputs for 3 measurements
- Modbus RS485 interface for 4 measurements
- With or without LCD display
- CE-approval

## Features

- Real time detection of in-duct air quality including CO<sub>2</sub> and VOCs
- NDIR infrared CO<sub>2</sub> sensor with special Self Calibration and up to 15 years' lifetime. It makes CO<sub>2</sub> measurement more accurate and reliable.
- Mix gases sensor with high sensitivity for VOCs from new furniture, wall coverings, office equipment, cleanser etc. and other pollutants from smoking and cooking etc.
- Combined temperature and humidity digital sensor provides a high accuracy measurement in full range.
- Provide up to 3 analog outputs (0~10VDC or 4~20mA or 0~5VDC) for CO<sub>2</sub>, air quality (VOC) and temperature or relative humidity.
- Modbus RS485 interface with outputs for CO<sub>2</sub>, temperature, humidity and air quality (VOC).
- Optional LCD display real-time measurements of CO<sub>2</sub>, air quality (VOC), temperature and relative humidity.
- Extendable probe is applied for more air duct systems
- 24VAC/VDC power supply.
- EU standard and CE-approval.

## Detection Focus

### Carbon Dioxide (CO<sub>2</sub>)

- High quality NDIR CO<sub>2</sub> sensor with up to 15 year lifetime
- ABC self-calibration technology guarantees reliable CO<sub>2</sub> measurement
- CO<sub>2</sub> range: 0~2000ppm or 0~5000ppm
- Rapid response, high stability and consistency

### Mix Gases including VOC(VOCs or TVOC)

VOCs sensor is a mix gases sensor with high sensitivity for VOC (kinds of volatile pollutant gases) such as ammonia, toluene, formaldehyde and cigarette smoke, alcohol, H<sub>2</sub>S, and carbon monoxide. So it is very suitable to detector the general indoor air quality in real time and long term. It responds quickly to any change of the concentration of such gases.

- TVOC should display six levels but no VOC actual number.
- Semi-conduct mix gases sensor with 5~7 years life time
- High sensitive to volatile gases like ammonia, toluene, formaldehyde, cigarette smoke, alcohol, H<sub>2</sub>S, etc.

### Temperature and humidity

Switzerland digital temperature/humidity sensor in with high accuracy and stability. It also has compensation to CO<sub>2</sub> and VOCs measurements .

## Typical Applications

- BAS and BMS
- Ventilation control systems
- Green buildings
- HVAC systems

## Specifications

Monitoring parameters	CO <sub>2</sub>	VOCs	Temperature	Relative humidity
<b>Sensing element</b>	Non-Dispersive Infrared Detector (NDIR)	Semiconductor mix gases sensor	Digital combined temperature and humidity sensor	
<b>Measuring range</b>	0~2000ppm(default) 0~5000ppm (selectable in the order)	0~30ppm	0°C~50°C (32°F~122°F) (default)	0~100%RH
<b>Display Resolution</b>	1ppm	5ppm	0.1°C	0.1%RH
<b>Accuracy@25°C(77°F)</b>	±50ppm + 3% of reading	-----	±0.4°C (0°C~50°C)	±3%RH (20%-80%RH)
<b>Life time</b>	15 years (normal)	5~7 years	10 years	
<b>Calibration cycle</b>	ABC Logic Self Calibration	-----	-----	-----
<b>Response Time</b>	<2 minutes for 90% change	<1 minute (for 10ppm hydrogen, 30ppm ethanol) <5 minute (for a cigarette) in 20m <sup>2</sup> room	<10 seconds to reach 63%	
<b>Warm up time</b>	2 hours (first time) 2 minutes (operation)			
<b>Electrical Characteristics</b>				
<b>Power supply</b>	24VAC/VDC			
<b>Consumption</b>	3.5 W max. ; 2.5 W avg.			
<b>Analog Outputs</b>	Two or three analog outputs 0~10VDC(default) or 4~20mA (selectable by jumpers) 0~5VDC (selected at place the order)			
<b>Modbus RS485 interface</b>	RS-485 with Modbus protocol, 19200bps rate, 15KV antistatic protection, independent base address			
<b>Conditions of Using and Mounting</b>				

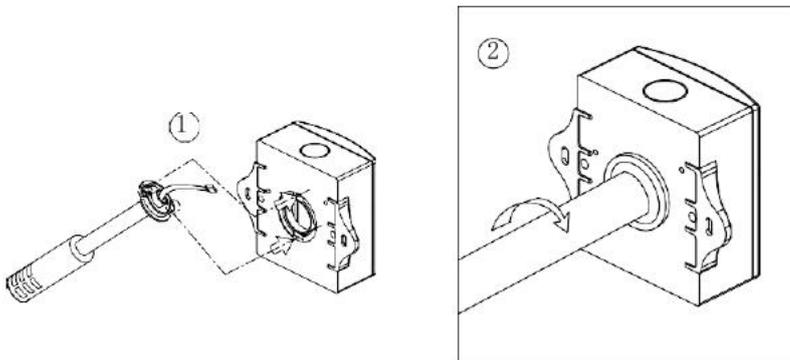
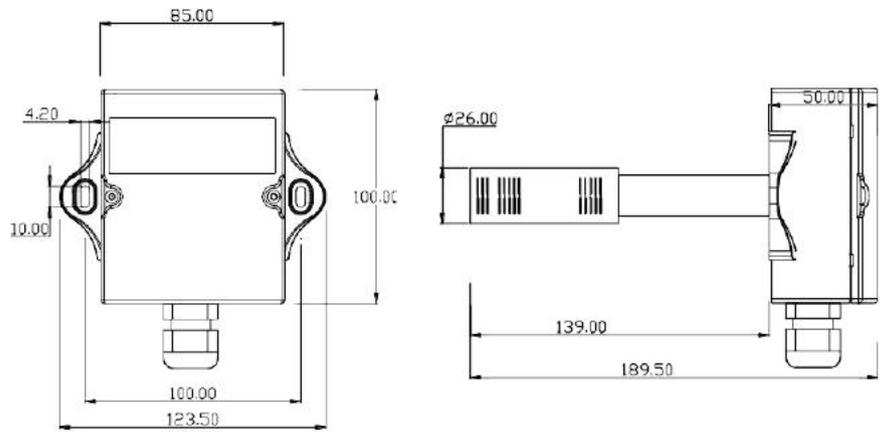


<b>Operation conditions</b>	0~50°C (32~122°F); 0~95%RH, non condensing
<b>Storage conditions</b>	0~50°C (32~122°F) / 5~95%RH
<b>Weight</b>	320g
<b>Installation</b>	Fixed on the air duct with 100mm installation hole size
<b>IP class of the housing</b>	PC/ABS IP50 for models without LCD; IP40 for models with LCD
<b>Standard</b>	CE-Approval

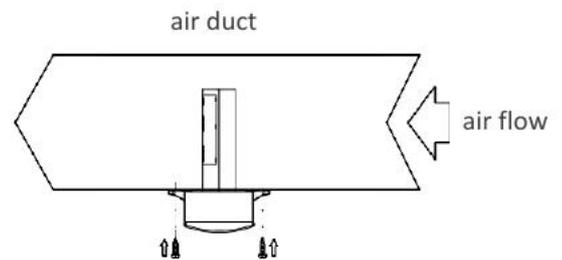
## Dimensions & Mounting

### Duct mounted

- Probe Length 139.00mm  
can be extended to 139+70mm
- Probe Diameter Ø26.00mm
- Installation Holes 100mm



Install or move the probe



The air flow direction

## Models Information

### TG9- X 1 8 2 L - Y 02/05 E - Tab

**X:** analog output

3- 3Xanalog outputs for CO2 + Air Quality (VOC) + Temp. /RH (selectable by jumpers)

2- 2xanalog outputs for CO2 + Air Quality (VOC)

0- no analog output

**1:** Modbus interface

**L:** LCD display

No **L** indicates no LCD

**Y:** Analog output type

**A-** 4~20mA (selectable via jumpers)

**V-** 0~10VDC (default)

**V5-** 0~5VDC (order description)

**02/05:** CO2 measurement range

02- 0~2000ppm (default)

05- 0~5000ppm

**E:** extended duct probe up to 209mm

No **E** indicates the standard probe length of 139mm

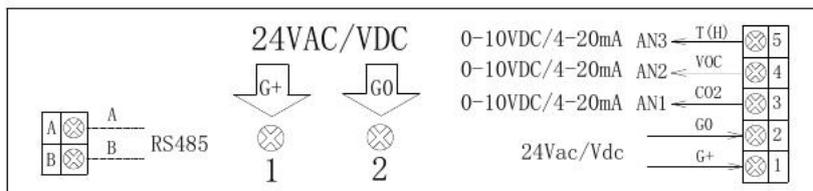
**Tab:** temperature scaling

**T05:** 0°C~50°C(32°F~122°F) default

**T06:** 0°C~60°C(32°F~140°F)

Without the item option indicates no output for temperature measurement.

## Wiring Diagram



# Ozone Monitor and Controller



## Product No: G09-O3

Ozone Monitor and Controller  
1X analog and 1X dry contact outputs  
RS485 interface with Modbus RTU



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- Real time detection and monitoring ambience ozone level
- Electrochemical ozone sensor inside
- 3-color backlight LCD indication and buzzer alarm optional
- Provide 1x relay dry contact outputs and 1x analog output
- Modbus RS485 communication Interface

## Features

- Design for real time detecting and monitoring ambient ozone and temperature, optional humidity monitoring
- Electrochemical ozone sensor with high sensitivity and stability
- Particular LCD display with three color backlight (Green/Yellow/Red for three ozone)
- Optional ozone measuring range: 20~1000ppb or 20~5000ppb.
- 1xOn/Off dry contact output to control an ozone generator or a fan
- 1X analog output (0~10VDC/4~20mA selectable)
- RS485 interface with Modbus RTU. 15 KV antistatic protection, individual IP address
- Temperature measurement and display
- Humidity measurement and display optional
- Multiple application, with wall mounting and desktop type



## Specifications

Gas Sensing	Ozone electrochemical gas sensor
Sensor lifetime	>3 years
Temperature & RH Sensor	High-precision capacitive sensor
Power Supply	24VAC/VDC (power adaptor optional)
Power Consumption	2.8W /Ave.
Response Time	<60s @T90
Signal Update	1s
Warm up Time	<60 seconds
Ozone Measuring Range	20~1000ppb ( 40~1996.6 ug/m <sup>3</sup> @20℃) default 20~5000ppb ( 40~9.81 mg/m <sup>3</sup> ) optional in purchasing
Display Resolution	1ppb
Accuracy	±10ppb + 10% reading
Nonlinear	<1%FS
Repeatability	<0.5%

Alarm	Buzzer sounds and Red backlight display
Display	<b>Green</b> – <30% ozone range <b>Orange</b> – 30%~70% ozone range <b>Red</b> – >70% ozone range
Temperature/humidity Range	0°C~60°C (32°F~140°F) /0~80%RH
Analog Output	0~10VDC(default) or 4~20mA linear output selectable
Analog Output Resolution	16Bit
Relay dry contact output	Max switching current 3A (220VAC/30VDC), resistance Load
RS485 Communication Interface	Modbus RTU protocol with 19200bps(default) 15KV antistatic protection
Working Condition/Storage Conditions	5°C~60°C (41°F~140°F) / 0~ 80% RH
Net Weight	190g
Dimensions	130mm(H)×85mm(W)×36.5mm(D)
Installation Standard	65mm×65mm or 85mm×85mm or 2"×4" wire box
Interface Connection (Max)	9 terminals
Wiring Standard	Wire section area<1.5mm <sup>2</sup>
Manufacturing Process	ISO 9001 Certified
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Compliance	EMC Directive 89/336/EEC

## Models

### G09-O3-X111-Y

1x 0~10VDC output  
1x dry contact output  
RS485 interface

### G09-O3-X211-Y

1x 4~20mA output  
1x dry contact output  
RS485 interface

**X:** 2- Ozone and temperature detection  
3-Ozone and Temp.&RH detection

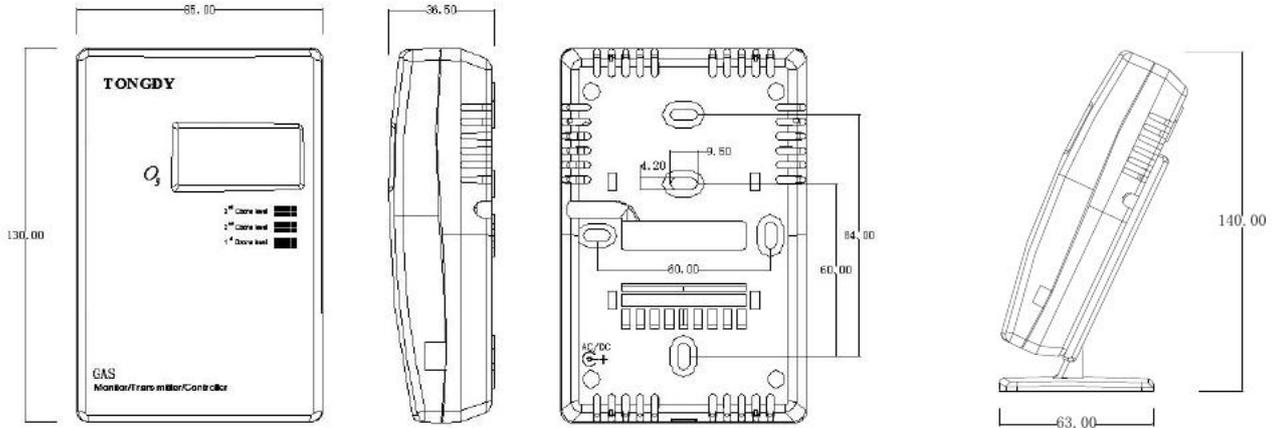
**Y**—Ozone range

B10- 20~1000ppb (default)

B50- 20~5000ppb

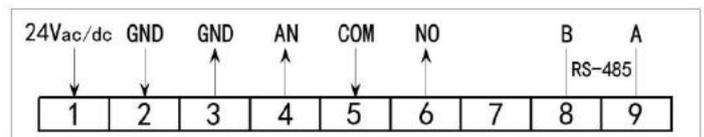
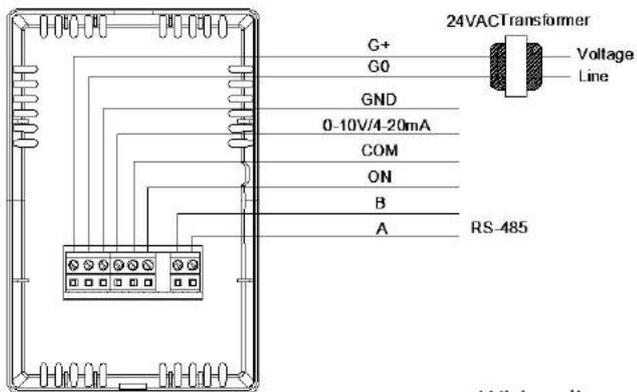


## Mounting and Wiring Diagrams



Wall mounting

Desktop placement



Wiring diagram

# Ozone Detector and Controller



## Applications

- Real-time measure ozone in air
- Control ozone generator or ventilator.
- Detect ozone data and connect to BAS system.
- Sterilization and disinfection/ Health supervision/ Fruit and vegetable ripening/ Air quality detection etc.

## Product No:TSP-O3

## Features

- Real-time detecting and monitoring ambience ozone concentration
- Electrochemical ozone sensor inside, with temperature compensation.
- Humidity monitoring optional.
- Alarm buzzer is available with setpoint preset
- Ozone sensor module design, easy to replace.
- Optional OLED display with operation buttons.
- One relay output to control an ozone generator or ventilator, with two control way and setpoints selection.
- One analog output for ozone measurement value.
- Modbus RS485 communication, WiFi is optional
- 24VAC/VDC power supply.



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## Applications

- Real-time measure ozone in air
- Control ozone generator or ventilator.
- Detect ozone data and connect to BAS system.
- Sterilization and disinfection/ Health supervision/ Fruit and vegetable ripening/ Air quality detection etc.

## Specifications

General Data	
Power Supply	24VAC/VDC±20% A power adaptor of 100~240VAC/24VDC selectable
Power Consumption	2.0W (average power consumption)
Wiring Standard	Wire section area <1.5mm <sup>2</sup>
Working Condition	-20~50℃/ 15~95%RH
Storage Conditions	0℃~35℃,0~90%RH (no condensation)
Dimensions/ Net Weight	95(W)X117(L)X36(H)mm / 260g
Manufacturing Process	ISO 9001 Certified
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Compliance	CE-EMC certified
Sensor Data	
Sensing Element	Electrochemical Ozone sensor
Sensor lifetime	>2 years, Sensor modular design, easy to replace.
Warm up Time	<60 seconds
Response Time	<120s @T90
Signal Update	1s
Measuring Range	0-500ppb/1000ppb(default)/5000ppb/10000ppb      optional
Accuracy	±20ppb + 5% reading
Display Resolution	1ppb (0.01mg/m <sup>3</sup> )

Stability	±0.5%
Zero Drift	<1%/Y
Humidity Detection	Option
<b>Outputs</b>	
Analog Output	One 0-10VDC or 4-20mA linear output for ozone detection
Analog Output Resolution	16Bit
Relay dry contact Output	One relay output to control an ozone generator or a fan Max, switching current 5A (250VAC/30VDC), resistance Load
Communication Interface	Modbus RTU protocol with 9600bps (default) 15KV antistatic protection WiFi is optional
LED Light	Green light: normal working Red light: Alarm or ozone sensor faulty
Display Screen (optional)	OLED display ozone and temperature and RH

## Models Guide

Model		Description
<b>Ozone Monitor / Controller</b>	TSP-O3-D0100	One relay output, display screen
	TSP-O3-D0110	One relay output, Modbus RS485 with display screen
	TSP-O3-D1010	One analog output, Modbus RS485 with display screen
	TSP-O3-D1100	One analog output, one relay output, Modbus RS485 with display screen..
	TSP-O3-B1010	One analog output, Modbus RS485. No display screen.
	TSP-O3-W021	WiFi interface

1、Above models with suffix –RH: Humidity detection.

2、Above models with suffix to choose measuring range:

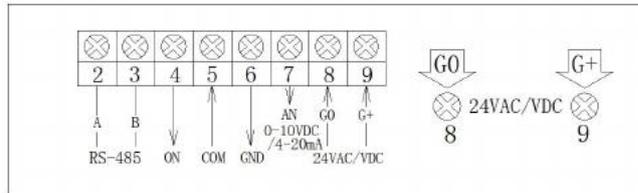
-005 means 0~500ppb

-010 means 0~1000ppb (default)

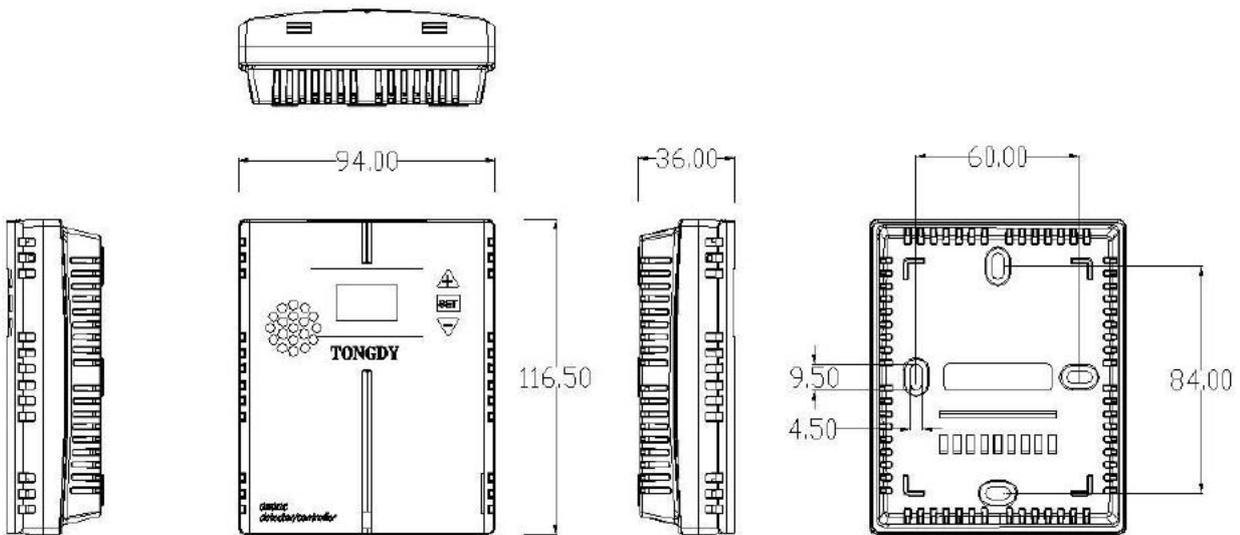
-050 means 0~5000ppb

-100 means 0~10000ppb

## Wiring Diagrams



## Mounting



Wall space mounting with the bracket



# Carbon Monoxide Transducer



## Applications

- Commercial carbon monoxide detector and transducer
- Ventilation control for indoor parking garages
- Recreational vehicle CO detectors
- Kitchen rooms and restaurants
- Freezing machine rooms and other places where air quality is easy to worsen

## Product No:F2000TSM-CO-C101

- Real time detect and transmit air carbon monoxide
- High quality electrochemical sensor inside with up to five years lifetime
- 1x analog output for linear measurement
- Modbus RS485 interface
- The highest performance with the lowest price

Design for real time detection air carbon monoxide concentration in enclosed or semi-enclosed places like car parks. According to the measurements of carbon monoxide to control ventilation systems or alarm .



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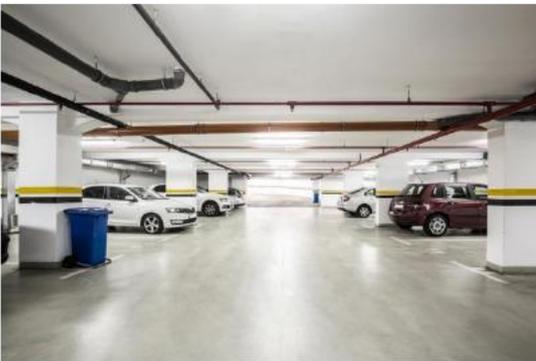
[info@tongdy.com](mailto:info@tongdy.com)

## Features

- Wall mounting, real time detect carbon monoxide of 0~100ppm range or optional 0~200pm/ 0~500ppm.
- Electrochemical sensor from Japanese Figaro offers several advantages over traditional electrochemical sensors.
- With the long lifetime character, the detector has perfect long term stability, and high accuracy.
- Especially the inside sensor is environmentally friendly without risk of electrolyte leakage.
- One analog output of the measurement of carbon monoxide with 0~10V or 4~20mA selectable
- Special built-in Self-Zero Correction algorithm.
- Modbus RS-485 communication with 15KV antistatic protection, also can be calibrated carbon monoxide measurement via the interface



## Typical Applications



- Commercial carbon monoxide detector and transducer
- Ventilation control for indoor parking garages
- Recreational vehicle CO detectors
- Kitchen rooms and restaurants
- Freezing machine rooms and other places where air quality is easy to worsen

## Specifications

### General Data

Power Supply	24VAC/VDC
Consumption	1.5 W
Wiring connections	5 terminal blocks (max.)
Operation temperature	0~60°C(32~140°F)
Operation humidity	5~99%RH, non condensing

Storage conditions	0~50°C (32~122°F)
Net Weight	190g
Dimensions	100mm×80mm×28mm
Installation standard	65mm×65mm or 2"×4" junking box
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP30
Compliance	EMC Directive 89/336/EEC

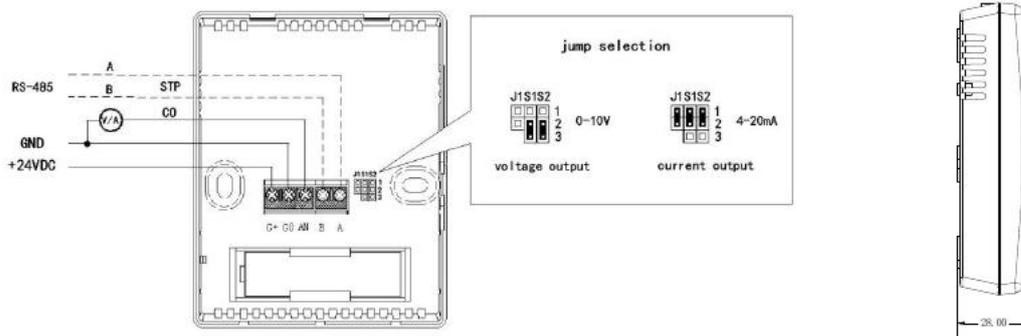
### CO Measurement

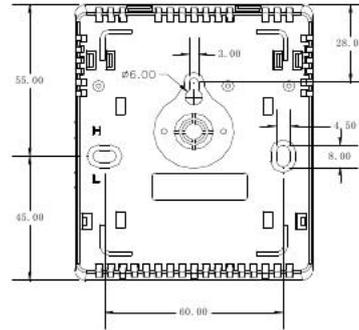
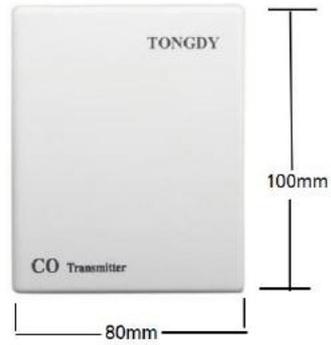
Gas detected	Carbon monoxide
Sensing element	Electrochemical sensor
Gas sample mode	Diffusion
Warm up time	1 hour (first time)
Response Time	Within 60 seconds
Signal Update	1s
CO Measuring Range	0~100ppm(default) 0~200ppm/0~500ppm    selectable in purchasing
Accuracy	<1ppm±3%
Stability	±5% (over 900 days)

### Outputs

Linear analog output	1x0~10VDC or /4~20mA
D/A resolution	16 bit
D/A conversion accuracy	0.1ppm
	Modbus RTU
RS485 Communication interface	9600,14400,19200(default), 28800, 38400 bps (programmable selection), 15KV antistatic protection

## Mouting and Wiring





## Models

ITEM	MODEL	DESCRIPTION
Carbon Monoxide Tranducer	F2000TSM-CO-C001	Carbon monoxide tranducer with Modbus RS485 communication interface
	F2000TSM-CO-C101-V/A	Carbon monoxide tranducer with one 0~10VDC/4~20mA output. Modbus RS485 communication interface

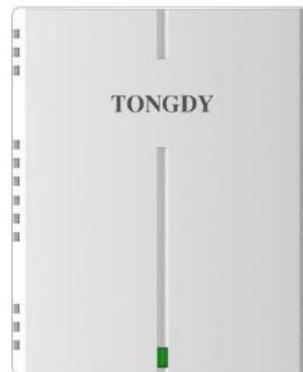
CO range(postfix after the model):

001: 0~100ppm (default)

002: 0~200ppm

005: 0~500ppm

# Carbon Monoxide Transducer and Controller



## Applications

- Underground parking lots
- BMS systems
- Monitoring and warning CO and smoking
- All ventilation control systems



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**Product No: TSP-CO**

## Features

- Real-time monitoring air carbon monoxide concentration and temperature
- Industrial class structure design for housings, which are firm and durable
- High quality Japanese carbon monoxide sensor inside, up to 5 years lifetime
- Modbus RTU or BACnet -MS/TP communication optional
- OLED display optional
- Three-color light indicates three CO ranges
- Buzzer alarm for setpoint
- Sensor coverage up to 30 meters radius subject to air movement.
- 1x 0-10V or 4-20mA analog linear output for CO measured value
- One or two on/off relay outputs to control a fan or a fan and alarm
- 24VAC/VDC power supply

## Typical Applications

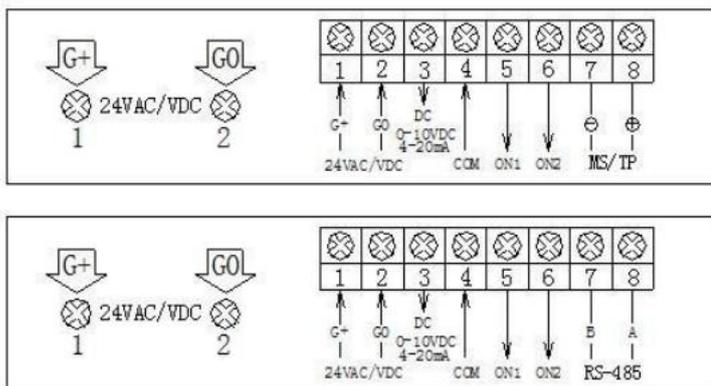
- Underground parking lots
- BMS systems
- Monitoring and warning carbon monoxide and smoking
- All ventilation control systems

## Specifications

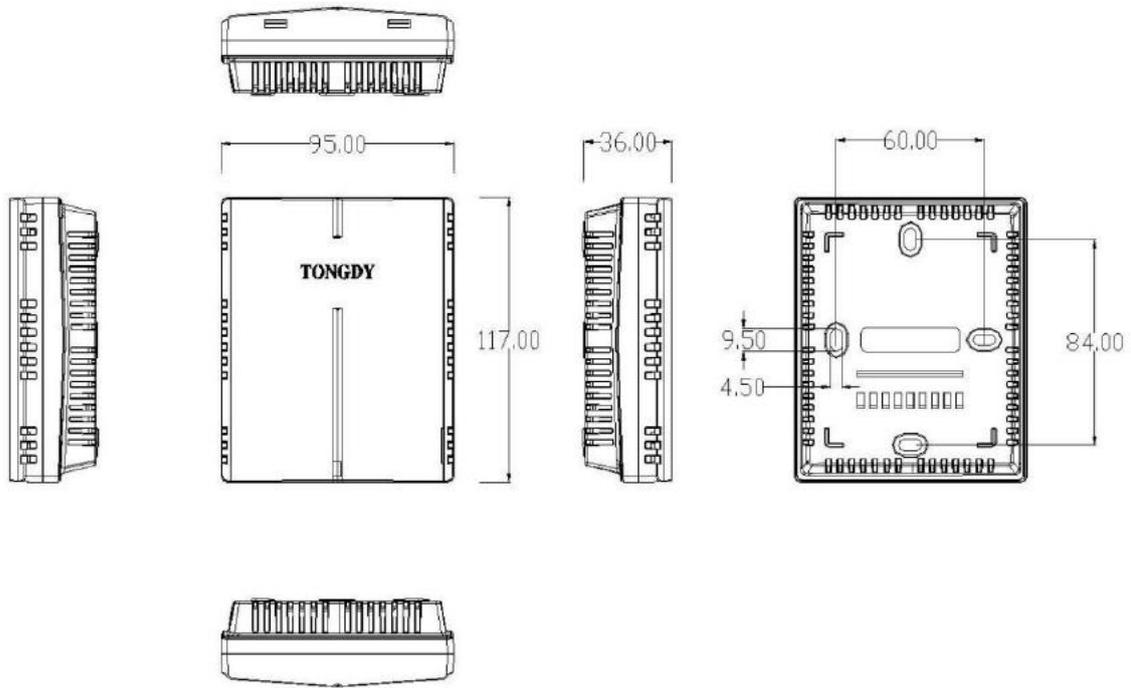
Parameters	
Power Supply	24VAC/VDC
Power Consumption	2.8W
Connection Standard	Wire cross-sectional area<1.5mm <sup>2</sup>
Operating Environment	-5-50℃ (0-50℃ for TSP-DXXX) , 0~95%RH
Storage Environment	-5-60℃/ 0~95%RH,non-condensing
Dimension/Net Weight	95mm(W)*117mm(L)*36mm(H) / 280g
Manufacturing Standard	ISO 9001
Housings and IP class	PC/ABS fire-proof material; IP30 protection class
Design Standard	CE-EMC Approval
Sensor	
CO Sensor	Japanese Electrochemical CO Sensor
Sensor Lifetime	Up to 5 years and replaceable
Warm Up Time	60 minutes(First use),1 minute(daily use)
Response Time(T90)	<130 seconds
Signal Refreshing	One second
CO Range (Optional)	0-100ppm(Default)/0-200ppm/0-300ppm/0-500ppm
Accuracy	<±1 ppm + 5% of reading (20℃/ 30~60%RH)
Stability	±5% (over 900 days)
Temperature Sensor	Capacitive sensor

Measuring Range	-5°C-50°C
Accuracy	±0.5°C (20~40°C)
Display Resolution	0.1°C
Stability	±0.1°C/year
<b>Outputs</b>	
LCD Display(Optional)	OLED screen, display real-time measured values with CO & Temp or CO, Temp & RH. (LCD display is required for models with relay outputs)
Analog Output	1x0-10VDC/4-20mA linear output for CO measured value
Analog Output Resolution	16Bit
Relay Dry Contact outputs	One or two on/off relay outputs, max current 5A (230VAC/30VDC),  One relay is for CO concentration by controlling a fan. Two relays are for CO concentration by controlling two stage fan(default), or for CO and temperature control.
RS485 Communication (Optional)	.Modbus RTU, Communication Baud:9600bps(Default) .BACnet MS/TP, Communication Baud:9600bps(Default) 15KV anti-static protection
Indicating light	Green: normal work with flashing every 5 seconds Red : when CO reaches alarm setpoint
Buzzer Alarm	When CO concentration exceeds the alarm setpoint, the buzzer will ring
<b>Alarm Standards</b>	
Audible alarm and CO set point	Chinese Standard: GB15322 European Standard: EN50291 (Default) American Standard: UL2034
<b>Calibration Functions (Follow-up Supply )</b>	
DIP Switches	Used for zero calibration mode setting
Sensor air chamber Accessories	Connect windpipe, cover the air chamber to make zero calibration

## Wiring Diagram



## Dimension and Mounting



## Models Guide

Models		Descriptions
CO Transducer	TSP-CO-B100	1x0~10V / 4~20mA analog output for CO value
	TSP-CO-B101	1x0~10V / 4~20mA analog output for CO value with Modbus RS485 interface
	TSP-CO-B102	1x0~10V / 4~20mA analog output for CO value with BACnet interface
	TSP-CO-B001	Modbus RS485 interface
	TSP-CO-B002	BACnet interface
CO Controller (with OLED)	TSP-CO-D010	1x relay output for CO value
	TSP-CO-D020-T	2x relay outputs for CO (default) Can be preset 2x relay outputs for CO and temperature
	TSP-CO-D110	1x relay output , and 1x0~10V / 4~20mA analog output for CO value

	TSP-CO-D101	1x0~10V / 4~20mA analog output for CO value with Modbus RS485 interface
	TSP-CO-D102	1x0~10V / 4~20mA analog output for CO value with BACnet interface

Notice:

1.All models with -T suffix mean this model has temperature measuring

2.Suffix CO range selection for all models:

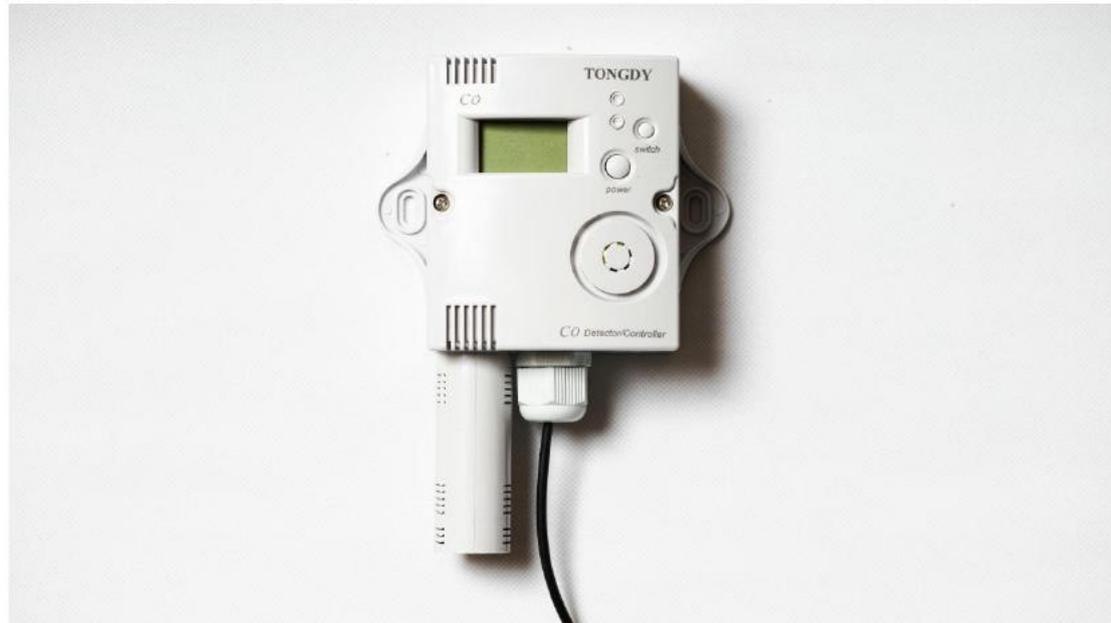
-001: 0~100ppm

-002: 0~200ppm

-003: 0~300ppm

-005: 0~500ppm

# Carbon Monoxide Controller



## Applications

- In underground parking lots and garages to detect CO and control ventilators
- In offices and public places to detect and control CO concentration
- Detect CO concentration in BAS systems
- For all ventilation control systems

## Product No: TKG-CO

### Features

- Design for real-time detection air carbon monoxide.
- High accuracy humidity and temperature detection optional
- LCD display carbon monoxide and optional temperature & RH measurement.
- Smart buttons for easy operation
- Excellent electrochemical CO sensor with up to 5 years life time in typical use
- CO sensor is replaced
- Provide 1X analog linear output (0~10VDC/4~20mA selectable) for the measurement
- Providing up to two dry contact outputs which are controller the setpoint
- RS485 Modbus /BACnet interface optional
- 24VAC/VDC power supply



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## Typical Applications



- In underground parking lots and garages to detect CO and control ventilators
- In offices and public places to detect and control CO concentration
- Detect carbon monoxide in BAS systems
- For all ventilation control systems

## Specifications

Sensors		
Gas Sensor	Electrochemical carbon monoxide sensor	
Sensor lifetime	Typically up to 5 years	
Warm up time	60 minutes (for the first time use)	
Response Time	Within 60 seconds	
Signal Update	1s	
CO Measuring Range	0~100ppm(default)/0~200ppm/0~500ppm selectable	
Accuracy	<1ppm+5%reading	
Stability	±5% (over 900 days)	
Temperature & Humidity Sensor (optional)	Temperature	Relative Humidity
Sensing element:	digital temperature and relative humidity sensor platform	
Measuring range	-10°C~60°C	0 -100%RH
Accuracy	±0.5°C (20~40°C)	±4.0%RH (25°C, 15%-85%RH)
Display resolution	0.1°C	0.1%RH
Stability	±0.1°C per year	±1%RH per year
Outputs		
LCD Display (optional)	Display real time CO measurement or CO+ temperature& humidity measurements	

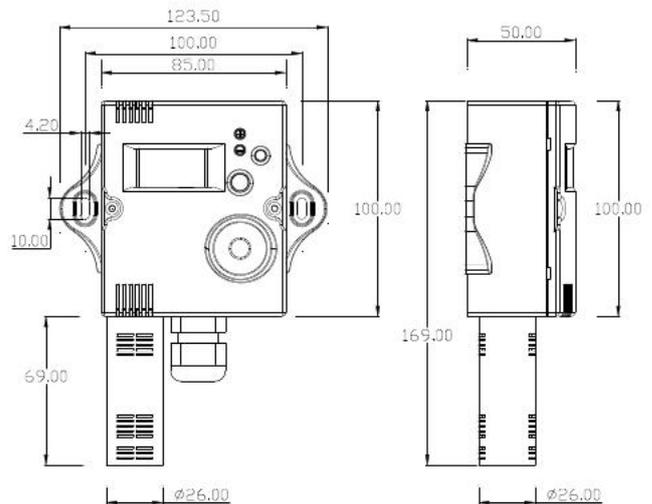
Analog Output	1X0~10VDC or 4~20mA linear output for CO measurement
Analog Output Resolution	16Bit
Relay dry contact Output	Up to two dry-contact outputs Max, switching current 5A (230VAC/30VDC), resistance Load
RS485 communication interface	Optional Modbus RTU protocol with 38400bps(default), Or BACnet MS/TP protocol with 38400bps(default)

**Electrical and General Items**

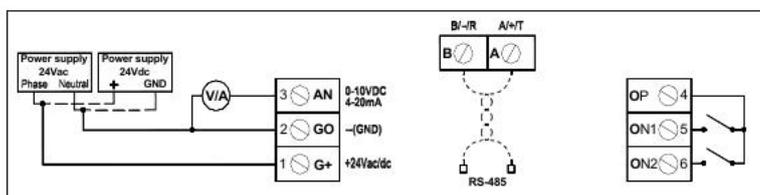
Power Supply	24VAC/VDC
Power Consumption	2.8W
Wiring Standard	Wire section area<1.5mm <sup>2</sup>
Working Condition	-10℃~60℃(14~140°F); 5~99%RH, non condensing
Storage Conditions	-10~60℃(14~140°F) / 5~99%RH, non condensing
Net Weight	260g
Manufacturing Process	ISO 9001 Certified
Housing and IP class	PC/ABS fireproof plastic material, protection class: IP40
Compliance	CE-EMC Approval

## Dimensions & Mounting

probe Length            69.00mm  
 Probe Diameter        Ø26.00mm  
 Installation Holes      100.00mm



## Wiring Diagrams



## Models Guide

### TKG-CO-1XYZC-R-TH/T

1: wall mounted with the external sensor in an adown probe

X: analog output

0: no analog output

1: 1x0~10VDC linear output(default)

2: 1X4~20mA linear output (default)

3: 1X0~10VDC output and can be switch to 4~20mA (just for only one analog output)

Y: relay dry contact output

0: no dry contact output

1: 1xdry contact output

2: 2xdry contact outputs

Z: Communication interface

0: no communication interface

1: Modbus RS485

9: BACnet communication

C: 24VDC/VAC power supply

R: co range

001: 0~100ppm (default)

002: 0~200ppm

005: 0~500ppm

-TH(option) temperature & RH detection and display

- T(option) temperature detection and display

-NL(option) No LCD display, only for the CO detector without the relay output.

For example: **TKG-CO-1101-001-TH** indicates the CO detector with 1X0~10VDC linear output and Modbus interface. CO range:0~100ppm. It has temperature and humidity detection and display.

# Carbon Monoxide Monitor & Controller



## Product No: GX-CO Series

### Applications

- Underground parking lots
- BMS systems
- Public places monitoring and warning
- All ventilation control systems

### Features

- Real-time monitoring air Carbon Monoxide concentration with optional temperature and humidity detection.
- Display real-time CO measurement values and 1-hour average
- Carbon monoxide module replaceable, longer than 5 years of sensor life
- 1x 0- 10V or 4-20mA analog linear output for CO measured value
- 2 on/off relay outputs for CO and temperature control
- Modbus RTU or BACnet -MS/TP communication optional
- Buzzer alarm for setpoint of carbon monoxide
- Zero calibration operation
- Provides powerful setting functions for different control requirements
- 24VAC/VDC power supply

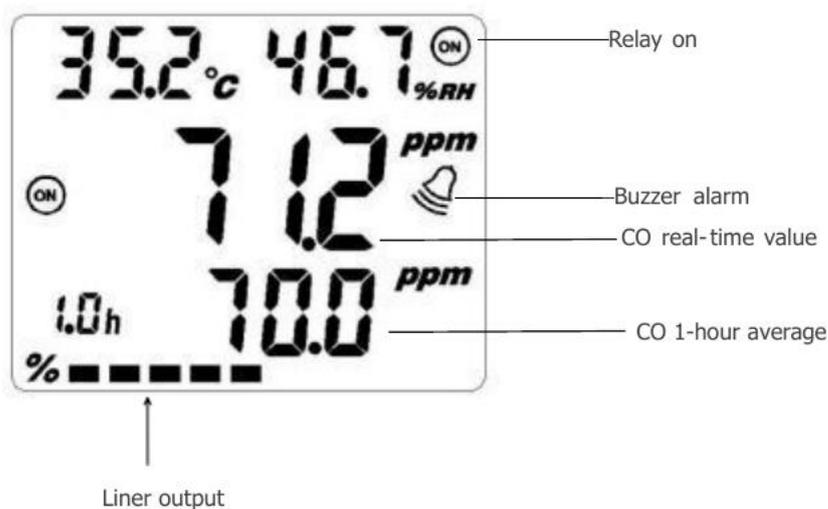


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## Display



## Applications



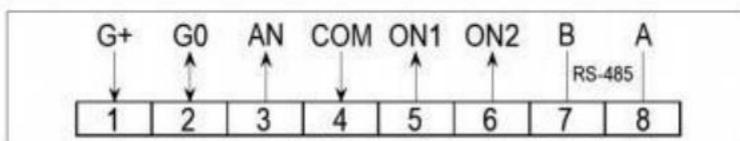
- Underground parking lots
- BMS systems
- Public places monitoring and warning
- All ventilation control systems

## Specifications

General Data	
Power Supply	24VAC/VDC±20%
Power Consumption	3.2W
Connection Standard	Wire cross-sectional area<1.5mm <sup>2</sup>
Operating Environment	-20-60C, 0~95%RH
Storage Environment	0-60C/ 0~90%RH, non-condensing
Dimension/ Net Weight	150mm(L) ×90mm(W) ×42mm(H)

Manufacturing Standard	ISO 9001
Housings and IP class	PC/ABS fire-proof material; IP30 protection class
Design Standard	CE-EMC Approval
<b>Sensor</b>	
CO Sensor	Figaro electrochemical sensor
Sensor Lifetime	More than 5 years Replaceable sensor module
Warm Up Time	120 seconds(daily use) Recommend 24 hours continuous power on to ensure data stabilityf or the first time usage or for the reusage after long-term power off
Response Time	< 120 seconds
Signal Refreshing	One second
CO Range (Optional)	0- 100ppm(Default)/0-200ppm/0-300ppm/0-500ppm
Accuracy	< 1ppm±3%
Stability	±5% (over 900 days)
Temperature Sensor(Optional)	Capacitive sensor
Measuring Range	- 20 C-60 C
Accuracy	±0.5C ( 10~40C)
Display Resolution	0.1 C
Stability	±0. 1C/year
<b>Outputs</b>	
LCD Display(Optional)	Display real-time measured values of carbon monoxide and temp.Humidity if optional
Analog Output	1x0- 10VDC/4-20mA linear output for CO measured value
Analog Output Resolution	16Bit
Relay Dry Contact outputs	One or two on/off relay outputs, max current 5A (230VAC/30VDC), Resistive load separately controls CO and Temperature
RS485 Communication (Optional)	.Modbus RTU, communication baud:9600bps(Default) .BACnet MS/TP optional, communication baud:9600bps(Default) 15KV anti-static protection
Red Backlight Alarm	LCD will be red after CO concentration exceeds the alarm setpoint
Buzzer Alarm	Buzzer alarm once CO concentration exceeds the alarm setpoint The alarm can be temporarily turned off manually
<b>Zero Calibration</b>	
Combination buttons to operate	Place the GX-CO in an environment with carbon monoxide being zero, press the combination buttons to perform zero point calibration

## Wiring Diagrams



## Models Guide

Models		Descriptions
Carbon Monoxide Monitor and Controller	GX-CO- 100	1x0~ 10V / 4~20mA liner output for CO value
	GX-CO- 110	1x0~ 10V / 4~20mA liner output for CO value 1x on/off relay output for CO concentration control
	GX-CO- 111	1x0~ 10V / 4~20mA liner output for CO value 1x on/off relay output for CO by control a fan Modbus RS485 interface
	GX-CO- 120	1x0~10V / 4~20mA liner output for CO value 2x on/off relay output to control CO and temperature or control a 2-speed fan
	GX-CO-001	Modbus RS485 interface
	Suffix -T	Temperature detection
	Suffix -TH	Temp. & RH detection
	Last suffix	CO measurement range

**Notice:**

Last suffix means CO range selection

- 001: 0~100ppm (default)
- 002: 0~200ppm
- 003: 0~300ppm
- 005: 0~500ppm

# Room IAQ Monitor / Alarm



## Applications

- Ambiance air quality detection and alarm
- Ventilation systems
- Air cleaning systems
- Bas systems
- Offices, schools and other indoor spaces



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## Product No: G02-VOC

- Real time indoor air quality detection and alarm
- High sensitivity to VOC and other indoor contaminative gases
- Temperature and humidity detection and display
- Three-color backlit LCD and optional buzzer alarm
- Provide 1 xon/off output to control a ventilator
- 1x 0~10V/4~20mA linear output optional
- Modbus RS485 interface optional
- Excellent performance for indicating indoor air quality

## Features

- Real time monitor ambience air quality
- Semiconductor mix gases sensor with more than 5 year lifetime
- Gas detection: cigarette smoke, VOC such as formaldehyde and toluene, ethanol, ammonia, hydrogen sulfide, sulfur dioxide and other harmful gases
- Monitor temperature and relative humidity
- Three-color (green/orange/red) LCD backlit indicating air quality at optimal/moderate/poor
- Preset warning point of buzzer alarm and backlight
- Provide one relay output to control a ventilator
- Modbus RS485 communication optional
- High quality technics and elegant appearance, best choice for home and office
- Four power supply types optional, and power adaptor available; desktop and wall mounting



G02-VOC monitor is specially designed to detect indoor air quality in offices and home environments. and make invisible pollution visible.

As there are many kinds of harmful gases in the air, it become really cost to monitor every single kind of air. It is recommended that CO and IAQ be monitored at home, and CO<sub>2</sub>, CO and VOC in classroom and office.

The internal mix gases sensor has high sensitivity not only to VOC's such as toluene and formaldehyde from wood finishing and construction products but also to other air contaminants which are emitted by cigarette smoke, ammonia, hydrogen sulfide etc. It's also sensitive to carbon monoxide, alcohol, disinfectant and other bad smells. So it is more suitable for monitoring IAQ than any other sensor that for a single kind of gas.

## Applications



- Ambiance air quality detection and alarm
- Ventilation systems
- Air cleaning systems.
- BAS systems
- Offices, schools and other public places

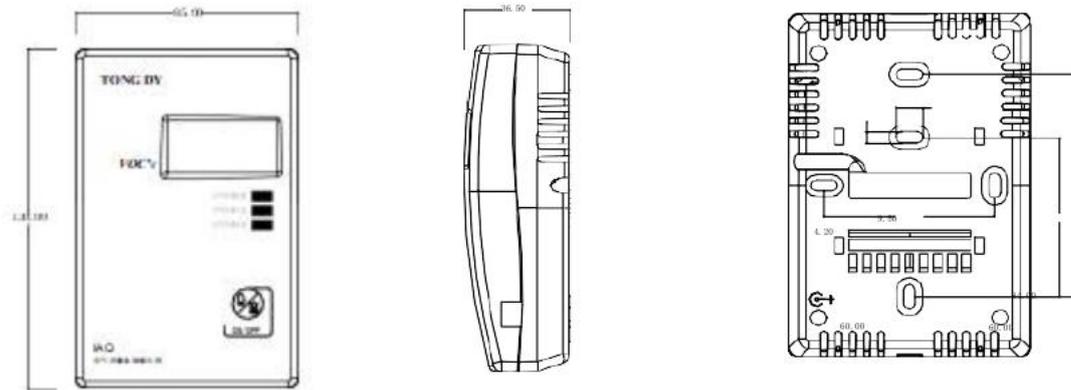
## Specifications

Gas detection	Highly sensitive to a lot of harmful gases, such as harmful gases from construction and decoration materials, VOC (like toluene and formaldehyde); Cigarette smoke; Ammonia and H <sub>2</sub> S and other gases from household wastes; CO, SO <sub>2</sub> from cooking and burning; Alcohol, Natural gas, detergent and other bad smells etc.	
Sensing element	Semiconductor mix gas sensor of long working life and good stability	
Signal update	1s	
Warm up time	72 hours (first time), 1 hour (normal operation)	
VOC measuring range	0.1~30ppm ( 1ppm= 1 part per million)	
Display resolution	0.1ppm	
Temperature & Humidity Sensor	Temperature	Relative Humidity
Sensing element	digital temperature and relativehumidity	sensor platform
Measuring range	0~50℃	0~100%RH
Accuracy	±0.5℃ (25℃, 40%-60%RH)	±4%RH (25℃, 40%-60%RH)
Display resolution	0.5℃	1%RH
Stability	±0.5℃per year	±1%RH per year
Relay output	1xrelay output to control a ventilator or air purifier, max current 5A resistance ( 220VAC )	
Analog output	1x0-10V(default) or 4-20mA 1x0~5V linear output	
Warning alarm	3- colors backlit and buzzer alarm when VOC value over 22ppm	
LCD backlit	Green—optimal air quality	▶ enjoy the air quality
	Orange—moderate air quality	▶ ventilation suggested
	Red—poor air quality	▶ ventilation immediately
RS485 interface (option)	Modbus RTU, 19200bps	
Operation condition	-20℃~60℃ (-4°F~140°F)/ 0~ 95% RH	
Storage conditions	0℃~50℃ (32°F~122°F)/ 5~ 90% RH	
Net Weight	190g	
Dimensions	130mm(L)×85mm(W)×36.5mm(H)	
Installation standard	Desktop or wall mount (65mm×65mm or 85mmX85mm or 2"×4" wire box)	
Wiring standard	Wire section area <1.5mm <sup>2</sup>	
Power supply	12VDC; 24VAC/VDC 220VAC; 100~240VAC	
Consumption	2.8 W	
Housing	PC/ABS fire-proof, IP30 protection	
Certificate	CE	

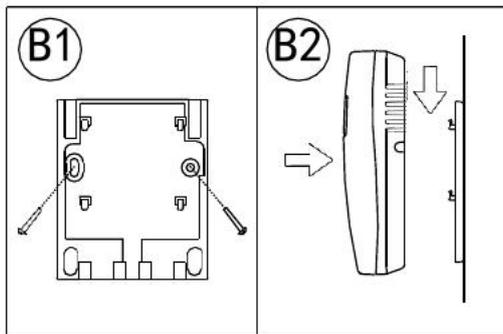
## Models

Model	Name	Description	Power	Type
G02-VOC-B320A	IAQ monitor	Three-color backlit LCD, buzzer alarm	220VAC	Wall mounting
G02-VOC-B332C	IAQ monitor	Three-color backlit LCD, buzzer alarm	24VAC/VDC, with DC socket and a power adaptor	desktop, with a bracket
G02-VOC-B340D	IAQ monitor/controller	Three-color backlit LCD, buzzer alarm; 1 on/off output; touch-key for operation	100~240VAC	Wall mounting
G02-VOC-B310C	IAQ monitor	Three-color backlit LCD, buzzer alarm. Modbus RS485 interface	24VAC/VDC	Wall mounting
G02-VOC-B380D	IAQ monitor	Three-color backlit LCD, buzzer alarm; 1 on/off output; touch-key for operation Modbus RS485 interface	100~240VAC	Wall mounting
G02-VOC-B350C	IAQ monitor	Three-color backlit LCD, buzzer alarm. 1x analog linear outpur.	24VAC/VDC	Wall mounting
G02-VOC-B350G	IAQ monitor	Three-color backlit LCD, buzzer alarm. 1x 0~5VDC linear outpur.	12VDC	Wall mounting
G02-VOC-B370C	IAQ monitor	Three-color backlit LCD, buzzer alarm. 1x 0~10VDC/4~20mA linear outpur. Modbus RS485 interface	24VAC/VDC	Wall mounting
921	Wall mounting plate	Accessory for wall mounting type.		
922	Desktop bracket			

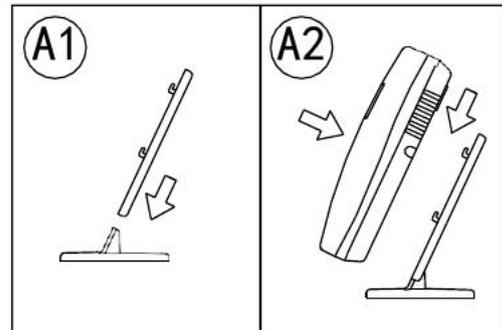
## Mounting and Dimensions



Wall mounting



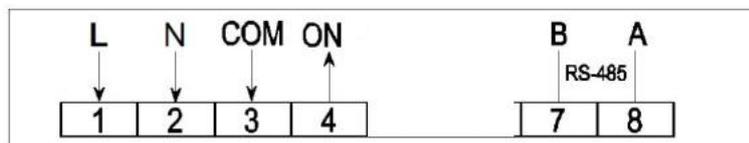
Wall mount with the backplane-921



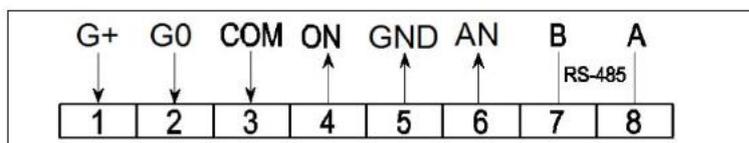
Desktop bracket -922

## Wiring Diagrams

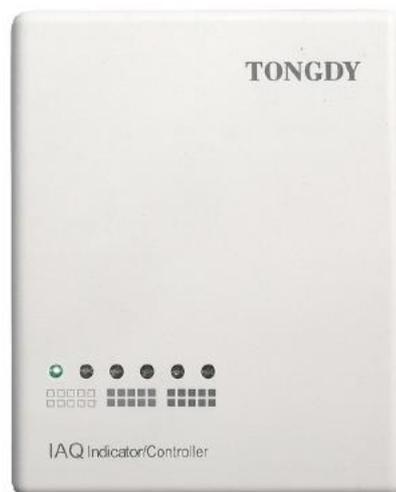
G02-VOC-3XXA/D



G02-VOC-3XXC/G



# Indoor Air Quality Indicator /Controller



## Applications

- Ambiance air quality detection and alarm
- Ventilation systems
- Air cleaning systems
- Bas systems
- Offices, schools and other indoor spaces



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## Product No: F2000TSM-VOC

- Real time detect and indicate Indoor Air Quality
- High sensitivity to VOC and various other indoor air gases
- 5~7 years lifetime
- Temperature and humidity compensation
- Providing 1x 0~10VDC/ 4~20mA linear output for VOC measurement
- Modbus RS485 communication interface
- Providing 1x dry contact output to control a ventilator
- Featured 6 LED indicator lights indicates different IAQ levels
- The highest performance with the lowest price

## Features

- Wall mounting, real time detect indoor air quality
- With Japanese semiconductor mix gas sensor inside. 5~7 years lifetime.
- High sensitive to contaminative gases and various kinds of odorous gases within the room (smoke, CO, alcohol, human odor, material odor).
- Two types available: indicator and controller
- Six LED lights to indicate six different IAQ levels.
- Temperature and humidity compensation makes the IAQ measurements consistent.
- Modbus RS-485 communication interface, 15KV antistatic protection, independent address setting.
- Optional one on/off output to control a ventilator/air cleaner. The user can select an IAQ measurement to turn-on the ventilator between four setpoints.
- Optional one 0~10VDC or 4~20mA linear output.



F2000TSM-VOC is designed to detect room IAQ level with a Modbus RS485 and an optional linear analog output, as well as an optional relay output to control a ventilator or an air cleaner based on the pre-set measurement.

Its internal mixed gas sensor (normally called VOC sensor) is very sensitive to VOC concentration and other air pollutants such as cigarette smoke, ammonia and H<sub>2</sub>S. It also has high sensitivity to CO, alcohol, natural gas and odorous smells from human bodies. Compared with other single air sensor, F2000TSM-VOC series is better for longtime IAQ detection.

## Applications



- Indoor air quality indicating
- Used in houses, offices, theaters, shops, restaurants, train stations and many other places
- Automatically ventilation control
- Energy saving for ventilation and AC systems

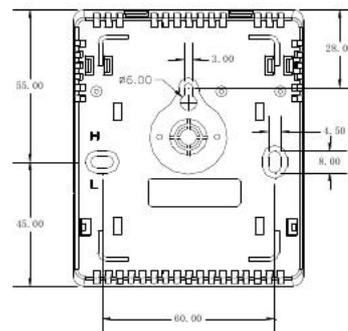
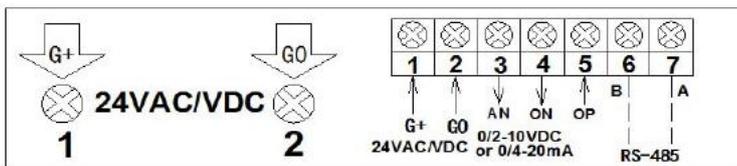
## Specifications

Gas detected	VOC ( toluene emitted from wood finishing and construction products); Cigarette smoke( hydrogen, carbon monoxide); ammonia and H2S, alcohol, natural gas and smell by people's body.
Sensing element	Semiconductor mix gas sensor
Measuring range	0.1~30ppm
Power Supply	24VAC/VDC
Consumption	2.5 W
Load (for the analog output)	>5K
Sensor query frequency	Every 1s
Warm up time	48 hours (first time) 10 minutes(operation)
Six indicator lights	The first green indicator light: Best air quality The first and the second green indicator lights: Better air quality The first yellow indicator light: Good air quality The first and the second yellow indicator lights: Poor air quality The first red indicator light: Poorer air quality The first and the second indicator lights: Poorest air quality
Modbus interface	RS485 with 9600bps(default) 15KV antistatic protection, independent base address
Analog output (Optional)	0~10VDC linear output
Output resolution	10Bit
Relay output (Optional)	One dry contact output, rated switching current 2A( resistance load)
Temperature range	0~50℃ (32~122°F)
Humidity range	0~95%RH, non condensing
Storage conditions	0~50℃ (32~122°F) /5~90%RH
Weight	190g
Dimensions	100mm×80mm×28mm
Installation standard	65mm×65mm or 2"×4"wire box
Wiring terminals	Maximum 7 terminals
Housing	PC/ABS Plastic fireproof material , IP30 protection class
CE approval	EMC 60730-1: 2000 +A1:2004 + A2:2008 Directive 2004/108/EC Electromagnetic Compatibility

## Models

ITEM	MODEL	DESCRIPTION
IAQ Indicator	F2000TSM-VOC-S110C-V/A	IAQ detector with 1X0~10VDC linear output. Modbus RS485 interface
	F2000TSM-VOC-S100C	IAQ detector, Modbus RS485 interface
	F2000TSM-VOC-S100C-SP	IAQ detector, Modbus RS485 interface. Power supply with a 24V/100~240VAC power adaptor
	F2000TSM-VOC-L110C-V/A	IAQ transmitter with 6 LED indicator lights, 1X analog output, Modbus RS485 interface
	F2000TSM-VOC-L100C	IAQ indicator with 6 LED indicator lights, Modbus RS485 communication interface
	F2000TSM-VOC-L100C-SP	IAQ indicator with 6 LED indicator lights, Modbus RS485 communication interface. Power supply with a 24V/230V power adaptor
IAQ Controller	F2000TSM-VOC-L101C	IAQ indicator/controller with 6 LED lights, One dry contact output, Modbus RS485 interface
	F2000TSM-VOC-L111C	IAQ indicator/controller with 6 LED lights, 1X0~10VDC linear output. One dry contact output, Modbus RS485 interface

## Mounting and Wiring



# PM2.5/PM10 Monitor



## Applications

- Display real-time PM2.5/PM10 with six colors backlight
- Collect PM2.5/PM10 data via RS485
- Used in residential places
- Small ventilation systems
- Schools, offices, and any public places

## Product No: G03-PM2.5/PM10

- Real-time monitoring air particle PM2.5/PM10, temperature and relative humidity
- Six color of LCD backlight switching corresponding to the six levels of AQI PM2.5 standard
- Modbus RS485 optional
- Wall mounting, or desktop placement
- Power supply: 5V power adaptor or 24VAC/VDC
- Application in residences, offices, small ventilation systems etc.



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## Features

- Real time monitor indoor PM2.5 and PM10 concentration.
- Monitor indoor air temperature & RH with a high accuracy temperature & RH sensor,
- LCD displays the real time PM2.5/PM10 and moving average of one hour, as well as real time temperature and RH measurements.
- Six backlight colors against PM2.5 AQI standard, which indicating PM2.5 more intuitive and clear.
- 24VAV/VDC power supply or 5V with a power adaptor
- Option: RS485 interface with Modbus RTU
- We provide other indoor air quality monitors like carbon dioxide, TVOC monitor, applied to the fresh air systems

## Main Applications

- Display real-time PM2.5/PM10 with six colors backlight
- Collect and gather PM2.5/PM10 data via RS485
- Used in residential places
- Small ventilation systems
- Schools, offices, and any public places

## Models Guide

Model	PM2.5 PM10	Temp/RH	5VDC With power adaptor	24VAC/VDC Power Supply	Output
G03-PM2.5-300	●	●	●		NONE
G03-PM2.5-340	●	●		●	RS485 (Modbus RTU)

## Specifications

General Data	
Power supply	5VDC with a power adaptor 24VAC/VDC
Work consumption	1.2W
Warm-up time	60s
Monitor parameters	PM2.5 or PM10, air temperature & RH
LCD display	LCD six backlit, displays six levels of PM2.5/PM10 and one hour average value. Green: Top Quality- Grade I Yellow: Good Quality-Grade II Orange: mild level pollution -Grade III Red: medium level pollution Grade IV Purple: seriously level pollution Grade V Maroon: severe pollution - Grade VI
DIP switches setting	DIP1: ON-diaplay PM10 OFF-display PM2.5 (default) DIP2: ON-circulate display PM2.5/ PM10 OFF-fixed display (default) DIP3: ON-turn off backlit OFF-turn on backlit (default) DIP4: ON-reset the default OFF-invalid (default)
Modbus RS485 interface	9600bps, 15KVa antistatic protective
Storage condition	0°C~60°C/ 5~95%RH
Dimensions	85mm×130mm×36.5mm
Housing materials	PC+ABS materials
Net weight	198g
IP class	IP30
PM2.5 Data	
Built-in sensor	Laser particle sensor, light scattering method
Measuring range	0~600µg/m <sup>3</sup>
Display resolution	1µg/m <sup>3</sup>
Zero Point Stability	±5µg/m <sup>3</sup>
Measuring accuracy (1h average)	±15% @ 25°C, 10%~50%RH
PM10 Data	
Built-in sensor	Laser particle sensor, light scattering method
Measuring range	0~1000µg/m <sup>3</sup>
Display resolution	1µg/m <sup>3</sup>

Zero Point Stability	±5µg/m <sup>3</sup>	
Measuring accuracy (1h average)	±20% @ 25°C, 10%~50%RH	
<b>Temperature and Humidity Parameters</b>		
Temperature humidity sensor	Built-in high precision digital integrated temperature humidity sensor	
Temperature measuring range	-20°C~50°C	
Relative humidity measuring range	0~100%RH	
Display resolution	Temperature:0.01°C	Humidity:0.01%RH
Accuracy	Temperature:<±0.5°C@30°C	Humidity:<±3.0%RH (20%~80)
Stability	Temperature:<0.04°C per year	Humidity:<0.5%RH per year

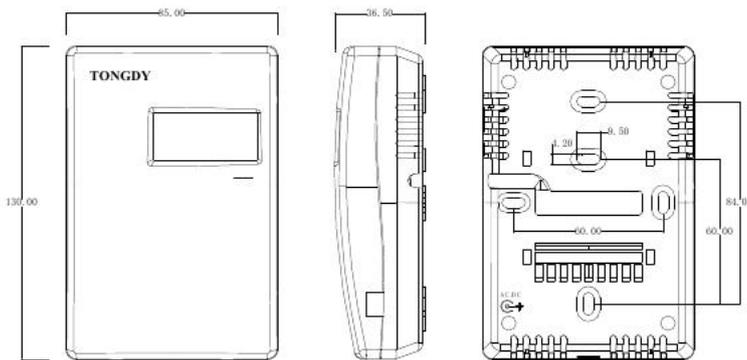
## Six - color backlit for PM2.5 index

Air Quality Levels			PM2.5 24h Average Concentration	Effects on Health
LCD Backlight	PM2.5 Level	Air Quality	µg/m <sup>3</sup>	
Green	Level I	Very good	0-35	Good air quality, almost no air pollution
Yellow	Level II	Good	36-75	Acceptable air quality, but some pollutants may has a weak effect on health of a handful of high sensitive people.
Orange	Level III	Light pollution	76-115	The symptom of susceptible people are mild sharpened and healthy people come on an symptom of irritation.
Red	Level IV	medium pollution	116-150	Further aggravate symptoms of vulnerable groups, it may has an impact on healthy people heart, lungs and respiratory system.
Purple	Level V	heavy pollution	151-250	Symptoms of vulnerable groups are further aggravated. Healthy people generally appear symptoms
Red-brown	Level VI	Serious pollution	>251	The exercise tolerance of healthy people is reduced with noticeable symptoms, and some symptoms appear ahead of time.

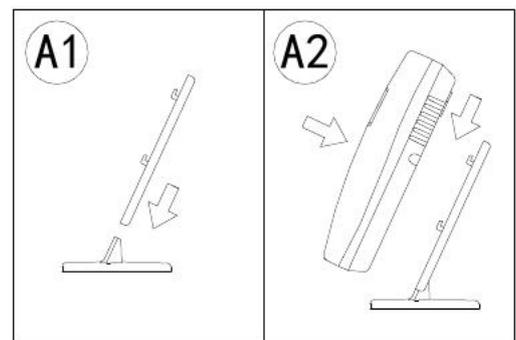
## Six - color backlit for PM10 index

Air Quality Levels			PM10 24h Average Concentration	Effects on Health
LCD Backlight	PM10 Level	Air Quality	$\mu\text{g}/\text{m}^3$	
Green	Level I	Very good	0-49	Good air quality, almost no air pollution
Yellow	Level II	Good	50-148	Acceptable air quality, but some pollutants may has a weak effect on health of a handful of high sensitive people.
Orange	Level III	Light pollution	149-248	The symptom of susceptible people are mild sharpened and healthy people come on an symptom of irritation.
Red	Level IV	medium pollution	249-348	Further aggravate symptoms of vulnerable groups, it may has an impact on healthy people heart, lungs and respiratory system.
Purple	Level V	heavy pollution	349-419	Symptoms of vulnerable groups are further aggravated. Healthy people generally appear symptoms
Red-brown	Level VI	Serious pollution	>420	The exercise tolerance of healthy people is reduced with noticeable symptoms, and some symptoms appear ahead of time.

## Mounting



Wall mounting



Desktop placement

# Humidity Controller



## Product No: F2000P-TH

Relative Humidity Control for Humidifier or Dehumidifier with Temperature Detection/Control

## Features

- Detect and display ambience relative humidity & temperature
- LCD displays room humidity and temperature, set point, and control status etc. Makes reading and operating easy and accurate
- One or two dry contact outputs to control an humidifier/dehumidifier and a cooling/heating device
- Enough parameters options in advanced settings for end users meet more applications.
- Button-lock function avoids wrong operation and is easy to manage
- RS485 interface with Modbus RTU
- Provides option of the external RH&Temp. sensor
- Other wall mounting and duct mounting humidity controllers and transmitters, please log on our website or contact sales

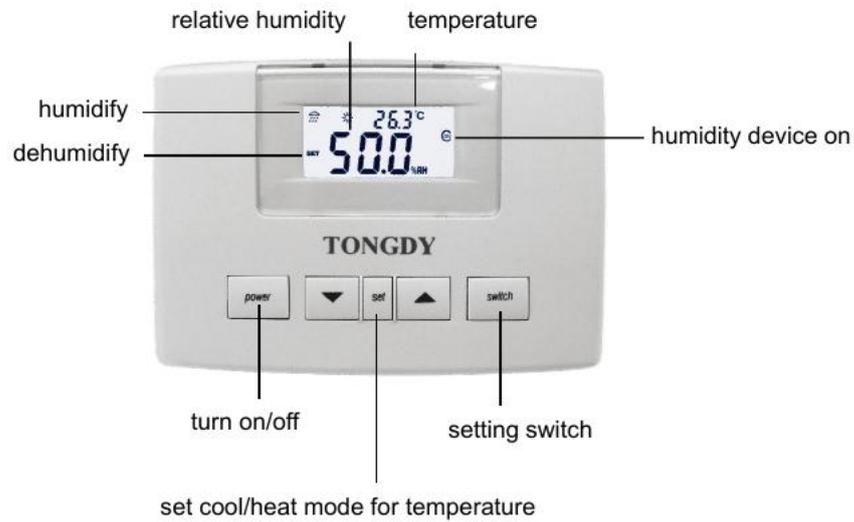


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## Buttons and LCD



## Specifications

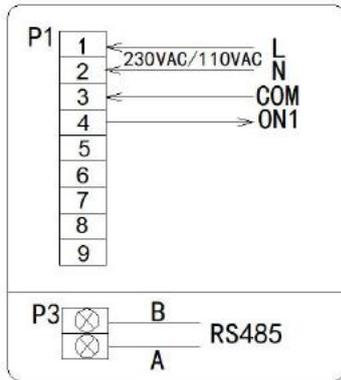
Power supply	230VAC、110VAC、24VAC/VDC Optional in the order	
Output	One or two relay in max. 5A	
Displaying	LCD with white backlight	
External sensor connection	Typical 2m, 4m/6m/8m selectable	
Net weight	280g	
Dimensions	120mm(L)×90mm(W)×32mm(H)	
Mounting standard	Wall mounting in the wire box of 2"×4" or 65mm×65mm	
Sensor spec.	Temperature	Humidity
Accuracy	±0.5℃	±3.5% RH (10%-80%RH)
Measuring range	0℃~60℃	0~100%RH
Display resolution	0.1℃	0.1%RH
Stability	<0.04℃/year	<0.5%RH/year
Storage environment	0℃-60℃	0%~70%RH

## Models Guide

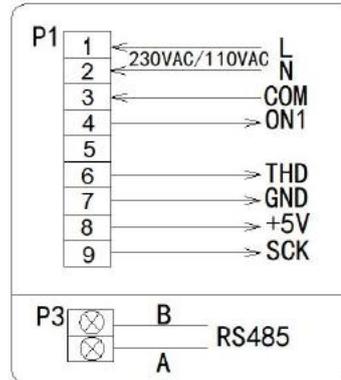
Name	Model	Description
Humidity Controller  Power supply: -(A)/(B)/(C) A: 230VAC B: 110VAC C: 24VAC/VDC	F2000P-TH-K01-(A)/(B)/(C)	Detect and display real time RH&Temp. 1XON/OFF relay output to control a humidifier or dehumidifier which max. current is 5A.
	F2000P-TH-K02-(A)/(B)/(C)	Detect and display real time RH&Temp. 2 ON/OFF relay outputs to control a humidifier/ dehumidifier and a cooling/heating device. The relay's max. current is 5A.
	F2000P-TH-K01-WT-(A)/(B)/(C)	Detect and display real time RH&Temp. The sensor is external with 2m cable. 1XON/OFF relay output to control a humidifier or dehumidifier.
	F2000P-TH-K02-WT-(A)/(B)/(C)	Detect and display real time RH&Temp. The sensor is external with 2m cable. Two ON/OFF relay outputs to control a humidifier/ dehumidifier and a cooling/heating device.
Humidity Controller With RS485 Modbus RTU	F2000PC-TH-K01-(A)/(B)/(C)	Detect and display real time RH&Temp. 1XON/OFF relay output to control a humidifier or dehumidifier. RS485 interface with Modbus RTU
	F2000PC-TH-K02-(A)/(B)/(C)	Detect and display RH&Temp. 2 ON/OFF relay outputs to control a humidifier/ dehumidifier and a cooling/heating device. RS485 interface with Modbus RTU.
	F2000PC-TH-K01-WT-(A)/(B)/(C)	Detect and display RH&Temp. 1XON/OFF relay output to control a humidifier or dehumidifier. The sensor is external with 2m cable. RS485 interface, Modbus RTU
	F2000PC-TH-K02-WT-(A)/(B)/(C)	Detect and display real time RH&Temp. Two ON/OFF relay outputs to control a humidifier/ dehumidifier and a cooling/heating device. The sensor is external with 2m cable. RS485 interface, Modbus RTU
<b>External sensor length options</b>		
Optional external sensor length (Standard cable length is 2 meters)		e4 means 4 meters e6 means 6 meters e8 means 8 meters

## Wiring Diagrams

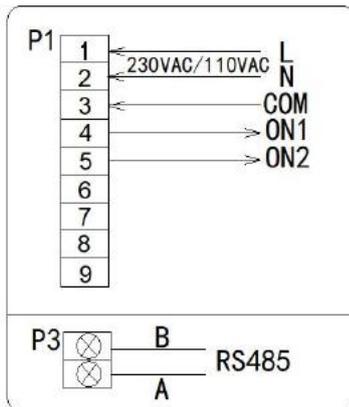
F2000PC-TH-K01-(A)(B)  
/F2000P-TH-K01-(A)(B)



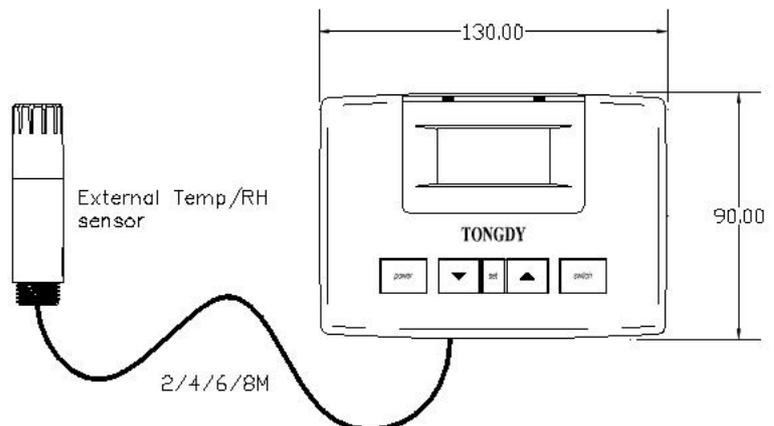
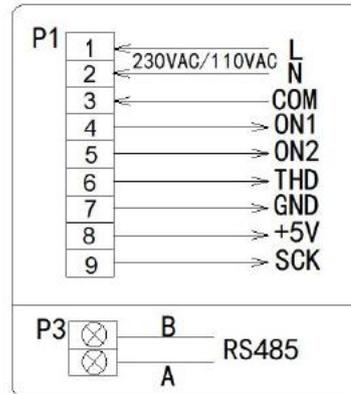
F2000PC-TH-K01-WT-(A)(B)  
F2000P-TH-K01-WT-(A)(B)



F2000PC-TH-K02-(A)(B)  
F2000P-TH-K02-(A)(B)



F2000PC-TH-K02-WT-(A)(B)  
F2000P-TH-K02-WT-(A)(B)



# Temperature & Humidity Transmitter



## Applications

- HVAC systems
- Clean rooms
- Green houses
- Mushrooms, stocks
- Workshops, stores
- Other places where need to measure temperature and humidity

## Product No: THP/TH9 Series

Wall Mounting and Duct Mounting

## Features

- Designed for detection and output relative humidity and temperature with high accuracy
- External sensors probe design let the measurements more accurate with reduction influence from inside heating
- Combined both humidity and temperature sensors seamlessly with the digital auto compensation
- Outside sensing probe with more accuracy and convenient usage
- Two linear analog outputs and Modbus RS485 communication
- Smart structure for easy mounting and disassembly, two lengths selectable for the sensor probe
- CE-Approval



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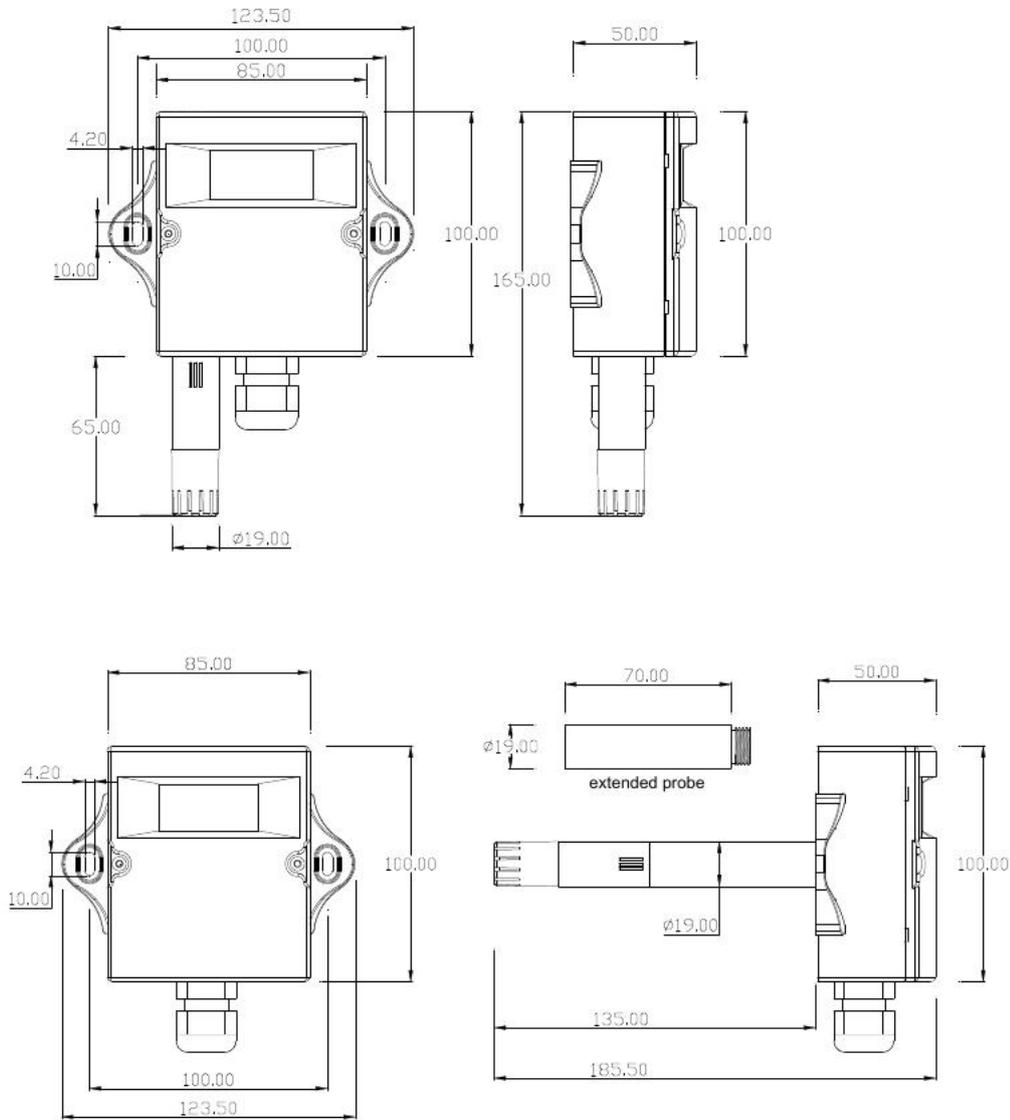
## Typical Applications

- HVAC systems
- Clean rooms
- Green houses
- Mushrooms, stocks
- Workshops, stores
- Other places where need to measure temperature and humidity

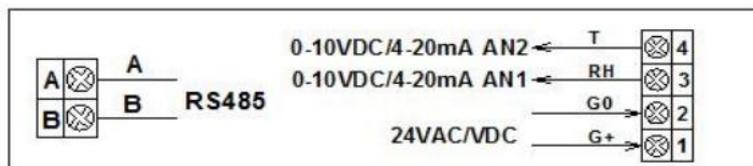
## Specifications

	Temperature	Relative Humidity
Accuracy	±0.4℃ @20℃	±3%RH (20%-80%RH)
Measuring range	0℃~50℃(32°F~122°F) (default)	0 -100%RH
Display resolution	0.1℃	0.1%RH
Stability	±0.1℃	±1%RH per year
storage environment	10℃-50℃, 20%RH~60%RH	
Output	2X0~10VDC(default) or 2X 4~20mA (selectable by jumpers) 2X 0~5VDC (selected at place orders)	
RS485 interface(optional)	Modbus RS485 interface	
Power supply	24 VDC/24V AC ±20%	
Power cost	≤1.6W	
Permissible load	Max. 500Ω (4~20mA)	
Connection	Screw terminals/ wire diameter:1.5mm <sup>2</sup>	
Housing/ Protection class	PC/ABS fireproof material IP50 (default), IP54 is optional for some models.	
Dimension	THP Wall-mounting series: 85(W)X100(H)X50(D)mm+65mm(external probe)X∅19.0mm TH9 Duct-mounting series: 85(W)X100(H)X50(D)mm +135mm(duct probe) X∅19.0mm	
Net weight	THP Wall-mounting series: 280g TH9 Duct-mounting series: 290g	

## Dimensions & Mounting



## Wiring Diagrams



## Models Information

Product Type	Model Name	Description
<b>Wall Mounting</b> (with adown external sensor probe) No LCD	<b>THP110/120/130</b>	2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. No LCD display.
	<b>THP111/121/131</b>	2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. Modbus RS485 interface. No LCD display.
	<b>THP101</b>	Modbus RS485 protocol for temperature and humidity measurements. No LCD display.
<b>Wall Mounting</b> (with adown external sensor probe) LCD Display	<b>THP201</b>	Modbus RS485 protocol for temperature and humidity measurements. LCD display temperature & humidity.
	<b>THP210/220/230</b>	2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. LCD display temperature & humidity.
	<b>THP211/221/231</b>	2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. Modbus RS485 interface. LCD display temperature & humidity.
<b>Duct Probe Type</b> No LCD	<b>TH9110/120/130</b>	Duct probe type with 2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. No LCD display.
	<b>TH9111/121/131</b>	Duct probe type with 2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. Modbus RS485 interface. No LCD display.
	<b>TH9101</b>	Duct type type with Modbus RS485 interface.
<b>Duct Mounting</b> With LCD	<b>TH9201</b>	Duct probe type with a Modbus RS485 interface. LCD display temperature & humidity
	<b>TH9210/220/230</b>	Duct probe type with 2X 0~10VDC/ 2X 4~20mA/ 2x 0~5VDC linear outputs for temperature and humidity measurements. LCD display temperature & humidity
	<b>TH9211/221/231</b>	Duct probe type with 2X 0~10VDC/ 2X 4~20mA/2x 0~5VDC linear outputs for temperature and humidity measurements. Modbus RS485 interface.LCD display temperature & humidity

There are below postfixes selectable for above models.

**Postfix 1: temperature scaling** (non requested option)

- T05:** 0°C~50°C(32°F~122°F) (default)
- T06:** 0°C~60°C(32°F~140°F)
- T26:** -20°C~60°C(-4°F~140°F)

**Postfix 2: IP54 class**

- Only for models without LCD.
- No the option means the housing is IP50 class

**Postfix 3: extended probe of TH9** (non requested option)

- E:** the probe length is added to 135+70mm
- No the option means the probe length is 135mm (default)

For example: **THP201-T05** indicates the wall mounting transmitter with Modbus RS485 interface for temperature and humidity measurements. LCD display temperature & humidity. The temperature range is 0°C~50°C.



## Applications

- High end HVAC systems
- Ventilation systems
- Detection and display temperature and RH measurements
- Control temperature and humidity devices
- Modbus communication systems
- Wireless receiving and transmission of temperature & RH



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## Product No: TKG-TH

### Features

- Designed for real-time detection of temperature and relative humidity
- High accuracy sensors combined temperature and relative humidity together with the digital auto compensation
- External sensing probe designed for more accurate measurements, no influence from components heating
- Special white backlit LCD can be selected with displaying both actual humidity and temperature
- Smart structure for easy disassembly
- Three types optional: wall mounting, duct mounting and external sensor type
- Provide up to two dry contact outputs with each 5amp
- Friendly operation buttons for setup and operating
- Modbus RS485 communication optional
- CE-Approval

## Typical Applications

- HVAC systems
- Ventilation systems
- Detection and display temperature and RH measurements
- Control temperature and humidity devices
- Modbus communication systems
- Wireless receiving and transmission of temperature& RH

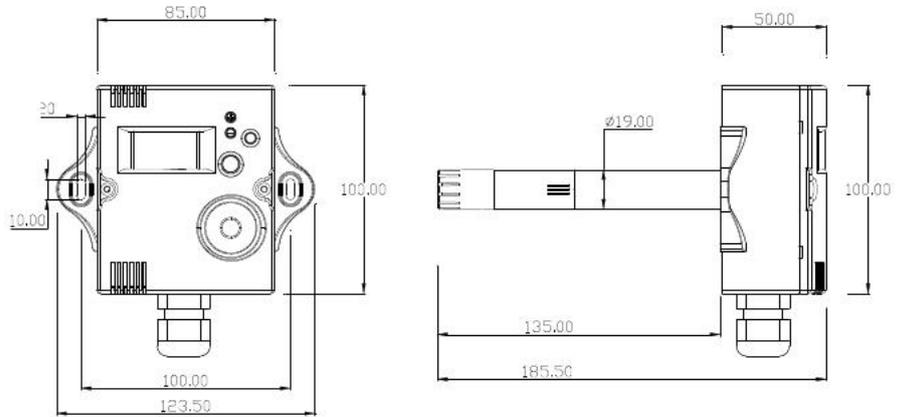
## Specifications

	Temperature	Humidity
Accuracy	±0.5℃ (20~40℃)	±4.5%RH (25℃, 15%-85%RH)
Measuring range	-20℃~60℃(default) 0℃~50℃ 0℃~60℃ selectable in orders	0 -100%RH
Display resolution	0.1℃	0.1%RH
Stability	±0.1℃	±1%RH per year
Storage environment	20℃-60℃, 5%RH~70%RH non condensing	
Connection	Screw terminals/ wire diameter:1.5mm <sup>2</sup>	
Housing	PC/ABS fireproof material	
Protection class	IP40	
Output	2X5Amp dry contacts	
RS485 interface (option)	Modbus RS485 interface optional	
Power supply	24VAC/VDC±10% or 230VAC±10% selectable	
Power cost	230V: ≤2.8W; 24V: ≤2.0W	
Dimension	Wall mounting: 85(W)X100(H)X50(D)mm+65mm(external probe)XØ19.0mm Duct mounting: 85(W)X100(H)X50(D)mm +135mm (external probe)XØ19.0mm	
Net weight	Wall mounting: 280g Duct mounting: 290g	

## Dimensions & Mounting

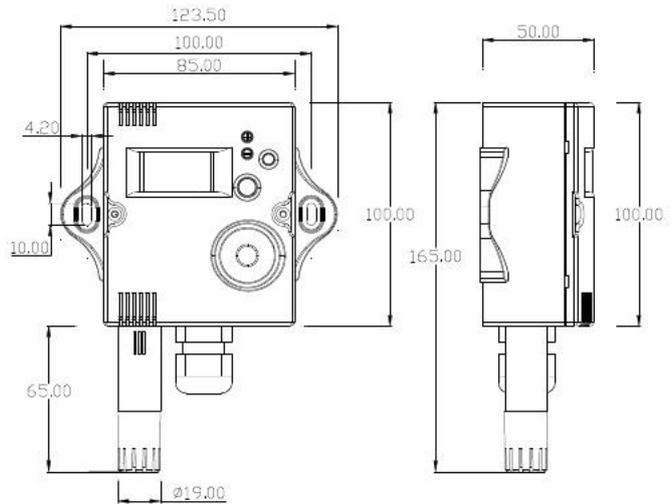
### Duct mounted

Probe Length 135.00mm  
 Probe Diameter Ø19.00mm  
 Installation Holes 100.00mm



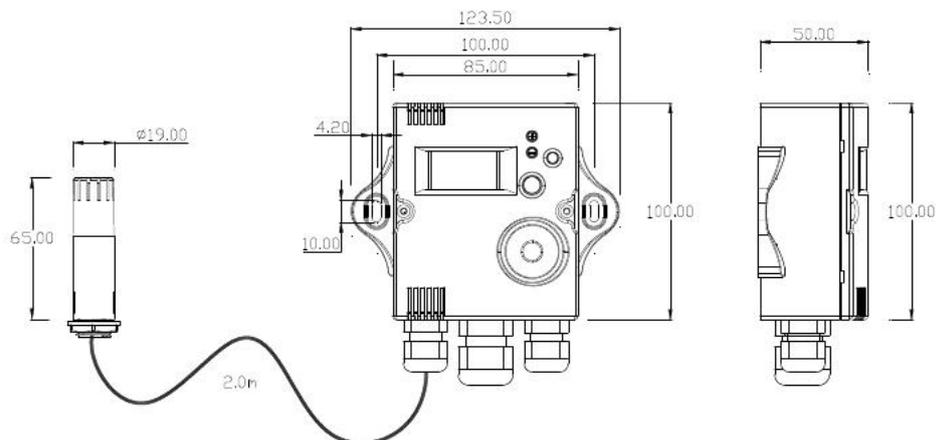
### Wall mounted

probe Length 65.00mm  
 Probe Diameter Ø19.00mm  
 Installation Holes 100.00mm



### External sensor type

probe Length 65.00mm  
 Probe Diameter Ø19.00mm  
 Installation Holes 100.00mm  
 Connection cable 200.00mm





## Models Guide

### TKG- TH- A 0 C D Y -Tab

A: the sensor installation type

- 1: wall mounted with the external sensor in an adown probe
- 2: probe duct mounted
- 3: split sensor with 2 meters cable connection

C: relay dry contact output

- 0: no dry contact output
- 1: 1xdry contact output (for humidity control)
- 2: 2xdry contact outputs (for humidity and temperature control)

D: Communication option

- 0: no communication
- 1: Modbus RS485 interface

Y: power supply

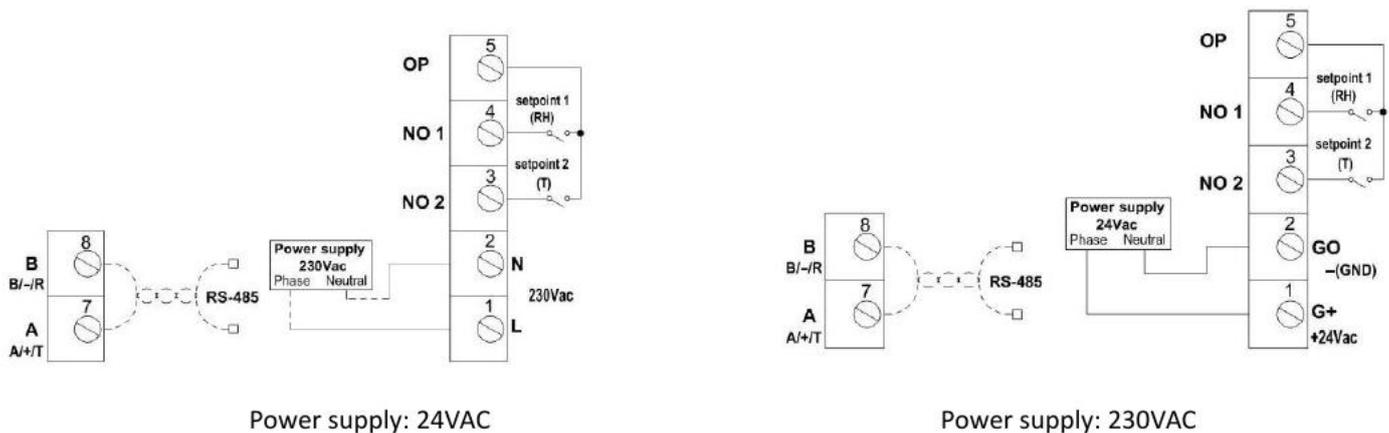
- F: 24VAC/VDC power supply
- A: 230VAC power supply

-Tab: temperature range

- T26: -20°C~60°C (default)
- T05: 0°C~50°C
- T06: 0°C~60°C

Without the Tab: the temperature range is -20°C~60°C (default)

## Wiring Diagram



# Plug & Play Humidity Controller with mould-proof



**Product No: THP-Hygro16**

## Applications

- High end HVAC systems
- Residential humidifying or dehumidifying control
- Libraries and laboratories
- Mould-proof auto control
- Other places that need to control relative humidity

## Features

- Designed to control ambient relative humidity with temperature monitoring
- Combined both humidity and temperature sensors seamlessly with the digital auto compensation
- External sensors insure humidity and temperature measurements correction with high accuracy
- White backlit LCD display both actual humidity and temperature
- A humidifier/dehumidifier or a fan control in max. 16Amp outlet
- Plug-and-play type and wall mounting type selectable
- Provide the special smart hygrostat THP-HygroPro with mould-proof control
- Compact structure for more applications
- Set points and work mode can be preset



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## Typical Applications

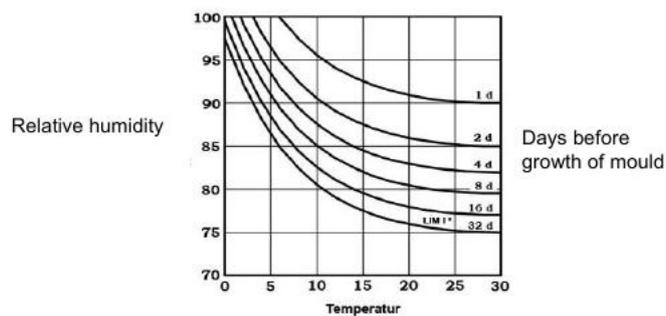
- High end HVAC systems
- Residential humidifying or dehumidifying control
- Libraries and laboratories
- Mould-proof auto control for above places
- Other places that need to control relative humidity

## Smart Hygrostat THP-HygroPro in Mould-Proof Control

### Two control modes selectable

#### Mode A: Mould-proof in auto control.

As you can see from the right diagram which indicates the relationship between a certain RH and the days before growth of mould at a certain temperature degree. The THP-HygroPro is designed to make the days before growth of mould up to be 32 days. With the smart auto control software, the hygrostat will control the relay output automatically to the dehumidifier to maintain comfortable air quality with the right humidity



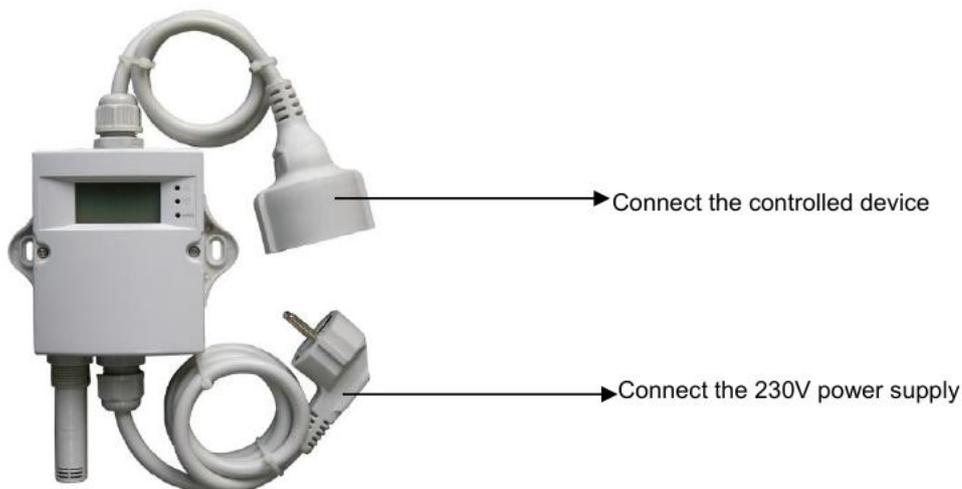
#### Mode B: Manual humidity level setting

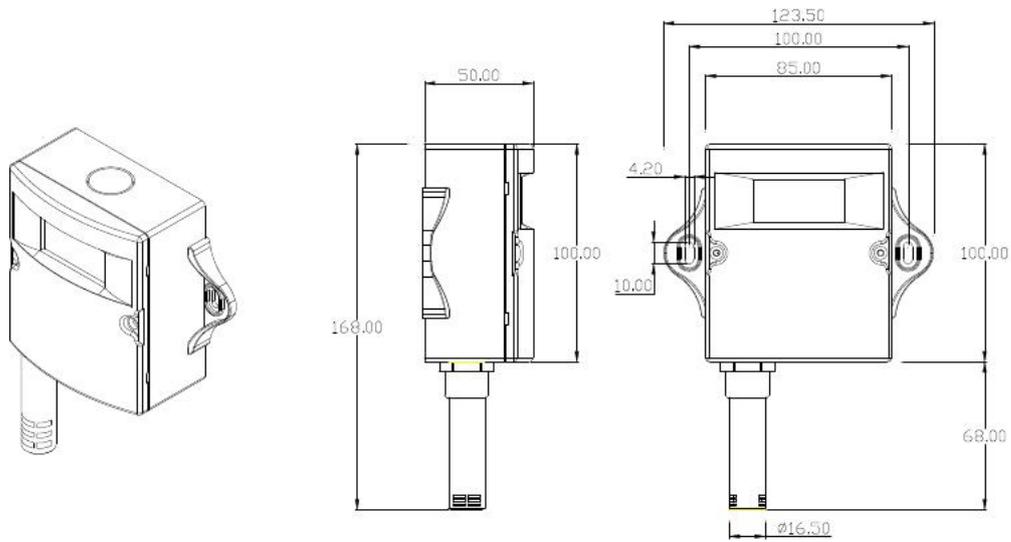
If you don't want to use above auto humidity control, you may preset the humidity level by yourself.

## Specifications

	Temperature	Humidity
Accuracy	<±0.4℃	<±3%RH (20%-80%RH)
Measuring range	0℃~60℃ selectable -20℃~60℃ (default) -20℃~80℃ selectable	0 -100%RH
Display resolution	0.1℃	0.1%RH
Stability	±0.1℃	±1%RH per year
Storage environment	10℃-50℃, 10%RH~80%RH	
Connection	Screw terminals/ wire diameter:1.5mm <sup>2</sup>	
Housing	PC/ABS fireproof material	
Protection class	IP54	
Output	1X16Amp dry contact	
Power supply	220~240VAC	
Power cost	≤2.8W	
Mounting type	Plug-and play or wall mounting	
Power plug and socket	European standard for plug and play type	
Dimension	95(W)X100(H)X50(D)mm+68mm(extend outside)X Ø 16.5mm (not including cables)	
Net weight	690g	

## Dimensions & Wall Mounting





## Model Information

Name	Model	Description
Hygrostat with Plug-and-Play Type	THP-Hygro16-pp	1X dry contact output for a humidifier/dehumidifier or a fan with max. 16A load. Humidity and temperature monitoring with white backlit LCD
Hygrostat with Wall Mounting Type	THP-Hygro16	1X dry contact output for a humidifier/dehumidifier or a fan with max. 16A load. Humidity and temperature monitoring with white backlit LCD
Smart Hygrostat with Mould-proof Control Plug-and-Play Type	THP-HygroPro	Mould-proof humidity controller with 1X dry contact output for a dehumidifier. Max. 16A load. Plug-and play type. Humidity and temperature monitoring with white backlit LCD

## Shipping Information

Indiv. Ctn. Dim	185mm×130mm×115mm
Master Ctn. Qty	12 (for plug-and-play type)
Master Ctn. Dim	45cm(L) ×34cm(W)×37cm(H)
Master Ctn. Net Wt.	15Kg

# VAV Room Thermostat



**F2000LV-A**



**F06-VAV**

VAV Room Thermostat with Proportional-Action Control for VAV Terminals

## Features

- Designed to control the room temperature for VAV terminals with 1X0~10 VDC output to cooling/heating or 2X0~10 VDC outputs to cooling and heating dampers.
- One or two relay outputs to control one or two stages electric aux. heater.
- LCD displays working status like room temperature, set point, analog output, etc. Makes reading and operating easy and accurate.
- Featured user-friendly setting buttons
- Smart and all around advanced settings meet various application systems
- Up to two-stage electric aux. heater control makes temperature controlling more accurate and energy-saving.



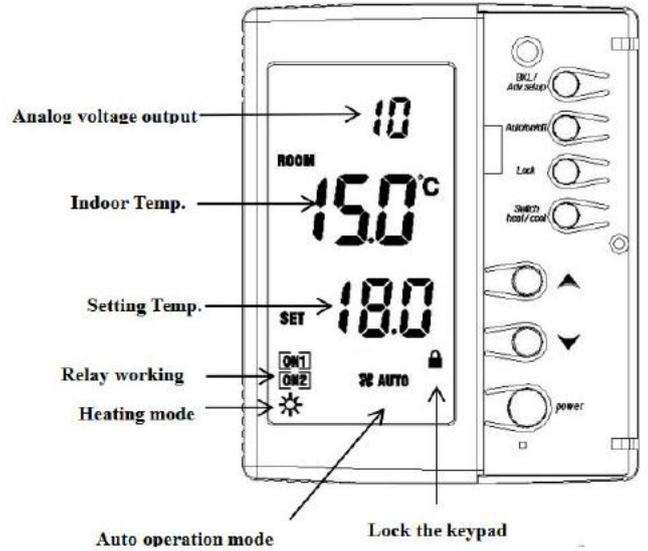
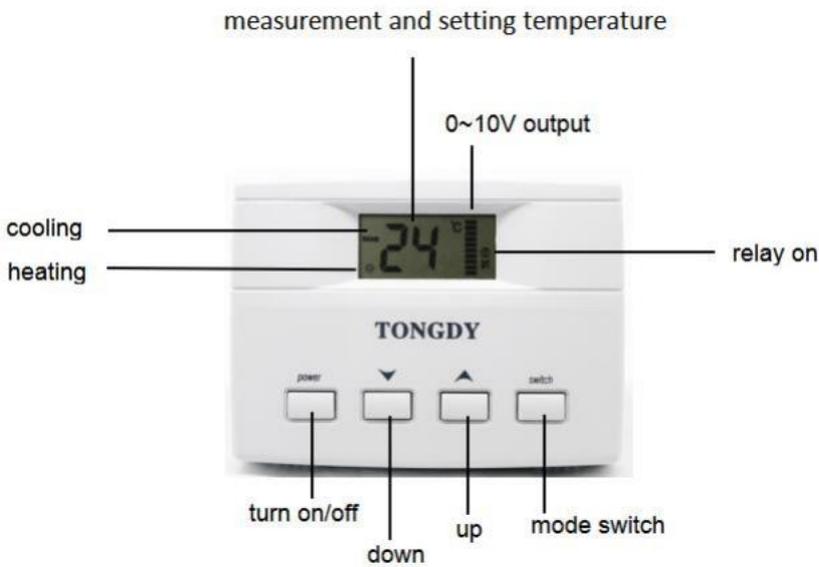
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- Low temperature protection
- Celsius or Fahrenheit degree selectable
- Cooling/heating mode auto changeover or manual switch selectable
- Two parts structure and quick wire terminal blocks make mounting easily.
- Two different appearances with two sizes display screen selectable
- Optional Modbus communication interface

## Buttons and LCD Display



## Specifications

Power supply

24 VAC±20% 50/60Hz

18VDC~36VDC

Electrical rating	F2000LV: 2A load per terminal F06-VAV: 1A load per terminal
Sensor	NTC 5K
Temperature control range	5-35°C (41°F-95°F)
Accuracy	±0.5°C (±1°F) @25°C
Analog output	One or two analog outputs Voltage DC 0V~DC 10 V Current 1 mA
Protection class	IP30
Operation condition	Temperature: 0 ~ 50°C (32~122°F) Humidity: 5 ~ 99%RH Non condensing
Storage condition	temperature: 0°C~50°C (32~122°F) humidity: <80%RH
Display	LCD
Net Weight	F2000LV-VAV: 240g F06-VAV: 280g
Dimensions	F2000LV-VAV: 120mm(L)×90mm(W)×24mm(H) F06-VAV: 110mm(L)×90mm(W)×25mm(H)
Material and colors:	PC/ABS Fireproofing house with white color
Mounting standard	Mounting on the wall, or 2"×4" / 65mm×65mm pipe box

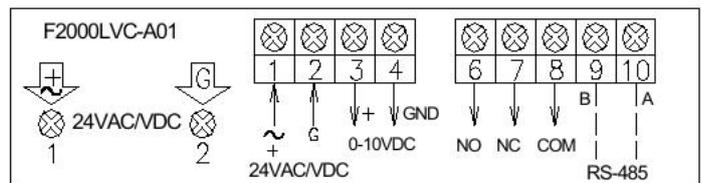
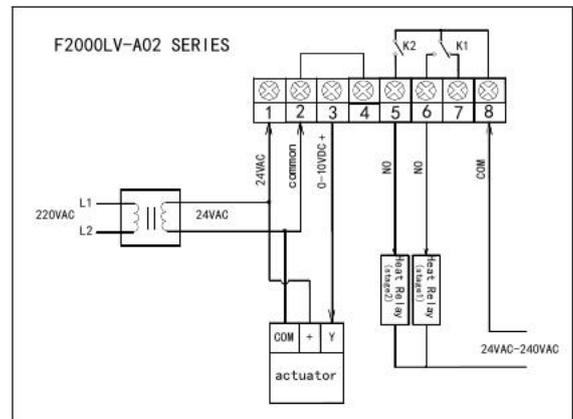
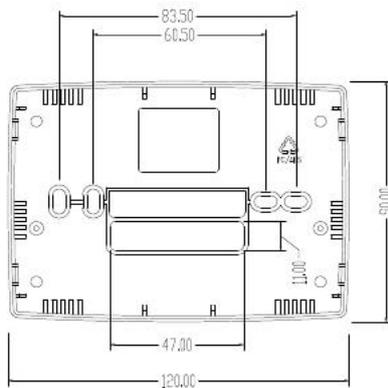
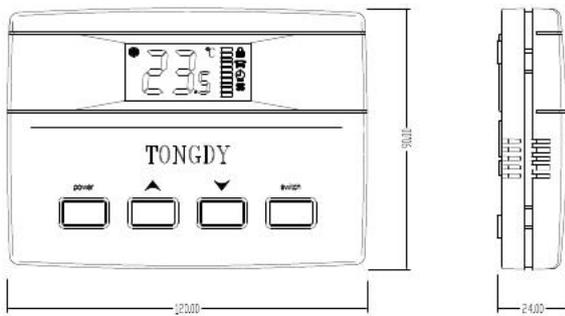
## Models

Type	Model	Characteristic
VAV Room Thermostat Power supply: 24VAC/VDC	F2000LV-A-N	1X 0~10V output for an actuator of VAV terminal with cool/heat manual switch
	F2000LV-A01	1X 0~10V output for an actuator, 1X on/off contact output to a heater. Cool/heat manual switch.
	F2000LV-A02	1X 0~10V output for an actuator, 2X on/off contact outputs for 2-stage heater. Cool/heat manual switch
	F06-VAV-A-N	1X 0~10V output for an actuator of VAV terminal with cool/heat manual switch

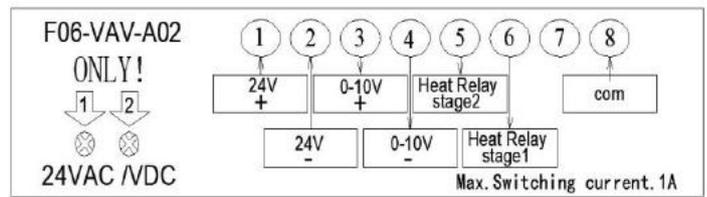
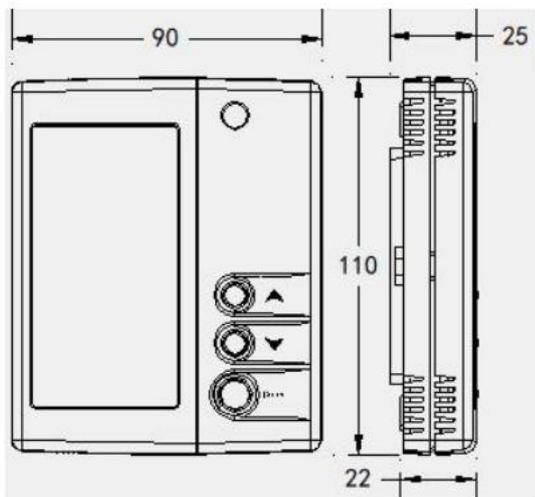
	F06-VAV-A02	1X 0~10V output for an actuator, 2X on/off contact outputs for 2-stage heater. Cool/heat manual switch
	F06-VAV-A01	1X 0~10V output for an actuator, 1X on/off contact output to a heater. Cool/heat manual switch.
	F06-VAV-A02	1X 0~10V output for an actuator, 2X on/off contact outputs for 2-stage heater. Cool/heat manual switch
VAV Room Thermostat with Modbus interface Power supply: 24VAC/VDC	F2000LVC-A-N	1X 0~10V output for an actuator of VAV terminal with cool/heat manual switch. Modbus interface
	F2000LVC-A01	1X 0~10V output for an actuator of VAV terminal. 1X on/off dry contact output to heater. Modbus interface

## Mounting and Wiring Diagrams

F2000LV-A Thermostat



F06-VAV Thermostat



# Dew-Proof Thermostat

for floor cooling/heating radiant AC systems with dew-proof control of the floor



**Product No: F06-DP**

## Features

- Special design for cooling/heating AC systems of floor hydronic radiant with dew-proof control of the floor
- Provides a more comfortable living environment with saving energy.
- The programming keys are built-in under the flip cover to avoid accidental operation. Lockable design makes all keys locked to eliminate accidental operation
- Large white backlit LCD with enough messages for quick and easy readability and operation. Like, real-time detected room temperature, humidity, and pre-set room temperature and humidity, calculated dew point temperature, working state of water valve, etc.
- Smart thermostat & hygrometer with room temperature control and floor dew-proof control in cooling.



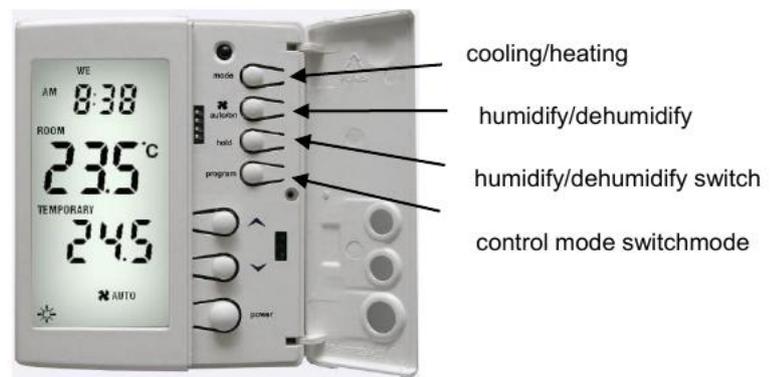
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- Room thermostat with maximum limit of temperature for floor in heating
- Used in the hydronic radiant cooling system with auto calculating the dew point temperature by real-time detecting room temperature and humidity.
- Floor temperature is be detected by the external temperature sensor. Room temperature & humidity and floor temperature can be pre-set by users.
- Used in the hydronic radiant heating system, it will be a room thermostat with humidity control and floor over heating protection.
- 2 or 3 on/off outputs to control the water valve/humidifier/ dehumidifier separately.
- Two control modes selectable by users in cooling to control the water valve. One mode is controlled by either room temperature or humidity. The another mode is controlled by either floor temperature or room humidity.
- Both temperature differential and humidity differential can be pre-set in order to maintain an optimal control of your hydronic radiant AC systems.
- Special design of pressure signal input to control the water valve.
- Humidify or dehumidify mode selectable
- All pre-set settings can be remembered even energized again after a power failure.
- Infrared remote control optional.
- RS485 communication interface optional

## Buttons and LCD



## Specifications

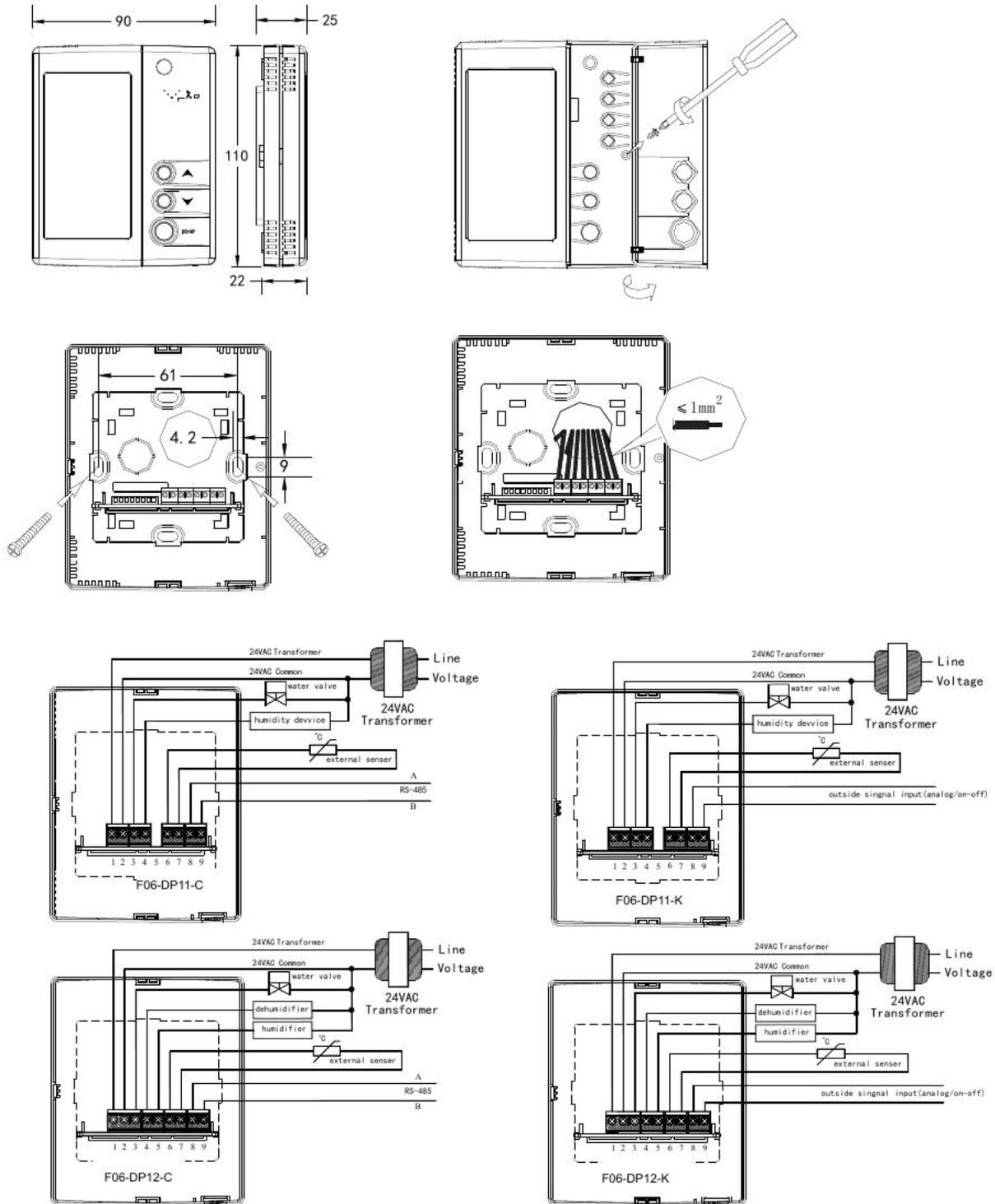
Power Supply	24VAC 50Hz/60Hz
Electrical rating	1 amp rated switch current/per terminal
Sensor	Temperature: NTC sensor ; Humidity: Capacitance sensor
Temperature measuring range	0~90°C (32°F~194°F)
Temperature setting range	5~45°C (41°F~113°F)
Temperature accuracy	±0.5°C(±1°F) @25°C
Humidity measuring range	5~95%RH
Humidity setting range	5~95%RH
Humidity accuracy	±3%RH @25°C
Display	White backlit LCD
Net weight	300g
Dimensions	90mm×110mm×25mm
Mounting standard	Mounting on the wall, 2"×4" or 65mm×65mm wire box
Housing	PC/ABS plastic fireproof material

## Models

MODEL	DESCRIPTION
<b>F06-DP11-K</b>	Dew-proof thermostat for hydronic radiant floor cooling/heating AC systems. White backlit LCD. 2xon/off outputs to a water valve and a humidity device (humidifier or dehumidifier). 1Xexternal on/off or analog signal input. 24VAC power supply.
<b>F06-DP11-C</b>	Dew-proof thermostat for hydronic radiant floor cooling/heating AC systems. White backlit LCD. 2xon/off outputs to a water valve and a humidity device (humidifier or dehumidifier). RS485 interface. 24VAC power supply.
<b>F06-DP12-K</b>	Dew-proof thermostat for hydronic radiant floor cooling/heating AC systems. White backlit LCD. 3xon/off outputs to a water valve, a humidifier and a dehumidifier. 1Xexternal on/off or analog signal input. 24VAC power supply.

<p><b>F06-DP12-C</b></p>	<p>Dew-proof thermostat for hydronic radiant floor cooling/heating AC systems.                  White backlit LCD.                  3on/off outputs to a water valve, a humidifier and a dehumidifier.                  RS485 interface. 24VAC power supply.</p>
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## Mounting and Wiring Diagram



# Programmable Thermostat

for floor heating & electric diffuser systems



**Product No: F06-NE**

## Features

- Design for control electric diffusers & floor heating systems.
- Easy to use and provides you with a more comfortable living environment and saving energy.
- Special design of double temperature modification avoids measurement to be influenced from heating inside, Provides you accurate temperature control.
- Two parts design makes electric load separate from the thermostat. Individual output and input terminals with rated 16amp make the electric connecting more safe and reliably.
- Pre-programmed for your convenience. Two program mode: Program a week 7 days up to four time periods and temperatures each day or program a week 7 days up to two periods of turning-on/turning-off each day. It must meet your lifestyle and makes your room ambiance comfortable.



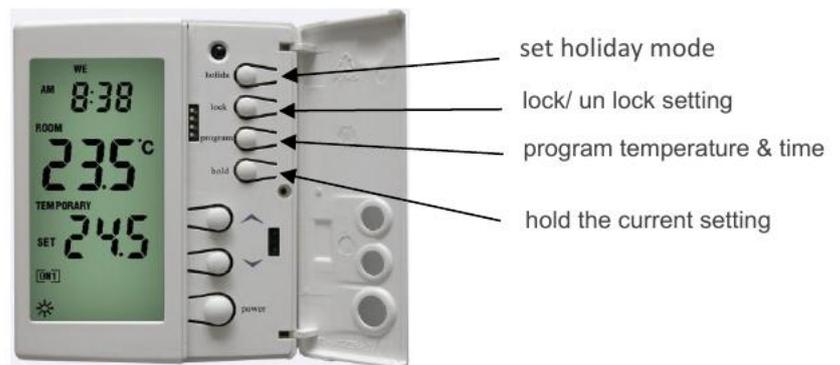
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- The programming keys are built-in under the flip cover to avoid accidental operation
- Lockable design makes all keys locked to eliminate accidental operation
- Programs are permanently held in non-volatile memory in the event of a power failure.
- Large LCD display with many messages for quick and easy readability and operation
- Both Internal and external sensor are available to control room temperature and set a highest limit of the floor temperature
- Temporary temperature override
- Holiday mode makes it keeping on a saving temperature during the presetting holidays
- Low temperature protection
- Infrared remote control optional
- RS485 Communication interface optional

## Buttons and LCD Display



## Specifications

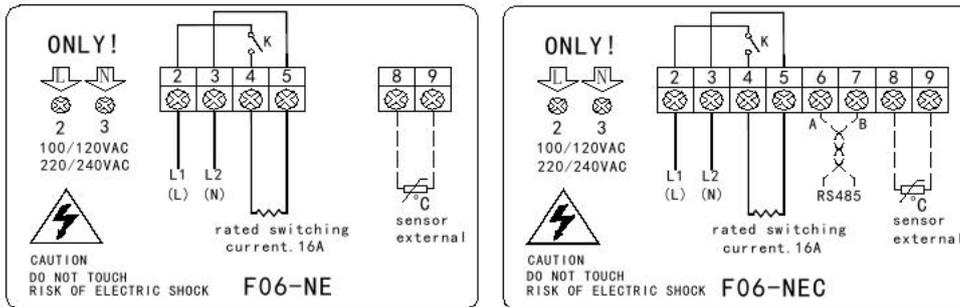
Power supply	230 VAC/110VAC±10% 50/60HZ
Power consume	≤ 2W
Switching Current	Rating resistance load: 16A 230VAC/110VAC
Sensor	NTC 5K @25°C
Temperature degree	Celsius or Fahrenheit selectable
Temperature control range	5~35°C (41~95°F) or 5~90°C
Accuracy	±0.5°C (±1°F)
Programmability	Program 7 days/ four time periods with four temperature set points for each day or program 7 days/ two time periods with turning-on/turning-off the thermostat for each day
Keys	On the surface: power/ increase/ decrease Inside: programming/temporary temp./hold temp.
Net weight	370g
Dimensions	110mm(L)×90mm(W)×25mm(H) +28.5mm(back bulge)
Mounting standard	Mounting on the wall, 2"×4" or 65mm×65mm box
Housing	PC/ABS plastic material with IP30 protection class
Approval	CE

## Models

	MODEL	DESCRIPTION
Programmable Thermostat for Floor Heating Systems	F06NE-(A)/(B)	Room thermostat for electric diffuser and floor heating. 7-day program with four time periods and temperatures each day. Holiday mode preset.
	F06NE-DW-(A)/(B)	Room thermostat for electric diffuser and floor heating. 7-day program with four time periods and temperatures each day. Holiday mode preset. Internal and external sensors can be used to control room temperature and the highest limit of floor temperature.

Power supply: -(A):230VAC -(B): 110VAC	F06NEC-(A)/(B)	F06NE with Modbus RS485 communication interface
	F06NE-PO-(A)/(B)	Room thermostat for electric diffuser and floor heating 7-day program with two time periods and turn-on/turn-off.
	F06NEC -PO-(A)/(B)	F06NE-PO with Modbus RS485 communication interface
		<b>OPTIONS</b>
External temperature sensor <b>-W</b>	Internal sensor and external sensor selectable for above items except F06-DW. The external sensor can detect the temperature of floor for protection.	
Backlight LCD <b>-EL</b>	Blue backlight of LCD	
Remote Control <b>-R</b>	Infrared remote control	

## Diagram Wiring



## Shipping Information

Indiv. Ctn. Dim	135mm×95mm×55mm
Master Ctn. Qty	40
Master Ctn. Dim	44cm(L)X32cm(W)X32cm(H)
Master Ctn. Wt.	18KG

## Mounting

