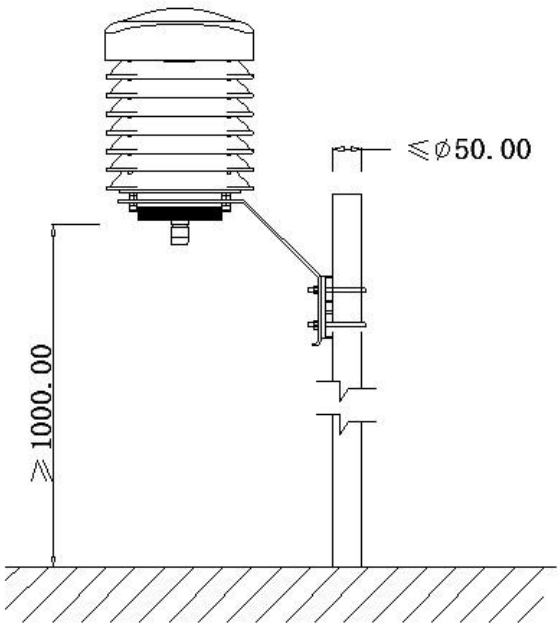
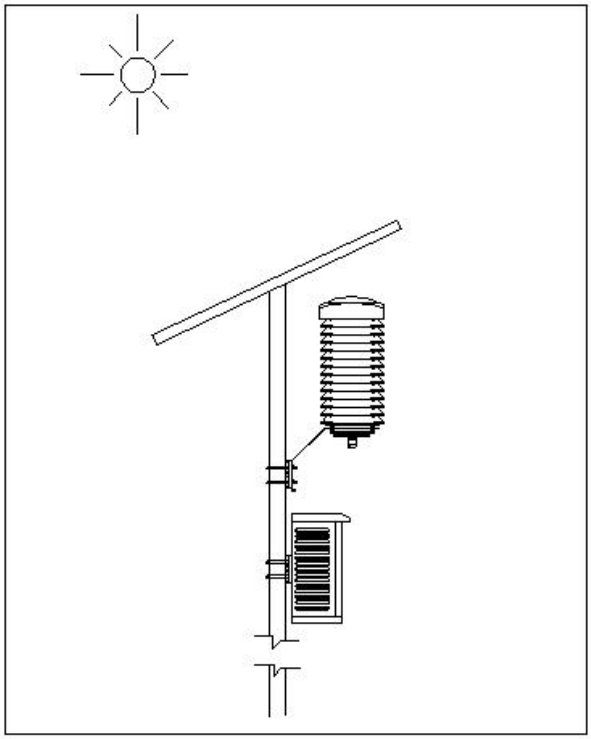
TF9 Outdoor Air Quality Monitor

- 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 4G+extra RS485.
- 12~24VDC powered with a 100~240VAC/ 1A power adaptor;
- Solar powered with Lithium-Polymer rechargeable battery, support the monitor working for at least 96 hours on rainy and cloudy days without sunlight.
- It’s installed on the outside wall of buildings, roof of buildings,on the ground, on the telegraph pole etc.





Specifications

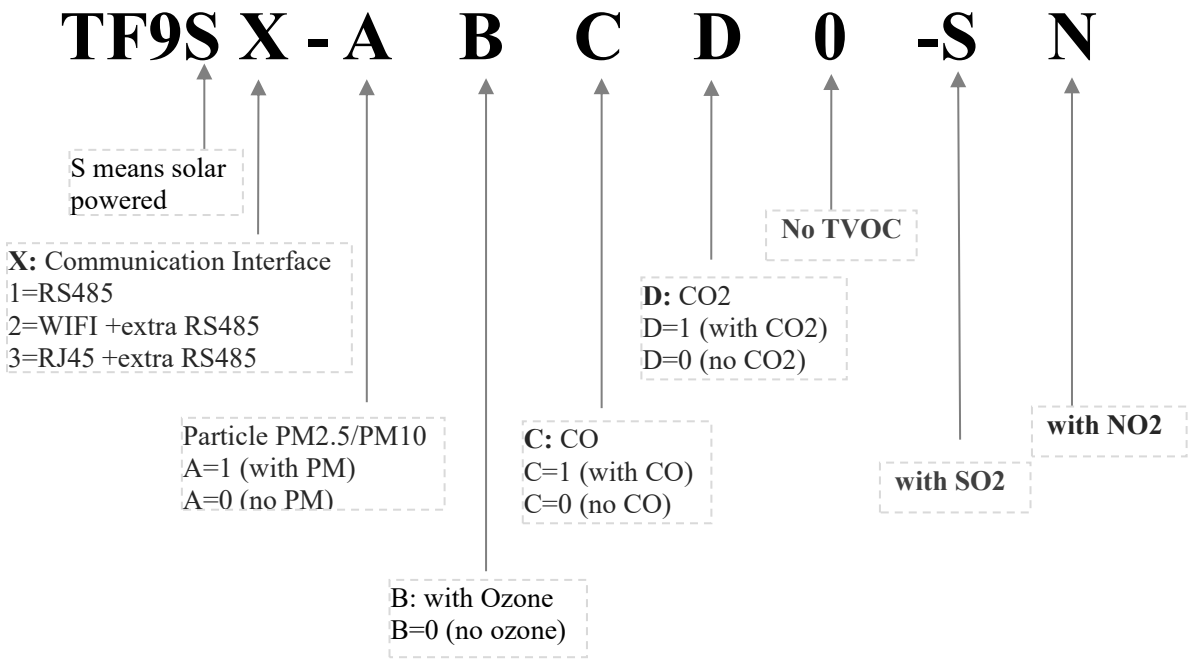
Power supply and communication		
Direct power supply		12-24VDC (with a 100~240VAC/ 1A power adaptor)
Solar power supply (support the monitor working >96 hours on rainy and cloudy days without sunlight)	Solor panel	Monocrystalline silicon energy solar panel (with 3.2mm fully tempered glass) 160W solar panel, 18V and 8.2A Demension: 700mm(L)x600mm(W)
	Lithium battery and power control box	A battery box is inside the power control box, 18pcs 18650 lithium batteries will be put in. Each 18650 typical capacity is 3400mAh to 2600mAh. Power control box: 300(W)x 150(T)x500mm(H)
	Dimentions / Net weight	Solor panel: 670*700*30mm/ 5.5Kg Power control box: 500*300*150mm/8.0 Kg

Communication interface options	A. RS485,Modbus RTU/BACnet MS/TP; B. WiFi@2.4 GHz 802.11b/g/n C. RJ45 Ethernet D. 4G: LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B18/B19/B20/ B25/B26/B28/B66 LTE-TDD: B34/B38/B39/B40/B41 B38/B40/B41
RS485 Interface	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
General Parameters of the Monitor	
Working condition	-20℃~70℃/ 0~99%RH
Storage condition	0℃~50℃/ 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	Depends on different models in around 53cm X 34cm X 25cm and 3.9Kg
Shell Material	PC material
Protection grade of the monitor	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 for the bare device. Installing a protective box on can increase the protection level.
Sensor Data	
Particles (PM2.5/ PM10)	
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℃)
PM10 Accuracy	±10ug/m3+15% of reading (0-500ug/m3, 0%-70%RH, @ 0-40℃)
Temperature and Humidity	
Inductive component	Band gap material temperature sensor, Capacitive humidity sensor
Temperature measuring range	-20℃-80℃

Relative humidity measuring range	0-99%RH
Accuracy	±0.3℃(-20~70℃)， ±3%RH (0%-70%RH)
Output resolution	Temperature: 0.01℃ Humidity: 0.01%RH
Carbon Monoxide(CO)	
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℃)
Ozone(O_3)	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-2000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40℃)
Nitrogen Dioxide(NO2)	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-4000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40℃)
Sulfur Dioxide (SO2)	
Sensor	Electrochemical Ozone sensor
Measuring Range	0-4000ug/m3
Output Resolution	1ug/m3
Accuracy	±15ug/m3+15% of reading (0-70%RH, @ 0-40℃)
Carbon Dioxide (CO2) (unnecessary for general outdoor air quality monitoring)	
Sensor	Non-Dispersive Infrared Detector (NDIR)
Measuring Range	350-2000ppm
Output resolution	1ppm
Accuracy	±30ppm + 5% reading
TVOC（applicable to green buildings)	
Sensor	Metal oxide sensor
Measuring Range	0.01-4.00mg/m3
Output resolution	0.001mg/m3
Accuracy	±0.05mg/m3+10% of reading (0-2mg/m3, 10%-80%RH,@0-40℃)

Atmospheric Pressure	
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	CO2	NO2	SO2	Communication
TF91-10110-MB TF91-10110-BN	•		•	•			RS485, Modbus RTU or RS485, BACnet MS/TP
TF93-11000	•	•					RJ45, MQTT Protocol
TF94-11100-NS	•	•	•		•	•	4G, MQTT Protocol

Note: If sulfur dioxide (SO_2) is selected, ozone must be selected together. Because measuring SO, needs ozone measurement as being compensation. Otherwise, the measured value of SO, is unreliable and have a very large deviation.

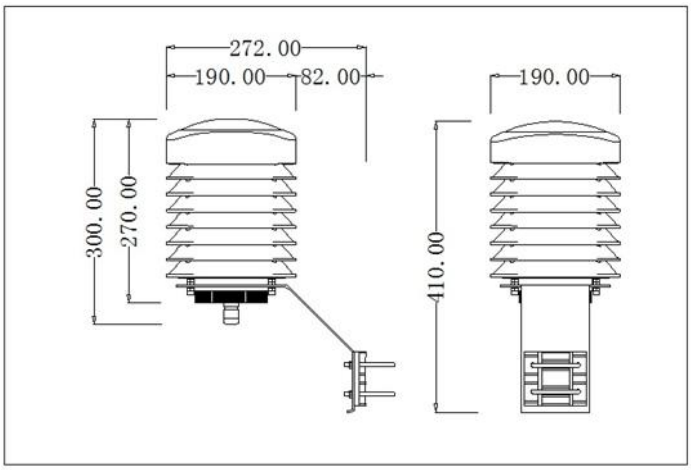
Protocol Support

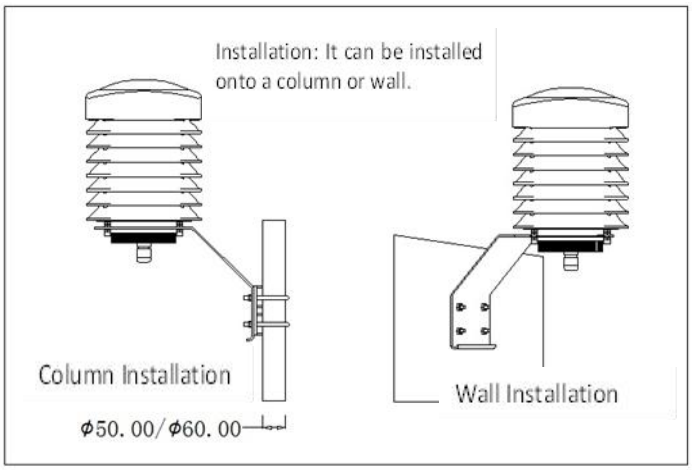
Communication protocol support

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

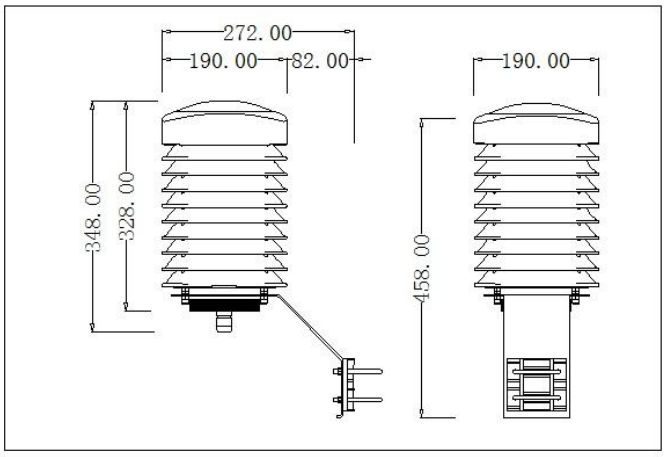
Examples of Dimension of the Monitor

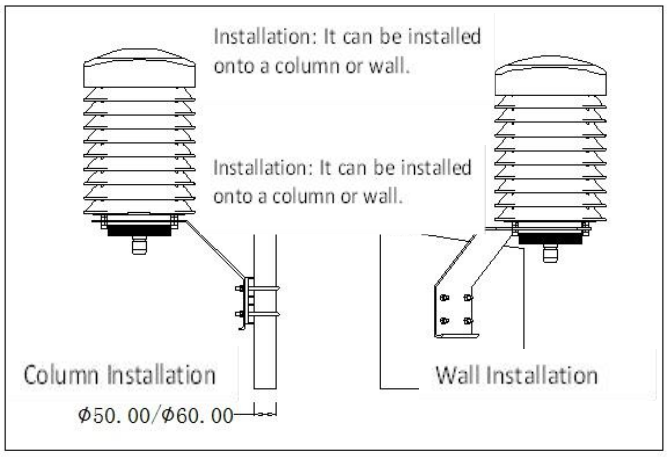
■ WIFI interface, RS485 interface for monitoring PM2.5/PM10, CO2, CO, T&RH
Overall size: width 190.00mm, height 434.00mm Net weight: 2.65Kg





■ RJ45 interface PM2.5/PM10, CO2, CO, T&RH
Overall Size: width 190.00mm, height: 458.00mm Net weight: 2.8Kg





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

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