

User Manual

AQD-WM300 (RS485)

Indoor Air Quality Controller

Date: March 2021

Doc Version:1.0

English



Applications

- Residential ventilation system.
- Business ventilation system
- Industrial ventilation system

Description

AQD-WM300 (RS485) is an indoor air quality controller with screen provides customers with visual indoor air quality readings, such as PM2.5, CO2, temperature, humidity, etc. It is widely used in residential, commercial and industrial applications, and can effectively improve air quality and create a healthy, comfortable, efficient, environmentally friendly, energy-saving living and working environment.

Features

Compatible with embedded and wall-mounted fixing methods;
Compatible with push-button and touch-screen operation;
Using standard 86 box size, thickness <24mm;
PM2.5, CO2, temperature and humidity etc., multiple sensors can be optionally selected.

Working Principle

The built-in dust sensor uses the principle of laser scattering technology to detect the indoor PM2.5 mass concentration in real time ($\mu\text{g}/\text{m}^3$).

The built-in carbon dioxide sensor uses the principle of NDIR technology to detect indoor CO2 concentration in real time (ppm).

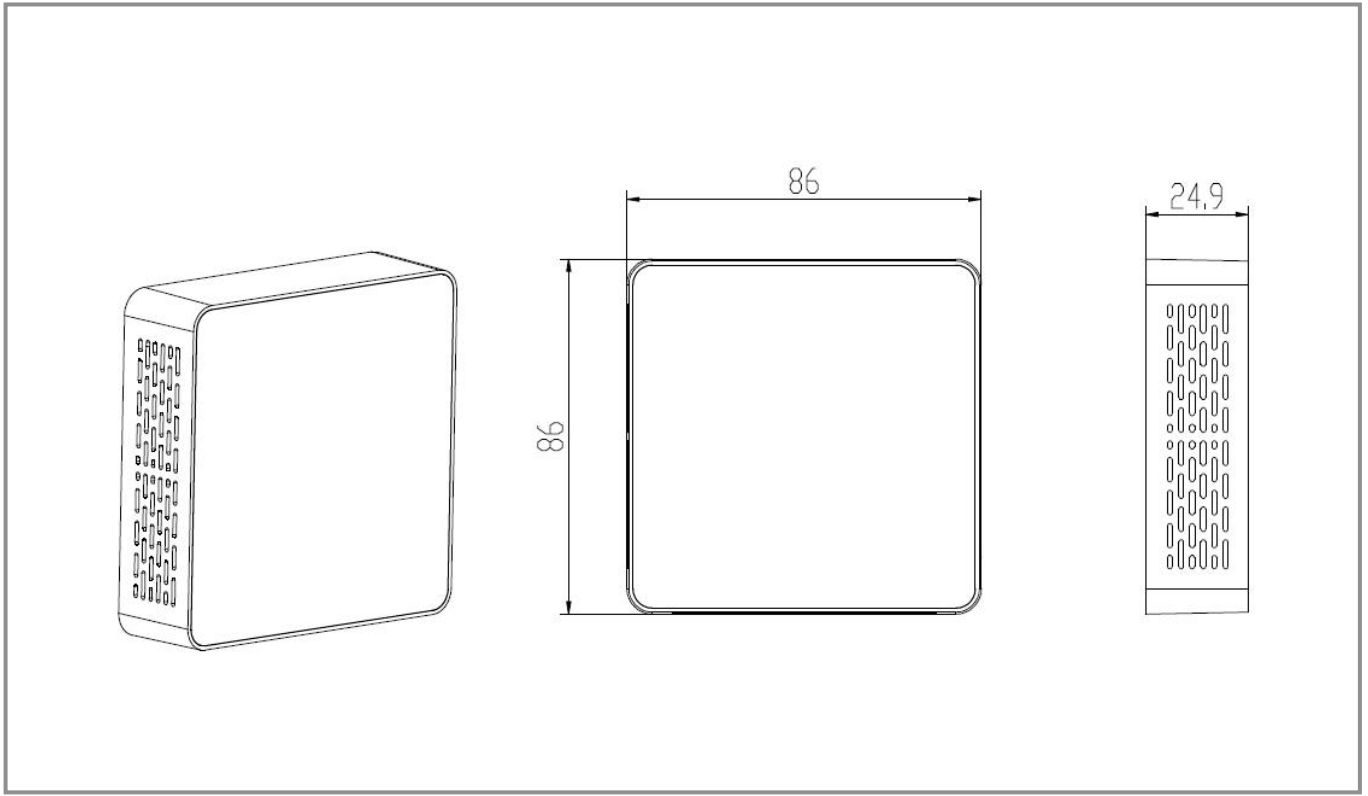
The temperature and humidity sensor use capacitor resistance material to detect the indoor temperature ($^{\circ}\text{C}$) and humidity (%) in real time.

Specifications

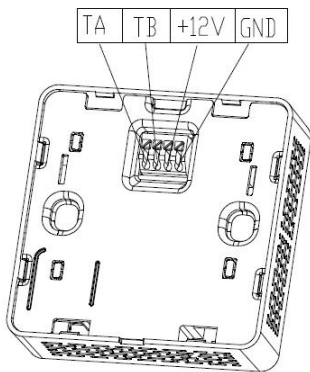
Working principle	CO2 : NDIR PM : Laser scattering principle
Measurement range	PM2.5 : 0~1000 $\mu\text{g}/\text{m}^3$ CO2 : 0~5000ppm Temperature : -10 $^{\circ}\text{C}$ ~50 $^{\circ}\text{C}$ Humidity : 0%~95%RH
PM2.5 Measurement accuracy	$\leq 100\mu\text{g}/\text{m}^3$: $\pm 10\mu\text{g}/\text{m}^3$ > 100 $\mu\text{g}/\text{m}^3$: $\pm 10\%$ reading Reference Instrument TSI 8530, 25 $\pm 2^{\circ}\text{C}$, 50 $\pm 10\%$ RH)
CO2 Measurement accuracy	$\pm (50\text{ppm} + 5\% \text{ reading}) @ 0\sim 50^{\circ}\text{C}$
Temperature Measurement accuracy	$\pm 1^{\circ}\text{C}$
Humidity Measurement accuracy	$\pm 8\%$ RH
PM Response time T90	$\leq 8\text{s}$
CO2 Response time T90	<120s
Working condition	-10~50 $^{\circ}\text{C}$, 0~95%RH(Non-condensing)
Storage condition	-20~60 $^{\circ}\text{C}$, 0~95%RH(Non-condensing)
Working voltage	DC 12V
Working current	<140mA
Standby current	$\leq 80\text{mA}$
Signal Output	RS485
Installation hole distance	60mm (standard)
Dimension	86*86*24.9 mm
Lifetime	PM : ≥ 5 years CO2 : ≥ 10 years

Dimensions and Interface Definition

1. Dimensions (Unit: mm, tolerance: ± 0.2 mm)



1. Pin definition



Nº	Pin	Description
1	TA	Communication port (RS485_TA)
2	TB	Communication port (RS485_TB)
3	+12V	Power input (+12V)
4	GND	Power input (GND)

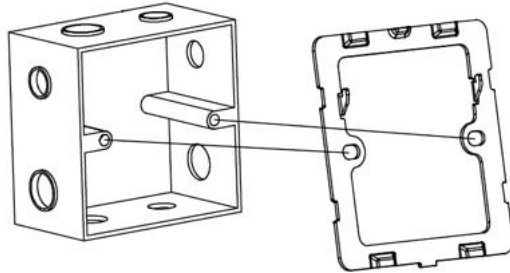
Dimensions and Interface Definition



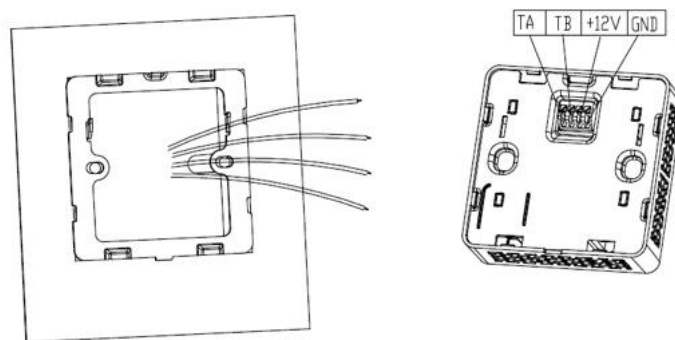
Parameter Range corresponding to color LIST			
Gas	Level	Range	Color
PM2.5 (µg/m ³)	Good	0~75	Green
	Just so so	75~115	Yellow
	Bad	≥115	Red
CO2 (ppm)	Good	0~600	Green
	Just so so	600~1000	Yellow
	Bad	≥1000	Red

Installation Instructions

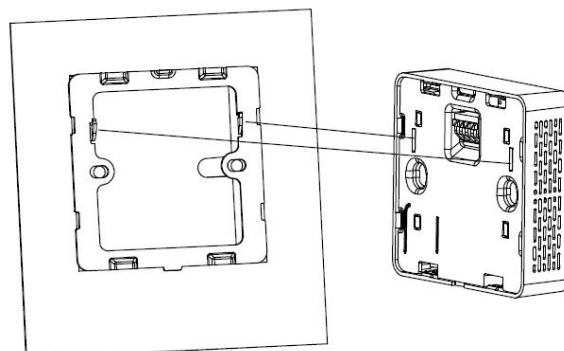
Step 1: Fix the wall mounted bracket with screws on the 86 box which in the embedded wall, as shown below:



Step 2: Connecting Cable, connect the corresponding cable to the controller's RS485 interface according to the interface definition, as shown below:



Step 3: Match the two holes in the controller with the hooks in the wall mount bracket and slide the controller down to ensure that the controller is tightly locked with the bracket.



Precautions for use

Do not place the controller in an environment where the ambient temperature is too high (above 60 ° C) or too low (below -20 ° C).

Keep it out of reach of children as much as possible to prevent injury from collision and fall.

Do not drop the controller or rub it against hard objects during use, otherwise it may cause damage to the controller's external light and damage.

Do not place the controller in a dusty environment to avoid dust accumulation in the controller and affect the measurement accuracy.

When using the controller, do not cover or block the vent hole with any object to avoid affecting the air quality monitoring.

Do not disassemble, repair or modify the controller without permission.

Communication Protocol

1. General Statement

- 1) Baud rate: 9600, Data Bits: 8, Stop Bits: 1, Parity: No
- 2) Communication distance \leq 2km; and we suggest the terminal impedance be 120Ω , 1 / 2W.

2. Format of serial Communication Protocol

Sending format of test software:

Start Symbol	Length	Command	IP Address	Data1	Data n	Check Sum
HEAD	LEN	CMD	ADD	DATA1	DATAn	CS
11H	XXH	XXH	XXH	XXH	XXH	XXH

Detail description on protocol format:

Protocol Format	Description
Start Symbol	Sending by controller is fixed as [11H]
Length	Length of frame bytes= data length +2 (including CMD+IP+DATA)
Command	Command is fixed as [55H]
Address	Controller address is (1~254, default is [01H])
Data	Data of writing or reading, length is not fixed
Check Sum	Cumulative sum of data = 256-(HEAD+LEN+CMD+IP+DATA)

3. Controller Command

The system's default slave device address is 01H, the controller command is 55H, and the command format is as below:

11 10 55 01 DF1 DF2 DF3 DF4 DF5 DF6 DF7 DF8 DF9 DF10 DF11 DF12 DF13 DF14 CS

Slave response

16 02 55 01 CS

4. Command Table of Serial Protocol

Name	Data	Description	Note
Mode	DF1	0x00 Timing Mode 0x01 Intelligent Mode 0x02 Manual Mode 0x03 Mute Mode	

Wind Speed Mode	DF2	0x01 Low 0x02 Medium 0x03 High	
Air Switch (For fresh air and air exhaust)	DF3	0x00 air exhaust switch off and fresh air switch on 0x01 air exhaust switch on and fresh air switch off 0x02 air exhaust switch on and fresh air switch on	
Indoor PM2.5 Concentration	DF4 - DF5	0--1000	$\mu\text{g}/\text{m}^3$
Indoor CO2 Concentration	DF6 - DF7	0--5000	ppm
Indoor Temperature	DF8 - DF9	0--600	(Corresponding value -100) / 10 ° C (-10.0-50.0), one decimal place is reserved
Indoor Humidity	DF10	0--95	0-95 %
Indoor HCHO Concentration	DF11 - DF12	Reserved	(0-1) mg/m^3
Error	DF13 - DF14	Reserved	
Checksum	CS		

