AQM-09

Air quality monitor system

Operating Manual

Henan Oceanus

Attention:

1. All operators who operate and test our company's factory instrument must read this manual carefully before operation. Only the instrument of this company is operated according to the operation manual of this company, can the instrument work normally.

2. The usage of the instrument of this company must conform to the regulations confirmed by the operation manual. The maintenance of the instrument and changing of the parts must adopt accessories offered by this company, and the maintenance operators must be the works who have been trained.

3. If the user repairs this product or change accessories arbitrarily and does not conform to the above-mentioned manual, the operator shall be responsible for the reliability of the instrument. And this company is not responsible for the warranty.

4. This machine is non-explosion-proof equipment. Please install it in a safe environment. The installation process must comply with the relevant national authoritative standards.

5. The usage of this instrument also should conform to the laws and regulations of the domestic relevant departments and instrument management of the factory.

6. Resistive touch screen is easy to be damaged by scratches, so do not use hard materials for touch operation.

7. In strict accordance with the output relay capacity to connect external devices, so as not to damage the host. For external equipment beyond capacity, please add AC contactor.

8. The machine should be grounded reliably in use. If there is no grounding wire

for power input, the machine should be grounded safely through the grounding terminal.

9. When the terminal wiring and plug in terminal or other operation are done, it is necessary to disconnect the power supply and operate.

10. The interval between instrument power failure and power on again is more than 5 seconds.

I. Product introduction:

AQM-09 is a new product which can monitor the air quality via the value of O3, SO2, NO2, CO, PM2.5, PM10, etc. The target value is converted into voltage signal by operational amplifier circuit, and then filtered through high-precision AD data acquisition system. Finally, the gas concentration is calculated by CPU. Particulates mainly use laser scattering method to produce different scattering light according to different particle diameters under laser scattering conditions. The scattered light intensity is collected by a response device, and the particle

concentration is obtained after amplification, filtering and AD acquisition. The obtained gas concentration and particulate matter concentration can be displayed on LCD screen in real time, and can also be transmitted to cloud platform or environmental protection platform through GPRS, 4G LTE and other network signals, so as to realize the monitoring of regional environmental quality.

1.1 Safe instruction

- Please do not to disassemble this monitor voluntarily in order to guarantee that the using of the monitor is safe and reliable.
- Please do not put this monitor in the high temperature, moist or strong static environment.
- Please do not install monitor in a large quantity of dust, salt and metal powder.
- Please do not clean this monitor using any corrosive liquid.
- The user cannot change the parts of this product voluntarily, and should deal with the breakdown in the process of operation with the maker, which can completely eradicate damage phenomena.
- 220V high voltage power supply inside the shell should pay attention to safety. If there are problems, a professional electrician is needed.
- The installment, use and maintenance should conform to operation manual, GB16808-2008.

1.2 Application

- Monitoring of urban ambient air quality.

- Monitoring at Expressway and street junctions.
- It can be installed on various mobile tools for monitoring, such as car, bus, etc.
- Monitoring agricultural straw burning, forest fire alarm, and air quality monitoring in tourist attractions.
- Industrial related monitoring: petrochemical industry, power plant, waste disposal station or yard, mining industry, heavy industry, airport, wharf, railway, construction site.
- Residential quarters, schools, hospitals.
- Environmental impact assessment and source apportionment.

II. Specification information

2.1 Basic parameters

Name	Air quality monitor system
Model	AQM-09
Sampling mode	Diffusion+Pump suction
Data transmit	RS485 Modbus，4G LTE optional
Pre-heating time	60s
Body material	Cold rolled steel plate
Install	Columns and wall-mounted optional
Working temperature	-20℃~60℃

Working humidity	0%RH ~99%RH
Storage temperature	-40℃~70℃
Power supply	AC220V/50Hz, Solar panels optional, customized for every country
Power	Humidity < 90%RH，power < 20W； Humidity > 90%RH，power > 40W，
Dimensions	500*400*300mm
Protection grade	IP55

2.2 Basic parameters of particle monitor system

Range	PM2.5（0-1000）ug/m3，PM10(0-1000)ug/m3
Sampling flow rate	1.3L/min,±0.15
Sampling time	Adjustable，default 1min
Particle size	PM2.5，PM10，PM100，TSP
Resolution	1ug/m3
Intake heating	Dynamic heating dehumidification based on ambient air humidity
Fault alarm	Real time display of fault alarm

2.3 Basic parameters of gas detection

Gas	Range/ppb	Resolution/ppb	Precision/%FS
O3	2000	1	±5
NO2	2000	1	±5
SO2	2000	1	±5
CO	200ppm	10ppm	±3
VOCs	20000	20	±5
H2S	20ppm	0.1ppm	±5

2.4 Reference standard

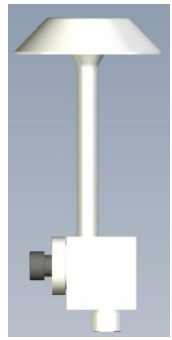
- HJ 654-2013, Technical Requirements and Detection Method of Continuous Automatic Monitoring System for Gaseous Pollutants in Ambient Air (SO2, NO2, CO, O3).
- Data transmission standard for HJ_T 212-2017 pollutant on-line monitoring (monitoring) system.
- HJ_T 524-2009 air pollutant name code.
- Technical requirements of HJ 907-2017 automatic monitoring system for environmental noise.
- HJ663-2012 technical specification for environmental air quality index (AQI) (Trial Implementation).
- GB/T 19582-2008 industrial automation network specification based on Modbus protocol.

2.5 Product features

- Modular design, configuration of arbitrary combination, easy to set different monitoring factors on demand, suitable for large-scale grid distribution points;
- The calibration is carried out on the basis of traceable reference standards.
- Select four electrode high precision import sensor.
- Do not need to replace the sampling cutter, and can simultaneously measure the mass concentration of PM10 and PM2.5.
- Industrial embedded processor is used in the circuit, which is suitable for harsh outdoor environment and working environment temperature range (-40-70)degrees Celsius.
- The high precision ADC data acquisition system can monitor pollutants at ppb level.
- The dynamic heating dehumidification control is adopted to remove the influence of water mist on the measurement data.
- The system adopts long life anti-interference sampling power system, which is quiet and efficient, and the sampling period is adjustable.
- Select industrial data transmission module, data transmission is stable and reliable, and the system adopts two-channel communication mode to ensure data continuity.
- It can not only realize remote data transmission, but also read system status information remotely. It can also realize remote control, modify instrument parameters remotely and diagnose faults.
- The weather parameter test system can be selected.

- IP cameras with various parameters can be selected to ensure night and line-of-sight shooting requirements, automatic capture, and real-time viewing by users.
- Field real time data display: terminal instrument data update time can be adjusted.
- Installation modes are various, and can be selected according to the site conditions: bracket installation, hanging rod installation and other ways, any installation mode is solid and reliable, and can resist instantaneous 12-level wind.

III. Function introduction



Cyclone type physical cutter

The particle concentration was measured by laser scattering. The test sample of the air in the atmosphere is pumped to the sensor assembly with a precision flow controlled membrane pump. The sensor measurement module is based on Gustav Mie particle light scattering theory and combined with Micro-Photoelectric detection technology to produce a complete set of air particle distribution concentration measurement system.

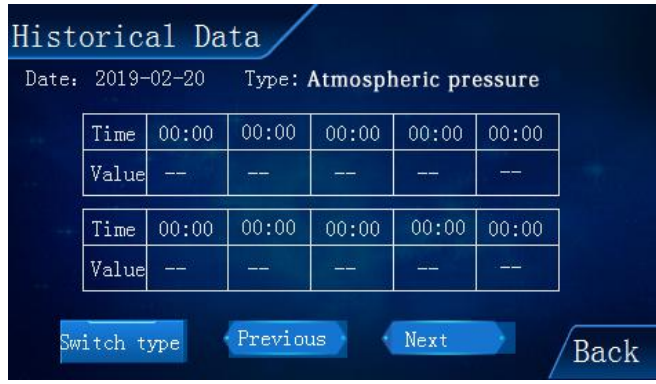
The system ingeniously designs the light sensitive area as the place where the scattering of particles occurs. When the particles pass through the light sensitive area formed by the focused laser, the light scattered by particles is collected by the Micro-Photoelectric detector on the detection window. The Micro-Photoelectric detector quickly and accurately converts the received light intensity signal into the equal voltage signal, and the signal is dense. Degree corresponds to the unit concentration value of particles. After coefficient conversion, the dust concentration value is output in real time through data interface. With cyclone physical cutter and PID real-time temperature control system, the response of humidity to test results can be effectively reduced. Combined with sheath gas protection system, the influence of test samples on optical elements is effectively prevented.

3.1 Introduction of usage

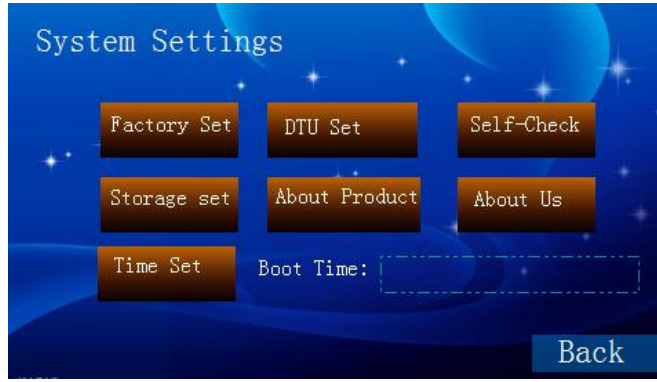
The main interface includes real-time data display, device networking status, real-time clock and some function buttons.:

3.2 Data check and export:

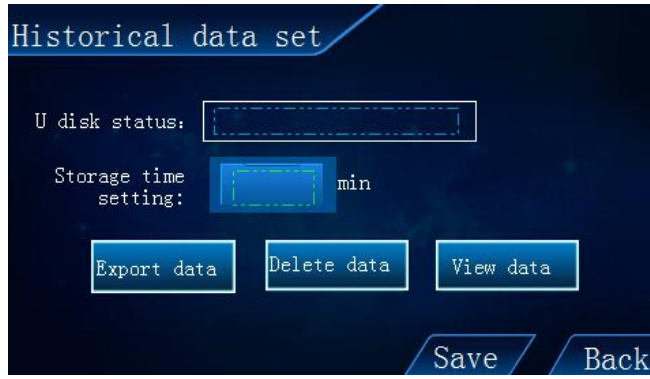
From the main interface choose the history data, you can check the history data; switch to check every gas type data, previous or next can view more data:



3.3 System



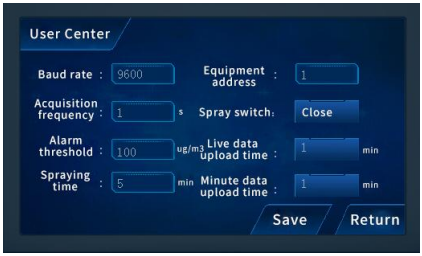
From the main interface choose the system , you can check and modify system setting,

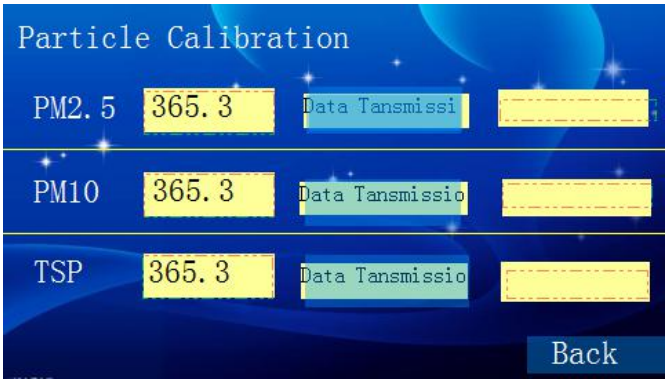


From the system setting choose the storage setting ,you can set whether use the U disk, and set the storage time , export , delete or check data.

.3.4 Dust calibration

From the main interface choose the user , you can calibrate the dust value, the password is 123456





IV. Installation

4.1 Installation notes

1. When installing products, please refer to the relevant literature to meet the basic requirements of gas detection in special application situations formulated by relevant industries.
2. The installation process must comply with the relevant authoritative standards

of the state.

3. Install and use the monitor in the indoor safety area without explosive gas environment.

4. Correct installation and reliable grounding to improve anti RFI interference and anti EMI interference capability.

5. Ensure that the test gas concentration does not exceed the gas range of the monitor.

6. Installation, use and maintenance of products shall comply with product specifications, GB3836.13-1997 "Electrical equipment for explosive gas environment Part 13: Maintenance of electrical equipment for explosive gas environment", GB3836.15-2000 "Electrical equipment for explosive gas environment Part 15: Electrical installation in dangerous places (except in coal mines) The relevant provisions of GB3836.16-2006 "Electrical equipment for explosive gas environment Part 16: Inspection and maintenance of electrical devices (except coal mines)" and GB50257:1996 "Code for construction and acceptance of electrical devices for explosive and fire dangerous environments in electrical equipment installation works".

4.2 Installation

Install type: Pole mounted installation

Installation accessories: two groups of hoops, according to the size of the hoop, the hoop size can be selected as 76 diameters/89 diameters/114 diameters; 4*M10 installation screws, Pole :1pc.

Steps:

1) Install and secure the holding pole in suitable place.

2) Install hoop and related accessories according to the illustration.

3) Install the instrument on the holding pole, tighten the screws, fix it safely and prevent the occurrence of dangerous situations such as slide.

V. Common fault maintenance & After-sale service Information

5.1 Common fault maintenance

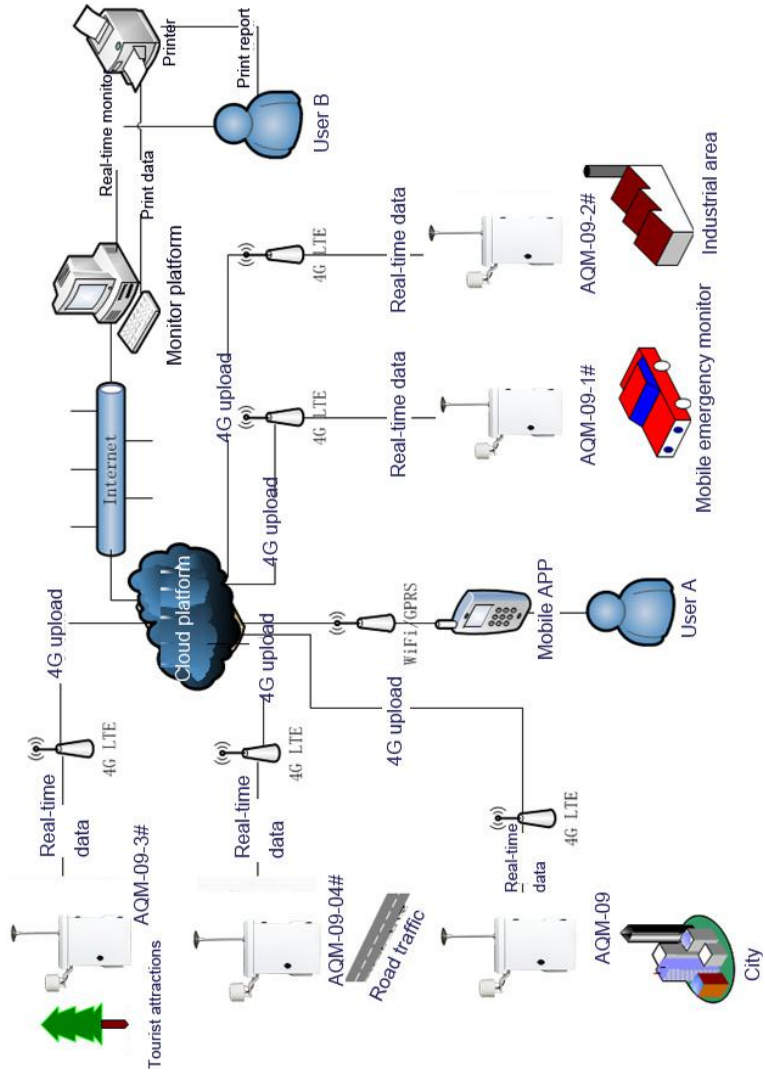
Fault	Possible cause	Solve
Can't start to work	Unconnected power supply	Check whether the power line is inserted
Can't connect the platform	The SIM card insert wrong side	Check whether the SIM insert in right; and check the antenna whether is ok.
Particle value always too high	The sensors need maintenance	Contact suppliers to solve sensor maintenance problems
Particle value always too low	Sensor exception	Contact suppliers
No action of cooling fan	Fan power cord not connected properly	Check whether the fan power cord is properly inserted

5.2 After-sale service Information

Before leaving factory of the products, the products have been calibrated and checked seriously by our company according to requirements. We promise that the products conform to the relevant standards and laws and regulations of national and industry.

The customer who purchases the instrument of our company enjoys 12 months warranty period. In the process of using, the user should abide by the application instructions, if the damages which is caused by the improper using, or the harsh working environment in the warranty period, the company would not be responsible for it. If the machine cannot work because of the quality problem, our company would maintain or change in free for the user. The company would accept the production cost after one year.

The sensor is the sensitive instrument; the standard of the sensor maker to the warranty conditions would prevail. The maker would not make warranty to the condition of manual damage or improper using.



Henan Oceanus Import & Export Co., Ltd.

Email: info@china-oceanus.com

Web: http://china-oceanus.com/