sisco

Particulate Matter Monitor

User Manual

catalogue

User instructions

Dear users:

Thank you for choosing the Online dust concentralion tester of our company!

For your safe and convenient use and reasonable maintenance, please pay attention to the following points:

1. Read the instruction manual carefully before use, and keep it properly for inspection.

2. When opening the product packaging, please check whether the accessories are ready in the first time.

3. Please put the product in the dry place when idle, and pay attention to prevent rain water.

4. Make sure that at any time, the product's power supply voltage is correct.

5. To ensure your safety, check whether your three-core socket is properly and reliably grounded.

6. Please observe the operating procedures and precautions in this manual.

7. If the instrument is faulty, please do not disassemble it and repair it or submit it to the unauthorized maintenance department of the company for repair. Please contact us in time to inform us of the fault phenomenon. We will serve you wholeheartedly.

Special explanation

In order to improve the performance and reliability of the parts and the whole machine, we will upgrade and change the instrument. The parameters and performance of the instrument may not be completely consistent with the contents in the instruction manual, so the company has the right of final interpretation. If any problems occur in the use, please contact us.

Friendly reminder

Please read this manual carefully before installation and operation, pay attention to the various signs on the equipment, and do not let the children touch it in case of accidents. Unauthorized maintenance personnel, do not remove the equipment without authorization.

This product is guaranteed for one year and lifelong maintenance. Please keep the after-sales service card on the last page of the manual.

Matters need attention

1. Avoid wiping the probe with dry cloth, if you need to wipe, you can use wet cloth, do not wipe with water or organic solvent.
2. Keep away from the strong electromagnetic field, if you must pass through a strong electromagnetic field, use a metal casing around the probe.
3. After the installation, try not to move the device at will, so as not to affect the use in the process of movement.
4. This device requires a 24V power supply.

1. Overview

1.1. Instrument description

SISCO Particulate Matter Monitor measures the amount of electrostatic charge induction by dust particles passing through a fixed probe. Dust particles induce with the sensor to generate electrostatic charges, which is amplified through the sensor and transmitted to the monitoring and control system. The magnitude of the electrostatic charge is proportional to the flow rate of the dust particles. The high-tech electronic circuit of this system converts this part of the charge into the control signal output, starts the alarm of excessive dust emission, and is used to continuously record the total amount or concentration of dust particles. The device provides the world's latest AC coupling technology. This is the most accurate and stable monitoring technology in modern times, especially suitable for continuous emission recording and data accrual.

The working principle of this monitoring system is to use the charge induction of dust particles flowing around the probe to confirm the online emission (mg / sec) or emission concentration (mg/m3). In the case of relatively stable combustion condition (that is, at the same emission point, the flow rate, temperature, pressure, humidity and soot particle properties do not change greatly, less than ± 90% change), the system can also be used for online monitoring of emission concentration (unit =mg / M3) after direct calibration.

1.2. range of application

SISCO Particulate Matter Monitor is widely used in a variety of industrial uses, including: steelmaking, power generation, petroleum, chemical industry, medicine, building materials processing, coal mining and mining, cement manufacturing and packaging and other industries. Typical uses include the detection of damaged bag filter bags, or recovery of powder materials, monitoring of total product transport, or monitoring of boiler soot emission concentration of various sizes and fuels.

1.3. functional characteristics

(1) Using the most advanced practical technology- -the patented modified AC coupling technology, the dust detection method has high sensitivity and good linearity.

(2) Standard second-line system 4-20 mA current output, easy to long-distance signal transmission, no special requirements for signal transmission wire, output current and dust concentration into a linear relationship, convenient for subsequent PLC data processing.

(3) The installation and use are completely consistent with the second-line pressure transmitter. The field engineering and technical personnel can use it correctly without any special training, and the installation is convenient and the operation is reliable.

2. Technical parameter

Operating environment temperature	-20℃ to 60℃(electronic components)
Operating environment humidity	90%
Operating environment vibration	Maximum continuous oscillation volume, any direction, any frequency: root mean square value 2g (20m / s2)
Operating environment electromagnetic field	Maximum value = 60 A/m at 50 Hz (equal to a magnetic field of 50AT in a 1 m 1 m square electromagnetic coil)
Operation environment protection	Protection grade: IP66 / NEMA4 aluminum alloy shell, suitable for installation in non-corrosive environment, stainless steel probe
Pipeline gas pressure	-0.1 - 1MPa
Pipeline gas flow rate	1m/s～30m/s
Pipeline gas temperature	－50℃～450℃
Pipe outer diameter	0.1 m ~4 m
Probe structure	The standard probe is M6 with a length of 160 mm 316 stainless steel stick.
Dust particle size range	Nominal 0.1 μ M~200 μ M, still receive outside the nominal range but signal characteristics.
zero drift	(Time) is below 1% of the range per year.
zero drift	(Temperature) within the specified temperature range, below 1% of the range.
Full range drift	(Time) is below 1% of the range per year
Full range drift	(Temperature) within the specified temperature range, below 1% of the range.

Line stability	High stability electronic assembly is selected of all components of the system.
Noise resistance	All 50 or 60 Hz audio and harmonics are all filtered out before the signal is received
measuring range	0-9/12/25/50/100/200/400/800/1000mg/M3
Transmitter power supply	15V － 32VDC

3. Installation of the sensor

(1) The sensor is best to be installed on the vertical pipe, more than 5 times the diameter of the valve, the elbow, away from the horizontal pipe sampling, should not be installed at the bottom. For the gas dust removal system running in parallel with multiple boxes, the hole (Φ 30 ± 2mm) shall be opened at the outlet of the measured dust removal box before the net gas header, and the base interface end of the fixed sensor shall be vertically welded to the top of the long horizontal pipe in the straight pipe section.

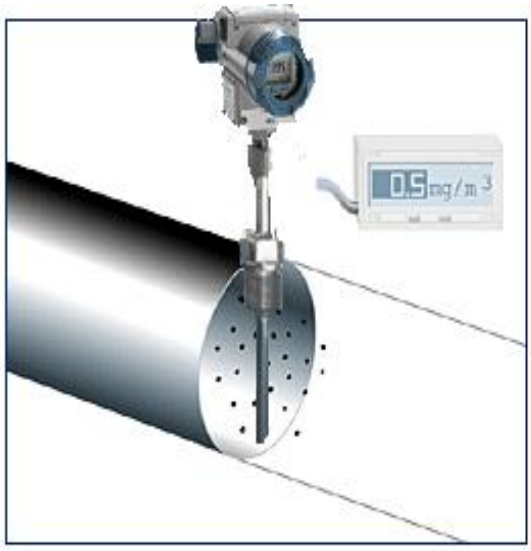


Figure 1 Diagram of pipe installation of electrostatic dust detector

(2) The length of the sensor probe rod is supplied by the instrument manufacturer. The base shall be the top of the insulation sleeve of the sensor probe rod matching or protruding from the inner wall of the pipe. The base is supplied by the instrument manufacturer.

(3) Add copper pad between the sensor and the socket to connect and tighten it to prevent the

leakage of toxic gas in the pipe.

(4) The sensor junction box is rain-proof. The signal cable is directly connected to the terminal in the box through the thread hole on the junction box, and then press the sealing ring. The external lead cable should be fixed nearby to swing back and forth in the wind and rain, causing mechanical damage to the transmission wire.

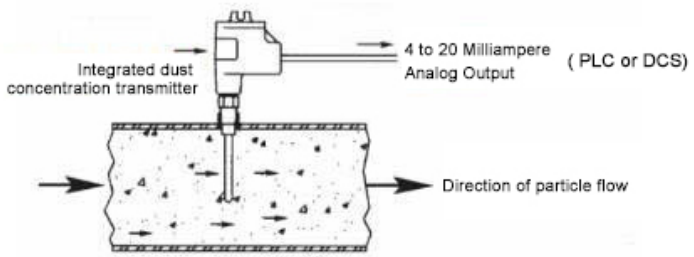


Figure 2 Schematic diagram of the signal connection of the electrostatic dust detector

Figure 3 Online dust concentralion tester and PC system components

4. Precautions

(1) The sensor base and length size are provided by the manufacturer, with the base opening size in the pipe Φ 30 ± 2mm.

(2) Please choose 0.75mm^2 -- 1.5mm^2 ordinary twisted-pair wire (in an environment with particularly strong interference, please use the shielded double-core cable, and ground the shielding layer well).

5. Calibration instructions of the dust emission monitor

After calibrating the dust emission monitor using the equivalent sampling test (Isokinetic sampling test), it can be set as mg / s or mg / M3 data of total output units. However, if the sampling port of isokinetic sampling is upstream of the probe, or too close to the probe, the insertion of the sampling instrument affects the stability of the air flow around the probe when inserted, and the dust emission monitor cannot be effectively calibrated. Therefore, the probe must be installed at a distance of 1 m upstream of the sampling port. In the dust emission monitor equipment, it is usually necessary to set up three horizontal lines, respectively representing three different dust emission concentrations. They are normal operating horizontal lines, alarm lines (indicating broken filter bags) and excessive discharge lines (indicating significant failure in the filtration system). These three lines are set within the output data range of 4-20 mA. Because the linear relationship between the dust concentration value measured by the dust emission monitor and the current (4-20 mA) is used (note: 0% = 4 mA, 100% = 20 mA), a conversion coefficient (expressed by K) can be established to calculate other dust emission concentration values in the constant sampling test.

6. Common faults and troubleshooting methods

No	phenomenon	fault analysis	resolvent
1	signal extraordinary stabilize	1. The transmitter signal line is not well connected well; 2. Transmitter signal line is open circuit or ground; 3. Sigline dial switch adjustment error; 4. The measured medium is too clean or the sensor insertion depth is unqualified; 5. Damage to the electrode coating or casing; 6. The transmitter board is damaged.	1. Reconnect the transmitter signal line; 2. Check whether the line is correctly connected; 3. Check whether the signal line fluctuation switch is opened correctly; 4. Sensor insertion at an appropriate depth; 5. Contact the manufacturer and return to the factory for maintenance; 6. Contact the manufacturer and return to the factory for repair.
2	signal undulate larger	1. bad earth; 2. There are strong electric field and strong magnetic field near the installation position; 3. Range adjustment error; 4. The transmitter board is damaged.	1. Check whether the power supply is well grounded; 2. It is recommended to add an external isolator; 3. Reset the range; 4. Contact the manufacturer and return to the factory for repair.
3	Transducer has voltage no current	1. Signal output circuit grounding; 2. The transmitter board does not directly contact with the junction box through the copper column; 3. Display the switch adjustment error;	1. It is recommended to add an external isolator; 2. Check whether the fixing screws on both sides of the instrument are tightened;

		4. The transmitter board is damaged.	3. Turn on the fluctuation switch; 4. Contact the manufacturer and return to the factory for repair.
4	transducer no voltage no current	1. Power supply line is open; 2. Poor contact of the power line terminals; 3. The transmitter board is damaged.	1. Connect and check the power supply line; 2. Connect and check the power supply line; 3. Contact the manufacturer and return to the factory for repair.
5	output circuit current shows about 30 mA more 2 mA	The power supply is not isolated from the ground, so it is recommended to install a power distribution isolator.	It is recommended to add an external isolator.

7. Transportation and storage

- If you find that the packaging is bad and the packaging is damaged, the accessories are inconsistent with the packing list, few parts, or within one year, the user complies with the transportation, storage, installation and use procedures of the instrument, please contact us .
- The instrument should be placed upward during transportation to avoid tilt and flipping.
- In the process of transportation and use, the instrument should avoid strong vibration, collision and the invasion of dust, rain and snow.
- The instrument shall be stored in a cool, dry and ventilated place.

8. Maintenance

Note: Power must be removed before any maintenance or maintenance operation!

- The probe should be cleaned regularly, and the surface can be wiped with alcohol, dried and then inserted into the pipe.
- Dust dust environment, the probe is recommended to be cleaned once a month.
- Wire sealing strip and shell sealing strip check regularly, dust and dust into.
- When the humidity in the instrument storage area is high, it is recommended to dry the water stains on the instrument surface first, and place the instrument in the ventilated and dry place for 20 minutes before starting up

9. Calculation of the K conversion coefficient

(1) In the isometric sampling test above using the isometric ammeter, assuming that the total value from the isometric sampling test is 10 mg/m3, if the reading is 8 mA, the final value of 4 mA is 4 mA. Therefore, the conversion coefficient K is read by the milliampere value: 10 / 4=2.5 mg / mA

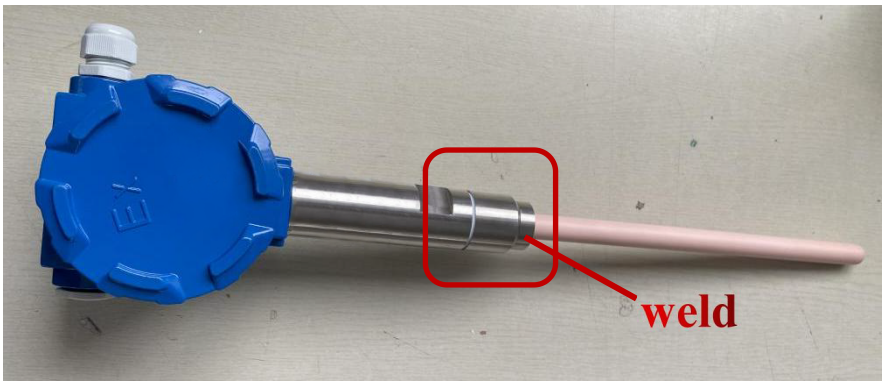
If the transmitter output is 16 mA, minus the basic current value of 4 mA, the final adjustment value is 12 mA. Finally, the total dust emission value calculated by the coefficient K is: 2.512 = 30 mg/m3 In the stable state of the emission condition (flow rate change < ± 90%), repeating the above steps can directly calculate the K coefficient of the emission concentration, unit mg / m3.

(2) Using the customer's PLC (DCS or PC) control system, see (1).

Note: Using the Sampling and Weighing Method to check the equipment must comply with the relevant steps identified by the State Environmental Protection Bureau of China and its affiliated institutions, as well as the use of the identified equipment and tools.

Attachment: Installation example

① Remove the flange interface of the transmitter and weld it vertically on the top of a long horizontal pipe in the straight pipe section with a pipe opening size Φ 30 ± 2mm.



② Transmission conductor (M20 * 1.5 two-core common twisted pair) is connected through the transmitter interface, as shown in the figure below,