

Single-core Multi-channel Particle Spectroscopy Sensor

Product Number: SDS029-FS

Version: V1.8



SHANDONG NOVA TECHNOLOGY Co.,Ltd.

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Overview

SDS029 is a multi-channel particle particle spectrum sensor developed based on the principle of single particle laser scattering. It has both particle counter and mass concentration detection functions. It can be used to measure particulate matter concentration (PM0.3, PM1, PM2.5, PM4, PM10, TSP, etc.) , supports up to 31 particle size channels, it can monitor the particle mass concentration and particle size distribution (particle spectrum) in real time, and meet the various needs of users. Compared with the traditional dust meter, SDS029 has higher measurement accuracy and particle size resolution, and has a stronger ability to resist the influence of humidity.

SDS029 adopts industrial-grade lasers and photosensitive components, adopts the latest generation of light scattering particle technology of SHANDONG NOVA TECHNOLOGY Co., Ltd., carefully adjusted optical and gas path structure, a new generation of high-frequency weak signal processing circuit and high-precision particle identification algorithm. The particle size identification range and accuracy are greatly improved, which can better adapt to the change of particle size components of the monitored object, and push the multi-channel particle spectrum monitoring technology to the application field suitable for mass deployment.

Characteristic

- Accurate Data: single particle laser scattering principle, industrial-grade laser light source, full sampling gas analysis, no matter high concentration or low concentration, high measurement accuracy, good repeatability and consistency;
- High Resolution: the minimum diameter of the resolution particles is 0.3 microns;
- 31 Particle Size Channels: 0.25/0.3/0.35/0.4/0.5/0.6/0.7/0.8/1/1.1/1.3/1.6/1.8/2.1/2.5/3/3.5/4/5/6/7/8/10/11/13/16/18/22/25/30/35[μm], output the particle number and mass concentration of each channel;
- High Reliability: aerodynamic correction, optical path and air path self-check, insensitive to vibration, to ensure system reliability and stability;
- Stable Flow: Active sampling method is adopted, and the sampling component can be selected with constant-current intake fan, the flow is stable, and high-performance electromagnetic pump can also be selected, which can meet the

long-distance long-distance high negative pressure sampling;

- Fast Response: Second-level data update;
- Easy to Integrate: RS485 and UART TTL serial output;
- Automatic Measurement: Remote control, wireless upload of data, access to the Internet of Things
- Hose Design: It can be connected to an external hose, which is convenient for integration;
- Safe and Friendly: Low-voltage power supply, no electric shock; no radioactive source, no light pollution.

Scope of Application

Construction site, road dust detection, environmental protection big data monitoring, pharmaceutical industry, electronics industry, food processing industry, finishing clean room, etc.

Working Principle

Using the principle of single particle laser scattering, through precise optical design and air path designed according to the principle of fluid mechanics, the particles in the sampled air pass through the beam in sequence with a high probability to generate weak scattered light; through the precise optical signal collection device, the scattered light is collected and projected onto a highly sensitive, high bandwidth photodetector. By identifying and analyzing the scattering pulse of each particle, the corresponding signal intensity of each particle is obtained; the particle size of each particle is obtained through the calibration procedure; the mass concentration is obtained by conversion and aerodynamic calibration.

Technical Indicators

NO.	Project	Parameter			Remark
1	Measurement output	Channel Number	Particle Size Range of Each Channel	Channels Are Named After the Starting	Not only supports common 0.3 μ m, 0.5 μ m, 1 μ m,

mb er		Particle Size	3μm, 5μm, 10μm particle counting functions, but also supports PM0.3, PM1, PM2.5, PM4, PM10, TSP mass concentration output
1	0.25~0.3μm	0.25	
2	0.3~0.35μm	0.3	
3	0.35~0.4μm	0.35	
4	0.4~0.5μm	0.4	
5	0.5~0.6μm	0.5	
6	0.6~0.7μm	0.6	
7	0.7~0.8μm	0.7	
8	0.8~1μm	0.8	
9	1~1.1μm	1	
10	1.1~1.3μm	1.1	
11	1.3~1.6μm	1.3	
12	1.6~1.8μm	1.6	
13	1.8~2.1μm	1.8	
14	2.1~2.5μm	2.1	
15	2.5~3μm	2.5	
16	3~3.5μm	3	
17	3.5~4μm	3.5	
18	4~5μm	4	
19	5~6μm	5	
20	6~7μm	6	
21	7~8μm	7	
22	8~10μm	8	

		23	10~11μm	10	
		24	11~13μm	11	
		25	13~16μm	13	
		26	16~18μm	16	
		27	18~22μm	18	
		28	22~25μm	22	
		29	25~30μm	25	
		30	30~35μm	30	
		31	>35μm	35	
2	Range	Number concentration range: 1~3000000P/L			The output unit is P/0.1L
		Mass concentration range: 0~500μg/m ³ @PM1			The range of TSP : 100000μg/m ³ CPA certificate : 50000μg/m ³
		Mass concentration range: 0~3000μg/m ³ @PM2.5			
		Mass concentration range: 0~20000μg/m ³ @PM4			
		Mass concentration range: 0~30000μg/m ³ @PM10			
		Mass concentration range: 0~50000μg/m ³ @TSP			
3	Input Voltage	DC12V [9~25VDC]			Recommended power supply 12V2A or above
4	Rated Power	3.5W			
5	Sleep Power	0.24 W			
6	Working Temperature	-20~60°C			

7	Humidity Range	0-99%RH	
8	Working Atmospheric Pressure	86KPa~110KPa	
9	Response Time	3S	
10	Communication Interface	RS485 + UART TTL	Can be customized
11	Protocol	Modbus-RTU	Can be customized
12	Counting Efficiency	70%@0.3 μ m 98%@0.5 μ m	@25°C, 50%RH
13	Relative Error	max of \pm 10%and \pm 8 μ g/m ³ @PM2.5	@25°C, 50%RH
14	Product Size	150*78*65mm	
15	Hose Size	Inside diameter: ϕ 5mm outside diameter: ϕ 8mm	
16	Life	3years	below 40°C

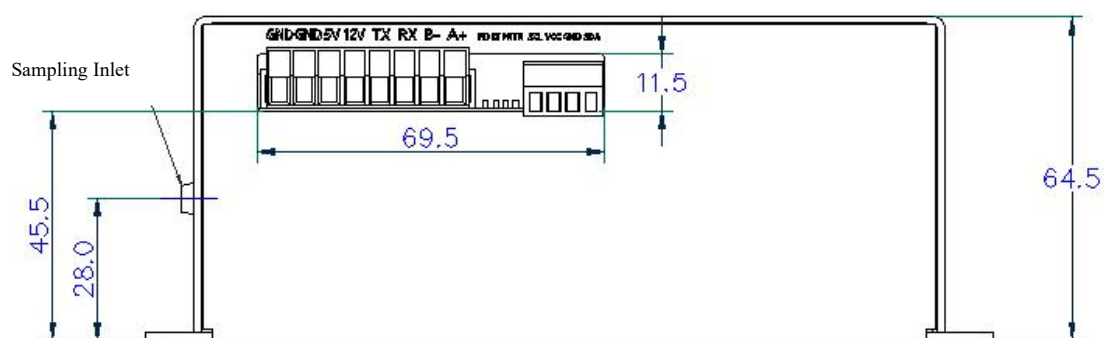
Interface Specification

Pin	Name	Remark
1	A+	A+ of 485 communication, 485 standard level
2	B-	485 communication B-, 485 standard level
3	Tx	TTL serial port send TX, level 5VDC
4	Rx	TTL serial port receiving RX, level 5VDC
5	12V	DC 12V working voltage (input range 9-25VDC)
6	5V	DC 5V power supply

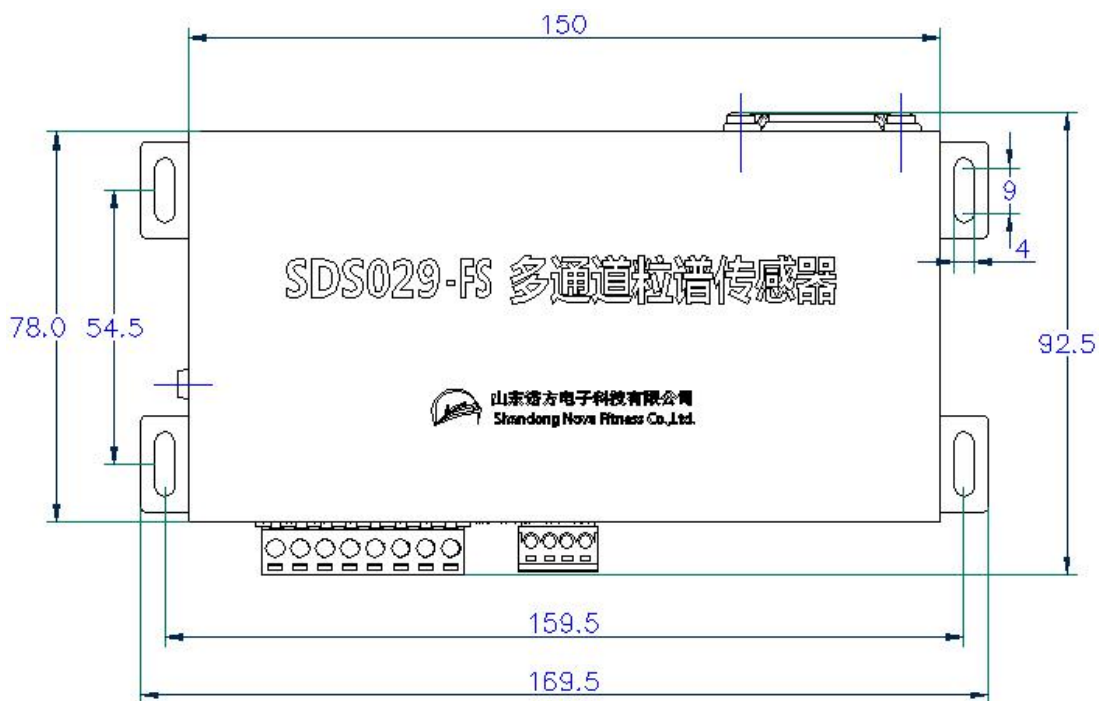
		(only for sensor parameter setting)
7	GND	equipment
8	GND	equipment

Product Specifications

(Unit: MM)



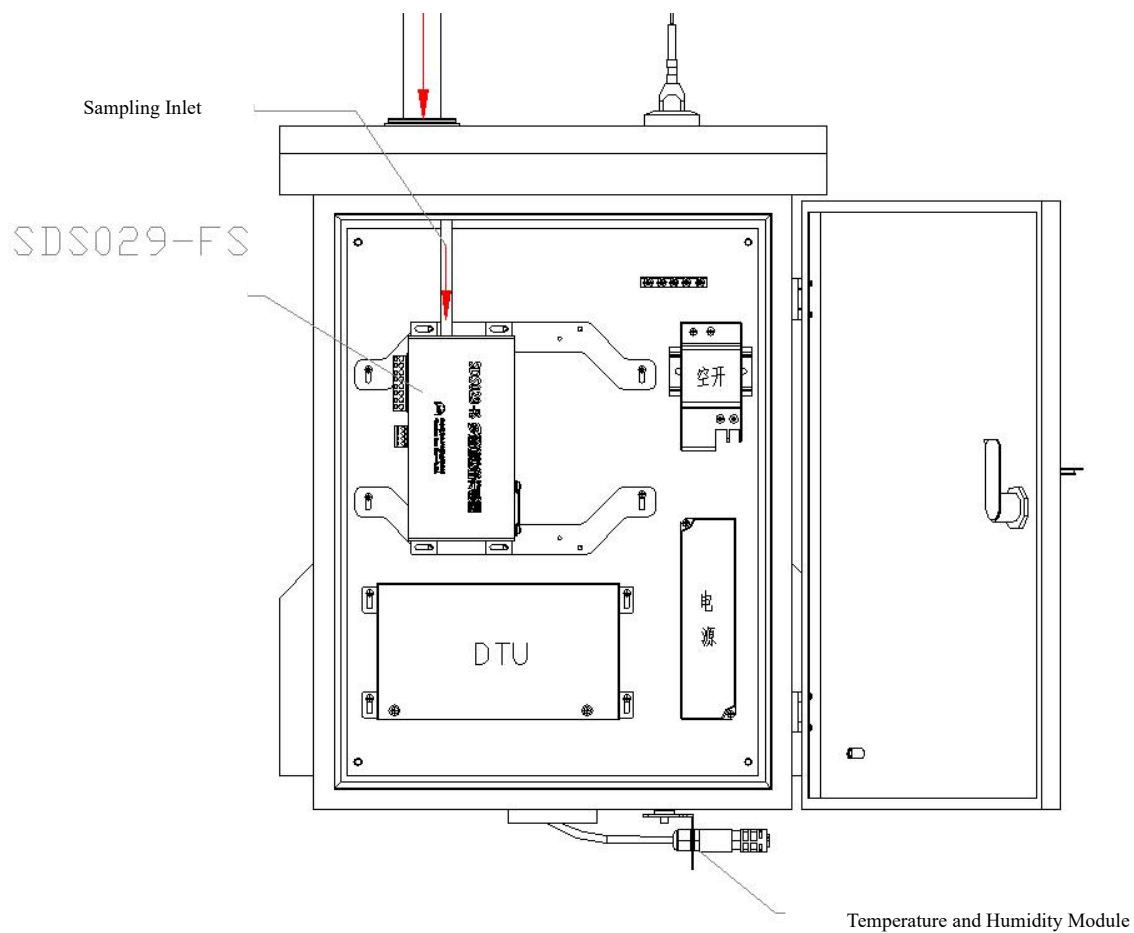
View A



View B

Recommended Installation Method

Under the general atmospheric environment, the optimal installation method of the equipment is shown in the following figure::



Equipment and Accessories List

Number	Name	Quantity	Remark
1	Host	1	
2	Hose	30cm	
3	Protective Net	1	Be sure to equip or use accessories with similar functions when the sensor is working
4	Data Line	1	Only for sample
5	TTL to USB	1	

Contact

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