



FS720E Dust Monitoring

Operation Manual



FineTek Co.,Ltd.

No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 23678

Tel : 886-2-22696789

Fax : 886-2-22686682

Website : <http://www.fine-tek.com>

E-mail:info@fine-tek.com

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1. Operation manual use

Thank you for purchasing this FineTek product. This operation manual describes the product features, operating principle, operation and maintenance methods, as well as precautionary measures that should be taken during the installation, operation or maintenance of this product. This manual is designed to prevent dangerous situations that can result in damage to the product or injury to an installer or operator.

- Please read this operation manual completely and carefully before installing the product.
- Please contact FineTek if this operation manual does not answer your questions.
- The content of this operation manual may be updated from time to time. Updates are Maintained on the FineTek website www.fine-tek.com for your easy access.
- Do not disassemble or attempt to repair the product as this will void the product warranty. Please return the product to FineTek for repair and calibration if required.
- This manual may utilize warning symbols. An explanation of these symbols is as follows:



Danger→this symbol indicates an incorrect operation will result in major accidents and death.



Note→this symbol an incorrect operation will result in injury to personnel and some damage to the product.



Electric shock→this symbol warns of a possible electric shock hazard.



Fire→this symbol warns of a possible fire hazard.



Prohibited→this symbol indicates the action is prohibited.

2. Product warranty

2.1 New product warranty

- Each FineTek Guided Wave Radar Level Sensor is backed by 1-year limited warranty. Should you experience a problem with one of our products deemed by our factory to be a product failure covered by our warranty, for a period of 1-year from the delivery date we will repair the unit at our factory or provide you with a replacement unit or sub-assembly at our discretion. A return authorization number must be obtained from FineTek before returning any unit.
- If the Guided Wave Radar Level Sensor product failed to operate out-of-the-box, and this failure was not due to transportation, handling or incorrect Installation, then you can request a replacement unit within 7 days from the delivery date.
- When returning a product to the factory, return the entire device and do not disassemble the unit as previously mentioned. In addition, wherever possible please returning the device please ensure it is packed to avoid damage during transportation.
- When returning a product to the factory, return the entire device and do not disassemble the unit as previously mentioned. In addition, wherever possible please returning the device please ensure it is packed to avoid damage during transportation.

The product is not warranted in the following situations or conditions, therefore charges will result for repair of product:

- The product is beyond its warranty term.
- The defect or damage to the product is caused by the incorrect operation or by not following the installation and operation instructions contained within the operation manual.
- The product damage is a result of force majeure factors, including but not limited to natural disasters, floods, fires, earthquakes, lightning, severe weather conditions such as hurricanes, typhoons, tornadoes etc., human error such as use of improper voltage, high-humidity, water leakage, stains, corrosion, loss, improper storage etc. and other abnormal factors.
- The damage is caused by installation, addition, expansion, modification and repair of parts not authorized specifically or certified by FineTek.
- If the data label information on the product is incorrect or unclear so as to not be able to read or confirm the product serial number.

2.2 Repair warranty

Repaired product is warranted for 6 months from the delivery date. The warranty is limited to the part(s) replaced or repaired during the repair. If the repaired or replaced part is defective within this term the same part(s) will be repaired or replaced free of charge.

2.3 Service Network

Company	Address	Telephon	Fax
Taipei Headquarters (Taiwan)	No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 23678	+886 2 2269 6789	+886 2 2268 6682
Taichung Sales office (Taiwan)		+886 4 2465 2820	+886 4 2463 9926
Kaohsiung Sales office (Taiwan)		+886 7 333 6968	+886 7 536 8758
Fine automation Co., Ltd. (China)	No. 451, Duhui Road, Zhuangqiao Township, Minhang District, Shanghai City 201109	+86 021 64907260	+86 021 6490 7276
Aplus FineTek (Sensor Inc.)	355 S. Lemon Ave, Suite D, Walnut, CA 91789	1 909 598 2488	1 909 598 3188
FineTek Pte Ltd. (Singapore Branch)	No. 60 Kaki Bukit Place, #07-06 Eunos Techpark 2 Lobby B, Singapore 415979	+65 6452 6340	+65 6734 1878
FineTek GmbH (Germany Branch)	Bei den Kämpen 26 21220 Seevetal-Ramelsloh, Germany	+49 (0) 4185 8083 12	+49 (0) 4185 8083 80
FineTek Co., Ltd. (Indonesia Branch)	Ruko Golden 8 Blok H No.38 Gading Serpong, Tangerang Indonesia 15810	+62 (21) 2923 1688	+62 (21) 2923 1988

3. Documentation

3.1 Purpose

This manual provides the information required for the installation, wiring and setting of the FS720E dust concentration sensor, as well as important instructions such as operation precautions, system maintenance and troubleshooting. Please read this manual before using the product and keep for future reference.

3.2 Customers

This manual is intended for trained professionals as a guide to the practical operation and use of the product.

3.3 Authorized Personnel

All operations described in this manual must be performed by authorized plant operators or specially trained personnel. Personal protective equipment must be worn when working to ensure safety.

3.4 Proper Use

The operational reliability of the product is only guaranteed when the instrument is used properly according to this manual and supplementary instructions.

3.5 Warning

Improper or incorrect use of this product may cause application-specific hazards. For example, incorrect installation or adjustment of settings may result in container overflow or damage to system components.

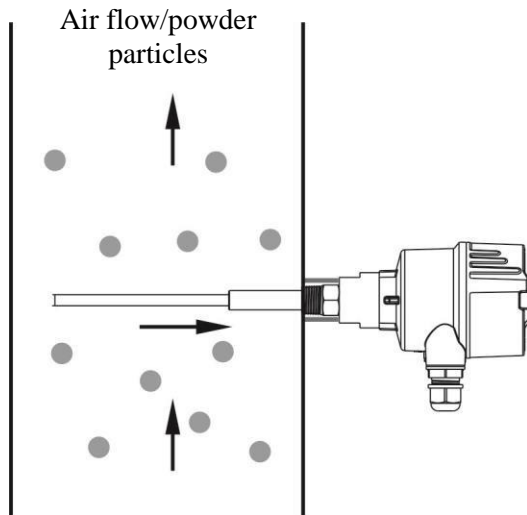
3.6 General Safety Precautions

The user must confirm the necessary occupational safety measures and the legality of the current rules and regulations, and pay attention to new regulations as well. The safety instructions, national installation standards, and valid safety regulations and accident prevention rules in this manual must be observed. For safety and warranty reasons, intrusive work on any device not described in the manual must be performed by personnel authorized by the manufacturer. Unauthorized replacement or modification is prohibited. The safety certification marks and safety instructions on the device must be observed when using.

4. Introduction

4.1 Description

FS720E series dust concentration sensor is based on the principle of electrostatic induction measurement. When dust (charged particles) collides with or rubs against the sensing probe, an electric charge is generated on the sensing probe. Such phenomenon is called electrostatic induction. The sensed electric charge is then amplified, analyzed, and processed via the sensing circuit.



4.2 Features

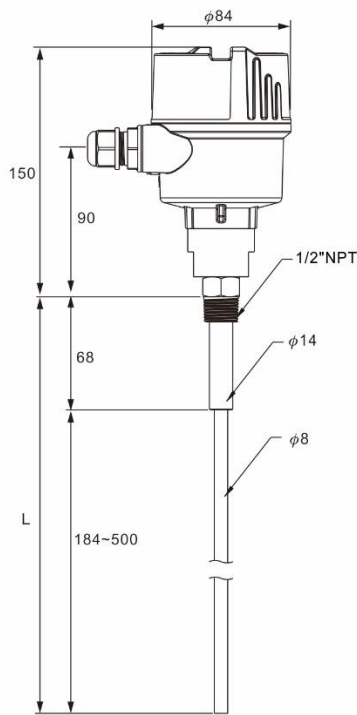
- With the detection principle of electrostatic induction, maintenance costs are much lower than those of optical dust monitors
- Continuous and reliable measurement
- Easy to install and activate
- Measurements are not affected by vibration, moisture or substances adhered to the probe
- Remote calibration support
- Protection rating IP67 (cables required)
- Measurable dust particles of up to 0.3 μ m or larger

4.3 Applications

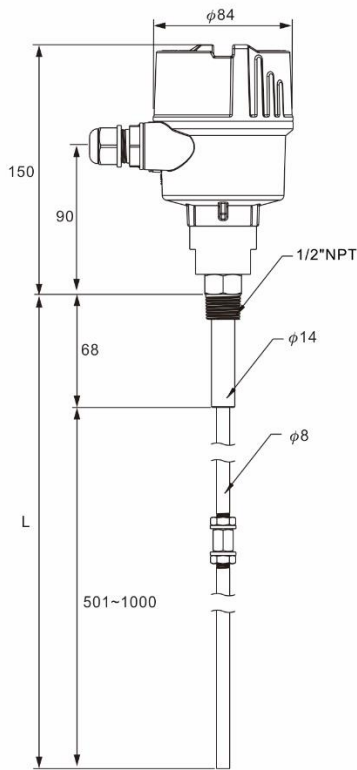
1. Electricity, metallurgy, chemical engineering, foundry
2. Feed, cement, pharmaceuticals, paper
3. Rubber, mining, tobacco, feed
4. Waste incineration, food processing, wood processing
5. Dust emission detection of stationary pollution sources
6. Efficiency detection and optimization control of dust collectors
7. Dust concentration measurement in flues and chimneys

4.4 Dimensions

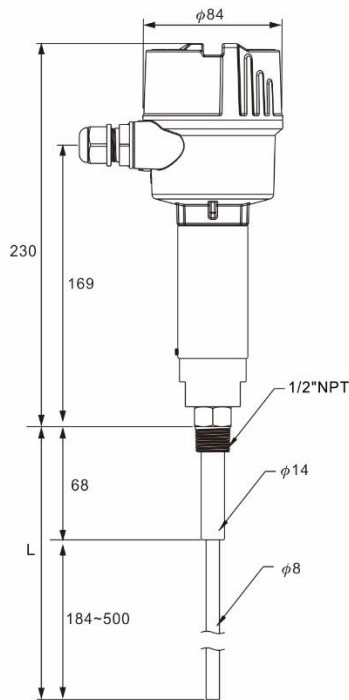
Standard type



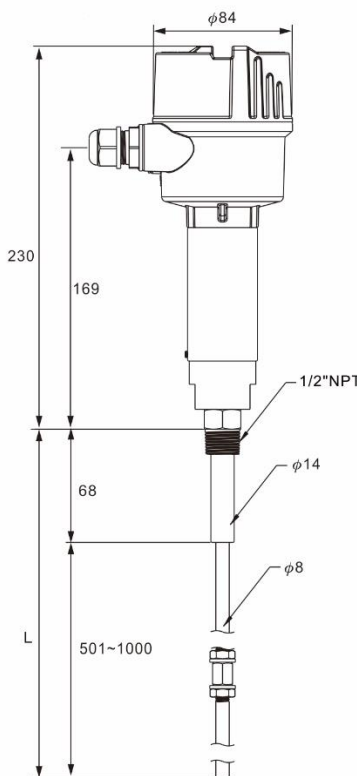
Extension type



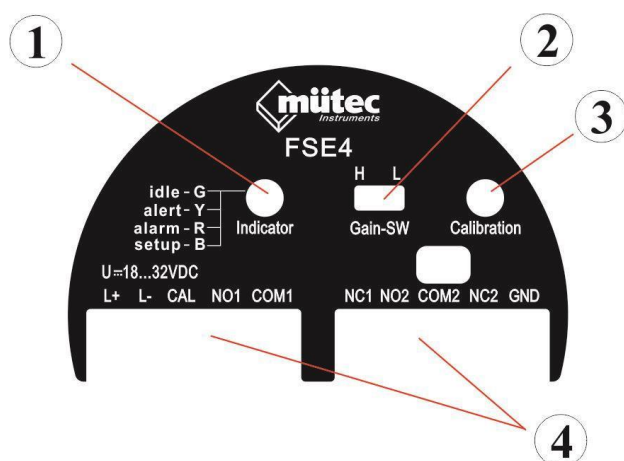
High temperature



High temperature extension



4.5 Panel Features



(Figure 1)

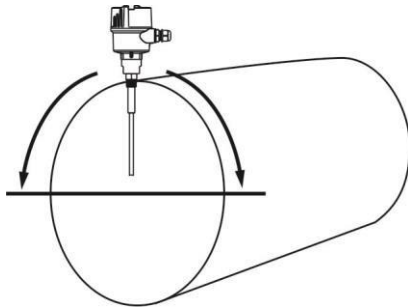
Number	Name		Description
1	Indicator	G-idle	Green LED indicates low dust concentration and good condition
		Y-alert	Yellow LED indicates middle dust concentration and alert condition
		R-alarm	Red LED indicates high dust concentration and alarm condition
		B-setup	Blue LED indicates setup condition
2	Gain-SW		Adjust gain (H for high gain, L for low gain)
3	Calibration		Calibration button (refer to the following)
4	L+		Power supply voltage (+Us)
	L-		Power supply voltage (-Us)
	CAL		Remote calibration (short-circuited with L- to enter calibration function)
	NO1		Alert status relay contact output (NO1)
	COM1		Alert status relay contact output (COM1)
	NC1		Alert status relay contact output (NC1)
	NO2		Alarm status relay contact output (NO2)
	COM2		Alarm status relay contact output (COM2)
	NC2		Alarm status relay contact output (NC2)
	GND		Protective ground, connect it to the system ground terminal

5. Specifications

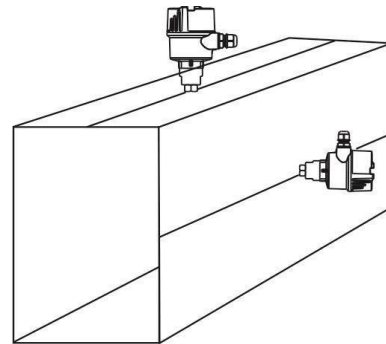
Power supply	18~32Vdc
Ambient temperature	-20 °C~85 °C
Process temperature	-40 °C~150 °C (-40~200 °C for high temperature type)
Junction box material	Aluminum alloy
Probe material	SUS304, SUS316, SUS316L
Insulation material	PEEK
Process pressure	Max. 2 bar
Output	Relay*2/SPDT ,240Vac/5A; 30Vdc/1A
Connection	1/2"NPT or 1/2"PT
Conduit	1/2"PF
Display	Idle: green, Alert: yellow, Alarm: red, Setup: blue
Current Consumption	Max.80mA
IP rating	IP67 (cables required)
Particle size	Solid particles in the airflow (0.3µm or larger)

6. Installation

6.1 Pre-installation Preparation



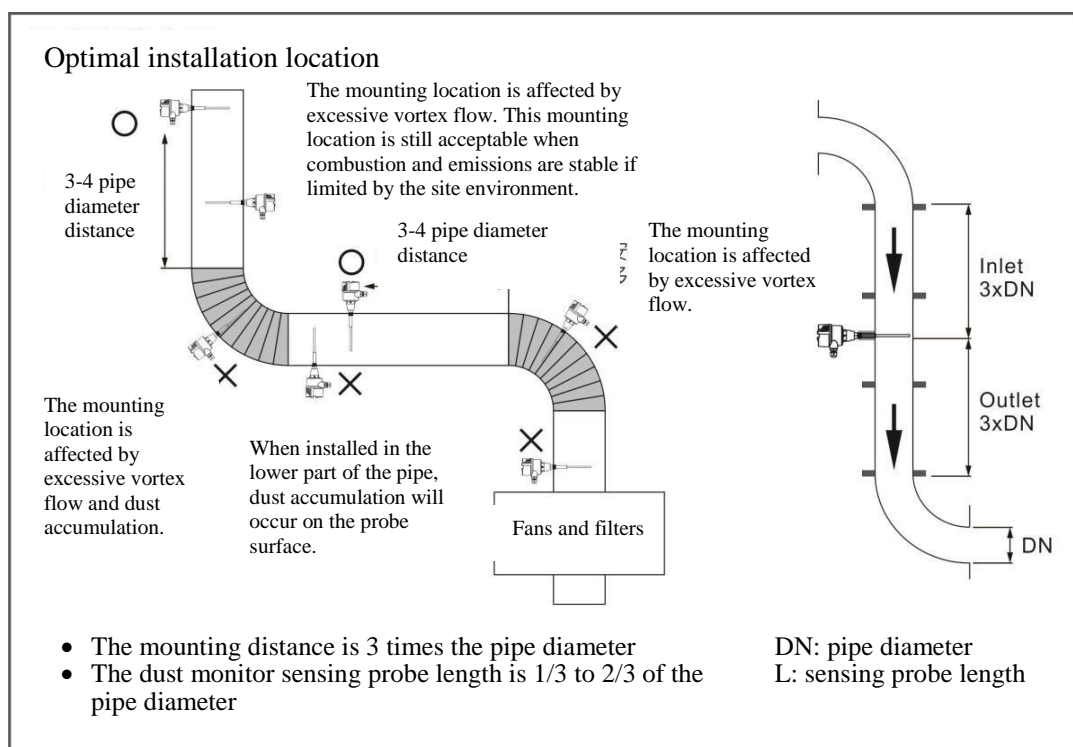
Circular pipe



Square pipe

- ※ The dust monitor sensing probe should be installed 90 degrees to the dust flow direction
- ※ For circular pipes, the dust monitor should be installed at any position between the nine o'clock and three o'clock positions (clockwise)
- ※ For square pipes, the dust monitor should be installed on the sides or the top of the pipes (bottom installation is not recommended)
- ※ Once the mounting location is confirmed, the pipe seat needs to be welded onto the pipe. A hole should be made in the pipe first (slightly larger than the hole in the pipe seat). When welding, make sure the pipe seat is perpendicular to the dust flow direction and well-sealed

Sensor application



7. Activation and Operation

7.1 Activation

Once the system is connected to the 24V power supply, the LED flashes blue for approximately one second. The switch output turns on. When the LED changes color, the device can be operated and calibrated.

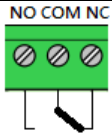
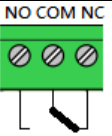
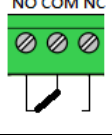
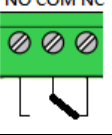
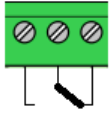
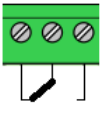
7.2 Gain Adjustment

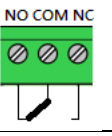
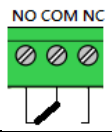
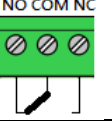
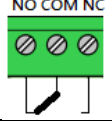
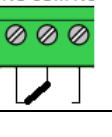
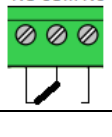
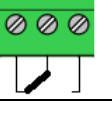
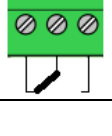
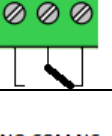
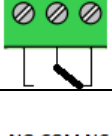

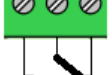
Gain-SW can be used to adjust H (high gain) and L (low gain). The factory setting is high gain. If the ambient dust concentration is too high and calibration fails (LED flashes red), it is recommended to set Gain-SW to L

7.3 Calibration

- The customer must confirm the state of the environment first. After the installation is complete, calibration needs to be performed when using it for the first time.
- After setting the gain switch (gain switch must be set to H), there are two ways to perform calibration. Press and hold the Calibration button for at least 3 seconds to enter calibration mode, or short-circuit CAL and L- for at least 3 seconds to enter calibration mode.
- When pressing and holding the Calibration button, the LED turns blue. After 3 seconds, the LED flashes blue, indicating that the calibration process has started.
- Lock the cover when the LED is flashing blue (this state will last for 1 minute). After 1 minute, the LED turns cyan.
- The calibration takes 10 minutes. Please wait for 10 minutes. After 10 minutes, open the cover of the junction box and check if the calibration was successful.
- If the calibration succeeds, the LED shows green and the device can be used; if the calibration fails, the LED flashes red and recalibration is needed
- Do not touch the probe or turn off the power during calibration

7.4 Operation

	Dust concentration	Status	LED	Switch Output 1 Alert	Switch Output 2 Alarm
Concentration ≤ 5 times	Low	Idle	Green		
20 times \geq concentration > 5 times	Middle	Alert	Yellow		
Concentration > 20 times	High	Alarm	Red		

Status	LED	Switch Output 1 Alert	Switch Output 2 Alarm
Press and hold the Calibration button until entering the calibration process	Blue		
Calibration process has started	Flash blue		
Calibrating	Cyan		
Calibration failed	Flash red		
Calibration succeeded	Green		
No power	Off		

8. Basic Troubleshooting

Problem	Possible causes	Solution
Abnormal operation (indicator LED does not light up) (indicator LED is abnormal)	1. The system is not powered. 2. The power supply is not within the specifications of the product.	Immediately remove the device and return it to the manufacturer for repair.

※In order to prevent signal leakage caused by powder accumulation after prolonged use, we recommend you to remove the device and clean the probe every two months.