

LEFOO 力夫

## LFS73 Explosion-proof&High-temperature integrated Air Velocity /Air Volume Transmitter

Product operating instructions



## DESCRIPTION

### Description

LFS73 Explosion-proof&High-temperature integrated Air Velocity/Air Volume Transmitter is a kind of transmitter suitable for high temperature explosion-proof environment of gas flow measurement, it can convert the flow rate / flow of gas into electrical signals, and transmit it to the control system. Measurement range can be adjusted through the button on site. Using IP65 protection housing, which is suitable for energy management system, VAV and fan control, environmental pollution control, smoke cover control, oven and boiler ventilation control and other fields.

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## SPECIFICATION

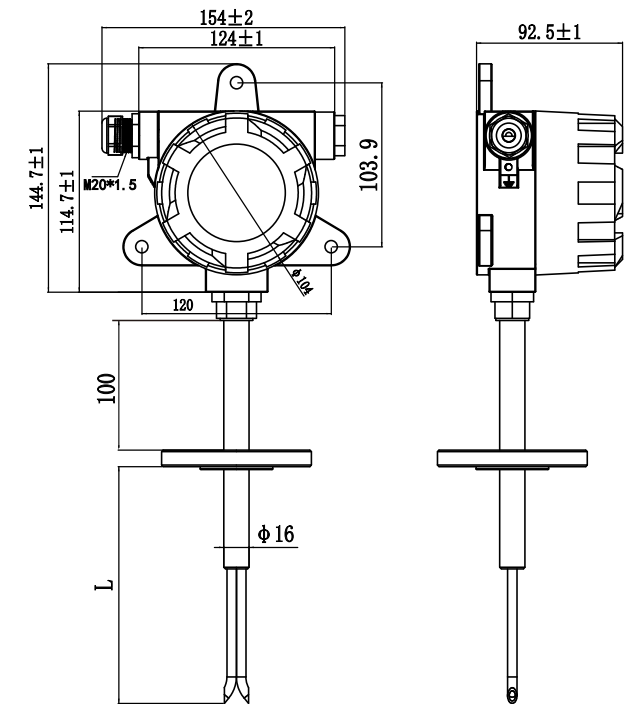
Measurement medium	Air or neutral gas
Range	Air velocity: 0~30m/s(range can be adjusted between 5~30m/s) 0~100m/s(range can be adjusted between 35~100m/s) Air volume: customized air volume (Max. 99999m³/h)
Overload pressure	10KPa(0~30m/s); 80KPa(0~100m/s)
Accuracy ①	±3.0%FS(Air velocity>3m/s)
Working temperature	Main Unit: -20℃~70℃; probe: -40℃~450℃
Compensation temperature	-10℃~60℃
Storage temperature	Main Unit: -40℃~80℃
Response time	0.5s/1.0s (default) / 2s / 4s
Ingress Protection	IP65
Electrical interface	Six-core wire, cable diameter of 8mm
Output signal	4~20mA&0~10VDC &RS485
Power Supply ②	12~30VDC/24VAC±20%
Power consumption	≤1.5W
Shell material	Cast aluminium
Communication	RS-485 standard Interface, Modbus RTU protocol
Certification project	ROHS,CE
Explosion-proof grade	Ex db IIC T6 Gb
Display	LCD backlit digital display

①Environmental conditions: temperature: 20℃, humidity: 45% RH, atmospheric pressure: 1035 hPa

②When the product uses the AC power supply, it is recommended to use the isolated AC power supply.

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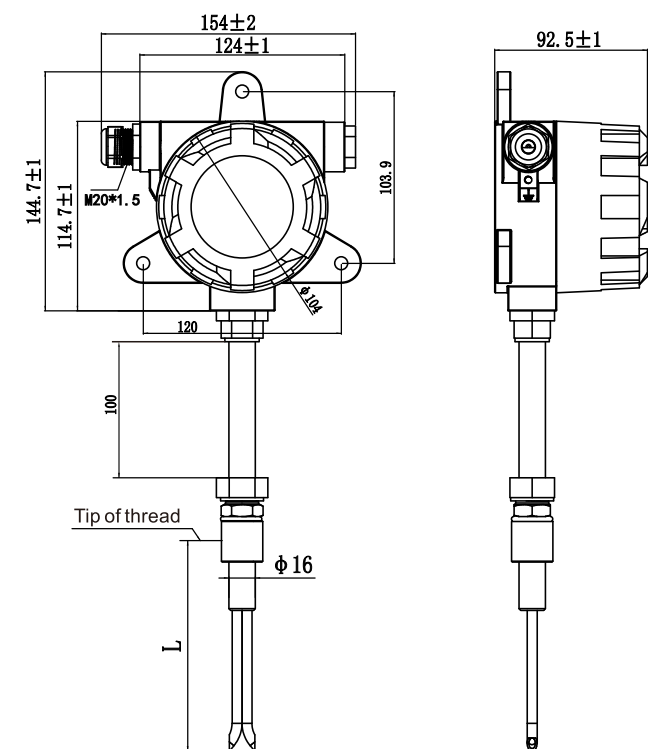
## DIMENSION(MM)



Flange installation products

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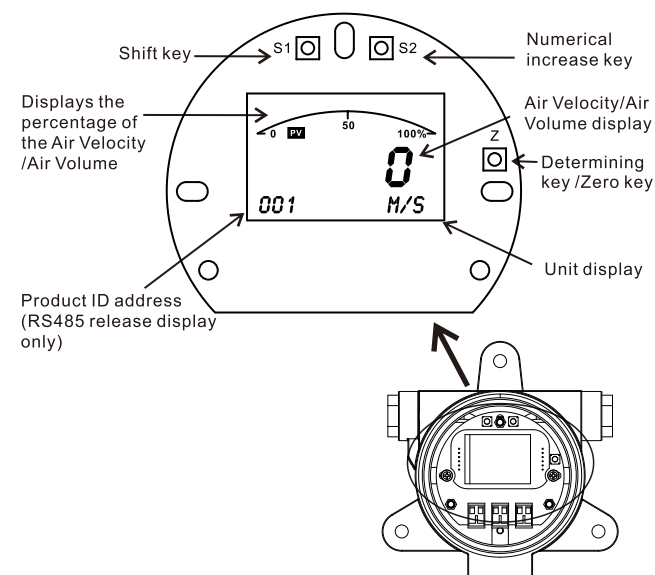
## FUNCTIONS



Thread installation products

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### Main display interface



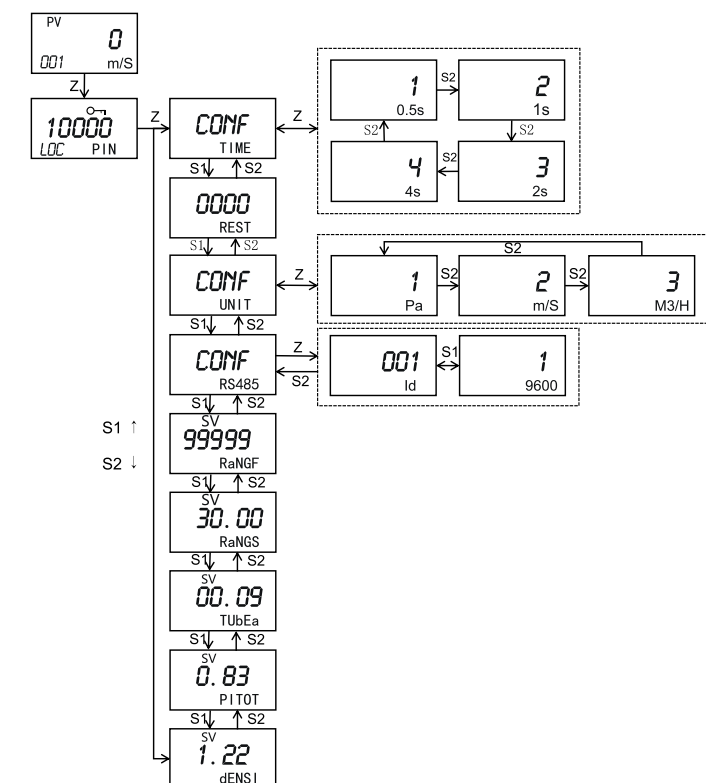
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### Key Instructions

Key	Function	Instructions
①	Zero clearing	1. Press the Z key twice in a row to enter the password setting menu;
	Return to the main interface	2. In the main display interface, long press the button for zero operation;
	Enter the secondary interface	3. In the setting interface, long press the key to return to the main display interface;
	Confirming key	4. In the setting interface, short press to enter the next level setting menu;
②	Switch the setting interface	5. In the setting interface, short press to modify or save the current parameters. When modifying the parameters, the parameters to be modified will flash on the screen.
	Shift key	1. In the setting interface, turn down to switch the setting menu;
③	Switch the setting interface	2. Press this button to move the blinking state to the next number.
	Go back to the previous level	1. In the setting interface, turn up to switch the setting menu;
④	Numerical increase	2. In the setting interface, return to the previous level menu;
		3. The value needs to be modified to add 1.

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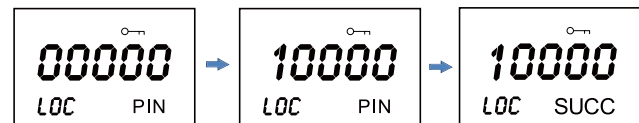
### Key function



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## Password input interface

Quickly press the button Z twice to enter the password input interface. "PIN" will appear in the lower right corner of the screen. The default password is 10000. If you need to change the parameter setting, you must first enter the correct password, otherwise the parameter cannot be modified. The correct password screen displays SUCC in the lower right corner, otherwise, Error. The screen automatically jumps into the next parameter settings interface.



1. Quickly press the Z key twice and enter the password input interface, The leftmost 0 is blinking.
2. Press the S2 key 0 increase to 1.
3. Press the Z key once to confirm the current input value, and the "SUCC" password is displayed in the lower right corner. The screen automatically jumps into the next parameter settings interface.

## Response Time Setting interface (TIME)

TIME is displayed in the lower right corner of the screen. When pressing Z key once, the screen will display the current response time setting parameters. Press S2 key to switch the response time setting. There are 4 choices of response time: 1 / 2 / 3 / 4.

- 1: Response time of 0.5s
- 2: Response time of 1s (default)
- 3: Response time of 2s
- 4: Response time of 4s

After the setting, press Z key to save the setting parameters and return to the previous menu.

## Gas Density Setting Interface (dENSI)

The lower right corner of the screen shows dENSI, setting the gas density to be measured in kg/m³. The default value is 1.18, and the setting parameter range is from 1.00 to 1.50. After the setting, press Z key to save the setting parameters and return to the previous menu.

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## Pitot Tube Coefficient Setting Interface (PITOT)

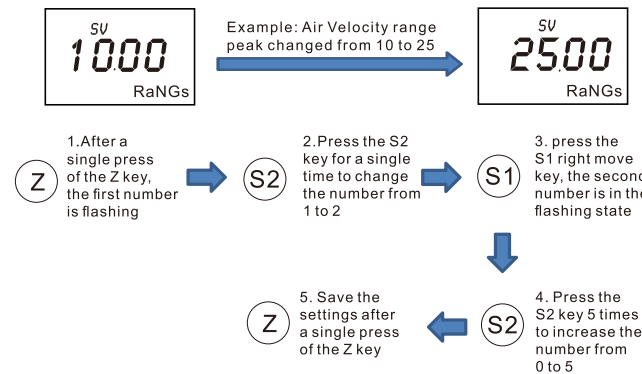
The PITOT is displayed in the lower right corner of the screen, indicating that the skin hosting coefficient is set. The default value is 0.84, and the range can be set is 0.81~0.86. After the setting, press Z key to save the setting parameters and return to the previous menu.

## Pipe cross-sectional area setting interface (TUBeA)

In the lower right corner of the screen, TUBeA, which indicates that the hosting coefficient is set in m². The default value is 0.09, and the setting range is from 0.01 to 15.00. After the setting, press Z key to save the setting parameters and return to the previous menu.

## Air Velocity Range Setting Interface (RaNGS)

The display in the lower right corner of the screen is RaNGS, indicating the high point of the Air Velocity range in m/s, can be set as 5~30 (Rang: 0-30m/s), 35-100 (Range: 0-100m/s).



After the setting, press Z key to save the setting parameters and return to the previous menu.

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## Air volume range setting interface (RaNGF)

The lower right corner of the screen shows RaNGF, indicating means the air volume range is set in m³/h, the default value is the order range, can be set as 1~99999, after the setting, press Z key to save the setting parameters and return to the previous menu. Note: Air volume = Air Velocity \* cross-sectional area of pipe. confirm whether the cross-sectional area of pipe is set correctly before modification.

## ID and Baud rate setting interface (RS485 version available)

Id is displayed in the lower right corner of the screen, indicating the product ID address setting, and the ID address setting range: 1~255. The lower right corner of the screen shows 9600, or 19200, which represents the product Baud rate setting.

## Unit setting interface (UNIT)

UNIT is displayed in the lower right corner of the screen with 3 choices: 1 / 2 / 3. This setting generally does not need to modify, if you need to modify, please contact the manufacturer.

- 1: Unit is Pa
- 2: Unit is m/s
- 3: Unit is m³/h

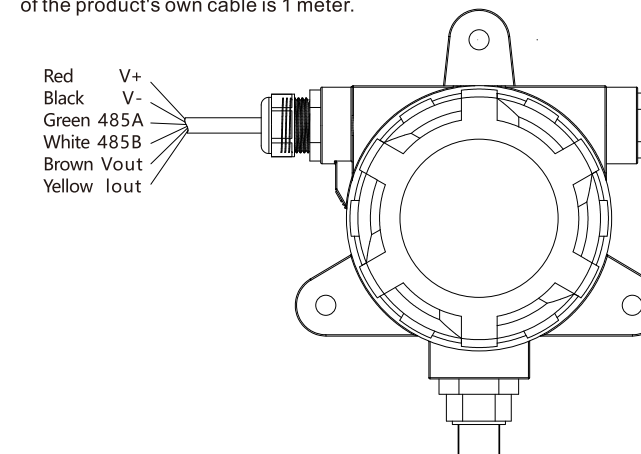
## Restore the factory setting interface (REST)

REST is displayed in the lower right corner of the screen. The password is set to 1234. After entering it, the setting is restored to the factory default setting.

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## Wiring

Note: The wiring shall be operated by qualified technicians. When wiring, the transmitter must stop supplying power. The default length of the product's own cable is 1 meter.



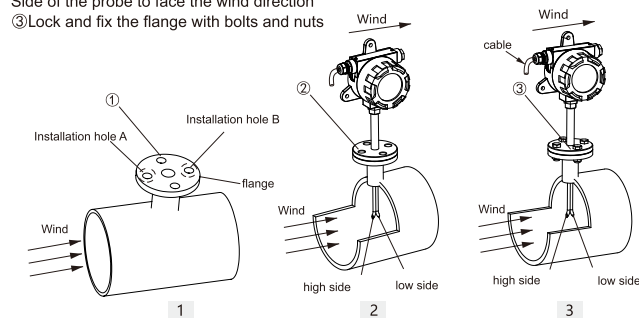
Wire function	Color	Wire instructions	Remarks
V+	Red	Positive terminal	
V-	Black	Negative terminal	
485A	Green	485 Communication interface	
485B	White		
Vout	Brown	0-10VDC voltage output port, connect to Power+ of the multimeter, and the other end of the multimeter connect to V-.	For different output, only reserve needed wires.
Iout	Yellow	4-20mA current output port, connect to Power+ of the multimeter, and the other end of the multimeter connect to V-.	

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# INSTALLATION METHOD

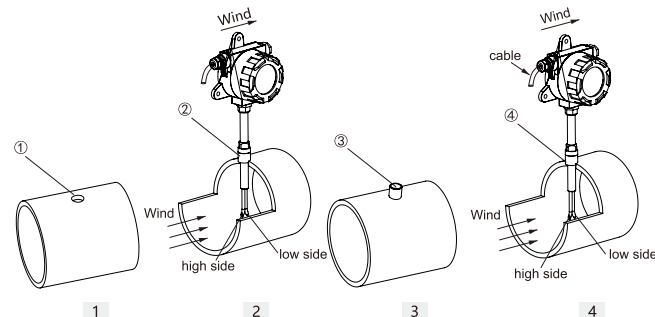
## Flange installation

- ① The flange installation holes A and B should be kept at the same horizontal line as the wind direction
- ② Install the product and adjust its position, requiring the high-pressure side of the probe to face the wind direction
- ③ Lock and fix the flange with bolts and nuts



## Threaded installation

- ① The diameter of the opening is greater than 25mm
- ② Install the product into the welding base, adjust the position and perform spot welding on the welding base, with the high-pressure side of the probe facing the wind direction
- ③ Dismantle the product and weld the base for full welding
- ④ Load the product with the high-pressure side facing the wind direction



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# RS485 COMMUNICATION PROTOCOL

The protocol operates in the RS485 hardware platform, enabling remote one-to-many control and signal acquisition via the 485 bus. This communication protocol shall be executed in accordance with the ModBus RTU standard protocol.

## Character format

Start: 1Bit

Data: 8Bit

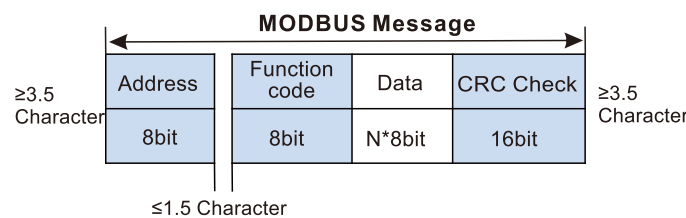
Parity: None, Even

Stop: 1Bit

Baud Rate: 9600bps, 19200bps

In RTU mode, the two-character interval must be less than 1.5 characters, otherwise the message frame is considered incomplete, and the receiver drops the message frame.

The two packets are separated by at least 3.5 characters.



## Communication statute

Read register (function code 0x03)

The host can read the slave register data through this function and can read one or more registers simultaneously.

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## Sequence format:

The master sends it to read a single register sequence					
Slave ID address	Function code = 0x03	Register start address	Number of registers	CRC low-order	CRC high-order
8Bit	8Bit	16Bit	16Bit	8Bit	8Bit
Slave normal response sequence					
Slave ID address	Function code = 0x03	Number of data bytes n	data	CRC low-order	CRC high-order
8Bit	8Bit	16Bit	N * 8Bit	8Bit	8Bit
Slave error response sequence					
Slave ID address	Error code = 0x83	Exception code = 0x02 or 0x03		CRC low-order	CRC high-order
8Bit	8Bit	8Bit		8Bit	8Bit

## Communication code example

Master dispatch sequence: 01 03 00 01 00 01 D5 CA  
Slave ID Function code Register start address Read the number of register CRC Check

Slave response sequence: 01 03 02 03 E8 D8 FA  
Slave ID Function code Data Length Data CRC Check

Slave inaccurate response sequence: 01 83 02 00 F1  
Slave ID Function code Error Code CRC Check

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## Register address reference table

Register address	Register definition	Data type	Read and Write type	Specific function description
0x0001	Pressure value (Pa)	Signed Integer /16Bit	Read only	① When the Air Velocity range ≤10m/s, In units of 0.1Pa. Pressure value = n (read value)/10, example: read value 0x0001 = 0.1Pa, read value 0x03E8 = 100.0Pa, read value 0x FFFF = -0.1Pa, read value 0x FC18 = -100.0Pa. ② When the Air Velocity range > 10m/s, In units of 1Pa. Pressure value = n (read value), example: read value 0x0001 = 1Pa, read value 0x03E8 = 1000Pa, read value 0x FFFF = -1Pa, read value 0x FC18 = -1000Pa.
0x0002 ~ 0x0003	Air Velocity value (m/s)	Float/32Bit	Read only	Use floating point small byte exchange mode (CDAB); The order of the sample accepted data is: 0A 3D 3F 57; then, 0x3F570A3D (0.84)
0x0004 ~ 0x0005	Air volume value (m³/h)	Float/32Bit	Read Only	Adopt the floating-point small-end byte exchange mode (CDAB); The order of the sample accepted data is: 0A 3D 3F 57; then, 0x3F570A3D (0.84)

## Exception code resolution

Error code	Cause of error	Solution
0x02	Read register start address error	Check whether the read register start address is readable against the register address reference table
0x03	Incorrect value for the write register	Check whether the values written to the register are in the list against the register address reference table

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