

For detailed selection, refer to page 5



# FS-80 Thermal Flow Switch

## Product description

Thermal flow switch is a flow monitoring device designed based on the principle of thermal conduction, which triggers the switch action by detecting the heat changes caused by fluid flow. It is widely used in industrial automation, mechanical equipment, air compression, refrigeration and air conditioning fields to achieve real-time monitoring and system protection of gas or liquid flow.

## Features

- Provide high-resolution measurement in the low flow rate range, capable of detecting small flow fluctuations and ensuring real-time feedback from the system.
- There are no mechanical moving parts inside, eliminating the risk of wear and tear, achieving maintenance free operation, and reducing downtime and maintenance costs.
- The structure is simple, with no mechanical delay and a typical response time of 2 seconds. It can quickly detect changes in flow and trigger actions.
- Suitable for various media such as gases, liquids, lubricants, etc., some models support monitoring of highly corrosive liquids.
- Minimal obstruction to fluid flow ensures normal system operation and avoids performance degradation caused by pressure loss.
- Not affected by clutter or electromagnetic interference, it exhibits stability when monitoring viscous fluids, magnetic fluids, or corrosive fluids.


## Working principle

When the fluid is stationary, the temperature of the heating sensor and the sensing sensor tends to balance; When the fluid flows, the flowing medium carries away the heat from the heating sensor, resulting in a temperature difference between the two sensors. The temperature difference signal is converted into an electrical signal. When the flow rate reaches the preset threshold, the switch outputs an alarm signal (such as relay action, PNP/NPN transistor conduction, or 4-20mA analog signal), triggering the system response (such as stopping equipment operation, starting backup pumps, etc.).

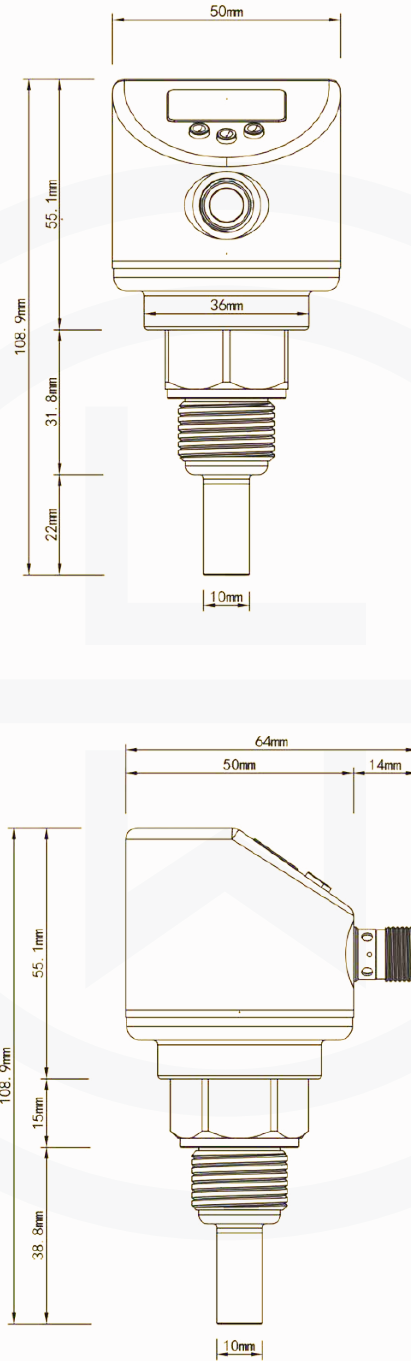


For more product information, please visit [www.ludwig-schneider.com.cn](http://www.ludwig-schneider.com.cn)

## Technical Specifications

<p><b>Product image</b></p>	
Model	FS-80
Application	Gas/Liquid/Oil
Working Voltage	24VDC
Operating current	≤100mA
Operating Temperature	-20°C~80°C
Operating pressure	100Bar
Display mode	1.47 "LED LCD screen
Setting method	Button settings
Connection specifications	Thread:G <sub>1/2</sub> (customizable)
Probe rod material	304stainless steel/316L stainless steel/customization
Contact capacity	60V/1A
Output signal	2*4-20mA+1*PNP/NPN 1*4-20mA+2*PNP/NPN Relay
Wiring method	M12aviation connector
Material of junction box	304stainless steel/316L stainless steel
Protection level	IP67
Measurement range	Water:0.01~3M/S Oil:0.03~4M/S Air:0.2~300M/S

### Dimensional drawing of inclined LCD stainless steel flow switch



## Installation requirements and precautions

### 1. Installation location requirements

#### 1.1 Installation of straight pipelines

The flow switch must be installed on a straight pipeline, leaving at least 5 times the diameter of the straight section on both sides (if the diameter is 50mm, 250mm on each side)

If there is a bend or intersection at the end, the installation position should be no less than 4 times the diameter of the bend or intersection (if the diameter is 50mm, the distance should be at least 200mm).

Avoid fluid turbulence or eddy current interference with the induction of flow switches to ensure measurement accuracy.

#### 2.1 Vertical pipeline installation

Installation is only allowed in vertical pipelines where the medium flows from bottom to top, and inverted installation (i.e. the medium flows from top to bottom) is prohibited.

Reason: Inverted installation can cause sediment at the bottom of the pipeline to cover the probe, and gravity may also cause the flow switch parameter settings to fail.

#### 3.1 Installation of horizontal pipelines

Suitable for situations where the medium is a full pipe, it is necessary to ensure that the flow direction piece is perpendicular to the fluid flow direction during installation, and that the direction of the arrow on the outer shell is consistent with the fluid flow direction inside the pipeline.

### 2. Installation operation specifications

#### 2.1 Installation tools and techniques

When screwing in the three-way pipe, it is forbidden to hold the shell for installation. A hex wrench must be used to fix the valve body at the hexagon to prevent damage to the switch. The length of the installation joint should be moderate, avoiding

The probe is unable to come into contact with the flowing medium. If the connector is too long, it needs to be adjusted using the adapter provided by the manufacturer.

#### 2.2 Flow direction adjustment

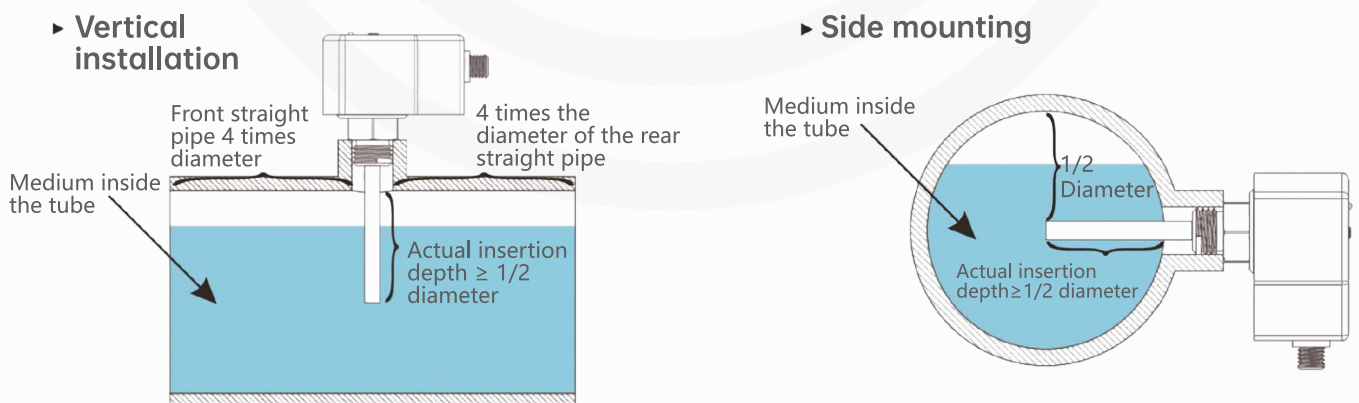
The flow plate must be perpendicular to the fluid flow direction and must not come into contact with the inner wall of the pipeline or the throttling device. After installation, you can check for any obstruction by removing the casing and lightly pressing the main lever,

If there is no obstruction, it proves that there is no contact. The length of the flow plate needs to match the pipe diameter. If it is too short, it will affect sensitivity and even cause the switch to not operate. If it is too long, it may not be able to be installed

#### 2.3 Waterproof measures

If a quick closing valve is installed below the flow switch, a throttle should be installed to buffer the impact of water flow and avoid damage to the switch due to water hammer.

## Installation Diagram



\*Note 1: The diameter refers to the inner diameter of the pipeline.

\*Note 2: The pipe diameter in the above figure is DN100, with an inner diameter of 100mm and an outer diameter of 114mm.

\*Note 3: The net length of the product in the above figure is taken as an example of 50mm.

## Selection and composition of thermal flow switch

Example Of Selection **FS-80**

1	A	2	B	3	D	4	J	5.1/5.2/5.3	L	5.1.1/5.2.1	6	A	7	V	8	P	T()
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1. Model	A	FS-80 inclined LCD digital display type														
2. Power supply	B	24VDC														
	C	220VAC														
3. Output	D	Relay														
	E	PNP/NPN														
	F	1*4-20mA+2*PNP/NPN														
	G	2*4-20mA+1*PNP/NPN														
	H	1*0-10V+2*PNP/NPN														
	T()	Other outputs														
4. Working temperature	J	-20°C~80°C														
	K	-20°C~150°C														
5.1 Thread specifications	L	1/2"														
	M	3/4"														
	N	1"														
	O	1-1/2"														
	P	2"														
	Q	2-1/2"														
	R	3"														
	S	3-1/2"														
	W	4"														
	U	5"														
T()	其它螺纹规格															
5.1.1 Thread type	A	PT (R) thread														
	B	NPT thread														
	C	BSP thread														
	E	PF (G) Dental Tube														
	T()	Other thread specifications														
5.2 Flange specifications	F	1/2"														
	G	3/4"														
	H	1"														
	I	1-1/2"														
	J	2"														
	K	2-1/2"														
	L	3"														
	M	3-1/2"														
	N	4"														
	O	5"														
	P	DN15														
	Q	DN20														
	R	DN25														

### Selection and composition of thermal flow switch

Example Of Selection **FS-80**     **A** / **B** / **D** / **J** / **L** / **A** / **V** / **P** / **T()**  
1      2      3      4      5.1/5.2/5.3    5.1.1/5.2.1    6      7      8

<b>S</b>	DN32
<b>A</b>	DN40
<b>B</b>	DN50
<b>C</b>	DN65
<b>D</b>	DN80
<b>E</b>	DN100
<b>F</b>	DN125
<b>G</b>	DN150

5.2.1 Voltage resistance level	<b>H</b>	150lbs
	<b>I</b>	300lbs
	<b>J</b>	PN10
	<b>K</b>	PN16
	<b>L</b>	PN25
	<b>M</b>	PN40
	<b>N</b>	5kg/cm <sup>2</sup>
	<b>O</b>	10kg/cm <sup>2</sup>
	<b>P</b>	Other voltage resistance levels

5.3 Sanitary Connection	<b>R()</b>	Sanitary clamp (clamp size note)
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6. Material of probe rod	<b>U</b>	304
	<b>V</b>	316L
	<b>W</b>	HC
	<b>T()</b>	Other materials

7. Display	<b>O</b>	Indicator light
	<b>P</b>	Display flow rate
	<b>Q</b>	Display flow rate+temperature switch
	<b>R</b>	Display flow rate+temperature simulation

8. Length	<b>T()</b>	Other lengths (unit: mm)
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#### Explanation:

FS-80 thermal flow switch, powered by 24VDC, relay output, operating temperature -20~80 °C, connection size 1/2 ", PT (R) thread, probe material 316l, displaying flow rate.

### Product Certification

Compliance and approval; The Ludwig water quality analyzer meets key standards and certifications for process measurement technology; To ensure the highest reliability in such settings;