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Operation Manual

SPK 81 Flow Switch



Our company reserves the modification right for this operation manual due to renovation of production technology and craftwork.

If some information is changed, no more notice will be edited.

Please pay attention to the latest version.

Our company reserves all the right of final explanation to this manual. Version

No. : V1.0

1 Introduction

SPK81 flow switch is an intelligent thermal diffusion principle-based flow monitoring sensor. It adopts ARM processing core and combines with high quality sensors and dedicated circuit. With temperature-compensation and calibration, it can ensure measurement accuracy in the case of water temperature change. It is available for real-time monitoring of pipe water flow. It can be used for cooling or lubrication system flow monitoring to realize pre-warning and protection for critical equipment when there is flow fault. It uses fully enclosed design, stainless steel construction to adapt to a variety of application environment. It is with overvoltage, overcurrent and reverse polarity protection function. With self-luminous OLED screen, it allows switchable display between the progress bar and digital display numbers. SPK81 supports quick action point set, also it has display inversion function that enables installation in any direction, and no need for frequent adjustment and maintenance. It can be applied for operation protection of large equipment in fields such as power generation, metallurgy, steel, paper, boilers etc.

2 Specification

Power Supply: (220±44) V AC; (24±4.8) V DC

Working Current: ≤60mA

Range : 1cm/s~150cm/s (water)

Optimal Range: 3cm/s ~ 100cm/s (water)

Display: OLED display, Resolution: 128×32

Electric Connection: M12×1.5-Pin Plug

Output signal: 1 relay | 2-way PNP | 2-way NPN (optional)

Output Function: NO,NC (optional) Relay Characters:

Switch voltage: ≤ 250V AC / 30V DC

Switch Current: ≤3A

Transistors Characters:

Switch Voltage Drop: ≤ 1.5V

Switch Current: ≤ 400mA

Switch accuracy: ±10cm/s Hysteresis: ±2cm/s~±8cm/s Electric Protection:

Reverse, Short-circuit, over-voltage

Switch Characteristic: typical 8s(2s~15s)

Switch-off time: typ. 2s (1s~15s)

Switch-on Time: typ. 2s (1s~13s) Housing: S.S.

Button: PP

Probe: S.S.

Endurance Pressure: 10MPa

Protection: IP67

Set: Button

Installation: Join mounting +adaptor

Gross Weight: 265g

Water Temp.: -20°C~80°C

Storage Temp. :-30°C~85°C

Working Temp.: -20°C~70°C

Temperature Compensation: 5°C~50°C (water)

Electromagnetic Compatibility:

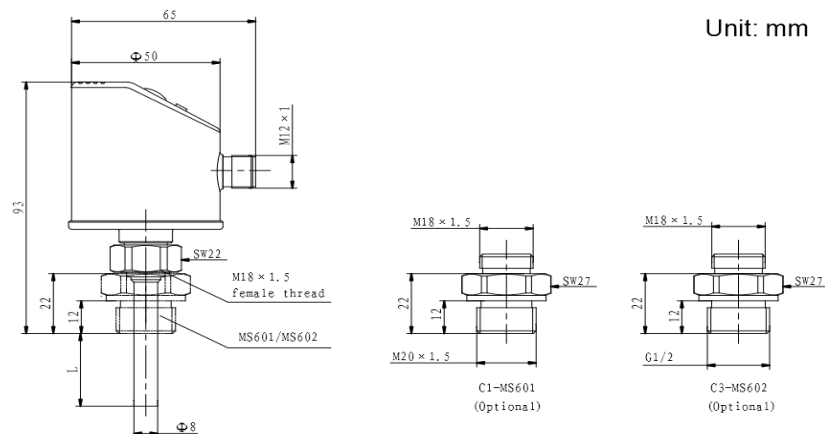
GB/T 17626.2/3-2006, GB/T 17626.4-2008

Shock: $\leq 20g$ (GB/T 2423.10-2008)

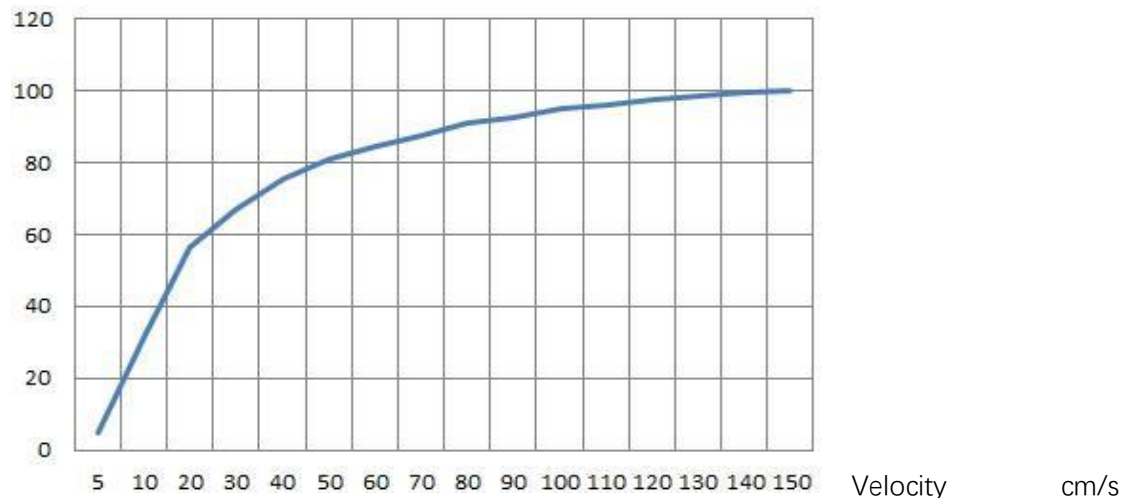
Impact: $\leq 50g/11ms$ (GB/T 2423.5-1995)

Note: The above specification test medium is water:5cm/s~ 100cm/s; 20°C
(Factory defaults)

3 Outline Construction and Dimension



Curvilinear relation between digital indication and velocity: Digital indication



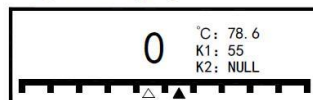
Progress bar:

Digital Display:

Progress bar:



Digital Display:



▲ --Switch Point K1 Δ --Switch Point K2

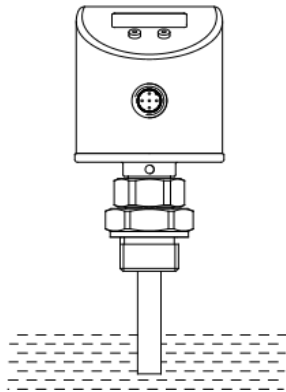
When Switch Point Sign light is flashing, it indicates that the velocity exceed the switch action velocity.

4 Installation

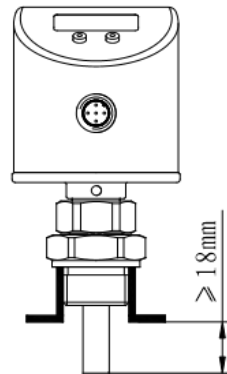
Notes prior to the installation:

- a) The product indication direction is vertical to the water flow direction.
- b) Check if the media velocity exceeds the measuring range of product;
- c) Make sure the probe top end in the middle of pipe diameter to achieve the best installation depth.
- d) Screw up the cable plug to ensure the water-proof performance.
- e) Ensure the switch top end not exposed to lubricant oil.

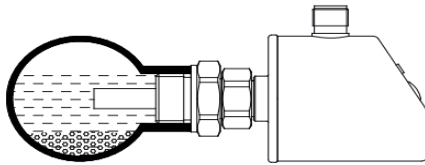
The probe front end must be submersible to the water. The probe inserting depth is 18mm min.



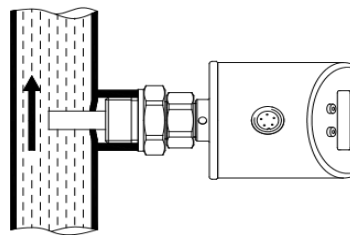
Suggested Installation Position
Horizontal pipe: installed at side



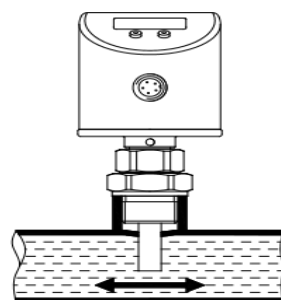
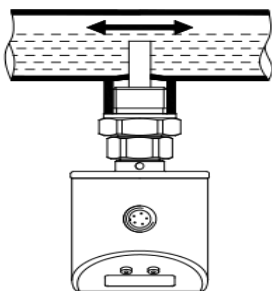
Vertical pipe: installed at the up-flow pipe



Limited Installation Position
No sediments in the horizontal pipe



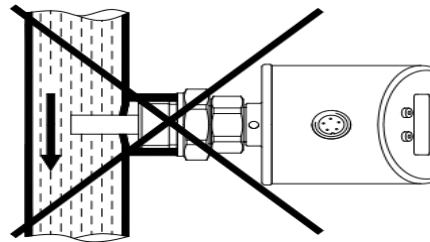
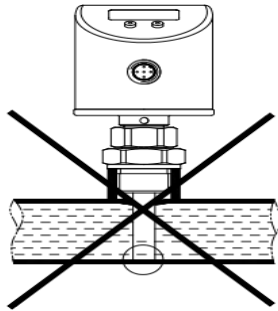
Fulfilled with water in the horizontal pipe



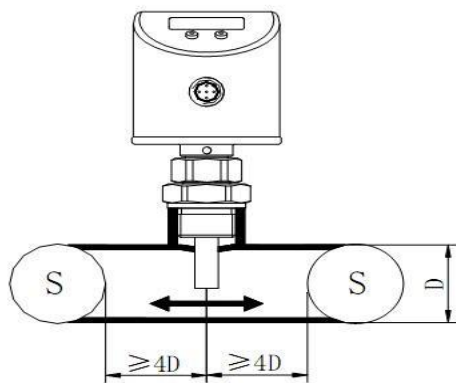
Notes

Keep the probe end away from the pipe down-flow

Please do not install the product on the pipe with bottom end unsealed.



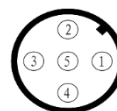
The components for installation of pipes, fittings, valves, reducers would be possible to cause turbulence and influence the operation of equipment, known as the interference source. Suggested: please keep a distance between switch and the interference source.

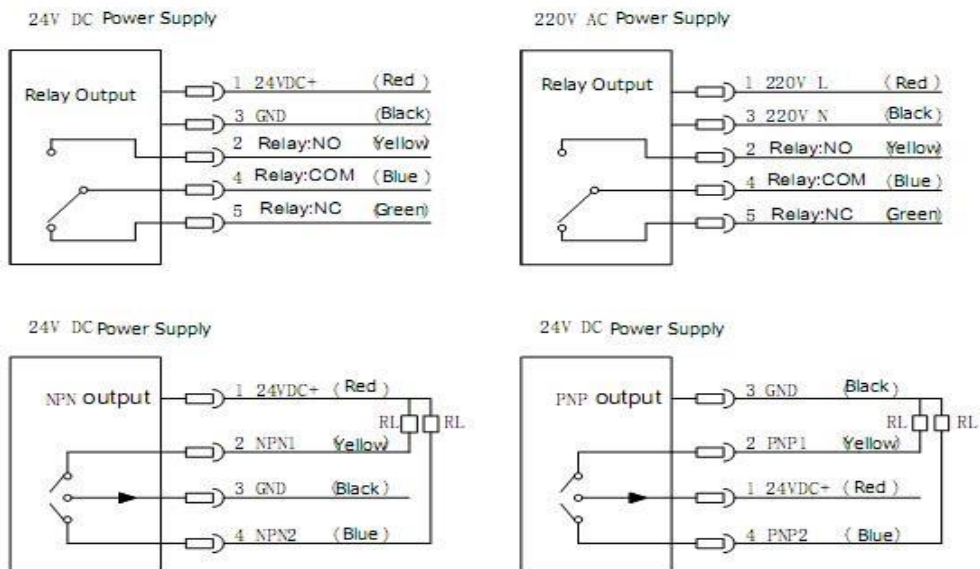


D= PIPE DIAMETER
S= INTERFERENCE SOURCE

5 Electric Connection This product uses M12×1 5-pin plug.

Color	PIN	220VAC	24VDC
Red	1	Power L	IN+
Black	3	Power N	IN-
Yellow	2	Relay : NO	Replay NO 、 NPN1、 PNP1
Green	5	Relay: NC	Relay NC
Blue	4	Relay : COM	Relay COM 、 NPN2、 PNP2





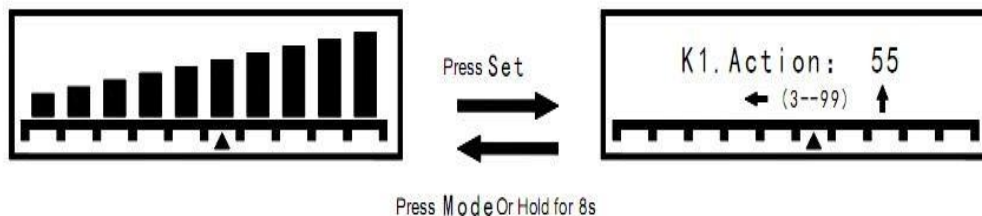
6 Specifications Set

There are two buttons, "Set" and "Mode". They can be used to set the switch act point, display model and other parameters.

Button	Function
Set	Left move/switch/screen reversal
Mode	Number Addition/Subtraction/Mode/Confirm

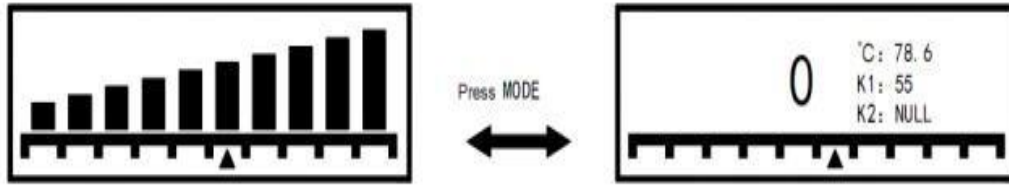
a) Velocity Act Point Set

When the product is powered on, the default display is in Progress Bar. Under this interface, after pressing "Set", it will switch to the interface for switch point set. Left button is used to move, and Right button for number modification, the act value can be set between 3~99. Long-press Mode button or no operation within 8 seconds, the value set would be saved automatically.





b) Mode Change or Reversal Display

When the product is powered on, the default display mode is progress bar. "Mode" button can allow for the switch between progress bar and numeric display. Under the progress bar or numeric display, long-press "Set" (about 2 seconds) can activate the display reversal function, it will be easy for users to operate and watch at any direction.







c) Parameter Set

By long-press “Mode” , it will go to the parameter set interface.
Select by left button, and Right to confirm.

Main Menu	Set	Level 1 st Menu	Options
	Switch Point	K1.Action	3~99
	Set	K2.Action	3~99
	Parameter Set	K1.Mode	NO/NC
		K2.Mode	NO/NC
	Mode	K.Act Lock?	Yes/No
	Factory.Set	Enter/Next	
	Save& Exit	Back/Exit	

d) Status and Display

Pipe Status	Progress Display	Digital Display
Empty Pipe No Water	 Flickeri ng	---
Static Water	 Static	0
Normal Velocity	 Static	1~119
Over velocity	 Flickering	120

7 Shipment Enclosed

Caution on unpacking: be sure the package is completed and rude strike on unpacking is forbidden to protect the instruments or components from damage.

The flow switch contains prior to delivery:

SPK81 flow switch	1 pc
2m MS901 cable and 5 pin M12x1 Female Elbow RVVP	1 pc
Operation Manual	1 pc
Quality Certificate	1 pc

8 Operation, Maintenance and Responsibility

Prior to running the equipment, please carefully inspect if its installation and electric

connection are correct. After it is powered on, the velocity act point then can be calibrated. Once powered on, the flow switch can work and display, but 1 min pre-heat would make the output signal more stable.

Flow switch is an integrated measurement instrument. please pay attention to the following items during daily use:

- a) Clean the encrustment on the probe with alkaline water regularly to ensure the normal performance of switch.
- b) After electric connection, make sure to screw down the base and nut to ensure the protection degree.

Notes:

- a) Please read this operation manual carefully before use, and complete the electric connection according to the instruction accordingly.
- b) Under the strong interference environment, please make sure the product is well grounded.

Responsibility

Within one year from the delivery date, we shall repair or replace the instrument with any quality fault caused by material parts or our manufacturing technique free of charge. For non-quality malfunction during user's operation, we are in charge of repair. But, the material cost and the shuttle transportation fees should be borne by users.