

# MFM500A

## Operation Manual

V1.0



MICROSENSOR



**Thank you very much for selecting Micro Sensor's product, please take some time to read this operation manual very carefully before using the product.**

## **1 Introduction**

MFM500A 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 over-voltage, over-current and reverse polarity protection function. With self-luminous OLED screen, it allows switchable display between the progress bar and digital display numbers. MFM500A 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:  $(24 \pm 4.8)$  V DC

Working Current:  $\leq 60$  mA

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)

| 2-way PNP+4mA-20mA

Output Function: NO,NC (optional)

Relay Characters:

Switch voltage:  $\leq 250\text{V AC} / 30\text{V DC}$

Switch Current:  $\leq 3\text{A}$

Switch accuracy:  $\pm 10\text{cm/s}$

Hysteresis:  $\pm 2\text{cm/s} \sim \pm 8\text{cm/s}$

Electric Protection: Reverse, Short-circuit, over-voltage

Transistors Characters:

Switch Voltage Drop:  $\leq 1.5\text{V}$

Switch Current:  $\leq 400\text{mA}$

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: Joint mounting +adaptor

Gross Weight: 265g

Water Temp. : -20℃ ~ 80℃

Storage Temp. : -30°C ~ 85°C

Working Temp. : -20℃ ~ 70℃

Protection: IP67

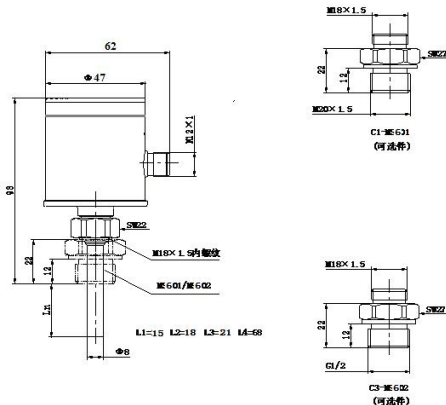
Temperature Compensation: 5°C ~ 50°C (water)

Electromagnetic Compatibility: GB/T17626.2/3-2006, GB/T 17626.4-2008

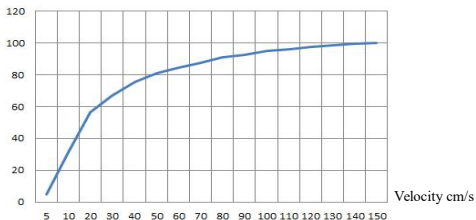
Shock:  $\leq 3g$  (GB/T JJG 882-2004)

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

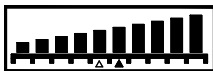
### 3 Outline Construction and Dimension (Unit:mm)



Curvilinear relation between digital indication and velocity:



Progress bar:



Digital Display:



▲ --Switch Point K1

△ --Switch Point K2

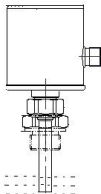
When Switch Point Sign light is flashing, it indicates that the velocity exceed the switch action velocity.

## 4 Installation

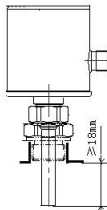
Attentions before installation:

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

The probe front end must be submersible to the water.

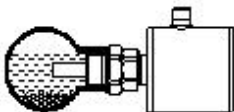


The probe inserting depth is 18mm min.

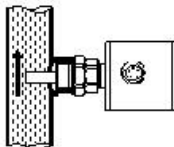


Suggested Installation Position:

Horizontal pipe: installed at side

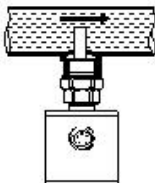


Vertical pipe: installed at the up-flow pipe

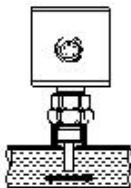


Limited Installation Position

No sediments in the horizontal pipe



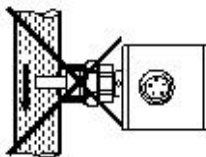
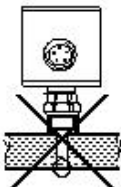
Fulfilled with water in the horizontal pipe n



Attentions:

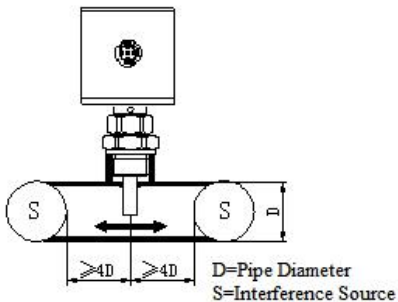
Keep the probe end away from the pipe

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



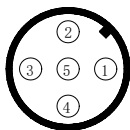
The components for installation of pipes, fittings, valves, reducers would be possible to cause turbulence and influence the operation of equipment, known as the interference source.

Suggested: please keep a distance between switch and the interference source



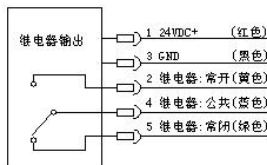
## 5 Electric Connection

This product uses M12×1 5-pin plug:

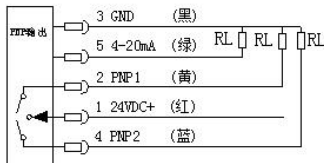


Color	Pin	24VDC
Red	1	IN+
Black	3	IN-
Yellow	2	Replay NO, NPN1
Green	5	Relay NC, 4mA-20mA DC
Blue	4	Relay COM, NPN2

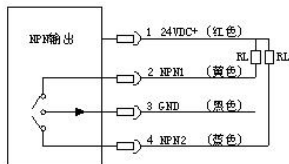
24V DC供电



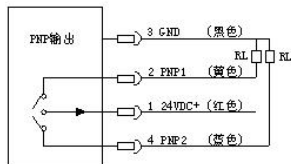
24V DC供电



24V DC供电



24V DC供电





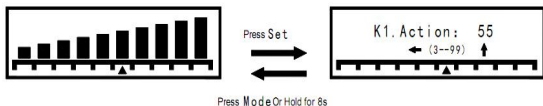
## 6 Specifications Set

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

### d) Status and Display

Pipe Status	Progress Display	Digital Display
Empty Pipe No Water	 Flashing	---

Static Water	 Still	0
Normal Velocity	 Still	1~119
Over Velocity	 Flashing	120

## 6 Shipment Enclosed

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

The packaging includes following parts before out-of-factory:

MFM500A Flow Switch	1pc
2m MS901 cable and 5 pin M12x1 Female Elbow RVVP	1pc
Operation Manual	1pc
Quality Certificate	1pc

## 7 Operation, Maintenance and Responsibility

Before 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 in daily use:

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

ensure the protection degree.

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

## **8 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.

[www.microsensor.cn](http://www.microsensor.cn)



**MICRO SENSOR CO.,LTD.**

ADD:No. 18 Ying Da Road, Baoji City, Shaanxi Province  
Tel: +86-(0)917-3600739/909 400 860 0606  
Fax:0917-3600755  
E-mail:sales@microsensor.cn