

Minyuan Water Flow Detector Datasheet

MWFD

The Minyuan Water Flow Detector (MWFD) utilizes a high-frequency capacitance detection chip to measure changes in the dielectric constant of liquid within pipes: differing capacitance values indicate whether air or liquid is present. Upon detecting air, it outputs a high-level signal to trigger an alarm.

The sensor features strong penetration capabilities, effectively overcoming challenges such as varying pipe materials, thick pipe walls, and differences in liquid conductivity. It offers rapid measurement response with a maximum detection cycle of 20ms. Combined with microprocessor algorithms, it can determine the current status within 500ms. The built-in microprocessor chip enables parameter calibration, temperature compensation, detection algorithm adjustment, and alarm threshold configuration.

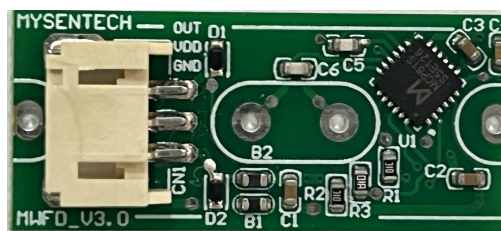


Figure 1 MWFD Module Appearance

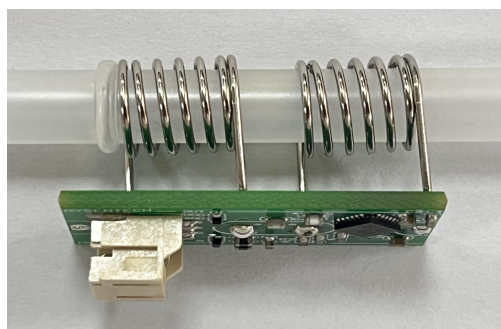


Figure 2 MWFD Sensor Appearance

1. Product Advantages

- High sensitivity, fast response;
- Can detect liquids with varying TDS levels (0-3000 ppm);
- Detectable viscous liquids;

- Non-contact capacitive detection method, high-frequency excitation with strong penetration capability.

2. Application Scenarios

- Smart home appliances such as water purifiers, coffee makers, steam ovens, and dryers feature water flow bubble indicators and low-liquid alerts;
- Medical IV tubing, oxygen concentrators, ventilators, etc. Detection of air bubbles in fluid flow and low fluid levels;
- Various industrial and consumer pumps for liquid extraction, detection of air bubbles and low fluid levels in water pipes.

3. Specifications

Supply Voltage: DC 3V to 5V

Operating Current: <10mA

Spring Inner Diameter: $\phi 7.0\text{mm}/\phi 4.5\text{mm}/\phi 3.5\text{mm}$

Flow Pipe Diameter:

$\phi 6.5 \pm 0.5\text{mm}$ (compatible with spring inner diameter $\phi 7.0\text{mm}$)

$\phi 4 \pm 0.3\text{mm}$ (compatible with spring inner diameter $\phi 4.5\text{mm}$)

$\phi 3 \pm 0.3\text{mm}$ (compatible with spring inner diameter $\phi 3.5\text{mm}$)

Operating temperature range: 0°C to $+50^{\circ}\text{C}$

Storage temperature range: -20°C to $+85^{\circ}\text{C}$

Output method: High/low level output, high level indicates bubble (low liquid) alarm

Selection Chart

Product Name	Model	Note
Water Flow Bubble Detector	MWFD	Spring inner diameter $\phi 7.0\text{mm}$
	MWFD-D4.5	Spring inner diameter $\phi 4.5\text{mm}$
	MWFD-D3.5	Spring inner diameter $\phi 3.5\text{mm}$

Note:

- 1) The sensor's operating temperature range is 0°C to $+50^{\circ}\text{C}$. Customization is required for temperatures outside this range.
- 2) The sensor does not come with a protective coating by default. Customization is required if needed.

4. Dimensions and Wire Sequence Specifications

See Figure 3 below for shape dimensions, connecting wires, and wire sequence (inspection method: measure with a vernier caliper).

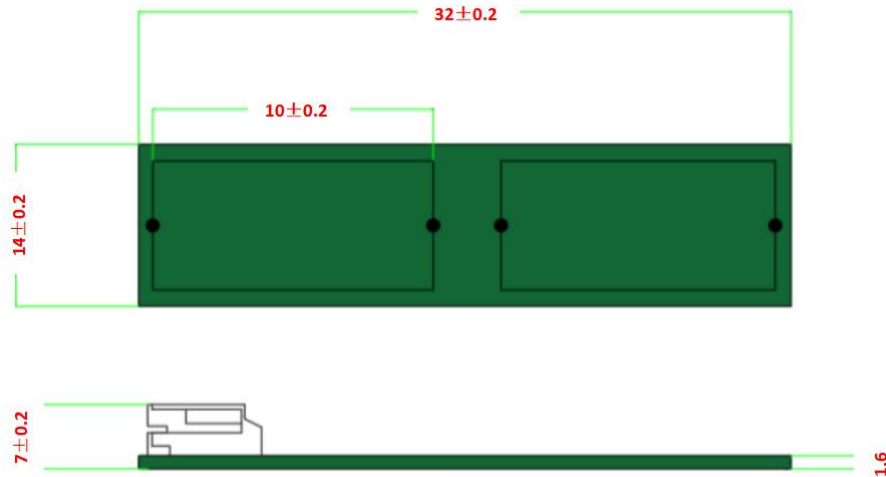


Figure 3 PCBA Dimensions

PCBA Dimensions: 32 (± 0.2 mm) *14 (± 0.2 mm) *7 (± 0.2 mm)

PCB board thickness: 1.6mm

Outlet Specifications: PH2.0-3P White terminal

Wire sequence:

Function	Note
O	Alarm Output
V	VDD
G	GND

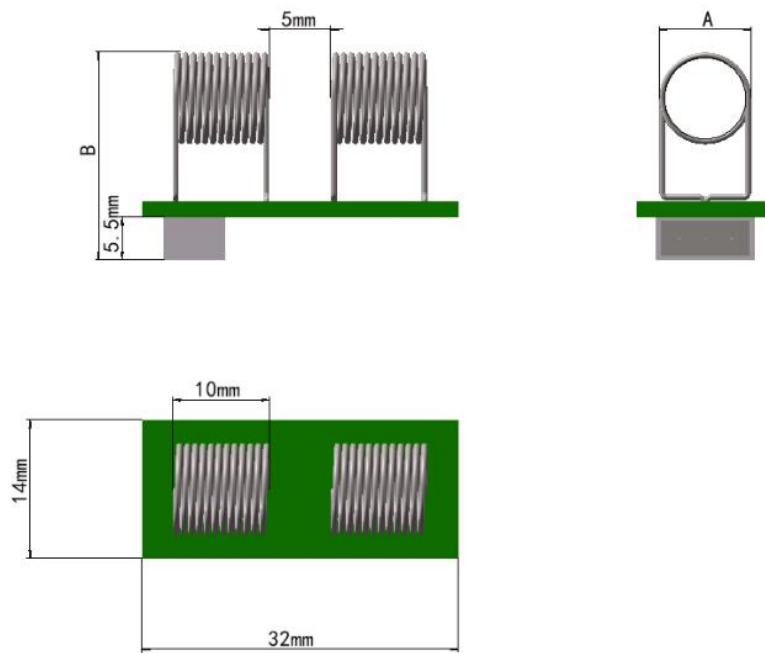


Figure 4 Sensor Dimension Drawing

The specifications for different spring sizes are shown in the table below..

Spring inner diameter	Dimensions A	Dimensions B
φ3.5mm	4.5mm	17.0mm
φ4.5mm	5.7mm	18.0mm
φ7.0mm	8.6mm	20.5mm

5. Instructions for Use

- 1) Pass the test tube through both springs simultaneously. To ensure detection sensitivity, the inner diameter of the springs should be as close as possible to the outer diameter of the tube, avoiding excessive gaps between them.
- 2) Perform an empty-load calibration when the tube contains no liquid (see the MWFD Calibration Manual for detailed calibration procedures).
- 3) When liquid flows through the tube, the sensor detects changes in the measured substance and outputs a corresponding status. It outputs a low level when liquid is detected and a high level when bubbles (or no liquid) are detected.

6. Impact Assessment

When a human body or metal object comes into contact with the detector or approaches within 1 cm of it, it will affect the detection.