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TenNuoDa YF-S402

TenNuoDa YF-S402 Water Flow Sensor Instruction Manual

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of the TenNuoDa YF-S402 Water Flow Sensor. The YF-S402 is a Hall effect turbine flow sensor designed for measuring the flow rate of liquids. It is suitable for various applications requiring precise water flow detection.

2. Product Overview

The TenNuoDa YF-S402 is a compact and lightweight water flow sensor that utilizes a Hall effect principle. As water flows through the sensor, it rotates an internal turbine. A Hall effect sensor detects the rotation of the turbine and outputs a series of electrical pulses. The frequency of these pulses is directly proportional to the water flow rate.

Key Features:

- **High Precision:** Designed for accurate flow rate measurement.
- **Stable Performance:** Constructed with quality materials for reliable operation.
- **Compact Design:** Small size and flexible appearance for easy integration.
- **Wide Application:** Ideal for use in drinking fountains, coffee machines, water filters, and similar systems.



Figure 1: Front view of the TenNuoDa YF-S402 Water Flow Sensor, showing the main body and electrical connector.

The sensor is typically installed at the water inlet of a device to monitor the influent flow. Its robust construction ensures durability and a long service life.



Figure 2: The YF-S402 sensor shown in an application context, indicating its placement at the water inlet for flow detection.

3. Specifications

The following table details the technical specifications for the TenNuoDa YF-S402 Water Flow Sensor:

Parameter	Value
Model	YF-S402
Monitoring Range	0.3 - 6 L/Min
Accuracy	±2% (for 0.15-3 L/Min)
Water Pressure Resistance	0.35 MPa
Working Voltage Range	DC 5V - 24V
Insulation Resistance	>100 MΩ
Product Dimensions	1.57 x 1.57 x 1.57 inches (approx.)

Parameter	Value
Item Weight	1.41 ounces (approx.)
Manufacturer	TenNuoDa

4. Setup

4.1 Physical Installation

1. **Orientation:** The sensor should be installed horizontally or vertically, ensuring the arrow on the sensor body aligns with the direction of water flow.
2. **Connection Points:** Connect the inlet and outlet of the sensor to your water system using appropriate fittings. Ensure a watertight seal to prevent leaks.
3. **Placement:** Install the sensor at the water inlet of the device where flow measurement is required. Avoid placing it near strong magnetic fields or areas with excessive vibration.

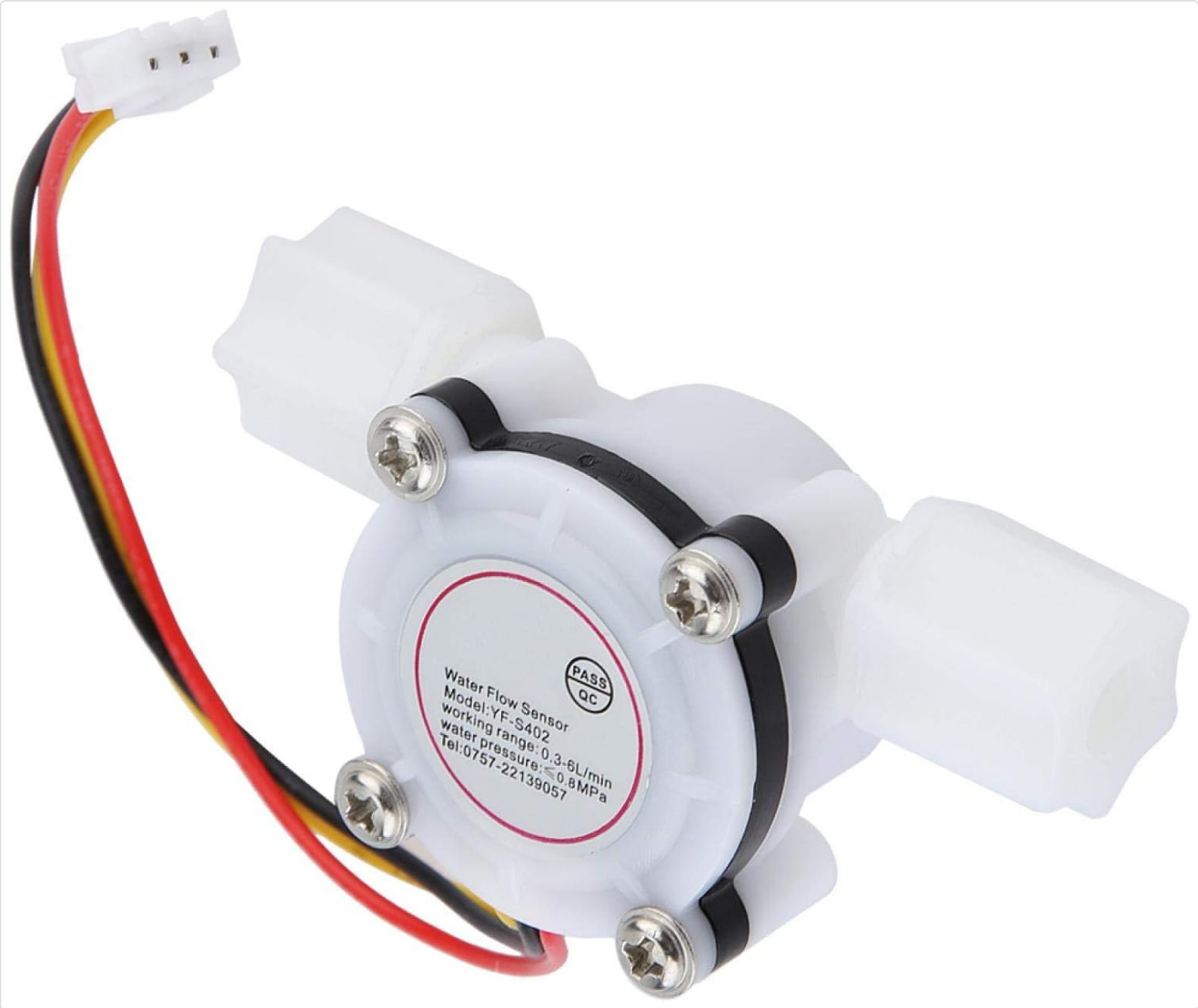


Figure 3: Side view of the YF-S402 sensor, illustrating the inlet and outlet ports for connection to a water line.

4.2 Electrical Connections

The YF-S402 sensor typically has three wires for electrical connection:

- **Red Wire:** Connect to positive power supply (DC 5V-24V).
- **Black Wire:** Connect to ground (GND).

- **Yellow Wire:** Pulse signal output. This wire should be connected to a microcontroller or other device capable of reading digital pulses.

Ensure all electrical connections are secure and properly insulated to prevent short circuits or damage to the sensor or connected equipment.

5. Operating Instructions

Once installed and connected, the YF-S402 sensor will generate a pulse signal proportional to the water flow. To calculate the flow rate, you will need to interpret these pulses using a microcontroller (e.g., Arduino) or a dedicated pulse counter.

5.1 Principle of Operation

The internal turbine rotates as water passes through. A magnet embedded in the turbine passes by a Hall effect sensor, generating a pulse for each rotation. The faster the water flows, the higher the frequency of the pulses.



Figure 4: An internal view of the YF-S402 sensor, highlighting the turbine mechanism responsible for generating pulses.

5.2 Flow Rate Calculation

The sensor typically provides a pulse output (Hz) that can be converted to a flow rate (L/Min) using a specific K-factor. While the exact K-factor may vary slightly between units, a common formula for similar sensors is:

> **Flow Rate (L/Min) = Pulse Frequency (Hz) / K-factor**

Refer to the sensor's specific K-factor if provided by the manufacturer for precise calibration. If not explicitly stated, empirical calibration may be necessary for critical applications.

6. Maintenance

To ensure optimal performance and longevity of your YF-S402 Water Flow Sensor, follow these maintenance guidelines:

- **Regular Inspection:** Periodically check the sensor and its connections for any signs of wear, damage, or leaks.
- **Cleanliness:** Ensure the water flowing through the sensor is free from large particles or debris that could obstruct the turbine or cause damage. If the sensor's performance degrades, it may be necessary to flush the system or carefully clean the sensor's internal components.

- **Environmental Conditions:** Operate the sensor within its specified temperature and pressure ranges. Avoid exposure to corrosive liquids or extreme temperatures.
- **Storage:** If storing the sensor for an extended period, ensure it is clean, dry, and protected from dust and physical damage.

7. Troubleshooting

If you encounter issues with your YF-S402 Water Flow Sensor, consider the following troubleshooting steps:

7.1 No Pulse Output

- **Check Power Supply:** Verify that the sensor is receiving the correct operating voltage (DC 5V-24V) via the red and black wires.
- **Inspect Wiring:** Ensure all electrical connections are secure and correctly wired (Red to VCC, Black to GND, Yellow to signal input).
- **Verify Water Flow:** Confirm that water is actually flowing through the sensor.
- **Check for Blockages:** Inspect the sensor's inlet and outlet for any debris or blockages that might prevent the turbine from rotating.
- **Test Signal Input:** Ensure the device connected to the yellow wire is correctly configured to read pulse signals.

7.2 Inaccurate Flow Readings

- **Recalibrate:** If possible, recalibrate the sensor with a known flow rate to determine the precise K-factor for your specific unit.
- **Check for Air Bubbles:** Air bubbles in the water line can interfere with accurate readings. Ensure the system is purged of air.
- **Verify Installation:** Confirm the sensor is installed correctly, with the flow direction matching the arrow on the sensor body.
- **Stable Flow:** Ensure the water flow is stable and not experiencing rapid fluctuations, which can affect measurement accuracy.
- **Turbine Obstruction:** Even small particles can affect turbine rotation. Consider cleaning the sensor if suspected.

8. Support

For any questions, suggestions, or technical assistance regarding your TenNuoDa YF-S402 Water Flow Sensor, please contact TenNuoDa customer support. We are committed to providing a positive experience and will assist you with any inquiries.

While specific warranty details are not provided in this manual, TenNuoDa strives to ensure product quality and customer satisfaction. Please retain your purchase receipt for any potential support claims.

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