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› Taidacent FS-IR02 Optical Infrared Liquid Level Sensor Instruction Manual

Taidacent FS-IR02

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INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of the Taidacent FS-IR02 Optical Infrared Liquid Level Sensor. This sensor is designed for precise liquid level detection in various applications, offering a reliable and accurate solution for monitoring fluid levels.



Figure 1: Taidacent FS-IR02 Optical Infrared Liquid Level Sensor

A view of the compact Taidacent FS-IR02 sensor with its wired connector, ready for integration into a system.

PRODUCT OVERVIEW

The Taidacent FS-IR02 is an advanced optical infrared liquid level sensor that provides high accuracy and reliability. Its solid-state design eliminates mechanical moving parts, reducing wear and increasing operational lifespan. It is suitable for a wide range of applications requiring precise liquid level control and protection.

Key Features:

- **High Accuracy:** Liquid level control accuracy within $\pm 0.5\text{mm}$, significantly more precise than many traditional float-type switches.
- **Flexible Installation:** Can be installed in multiple orientations including upside, downside, sideways, and diagonally, adapting to diverse tank designs.
- **Enhanced Reliability:** Absence of friction and mechanical moving parts ensures high reliability and prevents issues like sticking.
- **Broad Application:** Ideal for use in humidifiers, air-conditioning fans, steam generators, and other electrical products that require accurate water level monitoring and protection.

Optical Sensing Principle:

The sensor operates based on the principle of total internal reflection. An infrared LED emits light into a prism at the sensor tip. A receiver detects this light.

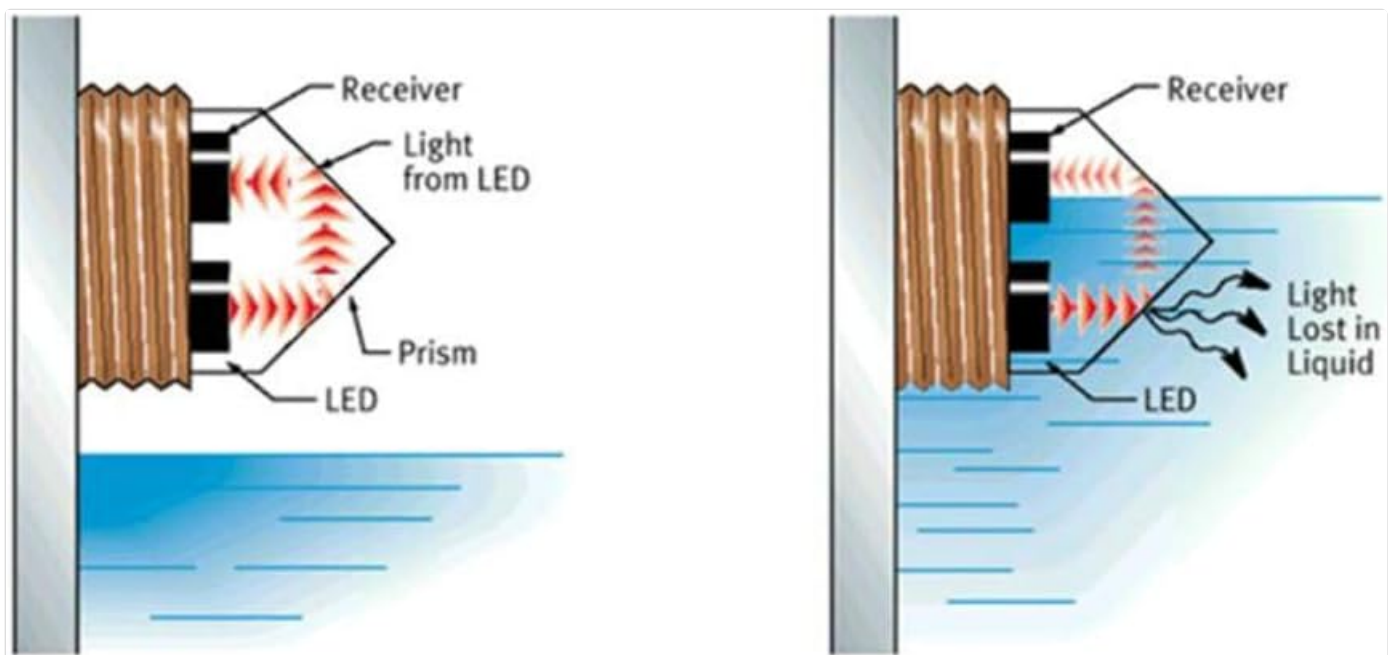


Figure 2: Optical Sensing Principle

When the sensor tip is dry (left), the infrared light from the LED undergoes total internal reflection within the prism and is directed to the receiver. When the sensor tip is submerged in liquid (right), the refractive index changes, causing the light to refract out into the liquid and be lost, resulting in a change detected by the receiver.

SETUP AND INSTALLATION

Component Identification and Wiring:

Before installation, familiarize yourself with the sensor's components and wiring diagram.

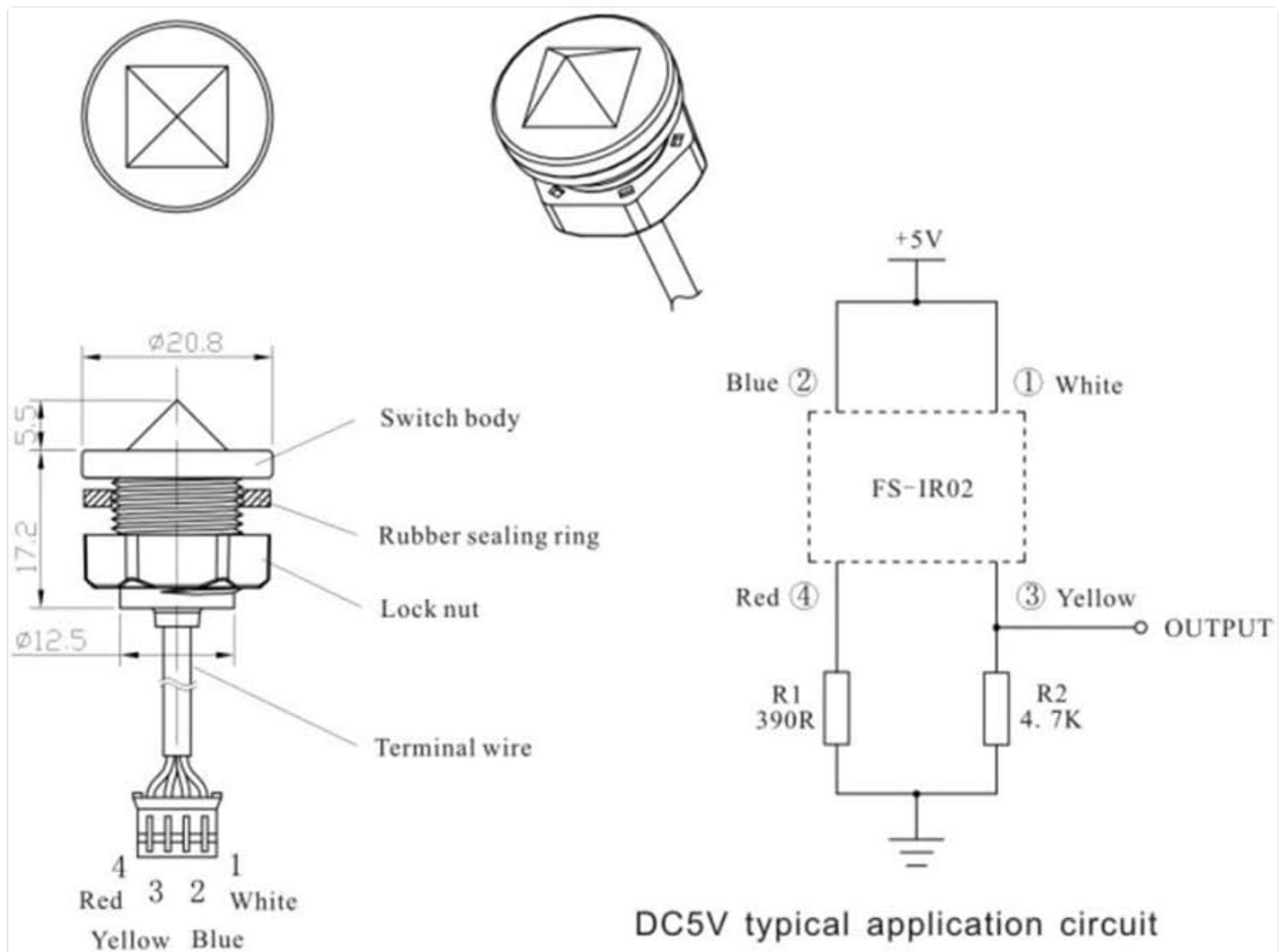


Figure 3: Sensor Dimensions and Wiring Diagram

This diagram details the physical dimensions (e.g., diameter, thread size), key components (switch body, rubber sealing ring, lock nut, terminal wire), and the recommended DC5V typical application circuit with resistor values ($R1=390\Omega$, $R2=4.7K\Omega$).

Wiring Instructions:

Refer to **Figure 3** for the typical DC5V application circuit. The sensor features a 4-pin connector with the following wire assignments:

- **White (Pin 1):** Connect to +5V DC Power Supply.
- **Blue (Pin 2):** Connect to Ground (GND).
- **Yellow (Pin 3):** This is the Output Signal.
- **Red (Pin 4):** Connect to one end of a 390 Ohm resistor ($R1$), with the other end of $R1$ connected to Ground.

A 4.7K Ohm resistor ($R2$) is typically connected between the output signal (Yellow wire) and Ground for proper signal conditioning and to ensure a stable output when the sensor is dry. It is crucial to ensure correct polarity and use the specified resistor values to prevent damage to the sensor and ensure accurate readings.

Installation Orientations:

The FS-IR02 sensor offers significant flexibility in mounting, allowing it to be integrated into various tank and container designs.

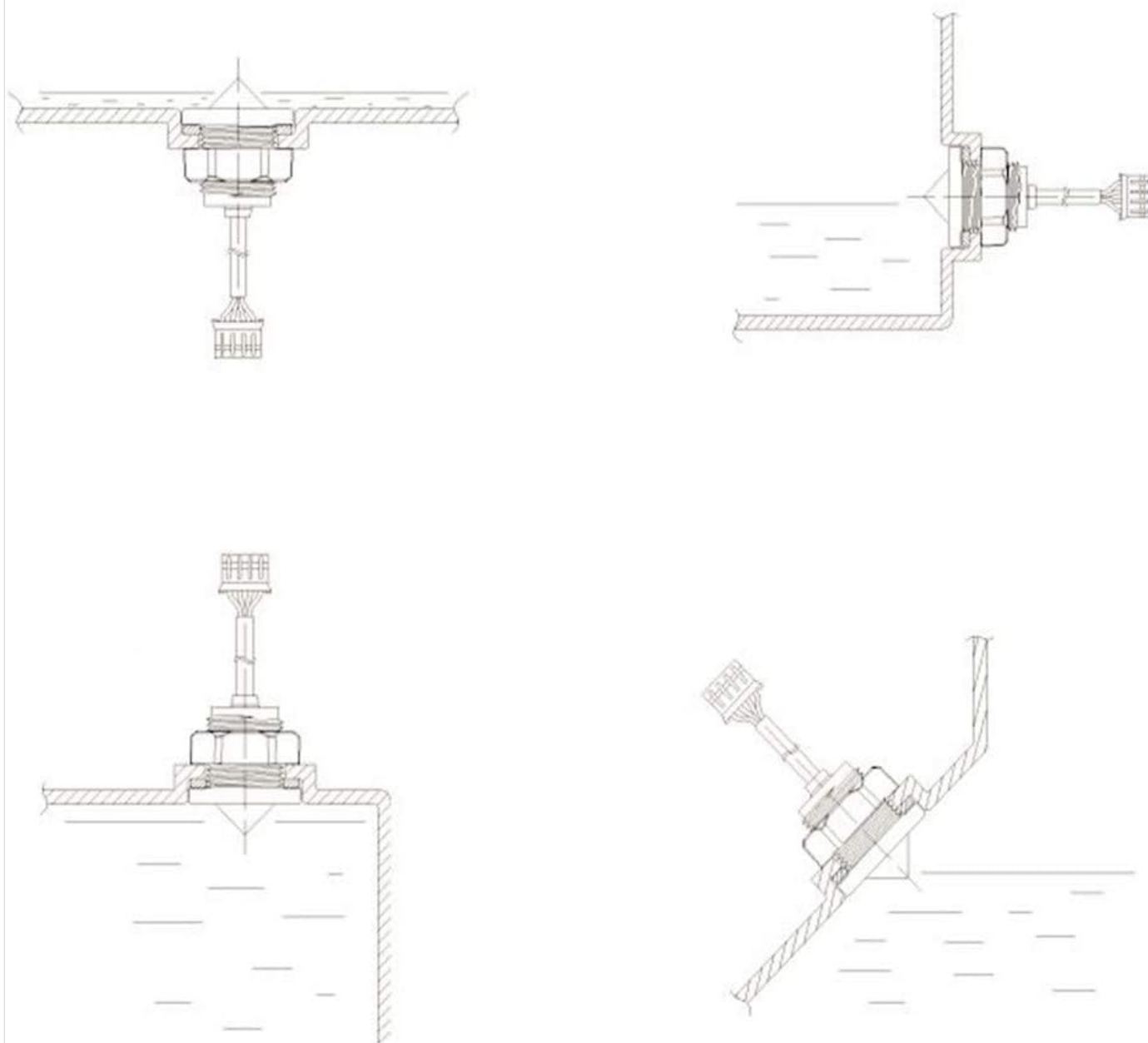


Figure 4: Flexible Installation Options

The sensor can be securely mounted from the top, bottom, side, or at an angle, depending on the specific requirements of your application and the desired detection point within the liquid container.

Ensure the sensor is securely fastened using the lock nut and that the rubber sealing ring provides a watertight seal to prevent leaks.

OPERATION

Once properly installed and wired, the Taidacent FS-IR02 sensor provides a digital output signal that changes state based on the presence or absence of liquid at its optical tip.

- **Dry State:** When the sensor tip is not submerged in liquid, the output signal will be in one state (e.g., a high voltage level, typically close to the supply voltage).
- **Wet State:** When the sensor tip is submerged in liquid, the output signal will switch to the other state (e.g., a low voltage level, typically close to ground).

The exact voltage levels for "high" and "low" states will depend on your power supply and the specific output circuit design (including R2). It is recommended to perform a simple test by submerging and removing the sensor from liquid to confirm its output behavior in your application environment.

MAINTENANCE

The Taidacent FS-IR02 sensor is designed for minimal maintenance due to its robust optical principle and lack of mechanical moving parts. This design significantly reduces the likelihood of wear and common issues associated with traditional float switches.

- **Cleaning:** Periodically inspect the optical tip of the sensor for any accumulation of dirt, scale, or residue that could interfere with light transmission. If cleaning is necessary, gently wipe the tip with a soft, non-abrasive cloth. Avoid using harsh chemicals or abrasive materials that could scratch the optical surface.
- **Connection Inspection:** Regularly check all wiring and electrical connections to ensure they remain secure, free from corrosion, and undamaged. A stable connection is vital for consistent sensor performance.

TROUBLESHOOTING

If you encounter issues with the FS-IR02 sensor, follow these troubleshooting steps to diagnose and resolve common problems:

- **No Output Change or Sensor Appears Inactive:**
 - **Power Supply:** Verify that the +5V DC power supply is correctly connected to the White wire and Ground to the Blue wire. Incorrect polarity or insufficient voltage will prevent operation.
 - **Resistor Values:** Double-check the resistance values of R1 (390 Ohm) and R2 (4.7K Ohm) in your circuit against the recommended values in **Figure 3**. Incorrect resistors can lead to improper signal conditioning.
 - **Wiring Integrity:** Inspect all wiring connections for continuity, secure contact, and proper soldering. Loose, broken, or incorrectly wired connections are a common cause of sensor malfunction.
 - **Optical Tip Cleanliness:** Ensure the sensor's optical tip is clean and free from any obstructions, opaque coatings, or significant buildup that could block the infrared light path.
 - **Basic Functionality Test:** Isolate the sensor and test it in a simple circuit with a known liquid to confirm its fundamental switching behavior.
- **Inaccurate or Erratic Readings:**
 - **Installation Position:** Confirm the sensor is installed precisely at the desired liquid level detection point.
 - **Environmental Factors:** Check for the presence of air bubbles, foam, or excessive turbulence around the sensor tip, which can interfere with accurate optical detection.
 - **Liquid Clarity:** While optical sensors are robust, highly opaque, extremely viscous, or heavily contaminated liquids might affect performance.
- **Intermittent Operation:**
 - **Power Stability:** Ensure the power supply is stable and free from voltage fluctuations.
 - **Connection Reliability:** Re-examine all wiring for any loose connections or intermittent contacts that might cause sporadic behavior.

SPECIFICATIONS

Feature	Detail
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Feature	Detail
Model	FS-IR02
Brand	Taidacent
Sensor Technology	Photoelectric Sensor
Liquid Level Control Accuracy	±0.5mm
Power Supply (Typical)	DC 5V
Item Weight	1.13 ounces (approx. 32g)
Package Dimensions	7.68 x 6.18 x 1.06 inches (approx. 19.5 x 15.7 x 2.7 cm)
UPC	792323444127
Color	Black

WARRANTY AND SUPPORT

Specific warranty information for the Taidacent FS-IR02 sensor is not detailed within this instruction manual. For comprehensive warranty terms, technical assistance, or customer support, please contact your original retailer or the manufacturer directly.

Manufacturer: Taidacent

For further inquiries, please refer to the contact information provided with your purchase or visit the official Taidacent website.

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Question

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Details

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