AJDFVHJF GRK-Z100N-RS485

AJDFVHJF GRK-Z100N-RS485 Photoelectric Displacement Sensor User Manual

Model: GRK-Z100N-RS485

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of the AJDFVHJF GRK-Z100N-RS485 Photoelectric Displacement Sensor. This sensor is designed for precise distance ranging and displacement measurement, offering high accuracy and fast response for various industrial applications. Its robust design ensures stable and reliable performance over time.

- **Precise Measurement:** Achieves high accuracy for reliable data acquisition.
- **Fast Response:** Provides immediate outcomes for displacement changes.
- **Versatile Applications:** Suitable for a wide range of industrial uses.
- **Durable Design:** Constructed for robustness and long-term stability.
- **Easy Installation:** Designed for straightforward setup and use.

2. Product Overview

The GRK-Z100N-RS485 is a photoelectric sensor capable of measuring displacement with high precision. It features a compact design and multiple detection modes. The sensor provides PNP voltage/current output and RS485 communication.

Figure 1: Front view of the AJDFVHJF GRK-Z100N-RS485 Photoelectric Displacement Sensor, showing the display, control buttons, and labeled wiring harness. The yellow label indicates the model GRK-Z100N-RS485 and wire color assignments for power, output, input, and RS485 communication.

3. Specifications

Parameter	Value
Measuring Center Distance	100mm
Measuring Range	±35mm
Repeatability	70µm
Straightness	±0.1% F.S.
Temperature Characteristic	0.03% F.S./°C
Supply Voltage	12~24V DC ±10%, pulsation P-P 10%
Ambient Humidity	35%~85% RH (storage: 35%~85% RH)
Cable	0.15mm² 5-core composite cable, 2m length
Package Dimensions	1.18 x 0.79 x 0.39 inches
Item Weight	2.2 pounds
Manufacturer	AJDFVHJF
Item Model Number	AJDFVHJF (GRK-Z100N-RS485)

Compliance

- **European Specification:** EMC Directive
- **US/Canada Specification:** CAN/CSA-C22.2 NO.60947-5-2-14

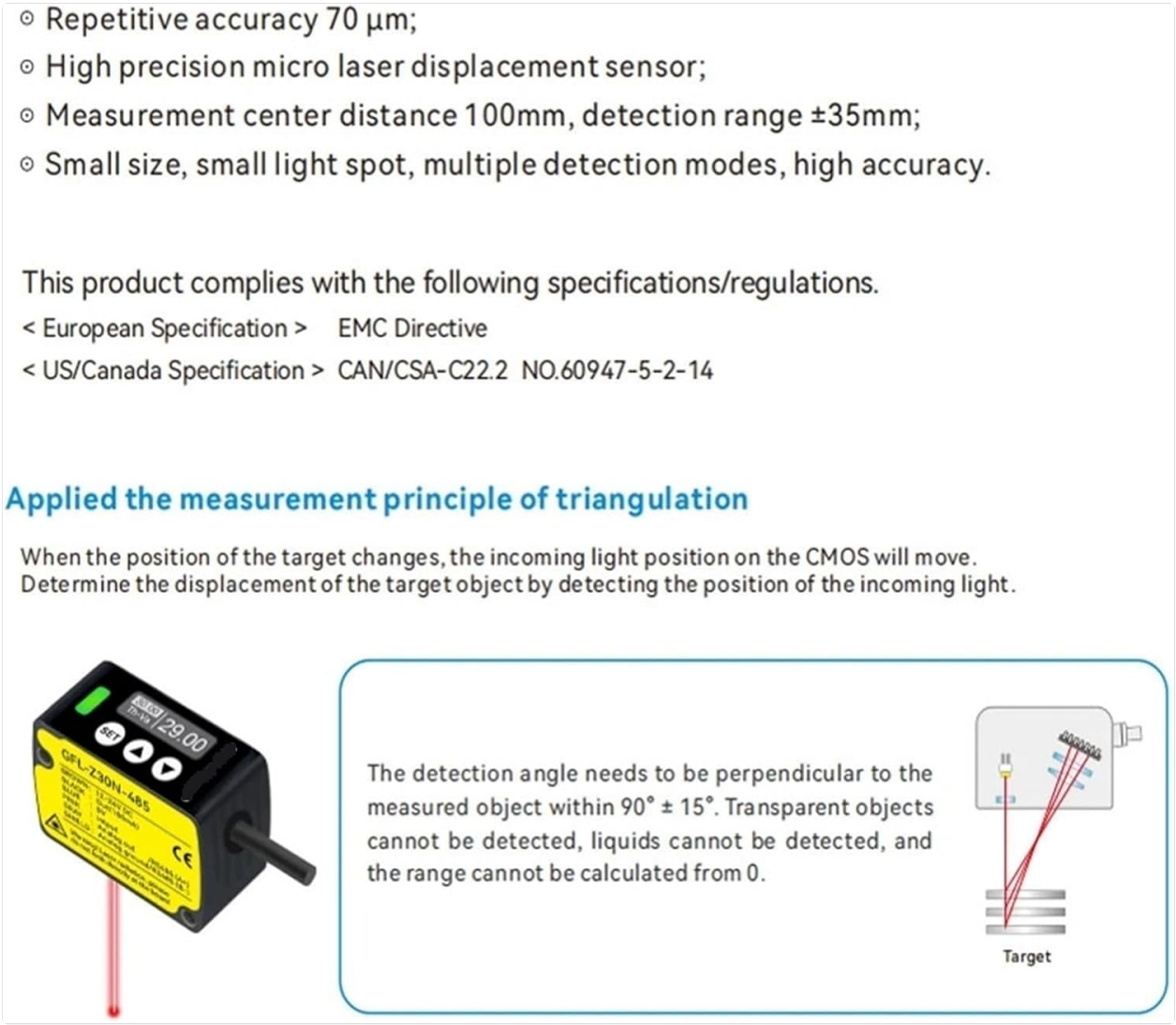

Figure 2: Detailed technical specifications including accuracy, measurement range, and compliance with European and US/Canada standards. This image also illustrates the measurement principle of triangulation.

4. Installation Instructions

Proper installation is crucial for the optimal performance of the sensor. Follow these guidelines for mounting and positioning.

4.1 Mounting the Sensor

The sensor can be mounted using M3 screws with the provided support and lock block. Ensure the sensor is securely fastened to prevent movement or vibration during operation.

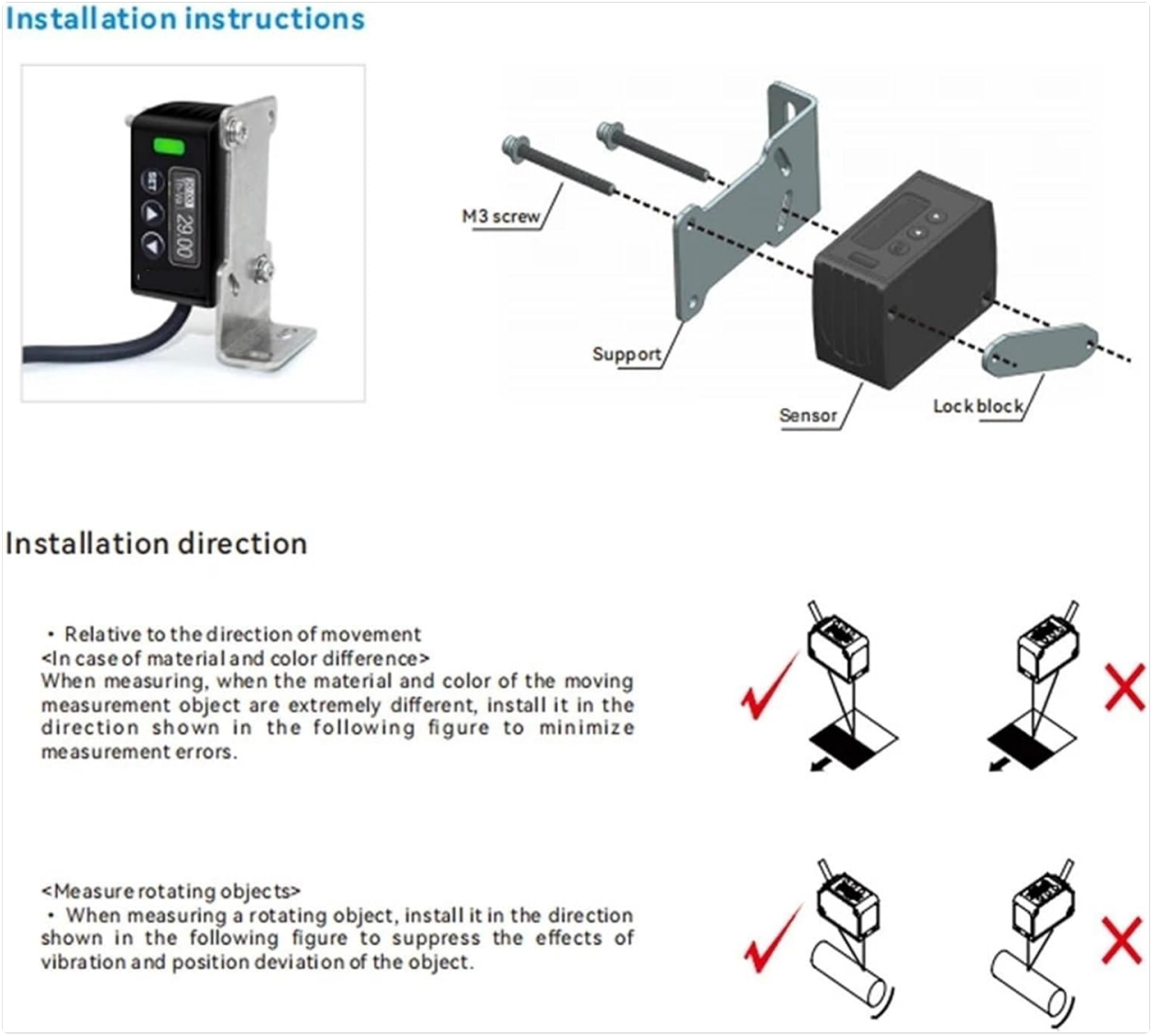

Figure 3: Exploded view of the sensor assembly, illustrating how the sensor, support bracket, lock block, and M3 screws fit together for mounting.

4.2 Installation Direction

The orientation of the sensor relative to the target object significantly impacts measurement accuracy. Consider the following:

- **Relative to the direction of movement:** When measuring objects with significant material or color differences, install the sensor in the direction shown in the figure to minimize measurement errors.
- **Measuring rotating objects:** For rotating objects, install the sensor in the direction shown to suppress the effects of vibration and position deviation.

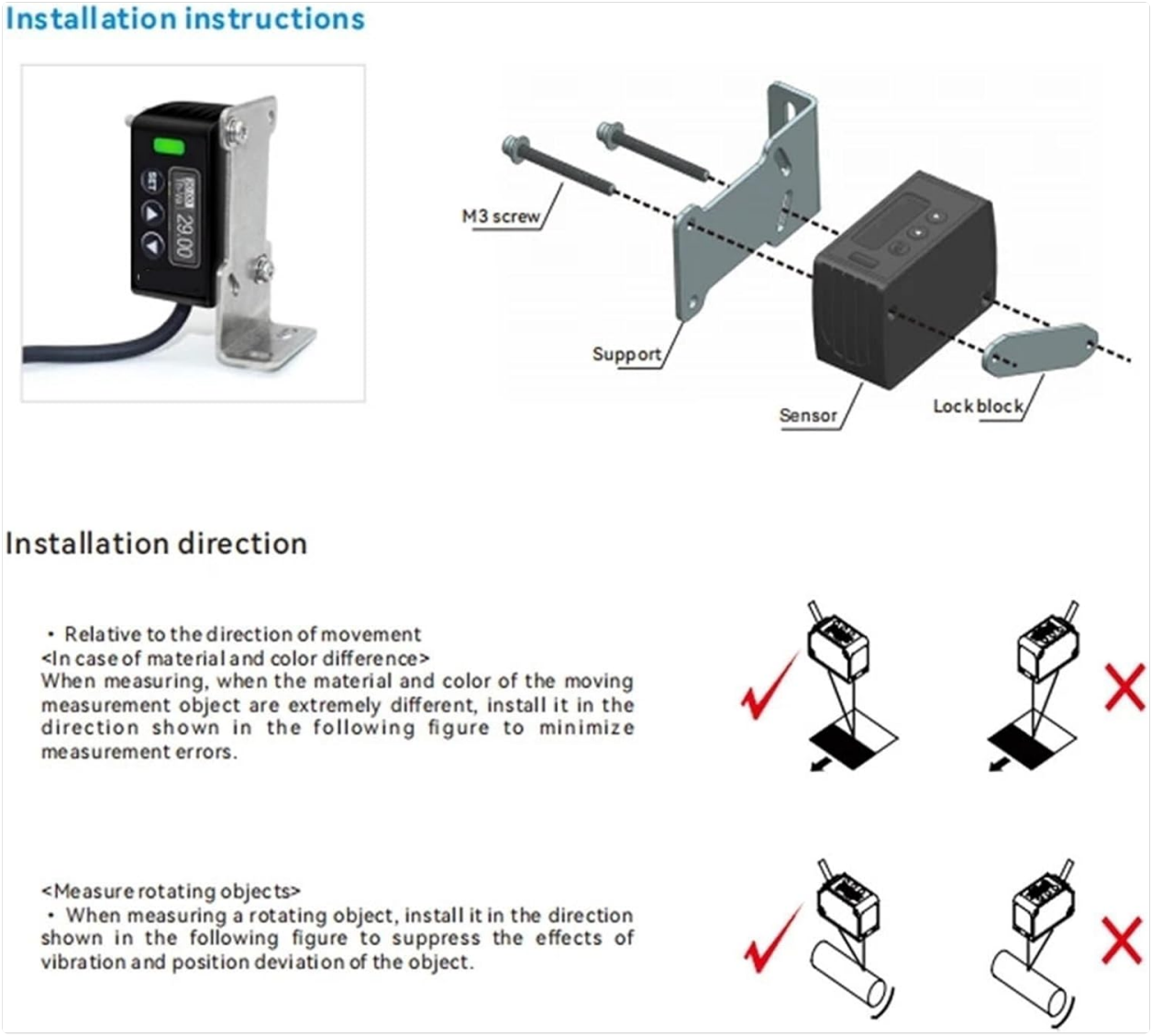

Figure 4: Visual guide for optimal sensor installation direction. It shows recommended orientations for measuring objects moving linearly and rotating objects, with 'X' marks indicating incorrect placements.

5. Wiring and Connections

The GRK-Z100N-RS485 sensor uses a 5-core composite cable. Ensure correct wiring according to the diagram below to prevent damage and ensure proper functionality.

5.1 Wire Color Code

- **BROWN:** 12-24V DC (Power Supply Positive)
- **BLACK:** Out (100mA) (PNP Output)
- **BLUE:** 0V (Power Supply Negative / Ground)
- **PINK:** 0V (Additional Ground / Common)
- **GRAY:** Input (External Input)
- **SHIELD:** Analog out / RS485 (A+)
- **SHIELD:** Analog ground / RS485 (B-)

5.2 Input/Output Circuit Diagram

The sensor supports both NPN and PNP analog output types with RS485 communication.

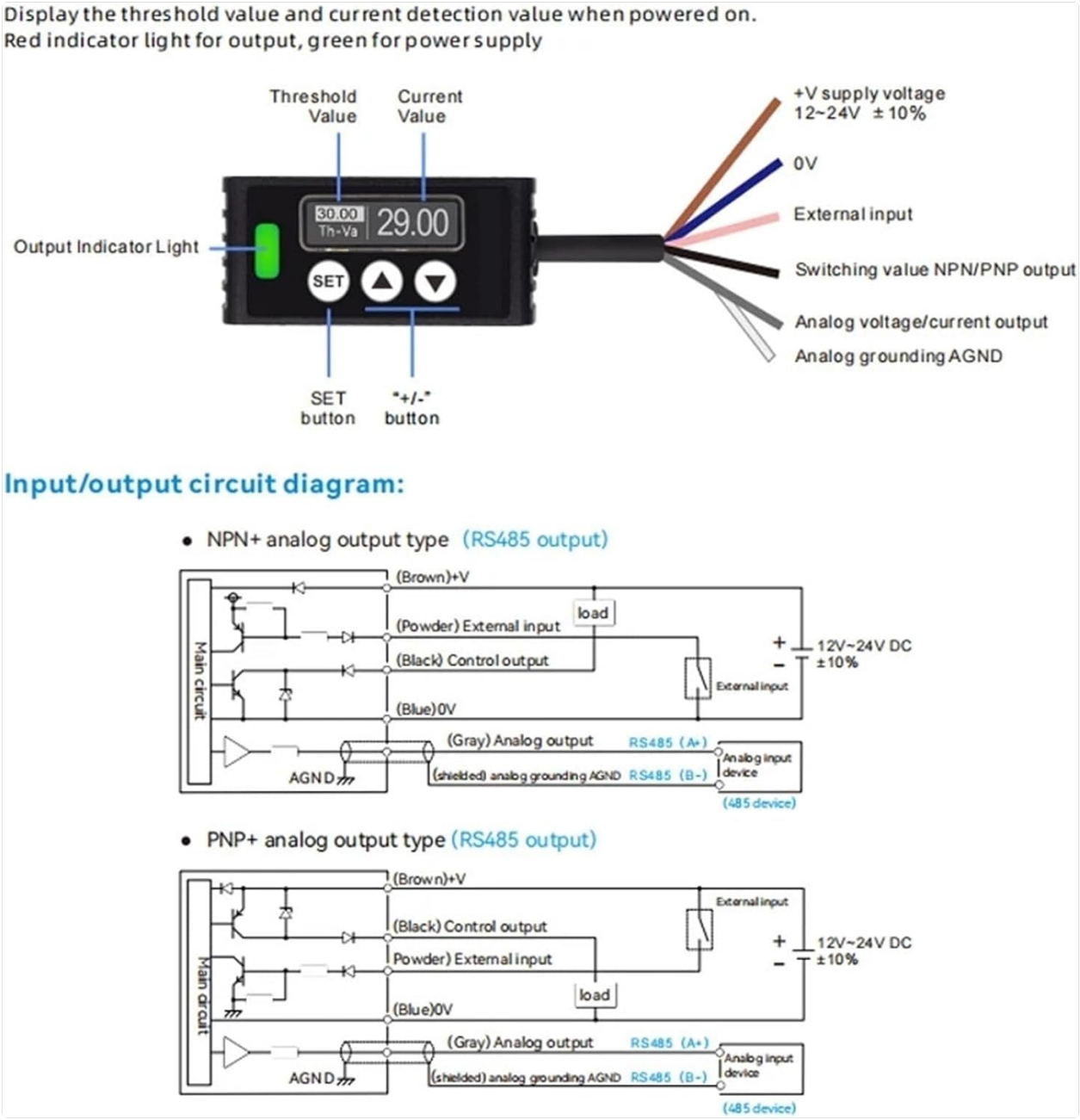

Figure 5: Comprehensive wiring diagrams for both NPN and PNP analog output configurations, including RS485 connections. The image also shows the sensor's display indicating 'Threshold Value' and 'Current Value', along with the 'SET' and '+/-' buttons for configuration. Output and power indicator lights are also depicted.

NPN + Analog Output Type (RS485 Output)

- **Brown:** +V (12-24V DC)
- **Black:** Control output
- **Blue:** 0V
- **Gray:** Analog output (RS485 A+)
- **Shielded:** Analog grounding (RS485 B-)
- **Pink:** External input

PNP + Analog Output Type (RS485 Output)

- **Brown:** +V (12-24V DC)
- **Black:** Control output
- **Blue:** 0V
- **Gray:** Analog output (RS485 A+)

- **Shielded:** Analog grounding (RS485 B-)
- **Pink:** External input

6. Operating Instructions

6.1 Display and Indicators

The sensor features a digital display that shows the 'Threshold Value' and 'Current Value'.

- **Red Indicator Light:** Illuminates when output is active.
- **Green Indicator Light:** Illuminates when power is supplied.

6.2 Buttons

- **SET Button:** Used to enter and confirm settings.
- **'+/-' Buttons:** Used to adjust values or navigate menu options.

6.3 Measurement Principle

The sensor operates on the principle of triangulation. When the position of the target changes, the incoming light position on the CMOS will move. The displacement of the target object is determined by detecting the position of the incoming light.

Important Considerations for Measurement:

- The detection angle needs to be perpendicular to the measured object within 90° ± 15°.
- Transparent objects cannot be detected.
- Liquids cannot be detected.
- The measurement range cannot be calculated from zero.

7. Maintenance

To ensure the longevity and accurate performance of your GRK-Z100N-RS485 sensor, follow these general maintenance guidelines:

- **Cleaning:** Regularly clean the sensor's optical surfaces with a soft, lint-free cloth. Avoid using abrasive materials or harsh chemical cleaners that could damage the lens or housing.
- **Environmental Conditions:** Ensure the sensor operates within the specified ambient humidity and temperature ranges to prevent condensation or overheating.
- **Cable Inspection:** Periodically check the cable for any signs of wear, cuts, or damage. Replace damaged cables immediately to prevent electrical hazards or signal loss.
- **Secure Mounting:** Verify that the sensor remains securely mounted and that all screws are tightened to prevent vibration-induced errors.

8. Troubleshooting

If you encounter issues with your GRK-Z100N-RS485 sensor, consider the following basic troubleshooting steps:

- **No Power/No Green Indicator:** Check the power supply connections (Brown to +V, Blue to 0V) and ensure the voltage is within the 12-24V DC range. Verify the power source is active.
- **No Output/No Red Indicator:** Confirm that the target object is within the measurement range and the

sensor is correctly aligned. Check the output wiring (Black wire). Review the threshold settings if applicable.

- **Inaccurate Readings:** Ensure the sensor is installed according to the recommended directions (Section 4.2). Verify that the target object is not transparent or liquid. Check for any obstructions on the sensor's optical path. Ensure the detection angle is perpendicular to the target.
- **Communication Issues (RS485):** Verify the RS485 A+ (Gray) and B- (Shielded) connections are correct and that the communication parameters (baud rate, parity, stop bits) match the connected device.
- **Sensor Not Responding to Buttons:** Ensure the sensor is powered on. If the issue persists, power cycle the device.

For persistent issues or advanced troubleshooting, please contact AJDFVHJF customer support.

9. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact AJDFVHJF directly through their official channels. Ensure you have your product model number (GRK-Z100N-RS485) and purchase details available when seeking support.