Sick LL3-TV05

SICK LL3-TV05 Plastic Fiber-Optic Sensor User Manual

Model: LL3-TV05 | Brand: Sick

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of the SICK LL3-TV05 Plastic Fiber-Optic Sensor. The LL3-TV05 is an individual, right-angled sensing fiber head designed for versatile applications, offering resistance to mechanical stress, chemicals, and high temperatures. It is suitable for detecting objects, surfaces, front rims, and fluid surfaces.
Please read this manual thoroughly before using the product to ensure safe and efficient operation.

2. Product Features

- LL3 Fiber Head design.
- Constructed from plastic and fiberglass fiber optic cable for durability.
- Versatile applications for various industrial sensing needs.
- Resistant to mechanical stress, chemicals, and high temperatures.
- Standard and customer-specific type availability.
- Designed for easy installation, saving time during setup.
- Capable of detecting objects, surfaces, front rims, and fluid surfaces.
- Detection Range: 170 to 400 mm (WLL170-2) and 350 to 4000 mm (WLL180T).
- Terminal Type: Wire lead; Electrical Connection: Cable.
- Housing Material: PE; Length: 6.6 ft (2.011 m).
- Operating Temperature: Max: +70°C.
- RoHS Compliance Status: Yes.

3. Components Overview

The SICK LL3-TV05 consists primarily of the fiber-optic head, which is designed for precise sensing in various environments. Below is an illustration of the fiber-optic head.



Figure 1: SICK LL3-TV05 Plastic Fiber-Optic Sensor Head. This image illustrates the physical structure of the SICK LL3-TV05 fiber-optic sensor head, featuring a right-angled sensing element, a hex nut for mounting, and a threaded body for secure installation.

4. Setup and Installation

Proper installation is crucial for optimal performance of the LL3-TV05 sensor. Follow these general guidelines:

1. **Mounting the Sensor Head:** Secure the LL3-TV05 fiber head using its hex nut and threaded body. Ensure it is firmly attached to a stable surface in the desired sensing position. The right-angled design allows for flexible positioning in confined spaces.
2. **Connecting the Fiber Optic Cable:** Insert the fiber optic cable into the sensor amplifier (not included, but required for operation). Ensure a clean and secure connection to prevent signal loss.
3. **Electrical Connection:** Connect the wire lead to the appropriate power supply and control unit as per your system's electrical diagram. Refer to the amplifier's manual for specific wiring instructions. The LL3-TV05 itself is a passive fiber head.
4. **Environmental Considerations:** Position the sensor head to avoid direct exposure to excessive mechanical stress or chemicals beyond its specified resistance limits. Ensure the operating temperature remains within the maximum +70°C.

5. Operating Instructions

The LL3-TV05 fiber head operates in conjunction with a compatible fiber optic amplifier (e.g., WLL170-2, WLL180T). The amplifier processes the light signals transmitted and received by the fiber head to detect objects.

1. **Power On:** Ensure the fiber optic amplifier is powered on and correctly configured according to its own manual.
2. **Alignment:** Position the LL3-TV05 fiber head so that its sensing tip is directed towards the target area. For through-beam applications, ensure the emitter and receiver fibers are aligned. For diffuse sensing, ensure the target is within the specified detection range.

3. **Sensitivity Adjustment:** Adjust the sensitivity settings on the connected fiber optic amplifier to optimize detection for your specific application and target material. This may involve teaching-in a background or target.
4. **Testing:** Perform test detections with actual objects to verify proper operation and detection reliability.

6. Maintenance

The SICK LL3-TV05 fiber head is designed for low maintenance. However, regular checks can prolong its lifespan and ensure consistent performance.

- **Cleaning:** Periodically clean the sensing tip of the fiber head to remove dust, dirt, or debris that may obstruct the light path. Use a soft, lint-free cloth and, if necessary, a mild cleaning solution. Avoid abrasive materials.
- **Inspection:** Visually inspect the fiber head and cable for any signs of physical damage, such as kinks, cuts, or excessive wear. Ensure the mounting remains secure.
- **Environmental Monitoring:** Confirm that the operating environment continues to meet the specified conditions regarding temperature and chemical exposure.

7. Troubleshooting

If you encounter issues with the LL3-TV05 fiber head, consider the following common problems and solutions:

Problem	Possible Cause	Solution
No detection or inconsistent detection	Sensing tip is dirty Incorrect alignment Target outside detection range Amplifier sensitivity too low/high Damaged fiber cable	Clean sensing tip Re-align fiber head Adjust position of fiber head or target Adjust sensitivity on the amplifier Inspect and replace if damaged
Fiber head appears loose	Mounting nut is not tightened	Tighten the hex nut securely.
Fiber cable connection issues	Poor connection to amplifier	Ensure the fiber cable is fully and cleanly inserted into the amplifier.

For further assistance, refer to the manual of your connected fiber optic amplifier or contact SICK technical support.

8. Technical Specifications

Parameter	Value
Product Group	Plastic and fiberglass fiber fiber optic cables
Quantity	1
Detection Range (WLL170-2)	170 to 400 mm (6.7 to 15.7 inches)
Detection Range (WLL180T)	350 to 4000 mm (13.8 to 157.5 inches)
Terminal Type	Wire lead

Parameter	Value
Electrical Connection	Cable
Housing Material	PE
Length	6.6 ft (2.011 m)
Operating Temperature (Max)	+70°C
RoHS Compliance Status	Yes
Package Dimensions	9 x 7 x 7 inches
Item Weight	1.42 pounds
ASIN	B093XQ34YD
Manufacturer	Sick

9. Warranty and Support

For information regarding product warranty, please refer to the official SICK website or contact your local SICK representative. Technical support is available to assist with any operational or installation queries.
SICK Official Website: www.sick.com

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