

POL-001

Fiber-Optic In-Line Polarizer

Operation Manual



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Section 1.0 Specifications:

Optical Characteristics:

Insertion Loss	0.3 dB typical, 0.5 dB max. (without connectors)
Center Operating Wavelength	1550 nm or 1310 nm
Operating Wavelength Range	±50 nm
Extinction Ratio	SM/SM: 40 dB Typ., 30 dB min. SM, PM/PM: >25 dB (Premier Grade) >22 dB (Grade A)
Optical Return Loss	55 dB min.
Optical Power Handling	300 mW

Physical Features:

Package Dimensions	32 mm (L) x 5.5 mm (Dia.) (pigtailed) 65 mm (L) x 9.5 mm (Dia.) (No Tail)
Fiber Pigtail Length	1 meter
Fiber Type	Single mode or PM
Fiber I/O Connectors	FC, SC
Fiber Connector Polish	PC/APC

Environmental Characteristics:

Operating Temperature	0°C to 70°C
Storage Temperature	-40°C to 85°C

Section 2.0 Product Overview:

POL-001 is an in-line polarizer designed for fiber-optic networks and measurement applications. Applications include polarization monitoring and control, SNR monitoring, PMD monitoring, spectrum filtering and control, polarization extinction ratio improvement, fiber laser mode-locking, and polarization interferometry. In analog fiber optic links where optical amplifiers are used, POL-001 can be used to eliminate ASE noises from the un-wanted polarization to reduce the system noise floor. When combined with a polarization controller, POL-001 can function as a variable optical intensity attenuator to adjust the optical power in the fiber. POL-001 offers low insertion loss, low back reflection, and high extinction ratio in a compact package, as shown in Fig. 1. POL-001 inserts a high extinction ratio micro-polarizer into a fiber-optic path to ensure high optical performance and stability. POL-001 is an ideal tool to create or analyze polarized light source for optical measurement, device characterization, network monitoring, optical power adjustment, modulator input light control, and other polarization related applications.



Figure 1 POL-001 in-line fiber polarizer.

Section 3.0 Feature Descriptions:

Warning:

- **Handle the optical fibers with care. Excessive force or bending may damage fiber pigtails and leads to high insertion loss and poor extinction ratio.**

Pigtail vs. No-tail:

POL-001 in-line polarizer has two package options: fiber pigtailed and “no-tail” versions. The pigtailed version has input/output fibers attached to the package, and no-tail version has two fiber connectors mounted directly on the package.

No-tail in-line polarizer is ideal for applications where extra fiber length is redundant and numerous fiber jumpers or connections are already in the system.

The pigtailed in-line polarizers are ideal for fiber systems that require optical components spliced to the networks or additional fiber is required to bridge the length gap. Pigtailed polarizer provides flexibility in device mounting and installing. The pigtail length is typically 1-2 meters each side. Fiber buffer/jacket diameter can be specified by user.

Pigtail fiber type

The pigtailed in-line polarizers have three types of input/output fiber combinations: single mode to single mode (SM/SM), single mode to polarization maintaining fiber (SM/PM), and polarization maintaining to polarization maintaining fiber (PM/PM).

SM/SM fiber pigtailed in-line polarizer operates bi-directionally. The input and output ports are interchangeable unless user specifies special connector combinations for the input/output fiber pigtails.

SM/PM fiber pigtailed in-line polarizer has the transmission axis of the polarizer aligned to the slow axis of the polarization maintaining fiber. The output PM fiber is also keyed to the slow axis at the connector. Both SM and PM fibers are clearly marked before shipment.

PM/PM fiber pigtailed in-line polarizer has the polarizer transmission axis aligned to the slow axes of both PM fibers. Although the PM/PM in-line polarizer is also bi-directional, it is recommended that user connect the device

according to the specified input and output direction to ensure the best extinction ratio. The input and output PM fibers are marked before shipment.

Fiber connectors:

Fiber connectors can either be FC/PC, SC/PC, or FC/APC per customer's specifications.

Before each connection, fiber connectors should be cleaned using industry standard fiber connector cleaning methods.

Section 4.0 Operation Instruction:

To operate POL-001 in user's optical system, optical connections are required during setting up. Follow the safety precautions when make the connections.

Warning:

- Never look at the fiber connector against the light exit direction when light source is connected. THE OUTPUT LIGHT FROM POL-001 MAY BE HARMFUL TO HUMAN EYES.

4.1 Unpacking

Great care must be taken when unpacking POL-001 in-line fiber polarizer from its original shipment package.

Inspect the device before using to check if any damage occurred during shipment.

Avoid applying excessive force to two optical fiber pigtails and do not let any free-drop of fiber connectors occur at any time.

4.2 Getting Started

The following steps are recommended to operate POL-001 in a fiber link.

1. Follow industry standard procedures to clean the fiber connectors.
2. Match the input/output fiber connectors with the same type of connectors and adaptors in your system. A mismatched connector such as PC-APC will have high insertion loss and may damage the connector surface.
3. If a fusion splice is required at user side for the PM fiber pigtail output device, great care must be taken to ensure high extinction ratio. The extinction ratio depends strongly on the alignment of the two PM fiber splice connection. PM fiber fusion machine is recommended.

4.3 Testing and Characterization:

POL-001 has no user serviceable components inside package. However, the performance of POL-001 can be tested by user with available polarization analysis instruments or other established methods.