Manual Mini
Polarization Rotator/Controller Lockable

High Precision with Three Waveplates

DATASHEET

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The Manual Mini Polarization Controller is based on a novel design featuring high precision, ultra-compact size, low loss, high extinction, and lockability. Unlike conventional fiber strain-based polarization controllers, the POCM contains three rotatable waveplates between a pair of collimators to provide all possible polarization states with high precision and repeatability. Rotation is accomplished by using a finger or a screwdriver and locking in position via a magnet. Once the polarization positions are selected, they can be locked in position without drift for years. The conventional strain-based polarization controller changes over time. It is designed for modules or systems with limited space.

Each plate's orientation will define the polarization transformation:

- **First Half-Wave Plate**: Rotates the initial polarization angle.
- **Quarter-Wave Plate**: Converts linearly polarized light into elliptical or circular polarization.
- **Second Half-Wave Plate**: Further rotates the polarization angle to reach the desired output state.

To adjust the wave plates to achieve the desired polarization state

- **Initial Setup**: Align the wave plates such that the first half-wave plate is at 0°, the quarter-wave plate is at 45°, and the second half-wave plate is at 0°.
- **Fine-Tuning**: Rotate each wave plate individually to adjust the polarization state at the output. Adjustments allow you to cover a full range of states:
  - Rotate the first λ/2 plate to set the initial linear polarization angle.
  - Rotate the λ/4 plate to introduce elliptical or circular polarization.
  - Rotate the second λ/2 plate to achieve the final desired linear polarization angle.

Features

- Low Loss
- High Reliability
- Compact

Applications

- Polarization Control
- Instrument
- Lasers

Specifications

Parameter		Min	Typical	Max	Unit
Center Wavelength		750		2400	nm
Wavelength Bandwidth [1]		± 15		± 40	nm
Wavelength Bandwidth		750	850	900	nm
Insertion Loss [1]	1250nm-1620nm	0.5	0.6	0.8	dB
	750nm-1100nm	0.8	1	1.3	
	450nm-700nm	1.2	1.5	2.5	
Return Loss		50			dB
Extinction Ratio (PM fiber)			26	32	dB
PMD		-	-	0.05	ps
Driving Voltage		3	4	4.5	V
Driving Current (@35 dB for each channel)				60	mA
Optical Power Handling				0.5	W
Operating Temperature		0	20	60	°C
Storage Temperature		-40	-	70	°C

Notes:

[1]. Short wavelengths have narrow bandwidth. ±40nm for wavelength >1310nm.

[2]. Without connectors, each connector ads 0.3dB

Rev 11/03/24

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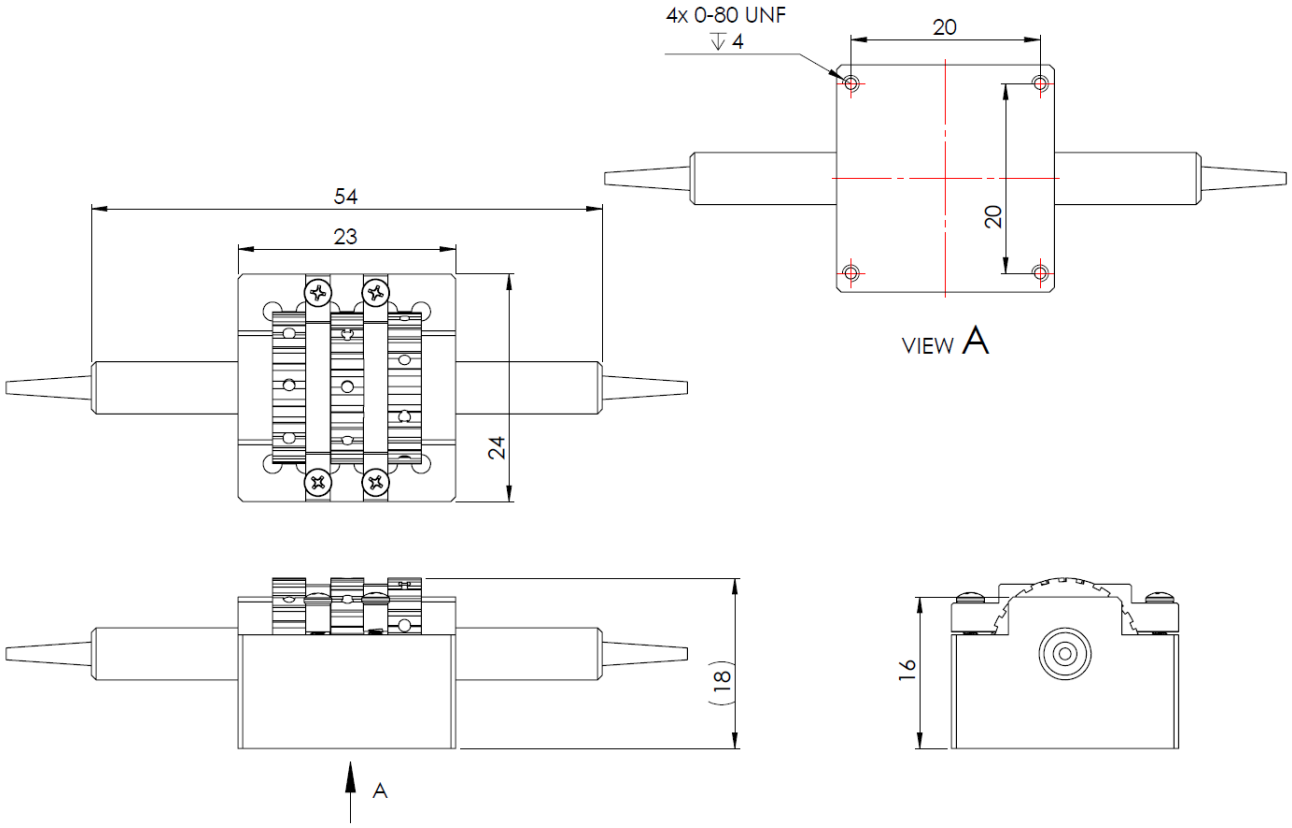
Dimensions For Package 5 (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Ordering Information

	1 1	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength ***	**Package**	**Input Fiber**	**Output Fiber**	**Fiber Cover**	**Fiber Length**	**Connector**
POCM-		1550 ± 40nm = 5 1367 ± 40nm = 3 810 ± 20nm = 8 780 ± 20nm = 7 1060 ± 40nm = 9 Special = 0	Standard = 5 Special = 0	SMF28 = 1 HI1060 = 2 HI780 = 7 PM1550 = 3 PM1310 = 4 PM980 = 5 PM850 = 6 Special = 0	SMF28 = 1 HI1060 = 2 HI780 = 7 PM1550 = 3 PM1310 = 4 PM980 = 5 PM850 = 6 Special = 0	Bare fiber = 1 900 µm tube = 3 Special = 0	0.25 m = 1 0.5 m = 2 1.0 m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 LC/APC = A LC/UPC = U Special = 0

* The listed wavelength bands have components made already. Other wavelength band requires a NRE of $490

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Application Notes

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.