



## Fiber Optics

Passive Components

Collimation Packages

Optical Switches

Rackbox Systems

Connectors/  
Termination Tools

Single-Mode Fiber

Rare Earth Doped

Single-Mode: PM

Photonic  
Crystal Fiber

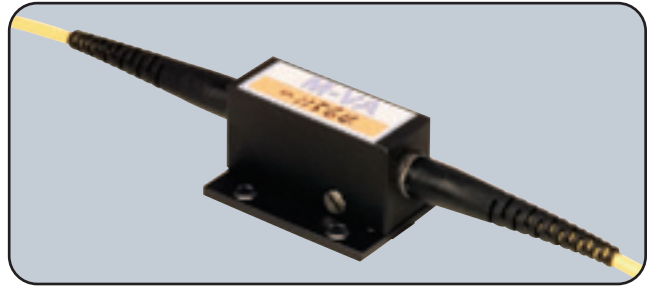
Multimode Fiber:  
Graded Index

Multimode Fiber:  
Step Index

Waveguide Circuits

# In-Line Variable Optical Attenuator (VOA)

In-line variable optical attenuators (VOAs) are used for balancing precisely the signal strengths in fiber circuits and for precisely balance an optical signal when evaluating the dynamic range of the measurement system. These in-line VOAs include SMF-28 fiber with a 3mm jacket and they are offered terminated with FC/APC connectors or non-terminated. These attenuators are available with other connector styles (see pages 848-849 for available connector styles); please contact your local Thorlabs office for a quotation.



### Specifications

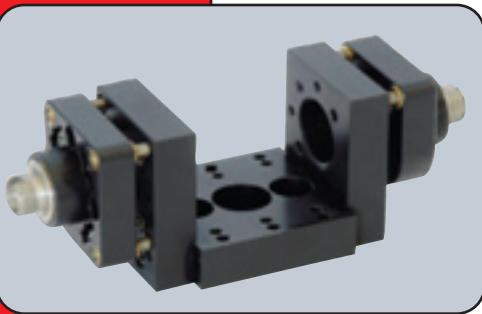
- **Operating Wavelength:** 1200 to 1600 nm
- **Fiber:** SMF-28 or equivalent
- **Residual Attenuation:**  $\leq 1.5$  dB
- **Attenuation Range:**  $\geq 50$  dB
- **Attenuation Resolution:**  $\leq 0.1$  dB
- **Back Reflection (Return Loss):**  $< -55$  dB
- **Polarization Sensitivity:**  $\leq 0.2$  dB
- **Optical Power:**  $\leq 300$  mW
- **Thermal Stability:**  $\leq 0.03$  dB/ $^{\circ}$ C
- **Operating Temperature:** 0 to  $60^{\circ}$ C
- **Storage Temperature:**  $-40$  to  $75^{\circ}$ C
- **Dimension:** 38 x 30 x 19 mm

### In-Line Variable Optic Attenuators

ITEM#	\$	£	€	¥	DESCRIPTION
VOA50	\$ 221.45	£ 166.09	€ 232.52	¥ 37,646	In-line Variable Optical Attenuator, 50dB
VOA50-APC	\$ 264.85	£ 198.64	€ 278.09	¥ 45,024	In-line Variable Optical Attenuator, 50dB, FC/APC

## Fiber Optic U-Bench

**NEW**



The new Thorlabs Fiber U-Benches with tilt adjustment options are prealigned at factory for minimum insertion losses, making them very easy to use. A variety of bulk optical devices, including polarizers and waveplates can simply be inserted into the U-Benches, using the fixed polarizer holders and rotation stages on the next page. Three extremely fine hex adjusting screws (M2.5-0.20mm) and two locking screws, per port, allow precision control of beam steering to maximize coupling efficiency.

The maximum core diameter of fibers that will give optimal coupling efficiency with this U-Bench is 50 $\mu$ m.

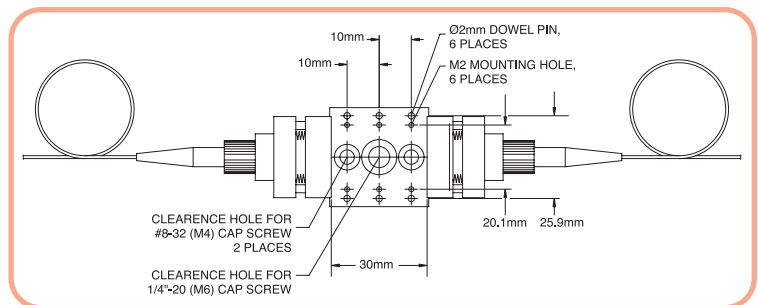
Please see bottom of next page for U-Bench fixed holders & rotation stages.

TYPE	$\lambda^1$	D <sup>2</sup>	FIBER <sup>3</sup>
-A	543nm	1.58mm	460HP
-B	633nm	1.62mm	SM600
-C	1310nm	1.43mm	SMF-28
-1550	1550nm	1.50mm	SMF-28

1) Calibration Wavelength

2) Measured 1/e<sup>2</sup> beam diameter @ 1 focal length from lens

3) Fiber used for Calibration



### Fiber U-Bench

Please see page 834 for detailed information on our F240xx Fiber Collimation Packages.

ITEM#	\$	£	€	¥	COMPATIBLE CONNECTOR	DESCRIPTION
FB240FC-1550	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	FC/PC	Fiber U-Bench with F240FC-1550 Collimation Pkgs.
FB240FC-A	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	FC/PC	Fiber U-Bench with F240FC-A Collimation Pkgs.
FB240FC-B	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	FC/PC	Fiber U-Bench with F240FC-B Collimation Pkgs.
FB240FC-C	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	FC/PC	Fiber U-Bench with F240FC-C Collimation Pkgs.
FB240APC-1550	\$ 785.00	£ 549.00	€ 824.00	¥ 131,840	FC/APC	Fiber U-Bench with F240APC-1550 Collimation Pkgs.
FB240APC-C	\$ 785.00	£ 549.00	€ 824.00	¥ 131,840	FC/APC	Fiber U-Bench with F240APC-C Collimation Pkgs.
FB240SMA-A	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	SMA	Fiber U-Bench with F240SMA-A Collimation Pkgs.
FB240SMA-B	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	SMA	Fiber U-Bench with F240SMA-B Collimation Pkgs.
FB240SMA-C	\$ 685.00	£ 479.00	€ 719.00	¥ 115,040	SMA	Fiber U-Bench with F240SMA-C Collimation Pkgs.