Narrowband Adjustable Isolators (IO-λ Series)

These Isolators are set for any center wavelength within the adjustment range specified at time of order. Adjustment range is a nominal 5% of the center wavelength. Unless otherwise specified at time of order, these Isolators are set for horizontal input polarization. Output polarization is in the +/- 45° quadrant. The output polarization plane can be rotated to horizontal or vertical with a ½-Wave Retarder. The IOT Series, have output polarization in the same plane as the input, available as indicated. These are two Isolators in tandem on a common base, sharing a common center Polarizer. Isolation is doubled and transmittance is reduced to approximately the squared value. Net rotation can be ordered to be 0° or 90° . All surfaces are AR-coated for maximum transmittance.

Narrow Range Adjustable Isolators for VIS and NIR.

Center wavelength is adjusted by turning output polarizer.

350nm TO 505nm Narrowband Adjustable Isolators

Catalog Number	*Aperture*	*Select Center λ Between*	*Use between*[1]	*Transmittance*	*Isolation*
IO-5C-λ-LP	5.0 mm	350-365 nm	350-365 nm	~80%	32-42dB
IO-3-λ-LP	3.0 mm	380-415 nm	±20 nm[1]	~84%	32-42dB
IO-5-λ-LP	5.0 mm	380-415 nm	±20 nm[1]	~84%	32-42dB
IO-3C-405-PHE	3.0 mm	400-415 nm	400-415 nm	74-77%	30-36dB
IO-3C-405-PBS	3.0 mm	405 nm	400-415 nm	82-88%	32-42dB
IO-3-λ-LP	3.0 mm	415-450 nm	±20 nm[1]	84-91%[3]	32-42dB
IO-5-λ-LP	5.0 mm	415-450 nm	±20 nm[1]	84-91%[3]	32-42dB
IO-3-λ-HP	3.0 mm	415-450 nm	±20 nm[1]	82-89%[3]	32-42dB
IO-5-λ-HP	5.0 mm	415-450 nm	±20 nm[1]	82-89%[3]	32-42dB
IO-3-λ-LP	3.0 mm	450-505 nm	±20 nm[1]	≥93%	36-39dB
IO-5-λ-LP	5.0 mm	450-505 nm	±20 nm[1]	≥93%	36-39dB
IO-3-λ-HP	3.0 mm	450-505 nm	±20 nm[1]	≥89%	35-42dB
IO-5-λ-HP	5.0 mm	450-505 nm	±20 nm[1]	≥89%	38-42dB
IO-3-488-VHP	3.0 mm	488 nm	±1 nm	≥91%	36-42dB
IO-5-488-VHP	5.0 mm	488 nm	±1 nm	≥91%	36-42dB

IOT-any of above: Isolation is ~60 dB. Transmittance is squared.

[1] Do not use outside limits in "Select Center λ" column without discussing with us.

[2] Under development.

[3] Transmittance varies with wavelength.

[4] When used with polarizers with >32dB isolation

505nm TO 700nm Narrowband Adjustable Isolators

Catalog Number	Aperture	Select λ between	Use between	Transmittance	Isolation
IO-3D-λ-PHE[3]	3.0 mm	514 or 532 nm	±10 nm	75-78%	34-40dB
IO-3D-633-PHE[3]	3.0 mm	633 nm	±10 nm	71-75%	34-40dB
IO-2D-633-VLP[3]	2.0 mm	633 nm	±10 nm	64%	35-40dB
IO-3D-633-VLP[3]	3.0 mm	633 nm	±10 nm	64%	34-40dB
IO-3D-λ-VLP[3]	3.0 mm	650-690 nm	±10 nm	74-80%[2]	34-40dB
IO-3-λ-LP	3.0 mm	505-700 nm	±30 nm[1]	>93%	35-40dB
IO-5-λ-LP	5.0 mm	505-700 nm	±30 nm[1]	>93%	36-40dB
IO-8-λ-LP	8.0 mm	505-700 nm	±30 nm[1]	>92%	33-38dB
IO-10-λ-LP	9.8 mm	505-700 nm	±30 nm[1]	>92%	33-38dB
IO-3D-λ-PBS	3.0 mm	625-690 nm	±30 nm[1]	88-93%	30-36dB
IO-5-λ-PBS	5.0 mm	625-690 nm	±30 nm[1]	86-90%	33-38dB
IO-3-λ-HP	3.0 mm	505-700 nm	±30 nm[1]	≥89%	38-44dB
IO-5-λ-HP	5.0 mm	505-700 nm	±30 nm[1]	≥89%	38-44dB
IO-8-λ-HP	8.0 mm	505-700 nm	±30 nm[1]	≥89%	33-44dB
IO-10-λ-HP	9.8 mm	505-700 nm	±30 nm[1]	≥89%	33-40dB
IO-3-532-VHP	3.0 mm	532 nm	±1 nm	>91%	36-42dB
IO-5-532-VHP	5.0 mm	532 nm	±1 nm	>91%	36-42dB
IO-8-532-VHP	8.0 mm	532 nm	±1 nm	>91%	33-37dB
IO-10-532-VHP	9.8 mm	532 nm	±1 nm	>91%	33-37dB

IOT-any of above: Isolation is ~60 dB. Transmittance is squared.
[1] Do not use outside limits in "Select Center λ" column without discussing with us.
[2] Transmittance varies with wavelength
[3] PHE polarizers are similar to VLP. Proper alignment of PHE and VLP polarizers is required because of absorption concerns.

760nm TO 925nm Narrowband Adjustable Isolators

Catalog Number	Aperture	Select Center λ Between	Use Between[1]	Transmittance	Isolation
IO-2.5D-λ-PBS	2.5 mm	760-860 nm	±40 nm[1]	86-91%	34-38dB
IO-3D-λ-PBS	3.0 mm	760-860 nm	±40 nm[1]	86-91%	34-38dB
IO-5-λ-PBS	5.0 mm	760-860 nm	±40 nm[1]	86-91%	34-38dB
IO-8-λ-PBS	8.0 mm	760-860 nm	±40 nm[1]	85-90%	33-38dB
IO-10-λ-PBS	9.8 mm	760-860 nm	±40 nm[1]	85-90%	33-38dB
IO-2.5D-λ-VLP[2]	2.5 mm	760-860 nm	±40 nm[1]	86-90%	34-40dB
IO-3C-λ-VLP[2]	3.0 mm	760-890 nm	±40 nm[1]	86-89%	37-42dB
IO-3D-λ-VLP[2]	3.0 mm	760-860 nm	±40 nm[1]	86-90%	34-40dB
IO-5-λ-VLP[2]	5.0 mm	760-925 nm	±40 nm[1]	86-90%	38-44dB
IO-5D-λ-VLP[2]	5.0 mm	770-810 nm	±40 nm[1]	85-89%	37-43dB
IO-8-λ-VLP[2]	8.0 mm	760-925 nm	±40 nm[1]	86-90%	33-38dB
IO-10-λ-VLP[2]	9.8 mm	760-925 nm	±40 nm[1]	86-90%	33-38dB
IO-3-λ-LP	3.0 mm	760-860 nm	±40 nm[1]	>93%	34-40dB
IO-3C-λ-LP	3.0 mm	760-890 nm	±40 nm[1]	>90%	36-40dB
IO-5-λ-LP	5.0 mm	760-925 nm	±40 nm[1]	>93%	36-40dB
IO-8-λ-LP	8.0 mm	760-925 nm	±40 nm[1]	>92%	33-38dB
IO-10-λ-LP	9.8 mm	760-925 nm	±40 nm[1]	>92%	33-38dB
IO-3-λ-HP	2.7 mm	760-860 nm	±40 nm[1]	>92%	34-40dB
IO-3C-λ-HP	3.0 mm	760-890 nm	±40 nm[1]	>92%	36-40dB
IO-5-λ-HP	5.0 mm	760-925 nm	±40 nm[1]	>92%	38-44dB
IO-8-λ-HP	8.0 mm	760-925 nm	±40 nm[1]	>92%	33-44dB
IO-10-λ-HP	9.8 mm	760-925 nm	±40 nm[1]	>92%	33-40dB
IOT-any of above: Isolation is ~60 dB. Transmittance is squared.					
IOT-5D-λ-VLP[1]	5.0 mm	765-815 nm	discuss	78-82%	57-62 dB

[1] Do not use outside limits in "Select Center λ" column without discussing with us.
[2] Proper alignment of VLP polarizers is required because of absorption concerns.

925nm TO 1100nm Narrowband Adjustable Isolators

Catalog Number	Aperture	Select Center λ between	Use between[1]	Transmittance	Isolation
IO-1x2-980-VLP[3]	1.0 x 2.0 mm	980 nm	±20 nm	90-92%	34-40 dB
IO-2.5D-λ-VLP[3]	2.5 mm	950-1010 nm	±40 nm[1]	>86%	28-36 dB
IO-3-λ-VLP[3]	3.0 mm	925-1020 nm	±40 nm[1]	>88%	36-42 dB
IO-3C-λ-VLP[3]	3.0 mm	925-1020 nm	±40 nm[1]	>88%	36-42 dB
IO-5-λ-VLP[3]	5.0 mm	925-1020 nm	±40 nm[1]	88-90%	38-42 dB
IO-3-λ-HP	3.0 mm	925-1020 nm	±40 nm[1]	>92%	38-43 dB
IO-5-λ-HP	5.0 mm	925-1020 nm	±40 nm[1]	>92%	37-42 dB
IO-1x2-λ-VLP[3]	1.0 x 2.0 mm	1047-1085 nm	±20 nm[1]	90-92%	34-40 dB
IO-2.5-λ-VLP[3]	2.5 mm	1064-1100 nm	discuss[2]	≥78%	>42 dB
IO-2.5E-λ-VLP[3]	2.5 mm	1020-1100 nm	±40 nm[1]	≥86%	28-33 dB
IO-3D-λ-VLP[3]	3.0 mm	1020-1100 nm	±40 nm[1]	90-92%	38-44 dB
IO-5-λ-VLP[3]	4.8 mm	1020-1100 nm	±40 nm[1]	90-92%	38-44 dB
IIO-8-λ-VLP[3]	7.8 mm	1020-1100 nm	±40 nm[1]	89-91%	33-40 dB
IO-10-λ-VLP[3]	9.8 mm	1020-1100 nm	±40 nm[1]	89-91%	32-40 dB
IO-3-λ-HP	2.8 mm	1020-1100 nm	±40 nm[1]	≥93%	38-44 dB
IO-5-λ-HP	4.8 mm	1020-1100 nm	±40 nm[1]	≥93%	38-44 dB
IO-8-λ-HP	7.8 mm	1020-1100 nm	±40 nm[1]	≥92%	33-40 dB
IO-10-λ-HP	9.8 mm	1020-1100 nm	±40 nm[1]	≥92%	32-40 dB
IO-3-λ-VHP	2.8 mm	1053 or 1064 nm	±3 nm	≥91%	35-44 dB
IO-5-λ-VHP	4.8 mm	1053 or 1064 nm	±3 nm	≥91%	35-44 dB
IO-8-λ-VHP	8.0 mm	1053 or 1064 nm	±3 nm	90-92%	33-40 dB
IO-10-λ-VHP	9.8 mm	1053 or 1064 nm	±3 nm	90-92%	30-38 dB
IO-12-λ-VHP	12.0 mm	1053 or 1064 nm	±3 nm	89-92%	30-38 dB
IO-15-λ-VHP	15.0 mm	1053 or 1064 nm	±3 nm	88-92%	30-38 dB

IOT-any HP units above: Isolation is ~60 dB. Transmittance is squared.
[1] Do not use outside limits in "Select Center λ" column without discussing with us.
[2] Max power 500 mW cw at 1064 nm. Transmission and max power varies with wavelength.
[3] Proper alignment of VLP polarizers is required because of absorption concerns.

1260nm TO 1650nm Narrowband Adjustable Isolators

Catalog Number	Aperture	Select λ Between	Use Between	Transmittance	Isolation
IO-2.5-λ-VLP[2]	2.5 mm	1260-1650 nm	±40 nm[1]	>95%	>40 dB
IO-4-λ-VLP[2]	4.0 mm	1310 or 1550 nm	±40 nm[1]	>95%	>40 dB
IO-5-λ-VLP[2]	5.0 mm	1310 or 1550 nm	±40 nm[1]	>95%	>40 dB
IO-2.5-λ-HP[3]	2.5 mm	1260-1650 nm	±40 nm[1]	>92%	>36 dB
IO-4-λ-HP[3]	4.0 mm	1310 or 1550 nm	±40 nm[1]	>92%	>36 dB
IO-5-λ-HP[3]	5.0 mm	1310 or 1550 nm	±40 nm[1]	>92%	>36 dB
IO-8-λ-HP[3]	8.0 mm	1550 nm	±40 nm[1]	>91%	>33 dB

IOT-any of above: Isolation is ~60 dB. Transmittance is squared.
[1] Discuss with us if intended use is outside "selected λ" limits.
[2] Proper alignment of VLP polarizers is required because of absorption concerns.
[3] Rated Power: 20 W cw max recommended for 2-3 mm beams.

1950nm TO 2200nm (Ho : YAG) Narrowband Adjustable Isolators

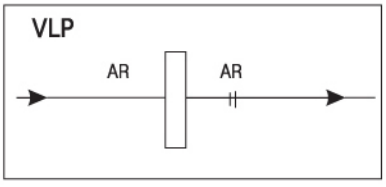
Catalog Number	Aperture	Select λ Between	Use Between	Transmittance	Isolation
IO-2.5-λ-HP[2]	2.5 mm	1950-2200 nm	±100 nm[1]	91-93%	>33 dB
IO-4-λ-HP[2]	4.0 mm	1950-2200 nm	±100 nm[1]	91-93%	>33 dB
IO-5-λ-HP[2]	5.0 mm	1950-2200 nm	±100 nm[1]	91-93%	>33 dB
IO-6-λ-HP[2]	6.0 mm	1950-2200 nm	±100 nm[1]	91-93%	>33 dB

[1] Discuss with us if intended use is outside "selected λ" limits.
[2] Rated Power: 20 W cw max recommended for 2-3 mm beams

Types of Polarizers and Power Limits

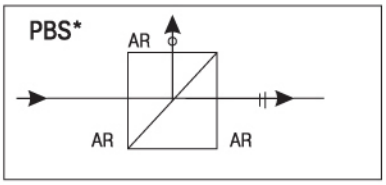
Number	Type of Polarizer	CW	Pulsed
VLP	Dichroic thin plate	25 W/cm²	300 kW/cm²
PBS	Polarizing B/S Cube	13 W/cm²	-
LP	Air-spaced Calcite	100 W/cm²	25 MW/cm²
HP	Air-spaced Calcite	500 W/cm²	150 MW/cm²
HP-YAG	Air-spaced Calcite	750 W/cm²	200 MW/cm²
VHP	Brewster's Angle Plate	20 kW/cm²	1 GW/cm²

Note : Pulsed measurements made at 1064nm 20ns pulse width 20Hz



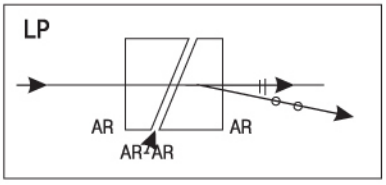
VLP Polarizers

- Thin glass plate
- AR Coated
- Extinction[3] ≥45 dB
- Dichroic Polarizer
- Transmittance[3] ≥95% (λ > 1250nm)
- Absorbs unwanted polarization



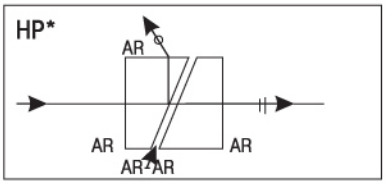
*PBS Polarizers

- Cemented prism beamsplitter
- AR Coated
- Extinction[3] ≥33 dB
- Energy Injection at 90°
- Transmittance/reflectance[3] ≥95%



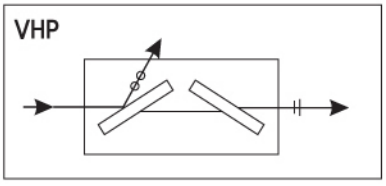
LP Polarizers

- Air-spaced design
- Extinction[3] ≥53dB
- Transmittance[3] ≥98%
- AR Coated



*HP Polarizers

- Air-spaced design
- Extinction[3] ≥53dB
- Transmittance[3] ≥98%
- AR Coated



VHP Polarizers

- Double dielectric Brewster's Plate
- Highest power damage resistance
- AR coated
- Transmittance[3] ≥96%
- Extinction[3] ≥40dB

*Access to beam through side window
The PBS and HP series allow access to the laser beam via the side window.
This entry/exit face is used to sample the rejected energy, or to inject energy into the beam.
The PBS is a cemented beamsplitter cube and therfore is power limited. All faces are AR coated.