

PowerXP Motorized Attenuators

Description

Altechna offers four types of laser beam intensity attenuators for high energy applications:

- CA 8 mm – Compact version
- CA 18 mm – Maxi Reflection/Transmission version
- CA 18 mm – Maxi Transmission Collinear version
- CA 18 mm – Maxi Cube version

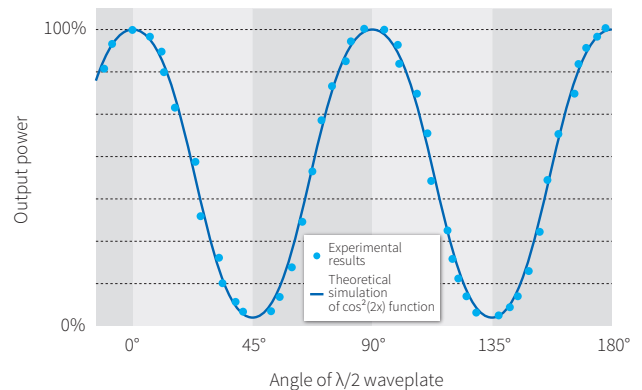
Watt Pilot attenuators. New generation PXP units have upgraded belt-driven rotator mechanism for quick and precise laser beam intensity control and also brand new electronics and control driver for more connectivity options and reliable long-distance communication.

PowerXP motorized attenuators are a reliable solution for industrial applications. Each attenuator includes motorized rotating quartz $\lambda/2$ phase waveplate, optically aligned to a single/dual thin film polarizers or polarizing beamsplitting cube which separates the input beam into individual s-polarized and p-polarized parallel or perpendicular output beams.

Special PowerXP Transmission Collinear version includes an additional uncoated UVFS window positioned at Brewster angle after the polarizer to compensate the lateral beam shift caused by polarizing plate and guarantees less than 100 μm radial beam displacement between input and output laser beam for ultra-precise applications.

High energy applications compatible optics, fast rotation speed of PowerXP Maxi version, compensated beam displacement output of Maxi Collinear version, convenient polarization separation angle of Maxi Cube version and small footprint of Compact version makes PowerXP motorized attenuators a go-to solution for power control, attenuation, and beam-splitting in demanding laser processing applications.

Example of performance provided by attenuator comprising a waveplate and a polarizer.



Features

- User-friendly software interface, USB, RS232, Ethernet connection
- Divides laser beam into two s-pol and p-pol beams of adjustable intensity ratio
- Low dispersion optics for ultrashort and high energy laser pulses
- Ideal for integration into other systems
- Time between min and max attenuation less than 0.2 sec

Optional model without attenuating optics set

- A PowerXP Attenuator can also be ordered as a separate motorized waveplate rotator based on the PowerXP Maxi model without attenuating optics set and a polarizer holder
- A motorized waveplate rotator without attenuating optics set is also available on request

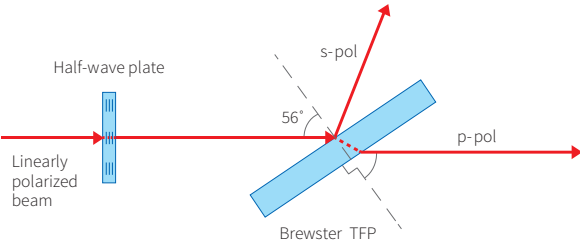
Compact version

Standard specifications

Clear aperture	Ø8 mm
Recommended maximum input beam diameter at 1/e ²	Ø5 mm
Optimization	Transmission type
Configuration	$\lambda/2$ Optically bonded waveplate + IBS technology High Contrast Thin Film Polarizer
Attenuation range* @ CWL	From <0.1% to >99%
Typical applications	High power pulsed and CW lasers
Damage threshold	>20 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	35 x 55 x 60 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	14400
Resolution	<11.25 arcsec/step
Maximum power transmission	T _{max} >99% at p-pol output
Maximum power blocking	T _{min} <0.1% at p-pol output
*Optional attenuation range	T _{max} >99.7%, T _{min} <4% at s-pol beam dump output



Transmission type



Typical items

Wavelength, nm	Configuration	Optimization	Attenuation range at p-pol output (T _{min} -T _{max}) @ CWL	Product ID
343	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.3-96%	PXP-08-0343
355	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.3-96%	PXP-08-0355
515	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.1-99%	PXP-08-0515
532	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.1-99%	PXP-08-0532
1030	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.1-99%	PXP-08-1030
1064	$\lambda/2$ Optically bonded waveplate + HCTFP	Transmission	0.1-99%	PXP-08-1064

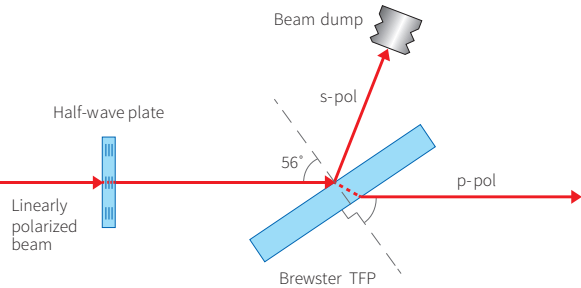
Maxi Transmission version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at 1/e ²	Ø12 mm
Optimization	Transmission (“T” model)
Configuration	λ/2 Air-spaced or Optically bonded waveplate + Thin Film Polarizer
Attenuation range* @ CWL	From <0.5% to >95%
Typical applications	High power pulsed and CW lasers
Damage threshold	>10 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 99 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Maximum power transmission	T _{max} >95% at p-pol output
Maximum power blocking	T _{min} <0.5% at p-pol output
Integrated beam dump power limit	15 W
*Optional attenuation range	T _{max} >99.5%, T _{min} <5% at s-pol beam dump



Transmission type



Typical items

Wavelength, nm	Configuration	Optimization	Attenuation range at p-pol output (T _{min} -T _{max}) @ CWL	Product ID
266	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0266
343	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0343
355	λ/2 Optically bonded waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0355
515	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0515
532	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-0532
1030	λ/2 Air-spaced waveplate + TFP	Broadband Transmission	0.5-95%	PXP-18-T-1030
1064	λ/2 Air-spaced waveplate + TFP	Transmission	0.5-95%	PXP-18-T-1064

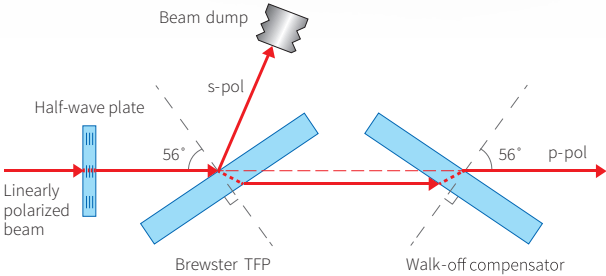
Maxi Collinear version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at 1/e ²	Ø12 mm
Optimization	Transmission type with lateral beam shift compensation ("CL" model)
Configuration	$\lambda/2$ Air-spaced or Optically bonded waveplate + TFP and Compensating Window
Attenuation range @ CWL	From <0.5% to >95%
Typical applications	High power pulsed and CW lasers
Damage threshold	>10 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 144 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Maximum power transmission	$T_{\max}$ >95% at p-pol output
Maximum power blocking	$T_{\max}$ <0.5% at p-pol output
Integrated beam dump power limit	15 W



Collinear type



Typical items

Wavelength, nm	Configuration	Optimization	Attenuation range at p-pol output ($T_{\min}$ - $T_{\max}$) @ CWL	Product ID
343	$\lambda/2$ Optically bonded waveplate + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-0343
355	$\lambda/2$ Optically bonded waveplate + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-0355
515	$\lambda/2$ Air-spaced + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-0515
532	$\lambda/2$ Air-spaced + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-0532
1030	$\lambda/2$ Air-spaced + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-1030
1064	$\lambda/2$ Air-spaced + TFP + compensating window	Transmission	0.5-95%	PXP-18-CL-1064

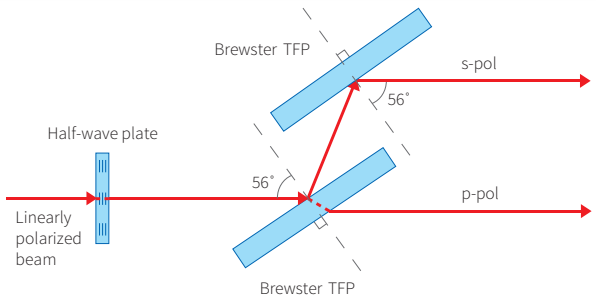
Maxi Reflection version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at 1/e ²	Ø12 mm
Optimization	Reflection ("R" model)
Configuration	$\lambda/2$ Air-spaced or Optically bonded waveplate + 2x Thin Film Polarizers
Attenuation range* @ CWL	From <0.3% to >99%
Typical applications	High power pulsed and CW lasers
Damage threshold	>10 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 99 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Maximum power transmission	T _{max} >99% at s-pol output
Maximum power blocking	T _{min} <0.3% at s-pol output
*Optional attenuation range	T _{max} >95%, T _{min} <0.5% at p-pol output



Reflection type



Typical items

Wavelength, nm	Configuration	Optimization	Attenuation range at s-pol output (T _{min} -T _{max}) @ CWL	Product ID
266	$\lambda/2$ Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0266
343	$\lambda/2$ Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0343
355	$\lambda/2$ Optically bonded waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0355
515	$\lambda/2$ Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0515
532	$\lambda/2$ Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-0532
1030	$\lambda/2$ Air-spaced waveplate + 2x TFP	Broadband reflection	0.3-99%	PXP-18-R-1030
1064	$\lambda/2$ Air-spaced waveplate + 2x TFP	Reflection	0.3-99%	PXP-18-R-1064

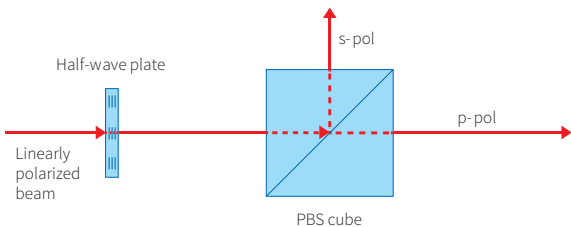
Maxi Cube version

Standard specifications

Clear aperture	Ø18 mm
Recommended maximum input beam diameter at 1/e ²	Ø12 mm
Optimization	Transmission and Reflection
Configuration	λ/2 Air-spaced or Optically bonded waveplate + Optically bonded PBS cube
Attenuation range @ CWL	From <0.3% to 97% in transmission mode From <3% to 99% in reflection mode
Typical applications	High power pulsed and CW lasers
Damage threshold	>10 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Dimensions H x L x W	56 x 82 x 90 mm
Time between min and max attenuation	<0.2 sec
Steps between min and max attenuation	24000
Resolution	<7 arcsec/step
Transmission mode:	
Maximum power transmission	T _{max} >97% at p-pol output
Maximum power blocking	T _{min} <0.3% at p-pol output
Reflection mode:	
Maximum power transmission	T _{max} >99% at s-pol output
Maximum power blocking	T _{min} <3% at s-pol output



Cube type



Typical items

Wavelength, nm	Configuration	Attenuation range at p-pol output (T _{min} -T _{max}) @ CWL	Attenuation range at s-pol output (T _{min} -T _{max}) @ CWL	Product ID
355	λ/2 Optically bonded waveplate + Optically bonded PBS cube	0.3-96%	4-99%	PXP-18-C-0355
515	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-0515
532	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-0532
1030	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-1030
1064	λ/2 Air-spaced waveplate + Optically bonded PBS cube	0.3-97%	3-99%	PXP-18-C-1064