

EO-PC-850 - August 16, 2023

Item # EO-PC-850 was discontinued on August 16, 2023. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

POCKELS CELLS

- ▶ Voltage-Controlled Wave Plate
- ▶ KD*P Electro-Optic Crystal
- ▶ Ideal for Q-Switching



OVERVIEW

Features

- 2 Wavelength Range Options:
 - 700 - 1000 nm
 - 1064 nm
- Longitudinal Pockels Cell
- Wedged Windows for 0° Offset and Minimal Back Reflection

Thorlabs' Pockels Cells offer fast, precise control of the output light's polarization direction as a function of applied voltage. They can be thought of as voltage-controlled wave plates. Our family of Pockels cells uses a potassium di-deuterium phosphate (KD*P) crystal with the electric field applied in the longitudinal direction. Using the longitudinal orientation causes the drive voltage to be independent of aperture size, thus allowing for larger apertures than can be realized in a transverse Pockels cell. Since the response is much faster than standard acousto-optic or liquid crystal devices, Pockels cells are ideal for Q-switching lasers. Our Pockels cells utilize wedged windows to ensure 0° offset and to minimize back reflections. The windows are AR coated for 700 - 1000 nm or 1064 nm.

Item #	EO-PC-850	EO-PC-1064
Wavelength Range	700 - 1000 nm	1064 nm
Design Wavelength	785 nm	1064 nm
Aperture	Ø9.5 mm	
Clear Aperture	Ø9.0 mm	
Transmission	>99%	
Half-Wave Voltage	5 kV @ 800 nm	6.6 kV @ 1064 nm ^a
Extinction Ratio^b	>550:1	>1000:1
Capacitance	8 pF	

- a. We do not recommend applying a voltage greater than 6 kV. If half-wave retardance is desired, we recommend setting the Pockels cell to act as a quarter wave plate in a double-pass beam geometry.
- b. Specified at the design wavelength.

The Pockels cell is an electro-optic device (much like an electro-optic modulator) that consists of an electro-optic crystal through which light is transmitted. The

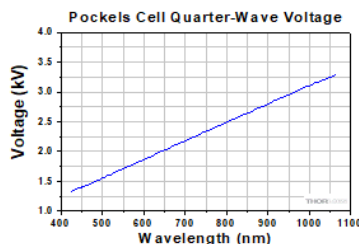
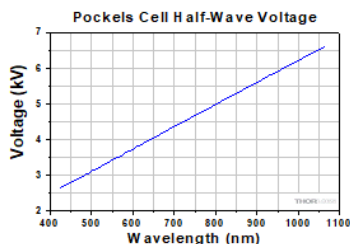
polarization direction of the light is controlled by the voltage applied to the crystal. The Pockels Effect explains the behavior of the Pockels cell: an applied constant or variable voltage (electric field) to the crystal produces linear changes in the birefringence of the crystal (in contrast to the Kerr Effect, which is quadratic with E). Applying a constant voltage allows the Pockels cell to operate as a voltage-controlled wave plate. By applying a variable voltage, one can use a Pockels cell to vary the phase delay through the crystal. Pockels cells are essential components in various optical devices such as Q-switches for lasers and electro-optical modulators.

We recommend a drive voltage no greater than 6 kV, as excessive voltage can damage the crystal. The recommended maximum modulation frequency for these K*DP crystal Pockels cells is 5 kHz. Although the cells can be driven up to 20 kHz, they experience piezoelectric ringing at frequencies beyond 5 kHz. We do not recommend driving at these frequencies unless this ringing is acceptable in your application. For general use, a power supply capable of up to 5 kHz modulation and 5 - 6 kV output is recommended. For applications such as Q-switching, fast rise times (on the order of 50 ns) are desired and the user should ensure that his or her power supply is capable providing such fast rise times. To create the electrical connections, these Pockels cells have two electrical sockets for 1 mm pins. Please note that Thorlabs does not currently offer Pockels cell drivers that are compatible with those sold here.

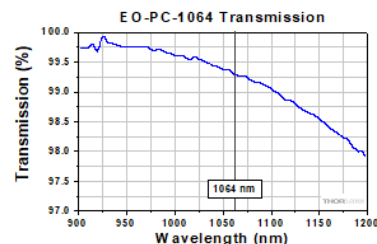
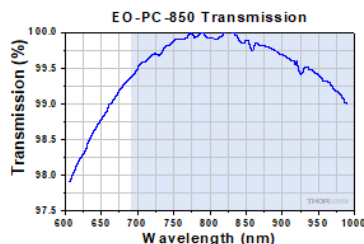
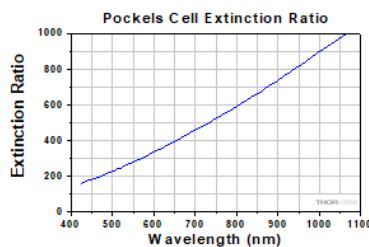
Handling Note

Thorlabs' Pockels cells should not be disassembled under any circumstances. These extremely sensitive devices are precisely aligned in an ultra-clean environment by skilled technicians. The only approved cleaning method is the use of dry nitrogen to blow off external dust. Please contact Tech Support if you suspect the cell is damaged or contaminated.

GRAPHS



We do not recommend applying a voltage greater than 6 kV. If half-wave retardance is desired at 950 nm and above, we recommend setting the Pockels cell to act as a quarter-wave plate in a double-pass beam geometry.



The shaded region in the graph above denotes the spectral range over which we recommend using this Pockels cell.

Part Number	Description	Price	Availability
EO-PC-850	Pockels Cell, 700 - 1000 nm	\$2,620.42	Lead Time
EO-PC-1064	Pockels Cell, 1064 nm	\$2,620.42	Today

EO-PC-850 Transmission

