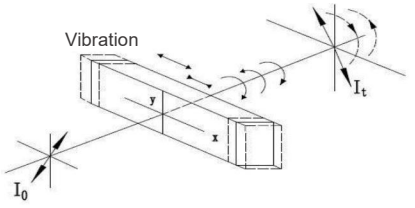
Photoelastic Modulators

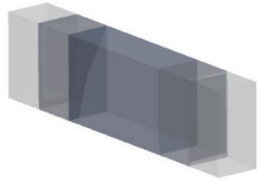
A "Dynamic Optical Waveguide".

The Photoelastic modulators (PEM) are modulation devices that can change the polarization state of light, causing a dynamic phase retardation of transmitted light. The light-transmitting part of the device is made of isotropic materials, which vibrate periodically at its inherent resonant frequency. Due to the photoelastic effect, the refactive index of the optical material changes periodically, altering the phase retardation of incident light. PEMs produced by CASTECH have the advantages of large acceptance angle, large aperture, wide wavelength range, high modulation frequency, and high precision.

According to the working mode, CASTECH's PEMs can be divided into one-dimensional and two-dimensional types. 1D PEMs have only one vibration dimension, suitable for ultraviolet, visible, and near-infrared bands; 2D PEMs have two vibration dimensions, enabling a wider range of phase modulation, mainly used in visible and infrared bands.



Schematic diagram of photoelastic principle.


Schematic diagram of one-dimensional PEM vibration

Applications

- Polarization measurement
- Spectrometer
- Magnetometer
- Quantum sensing
- Astronomical observation

CASTECH's PEMs are fully manufactured in-house throughout the entire production process, and can be customized to meet specific customer needs.

Model Number: CPEM-f-a-m-t-h-λ

Frequency (f)	Aperture (a)	Material (m)	Type (t)	Housing (h)	Wavelength (λ)
40 (40 kHz) ...	13 (13 mm) ...	FS ...	1D (one-dimensional) 2D (two-dimensional)	A01 ...	633 nm ...

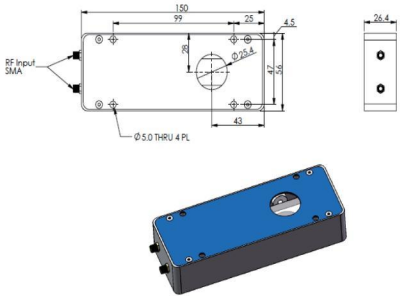
Typical Specifications

Frequency	Type	Aperture	Transmission	Acceptance Angle	Retardation
50 kHz	1D	16 mm	≥98 %	20°	λ/2
60 kHz	1D	13 mm	≥98 %	20°	λ/2
50 kHz	2D	22 mm	≥98 %	20°	λ/2
60 kHz	2D	13 mm	≥98 %	20°	λ/2

*Measured using a wavelength of 632.8 nm. For more frequencies and wavelengths, please consult us.

Housing dimensions(mm):

CPEM-050-016-FS-1-A01-λ



CPEM-050-022-FS-2-A02-λ