



# QUANTUM TECHNOLOGY, INC.

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## SERIES 300 KD\*P MODULATORS DATA SHEET 752

### KD\*P E-O MODULATORS

Quantum Technology E-O modulators of KD\*P crystal material offer the widest transmission from 300 to 1100 nm. The KD\*P material offers high average power handling capability (3W/mm<sup>2</sup>) and high contrast ratios (Typically 500:1 @ 633nm). Generally, KD\*P has better transmission in the UV than ADP crystal material. The modulators have some piezoelectric resonance in the 100-800 KHz fundamental frequencies. These resonances are about 20% larger than devices made from Lithium Tantalate crystals. The resonances are not excited when driven by very short pulses such as in pulse picking applications and in cavity dumping applications. They are generally limited to sine wave modulation in the low frequency range. The devices are available in several impedances; 1) lumped capacitive, 2) 50 ohm and 100 ohm. Amplitude modulators made by Quantum Technology are constructed to compensate for any thermally induced birefringence by proper orientation of the crystals. The modulators are optimized for intensity modulation such that when it is operated as a phase modulator, this results in **half** the modulation as one of the crystals is not in the correct orientation. When a permanent factory modification is requested ( Model -P ), it restores the modulator phase sensitivity to a maximum. The modulators can also be converted to a polarization rotator by the addition of an internal wave plate.



#### Standard Apertures:

6.0 mm for Models 364 and 362.

5.0 mm for Models 352 and 354.

4.0 mm for Models 342 and 344.

3.0 mm for Models 332 and 334.

2.8 mm for Model 327

### KD\*P EO MODULATOR SPECIFICATIONS

MODEL Parameter	364	362	354	352	344	342	334	332	327
Half Wave Voltage @ 633 nm	520V	1040V	435V	870V	345V	690V	260V	520V	160V
Half Wave Voltage @ 1064 nm	875V	1750V	728V	1460V	582V	1160V	438V	875V	268V
Aperture Crystal Size in mm <sup>3</sup> (Number of crystals)	6 mm 6x6x25 (x4)	6 mm 6x6x25 (X4)	5 mm 5x5x25 (X4)	5mm 5x5x25 (X2)	4 mm 4x4x25 (x4)	4 mm 4x4x25 (X2)	3mm 3x3x25 (x4)	3mm 3x3x25 (x2)	2.8 mm 2.8x2.8x50 (x4)
Capacitive Load (no dash) 50 ohm impedance ( - 50 ) 100 ohm impedance ( - 100 )	96 pF NA NA	48 pF NA NA	80 pF NA NA	40 pF NA NA	64 pF NA NA	32 pF NA NA	48 pF Yes Yes	24 pF NA NA	96 pF Yes Yes
Transmission (Typical)	90%	90%	90%	92%	90%	92%	90%	96%	86%
Connectors (See note below)	BNC	BNC	BNC	BNC	BNC	BNC	BNC	BNC	BNC
Housing Length	125 mm	75 mm	125 mm	75 mm	125 mm	75 mm	125 mm	75 mm	225 mm
Housing Diameter	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm

**Notes:** Phase modulator options ( -- P ) and Polarization Rotators ( -- NP ) are available on all modulators. The standard versions have two BNC connectors, and the transmission line types have two triax and one bias connector. All models are filled with FC-fluid. Dry versions ( D in suffix ) are available. In custom units, a minimum of two crystals (45° Z-cut) must be used. For example, two crystals of dimension 3mm x 3mm x 15mm would be available as a custom unit. Contact Quantum Technology for details. Please note that KD\*P modulators are dependent on the deuteration level. Quantum Technology uses a 95% deuteration level for the crystals. Lower levels would require higher halfwave voltage.