QX SERIES

KD*P Pockels Cell – 99% Deuteration

PRODUCT DATASHEET

The continuously evolving QX series sets the standard for KD*P electro-optic Q-switches.

The industry standard QX design provides reliable and stable performance for a diverse range of laser applications, from 300 to 1100 nm. G&H has an active installed base of several thousand units and it is increasing every day.

The standard configuration employs a broad band, high damage threshold solgel AR coating for improved durability and performance.

All units are supplied with a QA inspection report and suggested alignment procedures. We offer a unique rebuild program that extends the QX lifetime. All rebuilt units are upgraded with the latest product improvements and are returned with a new one-year warranty.



Key Features

- Crystal grown by G&H in the USA
- Highest purity KD*P crystal with 99% deuteration levels for > 99% transmission (see Figures 1 and 2)
- Low loss KD*P crystal 0.4%@1064 nm
- Intrinsic contrast ratio > 5000:1 (See Figure 3)
- Voltage contrast ratio >2500:1 (See Figure 4)
- High operation frequency at 3 kHz (10 kHz attenuated versions)
- LIDT >10 J/cm^2 (1064 nm, 10 ns, 10 Hz)
- Ceramic aperture eliminating outgassing
- Nitrogen backfilled ensuring long lifetime
- Adhesive/epoxy-free assembly
- Test documentation with each device

Options

- Attenuated version to allow for 10 kHz modulation frequency
- Window and sol gel coatings with choice of operational wavelengths
- KD*P crystals other than 99% deuteration available at a reduced price

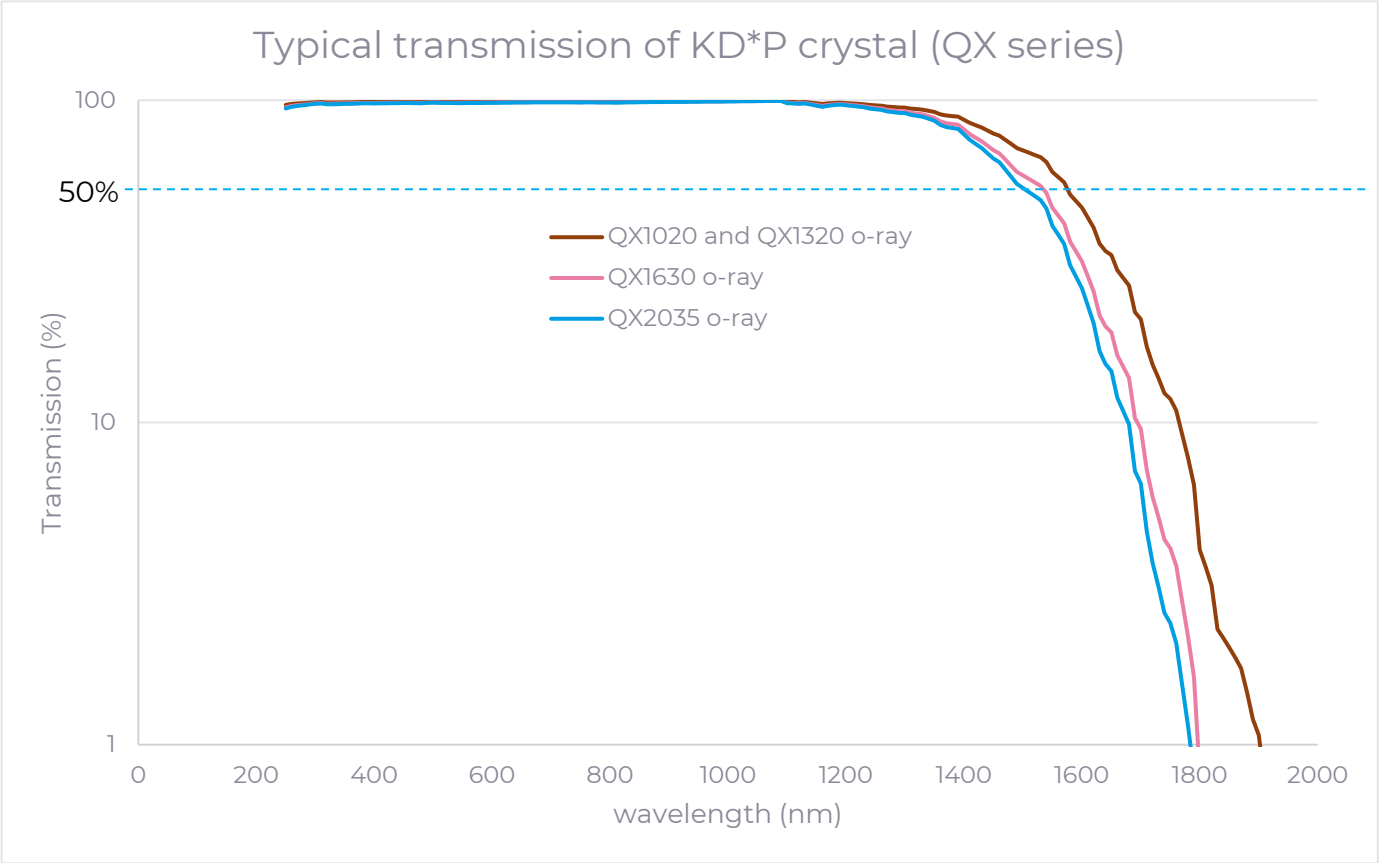
Applications

- Q-switching
- Pulse picking/cavity dumping

Performance Data

QX Series: Typical Specifications 99% KD*P	QX 1020	QX 1320	QX 1630	QX 2035
PHYSICAL				
Hard aperture diameter	9.25 mm	12.3 mm	15.1 mm	19.5 mm
Single pass insertion loss @ 1064 nm	< 1.0%, see figure 1			
Intrinsic contrast ratio (ICR) @ 1064 nm	> 5000:1, see figure 3			
Voltage contrast ratio (VCR) @ 1064 nm (parallel polarizers)	> 2500:1, see figure 4			
Single pass distortion @ 1064 nm	<λ/10			
ELECTRICAL				
Capacitance (DC)	6 pF	9 pF	9 pF	13 pF
DC quarter wave voltage @ 1064 nm	3.5 kV			
10-90% rise time (theoretical) into 50 Ω line	0.8 ns	1.1 ns	1.1 ns	1.5 ns
Modulation frequency	<1 kHz			
Duty cycle (recommended)	<5%			
LASER DAMAGE THRESHOLD (LIDT)				
1064 nm, 10 ns, 10 Hz, 1 mm beam	>10 J/cm^2			
ENVIRONMENTAL CONDITIONS				
Operating conditions				
Temperature range	+15 C to +35 C			
Humidity	< 85% RH (non-condensing)			
Storage conditions				
Temperature range	-50 C to +85 C			
Humidity	Non-condensing			

Typical transmission spectra of QX Pockels cell series (99% deuterated KD*P)



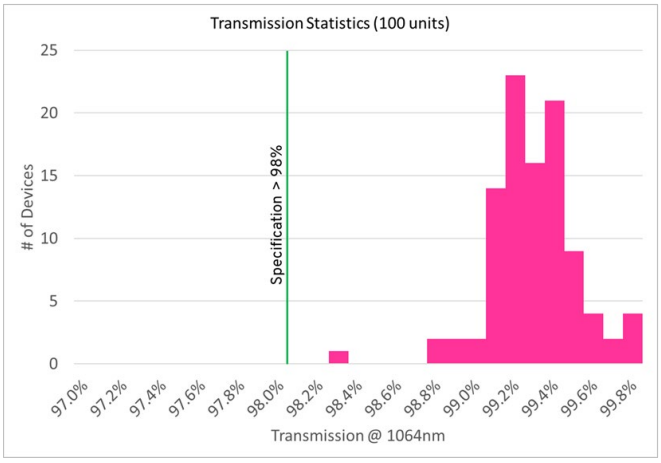


Figure 1 Single pass insertion loss

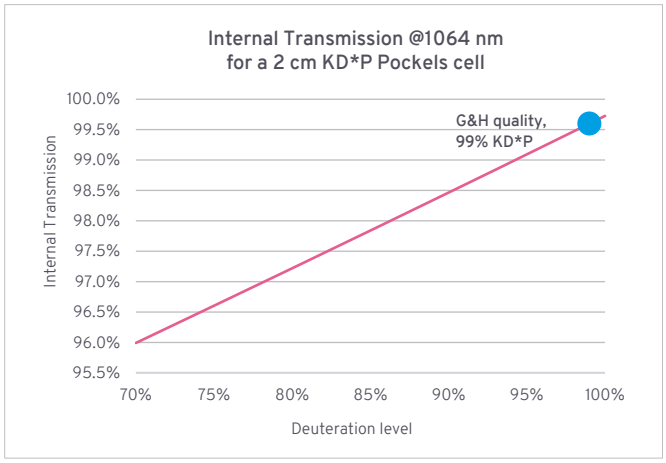


Figure 2 Internal KD*P transmission

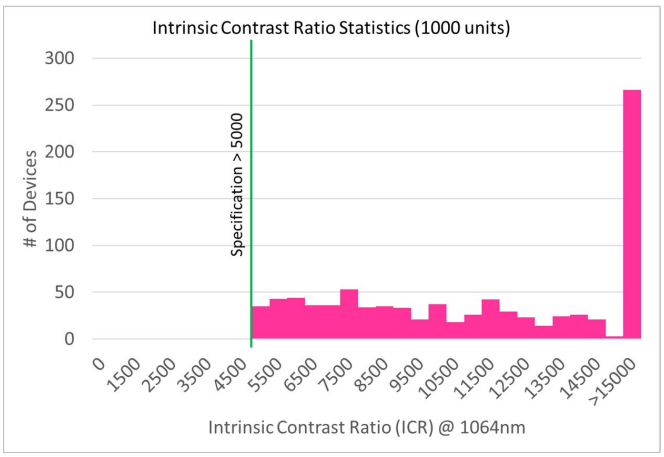


Figure 3 Intrintsic contrast ratio

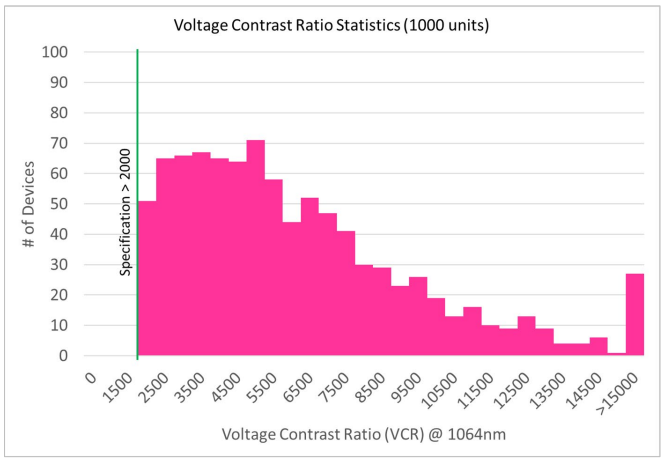
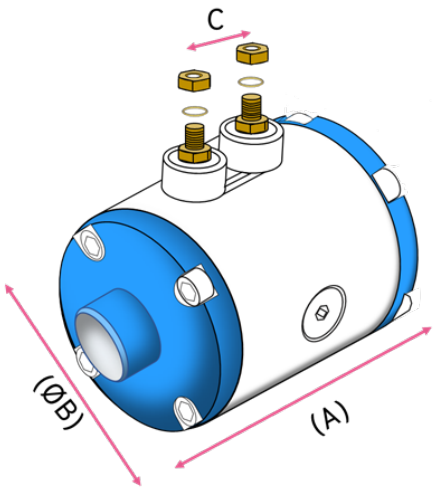
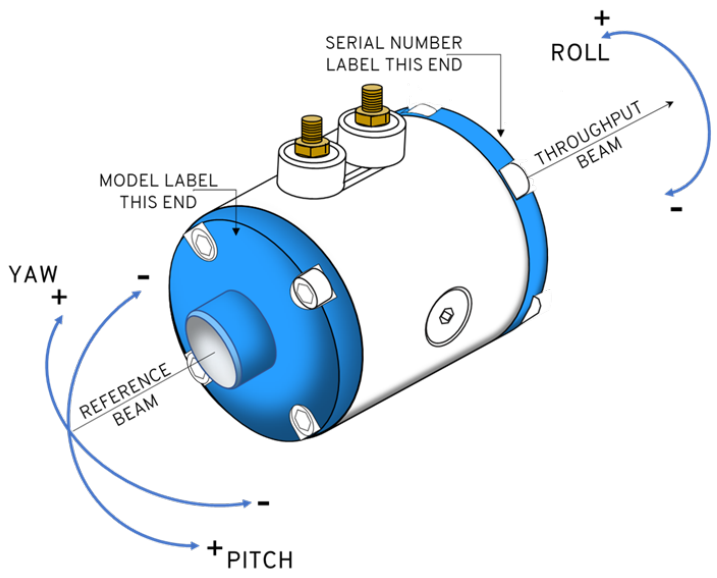


Figure 4 Voltage contrast ratio

QX: DIMENSIONS (inches [mm])			
MODEL	DIM 'A'	DIM 'B'	DIM 'C'
QX 1020	1.791 [45.5]	1.370 [34.8]	0.475 [12.1]
QX 1320	1.907 [48.4]	1.563 [39.7]	0.475 [12.1]
QX 1630	2.397 [60.9]	1.625 [41.3]	0.869 [22.1]
QX 2035	2.902 [73.7]	1.820 [34.9]	0.869 [22.1]



Example of test data provided with each device



NOTES:

1: Definitions:
ICR: Intrinsic contrast ratio
VCR: Voltage dependent contrast ratio
TWE: Transmitted wavefront error/distortion
2: Inspection beam is HeNe, vertically polarized
3: Pockels cell is depicted in inspection orientation
4: Typical input polarization shown (parallel or perpendicular to electrodes
5: Pockels cell has sensitive optical surfaces: Remove from package and handle only in cleanroom environment
6: Do not attempt to clean optical surfaces: Doing so will void the warranty and/or shorten the lifetime of the cell
7: Do not attempt soldering operations on or near the cell
8: Refer to 'Pockels cell alignment' datasheet for additional information and precautions
9: Typical configuration shown: End cap and electrode may vary depending on configuration purchased

QX Series Pockels Cell Inspection Report

MODEL:	QX 1020
CLEAR APERTURE (mm):	9.5
SERIAL NUMBER:	XXXX
PART NUMBER:	139-QX1020DT-029-04-09
SHIP DATE:	9/30/2022
KD*P CRYSTAL TYPE:	Standard (Beam Normal)
KD*P CRYSTAL DEUTERATION:	99%
AR COATING (nm):	810
ICR[1] (@ 633 nm):	2124:1
VCR[1] (@ 633 nm):	2791:1
λ/2 VOLTAGE (@ 633 nm):	3.52
LEAKAGE CURRENT @ λ/2 V (μA):	0.06
TRANSMISSION (%):	99.62
TYPICAL CAPACITANCE (pF):	6
YAW (MINUTES):	+5.50
PITCH (MINUTES):	-2.75
ROLL (DEGREES):	-1.09
TWE[1] (@ λ=633nm):	< λ/6 TYPICAL
BEAM DEVIATION (SECONDS):	NA