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**SERIES QC KD*P
Q-SWITCHES**

DATA SHEET 722

KD*P POCKELS CELLS



Fig 1: Photo of a typical QC-10S-DG

The Series QC Pockels cells utilize high quality strain-free crystals oriented in the longitudinal mode incorporating cylindrical ring electrodes for uniform electric fields. These Pockels cells are sealed units with AR coated windows and filled with an inert index-matching fluorocarbon fluid (FC-43) or antireflection coated (-DG) to minimize transmission losses. The windows are only generally aligned to the crystal faces to minimize disturbance of the optical path. The optic axis of the crystal is aligned parallel to the cell, and thus to the beam, within 3 minutes of arc. This type of accuracy is necessary for the Pockels cell to operate optimally. Also, the X and Y axes of the crystal must be parallel and perpendicular to the plane of polarization of the laser

SPECIFICATIONS OF SERIES QC POCKELS CELLS

These are available in usable apertures from 8 to 24 mm. Large aperture Pockels cells (Series LAP) are also available and are described in our product catalog (data sheet DS721A). Windows are AR coated at the specific wavelength of the laser. Standard cells are supplied with crystals having 98~99% deuteration level and with resistivity greater than 10^{10} ohm-cm for increased optical isolation and improved performance at elevated temperatures. Model QC-10S-2-DG and QC-16S-2-DG are a two crystal design of 9.5 mm and 16mm aperture respectively for lower half-wave voltage. Table 1 describes the optical, electrical and physical parameters of the series QC Pockels cells.

The fluid filled cells namely, QC-12, 16, -20, -24 are capable of withstanding 500MW/cm² for 1064nm, 10ns laser pulses. Higher transmission cells having the -DG designation with low loss, high power dielectric AR coatings can also withstand 500MW/cm². QC-8-SG is rated up to 750MW/cm².

TABLE 1
OPTICAL AND ELECTRICAL CHARACTERISTICS OF SERIES QC POCKELS CELLS

MODEL	QC-8-SG	QC-8-DG	QC-10S-DG	QC-10S-2-DG	QC-12-DG	QC-16-DG	QC-16-2-DG	QC-20-DG	QC-24-DG
OPTICAL PARAMETERS									
Aperture (mm)	8	8	9.8	9.5	12	16	16	20	24
$\lambda/4$ voltage KV (at 1064nm) ¹	3.4	3.4	3.4	1.7	3.5	3.5	1.8	3.6	3.7
Deuteration Level (nominal)	98%	98%	98%	98%	98%	95%	98-99%	95%	95%
Transmission (at 1064nm) [%]	>98.5	>98.5	>98.5	>97.5	>98.5	>98.5	>97.5	>98.5	>98.5
Contrast Ratio	>1000:1								
Wavefront distortion (max)	$\lambda/10$								
Wavelength Range	250-1100 nm								
ELECTRICAL PARAMETERS									
Capacitance, pF (1KHz)	5	5	5	10	5	6	15	10□	12
Rise time, Typical (ns)	<1	<1	<1	<1	<1	<1	<1.5	<1.5	<1.5
PHYSICAL PARAMETERS									
Connectors	0.025 pin jacks	0.080 pin jacks	4-40 Threaded Terminals	4-40 Threaded Terminals					
Weight (gm)	100	150	150	250	250	300	300	500	600

NOTE:

- 1) Quarter-wave voltage is directly proportional to wavelength
- 2) For QC-12 through -24, plastic caps on the two connectors protrude 0.5" above the cylindrical body.
- 3) Dry cells have -DG or -SG suffix and are AR coated.
- 4) Cells feature stainless steel hard aperture to reduce chances of damage to crystal due to spurious beams. Ceramic aperture plates are available on request.

Please specify the wavelength of the laser for desired AR coatings. Other models are available with index-matching fluids such as Deuterated Decalin. QC-16, -20, -24 are available in dry cell (- DG) version too. Please contact QTI sales engineers for

dimensions and other details. The KD*P cylinder is held in a hermetically sealed, adhesive free mount to ensure years of reliable long term service. These cells may be used at typical power levels over 500 MW/cm² peak powers and 40 watts average powers with 6mm or more diameter in the near IR wavelength region. The -DG cells have a damage threshold of >5J/cm² at 10 ns, 1064 nm pulses.

All models can be fabricated with two crystals and are designated with the suffix -2, such as Model QC-10S-2-DG. Typical parameters of these models are shown in Table 2. These two crystal devices operate at lower voltages, generally for extra-cavity half wave applications. For example, if the quarter-wave voltage for a QC-10 (a single crystal element) is 3.4KV, then the half-wave voltage for a QC-10S-2-DG (dual crystal element) would be the same voltage.

On special order, larger apertures of 50 mm or more are available. These units have cylindrical ring electrodes design (Model LAP-50, for example).

For very low insertion loss, a Brewster angled KD*P Pockels cell may be used. Contact our sales engineers for size and other details. Please note that dimensions may be subject to change.

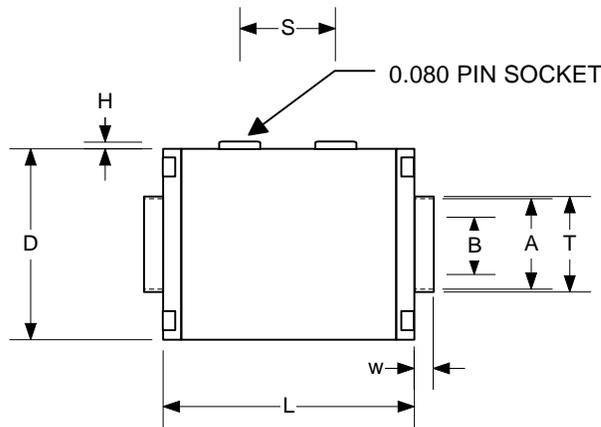


Fig.2: A typical look of a QC-series Pockels cells, except that for 10S-DG, -10-DG and -2 Models, in which cases connectors are 2 mm pins. Also, dual crystals Pockels cells have 4 terminals as opposed to 2 terminals. Dust tubes are optional.

TABLE 2
MODEL QC-SERIES OUTLINE DIMENSIONS¹ INCH (MM)

Outline Dimensions ¹ – inch (mm)						
MODEL	LENGTH	DIAMETER	APERTURE	CONN. SEP.	DUST TUBE O.D	CONN. HEIGHT
	L	D	A	S	T	H
QC-10-DG	1.25 (32)	1.375 (35)	0.375 (9.50)	0.47 (12)	n.a.	0.125 (3.2)
QC-12-DG	1.875 (48)	1.375 (35)	0.470 (12.0)	0.47 (12)	n.a.	0.125 (3.2)
QC-16-DG	2.24 (56.9)	1.62 (41.2)	0.63 (16.0)	0.63 (16)	0.75 (19)	0.125 (3.2)
QC-20-DG	2.24 (56.9)	1.97 (50)	0.79 (20)	0.63 (16)	n.a.	0.125 (3.2)
QC-24-DG	2.63 (66.8)	1.97 (50)	0.94 (23.9)	1.00 (25.4)	1.0 (25.4)	0.125 (3.2)

¹ Dimensions subject to change

QC-8-SG SERIES SINGLE-CRYSTALS POCKELS CELLS (0.75" DIA BODY)

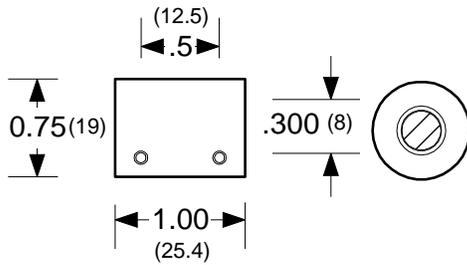


Fig. 3: A typical look of a QC-8-SG series Pockels cells with single crystal. Pockels cells have two 0.6mm pin socket terminals. It has stainless steel aperture plate for high power applications and white Delrin body.

QC-10S-DG SERIES SINGLE-CRYSTALS POCKELS CELLS (1.0" DIA BODY)

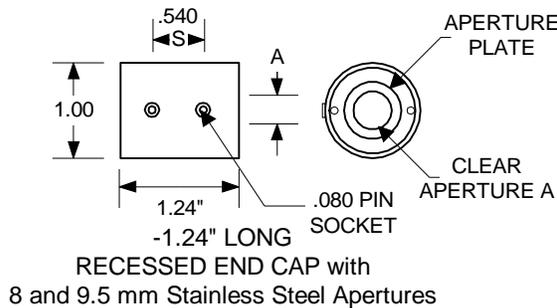


Fig. 4: A typical look of a QC-10-DG Pockels cells. Pockels cells have two 2mm pin socket terminals. It has stainless steel aperture plate for high power applications and white Delrin body. Dimensions are specified in Table 3. The QC-10-DG is a 1.375" Dia version of this cell.

QC-10S-2 DUAL-CRYSTAL POCKELS CELLS

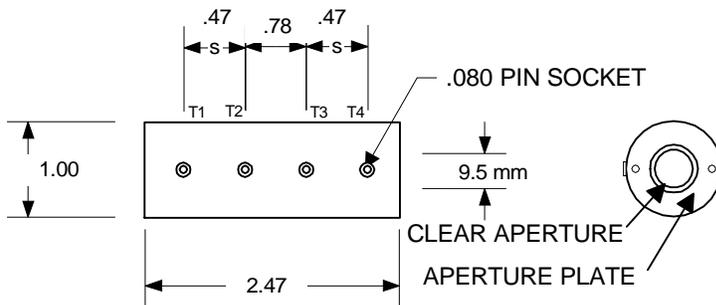


Fig. 5: Dimensions of a two crystals QC-series Pockels cells. Pockels cells have 4 2mm pin terminals. Dust tubes are optional.

² Dimensions subject to change. Please confirm at the time of ordering.

ALSO AVAILABLE: BBO and LITHIUM NIOBATE Q-SWITCHES

Quantum Technology has developed it's QS-series Super Switch Line of Pockels cells for average powers of 30-100W, using BBO Crystal Material. These high powers are typical of Diode-Pumped Solid State (DPSS) Lasers. BBO Crystal material does not suffer from some problems which may arise in KD*P or LiNbO₃ materials. The QS-3 series is ideal for Q-switching of high power compact DPSS Lasers at sub-nanosecond speeds. Please refer to Data Sheet 718. For Lithium Niobate Q-switches (LN-series), see data sheet 738.