

# LEYSOP LTD

manufacturers and suppliers of electro-optic components

Transverse electric field  
birefringence compensated  
design

Maximum repetition rate to  
1MHz for pulse picking  
and >200kHz for Q-  
switching

High peak power handling

Low optical loss

Standard Ø35mm package



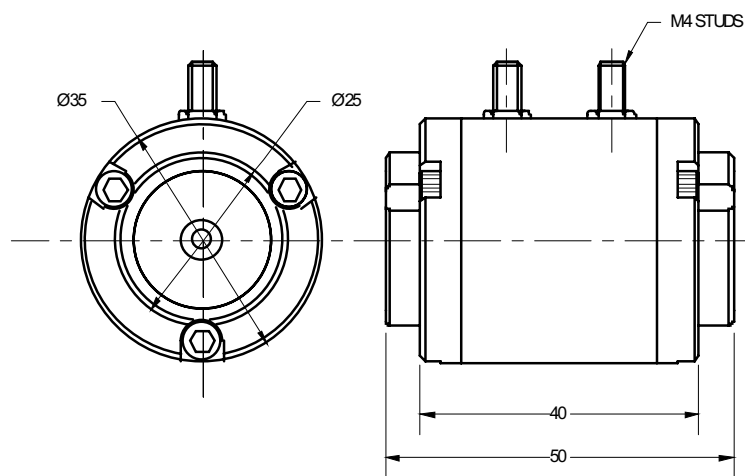
## RTP Pockels Cells

Electro-Optic Q-switches have previously always lagged behind acousto-optic Q-switches when high repetition rates have been required. This is no longer the case with the advent of the new EO material RTP (rubidium titanyl phosphate) which has been demonstrated to offer Q-switching action to over 200kHz with no evidence of the presence of acousto-optic resonances which usually limit the upper frequency of operation of electro-optic device which are repetitively pulsed. BBO offers good performance to 30kHz but this is usually the limit and the only alternative has been AO devices. However, these suffer from very slow rise times (~ tens of  $\mu$ s) as they depend on the slow propagating acoustic wave

to fill the active aperture to change the state of the transmitted optical beam. However, the RTP Pockels cell has a huge advantage here in that it can easily be fully switched within a timeframe of a few ns only. This leads to shorter pulses when used for Q-switching but also provides for what is probably its most exciting application which is selecting pulses from a mode locked laser pulse train at hitherto unprecedented rates of 1MHz and perhaps even higher. This provides then a very useful “gear shift” for the mode locked laser where the usual ~80MHz rate is too high but the kHz output rates of conventional pulse picking systems limits the available data collection rates.

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3mm aperture RTP Pockels cell shown approximately at full size

RTP is a relatively new EO material and our experience to date is that does not offer the same degree of thermal stability available with Z-cut BBO. This is due to optically induced birefringence effects and this limits the RTP cell to Q-switching at average output powers of a few watts typically. However, for pulse picking applications the cell may easily be set-up for operation at a particular repetition rate with excellent stability out to 1MHz and perhaps beyond.

## PRODUCT SPECIFICATIONS

Model	RTP-3-20	RTP-4-20	RTP-6-14	RTP-6-20
Aperture (crystal dimensions)	3mm	4mm	6mm	6mm
Total crystal length (2 crystals)	20mm	20mm	14mm	20mm
Approximate half wave voltage (1064nm)	1.0kV	1.3kV	3.4kV	2.4kV
Typical dynamic extinction ratio (1064nm)	>200:1	>200:1	>200:1	>500:1
Typical capacitance	~6pF	~6pF	~4pF	~6pF
Peak damage threshold (1064nm, 1ns pulse)	>1GWcm <sup>-2</sup>	>1GWcm <sup>-2</sup>	>1GWcm <sup>-2</sup>	>1GWcm <sup>-2</sup>
Insertion loss	<2%	<2%	<2%	<2%
Physical dimensions (mm)	Ø35 x 50	Ø35 x 50	Ø35 x 50	Ø35 x 50

Specifications for guidance only, subject to modification without notice.



A 100kHz maximum repetition rate Q-switch driver is also available. This may be configured for pulse operation for half or pulsed quarter wave mode, or in switch to ground operation for quarter wave switching (operating mode must be set at manufacture). Maximum standard voltage 2kV but up to 2.5kV may be available to special order. See separate data sheet for details.