



Components



OG Pulse Pickers

The pulse picker consists of the pockels cell, high voltage driver, synchronization and delay generator. It is suitable for single pulse selection from train of femtosecond or picosecond pulses. Also the device is used for pulse slicing in order to increase contrast. USB connection with LabView-compatible driver provides smooth control over device performance.

Customer-requested high voltage generators up to 50kV are also available.



OG8/1 pulse picker with control unit

Features

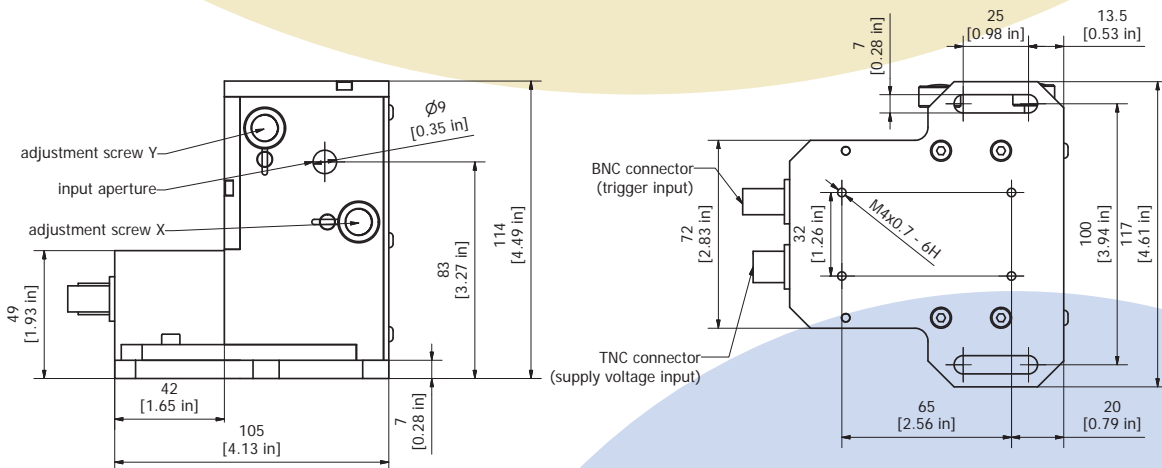
- Possible wavelengths: 250 - 2100 nm
- Adjustable amplitude up to 12 kV
- HV pulse adjustable delay
- HV pulse duration from 3 to 1250 ns
- Fast rise time down to 1 ns or less
- Single-shot up to 100 kHz picking rate
- Low jitter <200 ps
- Synchronization by optical train or by external TTL signal
- Built-in photodetector with fiber input for synchronization by optical train
- Internal / external triggering;
- Burst mode operation by external or internal signals
- Single control unit can drive up to three Pockels cells
- Two built-in frequency dividers
- Four independent delay channels 0...4 us (up to 800 us on request)
- 1 ms additional group delay for all channels
- All internal signals of the control unit are available at programmable outputs
- USB control and LabView drivers

Application:

- Single or multiple pulse selection from a femtosecond or picosecond pulse train
- Reduction of pulse repetition rate for power amplifiers
- Pulse picking for contrast improvement
- Injection/ejection of pulses into/out of regenerative amplifiers
- Synchronizing and triggering external devices

The basic OG8/1 system includes:

- OG pulse picker optical head with HV driver
- Control , synchronization and power supply electronics 19" module with USB
- Two Glan prisms with mounts and holder posts
- 1.5-meter optical fiber cable for built-in photodetector



OG8/1, OG8/10, OG12/1 drawing

OG pulse picker system extended specifications

| | OG8/1 OG12/1 | OG8/10 OG12/10 | OG8/25 | OG8/50 | OG55/1 | OG88/1 | OG8/1-F |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------|-------------------|------------|----------------------------------------|----------|-------------------|
| Pockels cell voltage ¹⁾ , adjustable | 5...8 kV 7...12 kV | | 5...8 kV | | 3...5 kV | 5...8 kV | 5...8 kV |
| ARC | 750-850 nm for OG8 and 1000-1100 nm for OG12/OG55 (other ranges and wideband on request) | | | | | | |
| EO crystal | DKDP | | | | BBO | | DKDP |
| Clear aperture | 5 mm standard (up to 20 mm on request) | | | | 3.5 mm | | 5 mm |
| HV pulse width at 10% of peak amplitude | <10 ns, bell-shaped | | | | 15...1250 ns adjustable, square-shaped | | <3 ns |
| Rise time | <4 ns | | | | <10 ns | | <700 ps |
| Fall time | <4 ns | | | | <10 ns | | <2 ns |
| Output repetition rate ²⁾ | 0...1 kHz | 0...10 kHz | 0...25 kHz | 0...50 kHz | 0...1 kHz | | 0...1 kHz |
| High voltage driver response time | <180 ns (fixed delay between the trigger pulse and the high voltage pulse) | | | | | | |
| Typical transmission of optical system | half-wave scheme >85%; quarter-wave scheme >80%; Pockels cell transmission without polarizers >98% | | | | | | |
| Timing stability (jitter) | <200 ps | | | | | | |
| Trigger | internal or external (see specs for Control and Supply Unit) | | | | | | |
| Sync. RF signal | optical (supplied to built-in fiber-coupled photodetector) or electric | | | | | | |
| Input optical train rep. rate | 2...150 MHz and 1 Hz...2 MHz ³⁾ | | | | | | |
| Adjustable delay | 0...4 μs (0...800 μs on request) | | | | | | |
| Contrast ratio | >10 ³ :1 | | | | | | |
| External water requirements | no | | yes ⁴⁾ | | no | | yes ⁴⁾ |

¹⁾ The Pockels cell voltage defines the wavelength on which the system operates. Thus in a simple half-wave scheme the voltage amplitude in kV roughly corresponds to wavelength in hundreds of nm, i.e. if you require the system for 800 nm you are looking for a ~8 kV unit, 1064 nm – 10 kV etc. ARC can be then done according to your request.

²⁾ The optical train rep. rate is first optionally divided by a prescaler of either 1/16/256/4096 and then by a compulsory divisor of an integer from range of 2 to 65535 to get the desired output frequency. The unit also provides burst and single-shot modes. There is also an additional external electric TTL trigger connection available for control of output pulse frequency. See CU specs for more details.

³⁾ Proper operation with input train rep. rate 1 Hz...2 MHz is only available with triggering by external signal. The external trigger signal must lead the optical pulse by 0.25-3 μs and must be strictly locked to the optical train with jitter less than 200 ps

⁴⁾ Value of dissipated thermal power for OG8/25 and OG88/1 is approximately 25 W, for OG8/50 around 50 W

Optional units:

- OG8(12)/1(10)-2 2-channel system driving single Pockels cell by two HV pulses. Perfect for injection/ejection in solid-state fs amplifiers.
- OG8/100 Up to 100 kHz repetition rate, external water cooling is needed (the value of dissipated thermal power at 100 kHz is approximately 80 W).
- OG55/20 Up to 20 kHz repetition rate, external water cooling is needed (the value of dissipated thermal power at 20 kHz is approximately 40 W).