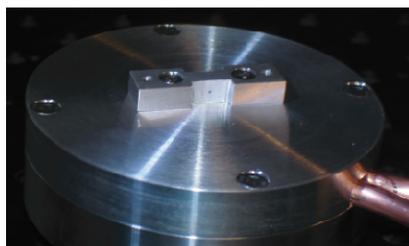


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## Pulsed valve GR001 Data sheet.



- Up to 1 kHz repetition rate
- Mechanical opening time down to 30  $\mu\text{s}$ \*
- Amount of gas injected: down to 1  $\mu\text{mol}$

The GR001 pulse valve is designed to precisely inject gas in a vacuum chamber. Both the timing and the amount of gas released can be finely tuned.

### Applications examples:

- High Order Harmonic generation
- Attophysics
- Molecular alignment
- Cluster science
- Electron spectrometers
- Gas phase spectroscopy
- Molecular beams

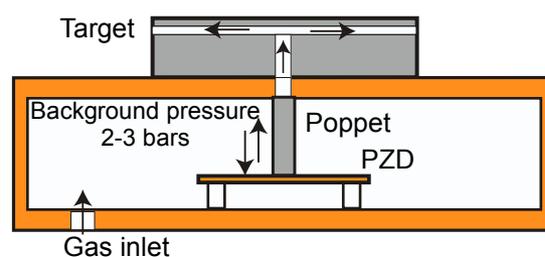
### Principle of operation:

The pulse valve is driven by a piezo electric disc (PZD) on which a small poppet is tightened. It periodically opens and closes a 1 mm diameter pipe where the gas flows. The moving parts are kept as light as possible, which makes opening times as short as 30  $\mu\text{s}$  feasible.\*

The PZD and the poppet are mounted inside the valve body where backing pressures up to 5 bars can be applied. The valve opens when applying a voltage to the PZD and the backing gas flows in the 1 mm pipe through the body. The amount of gas is controlled by the voltage applied to the PZD. At the end of this pipe the target is tightened to the body by two screws. The target is decoupled from the moving parts; this makes the switch between targets very easy, and allows for custom-made target designs.

The valve can be driven by standard commercially available high voltage power supplies, together with a delay box. This scheme allows using a gate to drive the piezo. A 120  $\mu\text{s}$  electrical gate corresponds to a mechanical opening time down to 30  $\mu\text{s}$ .

The body of the valve is cooled down by an internal water circuit.



### Electrical specifications

- Voltage required 150 to 350 V
- Bandpass: > 1kHz
- Duty cycle down to 0.1
- BNC connection

### Gas inlet

- Regulated up to 5 bars backing pressure
- 6 mm swagelok hose connectors

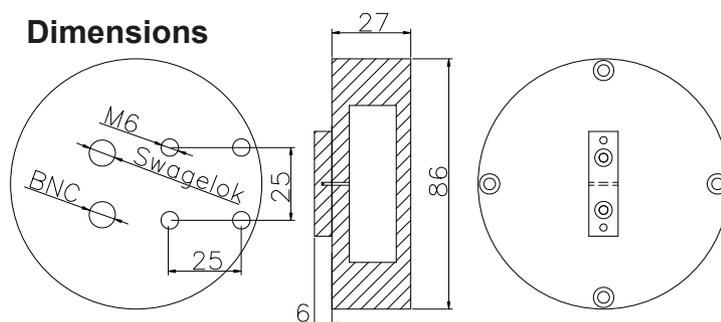
### Water cooling

- Water @15 degrees Celsius, 2 watts cooling power
- Two 6 mm swagelok hose connectors

### Target

- Standard T-shape: down to 0.5 mm drilling diameter, up to 10 mm length.
- Custom targets on demand (e.g. conical)

### Dimensions



- 4 M6 screws on the backside for the mounting

\*The opening time is estimated from how much the valve's trigger must be temporally detuned from a laser pulse to completely cancel the high harmonic yield from the laser-gas-interaction