

PSDs

- Fast position measurement
- Target position for stabilization can be freely selected
- Submicrometer resolution



Figure 1: Rear view of a PSD detector
(The base plate is not included in the delivery.)

Product description

PSD detectors use a "position sensitive device" with a resistive sensor surface for detection. Such sensors have no segmentation and provide continuous position information. In contrast to 4-quadrant detectors, PSD detectors thus enable position measurement over the entire detection area.

With the *Adjust-In* option of the *Compact* beam stabilization, laser beams can be stabilized at any point on the detection surface. With this feature the PSD detectors complement the most commonly used 4QD detectors with higher resolution.

By using Invar, a material with a small coefficient of thermal expansion, the high resolution of the detectors is permanently maintained.

For easy adjustment of the laser to the sensor, our PSD detectors have position and intensity indicators on the back.

Vacuum and clean room versions are also available.

Applications for beam stabilization

1. When using the *Compact* beam stabilization, the PSD detectors can be positioned before the laser is finally adjusted. Once the laser has been adjusted, the target positions can be read out and the beam can be stabilized to these positions using the *Set&Hold* function.
2. The laser beam can be moved to different points with high precision by changing the target position on the detector. In doing so, the laser beam follows the external target but remains stabilized at the highest resolution.

Specification Visible PSD

Wavelength range	320 – 1100 nm
Detection area	9 x 9 mm ²
Resolution / Accuracy	< 0.5 µm / grating structure leads to repeatability of 1.5 µm when addressing a target point
Linearity over sensor area	±3%
Bandwidth	up to 100 kHz, limited to 30 kHz by default
Sensitivity (power/pulse energy)	25 – 1500 µW / 25 – 1500 nJ @ 532 nm, cw / 1 kHz *
Optical filter in compartment in front of sensor / dimension	2 pieces, exchangeable / 11.9 x 11.9 mm ²
Position / intensity display on housing	LED cross with 9 LEDs / LED line with 10 LEDs
Minimum beam diameter	> 200 µm (for pulsed lasers)**
Signal scaling of position output	1.20 (± 0.04) mV/µm
Electrical power consumption	max. 1.3 W (12 V, 110 mA)

Specification UV PSDs 4x4 and 10x10

Wavelength range	200 – 1000 nm
Detection area	4 x 4 mm ² or 10 x 10 mm ²
Resolution / Accuracy	< 0.7 µm
Linearity over sensor area	< ±5%
Bandwidth	up to 100 kHz, limited to 30 kHz by default
Sensitivity (power/pulse energy)	20 – 1250 µW / 20 – 1250 nJ @ 532 nm, cw / 1 kHz *
Optical filter in compartment in front of sensor / dimension	2 pieces, exchangeable / 11.9 x 11.9 mm ²
Position / intensity display on housing	LED cross with 9 LEDs / LED line with 10 LEDs
Minimum beam diameter	> 200 µm (for pulsed lasers)**
Signal scaling of position output	4 x 4 mm ² : 2.9 (± 0.1) mV/µm 10 x 10 mm ² : 1.1 (± 0.05) mV/µm
Electrical power consumption	max. 1.3 W (12 V, 110 mA)

* The specification refers to the values on the sensor. With optical filters in front of the sensor, higher powers or energies can be applied. In case of higher pulse energies the beam diameter must not be too small. A fine adjustment of the sensitivity is possible via a digital potentiometer in 128 steps.

** Smaller beam diameters are possible for cw lasers and lasers with high repetition rates.

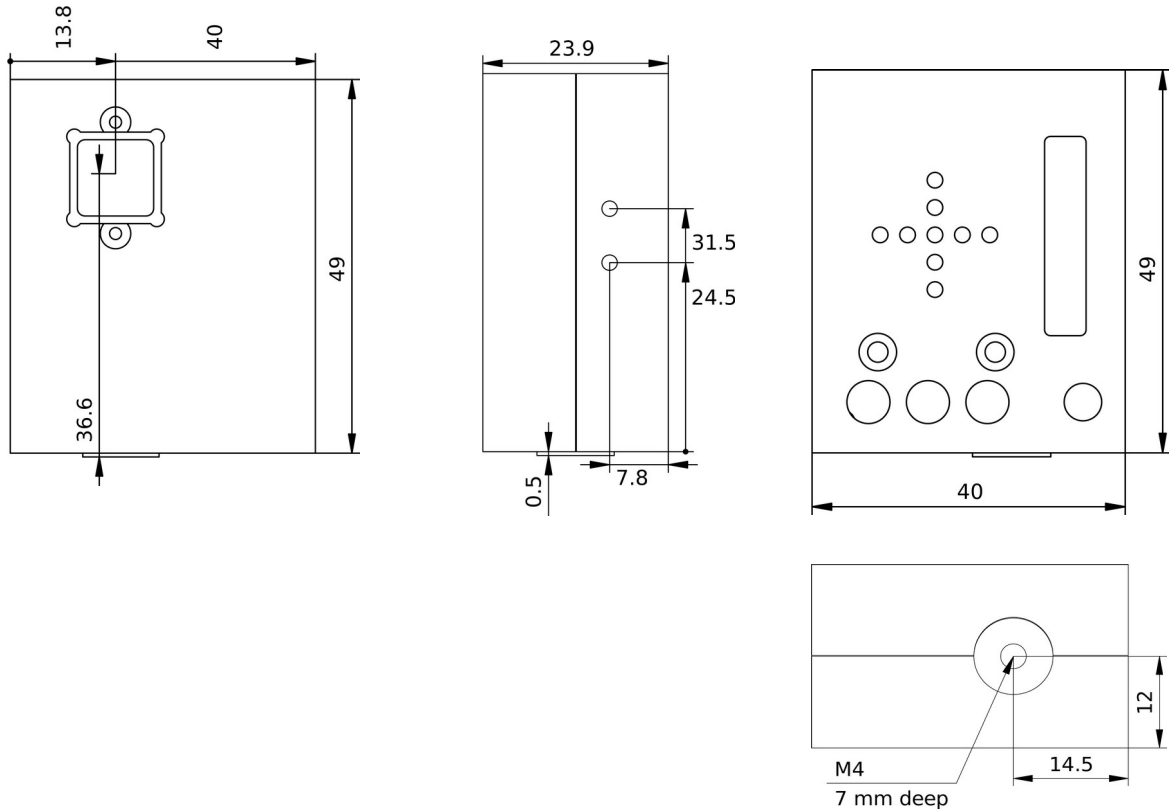
General data

Material	anodized aluminum, invar, etc.
Dimensions (H x W x D)	49.5 x 40 x 23.9 mm (without base plate and rod; UV PSDs: height of filter adapter: 4 mm)
Weight	85 g (without base plate and rod)
Cables	Adapter cable: 4x MCX (on the detector), length 16 cm Extension cable: LEMO→LEMO, length 4 m

Pin configuration LEMO FGG.0B.306.CLAD52

LEMO	Signal
Pin 1	GND
Pin 2	+ 12V
Pin 3	-
Pin 4	X signal
Pin 5	Y signal
Pin 6	Intensity

Technical drawings



Note: The UV PSDs are equipped with an additional filter adapter with dimensions of H x W x D = 25 x 27 x ~4 mm in front of the sensor.



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Subject to change without prior notice.