

CompactPowerMonitor CPM



The products of the CompactPowerMonitor (CPM) series distinguish themselves by the compact design as well as their easy handling and operation. Depending on the version, laser powers of 0.1 up to 20 kW can be measured. Here, not only the power but also the maximum permissible power density of the laser radiation is crucial. The different versions of the CPM vary mainly in terms of absorber sizes and the required flow rate of the cooling water. Connection, operation, and handling of the devices are identical.

In Practice

The CompactPowerMonitor is intended for both laser source manufacturers and plant manufacturers for the measurement of laser power. The high mobility, which is due to the compact design, enables an application of the device at different machines within a company. However, the CompactPowerMonitor is also suitable for process control when it comes to system integration.

Measured Beam Parameters

Raw beam power of continuous wave laser beams in wavelength ranges of solid-state lasers (YAG) or CO₂ lasers (CPM C-9 only), depending on the calibration.

Models and Options

CPM F-1 (1 kW)

The CPM F-1 is a calorimetric power meter for the range between 100 W and 1.4 kW- derived from the CompactPowerMonitor CPM F-10. The format was reduced considerably in order to enable work in very restricted laser processing cells.

CPM F-10 (10 kW)

The CPM F-10 is to be emphasized, as it distinguishes itself by its large, flat absorber as well as the low weight and the extremely low back reflection. The calorimetric measuring principle allows highly precise measurements independent from the beam position on the absorber or beam dimensions.

CPM F-20 (20 kW)

The weight of the "big brother" has also been optimized. The free aperture of

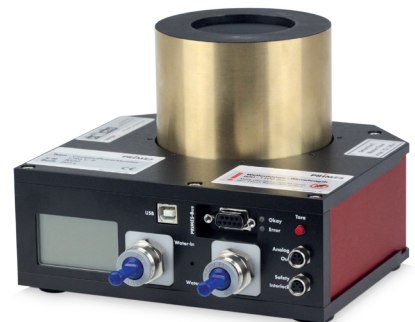
135 mm allows power measurements far behind the focusing plane or of very large raw beam diameters, e.g. behind a telescope.

CPM C-9 (9 kW)

The CPM C-9 with a conical reflector and a cylindrical absorber is employed for far higher power densities. All models are water-cooled and intended for a long-term operation – even with deionized water. However, the maximum power density lies at 10 kW/cm².

Optional Accessories:

- Adapter for measurements at the fiber (LL, LLK-D, QBH, QD)
- Transport box
- External display unit
- Different interfaces
- Mounting accessories for connection with the FocusMonitor



CompactPowerMonitor C-9



CompactPowerMonitor F-1 with adapter ring

CompactPowerMonitor CPM



CompactPowerMonitor F-20

Fiber Adapter

The fiber adapter is necessary to directly couple a fiber with the laser power meter. This enables safe laser power measurements even with high power lasers.

For the CompactPowerMonitors CPM F-1, CPM F-10 and CPM F-20 adaptors are available for some of the common fiber couplers, such as LLK-B and LLK-D as well as QBH and QD.



CPM F-10 with LLK-D fiber connector

Technical Data

	CPM F-1	CPM F-10	CPM F-20	CPM C-9 ¹⁾
Measurement Parameters				
Power range	0.1 – 1.4 kW	0.5 – 10 kW	1.0 – 20.0 kW	0.5 – 9 kW
Irradiation time	continuous			
Wavelength range	800 – 1100 nm	800 – 1100 nm	800 – 1100 nm	800 – 1100 and 10600 nm
Entrance aperture	45 mm	90 mm	135 mm	55 mm
Max. power density	1 kW/cm ²	1 kW/cm ²	1 kW/cm ²	10 kW/cm ² (Ø < 10 mm) 5 kW/cm ² (Ø 10 – 30 mm) 0.5 kW/cm ² (Ø 30 – 55 mm)
Average power density	0.5 kW/cm ²	0.5 kW/cm ²	0.5 kW/cm ²	5 kW/cm ² (Ø < 10 mm) 5 kW/cm ² (Ø 10 – 30 mm) 0.5 kW/cm ² (Ø 30 – 55 mm)
Accuracy	± 3 %			
Reproducibility	± 1.5 %			
Time constant	< 10 s			
Supply Data				
Power supply	24V DC ± 5 %, max. 0.5 A	24V DC ± 5 %, max. 0.5 A	24V DC ± 5 %, max. 0.5 A	24V DC ± 5 %, max. 0.5 A
Cooling water flow	> 1 l/min	> 5 l/min	> 10 l/min	> 5 l/min
Maximum water inlet pressure	3 bar	4 bar	4 bar	3 bar
Communication				
Interfaces	serial/USB			
Dimensions and Weight				
Dimensions (L × W × H) (excl. connectors)	180 × 123 × 71 mm	180 × 162 × 71 mm	260 × 162 × 113 mm	180 × 162 × 136 mm
Weight	0.9 kg	2.9 kg	4.8 kg	4.8 kg
Environmental Conditions				
Operating temperature range	+10 °C up to +40 °C			
Permissible relative humidity (non-condensing)	10 – 80 %			

¹⁾ This model requires a beam incidence central to the aperture.