



TEMA-CW. Yb-Doped Solid-State Continuous Wave Laser

- 1010 to 1070 nm tuning range
- 7.5 W at 1050 nm average power
- Highly stable monolithic thermally stabilized body
- Built-in pump source



The TEMA-CW continuous wave laser system

Product overview

TEMA-CW is a solid-state diode-pumped IR laser emitting continuous-wave radiation at 1050 nm. TEMA-CW is derived from the popular ultrafast laser TEMA series and therefore inherits its outstanding reliability and long-term stability of output power. However, the beam quality of TEMA-CW is superior even to its femtosecond counterparts. Low beam divergence, astigmatism and ellipticity combined with TEM00 intensity profile, output power of up to 7.5W and 1010-1070 nm wavelength tuning capability make for an invaluable tool for such applications as:

- making of optical tweezers and optical traps
- micro-engraving, micro-welding and other micromachining techniques
- laser spectroscopy
- etc.

The optical head unit of the TEMA-CW laser is rugged monolithic design employing a chiller-based cooling system to keep the head thermally stabilized, which allows for operation in a broader temperature range of 10-30°C. The optical head of TEMA-CW system comes as a sealed unit, which makes the laser truly maintenance-free, ensures long-term stability and beam quality and enables the turn-key mode of operation.

Like other systems of the TEMA series, TEMA-CW includes a compact control electronics unit featuring a humidity meter of the insides of the laser head, multiple temperature controllers as well as a built-in power meter. The control electronics unit is paired with a specially designed software for remote monitoring & control of laser parameters via a standard USB interface. The real-time values of cavity elements' temperature, relative humidity within the optical head, values of set and measured output power are displayed and can be modified by using both the sensor display of the electronics unit and the control software. This functionality allows for OEM use of TEMA-CW laser and its integration into research- and industrial-grade systems for various applications.

Before leaving the factory, all TEMA laser systems are subjected to rigorous quality control and thorough testing, which includes long-term power stability test, optical head impermeability test, extreme heating/cooling stress test and many others. The long-term power test conducted in normal operating conditions yields perfect passive stability during some hundreds of hours without the need for any maintenance, even though active stabilization of output power is still possible via adaptive control of the built-in pump laser diode current. The cyclic stress test exposing the laser system to repetitive high-amplitude ambient temperature / humidity fluctuations shows its high tolerance to instability of environmental conditions.



AVESTA

LASERS AND OPTICAL SYSTEMS



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TEMA-CW	
Output power	>7.5 W @ 1050 nm >2.5 W @ 1010 nm >1.5 W @ 1070 nm
Tuning range	1010-1070 nm
Output linewidth	< 45 GHz ²⁾
Spatial mode	TEM ₀₀
M ²	<1.15
Output beam diameter (at 1/e ²)	1±0.2 mm
Output polarization	linear, horizontal
Beam divergence	<1.8±0.3 mrad
Beam asymmetry	<15%
Astigmatism	<15%
Long-term output power stability ¹⁾	<0.3% rms
Cold start warm-up time	<10 min
Cooling requirements	
Laser head	closed-loop chiller included
Control unit	air-cooled
Physical dimensions (L × W × H)	
Laser head	412 × 190 × 93 mm
Control unit	290 × 200 × 80 mm
Closed-loop chiller unit	430 × 340 × 190 mm
Umbilical length	1.8 m
Environmental and utility specifications	
Operating temperature	18-28 °C
Relative humidity	<60%, non-condensing
Voltage	single-phase; 100-240 VAC; 50/60 Hz
Power consumption	<1 kW
1) after 30 min warm-up with cold start, during 12-hour continuous operation under equal room temperature conditions using factory-supplied/recommended stabilized closed-loop chiller with proper capacity. 2) Output linewidth less than 45GHz upon request.	

