

48 SERIES LASER CLOSED LOOP SYSTEM

MAXIMIZE POWER STABILITY IN 48 SERIES CO₂ LASERS

The 48 Series Closed Loop System stabilizes the output power of Novanta's water-cooled 48-1 CO₂ laser. The system includes a factory installed beam sampler and closed loop control system, that works with the UC-2000 laser controller.

The optical sampler portion of the kit is attached to the front of the laser and replaces the standard end plate. The beam passes through the adapter with only a minor vertical displacement of the beam axis (less than .05"). There is no shift in beam direction.

A beam splitter internal to the sampler diverts 8% of the output beam to a diffuser and thermo-pile detector. The thermo-pile detector signal is amplified within the sampling enclosure to a 1 to 12V signal level. A remotely located controller generates a variable duty cycle 5 kHz signal to maintain constant average power of the laser. On a custom basis, the control frequency can be raised to 20 kHz for less optical ripple.

The power "set point" can be adjusted on the UC-2000 to provide a laser output between approximately 20% and 80% of full power. This 20% window on either side of the range allows the UC-2000 to maintain full dynamic power regulation. Within the dynamic response time of the system, the UC-2000 can be gated from an external low frequency signal source. Servo settling time (to 90% of final value) is approximately 2 msec.

Performance of the system is typically $\pm 2\%$ even when the laser line hops between 10.57 and 10.63 μm . This accuracy is achieved by a combination of a wavelength insensitive beamsplitter and assured linear polarization of the signal impinging on the beamsplitter. The beamsplitter is a 45° oriented disc of ZnSe, AR coated on one side only. The optical input is provided through a Brewster angle polarizer, removing any residual orthogonally polarized components. The uncoated side of the ZnSe beamsplitter provides a wavelength independent signal used as sample input. Spatial non-uniformities of the beam are removed by reflecting the sampled signal from a metal grid diffuser before entering the broadband detector. The sampling detector has no window and has a flat black coating.

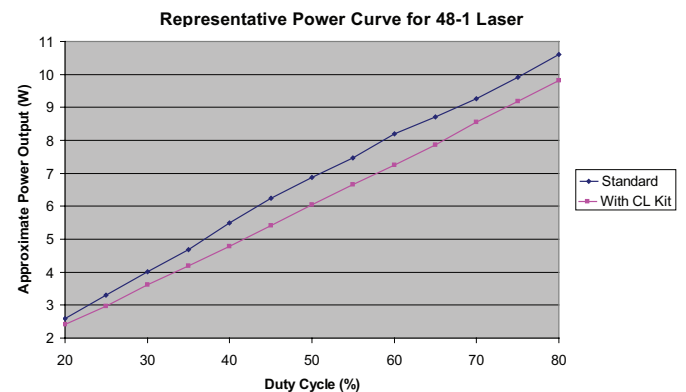


UC-2000 CO₂ Laser Controller Sold Separately

Specifications*	
Optical Transmission	92 \pm 1%
Input Power (optical)	150 W max.
Power Stability (guaranteed)**	\pm 2%
Control Range	20 - 80% of full output power
Servo Setting Time (90%)	2 msec (typical)
Control Frequency	5 kHz
Power Input (electrical)	12 Vdc @ 3 mA (from UC-2000)

* Specifications subject to change without notice

** Power instabilities are guaranteed not to exceed 2%



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