

Mira

Widely Tunable, Femtosecond, Picosecond and CW Flexible, Ultrafast Ti:Sapphire Lasers

Continuing to enabling new research, and still in demand since its introduction in 1991, Mira remains the most powerful and flexible ultrafast Ti:S laser system available — a testament to its great design, with many features that remain unique to this day.

For example, switching between femtosecond, picosecond and continuous-wave operation is fast and simple, while robust, passive Kerr lens modelocking reduces complexity and improves reliability. Every system also comes with Optima™ a suite of controls and diagnostics that greatly simplifies system optimization and daily operation.



FEATURES & BENEFITS

- Simple, stable Kerr lens modelocking for ease-of-use and reliability
- Optima™ simplifies system alignment, monitoring and control of the laser. It consists of:
 - Fast photodiode
 - Autoranging power monitor detector
 - CW detector
 - Automatic modelocking starter
 - β -Lock™ automatic GTI control for skip-free ps wavelength tuning – only available on Mira
- Integrated pump beam steering optics with multiple pump port options for easy pump alignment and flexible layout
- Auxiliary CW cavity included for ease of alignment and tunable CW output

APPLICATIONS

- Time-Resolved Spectroscopy
- Raman Spectroscopy (CARS)
- Ti:S Ultrafast Amplifier Seeding
- Terahertz Generation
- Material Modification Including Micro- and Nano-Texturing, LIPSS
- Quantum Communication Studies

SPECIFICATIONS ^{1,2}	Mira 900-D		Mira HP-D	
	Mira 900-F	Mira 900-P	Mira HP-F	Mira HP-P
Output Power (W) (depending on Pump Laser below)				
Verdi-G5	>0.75	>0.75		
Verdi-G8	>1.0	>1.0		
Verdi-G10	>1.4	>1.4		
Verdi-G12	>1.8	>1.8		
Verdi-G15	>2.2	>2.2	>2.8	>2.5
Verdi-G18			>3.5	>3.0
Verdi-G20			>4.0	>3.5
Tuning Range (nm)	700 to 1000 ³	700 to 1000 ³	690 to 1050 ³	700 to 1000 ³
Pulse Width ⁴	<115 fs	<2 ps	<130 fs ⁵	<2 ps
RMS Noise ⁶ (%)	<0.1	<0.1	<0.1	<0.1
Peak-to-peak power stability measured over 2 hours ⁷ (%)	<3	<3	<3	<3
Repetition Rate ⁸ (MHz)	76	76	76	76
Spatial Mode ⁹	TEM ₀₀	TEM ₀₀	TEM ₀₀	TEM ₀₀
1/e ² Beam Diameter at Exit Port (mm)	0.8 ±0.2	0.8 ±0.2	0.8 ±0.2	0.8 ±0.2
Full Angle Beam Divergence at Exit Port (mrad)	1.9 ±0.3	1.7 ±0.3	1.5 ±0.3	1.5 ±0.3
Polarization	Horizontal	Horizontal	Horizontal	Horizontal
STANDARD FEATURES				
Optima™				
- Fast photodiode	•	•	•	•
- Autoranging power monitor detector	•	•	•	•
- CW detector	•	•	•	•
- Automatic modelocking starter	•	•	•	•
- Relative humidity sensor	•	•	•	•
- β-Lock™ automatic GTI control for skip-free ps wavelength tuning	NA	•	NA	•
Purgeable enclosure for operation across the water absorption bands	•	•	•	•
Integrated pump beam steering optics with 3 pump port options for easy alignment and layout flexibility	•	•	•	•
Auxiliary CW cavity for ease of alignment and tunable CW output ¹⁰	• ¹¹	•	• ¹¹	•

1 Specifications apply only with Coherent pump lasers.

2 Specifications apply at 800 nm and standard rep. rate of 76MHz unless otherwise stated.

3 Wider coverage possible with short wave or extended long wave optics sets.

4 Based on sech² deconvolution of 0.65 times autocorrelation width.

5 In fs mode, the pulses are typically 1.5x the transform limit and so can be further compresses in an external compressor.

6 Measured rms in a 10 Hz to 20 MHz bandwidth.

7 Measured after warm-up with crystal cooling water maintained at ±0.1°C.

8 Rep. Rates in the range of 74 to 84 MHz available on request.

9 Typical M² <=1.1.

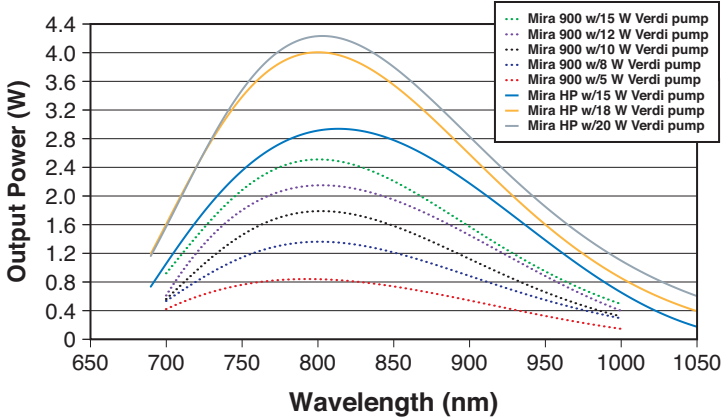
10 Additional test option required for optimum CW tuning performance.

11 Requires additional 3-plate BRP tuning element (not included) for skip-free tuning.

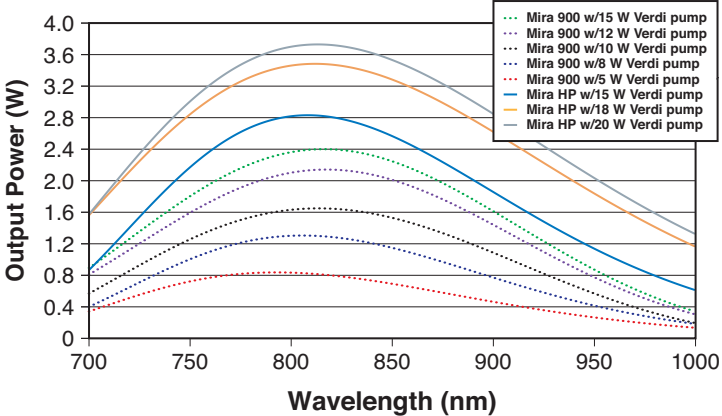
OPTIONS AND ACCESSORIES (NOT INCLUDED)	Mira 900-D		Mira HP-D	
	Mira 900-F	Mira 900-P	Mira HP-F	Mira HP-P
	Short Pulse Option (<70 fs)	Long Pulse Option (>3.5 ps or >6 ps)	Short Pulse Option (<70 fs)	Long Pulse Option (>3.5 ps)
	External Pulse Compressor (SPO-I or -II)		External Pulse Compressor (SPO-I or -II)	
	PowerTrack™ Active Pump Beam Steering (enhances power stability specification to <2% over 24 hours)			
	SynchroLock-AP - Repetition Rate Synchronization			
	Pulse Picker			
	Harmonic Generators (SHG, THG, FHG)			
	Mira OPO-X - Optical Parametric Oscillator (IR, Visible, fs, ps)			
ELECTRICAL AND COOLING REQUIREMENTS				
Voltage (VAC)	110 or 240			
Current Max. (A)	1			
Line Frequency (Hz)	50 or 60			
Cooling	Water cooled via pump laser cooling loop			
Laser Head Dimensions (L x W x H)	111.1 x 38.1 x 19.7 cm (43.75 x 15 x 7.75 in.)			
Beam Height	120.6mm (4.75 in)			

TYPICAL PERFORMANCE DATA

Typical Power Curves for Verdi-pumped Mira 900-F and Mira HP-F

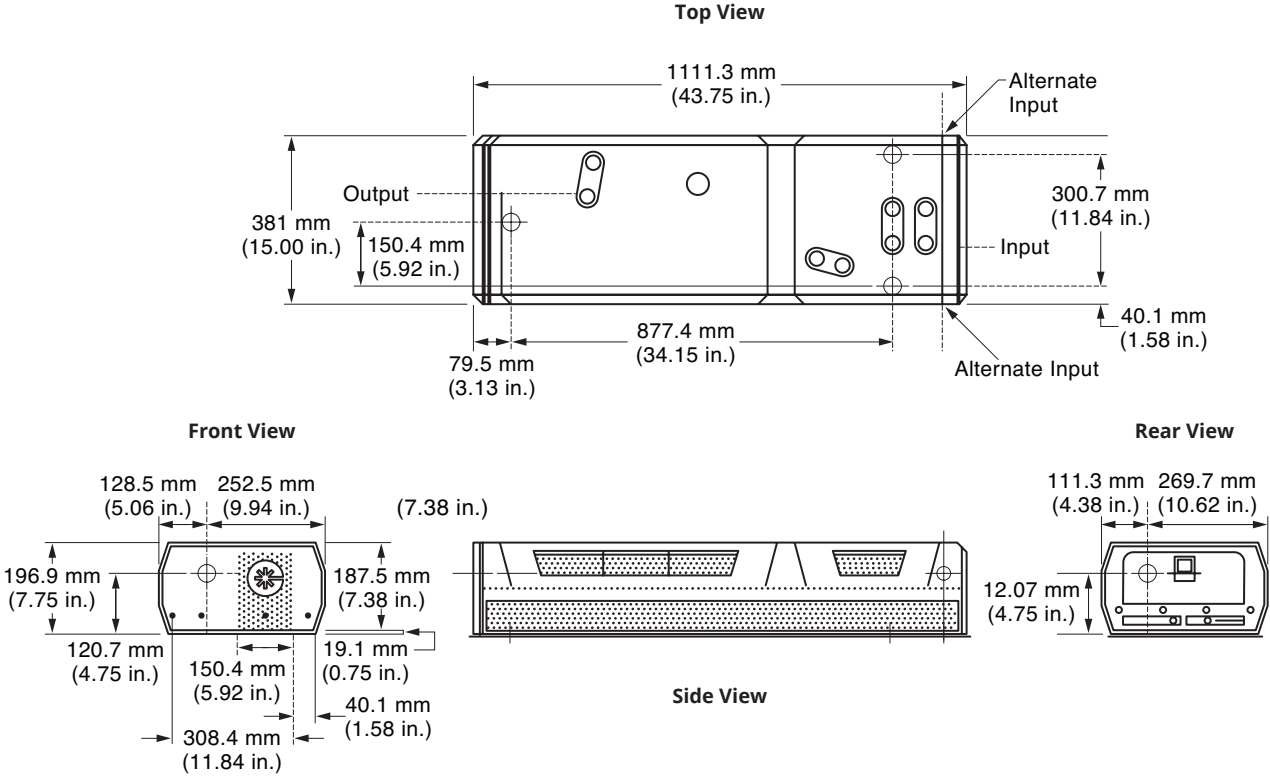


Typical Power Curves for Verdi-pumped Mira 900-P and Mira HP-P



MECHANICAL SPECIFICATIONS

Mira



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice. Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.
 Coherent offers a limited warranty for all Mira Lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.
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