

# Innova Sabre

## Ultra-Narrow Linewidth Configurable Wavelength Ion Plasma Laser

The Innova® Sabre™ Series provides the ultimate in high power ion laser performance combined with extraordinary ease of use.

Every Innova Sabre combines an extremely stable passive design with performance-enhancing active components. Sabre's powerful Sentry laser management system optimizes all beam parameters to deliver the highest beam quality. Time-saving features, such as automatic wavelength selection, automatic mode control, and automatic Search-and-Tune, bring increased productivity to every laser project. The overall result is optimal performance and completely hands-off operation.

The Innova Sabre R combines the extremely stable passive design of the Innova Sabre with most of its performance-enhancing features to provide a high performance, high-powered scientific ion laser.

All laser functions are accessed from a compact remote-control module. Standard RS-232/422 and optional IEEE-488 ports also allow you to control Sabre and Sabre R from your computer.



### Sabre Features

- Sentry System: Hands-off operation "Search and Tune" Automatic Mode Control
- PowerTrack™: Lowest noise, best mode, and best stability
- Series V™ Innova Plasma Tube: Longest tube lifetime, highest tube performance
- Integral Heat Exchanger: Enhanced stability and longer tube lifetime
- Low-Noise Magnet: Minimal acoustic disturbance of laser resonator and your experiment
- External Shutter: Laser safety mechanism
- v-Track: Stable and fast single-frequency operation

### Sabre R Features

- PowerTrack: Lowest noise, best mode, and best stability
- Series V Innova Plasma Tube: Longest tube lifetime, highest tube performance
- Integral Heat Exchanger: Enhanced stability and longer tube lifetime
- Low-Noise Magnet: Minimal acoustic disturbance of laser resonator and your experiment
- External Shutter: Laser safety mechanism
- v-Track: Stable and fast single-frequency operation



## SPECIFICATIONS<sup>1</sup>

Sabre Argon Systems with Dual Brewster Window (DBW) Tubes							
	Wavelength (nm)	DBW 10	DBW 15	DBW 20	DBW 25		
Multiline Visible		10.0	15.0	20.0	25.0		
		0.8	1.0	1.4	1.8		
		5.0	7.0	9.0	10.0		
		0.8	1.0	1.4	1.8		
		1.2	1.8	2.4	3.0		
		4.0	6.0	7.0	8.0		
		1.2	1.8	2.4	3.0		
		0.4	0.6	1.0	1.3		
		0.2	0.4	0.6	0.8		
		0.8	1.2	1.4	1.5		
	0.2	0.4	0.6	0.8			
	Wavelength (nm)	DBW 10/2	DBW 15/3	DBW 20/4	DBW 25/5	DBW 25/7	
UV	<b>333.6 to 363.8</b>	2.0	3.0	4.0	5.0	7.0	
UV	<b>351.1</b>	0.6	0.8	1.2	1.5	1.8	
UV	<b>363.8</b>	0.6	0.8	1.2	1.5	1.7	
Multiline Visible							
	LUV	<b>351.1 to 385.8</b>	1.2	2.0	2.8	3.6	4.4
	SUV	<b>300.3 to 335.8</b>	0.7	1.5	2.0	2.5	3.0
	DUV	<b>275.4 to 305.5</b>	0.3	0.6	0.9	1.2	1.6
	<b>275.4 only<sup>2</sup></b>	-	-	0.15	0.25	0.35	
Single-Line Options							
	SUV	<b>334.5</b>	-	-	0.40	0.45	0.50
	SUV/DUV	<b>302.4</b>	-	-	0.28	0.33	0.38
	DUV <sup>2</sup>	<b>275.4</b>	-	-	0.08	0.13	0.18
Sabre Argon Systems with Tunable Sealed Mirror (TSM) Tubes – Visible Region							
	Wavelength (nm)	TSM 10	TSM 15	TSM 20	TSM 25		
Multiline Visible		10.0	15.0	20.0	25.0		
		5.0	7.0	9.0	10.0		
		0.8	1.0	1.4	1.6		
		1.2	1.8	2.4	3.0		
		4.0	6.0	7.0	8.0		
		1.2	1.8	2.4	3.0		
		0.2	0.5	1.0	1.3		
		0.1	0.4	0.6	0.8		
		0.8	1.2	1.4	1.5		
		-	-	0.3	0.5		
Sabre Argon Systems with Tunable Sealed Mirror (TSM) – UV Region							
	Wavelength (nm)	TSM 2	TSM 3	TSM 4	TSM 5	TSM 7	
UV	<b>333.6 to 363.8</b>	2.0	3.0	4.0	5.0	7.0	
UV	<b>351.1</b>	0.6	0.8	1.2	1.5	1.8	
UV	<b>363.8</b>	0.6	0.8	1.2	1.5	1.7	
Multiline Visible							
	LUV	<b>351.1 to 385.8</b>	1.2	2.0	2.8	3.6	4.4
	SUV	<b>300.3 to 335.8</b>	0.7	1.5	2.0	2.5	3.0
	DUV	<b>275.4 to 305.5</b>	0.3	0.6	0.9	1.2	1.6
	<b>275.4 only<sup>2</sup></b>	-	-	0.15	0.25	0.35	
Single-Line Options							
	SUV	<b>334.5</b>	-	-	0.40	0.45	0.50
	SUV/DUV	<b>302.4</b>	-	-	0.28	0.33	0.38
	DUV <sup>2</sup>	<b>275.4</b>	-	-	0.08	0.13	0.18

<sup>1</sup> Power in Watts. Standard specifications appear in bold type. Other lines and wavelength ranges available as options.

<sup>2</sup> The 275.4 nm single-line wavelength can be obtained with either wavelength-selective mirrors or a prism wavelength selector. Under Multiline Options, 275.4 nm is specified using wavelength-selective mirrors; under Single-Line Options, 275.4 nm is specified using a prism wavelength selector. Lower powers are specified using the prism wavelength selector.

## SPECIFICATIONS<sup>1</sup>

Sabre Krypton System with Dual Brewster Window (DBW) Tube					
Wavelength (nm)					
Red	<b>647.1 to 676.4</b>	4.6			
Red	<b>676.4</b>	0.9			
Red	<b>647.1</b>	3.5			
IR	<b>752.5 to 799.3</b>	1.6			
IR	<b>799.3</b>	0.3			
IR	<b>752.5</b>	1.2			
Yellow/Green	<b>520.8 to 568.2</b>	3.3			
Yellow/Green	<b>568.2</b>	1.1			
Yellow/Green	<b>530.9</b>	1.5			
Yellow/Green	<b>520.8</b>	0.7			
Blue/Green	<b>468.0 to 530.9</b>	3.5			
Blue/Green	<b>482.5</b>	0.4			
Blue/Green	<b>476.2</b>	0.4			
Blue/Green	<b>468.0</b>	0.5			
Violet	<b>406.7 to 415.4</b>	3.0			
Violet	<b>415.4</b>	0.28			
Violet	<b>413.1</b>	1.8			
Violet	<b>406.7</b>	0.9			
UV	<b>337.5 to 356.4</b>	2.0			
UV	<b>350.7</b>	0.8			

Sabre Argon Systems – Single-Frequency Power					
Wavelength (nm)	DBW 10 TSM 10	DBW 15 TSM 15	DBW 20 TSM 20	DBW 25 TSM 25	
<b>514.5</b>	3.0	4.2	5.4	6.0	
<b>488.0</b>	2.4	3.6	4.2	4.8	
<b>457.9</b>	0.5	0.7	0.8	0.9	

Wavelength (nm)	DBW 10/2 TSM 2	DBW 15/3 TSM 3	DBW 20/4 TSM 4	DBW 25/5 TSM 5	DBW 25/7 TSM 7
<b>351.1</b>	0.35	0.5	0.7	0.85	1.0
<b>363.8</b>	0.35	0.5	0.7	0.85	1.0

Sabre Krypton System – Single-Frequency Power		
Wavelength (nm)		
<b>647.1</b>	2.1	
<b>413.1</b>	1.1	
<b>350.7</b>	0.5	

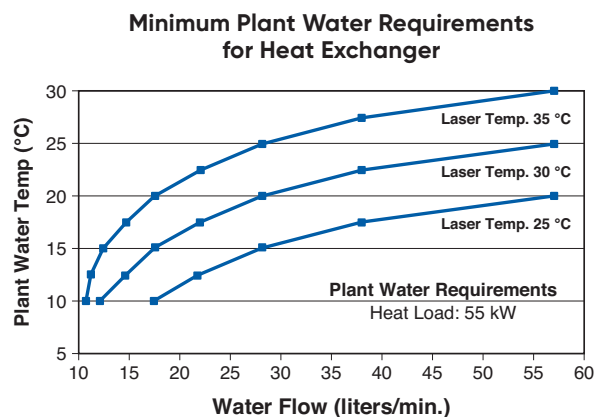
<sup>1</sup> Power in Watts. Standard specifications appear in bold type. Other lines and wavelength ranges available as options.

## SPECIFICATIONS

BEAM PARAMETERS <sup>1</sup>				
Wavelength (nm)	514.5	351.1	647.1	413.1
Beam Diameter (at 1/e <sup>2</sup> points) (mm)	2.1	1.7	2.0	1.6
Beam Divergence (full angle) (mrad)	0.35	0.31	0.50	0.40
Beam Pointing Stability <sup>3</sup>				
Angle	<5.0 μrad			
Offset	<5.0 μm			
Long-Term Power Stability <sup>4</sup> (%)				
Light Regulation	±0.5			
Current Regulation	±1.0			
Optical Noise <sup>5</sup> (rms) (%)	0.2	0.2	0.3	0.2
Frequency Drift <sup>6</sup>	≤30 MHz/°C			
Temperature Range for Mode-Hop-Free Operation <sup>6</sup>	±10 °C			
Warm-up Time to Mode-Hop-Free Operation <sup>7</sup>	≤5 min.			
UTILITY REQUIREMENTS				
Input Power	3-phase with ground			
Voltage	480 VAC, ±10%, 50 or 60 Hz			
Max. Current Draw	70 A/phase at 480 VAC			
System Weights	<b>Crated</b>			
Laser Head	195 kg (430 lbs)			
Power Supply	134 kg (295 lbs)			
Heat Exchanger	102 kg (225 lbs)			
System Weights	<b>Uncrated</b>			
Laser Head	109 kg (240 lbs)			
Power Supply	107 kg (235 lbs)			
Heat Exchanger	75 kg (165 lbs)			
Recommended Plant Water Parameters				
Temperature	≤25 °C			
Pressure Differential	40 psi to 60 psi			

1 All performance parameters are measured at specified output power at 514.5 nm or 351.1 nm  
 2 Beam diameter is measured at the output coupler mirror.  
 3 Per °C change in air or water temperature.  
 4 Maximum peak variation after a 15-minute warm-up.  
 5 Measured with a 10Hz to 2 MHz photodiode driving a resistive load at 514.5 nm or 351.1 nm at specified ou-put power levels.  
 6 Change in ambient temperature.  
 7 Wavelength the same as at shut-down; key switch left on.

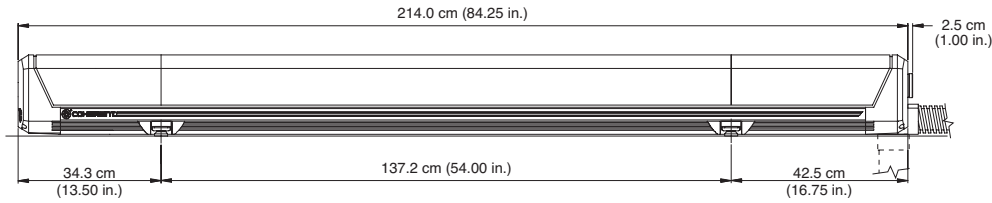
## TYPICAL PERFORMANCE DATA



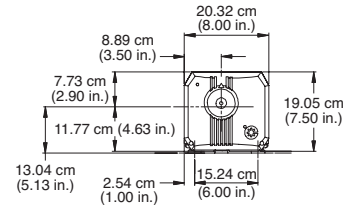
## MECHANICAL SPECIFICATIONS

### Innova Sabre

#### Side View

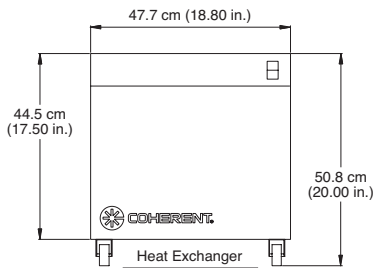


#### Front View

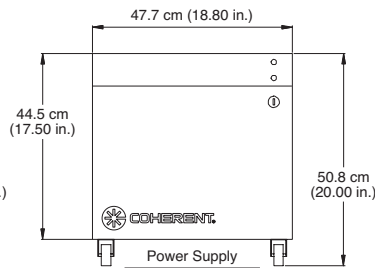


### Heat Exchanger/Power Supply

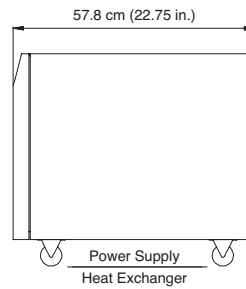
#### Front View



#### Front View

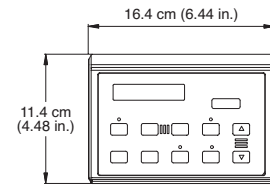


#### Side View

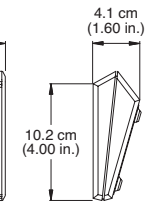


### Remote

#### Front View



#### Side View



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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 Innova Sabre Lasers. For full details of this warranty coverage, please refer to the Service section at [www.Coherent.com](http://www.Coherent.com) or contact your local Sales or Service Representative.

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