

High performance *t-series* technology in a fully integrated package

firestar-ti 60, 80 & 100W



Maximum power and performance is the drive behind *firestar t*-technology. Developed in 2001, the highlights of this design are the fast rise/fall time (typically <math><50\mu\text{sec}</math>) and high beam quality.

In 2009, responding to market demands for more compact and lower cost lasers, while retaining the performance and reliability of the existing *t-series*, we developed a new RF technology to eliminate the separate RF power supply and associated cables.

The resulting *firestar ti-series* is compact, lower cost, more energy efficient, and delivers the high power, fast pulsing, and optical quality essential for applications such as laser coding and large area engraving, where high-speed scanning or modulating of the laser beam is required.

The *ti-series'* combination of compact size, high performance, and low price allows our OEM customers to succeed in their worldwide markets.

Specifications

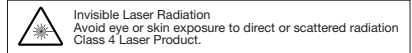
Model	<i>ti60</i>	<i>ti60W</i>	<i>ti80</i>	<i>ti80W</i>	<i>ti100W</i>
Output Power	60W		80W		100W
Mode Quality	$M^2 \leq 1.2$		$M^2 \leq 1.2$		$M^2 \leq 1.2$
Ellipticity	<1.2		<1.2		<1.2
Rise Time	<75 μsec		<75 μsec		<75 μsec
Beam Diameter	2.0 \pm 0.3mm		2.0 \pm 0.3mm		2.0 \pm 0.3mm
Beam Divergence (full angle)	7.0mR		7.0mR		7.0mR
Wavelength	10.57-10.63 μm		10.57-10.63 μm		10.57-10.63 μm
Power Stability, from cold start (guaranteed)	$\pm 7\%$		$\pm 7\%$		$\pm 7\%$
Polarization	Linear (Vertical)		Linear (Vertical)		Linear (Vertical)
Cooling	Air	Water	Air	Water	Water
Heat Load (max)	900W		1200W		1700W
Flow Rate, Air	150 CFM x 2	N/A	190 CFM x 2**	N/A	N/A
Flow Rate, Water (18-22°C)	N/A	1-2 GPM, <60 PSI	N/A	1-2 GPM, <60 PSI	1-2 GPM, <60 PSI
Input Voltage / Current	48 VDC / 18A		48 VDC / 22A		48VDC / 35A
Dimensions* (in)	20.7 x 4.5 x 5.8	21.4 x 4.1 x 5.9	20.7 x 4.5 x 5.8	21.4 x 4.1 x 5.9	21.4 x 4.1 x 5.9
(mm)	526 x 114 x 148	544 x 104 x 150	526 x 114 x 148	544 x 104 x 150	544 x 104 x 150
Weight*	28.9 lbs / 13.1 kg	26.2 lbs / 11.9 kg	28.9 lbs / 13.1 kg	26.2 lbs / 11.9 kg	26.2 lbs / 11.9 kg

* Air-cooled models are measured and weighed without optional fan cover

**Static air pressure 0.7 inch H2O (173Pa)

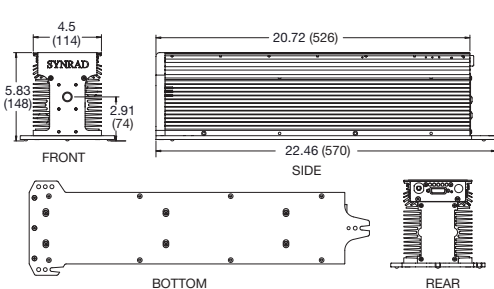
Beam specifications measured at $1/e^2$.

All specifications are preliminary and are subject to change without notice.

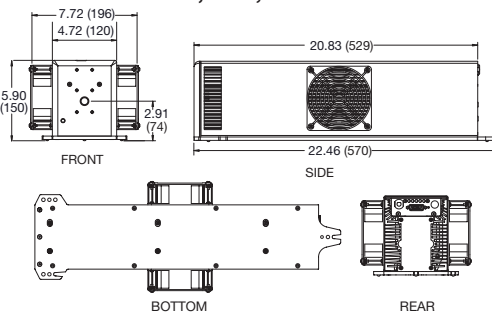


Outline & Mounting

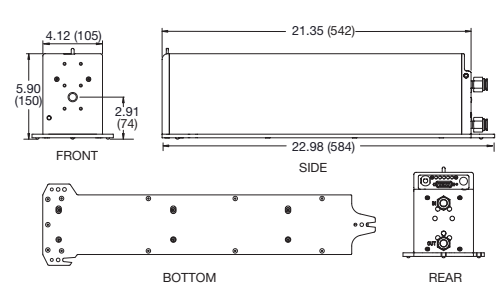
ti60, ti80, OEM, air-cooled



ti60, ti80, fan-cooled



ti60, ti80, ti100, water-cooled



Dimensions are in inches (millimeters)

ti-series HS – High Stability Water Cooled CO₂ Lasers



www.synrad.com



- Output power > 100W**
- Low cost of ownership**
- Compact design**
- Excellent power stability**
- Easy-to-integrate & upgrade, robust design**
- Synrad performance & reliability**

Introducing a high-stability version of the ti-series lasers which deliver average output power in the range of 60 to 100W. With excellent power stability coupled with the proven performance features of the ti-series like the fast rise/fall times and exceptional beam quality, you have all you need for high-speed processing in precision applications which demand power stability.

The HS series are water-cooled and easy to integrate into you OEM systems or upgrade from the Firestar v or ti series. The HS series has the smallest footprint in its class and a strong, robust design for years of performance. What makes the HS-series unique is the incredible power stability, it guarantees warm power stability of $\pm 2\%$, making this the laser series of choice for applications that are sensitive to power density fluctuations such as electronics film processing, 3D printing, and denim fabric marking. Its low cost of ownership and energy efficient nature make it a workhorse.

Firestar ti-series HS Core Features:

- Based on ti-series' renowned fast rise/fall time
- Excellent power stability and pulsing characteristics
- High modulation frequency up to 160 kHz
- Integrated 48V RF design
- Most compact laser in its class
- Low-cost and energy efficient
- Built in "tickle" generator
- Built in "Strike Detect" sensing and feedback
- Color-coded LEDs mirror user outputs
- Robust construction
- Easily upgradable and easy integration with common beam exits with the Firestar v and ti series lasers

Specifications:

	ti100hs	ti80hs	ti60hs
Average Output Power (minimum) ^{1,2}	100W	80W	60W
Wavelength	10.57 - 10.63 μm	10.57 - 10.63 μm	10.57 - 10.63 μm
Rise Time (typical, tested at 1kHz, 50% Duty Cycle)	< 75 μs	< 75 μs	< 75 μs
Power Stability from Cold Start ² (typical)	$\pm 4\%$	$\pm 4\%$	$\pm 4\%$
Power Stability after 3 Minutes ² (guaranteed)	$\pm 2\%$	$\pm 2\%$	$\pm 2\%$
Duty Cycle Range	1% - 100%	1% - 100%	1% - 100%
Operating Frequency	0 - 160 kHz	0 - 160 kHz	0 - 160 kHz
Beam Waist Diameter (at 1/e ²) ²	2.0mm \pm 0.3mm	2.0mm \pm 0.3mm	2.0mm \pm 0.3mm
Beam Diameter at Faceplate (at 1/e ²)	2.0mm \pm 0.3mm	2.0mm \pm 0.3mm	2.0mm \pm 0.3mm
Beam Divergence, full angle (at 1/e ²) ²	7.0 mrad	7.0 mrad	7.0 mrad
Mode Quality ²	M ² \leq 1.2	M ² \leq 1.2	M ² \leq 1.2
Ellipticity ²	<1.2	<1.2	<1.2
Polarization	Linear (vertical)	Linear (vertical)	Linear (vertical)
Cooling	Water	Water	Water
Heat Load (maximum)	1700W	1200W	900W
Flowrate ³	1.0-2.0GPM	1.0-2.0GPM	1.0-2.0GPM
Input Voltage/Current (maximum)	48V/35A	48V/22A	48V/18A
Dimensions (inches)	21.4x4.1x5.9	21.4x4.1x5.9	21.4x4.1x5.9
Dimensions (mm)	544x104x150	544x104x150	544x104x150
Weight	42lbs / 19kg	42lbs / 19kg	42lbs / 19kg

Specifications subject to change without notice.

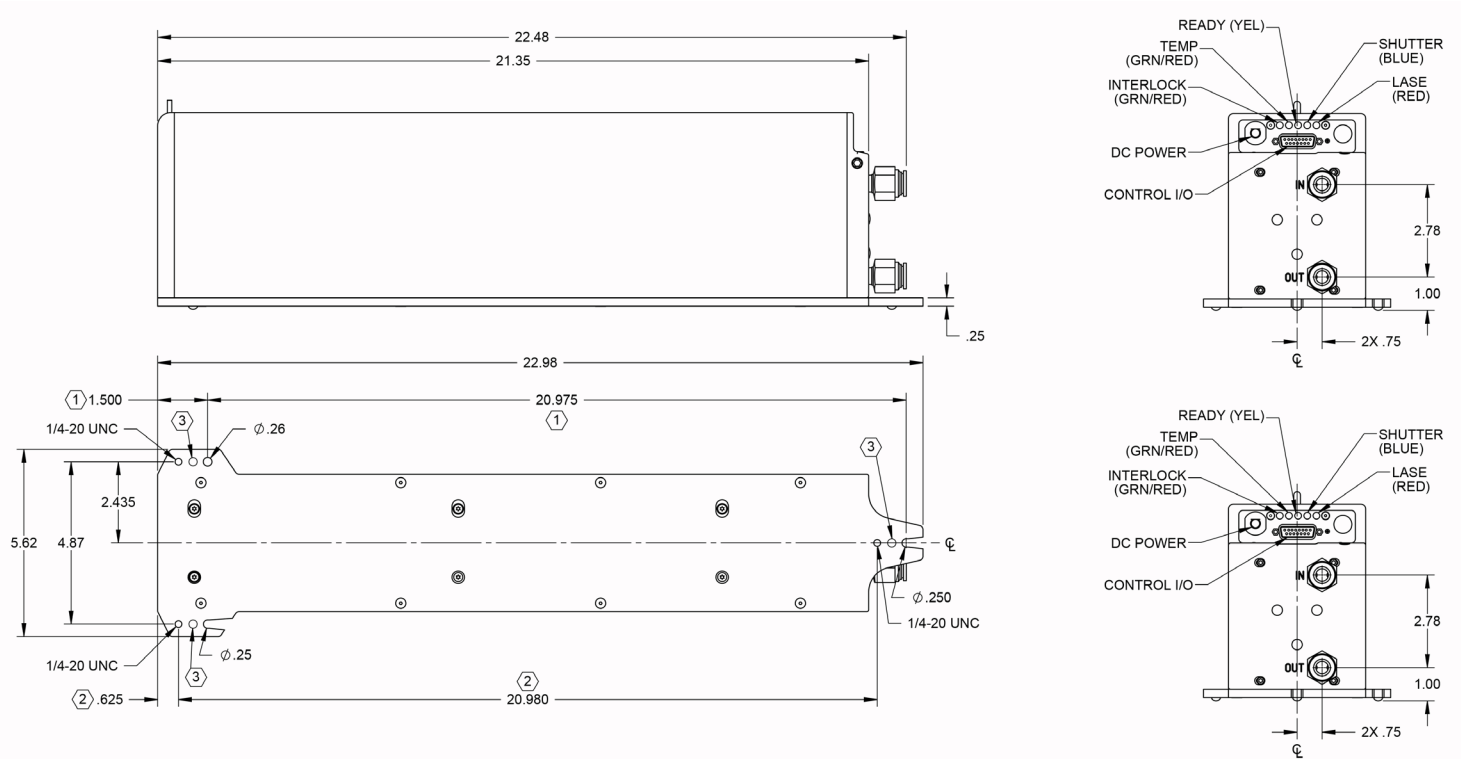
1. Power level guaranteed for 24 months from date of shipment, regardless of hours, provided laser is operated within the recommended coolant flowrate and operating temperature range

2. Measured at 5kHz, 99% duty cycle, 2 GPM and 20° C water temperature

3. At coolant temperatures above 22°C, derate power 0.5 W/°C to 1 W/°C up to a coolant temperature of 28°C

ti-series HS – High Stability Water Cooled CO₂ Laser

Outline and Mounting:



Typical Applications:

The high stability, average power, fast rise and fall times, makes the ti-series HS the laser of choice for applications sensitive to power fluctuations like electronic films and denim. Use the ti-series HS for 3D printing, cutting film for the electronics industry, the sensitive business of marking denim and the detail needed for marking wood.



3D Printing


Cutting electronic films



Marking denim

Marking wood

These are only some examples of potential uses for the firestar ti100HS. Contact your Synrad Representative to determine the best laser for your application.

 Invisible Laser Radiation.
Avoid eye or skin exposure to direct or scattered radiation.
Class 4 Laser Product.



To learn more about the firestar ti100HS, scan here

