



firestar

*f*series

100, 200 & 400W CO₂ Lasers



Continuing our 20 year tradition as the world's leading provider of sealed CO₂ lasers, Synrad developed the *firestar f-series* of high-power, fully integrated lasers to meet the challenges of a global manufacturing marketplace that requires a new standard of performance, price, and reliability. The *f-series* lasers deliver the industry's most cost-effective combination of high power with near perfect beam quality, in a compact package designed for the most rugged industrial environments.

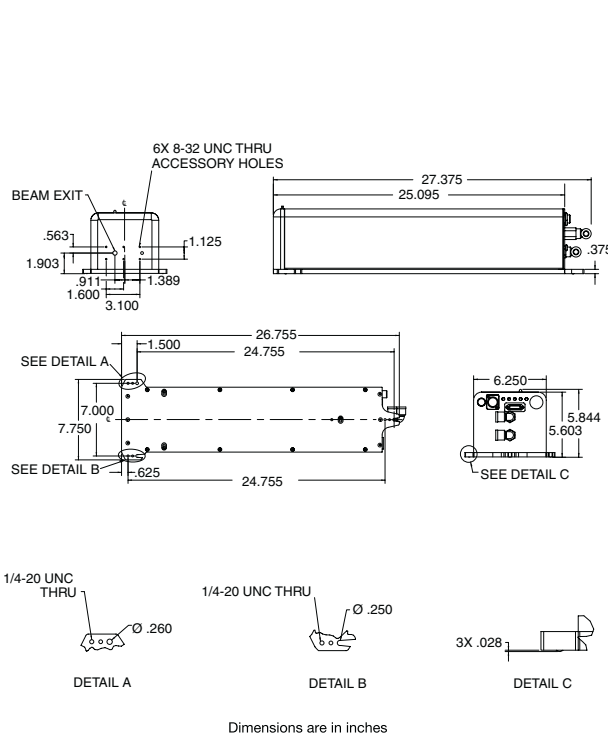
With output powers ranging from 100 to 400 watts, *firestar f-series* lasers excel in today's most challenging materials processing applications. Whether mounted on a robotic arm, integrated into a high-speed marking system, or incorporated into a large area flatbed cutter, Synrad's *f-series* lasers have the power, package, and capabilities to do the job fast, on-time, and in budget. They are the best high-power CO₂ laser solution available for applications such as metal cutting and welding, dieboard cutting, complex signage, and textile processing.

With fully integrated RF supplies and clean, simple interfaces to water-cooling and control signals, *firestar f-series* lasers speed integration time while providing the maximum flexibility for system designers, OEM manufacturers, and full turnkey system providers.

All Synrad *firestar f-series* laser models feature:

- Integrated RF Supply
- Low Cost
- Excellent Beam Quality
- Rugged, 3-point Mounting
- Internal Tickle Signal
- 5-24VDC I/O Ports
- Remote Control / Status via 15-Pin D Connector

The industry's smallest, fully integrated 100W laser



firestar **f100**

The *firestar f100* is constructed around the basic building block of all *f-series* lasers - Synrad's patented, compact, free-space resonator tube. Together with the *f-series'* innovative, on-board RF supply, the *f100* represents the industry's smallest fully RF integrated 100W laser solution.

The *firestar f100's* tube design creates a laser that is only 25.1 inches in length and operates from a single low-cost 96 VDC power supply. In applications where space constraints can be a key project requirement, the *f100* is a perfect fit.

- Low Cost Design
- Small Footprint, Compact Size
- Water-Cooled • Linear Polarization
- OEM & Keyswitch models

The compact, fully RF-integrated 200W laser

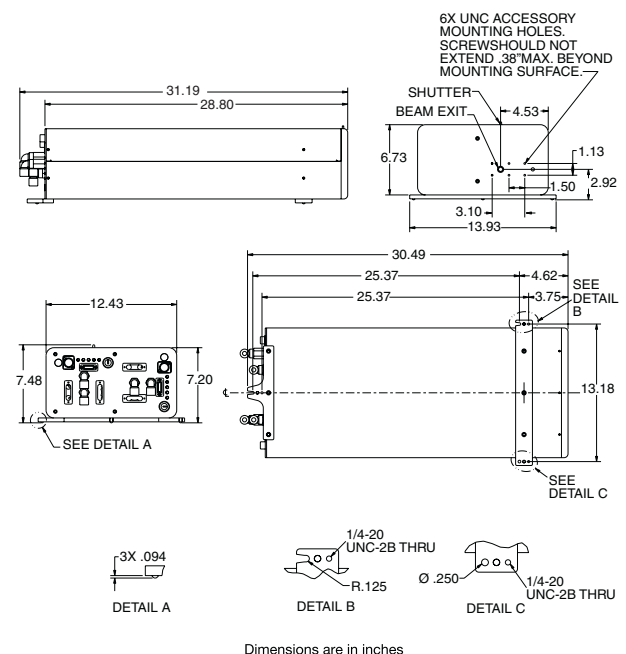


firestar **f200**

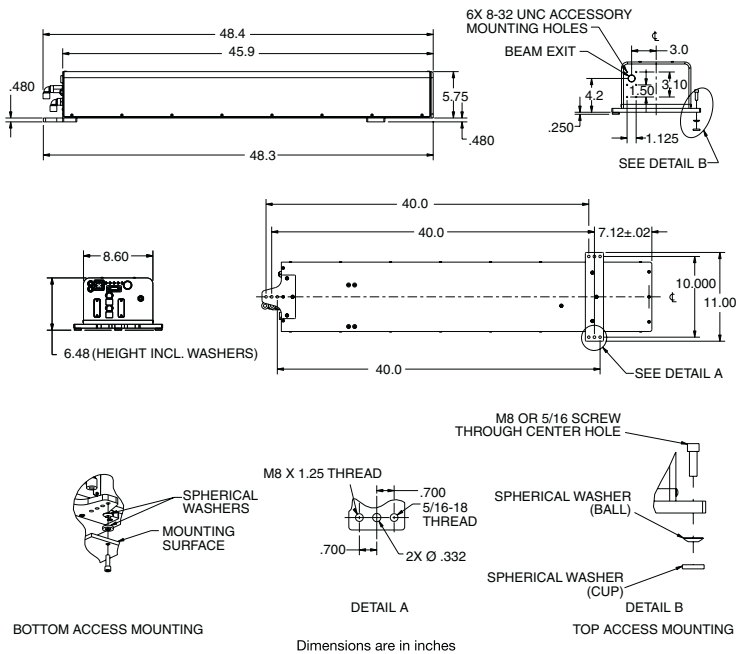
Utilizing our industry proven *Duo-Lase*[®] technology to combine two *f100* lasers into a single package, Synrad has created the smallest, fully integrated, 200 watt CO₂ laser on the market. Measuring only 28.8 inches long, Synrad's *f200* provides all the performance of much larger lasers with the convenience of a single, compact laser source.

The *f200's Duo-Lase*[®] configuration produces a randomly polarized beam, making it ideal for complex cutting applications where kerf control is a critical issue. The compact size, high performance, and low cost of the *f200* make it ideal for integration into laser engravers, mounting on robotic arms, or incorporation into flatbed cutting systems.

- Low Cost Design
- Small Footprint, Compact Size
- Random Polarization
- OEM & Keyswitch models



More processing power from a 200W laser



By expanding upon the *f-series*' core building blocks, Synrad's patented free-space resonator design and fully integrated RF drive, the newest member of Synrad's *firestar f-series*, the 200W *f201*, provides the best cost-per-delivered-watt available in today's industrial laser marketplace.

The 200W single tube *f201*, with its innovative design, displays excellent power stability and features internal beam conditioning that delivers a near-perfect beam in both the near and far field.

With a Beam Quality Number (M^2) that approaches theoretical limits, the *f201* delivers more focused processing power than lasers with higher raw output numbers. Complete with gas purge (standard) to maintain internal optic integrity and water cooling for higher electronic component efficiencies and longer lifetimes, the *f201* is built to last and manufactured for the toughest industrial environments.

- Near-Perfect Beam Quality • Excellent Power Stability
- Linear (Horizontal) Polarization • Gas Purge (Standard)
- Metric and English Mounting, Standard • OEM model

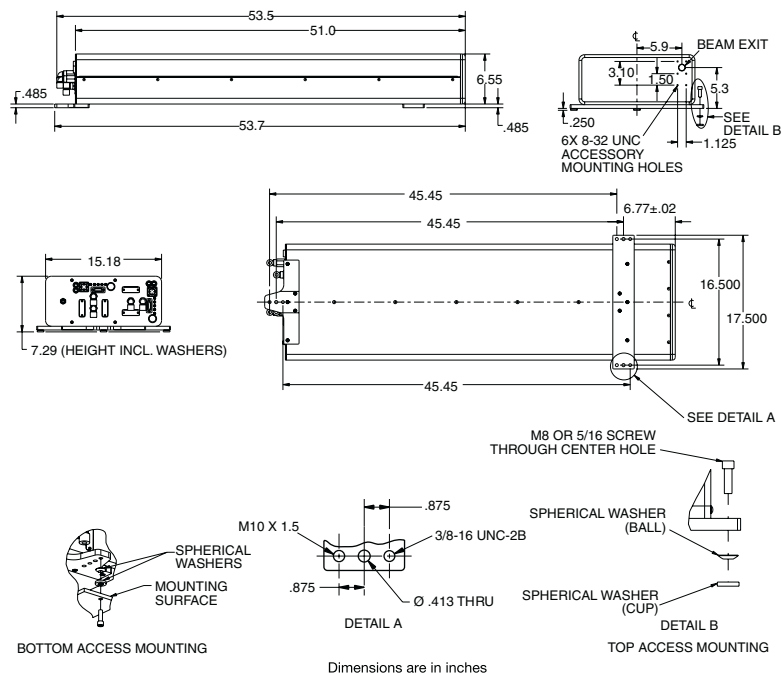
The most powerful, RF-integrated, sealed CO₂ laser on the market



Using our *Duo-Lase*® technology to combine two *f201* lasers into a single package, the *f400* offers users all the advantages of the *f201* at the 400W power level.

Like the *f201*, the *f400* delivers a near-perfect beam in both the near and far field. This difference in focused power density makes traditional watt-based comparisons obsolete. For example, when compared to other lasers that specify 500W output, but with poorer beam quality, the *firestar f400* delivers an additional 23% of usable laser power.

The *f400*, with its innovative tube design, offers excellent power stability, a distinct advantage in any cutting application where power control is essential. The internal RF supply makes it easy to mount onto systems where the laser moves.



- Near-Perfect Beam Quality • Excellent Power Stability
- Random Polarization • Gas Purge (Standard)
- Metric and English Mounting, Standard • OEM model



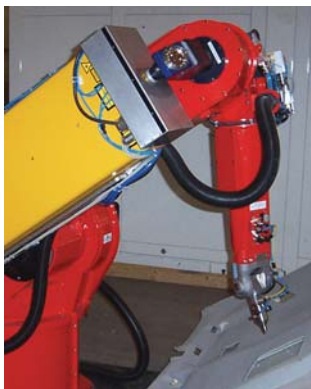
Specifications

Model	f100	f200	f201	f400
Output Power	100W	200W	200W	400W
Mode Quality	TEM ₀₀ , 95% Purity M ² <1.2±0.1	TEM ₀₀ , 95% Purity M ² <1.2±0.1	TEM ₀₀ , 98% Purity M ² <1.2±0.1	TEM ₀₀ , 98% Purity M ² <1.2±0.1
Ellipticity	<1.2	<1.2	<1.2	<1.2
Rise Time	<150µsec	<150µsec	<150µsec	<150µsec
Beam Diameter	3.5mm	3.5mm	4.5mm	4.5mm
Beam Divergence (full angle)	4.0mR	4.0mR	4.0mR	4.0mR
Wavelength	10.2-10.7µm	10.2-10.7µm	10.2-10.7µm	10.2-10.7µm
Power Stability, from cold start (guaranteed) after 2 minutes (typical)	±10% ±6%	±10% ±6%	±7% ±5%	±7% ±5%
Polarization	Linear (Horizontal)	Random	Linear (Horizontal)	Random
Cooling	Water	Water	Water	Water
Heat Load (max)	2000W	4000W	4000W	8000W
Flow Rate, Water (18-22°C)	2 GPM, <60 PSI	4 GPM, <60 PSI	2 GPM, <60 PSI	4 GPM, <60 PSI
Input Voltage / Current	96 VDC / 18A	96 VDC / 36A	96 VDC / 36A	96 VDC / 72A
Dimensions (in)	25.1 x 6.3 x 5.6	28.8 x 12.4 x 7.2	48.4 x 8.6 x 6.5	53.5 x 15.2 x 7.3
(mm)	638 x 160 x 142	732 x 315 x 183	1229 x 218 x 165	1359 x 386 x 185
Weight	38 lbs / 17.2 kg	80 lbs / 36.3 kg	96 lbs / 43.5 kg	170 lbs / 77.1 kg

Beam specifications measured at 1/e².

Specifications subject to change without notice.

Class 4 Laser Product.



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