Novanta

i401 TO i501 CO_2 LASER UPGRADE GUIDE

UNLEASH OVER 500W OF STABLE CO_2 LASER POWER

The i501 delivers true continuous wave (CW) power with over 500 W of output, enabling faster throughput and precision detail in demanding applications.

Breakthrough Dynamic Range - a 1%–100% duty cycle, the i501 switches effortlessly between low power for fine features and high power for speed, offering the largest dynamic range in its class.

Upgrade Without Disruption - The i501 matches the i401 footprint, making integration seamless. The mounting features and dimensions (48.3 in × 8.2 in × 11.8 in) are identical, with a minimal 9% (5.5 kg/12 lbs.) increase in weight.

Feature	i401	i501	Benefit
Average Power Output	> 400 W	> 500 W	+25% power boost
Beam Quality M^2	< 1.2	< 1.2	Same high-quality beam
Duty Cycle	1% - 100% (CW)	1% - 100% (CW)	Same true CW Operation
Operating Frequency	0–100 kHz	0–100 kHz	No change
Power Stability (after 3 minutes)	±5%	±5%	No change
Beam Diameter	6.7 mm ± 0.7 mm	6.7 mm ± 0.7 mm	No change
Divergence	2.5 mrad ± 0.3 mrad	2.5 mrad ± 0.3 mrad	No change
Polarization	Linear (45°)	Linear (45°)	No change
DC Voltage Input	48 VDC	48 VDC	No change
Maximum Current	125 A	175 A	Upgrade may be required for power supply and cabling

ELECTRICAL REQUIREMENTS

Parameter	i401	i501	Notes
DC Input Voltage	48 VDC	48 VDC	No change
Max Current	125 A	175 A	Upgrade may be required for power supply and cabling

COOLING REQUIREMENTS

Parameter	i401	i501	Notes
Max Heat Load	6000 W	8500 W	Upgrade may be required for chiller capacity
Coolant Temp	18–22°C	18–22°C	No change
Min Flow Rate	4.0 GPM, < 60 PSI	4.2 GPM, < 60 PSI	Upgrade may be required for increased flow rate
Purge Gas	Optional	Mandatory	Installation of purge gas connection is needed

ENVIRONMENTAL & OTHER CONDITIONS

Parameter	i401	i501	Notes
Ambient Temp	15–40°C	15–40°C	No change
Humidity	95%, non-condensing	95%, non-condensing	No change
Weight	130 lb / 59.0 kg	142 lbs / 64.5 kg	Confirm system can support heavier weight

INTEGRATION CHECKLIST

- [ ] **Verify power supply** can deliver at least **175 A at 48 VDC**
- [ ] **Verify cooling system** can handle **8.5 kW heat load** and **4.2 GPM flow rate**
- [ ] **Install purge gas system**
- [ ] **Update system documentation** with higher output power specs
- [ ] **Train operators** on increased power capabilities
- [ ] **Adjust application parameters** for higher output power

For installation assistance or questions, please contact your local Novanta Account Manager. They will connect you with the appropriate branch of our technical support team.

CONTACT US

Americas, Asia Pacific
Novanta Headquarters
Bedford, USA
P +1-781-266-5700
Photonics@Novanta.com

Europe, Middle East, Africa
Novanta Europe GmbH
Wackersdorf, Germany
P +49 9431 7984-0
Milan, Italy
P +39-039-793-710
Photonics@Novanta.com

China
Novanta Sales & Service Office
Shenzhen, China
P +86-755-8280-5395
Suzhou, China
P +86-512-6283-7080
Photonics.China@Novanta.com

Japan
Novanta Service & Sales Office
Tokyo, Japan
P +81-3-5753-2460
Photonics.Japan@Novanta.com