

TruDiode 151/301
TruDiode 603/903

Direct diode
lasers



Low power direct diode lasers from TRUMPF.

Flexible and reproducible material processing.

The TruDiode 151 & 301 are ideal for plastic welding and thin gauge metal welding, while the TruDiode 603 & 903 can weld up to 2 mm depths and are also perfect for small part brazing, deposition and laser hardening. With the integrated LEM (laser energy monitoring) the TruDiode lasers maintain a power stability of $\leq 1\%$ over the entire lifetime of the laser.

Easy and safe operation.

The TRUMPF TruControl 1000 interface is standard and offers a simple, yet extensive operator interface which controls power levels, pulse shapes, PFO and the dual channel E-stop safety circuit, to mention a few. TruControl supports the standard interfaces such as parallel I/O, DeviceNet and Profibus, and more. Multiple outputs are available and are fiber delivered for easy integration.



Low cost of ownership.

The latest generation diode modules are more powerful, smaller and more efficient than their predecessor. This high efficiency combined with virtually no moving parts yields a laser with very low cost of ownership.

Technical data

	TruDiode 151	TruDiode 301	TruDiode 603	TruDiode 903
Power at the workpiece	150 watts	300 watts	600 watts	900 watts
Power stability	$\leq \pm 1\%$ @ 100% power	$\leq \pm 1\%$ @ 100% power	$\leq \pm 1\%$ @ 100% power	$\leq \pm 1\%$ @ 100% power
Wavelength	920 – 970 nm	920 – 1050 nm	920 – 1050 nm	920 – 1050 nm
Modulation frequency	3 kHz	3 kHz	3 kHz	3 kHz
BPP	< 8 mm x mrad	< 8 mm x mrad	< 16 mm x mrad	< 16 mm x mrad
Polarization	random	random	random	random
Fiber type	LLK-A non-interchangeable	LLK-A non-interchangeable	LLK-D plug and play	LLK-D plug and play
Fiber diameter	150 μm (optional 200, 300, 400 or 600 μm), NA ≤ 0.12		300, 400 or 600 μm , NA ≤ 0.12	
Fiber lengths	6 or 15 m ¹	6 or 15 m ¹	10 - 100 m	10 - 100 m
Beam management	Optional 2 output external beam switch ²	Optional 2 output external beam switch ²	up to 4 outputs	up to 4 outputs
Cabinet type	19 in. rack or stand alone rack cabinet		TRUMPF cabinet style "C"	TRUMPF cabinet style "C"
Dimensions (w x d x h)	Rack version 483 x 513 x 495 mm Cabinet version 600 x 800 x 1500 mm		980 x 1220 x 715 mm	980 x 1220 x 715 mm
Cooling	External cooling temp. 25 \pm 1 °C		W-W heat exchanger included; external water supply 5 – 22 °C \leq 6 bar	
Power requirements	Version 19 in.: 230V ($\pm 15\%$) @ 50Hz – 60Hz Stand alone or optional 19 in. configuration 380V (-10%) – 460V (+10%) @ 50Hz (-3Hz) – 60Hz (+3Hz); CW rotation		380V (-10%) – 460V (+10%) @ 50Hz (-3Hz) – 60Hz (+3Hz); CW rotation	

¹ When using optional switch box, fiber is 6 m on input side and 6 or 15 m on output side.

² When using optional switch box only a single safety circuit is available. Output fibers must have a larger fiber diameter than the input fiber. 2x100 or 50/50 is possible.

TRUMPF Laser Technology Center

47711 Clipper Street · Plymouth Township, MI 48170 · Phone 734 454 7200 · Fax 734 354 9769

E-Mail oeminfo@us.trumpf.com · Homepage www.us.trumpf.com

02.2013



TruDiode
3006/6006:

High power,
long lifetime

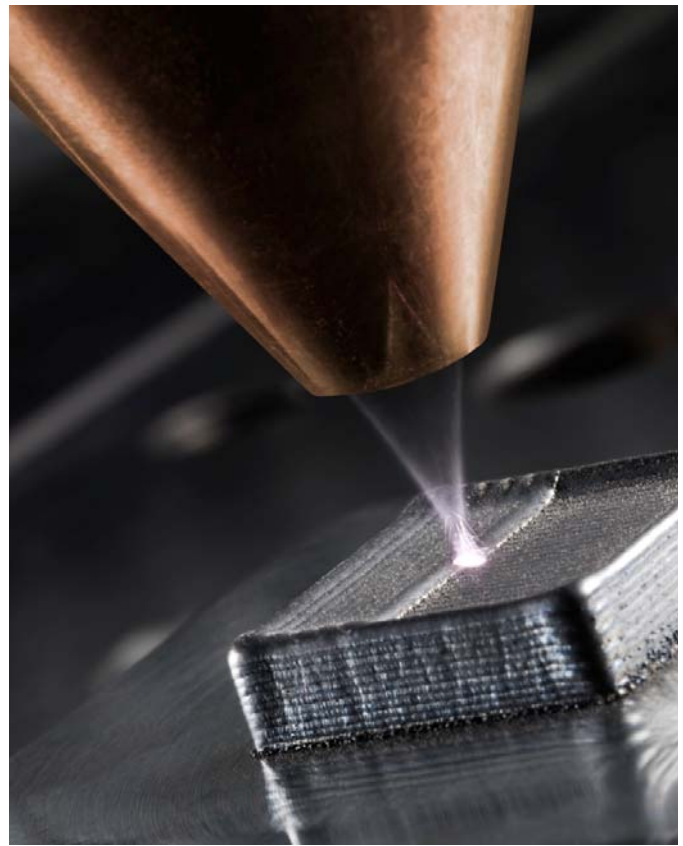


Big results in a small footprint.

TRUMPF's new TruDiode high power diode lasers for 1 μm wavelength material processing are the right tool for the job. By directly coupling the diodes into one or more processing fibers, users can achieve up to 40% wall plug efficiency, with the additional benefits of robustness and flexibility. The new ultra compact high power diode lasers range in power from 3 to 6 kW and feature the latest advancement in TRUMPF's passively cooled diodes, resulting in extremely long life in a modular architecture. The beam quality of 50 mm-mrad with NA of 0.2 is the best in class at this power level and ideal for brazing, laser metal deposition and laser hardening in industries such as electronics, automotive and aerospace.

Performance with value.

TruDiode offers many standard features, such as real time power measurement for constant output power from the very start, delivering repeatable performance daily. Plug and play fibers need no alignment, and the robust and modular design ensures a long laser life and simple maintenance when required. TRUMPF's TruControl interface lets users create and store customized parameters such as ramping, power, pulse shaping, and more. Additionally, this powerful interface comes with a dual channel e-stop circuit and safety circuit ready to be connected to your system.



Technical Data

	TruDiode 3006	TruDiode 4006	TruDiode 5006	TruDiode 6006
Power at the workpiece	3000 watts	4000 watts	5000 watts	6000 watts
Power stability ^[1]	less than $\pm 1\%$ @ 100% power			
Wavelength	920 – 1040 nm			
Mode of operation	CW			
Modulation frequency ^[2]	5 kHz			
Numerical aperture	NA 0.2			
BPP	50 mm x mrad (NA 0.2)			
Polarization	Random			
Fiber type ^[3]	TRUMPF LLK D plug and play, smart code type			
Smallest diameter fiber possible	600 μm			
Beam management	Up to 2 outputs			
Cabinet type	Cabinet on rollers			
Dimensions (W x H x D)	29.5 x 52.2 x 34.3 in.			
Cooling	Water to water heat exchanger included; external water supply 41 – 68°F \leq 87 PSI			
Power requirements	380V (-10%) – 460V (+10%) @ 50Hz (-3Hz) – 60Hz (+3Hz); CW rotation			

^[1] Real time power control for the lifetime of laser regardless of ambient temperature

^[2] With TRUMPF TruControl 3.3 kHz (5 kHz possible with analog input card and external modulation)

^[3] TRUMPF D-style connector same as industry automotive type or standard QD

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9.2015



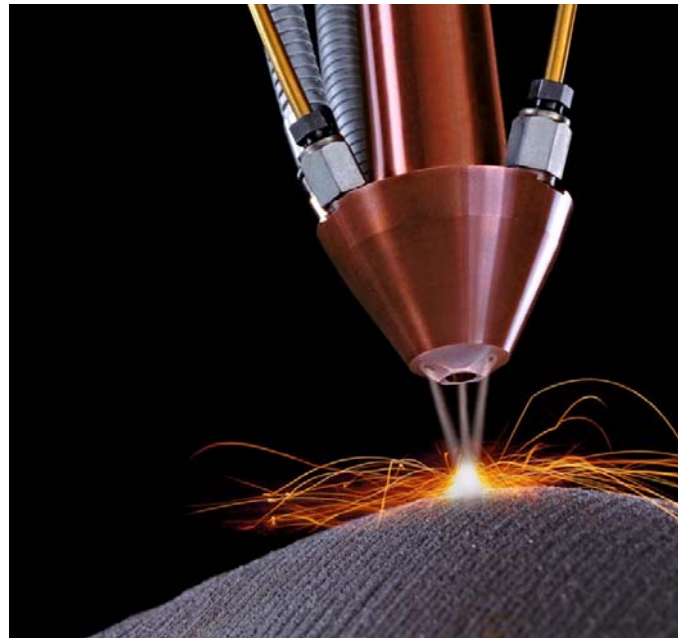
TruDiode
2006/4006:

Power and
efficiency in a
compact size.



Built for industry.

TRUMPF's TruDiode lasers are designed for harsh industrial environments, including extreme dust, vibration and ambient conditions. Once yearly changing of the cooling water is the only scheduled maintenance required. If a component should ever need to be replaced, the modular system design makes repair in the field possible. The innovative TruControl 1000 software allows for ease of programming, remote access from your desk or office, email notifications and monitoring functions with warning and error messages. Additionally the TelePresence feature allows for fast and easy troubleshooting and software updates done remotely by a TRUMPF technician, making sure you have the maximum uptime of your laser.



Technical Data	TruDiode 2006	TruDiode 3006	TruDiode 4006
Power at the workpiece	2000 watts	3000 watts	4000 watts
Wavelength	920 – 1040 nm		
Mode of operation	CW / modulated CW		
Modulation frequency ^[1]	5 kHz		
Numerical aperture	NA 0.1		
BPP	30 mm x mrad		
Polarization	Random		
Power stability ^[2]	Less than $\pm 1\%$ @ 100% power		
Fiber type ^[3]	TRUMPF LLK D plug and play, smart code type		
Smallest diameter fiber possible	600 μm		
Beam management	Up to 2 outputs		
Cabinet type	Cabinet on rollers		
Dimensions (W x D x H)	29.5 in. x 34.3 in. x 52.2 in.		
Cooling	Water-to-water heat exchanger included; external water supply 41-68°F \leq 87 PSI		
Power requirements	390 V (-10%) – 460 V (+10%) @ 50 Hz (-3 Hz) – 60 Hz (+3 Hz); CW rotation		

Unparalleled performance.

Trust TRUMPF's latest TruDiode high power lasers to exceed your industrial production requirements. With high beam quality of 30mm-mrad and a numerical aperture of 0.1, they are ideal for deep penetration welding, heat conduction welding, and surface applications such as hardening and cladding. With the real time power control, a power stability of $\pm 1\%$ is achieved, guaranteeing reproducible results every day. All this is found in the smallest footprint multi-kilowatt laser available on the market.

Efficient and flexible.

TruDiode offer up to 40% system efficiency, resulting in the lowest operating costs along with energy-saving sleep and standby modes. Passively cooled diodes allow for long life diode operation without premature failure of the micro channel design. The new TruDiode lasers range in power from 2 to 4 kW, with up to 2 outputs through a 600 μm diameter delivery fiber. As with all TRUMPF's high power 1 micron lasers, the fibers feature a "plug and play" fiber connection design, so no microscope is required to verify fiber alignment, focus or power loss. All TruDiode models have a modular design and several standard interface options.

^[1] With TRUMPF TruControl 3.3kHz (5kHz possible with analog input card and external modulation)

^[2] Real time power control for lifetime of laser regardless of ambient temperature

^[3] TRUMPF D-style connector same as industry standard QD or automotive type

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