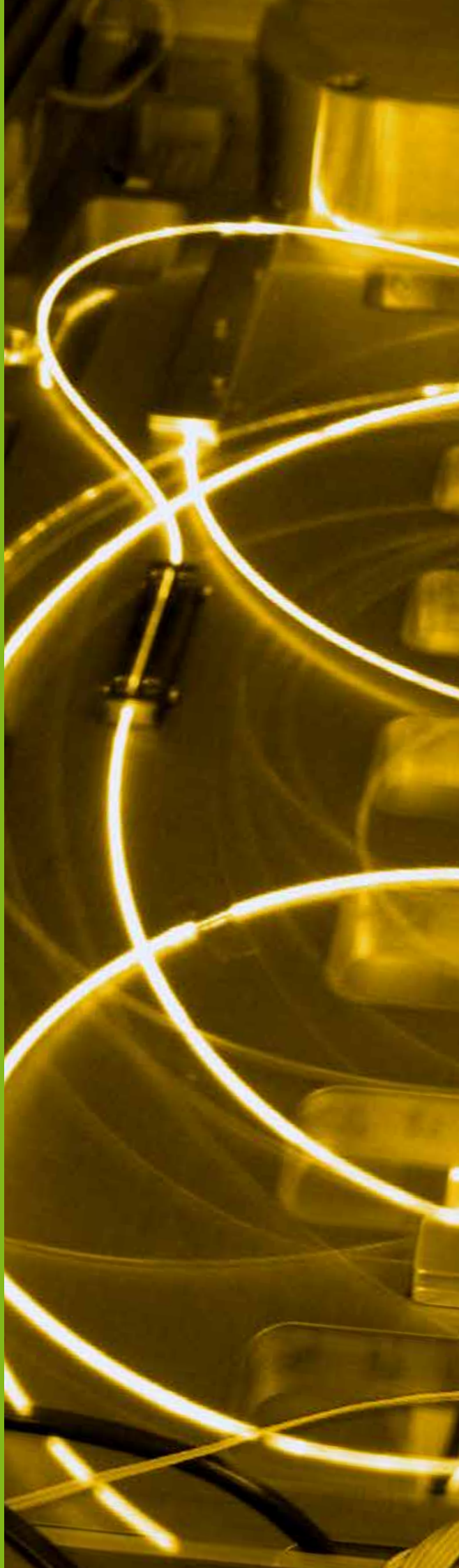


# Convergent

Flexibly Your Laser Partner





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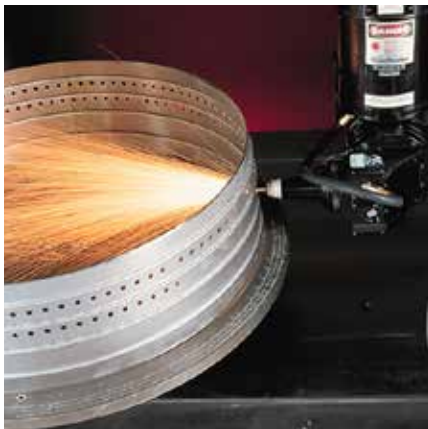
## Laser material processing

High quality material processing performance of **Convergent Photonics** fiber and CO<sub>2</sub> laser is primarily a result of:

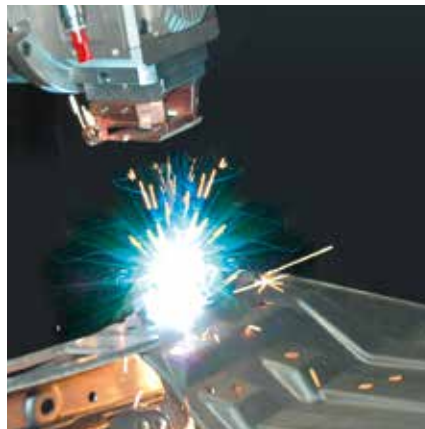
- Laser beam quality that is optimized for material processing at a competitive speed.
- Laser beam symmetry such that cut width is independent of process direction.
- Ability to deliver pulses having fast rise and fall times for example to minimize piercing time in cutting.
- Stable output over time in the environment of the manufacturing facility.

### Application Guide

	CF1000	CF2000/CF3000/CF4000/CF6000	CD6000	CT6000	CMxx/CX/CVxx	CLxx
Brazing			X	X		
Cladding		X	X	X		
Cutting	X	X		X	X	
Drilling						X
Heat Treating		X	X	X	X	
Welding	X	X	X	X	X	
Additive Manufacturing	X					



*Precision cutting of an aircraft engine component using **Convergent Photonics** CL50k Nd:YAG laser.*



*Laser welding titanium alloy using **Convergent Photonics** CV5000 CO<sub>2</sub> laser.*



*3D cutting high strength steel B-pillar using **Convergent Photonics** CF3000 Fiber laser.*





3D bevel cutting of 12mm mild carbon steel using **Convergent Photonics CV5000 CO<sub>2</sub> laser**.



Laser cutting of stainless steel combustor using **Convergent Photonics CX3000 CO<sub>2</sub> laser**

## Pulsing

The piercing performance of the laser is influenced by its pulsing characteristics.

**Convergent Photonics** lasers give fast (~60microsecond for CO<sub>2</sub> lasers, ~20 microsecond for Fiber lasers) rise time on the pulse that contributes to faster piercing.

## Laser Drilling

High speed, high profile laser drilling requires high peak power that **Convergent Photonics** Nd:YAG lasers are designed for. At 50kW maximum peak power, CL Series lasers can drill as small as 0.1mm diameter hole on uncoated or thermal barrier coated components. At 0.25mm diameter, the laser is capable of drilling aerospace quality cooling hole of 25mm deep at angle as shallow as 10 degrees to the surface, in a fraction of time of other processing methods.

It is no surprise that **Convergent Photonics** Nd:YAG lasers have been aerospace and energy industry standard for laser drilling for more than 30 years.

### High Peak Power

50kW maximum peak power, with variable pulse width and pulse frequency, **Convergent Photonics** Nd:YAG is unmatched in speed and quality of deep hole drilling.

### Variable Spot Size

Equipped as standard device, Variable Spot Module enables adaptive hole size control for percussion drilling.

### Drilling on the Fly

Percussion drilling can be efficiently performed using “*Drill on the Fly*” feature, where laser beam pulsing can be synchronized to the CNC encoder feedback.

## Cutting Capability

Typical cutting capability represented by maximum thicknesses for mild steel, stainless steel, aluminum, copper and brass is shown in the table below.

	CX2500	CX3000	CM4000/ CM4500	CV5000	CF1000	CF2000	CF3000/CF4000	CF6000
Mild Steel	15	20	25	25	10	15	20	25
Stainless Steel	8	10	15	20	4	8	12	25
Aluminum	5	8	12	12	4	6	8	30
Copper	-	-	-	-	3	4	5	10
Brass	-	-	-	-	3	4	5	10

Thicknesses values in mm.



Laser drilling of aerospace turbine blade and vanes using **Convergent Photonics CL50k Nd:YAG laser**.

## Back reflection protection

With the growing popularity of fiber lasers in sheet metal cutting and welding applications, users are increasingly aware of one weakness of fiber lasers: vulnerability against back-reflection from the metal work-piece.

Even with high power QBH or QD delivery cables designed to handle kW-level back-reflection stripping from the fiber cladding, back-reflected light couples into the core of the delivery cable which then couples back into the fiber laser. Even with fiber lasers from leading suppliers, through numerous painful lessons, system integrators have learned that laser combiners, and/or modules can be damaged if back-reflection protection is not robust.

Building upon Convergent Photonics' years of experience in high power industrial lasers, the new CF series lasers have incorporated **cutting-edge back-reflection prevention techniques** suitably distributed through-out the laser. The coupled back-reflection is stripped through proprietary mode-stripping techniques, and safe dissipation of unwanted light, at critical points in the laser.

These sophisticated back-reflection techniques have also been tested, and their robustness demonstrated, in -kW level fiber amplifiers that are much more sensitive to back reflected light. Incorporating these back reflection protection schemes in the new CF series fiber lasers has resulted in unparalleled performance in cutting and welding a variety of highly reflective metallic material from as thin as <0.5mm to as thick as 30mm. Compared to third parties typical performances, and depending on material and set-up, Convergent Photonics laser, compared to similar sources, is 3 to 30 times more resistant to back reflection due to focal errors, according to the optical configuration.

Specifically, CF laser systems incorporating these protection schemes have been demonstrated to be tolerant to positional offsets from the focal position, during extensive cutting trials in brass and copper. CF lasers have exhibited virtually no false-faults or reliability issues when operating with this unique, proprietary protection scheme.

## CF SERIES - High Power Industrial Fiber lasers

**Convergent Photonics** CF Series fiber lasers are designed to deliver the best performance in material processing to better suit the customer needs. Its modular and robust design is highly efficient and compact with output powers up to **6kW**. The CF series lasers guarantees high reliability, superior performance, and low operational cost with virtually no maintenance required. The lasers are equipped with a patented PLe certified high speed electronic shutter wich allows high speed shut off and restart of laser processing in a safe manner with no wear out of electronics parts. The CF lasers are very easy to integrate into different machine configurations. In addition, lasers can be configured with an optional FFS (Fiber-Fiber-Switch) which allows the laser to be time shared with multiple workstation processes to maximize efficiencies. The user friendly MMI software is simple to use and continuously monitors the laser performance and records data for analysis.



# CF1000



## CF1000

Features of CF1000 fiber laser are:

- Flexible laser beam delivery, up to 5 m standard delivery fiber length, longer lengths upon request
- High electro-optical efficiency, up to 32% wall-plug efficiency
- High peak energy in pulsed mode
- Simple, compact, maintenance free and robust design
- Available in two configurations: 19" Rack configuration integrated Power Supply with communication cards or in cabinet with integrated double chiller

### General Specifications

		Cabinet Version	19" rack configuration
Nominal Output Power		1000 W	
Power Range		150 W - 1050 W	
Power Stability		Typ. ± 1%	
Pulsing Frequency		0 - 5 kHz	
Wavelength		1070 nm - 1080 nm	
Polarization		Random	
Beam Parameter Product (1/e <sup>2</sup> )		0.7 mm*mrad - 1 mm*mrad	
Feeding fiber core diameter		20 µm or 50 µm	
Feeding fiber length		5 m	
Minimum bend radius		100 mm	
Output connector		QBH	
Electronic Shutter		200 ms	
Safety		PLd	
Diode Pointing Laser		Wavelength 635/658 nm Power < 1 mW	
Electrical Power Consumption		6,5 kW	3.3 kW - 4.0 kW EOL
Voltage		200/400/480 Vac 3P	90/230/264 Vac 1P
Operating Environment (min/max)		5° C / 50° C	20° C / 35° C
Relative Humidity		< 95% non-condensing	
Laser Cooling 35% Glycol Mix	Cooling Cap.	Internal chiller	2.3 kW*
	Pressure		3 bar - 7 bar
	Flow		7 l/Min - 10 l/Min
	Temp.		20 ± 1 ° C
Process Fiber Cooling 35% Glycol Mix	Cooling Cap.	Internal chiller supplies the external optics, 0.3 kW	0.3 kW
	Pressure		1.5 bar - 4 bar
	Flow		2 l/min
	Temp		27° C - 33° C
Dimensions W / H / L	Power Supply	600 mm / 1000 mm / 1200 mm	501 mm / 133 mm / 787 mm (3U)
	FLM		501 mm / 89 mm / 787mm (2U)
Weight	Power Supply	400 kg	64 kg
	FLM		23.5 kg
Connections	Coolant	½" barbed fitting for optics cooling output	10 mm push lock fitting (x2)
Protection Degree (IEC60529)		IP54	Must be located inside an IP54 cabinet

\*Note: in case of rack configuration additional 1kW suggested for power meter cooling during service.



**CF2000**  
**CF3000**  
**CF4000**



CF4000 Fiber Laser

**CF2000 - CF3000 - CF4000**

Main features:

- Flexible laser beam delivery, up to 30 m delivery fiber length
- High electro-optical efficiency, over 30% wall-plug efficiency
- Patented high speed electronic shutter [200 ms]
- Highly resistant to back-reflection, compatible with all metal materials including copper and brass
- Simple, compact, maintenance free and robust design
- Optimized beam profile for both thin and thick sheet metal cutting and welding
- Capable cutting up to 20mm mild steel

CF lasers **metal cutting typical capabilities** are given below. Real performances depend also on beam delivery system and cutting head design.

	CF2000	CF3000/CF4000
Mild Steel	15 mm	20 mm
Stainless Steel	8 mm	12 mm
Aluminum	6 mm	8 mm
Copper	4 mm	5 mm
Brass	4 mm	5 mm

**General Specifications**

		CF2000	CF3000	CF4000
Nominal Output Power		2000 W	3000 W	4000 W
Power Range		200 W - 2100 W	300 W - 3150 W	400 W - 4200 W
Power Stability		Typ. ± 1%		
Pulsing Frequency		0 - 5 kHz		
Wavelength		1070 nm - 1080 nm		
Polarization		Random		
Beam Parameter Product (1/e2)		2.7 mm*mrad - 3.4 mm*mrad		
Feeding fiber core diameter		100 µm		
Feeding fiber length		20 m or 30 m		
Minimum bend radius		200 mm		
Output connector		QBH		
Electronic Shutter		200 ms		
Safety		PLe		
Diode Pointing Laser		Wavelength 635/658 nm Power <1 mW		
Electrical Power Consumption		6.6 Kw - 7.5 kW EOL	10 Kw - 12 kW EOL	13 Kw - 16 kW EOL
Voltage		360/510 Vac 3P		
Operating Environment (min/max)		5° C / 50° C		
Relative Humidity		< 95% non-condensing		
Laser Cooling 35% Glycol Mix	Cooling Cap.	5.5 kW *	9 kW *	12 kW *
	Pressure	3 bar - 7 bar		
	Flow	12 l/min - 18 l/min	18 l/min - 35 l/min	25 l/min - 40 l/min
	Temp	20 ±1 °C		
Process Fiber cooling	Cooling Cap.	0.3 kW		
	Pressure	1.5 bar - 1.5 bar		
	Flow	1 l/min - 2 l/min		
	Temp	27 °C - 33 °C		
Dimensions W / H / L		1035 mm / 1125 mm / 830 mm		
Weight		411 kg	411 kg	445 kg
Connections	Coolant	1 inch hose barb (x2)		
Ingress Protection Rating (IEC60529)		IP54 (NEMA13 equivalent)**		

Additional nominal power (2 kW, 3 kW, 4 kW) suggested for power meter cooling during service.

\*\*Note: as per IEC 60825-1:2007, EN 60825-1:2007, FDA Regulation 21 CFR Chapter J 1040.10



# CF6000



CF6000 Fiber Laser

## CF6000

Main features:

- Flexible laser beam delivery, up to 30 m delivery fiber length
- High electro-optical efficiency, over 30% wall-plug efficiency
- Patented high speed electronic shutter [200 ms]
- Highly resistant to back-reflection, compatible with all metal materials including copper and brass
- Simple, compact, maintenance free and robust design
- Optimized beam profile for both thin and thick sheet metal cutting and welding
- Capable cutting up to 25mm mild steel

CF6000 lasers **metal cutting typical capabilities** are given below. Real performances depend also on beam delivery system and cutting head design.

	CF6000
Mild Steel	25 mm
Stainless Steel	25 mm
Aluminum	30 mm
Copper	10 mm
Brass	10 mm

### General Specifications

		CF6000
Nominal Output Power		6000W
Power Range		600 W - 6300 W
Power Stability		Typ. ± 1%
Pulsing Frequency		0 -5 kHz
Wavelength		1070 nm - 1080 nm
Polarization		Random
Beam Parameter Product (1/e <sup>2</sup> )		3.2 mm*mrad - 3.8mm*mrad
Feeding fiber core diameter		100 µm
Feeding fiber length		20 m or 30 m
Minimum bend radius		200 mm
Output connector		QBH
Electronic Shutter		200 ms
Safety		PLe
Diode Pointing Laser		Wavelength 635/658 nm Power <1 mW
Electrical Power Consumption		20 kW - 22 kW EOL
Voltage		360/510 Vac 3P
Operating Environment (min/max)		5° C / 50° C
Relative Humidity		< 95% non-condensing
Laser Cooling 35% Glycol Mix	Cooling Cap.	14 kW *
	Pressure	7 bar
	Flow	60 l/min
	Temp	20 ±1 °C
Process Fiber cooling	Cooling Cap.	0.3 kW
	Pressure	6 bar
	Flow	1 l/min
	Temp	27 °C - 33 °C
Dimensions W / H / L		1143 mm / 1320 mm / 1879 mm
Weight		650 kg
Connections	Coolant	1 inch hose barb (x2)
Ingress Protection Rating (IEC60529)		IP54 (NEMA13 equivalent)**

\*\*Note: as per IEC 60825-1:2007, EN 60825-1:2007, FDA Regulation 21 CFR Chapter J 1040.10.

# CT6000

## CT6000 – High Power Twin Laser

CT6000 Convergent Photonics laser is an innovative concept laser based on patented technology. It is equipped with two different process fibers, one with high power low brightness for welding/brazing (BPP = 66 mm\*mrad ), one at lower power higher brightness (BPP = 4 mm\*mrad) for cutting/remote welding .

At the push of a button the laser can switch between one fiber and the other, allowing:

- maximum flexibility, as the same laser suits all possible applications
- wider application spectrum (cutting, laser welding, brazing, cladding)
- lower ownership cost
- optimal for low to medium production capacity, switching over different jobs

Switching from a configuration to the other does not require recalibration or adjustment, and require just a few seconds. The laser will supervise the fiber safety of both cables independently, and allows to use one process fiber while the other is disconnect or its working cell is accessed to change part.

Convergent Photonics laser CT6000 is equipped with n. 2 exit fibers a 100 µm core feeding fiber on the fiber side, a 600 µm core feeding fiber on diode side:



CT6000 with integrated chiller.

Hybrid		
	Diode	Fiber
Feeding fiber length	20 m	
Minimum bend radius	200 mm	
Feeding fiber core diameter	600 µm	100 µm
Output connector	QD	QBH
Beam quality	66 mm*mrad	4 mm*mrad
Safety functions Performance Level(*)	PLc	

Building upon Convergent Photonics’ years of experience in high power industrial lasers, the new CT series lasers have incorporated cutting-edge back-reflection prevention techniques, suitably distributed through-out the laser. The coupled back-reflection is stripped through proprietary mode-stripping techniques, and safe dissipation of unwanted light, at critical points in the laser.

## General Specifications

General Specifications		CT6000	
Electrical power input	27,6 kW		
Electrical power input Laser w/o chiller	20 kW		
Voltage	400/460 Vac 3P		
Frequency	50/60 Hz		
Ambient temperature	10°C - 42°C		
Relative humidity	95% non-condensing		
Power range (Fiber)	400-4200 W		
Power range (Diode)	600-6200 W		
Power stability	Typ. ± 2%		
Polarization	Random		
Fiber wavelength	1070 nm - 1080 nm		
Diode wavelength	910 nm - 960 nm		
Line width (FWHM)	5 nm		
Pulse ON/OFF time	80 µs		
Pulse Repetition rate	5 kHz		
Electronic shutter	200 ms		
Safety	PLe		
Dimensions W / H / L	1050 mm/ 2100 mm (1300 mm w/o chiller) / 1050 mm		
Weight	950 kg / 650 kg w/o chiller		
Diode Pointing Laser	Wavelength 635/658 nm Power <1 mW		
Cooling (Integrated Water-Water Chiller)			
Required capacity	15 kW		
Inlet temperature	15° C - 27° C		
Inlet pressure	3 bar - 6 bar		
Flow rate	30 l/min - 35 l/min		
Fluid	Tap Water		
Filter requirement	100 µm		
Cooling (Without Integrated Water-Water Chiller)		Laser Circuit	Optics Circuit
Required capacity	14 kW	1 kW	
Inlet temperature	20 ±1 °C	25 ±3 °C	
Inlet pressure	3 bar - 6 bar	1.5 bar - 3 bar	
Flow	60 l/min	30 l/min	
Fluid	Distilled water with 35% DOWFROSTTM HD	DI Water	
Filter requirement	100 µm		

\*Note: as per EN ISO 13849:2008

\*\*Note: as per IEC 60825-1:2007, EN 60825-1:2007, FDA Regulation 21 CFR Chapter J 1040.10.

# CD6000

## CD6000 - High Power Diode Laser

CD6000 Diode laser has been designed for applications which do not require high brilliance (i.e. welding, brazing, cladding).

### General Specifications

General Specifications		CD6000	
Electrical power input	27,6 kW		
Electrical power input Laser w/o chiller	20 kW		
Voltage	400/460 Vac 3P		
Frequency	50/60 Hz		
Ambient temperature	10 °C - 42 °C		
Relative humidity	95% non-condensing		
Power range (Diode)	600-6200 W		
Power stability	Typ. ± 2%		
Polarization	Random		
Fiber wavelength	1070 nm -1080 nm		
Diode wavelength	910 nm - 960 nm		
Line width (FWHM)	5 nm		
Pulse ON/OFF time	80 µs		
Pulse Repetition rate	5 kHz		
Electronic shutter	200 ms		
Safety	PLe		
Dimensions W / H / L	1050 mm/ 2100 mm (1300 mm w/o chiller) / 1050 mm		
Weight	950 kg /650 kg w/o chiller		
Diode Pointing Laser	Wavelength 635/658 nm Power <1 mW		
<b>Cooling (Integrated Water-Water Chiller)</b>			
Required capacity	15 kW		
Inlet temperature	15 °C - 27 °C		
Inlet pressure	3 bar - 6 bar		
Flow rate	30 l/min - 35 l/min		
Fluid	Tap Water		
Filter requirement	100 µm		
<b>Cooling (Without Integrated Water-Water Chiller)</b>			
	Laser Circuit	Optics Circuit	
Required capacity	14 kW	1 kW	
Inlet temperature	20 ± 1 °C	25 ± 3 °C	
Inlet pressure	3 bar - 6 bar	1.5 bar - 3 bar	
Flow	60 l/min	30 l/min	
Fluid	Distilled water with 35% DOWFROSTTM HD	DI Water	
Filter requirement	100 µm		

\*Note: as per EN ISO 13849:2008

\*\*Note: as per IEC 60825-1:2007, EN 60825-1:2007, FDA Regulation 21 CFR Chapter J 1040.10.



# CX2500

## CX Series

# CX3000

CX Lasers main features are:

- High Reliability
- High Operational Efficiency
- Small Footprint

Convergent Photonics CX Series Lasers, designed with operational efficiency in mind for laser processing, are considered as the best economical fit for cutting and welding broad range of materials and thickness in 2D and 3D. Technologies used have been refined over years of development to ensure most economical solution to the users without sacrificing performance and reliability.



CX3000 CO<sub>2</sub> Laser

### General Specifications

		CX2500	CX3000
Power Range		200 W - 2500 W	200 W - 3000 W
Wavelength		10.6 μm	
Beam Propagation Factor M2 typical (Prometec)		2.1 - 2.5	
Beam Divergence		1.5 mrad half angle	
Beam Diameter at Output		14.5 mm @ 1/e <sup>2</sup> , 19 mm full beam	
Pulse Rep. rate		0 - 2 kHz	
Pulse width		>100 μseconds	
Pointing stability		+/-150 μrad	
Diode Pointing Laser		Wavelength 635 nm Power <1 mW	
Electrical Power Consumption		29 kW	32 kW
Voltage		400/600 Vac 3P	
Operating Environment (min/max)		10° C / 40° C	
Relative Humidity		< 95% non-condensing	
Cooling	Req. Capacity	27 kW	29 kW
	Temperature	18° C / 20° C	
	Pressure	4 bar - 5 bar	
	Flow	133 l/min	
	Fluid	Distill water /35% Glycol	
	Filter requirement	500 μm	
Dimensions W / H / L		850 mm / 887 mm/ 2551 mm	
Weight		1137 kg	
Gas Consumption He (68%), N2 (36%), CO2(4%)		20 - 70 l/hour	
Protection Degree (IEC60529)		IP54 (NEMA13 equivalent)	

## CM4000 CM4500

### CM Series

New CM Series features include:

- New turbine equipped with Magnetic Bearing rotating mechanism.
- Smart gas feed system to minimize laser gas consumption. Total gas consumption as low as 5-15 l/hour
- New Solid State high voltage power supply with hi-tech resin, Oil Free Transformer (no more oil submerged components).

Convergent Photonics provides the highest performing, highly efficient and very reliable CO<sub>2</sub> Lasers for manufacturing.

New CM Series Lasers by Convergent Photonics, with optimum beam quality for laser processing, excel in cutting and welding broad range of materials and thicknesses.

CM Series Lasers with DC discharge are the most efficiently run industrial CO<sub>2</sub> laser available. CM Series Lasers are equipped with most recent technological advancement available to the fast flow CO<sub>2</sub> lasers.



CM Series laser turbine with magnetic bearing saves maintenance cost.



CM4000 CO<sub>2</sub> Laser

### General Specifications

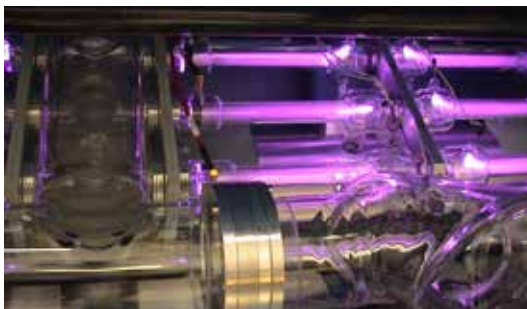
	CM4000	CM4500	
Power Range	200 W - 4000 W	200 W - 4500 W	
Wavelength	10.6 μm		
Beam Propagation Factor M2 typical (Prometec)	2.0 - 2.4		
Beam Divergence	1.5 mrad half angle		
Beam Diameter at Output	14.5 mm @ 1/e <sup>2</sup> , 19 mm full beam		
Pulse Rep. rate	0 - 2 kHz		
Pulse width	>100 μseconds		
Pointing stability	+/-150 μrad		
Diode Pointing Laser	Wavelength 635 nm Power <1 mW		
Electrical Power Consumption	34 kW	36 kW	
Voltage	400/600 Vac 3P		
Operating Environment (min/max)	10° C / 40° C		
Relative Humidity	< 95% non-condensing		
Cooling	Req. Capacity	30 kW	
	Temperature	18° C / 20° C	
	Pressure	3 bar - 7 bar	
	Flow	133 l/min	
	Fluid	Distill water /35% Glycol	
	Filter requirement	500 μm	
Dimensions W / H / L	884 mm / 960 mm/ 3156 mm		
Weight	1200 kg		
Gas Consumption He (68%), N <sub>2</sub> (36%), CO <sub>2</sub> (4%)	5 - 15 l/hour		
Protection Degree (IEC60529)	IP54 (NEMA13 equivalent)		

# CV5000 CV Series

CV Series features include:

- High Quality Beam Output at High Power
- Magnetic Turbine Bearing to Minimize Maintenance Cost
- Solid State High Voltage Power Supply
- Oil free transformer Power Supply

Convergent Photonics CV Series Lasers with DC discharge are the most efficiently run industrial CO lasers, available with 5kW output model. With magnetic bearing turbine, the laser requires minimal maintenance; reducing total cost of ownership significantly. CV Series Lasers, with optimum beam quality for laser processing, excel in cutting and welding broad range of materials and thicknesses.



CV5000 CO<sub>2</sub> Laser

## General Specifications

		CV5000
Power Range		200 W - 5000 W
Wavelength		10.6 μm
Beam Propagation Factor M2 typical (Prometec)		2.2 - 2.6
Beam Divergence		1.5 mrad half angle
Beam Diameter at Output		14.5 mm @ 1/e <sup>2</sup> , 19 mm full beam
Pulse Rep. rate		0 - 2 kHz
Pulse width		>100 μseconds
Pointing stability		+/-150 μrad
Diode Pointing Laser		Wavelength 635 nm Power <1 mW
Electrical Power Consumption		40 kW
Voltage		400/600 Vac 3P
Operating Environment (min/max)		10° C / 40° C
Relative Humidity		< 95% non-condensing
Cooling	Req. Capacity	36 kW
	Temperature	18° C / 20° C
	Pressure	4 bar - 5 bar
	Flow	133 l/min
	Fluid	Distill water /35% Glycol
	Filter requirement	500 μm
Dimensions W / H / L		849,6 mm / 957 mm/ 3119 mm
Weight		1200 kg
Gas Consumption He (68%), N2 (36%), CO2(4%)		20 - 70 l/hour
Protection Degree (IEC60529)		IP54 (NEMA13 equivalent)



# CL30k

# CL50k

# CLR

## CL Series

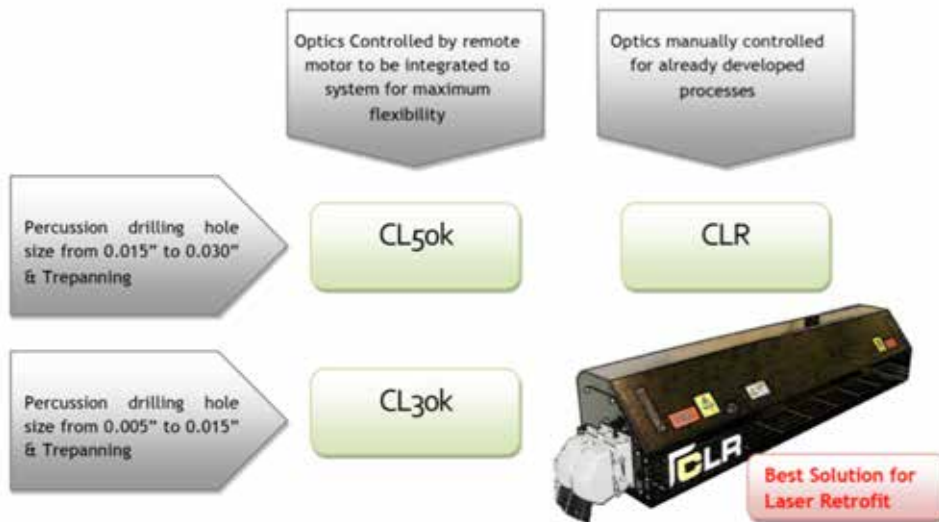
Today, world's 50% of laser drilling is performed by Convergent Photonics served Nd:YAG lasers. Our laser source is proven to work by various industries, including aerospace and land based turbine manufacturers and excel in percussion drilling and trepanning where very high peak power pulses up to 50 kW are demanded. Convergent Photonics CL Series Nd:YAG Pulse Lasers are specifically designed for laser drilling with features perfectly suited for drilling of cooling holes of turbine vanes, blades, shrouds, and combustor liners. CL Series lasers are also utilized in exotic aerospace material cutting.

Main features of CL Series are:

- High Peak Power Output for laser Drilling
- Drilling Spot Size Control
- Solid State Driving Flashlamp Power Supply

3 models are offered to meet user demands on percussion drilling and trepanning.

- CL30k best suited for small aerospace hole drilling as small as 0.1mm diameter with high profile.
- CL50k, 50kW peak power capable of drilling 25mm deep turbine blades and vanes cooling holes, as well as percussion drilling, trepanning, and cutting of combustion chamber.
- CLR is designed as upgrade for users' aging Nd:YAG laser.



	CL30k	CL50k	CLR
Excitation Source	Xenon Flashlamps		
Rated Maximum Output Power	150W	200W (HBICT) 250W (MBICT & LBICT)	
Rated Maximum Output Energy	30J	45J (HBICT) 50J (MBICT & LBICT)	
Rated Maximum Pulse Peak Power	30 kW	45 kW (HBICT) 50 kW (MBICT & LBICT)	
Power Stability	+/-5%		
Pulse Width Range	0.25 - 9.00msec, 0.01msec resolution		
Repetition Rate Range	1 - 200Hz, 0.1Hz resolution for < 50Hz, 1Hz > 50Hz		
Beam Propagation Ratio	M2<10	M2<20 (HBICT) M2<35 (MBICT) M2<40 (LBICT)	





*CP4000 CO<sub>2</sub> Laser retrofitted with new magnetic bearing turbine to improve performance and lower the cost of maintenance.*

### Retrofit Your Convergent Product

Are you considering upgrading or retrofitting your **Convergent Photonics** lasers? We may be able to provide you with upgrade/retrofit kit and service which will surely provide you with good return on investment.

### Convergent Laser Service

**Convergent Photonics** with expert laser engineers can support your equipment needs on site, over the telephone, or by e-mail.

### Convergent Spare Parts

**Convergent Photonics** manufacturing facility holds extensive number of spare parts for current and legacy lasers to support production demand of laser users around the world.

### Global Coverage

**Convergent Photonics** products are globally supported 24/7.



Get in contact with **Convergent Photonics** worldwide:

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## History of Convergent Photonics

The history of Convergent Photonics dates back in 1961, shortly after the invention of the laser in 1960. The CO<sub>2</sub> product line of Convergent can be traced to 1966, with the start-up of Coherent Radiation (Palo Alto, CA). Coherent founders demonstrated their first CO<sub>2</sub> laser at the Westcon exhibition in the fall of 1966. The first customer for the laser was the Boeing Co. where it was used “to investigate cutting and welding titanium”.

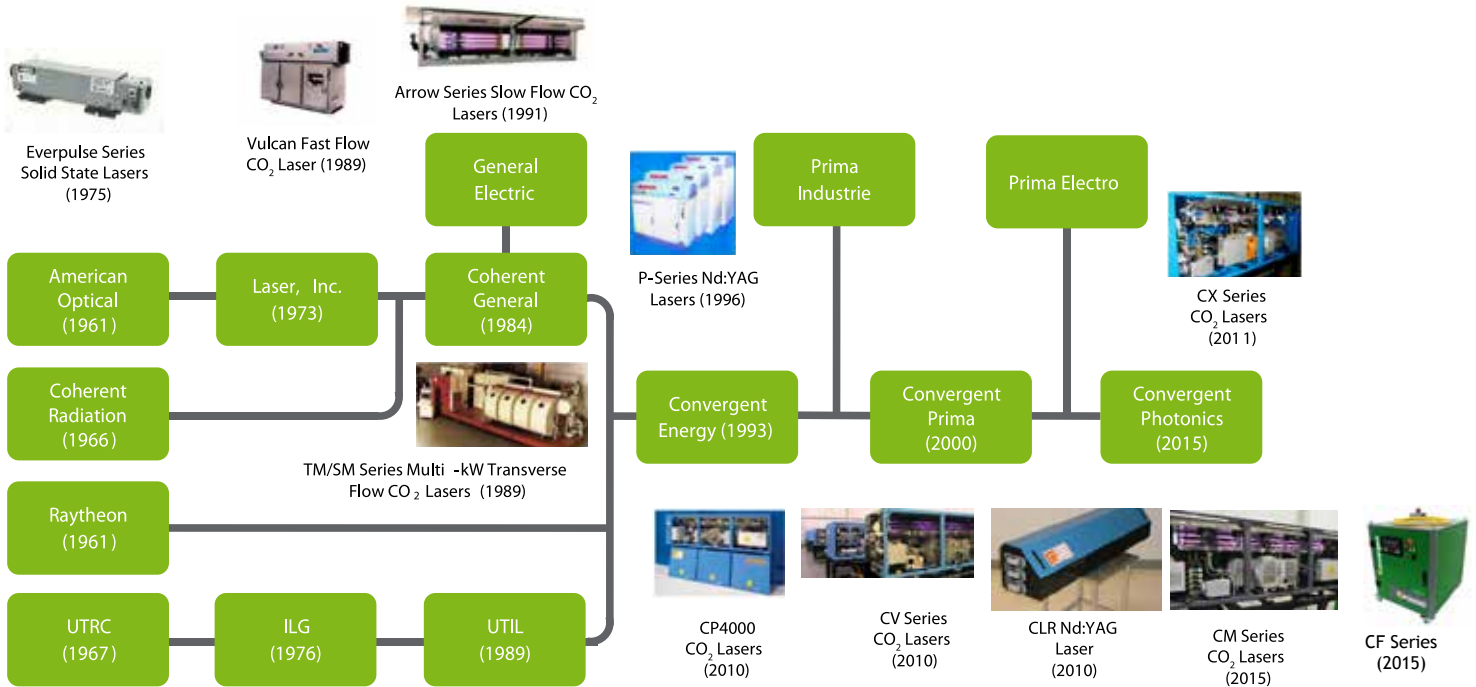
In 1981, Laser Inc. began to purchase and assemble kits for CO<sub>2</sub> lasers from Coherent and shortly thereafter, Coherent acquired Laser Inc., which became the industrial arm of Coherent, producing several models of slow flow CO<sub>2</sub> lasers. Coherent General was formed in 1984 when General Electric made an investment in the company with the goal of obtaining a next generation Nd:YAG drilling laser. This business, which was now producing both CO<sub>2</sub> and Nd:YAG industrial lasers, was sold to Transtec in 1993, but, as part of the acquisition, Transtec was required to change the name no longer using ‘Coherent’.

The name Convergent Energy was then given to the laser business. During this same time, Transtec also acquired the rights for manufacturing and service of the Raytheon solid state laser products which had first appeared in the market also in the early 1960’s. Meanwhile, UTRC (United Technology Research Center) which was formed in 1967, had started developing high power CO<sub>2</sub> lasers (6 to 45 kW). The company that came out of the development was originally called the Industrial Laser Group (ILG) and, in 1989, was renamed United Technologies Industrial Lasers, or UTIL, headquartered in East Hartford, CT. This business was taken over by Transtec in 1994 when UTRC decided that it no longer wanted to pursue the industrial laser business, at which point Convergent Energy was renamed Convergent Lasers.

In 2000, Convergent Lasers was acquired from Prima Industrie Group, becoming part of Prima Electro Division in 2011, under the brand name of Convergent. In 2014 was announced that Convergent changed its name to Convergent Photonics, a strategic branding choice to communicate its new dynamic outlook and further underscoring the company’s drive to offer high reliability, innovative solutions to the market place. With this new identity, Convergent Photonics presents itself as a global supplier of photonics technologies and a myriad of high power industrial laser sources for materials processing. This transition heralds a new beginning for Convergent Photonics as it becomes a reliable international partner and provider to all leading OEMs, offering unparalleled customer satisfaction, worldwide.



Proud to be part of Laser History from the beginning





# convergent



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