EVO MOBILE

DIODELINE

www.or-laser.com

Diode-pumped Laser

Mobile and compact laser welding system
for open laser workstations

ORLASER

DIODELINE

15 times higher efficiency!

No wear parts!

No water cooling!

Other highlights

- Very high efficiency of over 20 % (electrical to optical)
- Low power consumption in comparison to lamp-pumped Nd:YAG lasers
- A simple power outlet is sufficient! (230 V / 16 A / 1 phase)
- Maintenance-free operation
- Long life of the pump diodes
- Can be operated in pulse and cw mode (continuous line)
- Excellent, stable beam quality
- Small and flexible laser head

DIODE LINE – the diode-pumped laser

With the DIODE LINE concept, OR Laser enters a new dimension in the field of laser material processing through the use of diode-pumped laser systems.

The new concept impresses by offering a number of key advantages over conventional flashlamp-pumped systems. In addition to the compact design and the extremely long life, diode-pumped laser systems are characterized by their 15 times higher energy efficiency. This not only saves cash, but also provides a valuable contribution to the protection of the environment.

A high-voltage connection is no longer required! A normal 230 V outlet is sufficient for operation of the laser system.
As there are no wear parts, the system operates practically maintenance-free. The system further convinces through its excellent beam quality even with very small spot sizes down to 50 µm. Thus even the most demanding welding jobs present no problems for the new system.

OR Laser offers systems with peak performances up to 3 kW (300 W mean power) with pulse lengths from 0.1 ms to 50 ms at 0.1 to 100 Hz.

Comparison with conventional laser welding

Comparison	STANDARD INSTALLATIONS (ND:YAG LAMP-PUMPED)	DIODE LINE (DIODE-PUMPED)
Mean power (pulsed)	up to 300 Watt	up to 300 Watt
Mean power (CW)	---	250 Watt
Efficiency (electrical - optical)	ca. 3 %	> 20 %
Mains connection	400 V / 16A / 3 phases	230 V / 16A / 1 phase
Max. power consumption	15 kw	3 kW
Max. pulse duration	20 ms	50 ms
Max. pulse frequency	20 Hz	100 Hz

Lens recognition

The innovative design of the laser welding head allows the use of different focusing lenses with different focal lengths with the system. The focal length is coded electronically on each focusing lens. The welding system automatically recognizes which focusing lens is being used and accurately displays the actual spot size to the user in the control system. Depending on the lens being used, the spot size can be adjusted almost continuously via an electro-mechanical beam expander.

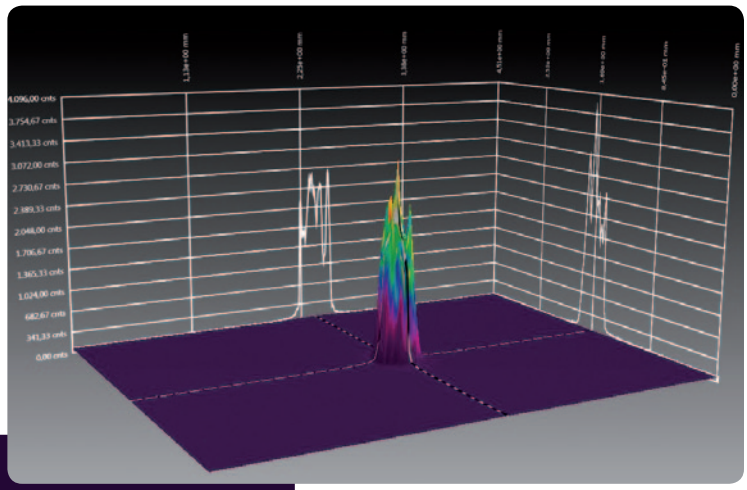
Beam characteristic

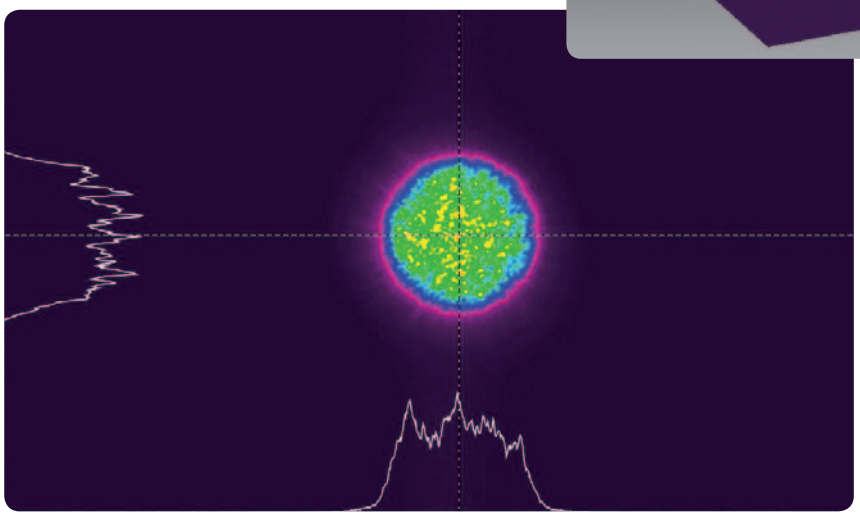
The beam quality of the laser systems is described by the key indicator, beam parameter product (BPP), and it essentially defines the ability to focus a laser beam. Thus a smaller BPP value indicates a better focusing ability.

The smallest theoretical value with a wavelength of 1064 nm is 0.339 mm x mrad. The BPP value of our lasers starts at 1.4 mm x mrad and makes focus sizes of 50 pm possible.

Below, a table of BPP values for different glass fibers:

Fiber: 50 µm → BPP = 1 – 2 mm x mrad
Fiber: 100 µm → BPP = 2 – 5 mm x mrad
Fiber: 200 µm → BPP = 5 – 15 mm x mrad



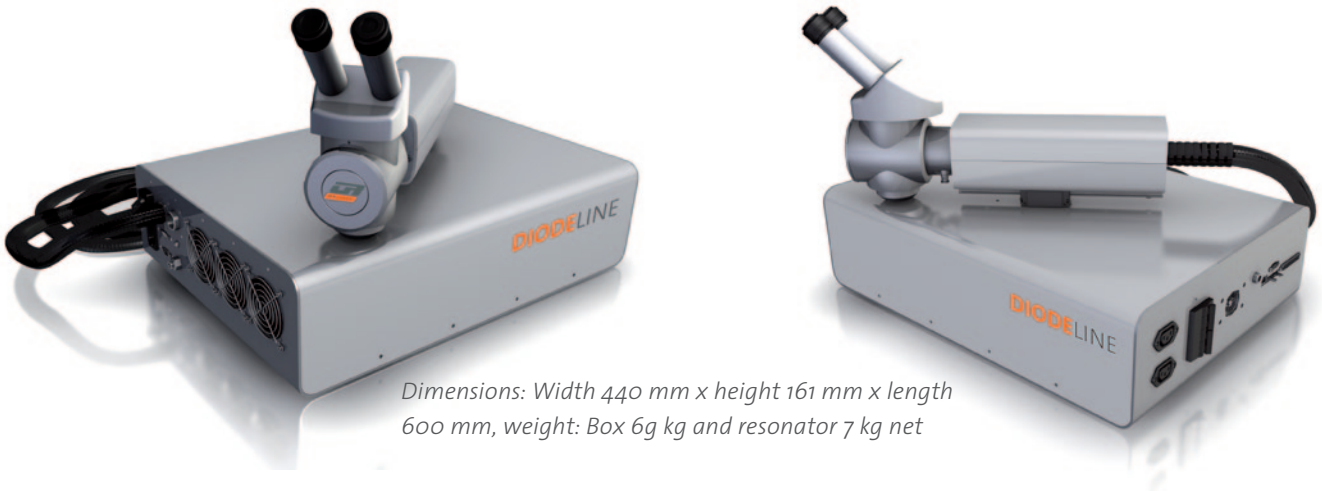


Beam profile of a 200 pm fiber, focused at a focal distance of 100 mm.

DIODE LINE as OEM Modul

The DIODE LINE *OEM* is designed as a module for installation in a system, a production line, or a manual workplace. The module is suitable for machine builders and integrators who want to integrate the laser into their system via a simple interface. The module can be used in a variety of ways because of its compactness and flexibility.

This module includes an external controller that can be used to control the laser and to set and store the laser parameters. External control systems can communicate with the DIODE LINE OEM module via digital and analog interfaces. In this way, important parameters like the laser power can be specified externally or even individual laser pulses can be set.



Dimensions: Width 440 mm x height 161 mm x length 600 mm, weight: Box 69 kg and resonator 7 kg net

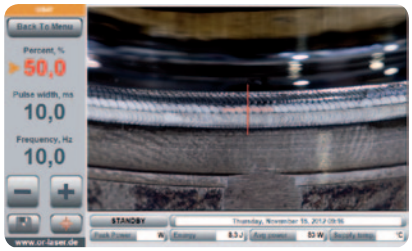
Operation via touch screen

The 10” touch screen offers you access to all parameters and countless options to make important settings, which can also be stored directly. The stored data can be accessed at any time.

SETTING EXAMPLES:

Laser parameters
Unerring and easy setting.

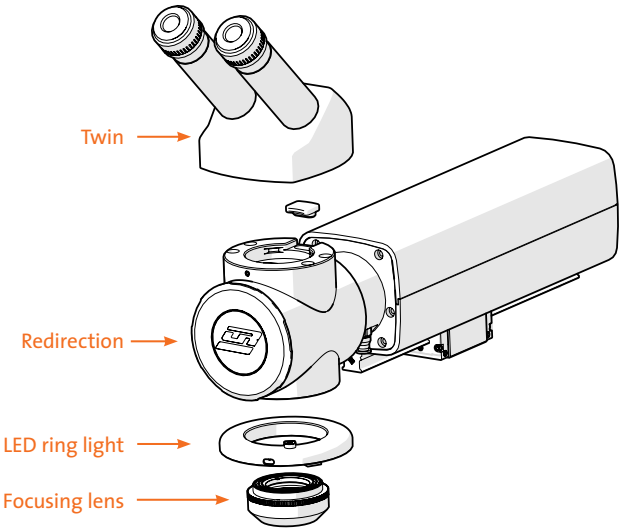
Pulse formation
Program ideal settings.

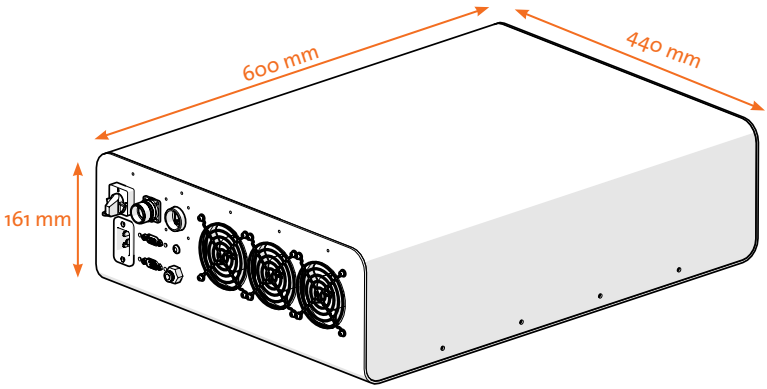


Video
Live monitoring of the welding process.

Motion
Specify the welding tracks.

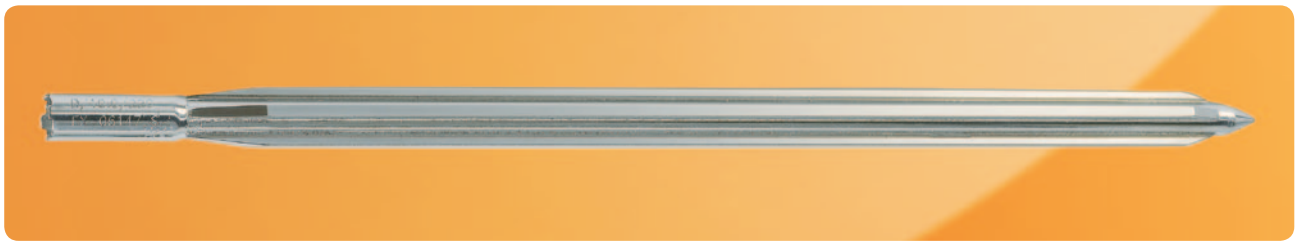
Description of the system components





Many sectors, always ready for use: EVO MOBILE DIODELINE

Medicine

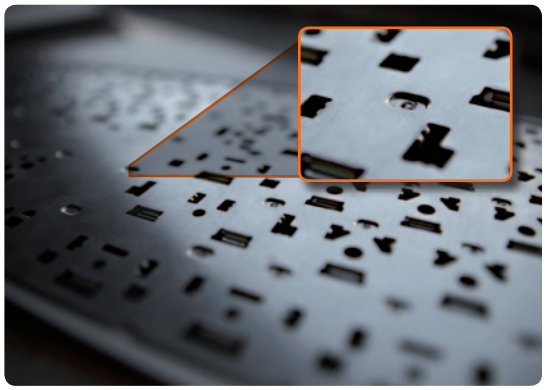


Implants for invasive transplantation

Aeronautical engineering

Engine components for aviation

Electronics



Spot welding of a keyboard

Technical Data

Power

	Typ: 120 W	Typ: 160 W	Typ: 200 W	Typ: 300 W
Laser type	diode-pumped	diode-pumped	diode-pumped	diode-pumped
Max. mean power	120 W	160 W	200 W	300 W
Pulse peak power	1,5 kW	1,5 kW	3 kW	3 kW
Max. pulse energy	15 J	15 J	30 J	30 J
Pulse duration	0,4 – 50 ms	0,4 – 50 ms	0,4 – 50 ms	0,4 – 50 ms
Pulse rate	0,1 - 100 Hz	0,1 - 100 Hz	0,1 - 100 Hz	0,1 - 100 Hz
Spot diameter	0,05 - 2,0 mm	0,05 - 2,0 mm	0,05 - 2,0 mm	0,05 - 2,0 mm
Mains voltage (V/ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50

SYSTEM EQUIPMENT

Laser system

- Mains power supply including mains fuse
- Mains circuit breaker
- Emergency OFF switch
- Motor circuit breaker
- Low-voltage power supply 24 V DC
- Interface with hardware monitoring function
- Industry controller for adjustment and indication of power, pulse duration, pulse repetition frequency with external trigger via foot switch
- Cooling system: Air cooling

Processing optics

- Motorized beam widening
- Beam deflection
- Safety glass
- LCD visor
- Binoculars with 10 times magnification
- Focusing lens
- LED illumination

Control unit

- Integrated control via a 10“ touch screen
- One-handed operation via joystick
- Simple coordinate transformation
- Teach-in and synchronized control for feed and laser
- Circle and track control with pulse synchronization

Linear system

- z-axis for mounting the resonator
- Swiveling unit for resonator for the motor-controlled welding of large molds
- Operation via joystick
- Shielding gas supply direct
- Traverse range z-axis: 570 mm controlled via solenoid valve
- Two x-y axis for positioning the resonator
- Positioning speed 0.5 – 15 mm/s
- Stable construction made of aluminum sections adjustale via step motors with powder-coated steel plate covers
- Massive steel substructure mounted on heavy duty rollers
- Traverse range: x-axis: 700 mm / y-axis: 400 mm
- LED lighting

Dimensions and weight

Dimensions: width 950 x height 1550 x length 1250 mm
Weight: 295 kg net

wORld of LASER

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Your Engineering Quality is always on our focus