



# Laserline LDF

## The Benchmark for Diode Lasers

# The Modular Laserline LDF Platform

## VG66

Mobile LDF diode laser with  
integrated cooling unit



## VG64

Mobile LDF diode laser with  
removable control panel and  
integrated cooling unit



How can superior technology be improved? By making it more versatile to use while preserving all proven properties. The Laserline LDF diode laser of the 6th generation sets the standards for industrial applications in the multi-kilowatts range with regard to power, mobility, efficiency and easier maintenance.

KG3

External water/air cooling unit perfectly adapted to the LDF diode lasers

VG62

Mobile LDF diode laser in most compact design

KG2

External water/water cooling unit for high power LDF lasers



# 25 kW Laser Power in Less than One Square Meter Footprint

## The LDF platform Thinking into the future

With the LDF series Laserline is setting the benchmarks for high power diode lasers. Even devices with over 20 kW laser power are set on sturdy castors allowing a single employee to move the laser to different locations for start-up in production – a unique benefit. All you need is electricity, water and an optical fiber – and the laser is ready for use at its new site.

Thanks to permanent development of our proven active diode cooling technology the system family is optimized to multi-kilowatt power levels even at high beam qualities: 7 kW out of a 600  $\mu\text{m}$  fiber at NA 0.1 in a compact system configuration at less than one square meter footprint.

## A modular concept provides maximum flexibility

Whether power, cooling or system interfaces: The LDF series can be individually configured and adapted to changing requirements. The systems are available with internal or external cooling system as water/water or water/air version.

With these Laserline chillers, perfectly aligned to the product line and fully integrated in the control system, high power lasers can now be operated permanently in production with a low footprint requirement. Through the internal networking of all system components malfunctions can be diagnosed in real-time and resolved immediately.





Mobile control unit, freely positionable



Innovative access to interfaces

## The benchmark for performance and functionality

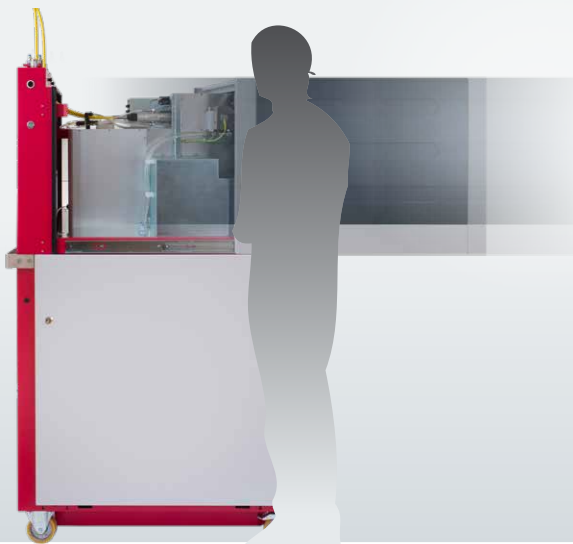
With an electrical efficiency of up to 50 percent, LDF diode lasers have the highest efficiency of all beam sources. The functionality leaves nothing to be desired: Thanks to the mobile hot-pluggable control panel the LDF lasers can be monitored and controlled very flexibly from a distance.

The three-stage fault management system displays information, warning and error messages, identifies causes and guides the user directly to efficient troubleshooting where appropriate. Service areas and interfaces are easily accessible through a retractable hood. System components can be easily replaced, avoiding any slowdown to the production process.

## The intelligent system control makes the difference

An industrial, latest-generation Ethernet network combines the system components and interfaces with the central control unit, which monitors the entire process in real time. An OPC-UA interface creates the prerequisites for platform-independent, vertical and horizontal data communication. It enables the integration of lasers in modern system architectures. All information is available at any time: on the mobile control panel directly on the laser, via network connection in a control center, as well as over secured remote access.

VG64 design with open laser hood



# High Efficiency with Multi-Kilowatt Power in Continuous Operation

With more than 2,300 installations worldwide, the Laserline LDF diode lasers in the multi-kilowatt range are among the world's most successful beam sources for industrial applications. They have proven their worth in continuous operation, even under hostile ambient conditions such as high humidity or excessive metal dust content.

## Technical advantages at a glance

The Laserline LDF diode lasers offers more power in less space than any other system in the multi-kilowatt range:

- > World's only mobile series with up to 25 kW laser power
- > Modular: Optional internal or external cooling system
- > Laserline water/water or water/air cooling unit
- > High electrical efficiency: Up to 50 percent
- > Field-proven active diode cooling technology
- > Internal networking of all system components
- > Real-time diagnosis for errors
- > Interfaces compatible with previous systems

## Excellence in every respect

Whether welding, hardening, or brazing – the LDF series also scores with its optimally adapted beam quality and maximum user friendliness:

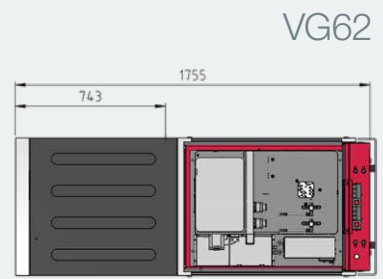
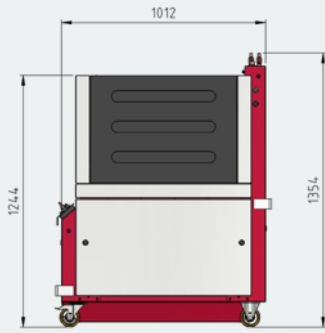
- > Hot-pluggable capable mobile control panel
- > Remote operation via network access
- > Convenient laser data backup on USB-stick
- > Easy maintenance thanks to sliding service hood
- > Robust system for over 30,000 hours of operation
- > Reliable continuous operation in multi-shift operation
- > 5 years warranty on laser diodes

4-exit beam switch

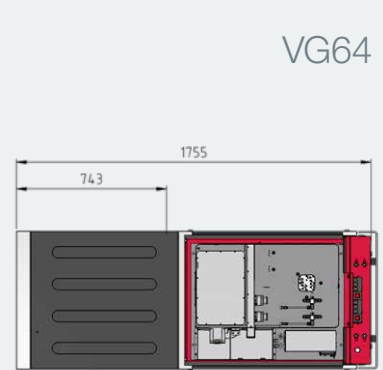
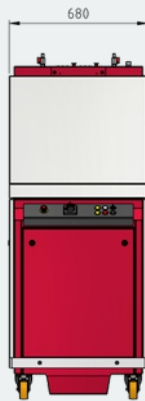
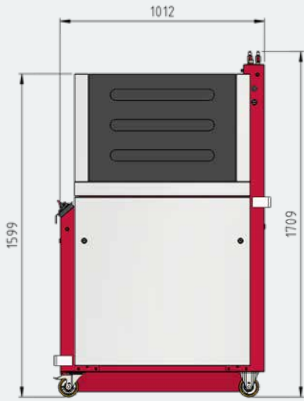


Sturdy handles, built-in protection brackets

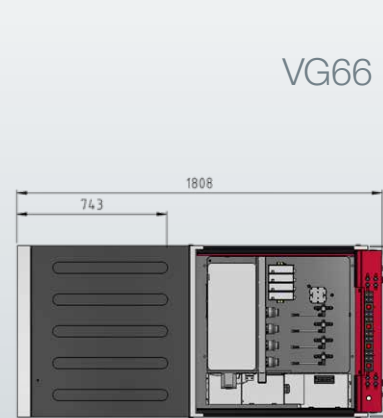
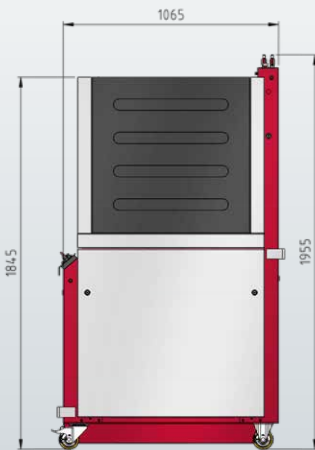




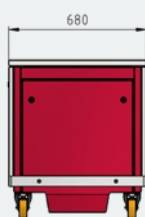
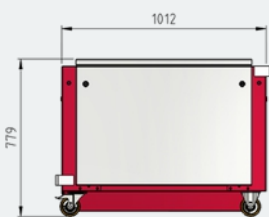
VG62



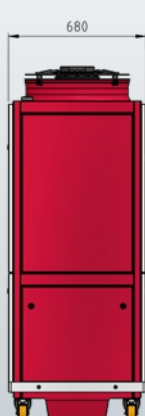
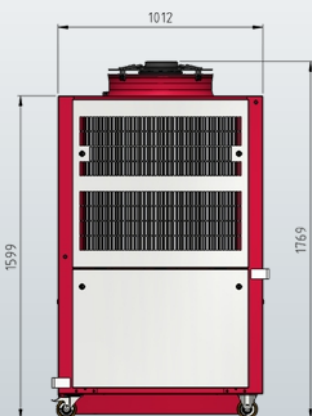
VG64



VG66



KG2



KG3

## LDF Series

### Optical specifications

Max. output power	7,000 W	9,000 W	15,000 W	20,000 W	25,000 W
Beam quality	30 mm mrad	40 mm mrad	60 mm mrad	100 mm mrad	200 mm mrad
	Other laser output powers available, tailored to the applications				
Optical fiber	600 µm [NA 0.1]	400 µm [NA 0.2]	600 µm [NA 0.2]	1,000 µm [NA 0.2]	2,000 µm [NA 0.2]
Min. focus at f = 150 mm	450 µm	600 µm	900 µm	1,500 µm	3,000 µm
Fiber-coupling unit	LLK-D/Auto, other types on request				
Fiber length	10 m, 20 m, 30 m, 50 m, 100 m, different lengths on request				
Power stability	< +/- 2% over 2 hours				
Wavelength range	900 nm to 1,080 nm				

### Mechanical specifications

VG 62	Weight approx. 600 kg, dimensions: 1,012 x 680 x 1,244 mm <sup>3</sup> (L x W x H)
VG 64	Weight approx. 750 kg, dimensions: 1,012 x 680 x 1,599 mm <sup>3</sup> (L x W x H)
VG 66	Weight approx. 800 kg, dimensions: 1,065 x 850 x 1,845 mm <sup>3</sup> (L x W x H)

### Connection data

Voltage	400 - 480 V ±10 %, 3 Phases, PE, 50 or 60 Hz				
Power connector	Harting 32 A - 125 A (according to power consumption)				
Power consumption, typical	22.3 kW	25.5 kW	40.8 kW	49.0 kW	62.5 kW
Cooling requirements, typical	15.3 kW	16.5 kW	25.8 kW	29.0 kW	37.5 kW
External inputs	Digital 24 V, analog power control 0-10 V, safety interlocks				

### Cooling systems

Water / water heat exchanger	CHW40, 40 kW cooling power, water temperature: 10 °C to 16 °C; internal or external
Water / water compressor chiller	CCW12, 12 kW cooling power, water temperature: 15 °C to 35 °C; internal or external
Water / air chiller	CCA12 / CCA20, 12 kW / 20 kW cooling power, ambient temperature: 38 °C; external

### Operating conditions

Temperature	10 - 45 °C operational, 5 - 65 °C storage
Humidity	Max. 70% @ 25 °C, with humidity protection max. 80% @ 35 °C, non-condensing
Protection rating / Safety class	IP54 / Laser safety class 1 according to EN 60825-01

### Options

Interface	PROFINET, Interbus-S, Profibus DP, DeviceNet, EtherNet/IP, EtherCat
Beam switch	Time Sharing or Power Sharing; 4 fibers (more configurations on request)
Optics	Laserline optics or commercial optics for every application
Others	Teleservice, pilot laser, pyrometer, CMOS camera, software for PC, mobile control panel, dust and humidity protection, water/water chiller with compressor, water/air chiller, optics chiller

### Warranty and Lifetime

Warranty	5 years on diode laser elements, 2 years on laser system
Diode cooling	Active for highest power density and reliability
Uptime	Typically > 99.5%

Concerning functional safety, the laser conforms to DIN EN ISO 13849-1 and achieves the performance level d.

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