

PHILIPS

Photonics

Industrial heating

VCSEL technology



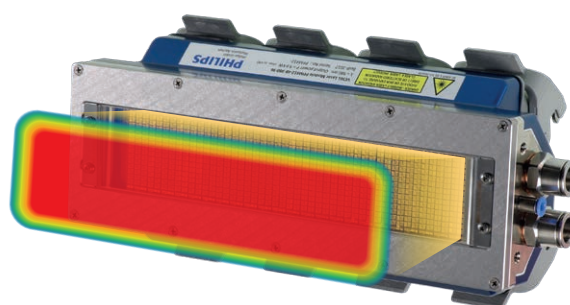
High Power Infrared Sources for Industrial Heating

Compact laser modules offering scalable and flexible solutions for industrial thermal processes

Laser sources based on VCSEL micro laser arrays are delivering directed large-area beams of near infrared power that can be applied in many industrial heating applications and production processes.

Considerable cost advantages compared to conventional lasers can be realized by direct illumination of the target area, without expensive optics or scanner systems.

As a unique feature, beyond precise control and fast switching of the infrared power, also the spatial heating profile can be arbitrarily programmed by independent control of small segments of the laser modules. Heating patterns can even change dynamically during operation, enabling an unprecedented level of process flexibility.



Direct large area treatment

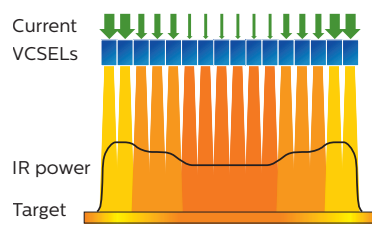
Philips Photonics

Philips Photonics is a leading innovator in VCSEL-based infrared lasers, developing and manufacturing devices, modules, systems and applications. Philips Photonics develops optimal solutions tailored to the specific needs of the process, in close collaboration with customers. Products and solutions are based on Philips' comprehensive know-how in technology, design, quality and production and a strong network to leading suppliers and scientific institutes. Philips Photonics is a fully owned business of Philips Electronics N.V.

Philips Photonics' VCSEL light sources offer excellent and reliable performance over a wide range of conditions

Key features

- High power infrared laser source based on Philips VCSEL (Vertical Cavity Surface Emitting Laser) technology
- Scalable kilowatt-range output power
- High power density of 100 W/cm² enabling fast processing
- Precisely controllable by individually addressable emission zones (tailored intensity profiles, in time and spatially)
- Compact, robust and easy to integrate
- Lower cost than conventional laser systems



Typical applications:

- General thermal processing
- Plastics welding / forming
- Composite manufacturing
- Drying / curing of coatings
- Printed electronics
- Photovoltaics
- Selective metal treatment



Flexible control of heating profile

PPM412 High Power Laser System - Typical Data

PPM412 laser systems can be scaled from small to large treatment width and up to several ten kilowatts infrared output power.

Laser Module	PPM412-12-980-24	PPM412-24-980-48	PPM412-48-980-96
Optical power (kW cw)	0.1 ... 2.4	0.2 ... 4.8	0.4 ... 9.6
Emission area (mm ²)	40 x 52	40 x 104	40 x 208
Distinct emission zones	12	24	48
Power density (W/cm ²)	min. 100 / typ. 115 (at emission aperture)		
Wavelength (nm)	980 ± 20		
Beam half angle	typ. 10 degrees (enclosing 95% power)		
Front glass	double borosilicate glass, anti-reflex coated		
Options	air curtain protection, integrated lenses		
Electrical interface	industry standard power connectors		
Laser module size (mm)	W 87 x H 48 (without connector)		
	L 108	L 160	L 264

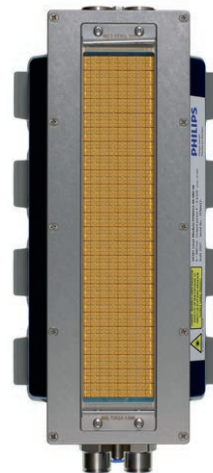
Driver Unit

Number of driver racks	1	2	4
Laser control	typ. 10ms time constant, individual control of laser emission zones, integrated laser zone monitoring		
Machine communication	Ethernet-based (EtherCAT® protocol)		
Mains voltage	3 phases 230V / 400V (±10%), 47-63 Hz		
Mains supply unit (option)	mains connection unit with safety circuit		

Safety information

The products contain laser arrays that can emit invisible high power laser radiation of class 4, which can cause serious injury. The machine manufacturer is responsible to fulfill the relevant laser-related and other safety regulations.

2.4 kW VCSEL module PPM412-12-980-24-c.
52 mm x 40 mm emission area in 12 separately programmable emission zones.



9.6 kW VCSEL module PPM412-48-980-96
208 mm x 40 mm emission area in 48 separately programmable emission zones

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