

Product Division



**LDBA**

## Laser Diode Bar Assemblies

Product

**PH-1800-QCW**

Description

1800W QCW pumping power, Ø3mm rod

Main  
Features

This compact laser pumping head consists of six water-cooled diode laser bars arranged radially around a central cavity suitable for accommodating a crystal laser rod as Nd:YAG. It shows excellent gain uniformity and lensing performance.

We have more than 10 years of experience with this product. We have combined the best high power laser diodes with a smart design optimizing efficiency, beam quality and lifetime, as well as reducing the cost. Our customers are very satisfied with its superior features and reliability, which help them gain competitive advantages.

The laser module is a CYLINDRICAL block. This allows rotation of the pumping chamber, thus giving flexibility during the production and optimization of a laser system.

With a pumped length of 23mm the laser rod is shorter than other similar products in the market. This is advantageous for regenerative amplifiers, since higher energy is available before self-focusing appears.

The pumping laser diode bars are mounted using our clamping technology. The main features of the solder-free concept of the clamping technology, exclusively used by monocrom, are:

- **Long lifetime**, due to the lack of the mechanical stress caused by the soldering process at high temperature.
- **Minimum “smile” effect**, less than 0,5 µm
- **High reliability** in pulsed conditions, since the clamped bars do not suffer the same fatigue effect than the soldered ones due to the thermal cycles.
- **Small thermal resistance**, owing the reduction of the contact resistance between electrodes and laser bar. No micro channels are needed to reach low thermal resistances.
- **Large storage temperature** interval tested from -60°C to + 85°C.

Monocrom active cooled mounts use millimetre-size water channels instead of micro-channels.

Some  
Applications

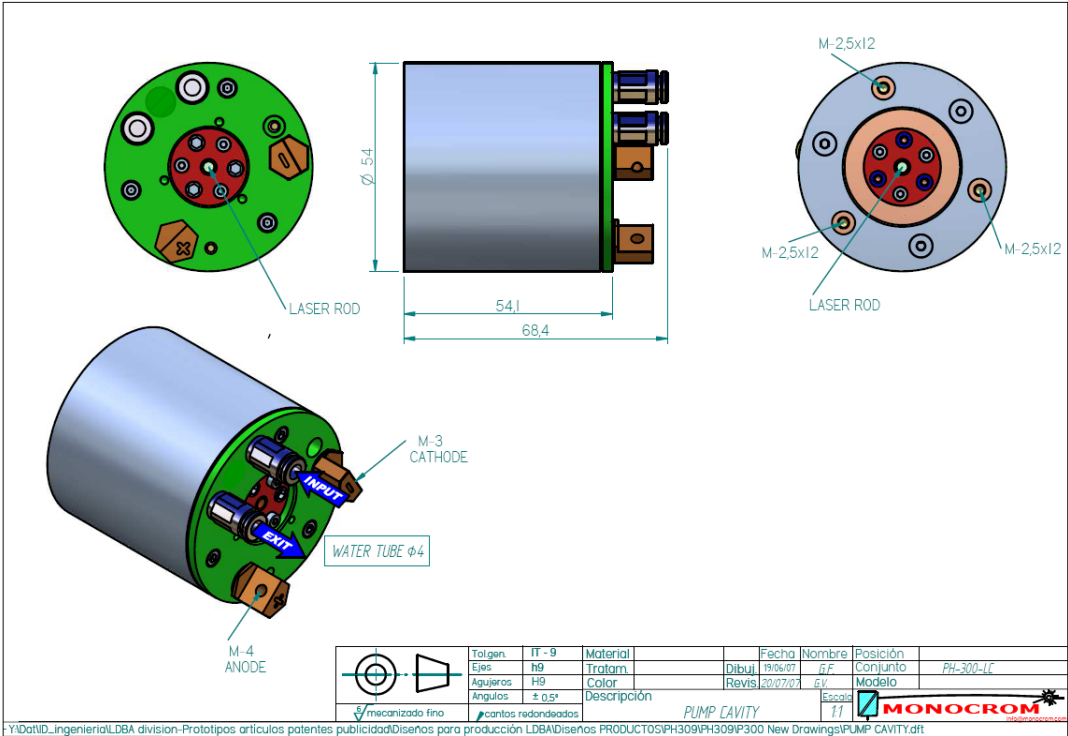
It is designed for scientific and industrial applications. For example:

- Laser marking
- Micro-machining
- Manufacturing
- Regenerative amplifiers
- Medical and aesthetical (ophthalmology, oncology, cosmetic medicine, dentistry laser)
- Scientific (fluid dynamics, laser spectroscopy)

Picture



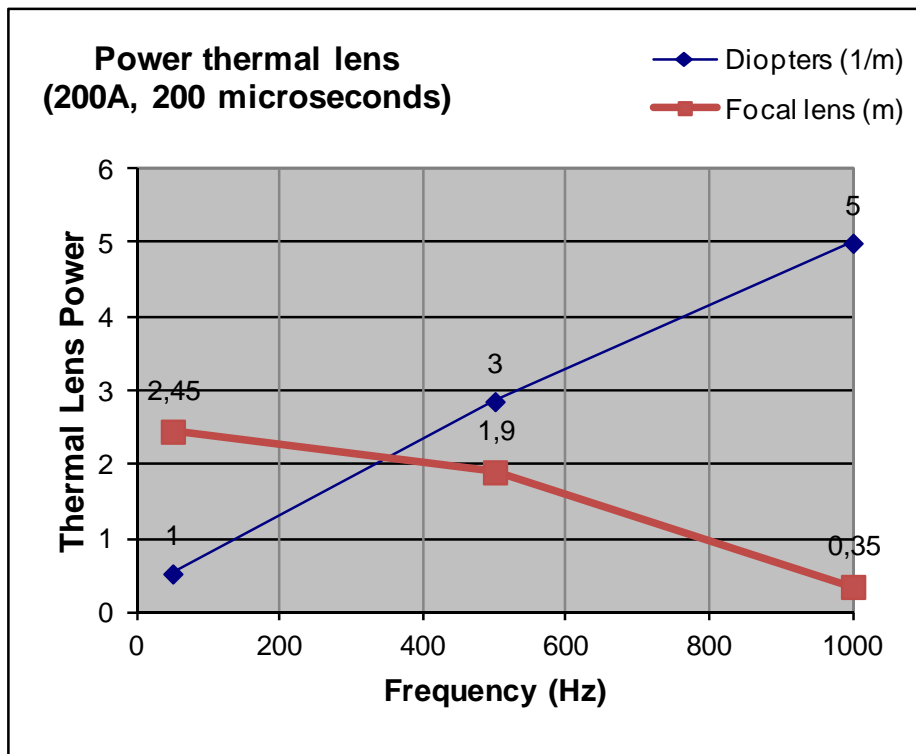
Outline



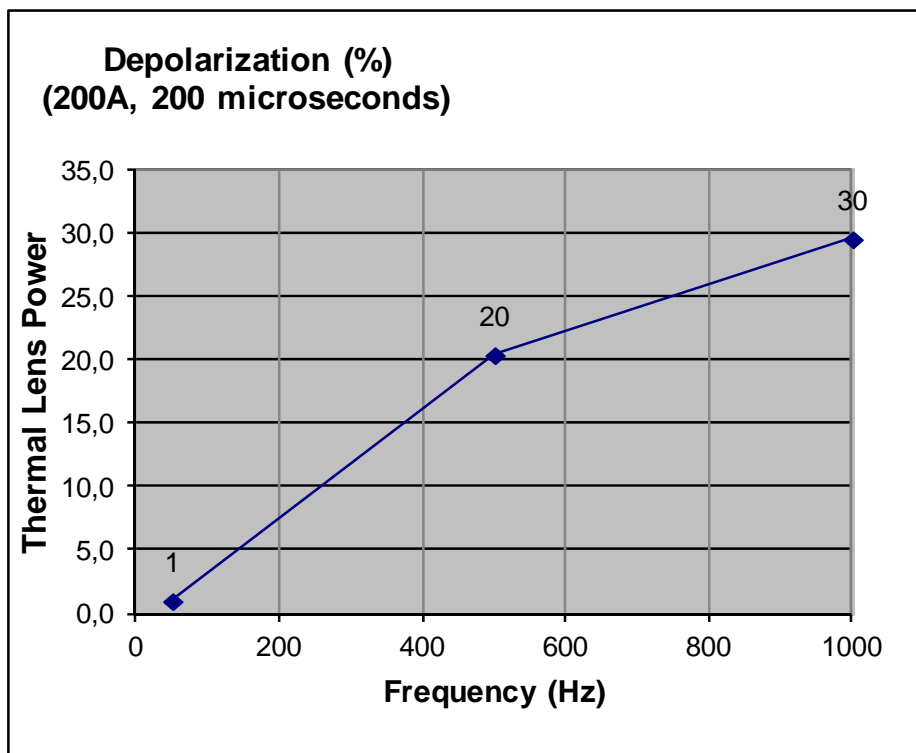
PH-1800-QCW   GENERAL TECH SPECIFICATION			
	Minimum	Operating	Maximum
Pumping power [W]		1800	2000
Pumping wavelength @ operating conditions <sup>1</sup> [nm]	804	806	808
Wavelength difference between bars [nm]		1	1,5
Operating current, I <sub>op</sub> [A]	30	270	300
Pulse length <sup>3</sup> , t <sub>p</sub> [μs]		250	1000
Frequency <sup>3</sup> , f [Hz]		300	1000
Duty cycle <sup>3</sup> [%]			10
Water temperature <sup>2</sup> (non-condensign) [°C]	15	35	45
Water flow [l/min]	0,7		
Water pressure (@input) [bar]	2		3
Wavelength Temperature shift [nm/K]		0,27	0,3
Operating voltage [V <sub>dc</sub> ]	10,8	12	13
Thermal lens @ Max. Ratings [m <sup>-1</sup> ]			3
Depolarization @ Max. Ratings [%]			20
Output beam diameter [mm]	3		
Rod pumped length [mm]	23		
Water connection	Water flow outlet for Ø4mm tube		
Electrical connections	Thread M3 for cathode, M4 for anode.		
Expected lifetime [pulses]	10 <sup>9</sup>		
Dimensions (Ø x length) [mm]	54 x 69		
Weight [g]	400		
Laser class product (EN-60825)	4		

1. QCW: 270A, 250μs, 300Hz, water temperature 35°C
2. Water temperature of 35°C for the above conditions to pump at 806nm. For other operating conditions different water temperatures may be needed in order to keep the pumping wavelength.
3. Be careful not exceeding any of these maximums (the module cannot work at maximum frequency and pulse length at the same time).

### Thermal lensing



### DEPOLARIZATION



Typical QCW characteristics @ 1064 nm; output mirror pl: 85% reflection; back mirror pl; resonator length 140 mm.

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## Installation Instructions

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### 1. Scope of delivery:

PH-180-QCW-LW (for specification, please see the data sheet)

### 2. Connections

The electrical contacts are indicated at the housing. The short-circuit should be removed before connecting the power supply to the electric contacts of the head

For the water-in and -outlet, quick connectors are used. Please use polyamide tubes with Ø4 mm, type JRE2602927, or equivalent. Deionised water +10% ethylene glycol is recommended for the cooling liquid, but not continuous maintenance of the liquid is required

### 3. Installation Instructions

- Please ensure that the water tubes are cut right-angled, please avoid that the tubes suffer stress at the in and outlets
- It is recommended to mount the cavity horizontal, in the case of vertical mounting the water in and outlet has to be located at the bottom side
- Cooling Water Requirements: around 1 L/min @ 2-3 bar, recommended water temperature: 15 to 35 °C
- Please use power supplies which avoid tension peaks.
- Please use interlocks for the water flow, over-current, under-temperature, and over-temperature.
- It is recommended to measure the pumping wavelength during the laser head operation, in order to set the optimum water temperature for maximum pumping absorption. The optimum absorption wavelength for Nd:YAG is 808 nm.

#### *Ordering Information:*



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