

Ordering Information:



800 Village Walk #316
 Guilford, CT 06437
 Ph: 203-401-8093

Email orders to: sales@xsoptix.com
 Fax orders to: 800-878-7282

Updated by GVM on 12/12/2012

info@monocrom.com

C. Vilanoveta, 6
 08800 Vilanova i la Geltrú
 Barcelona | Spain

Tel.: +34 938 149 450
 Fax.: +34 938 143 767
www.monocrom.com

Product Division



Laser Diode Bar Assemblies

Product

PH-900-QCW-YAG4

Description

Pump Laser Diode Head with Laser Crystal Nd:YAG of Ø4mm, pumping with 900W-QCW, water cooling, Ø54x56mm. More than 300W-QCW @ 1064nm. **Low thermal lens model.**

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 an OEM 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"**, 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 cycle.
- **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-water channels instead of micro-channels.

TAP WATER CAN BE USED FOR COOLING, without any obstruction or channel degradation.

Some Applications

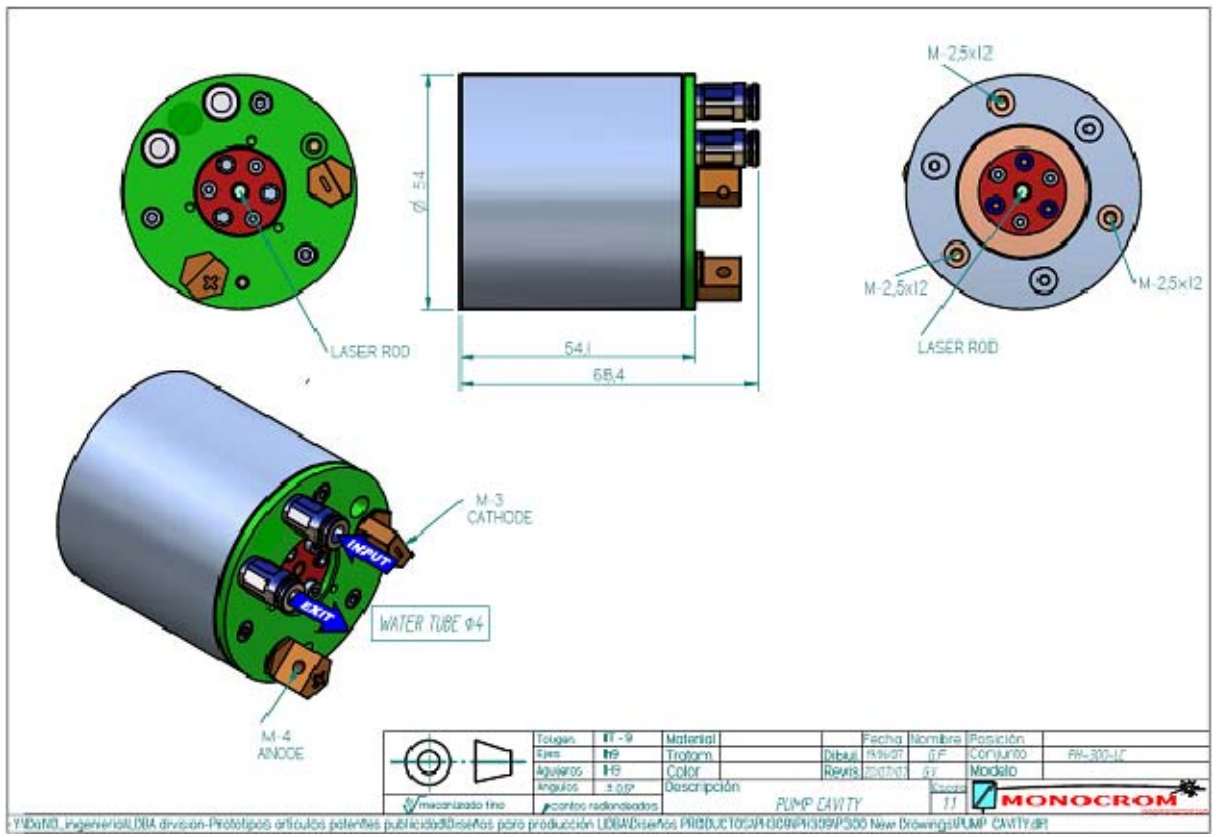
It is designed for scientific and industrial applications. For example:

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

Picture(s)



Outline



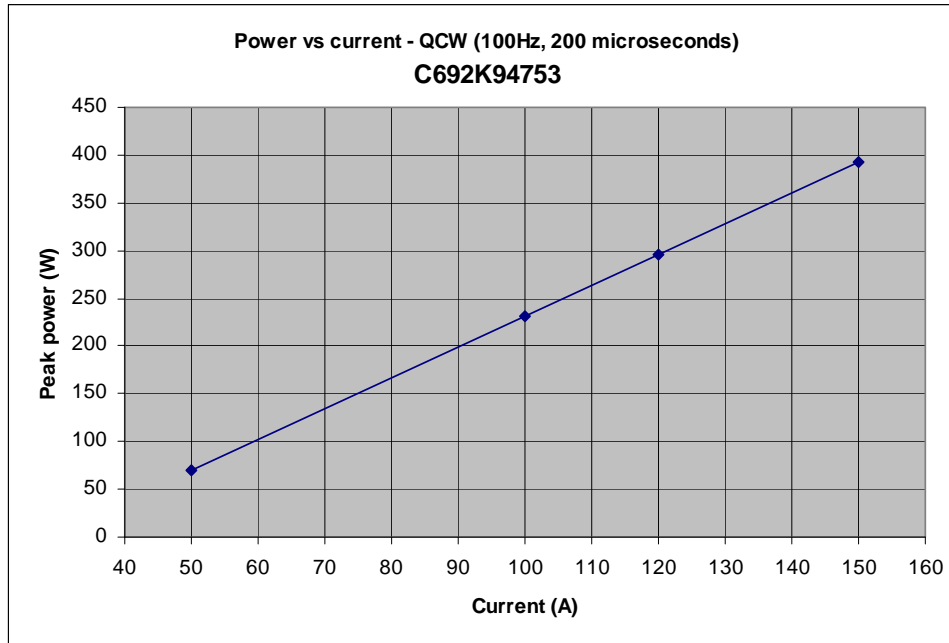
PH-900-QCW-YAG4 | GENERAL TECH SPECIFICATION

Emission Wavelength	1064 nm
Pumping wavelength @ Max. Op. current- QCW ¹	808 nm
Wavelength Temperature shift	0,27-0,3 nm/°C
Number of pumping LD bars	6
Maximum difference of wavelength in LD bars	1nm
Pumping peak power @ Max.Op.Current – QCW ¹ , maximum	900W
Output peak power @ 1064nm @ Max.Op.Current – QCW ^{1,2}	300W
Pulse energy @ 1064nm @ Max.Op.Current – QCW ^{1, 2}	90mJ
Recommended Operation Current ³	120 A
Maximum Operating Current	150 A
CW Maximum Operating current	30 A
Pumping Threshold Current, typical	20 A
Voltage before cables	<13V
Recommended QCW-Operation mode	300µs-100Hz
Maximum QCW ratings ⁴	1000µs-100Hz / 200µs-500Hz DC<10%
Thermal lens @ Max. Ratings, DIOPTERS	< 1,5 m ⁻¹
Depolarization @ Max. Ratings, DEPOLARIZATION	> 20:1 (<5%)
Output Beam Diameter without Aperture	4 mm
Active Medium, Crystal rod ⁵	0.4 – 1% Nd:YAG rod, Ø4x50 mm .
Rod pumped length	23 mm
Typical optical efficiency to 1064 nm	30-40%
Cooling Water Requirements	>0,7L/min @ 2-3 bar
Cooling Water Temp Range ⁶	<45 °C Out of condensation conditions
Water connection	Water flow outlet for Ø4mm tube
Electrical connections	Thread M3 for cathode, M4 for anode.
Expected lifetime @ CW 30A	10 ⁴ hours
Expected lifetime @ 120A, 300 µs	10 ⁹ pulses
Expected lifetime @ 120A, 1 ms	10 ⁸ pulses
Dimensions (see outline above)	Ø54 x 69 mm
Weight (aprox.)	400 g
Laser class product (EN-60825)	4

1. QCW: 150A, 300µs, 100Hz
2. Assuming 33,3% of optical efficiency. These values depend on the type of laser rods chosen by customer. Specifications are based on standard rods of Nd:YAG
3. Burn-In Current
4. Longer pulse length and duty cycles are available on request.
5. Other active media on request.

6. Water temperature of 45°C for 1%DC. For 10%DC the maximum temperature should be 30°C. The optimum water temperature depends on the operation current and water flow. It is recommended to measure the wavelength of the diode by using a spectrometer, so that water temperature is changed to achieve 808nm for optimum pumping.

Example of P-I characteristic



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

Installation Instructions

1. Scope of delivery:

PH-900-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 30 °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.