

# PNx High Peak Power Powerchip Series



## KEY FEATURES

- Peak power up to 200 kW
- Pulse width down to 350 ps
- 1064, 532, 355, 266 and 213 nm
- Single shot to 5000 Hz
- Excellent beam quality, TEM00  $M^2 < 1.3$
- All-in-one package

The PowerChip™ passively Q-switched MicroChip lasers offer the highest peak powers and shortest pulses at kilohertz repetition rates with an excellent beam quality. They feature a completely integrated platform which includes the laser head, power supply and air cooling in a compact, rugged, and turnkey package.

## APPLICATIONS

- Materials processing
  - Inscribing glass
  - Via drilling printed circuit boards
  - Micromachining
- MALDI-TOF
- Microdissection
- Laser Induced Fluorescence (LIF)
- Time Resolved Fluorescence
- Laser Induced Breakdown
- Spectroscopy (LIBS)
- Light Detection and Ranging (LIDAR)

## TECHNICAL SPECIFICATIONS

		<b>New!</b> Preliminary specs			<b>New!</b> Preliminary specs		<b>New!</b>		<b>New!</b> Preliminary specs
	PNP-M08010 1x0	PNP-M05550 1x0	PNG-M02010 1x0	PNG-M0400 5 1x0	PNG-M01550 1x0	PNV-M02510 1x0	PNV-M01050 1x0	PNU-M01210 1x0 <sup>(6)</sup>	PND-M00210 1xx
<b>Wavelength</b>	1064nm	1064nm	532nm	532nm	532nm	355nm	355nm	266nm	213nm + residual $\lambda^*$
<b>Max Repetition Rate <math>RR_{max}^{(1)}</math></b>	1000Hz	5000Hz	1000Hz	500Hz	5000Hz	1000Hz	5000Hz	1000Hz	400Hz**
<b>Constant Pulse width range (FWHM)</b>	<500ps	<600ps	<400ps	<400ps	<500ps	< 350ps	< 350ps	<350ps	<1000ps
<b>Output energy</b>	>80 $\mu$ J	>50 $\mu$ J	>20 $\mu$ J	>35 $\mu$ J	>15 $\mu$ J	> 25 $\mu$ J	> 10 $\mu$ J	>12 $\mu$ J	>2 $\mu$ J
<b>Peak Power</b>	>160kW	>85kW	>50kW	>80kW	>30kW	> 60kW	> 30kW	>35kW	>2kW
<b>Short term (1min) pulse to pulse stability <math>1\sigma</math></b>	$\leq 1\%$	$\leq 2\%$	$\leq 3\%$	$\leq 3\%$	$\leq 3\%$	$\leq 3\%$	$\leq 3\%$	$\leq 3\%$	$< 2\%$ <sup>(8)</sup>
<b>Long term (1h) output power stability <sup>(2)</sup></b>	$\pm 3\%$	$< 6\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$< 10\%$ <sup>(9)</sup>
<b>Beam profile</b>	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	See note <sup>(5)</sup>	Gaussian TEM00
<b>Beam divergence (Full @1/e<sup>2</sup>)</b>									
<b>Horizontal</b>	2.0 $\pm$ 0.5mrad	2.0 $\pm$ 0.5mrad	1.8 $\pm$ 0.5mrad	5.0 $\pm$ 1mrad	1.8 $\pm$ 0.5mrad	3.3 $\pm$ 0.5mrad	3.3 $\pm$ 0.5mrad	<0.9mrad	$\leq$ 0.3mrad
<b>Vertical</b>	2.0 $\pm$ 0.5mrad	2.0 $\pm$ 0.5mrad	1.8 $\pm$ 0.5mrad	4.0 $\pm$ 1mrad	1.8 $\pm$ 0.5mrad	3.0 $\pm$ 0.5mrad	3.0 $\pm$ 0.5mrad	<0.9mrad	$\leq$ 0.3mrad
<b>M<sup>2</sup> <sup>(3)</sup></b>	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4	$\leq$ 1.5
<b>Beam ellipticity <sup>(4)</sup></b>	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	-	$\leq$ 1.5
<b>Polarization</b>	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB

\*In addition with 213nm, the following residual wavelengths are present at the laser output of this laser model: 808nm, 1064nm, 532nm, 355nm. In order to select the 213nm wavelength only, the end-user needs to acquire a specific external filtering system and place it in front of the laser output.

The 808nm signal comes from the pumping diode. The residual energy at the other wavelengths come from signals which have been partially converted by the nonlinear stage.

\*\*The repetition rate can be factory-set up to 1kHz upon request. The stability and other specifications will change accordingly.

### NOTES

(1) See options p3

(2) For temperature variation  $\leq \pm 3^\circ\text{C}$  and  $< 3^\circ\text{C}/\text{hour}$

(3) Mean average value  $M = \sqrt{(XY)}$ , X and Y being respectively the major and minor axis of the ellipse

(4) Beam ellipticity is calculated as the ratio of the main axis far-field divergence.

(5) Beam exhibits different profile in horizontal (Gaussian) and vertical ( $(\sin x/x)^2$  in far-field) plans

(6) Contact factory for availability

(7) More compact separated leaser head and electronics package may be available upon request – Contact factory for further details

(8) Short term energy stability (1000 pulses, RMS)

(9) Long term (4hr) average energy drift

## COMPLEMENTARY INFORMATION & OPTIONS:

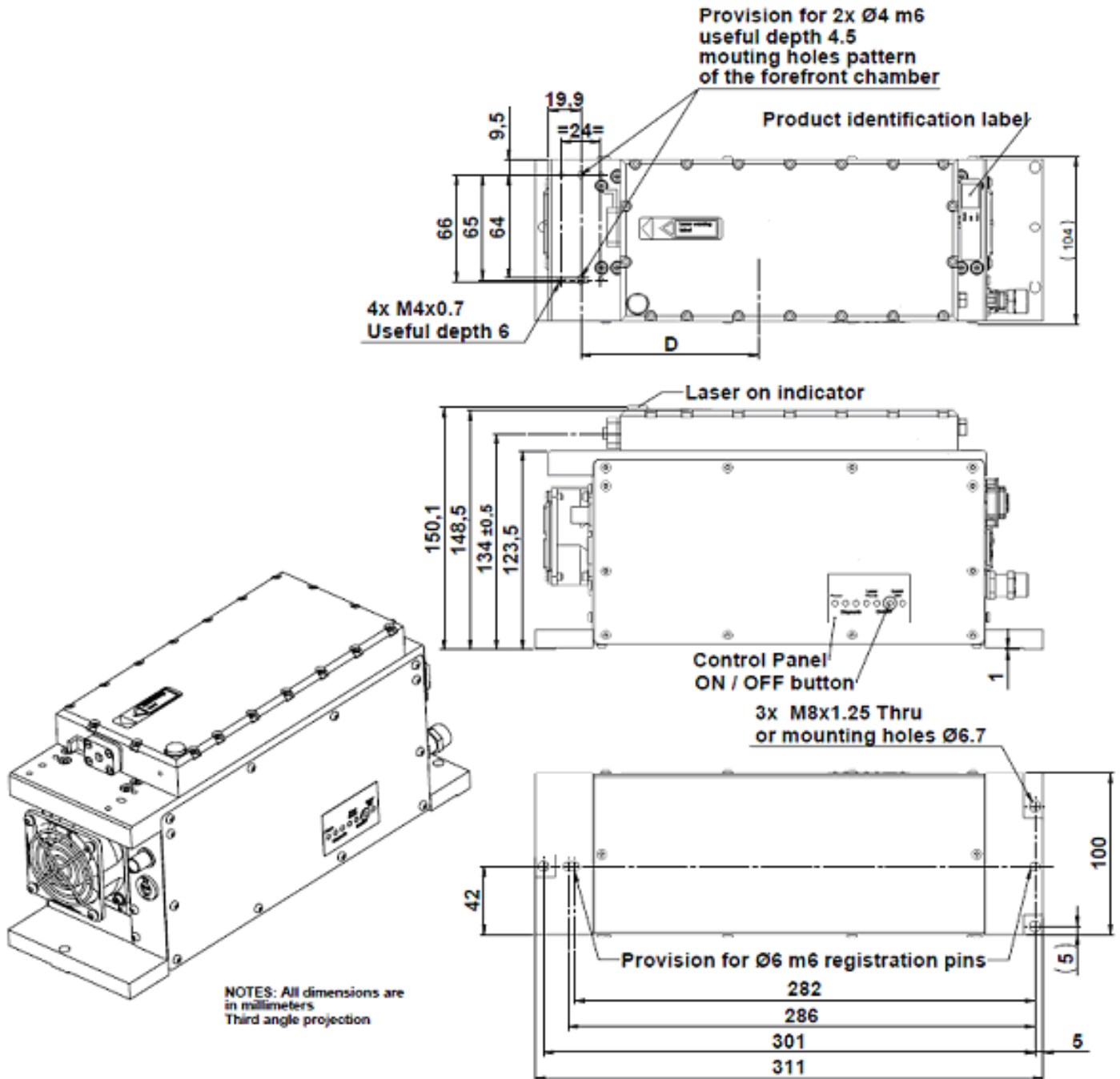
Environment parameters	
Operating Temperature	20-35 °C
Maximum Power Consumption	<75 W
Storage Temperature	0-50 °C
Shock of 11ms according to IEC 68-2-27, non operating	25 g
Vibration 5Hz to 500Hz sinusoidal according to IEC 68-2-6, non operating	2 g

Certification	
Laser Classification according to IEC 60825-1:2007	Class 3B Except PNU & PND : Class 4
CDRH	Yes if used with PCR-240500-100 power supply
ROHs	Yes

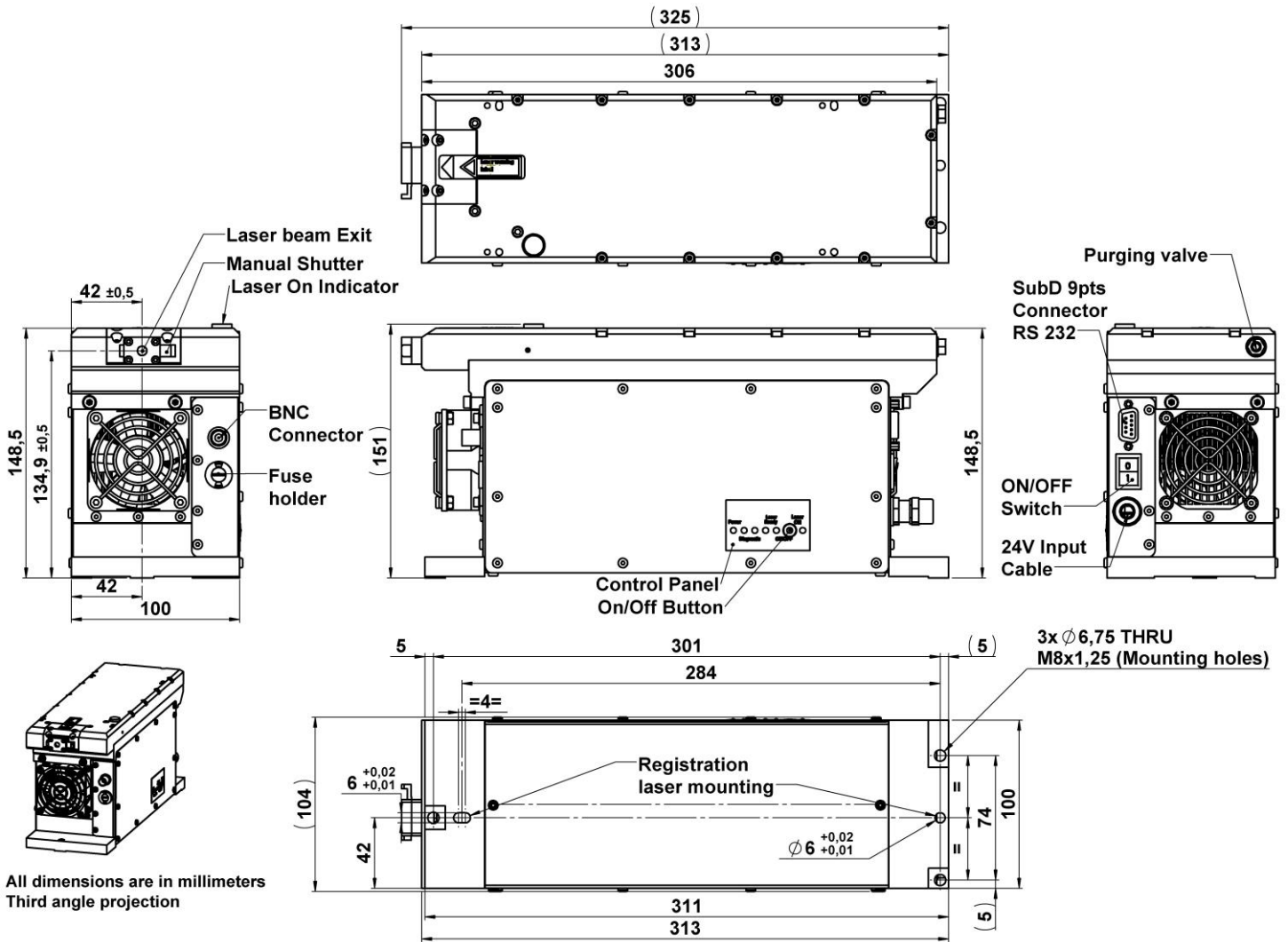
Package	
Laser Head dimensions, LxWxH <sup>(7)</sup>	311x100x149 mm
Laser Head weight	5.5 kgs
PCR-240500-100 AC/DC converter dimensions, LxWxH	315x262x77 mm
PCR-240500-100 AC/DC converter weight	3 kgs

Options	
Fixed Repetition Rate = $RR_{max}$	-100 version <i>Option NOT available for the PNP-M05550-1x0, the PNG-M01550-1x0, nor the PNV-M01050-1x0</i>
Fixed Repetition Rate $\neq RR_{max}$	-110 version ; RR to be chosen over 10Hz- $RR_{max}$ <i>Option NOT available for the PNP-M05550-1x0, the PNG-M01550-1x0, nor the PNV-M01050-1x0</i>
External Variable Repetition Rate	-120 version ; single shot to $RR_{max}$ , 1 optimized RR value
External Variable Multi-Repetition Rate	-130 version ; single shot to $RR_{max}$ , 3 optimized RR values
Beam expander for the 213nm PND-M00210 model only	-1xB version

## MECHANICAL DRAWINGS : CDRH POWERCHIP LASER HEAD EXCEPT FOR THE PND-M00210-1XX MODEL



## PRELIMINARY MECHANICAL DRAWINGS OF THE CDRH PND-M00210-1X0 LASER HEAD



## MECHANICAL DRAWINGS : PCR-240500-100 (CDRH COMPLIANT AC/DC CONVERTER)

