

aeroGAIN ROD

High-power PM ytterbium rod fiber gain module

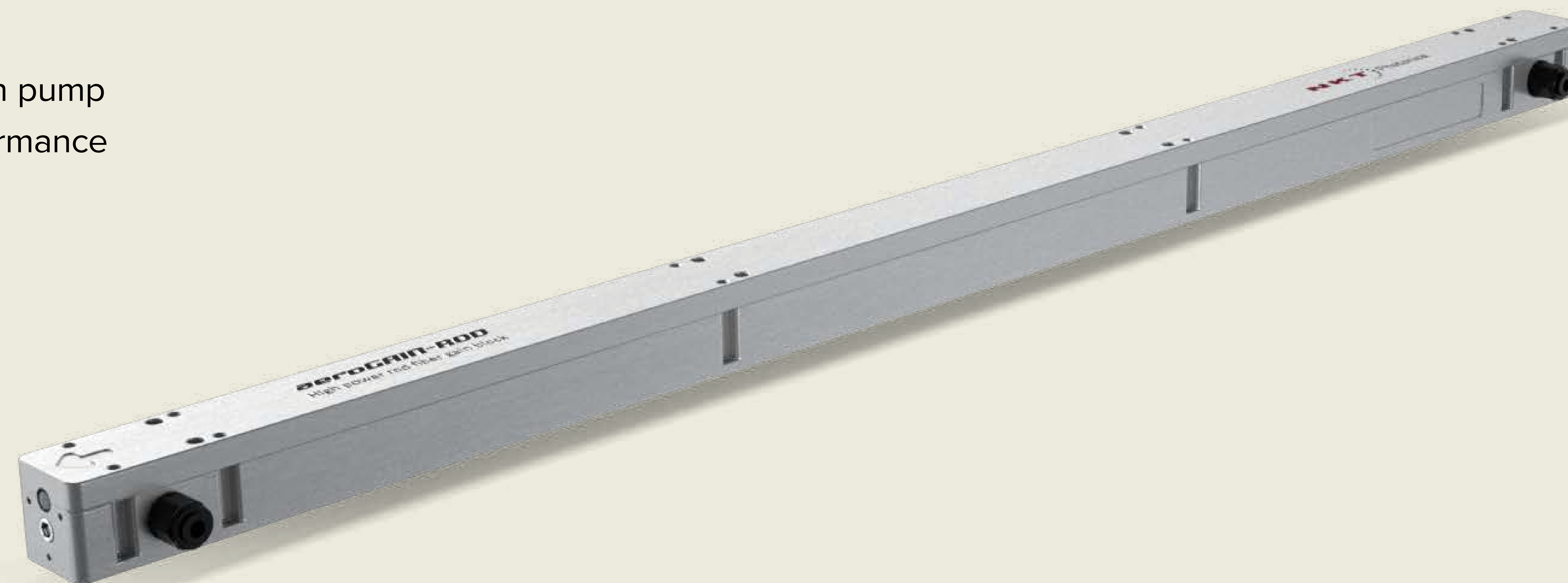


High power fiber amplification system for ultrafast lasers

Ideal for manufacturing of ultrafast high-power pulsed lasers

The aeroGAIN-ROD is the ultimate fiber amplifier module for pulsed lasers. It exhibits an exceptional power handling previously only available in solid-state configurations.

With an approximate 3300 μm^2 mode field area and high pump absorption, the aeroGAIN-ROD module offers high performance for demanding peak power applications.



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Applications

Ultrafast high-power pulsed
lasers

Benefits

Ideal gain medium for ultrafast high-power amplifiers

The excellent mode quality and easy coupling make the aeroGAIN-ROD module an ideal gain medium for ultrafast high-power amplifiers.

Large numerical aperture and reduced reflections

The pump light is guided by our proven airclad technology which boasts high reliability, high damage threshold, and a large NA.

The modules come with high-power AR coated endcaps. The output endcap is slightly angled to prevent reflections.

Robust design optimized for OEM integration

The rugged aluminum body makes the module easy to handle and mount for both OEM integration and scientific laboratory set-ups.

Thermal management ensures high performance

Integrated water cooling with quick coupling ensures efficient thermal management and a long, maintenance-free lifetime of thousands of hours.

Diffraction-limited gain modules

Both aeroGAIN-ROD models are diffraction-limited gain modules which gives several advantages compared to standard multimode Large Mode Area fibers:

- Better output beam stability
- Excellent beam quality
- No coiling-induced mode area compression

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FEATURES

Diffraction-limited beam quality

High peak power damage threshold

High NA pump cladding

AR coated endcaps

Optimized for 1030 - 1040 nm

Compact and robust industrial format

Long lifetime

Specifications

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Optical

Model	2.1	3.1*
Signal core diameter [μm]	≈ 85	≈ 85
Signal wavelength [nm]	1030 - 1040	1030 - 1040
Pump cladding NA (FWHM @ 950 nm)	≥ 0.5	≥ 0.5
Gain fiber length [mm]	804 ± 3	804 ± 3
Cladding absorption [dB]		
@ 915 nm	5 ± 0.7	5.7 ± 0.7
@ 976 nm, nominal	≈ 15	≈ 17
PER, typical [dB]	≥ 15	≥ 15
Typical optical efficiency [%] ¹	≥ 60	≥ 60
Beam quality	M ² ≤ 1.3	M ² ≤ 1.3
Mode-field diameter, 1/e ² [μm] ²	65 ± 10%	65 ± 10%
Signal average power [W]	≤ 100	≤ 250
Pump cladding diameter [μm]	260 ± 15	260 ± 15

¹ Seed level 5 W @ 1030 nm, 976 nm pumping.
² MFD decreases with thermal load. The actual reduction will depend on the system parameters. A typical reduction is less than 0.1 %/W (signal power).

Water cooling

Water cooling connection [mm / ”]	8 mm x 1/4” BSPP
Recommended water flow ³ [liter/minute]	> 1
Recommended water temperature ³ [°C]	≈ 25
Operating temperature [°C]	20 - 30 (ambient)
Storage temperature [°C]	-20 - 60

³ We recommend DI water containing an anti-corrosive additive to protect the aluminum cooling circuit. Required water flow and water temperature depend on the actual optical system parameters.

aeroGAIN-ROD Module 3.1 is now available as engineering sample with current draft specifications

Specifications

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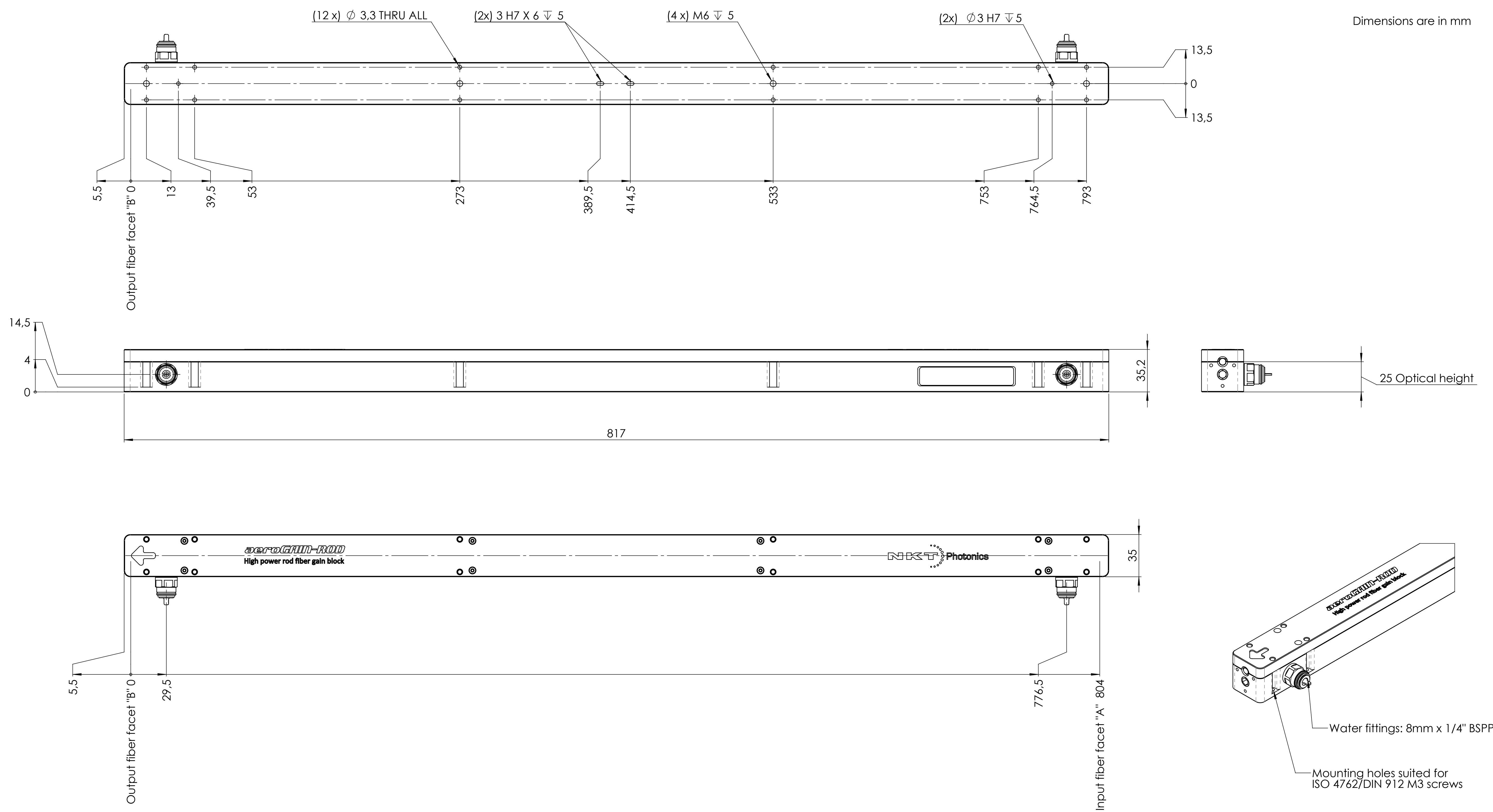
Mechanical

Dimensions (WxHxL) [mm3	35 x 35.2 x 817
Weight [kg]	2.5
Endcap length [mm]	5
Endcap diameter [mm]	6
Endcap coating R @ 1030 nm [%]	≤ 0.2
Endcap coating R @ 976 nm [%]	≤ 0.3
Endcap angle, input [°]	≤ 0.5
Endcap angle, output [°]	2 ± 0.7

Optical height [mm]	25
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Mechanical Drawings

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All NKT Photonics products are produced under our quality management system certified in accordance with the ISO 9001:2015 standard.



SOLUTIONS FOR INNOVATORS