## NIX - Photonics

# **BASE 12** High-power vtterbium fiber gai



### A HAMAMATSU COMPANY

## High-performance gain module

## Ideal for manufacturing of pulsed fiber lasers

The aeroGAIN-BASE-1.2 is a high-performance ytterbium fiber gain module designed for industrial manufacturers of pulsed fiber lasers. It provides laser beams with high spectral and spatial brightness. It is also suited as an easy entry into high-power scientific setups.

The aeroGAIN-BASE-1.2 has a reduced size compared to other members of the aeroGAIN-BASE family.









## Applications

**Ultrafast fiber lasers** 



#### Large single-mode mode field diameter

The gain medium is our world-renowned DC-200/40-PZ-Yb fiber providing the largest single-mode MFD in the industry.

#### Thermal management ensures high performance

The gain fiber is heatsinked to the aluminum base-plate that can be clamped to e.g. a water chilled plate or an air-cooled heat sink.

For optimal performance, the aeroGAIN-BASE-1.2 is designed for counter propagating pumping through the output endcap.

The endcap and the last part of the gain fiber is mounted in a water cooled housing to ensure maximum performance and lifetime.

#### Standard step-index input fiber

The module is equipped with a 10  $\mu$ m or 15  $\mu$ m step-index standard single-mode fiber input that can easily be spliced to a seed source.

Mode expansion and reduced reflections The output end of the module is equipped with a large AR coated endcap that provides mode expansion and reduces reflections. Excess pump light is removed by the integrated residual pump dump.

Proven reliability and long lifetime The aeroGAIN-BASE design has a proven 24/7 industrial reliability through a significant number of long-term tests including continuous 25,000 hours operation at 55 W output power.

The design has been subjected to extensive HASS testing.

Modules are mounted on a tooling plate for secure transportation. This tooling plate can also be used as a mount in the laboratory

## aeroGAIN **BASE 1.2**

### Features

Truly single-mode polarization maintaining system 10 μm or 15 μm step-index fiber input Excellent pointing stability Easy thermal management **Robust industrial construction** Long lifetime

## Specifications

## Optical

Seed input

Signal wavelength [nm]

Recommended signal input power [mW]

**Recommended pulse duration** 

Signal input fiber

Signal output

Max signal gain [dB]

Rated output power [W]

**Beam quality** 

Mode-field diameter, 1/e<sup>2</sup> [µm]

PER, typical [dB]

Typical optical efficiency [%]<sup>1</sup>

Typical core to cladding ratio [%]<sup>1</sup>

	Pump input	
1030 - 1040	Pump center wavelength [nm]	976 ± 2
> 500 for high power operation	Maximum pump power, Pp [W]	100 @ fibe
fs, ps or ns pulses shorter than 2 ns	Recommended pump type	Fiber deliv
10 $\mu m$ core PM 125 $\mu m/250$ $\mu m$ or		Max NA <
15 μm core PM 250 μm/350 μm	Pump cladding diameter [µm]	200 ± 2
< 20	<sup>1</sup> Evaluated with <sup>2</sup> W input power at <sup>1064</sup> nm and <sup>75</sup> W output power.	
75		
$M^{2} \leq 1.3$		
31 ± 2		
≥ 15		
> 70		
> 96		



er facet

vered 200/0.22

0.55

## Specifications

## Mechanical

Base plate dimensions <sup>1</sup> [mm]

Weight, excl. tooling plate [kg]

Length of input pigtail [m]

Output end facet angle [°]

Endcap length [mm]

Endcap diameter <sup>2</sup> [mm]

### Water cooling

Cooling flow for base [liter/minute]

**Cooling flow in the tube [liter/minute]** 

Cooling water temperature [°C]

Max temperature of base-plate [°C]

<sup>1</sup> The system is shipped on a larger tooling plate that can be used for mounting the module during test. <sup>2</sup> Open aperture

See drawing
1.8
1
0
6
7

4 ± 2	
0.2 - 0.5	
25 ± 5	
35	



Output endcap fixture





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## Mechanical Drawings





## aeroGAIN **BASE 1.2**

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







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