

# aeroGAIN BASE 1.1

High-power ytterbium fiber gain module



# High-performance gain module

Ideal for manufacturing of pulsed fiber lasers

The aeroGAIN-BASE-1.1 is a high-performance ytterbium fiber gain module designed for industrial manufacturers of pulsed fiber lasers.

It is also suited as an easy entry into high-power scientific setups.

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## Applications

**Ultrafast fiber lasers**



# Benefits

## 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-1.1 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  $\mu\text{m}$  or 15  $\mu\text{m}$  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

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

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.

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## FEATURES

Truly single-mode polarization maintaining system

10  $\mu\text{m}$  or 15  $\mu\text{m}$  step-index fiber input

Excellent pointing stability

Easy thermal management

Robust industrial construction

Long lifetime

# Specifications

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## Optical

### Seed input

Signal wavelength [nm]	1060 - 1070
Recommended signal input power [mW]	> 500 for high power operation
Recommended pulse duration	fs, ps or ns pulses shorter than 2 ns
Signal input fiber	10 $\mu\text{m}$ core PM 125 $\mu\text{m}$ /250 $\mu\text{m}$ or 15 $\mu\text{m}$ core PM 250 $\mu\text{m}$ /350 $\mu\text{m}$

### Signal output

Max signal gain [dB]	< 20
Rated output power [W]	75
Beam quality	$M^2 \leq 1.3$
Mode-field diameter, $1/e^2$ [ $\mu\text{m}$ ]	$31 \pm 2$
PER, typical [dB]	$\geq 15$
Typical optical efficiency [%] <sup>1</sup>	> 70
Typical core to cladding ratio [%] <sup>1</sup>	> 96

### Pump input

Pump center wavelength [nm]	$976 \pm 2$
Maximum pump power, $P_p$ [W]	100 @ fiber facet
Recommended pump type	Fiber delivered 200/0.22 Max NA < 0.55
Pump cladding diameter [ $\mu\text{m}$ ]	$200 \pm 2$

<sup>1</sup> Evaluated with 2 W input power at 1064 nm and 75 W output power.

# Specifications

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### Mechanical

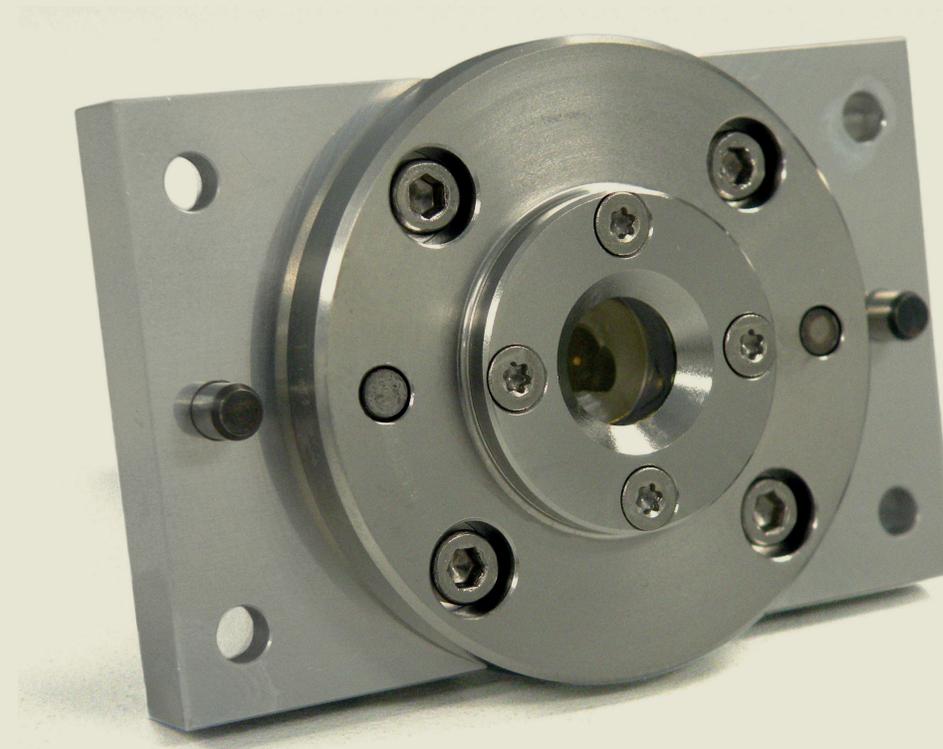
<b>Base plate dimensions <sup>1</sup> [mm]</b>	See drawing
<b>Weight, excl. tooling plate [kg]</b>	1.8
<b>Length of input pigtail [m]</b>	1
<b>Output end facet angle [ °]</b>	0
<b>Endcap length [mm]</b>	6
<b>Endcap diameter <sup>2</sup> [mm]</b>	7

### Water cooling

<b>Cooling flow for base [liter/minute]</b>	4 ± 2
<b>Cooling flow in the tube [liter/minute]</b>	0.2 - 0.5
<b>Cooling water temperature [°C]</b>	25 ± 5
<b>Max temperature of base-plate [°C]</b>	35

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

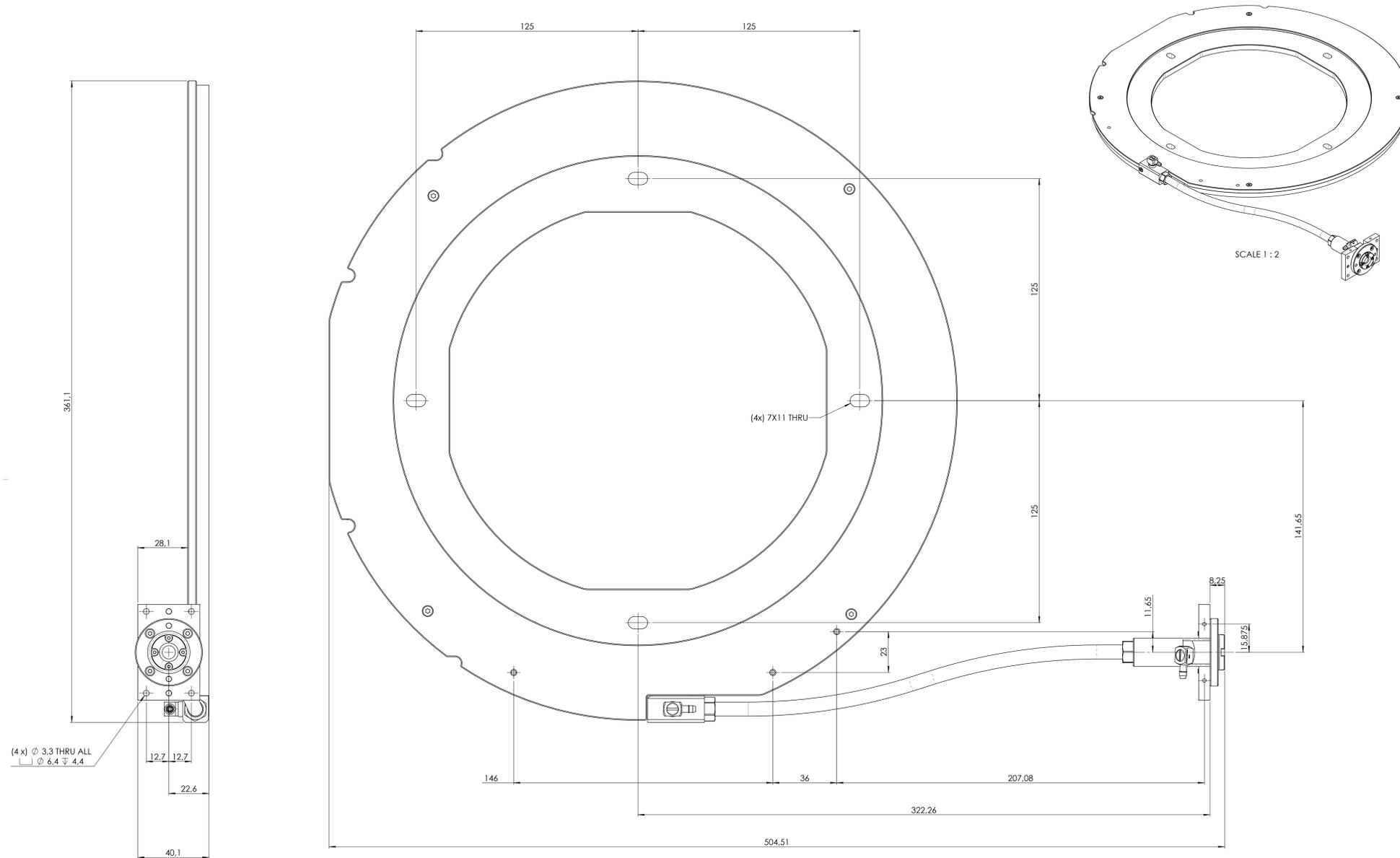
<sup>2</sup> Open aperture



Output endcap fixture

# Mechanical drawing

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



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