

OPIPHOTONICS

HIGH-POWER LASER DIODES



BrighteX Line
Fiber coupled
laser diodes



BrightboX Line
Laser diode
systems

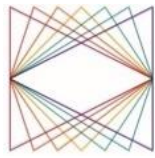


High-Power
Laser Switch
and Coupler



High-Power
Laser Collimator
and Optics

HIGH-POWER LASER BEAM DELIVERY SYSTEMS



LASER BEAM COUPLER

FOR FIBER AND DIRECT DIODE LASERS



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1 General overview

Application

- Material processing
- Industrial field

Input sources

- Fiber laser
- Direct diode laser

Features

- Up to 10 kW
- Low power loss
- Easy replacement of process fiber

Functionality

- OPI laser beam coupler allows the interconnection between the feeding fiber and the process fiber.

2 Specifications:

2.1 Fiber laser sources

	Parameter	Unit	Typical
Optical characteristics	Maximum power	kW	8
	Wavelength range	nm	1030÷1090
	Maximum NA	-	0.18 or 0.2
	Lens material	-	High-Quality Fused Silica
	Typical power loss	%	<5

2.2 Direct diode laser sources

	Parameter	Unit	Typical
Optical characteristics	Maximum power	kW	10
	Wavelength range	nm	800÷1100
	Maximum NA	-	0.22
	Lens material	-	High-Quality Fused Silica
	Typical power loss	%	<5

2.3 General specifications

	Parameter	Unit	Typical
Electrical characteristics	Power supply	V	24
	Current consumption	A	1
	Interlock safety range	kΩ	0.4÷12
	Waterflood sensors range	V	0÷24
	Output signals range	V	0÷24
Maximum ratings	Operating temperature	°C	10÷50
	Relative humidity	%	<80
	Storage temperature	°C	-20÷70
	Maximum ambient variation*	°C	±10
Cooling requirements	Minimum water flow	l/min	1
	Typical water flow	l/min	2
	Maximum pressure	bar	3
	Water temperature	°C	20÷30 (above dew point)
	Water quality	-	Tap or demineralized water
	Water pipe ID/OD	mm	4/6

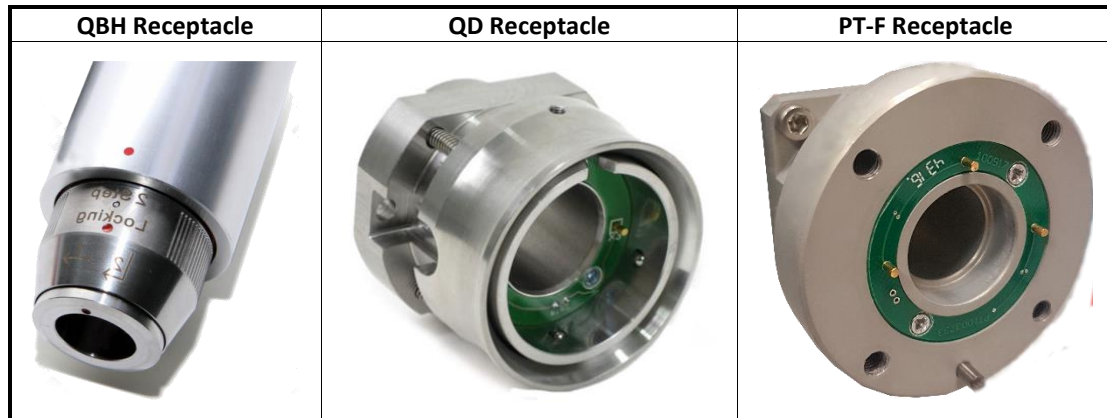
* If the temperature changes more than ±10°C during operation, within the specified operating temperature, the coupler could need a re-alignment.

3 Optical configurations

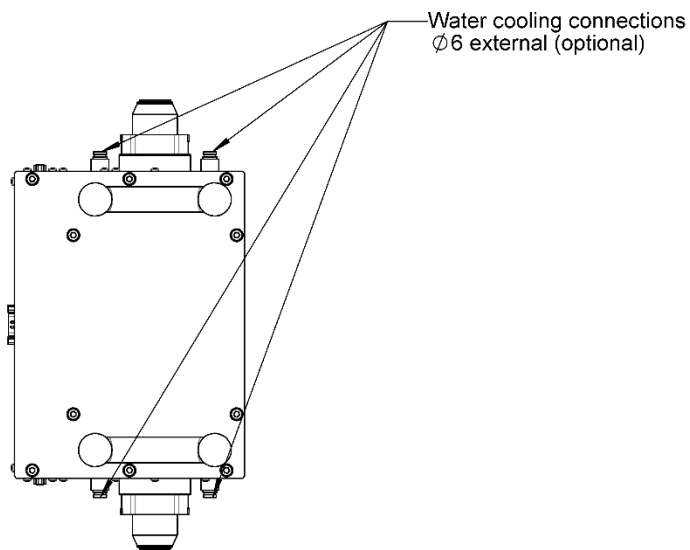
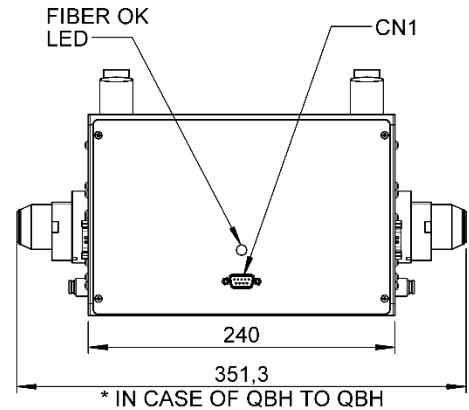
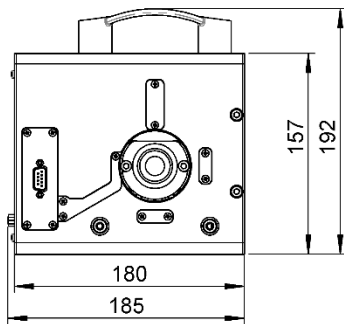
	Magnification factor	Maximum NA	Collimating lens focal length (mm)	Focusing lens focal length (mm)
Fiber Laser	0.8	0.18	60	50
	1	0.18	60	60
	1.2	0.2	50	60
	2	0.2	50	100
Direct Diode Laser	1	0.22	60	60
	1.2	0.22	50	60
	2	0.22	50	100

4 Receptacle configurations

The laser beam coupler can be equipped with several types of fiber receptacle, starting from the most diffuse QBH and QD coming to the new PT-F. One example of each receptacle is shown in the table below.



5 Technical drawings



All dimensions are in millimetres.

6 Electrical connections

6.1 Coupler interface connector:

The coupler interface connector (CN1) is a 9 ways male d-sub with the following pinout:

Pin	Signal	Function
1	24V	Input: 24V for power supplying
2	24V	
3	0V	Input: 0V for power supplying
4	0V	
5	Fiber_OK	Output: processing fiber interlock integrity detected
6	Water_Alarm	Output: water leakage not detected
7	Spare	-
8	Spare	-
9	Spare	-

7 Customization

The laser beam coupler for fiber and direct diode lasers is conceived as a standard product with some possible customizations.

Minor customizations are available on the standard part numbers and involve the following items and are tracked by the “OO” suffix in the extended part number:

- CANbus communication protocol
- Fiber scattering sensor

Major customizations will change the components used inside the device:

- Magnification factor (“X” field of the extended part number)
- Maximum numerical aperture (“Y” field of the extended part number)
- Input receptacle (“Z” field of the extended part number)
- Output receptacle (“A” field of the extended part number)
- Wavelength range (“B” field of the extended part number)
- Cooling system (“C” field of the extended part number)

Major customization is possible only on specific request and after feasibility evaluation.

8 Ordering information

Extended part number: CPL-X-Y-Z-A-B-C-OO

Part number data:

- Magnification factor – X:
 - 0.8
 - 1.0
 - 1.2
 - 2.0
- Maximum Numerical Aperture – Y:
 - 0.18
 - 0.2
 - 0.22
- Input and output receptacles – Z – A:
 - Q – QBH
 - D – QD
 - F – PT-F
- Wavelength range – B:
 - FL – Fiber Laser
 - DL – Direct Diode Laser
- Cooling system – C:
 - A – Air (newer version under development)
 - W – Water



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