Beam Delivery Components for High-Power Lasers

QD FIBER OPTIC CABLE

Diode Lasers

The QD fiber optic cable complies with the European automotive industry's standard interface requirements. Its innovative connector design features an integrated photodiode that enables detection of coupling losses on the input side as well as back reflections from the workpiece on the output side.

The QD fiber connector is water-cooled to ensure optimal performance and excellent power-loss handling capability. An integrated mode stripper removes unwanted cladding light, producing a well-defined output beam free from cladding power.

Combined with a reinforced, highly durable fiber hose, the QD fiber optic cable is ideally suited for demanding dynamic robotic applications.



FEATURES

- 10 kW (CW)
- Mode-stripper
- AR-coated end cap
- Scattered light detection
- Superior power loss handling
- Round or square fiber core
- Plug-and-play within 10 µm

APPLICATIONS

- Welding
- Cutting
- Surface Treatment
- Cladding
- 3D Additive Manufacturing

COHERENT

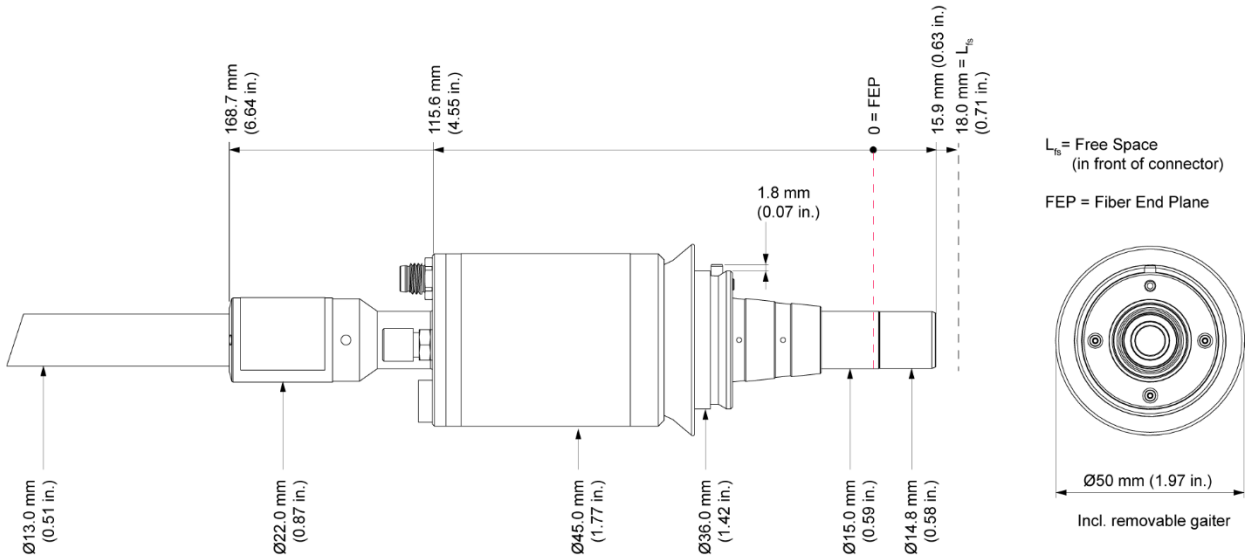
Specifications	QD
Maximum Power CW (kW)	10[1]
Wavelength (nm)	780 to 1100 (diode lasers)
Numerical Aperture $NA_{fiberacc}$	0.05 to 0.20
Fiber Core Dimensions (µm)	≤1000
Fiber Concentricity (µm)	≤10
Z-position Tolerance (µm)	±50
Pointing/Angular Deviation[2] (mrad) Core Diameter >200 µm Core Diameter ≤200 µm	 ≤10 ≤20
Power Loss Capability[3] (kW)	2.0 (10 s) 1.0 (10 min.) 0.5 (continuously)
Transmission Losses[4] (%)	<3
Fiber Cable Properties	
Cable Lengths (m)	≤200
Maximum Torsion (°/m)	90
Cooling	
Cooling Method	Water
Flow Rate (l/min)	2.0
Maximum Input Pressure (bar)	8.0
Pressure Drop (bar)[5]	1.1
Safety Interlock	
Interlock Circuit Resistance	3.3 kΩ ±5% +2 Ω/m cable length
Thermoswitch	Yes, 70°C ±5°C, reset temp >30°C
Dimensions & Weight	
Dimensions	See pages 3 to 4
Weight (kg) Fiber Connector Fiber Cable (per meter)	 0.6 0.2
Environmental Conditions	
Humidity (% RH)	<80
Operating Temperature (°C)	5 to 50 (non-condensing)
Storage Temperature (°C)	-20 to 70
Compliance Information	
RoHS	Directives 2011/65/EU and (EU) 2015/863
REACH	Regulation (EC) No. 1907/2006

1. >10 kW to be validated.
2. Pigtail fibers: Cladding diameter up to and equal 500 µm: ≤20 mrad.
3. Within specified fiber NA.
4. ≤100 m cable length.
5. At flow rate: 2.0 l/min.

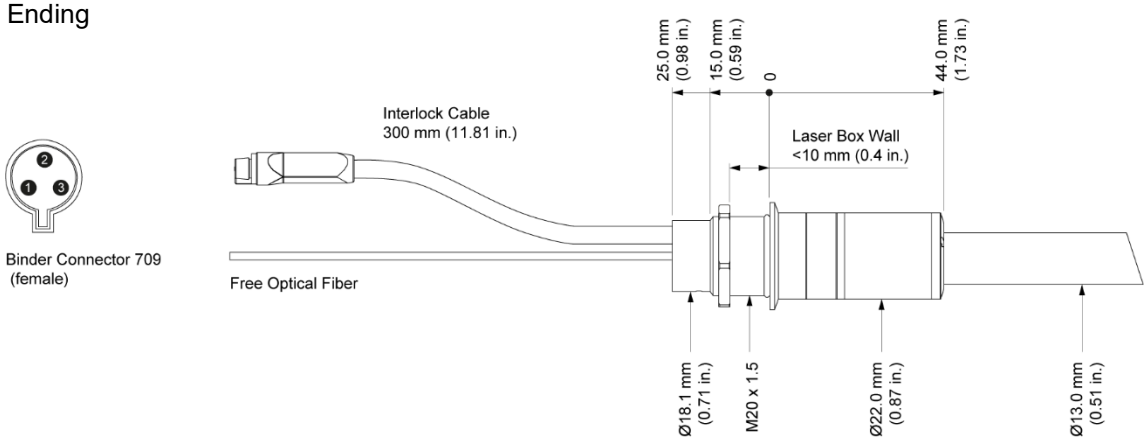
Mechanical Specifications

Connector Dimensions

QD



Pigtail Ending

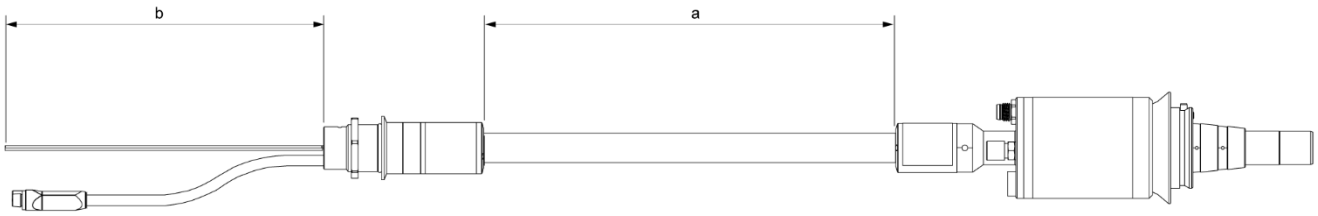


Length Definitions

Two Connectors



One Connector (Pigtail)



a = Fiber Cable Length
b = Free Optical Fiber Length

Part Numbers

QD Fiber Optic Cables

Circular Fiber Core, Two Connectors

	5 m	10 m	15 m	20 m	25 m	30 m	50 m
50 µm	2216963	2216964	2216965	2216966	2216967	2216968	2216969
100 µm	2216972	2216973	2216974	2216975	2216976	2216977	2216978
150 µm	2216981	2216982	2216983	2216984	2216985	2216986	2216987
200 µm	2216990	2216991	2216992	2216993	2216994	2216995	2216996
300 µm	2216999	2217000	2217001	2217002	2217003	2217004	2217005
400 µm	2217008	2217009	2217010	2217011	2217012	2217013	2217014
600 µm	2217017	2217018	2217019	2217020	2217021	2217022	2217023
800 µm	2290840	2290841	2290842	2290843	2290844	2290845	2290846
1000 µm	2290847	2290848	2290849	2290850	2290851	2290852	2290853

Square Formed Fiber Core, Two Connectors

	5 m	10 m	15 m	20 m	25 m	30 m	50 m
100x100 µm	2217044	2217045	2217046	2217047	2217048	2217049	2217050
200x200 µm	2217053	2217054	2217055	2217056	2217057	2217058	2217059
400x400 µm	2217062	2217063	2217064	2217065	2217066	2217067	2217068
600x600 µm	2290861	2290862	2290863	2290864	2290865	2290866	2290867
800x800 µm	2377085	2377086	2377087	2377088	2377089	2377090	2377091
1000x1000 µm	2377092	2377093	2377094	2377095	2377096	2377097	2377098

Customized lengths and dimensions are available upon request.

Fiber Optic Cable Accessories

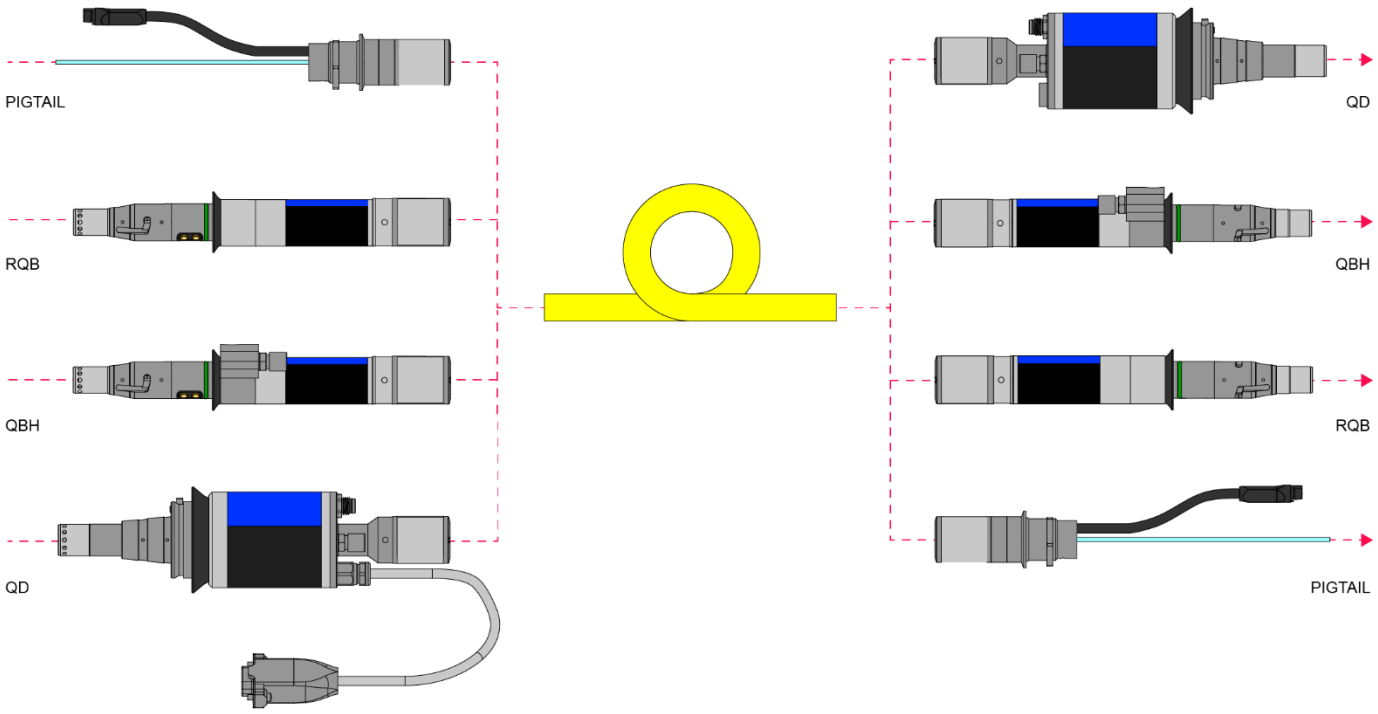
Product Description	Part Number
QD Protection Window, Input Side, 1030 to 1090 nm	2217239
QD Protection Window, Output Side, 1030 to 1090 nm	2216860

Hybrid Fibers

The flexible fiber cable design enables both standard configurations with identical connectors at each end and hybrid configurations with different input and output connectors selected to meet application requirements.

Hybrid fibers provide a simple and cost-effective solution for connecting a laser source and processing head that use different fiber interfaces, eliminating the need for additional adapters or interface components.

For pigtail configurations, the splice-ready pigtail termination can be provided on either the input or output side of the fiber cable.



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