

QD FIBER OPTIC CABLE

Diode Lasers High-Power Beam Delivery

The QD fiber optic cable fulfills the European Automotive Industry standard interface. The innovative connector design includes a built-in photodiode that can detect coupling losses on the input side and back reflection from the work piece on the output side.

The QD fiber connector is water-cooled to optimize the performance, including its superior power loss capability. The built-in mode stripper generates a well-defined beam without any cladding power. With the reinforced and extremely durable fiber hose it is well-suited for dynamic robot 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

| 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 | | ≤10 |
| Core Diameter ≤200 µm | | ≤20 |
| Power Loss Capability ³ (kW) | | |
| 10 seconds | | 2.0 |
| 10 minutes | | 1.0 |
| Continuously | | 0.5 |
| 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 |
| Pressure Drop (bar at 2.0 l/min) | | 1.1 |
| Safety Interlock | | |
| Interlock Circuit Resistance | | 3.3 kOhm ±5% +2 Ohm/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 | | 0.6 |
| Per Meter Fiber Cable | | 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 2015/863/EU |
| REACH | | Directive EC no 1907/2006 |

1 >10 kW to be validated.

2 Pigtail fibers: Cladding diameter up to and equal 500 µm: ≤20 mr ad.

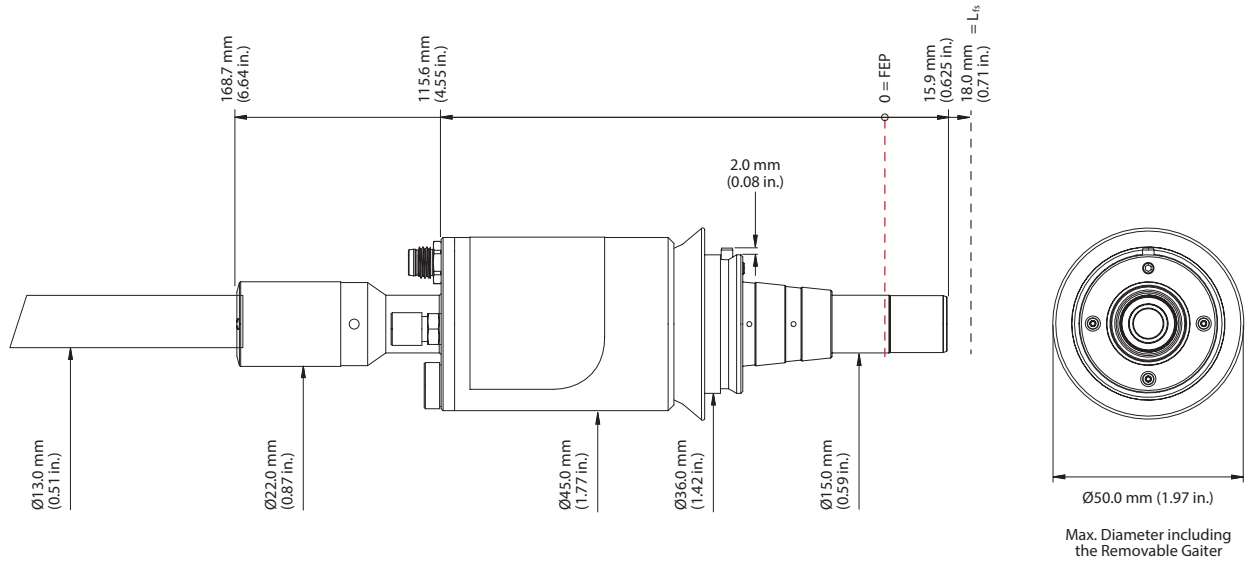
3 Within specified fiber NA.

4 ≤100 m cable length.

Mechanical Specifications

Connector Dimensions

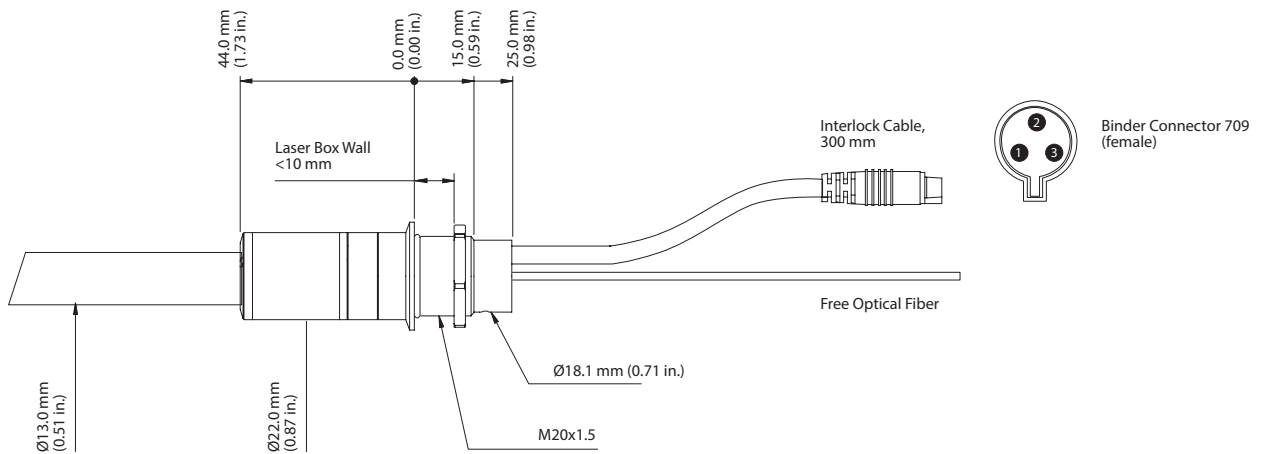
QD



L_{fs} = Free Space in Front of Connector

FEP = Fiber End Plane

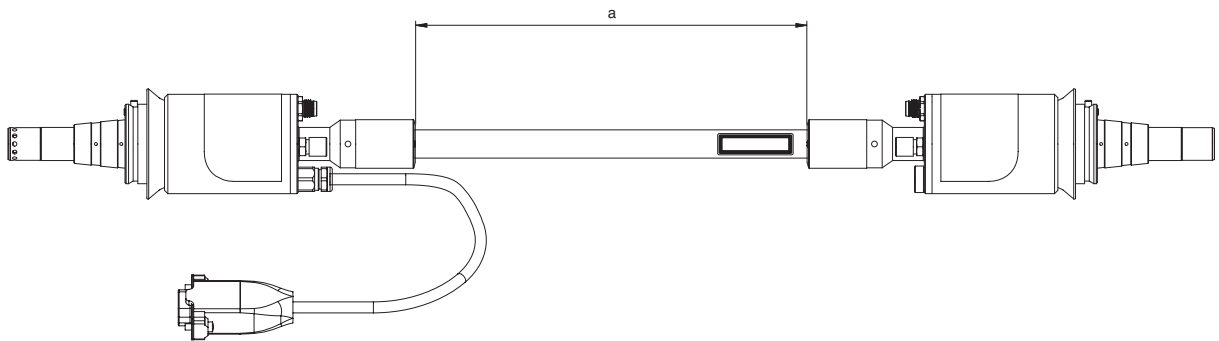
Pigtail Ending



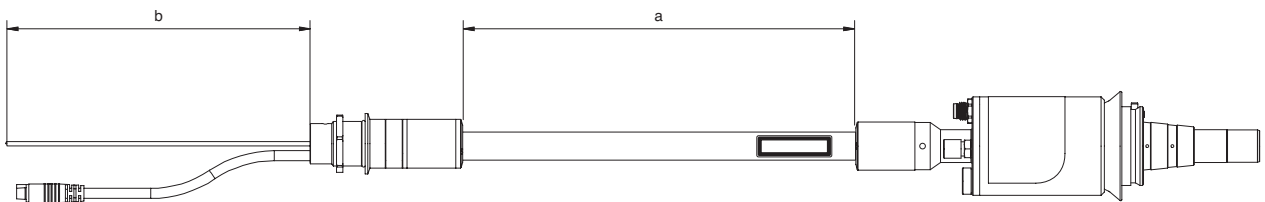
Mechanical Specifications

Length Definitions

Two Connectors



One Connector (Pigtail)



a = Fiber Cable Length
b = Free Optical Fiber Length

Part Numbers

Circular Fiber Core, Two Connectors

| | 5m | 10m | 15m | 20m | 25m | 30m | 50m |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 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

| | 5m | 10m | 15m | 20m | 25m | 30m | 50m |
|--------------|---------|---------|---------|---------|---------|---------|---------|
| 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 | 2217080 | 2217081 | 2217082 | 2217083 | 2217084 | 2217085 | 2217086 |
| 1000x1000 μm | 2217089 | 2217090 | 2217091 | 2217092 | 2217093 | 2217094 | 2217095 |

Customized lengths and dimensions are available upon request.

Hybrid Fibers

The flexible Coherent fiber cable design makes it possible for us to not only offer fiber cables with same type of connectors on both sides but also hybrid fibers where customer select input and output connectors. For many end-users, this is a simple and cost-efficient way to connect laser and process head even in cases where they don't share the same fiber interface. For pigtail fibers, it is possible to have the pigtail termination for splicing at either input or output side of the fiber cable.

