Beam Delivery Components for High-Power Lasers

SmartQD FIBER OPTIC CABLE

1030 nm to 1090 nm

The SmartQD fiber optic cable complies with the European automotive industry's standard interface requirements. Its patented connector design monitors light reflected from the workpiece, enabling early detection of process variations and supporting reliable process monitoring.

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

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



FEATURES

- Integrated process monitoring
- Up to 20 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	SmartQD
Maximum Power CW (kW)	20
Wavelength (nm)	1030 to 1090
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[1] (mrad) Core Diameter >200 µm Core Diameter ≤200 µm	 ≤10 ≤20
Power Loss Capability[2] (kW)	2.0 (10 s) 1.0 (10 min.) 0.5 (continuously)
Transmission Losses[3] (%)	<3
SmartQD Sensor Data	
Connector	X-coded M12, Ethernet (100Base-TX)
Communication Protocol	TCP/IP
Command Protocol	SCPI
Sensor Data Encoding	WAV stream
Sample Rate (kHz)	3 x 800
Sensors	Plasma / Visible Temperature / NIR Laser back-reflection
Operating Voltage (V DC)	24
Current Consumption (mA)	<500
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)[4]	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

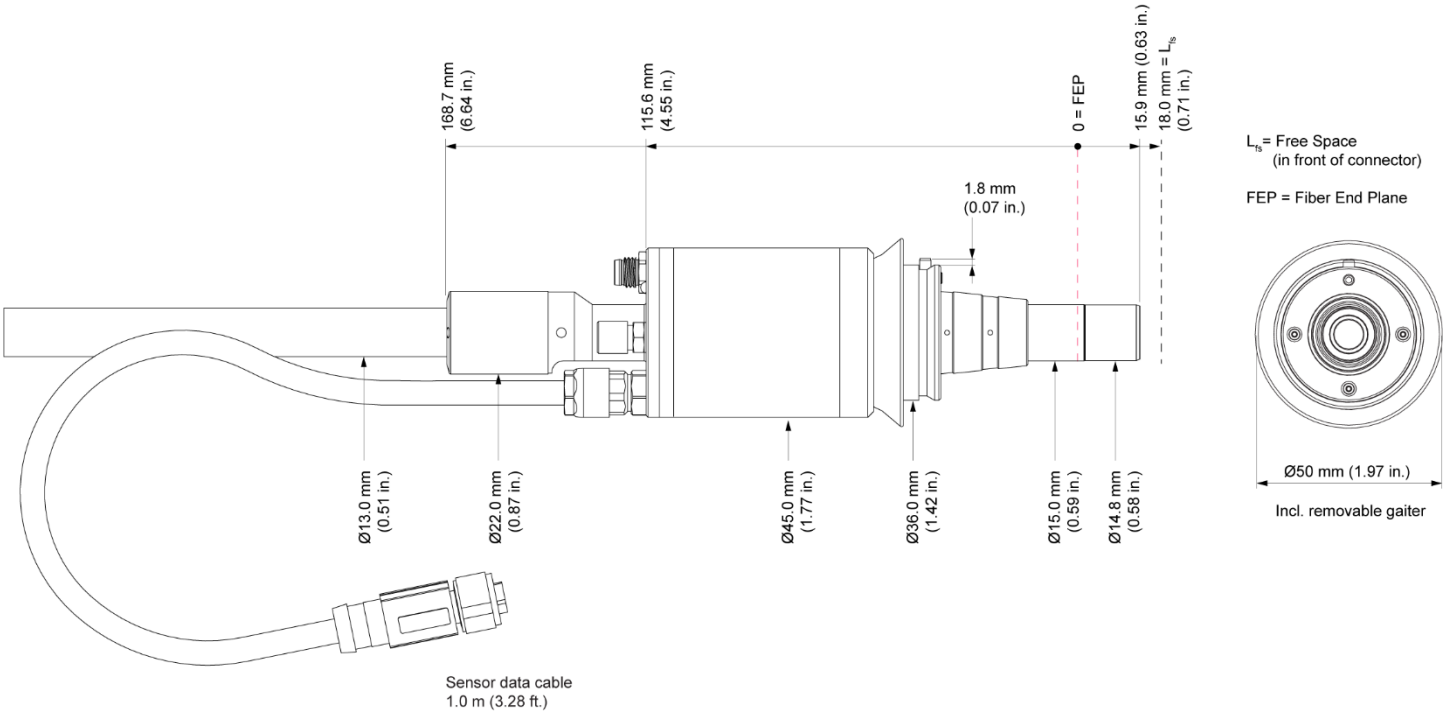
1. Pigtail fibers: Cladding diameter up to and equal 500 µm: ≤20 mrad.
2. Within specified fiber NA.
3. ≤100 m cable length.
4. At flow rate: 2.0 l/min.

Dimensions & Weight	
Dimensions	See pages 4 to 5
Weight (kg) Fiber Connector Fiber Cable (per meter)	 0.7 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

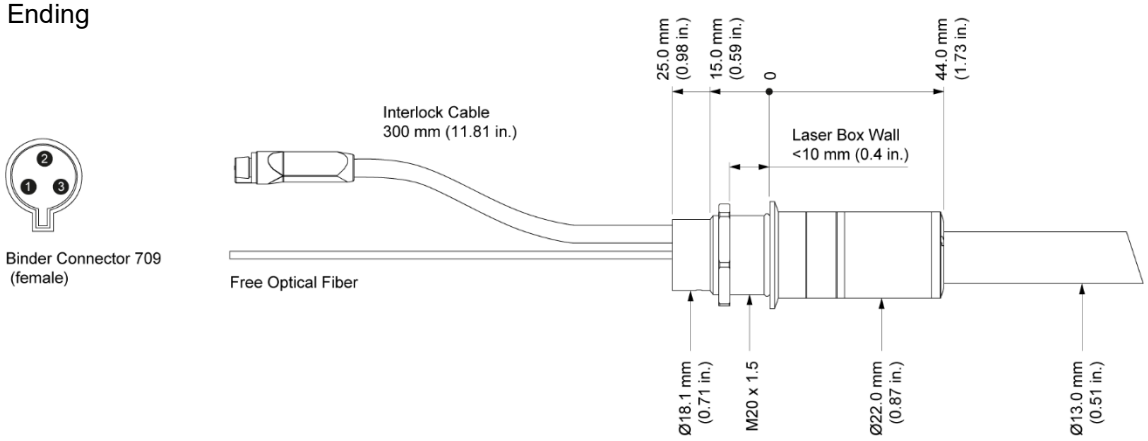
Mechanical Specifications

Connector Dimensions

SmartQD

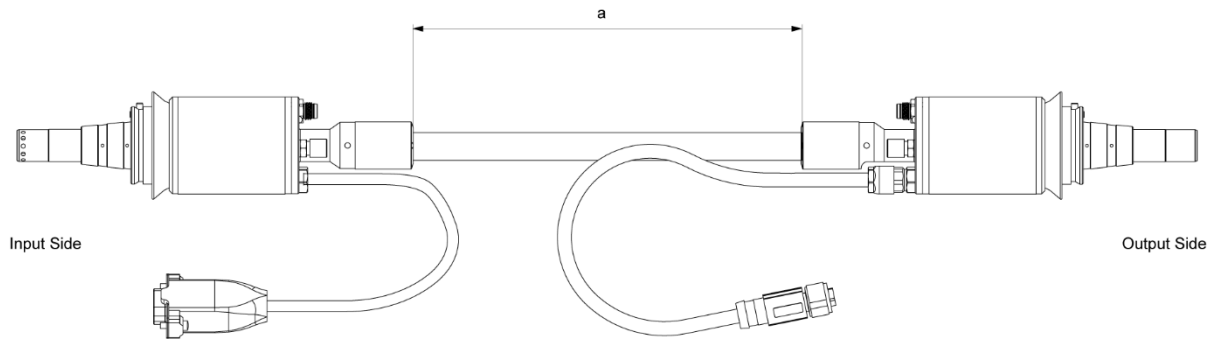


Pigtail Ending

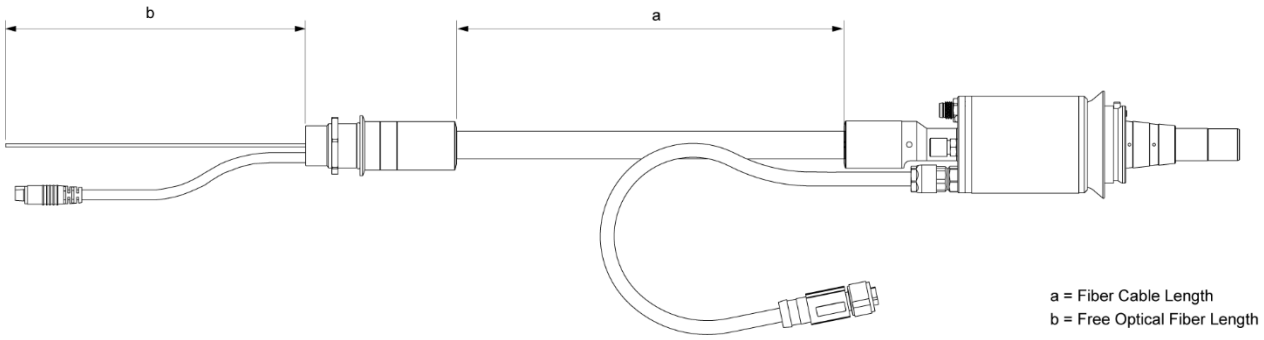


Length Definitions

Two Connectors



One Connector (Pigtail)



Part Numbers

SmartQD Fiber Optic Cables

Circular Fiber Core, Two Connectors

	5 m	10 m	15 m	20 m	30 m	35 m	50 m
50 µm	2337935	2337936	2337937	2337938	2337939	2337940	2337941
100 µm	2337942	2337943	2337944	2337945	2337946	2337947	2337948
150 µm	2337949	2337950	2337951	2337952	2337953	2337954	2337955
200 µm	2337956	2337957	2337958	2337959	2337960	2337961	2337962
300 µm	2337963	2337964	2337965	2337966	2337967	2337968	2337969
400 µm	2337970	2337971	2337972	2337973	2337974	2337975	2337976
600 µm	2337977	2337978	2337979	2337980	2337981	2337982	2337983
800 µm	2337984	2337985	2337986	2337987	2337988	2337989	2337990
1000 µm	2337991	2337992	2337993	2337994	2337995	2337996	2337997

Circular Fiber Core, One Output Connector (Pigtail)

	2 m	3 m	5 m	10 m	15 m	20 m	25 m
20/395 µm	2337998	2337999	2338000	2338001	2338002	2338003	2338004
50/360 µm	2338005	2338006	2338007	2338008	2338009	2338010	2338011
100/360 µm	2338012	2338013	2338014	2338015	2338016	2338017	2338018

Note: Free optical fiber length b>1.0m.

Square Formed Fiber Core, Two Connectors

	5 m	10 m	15 m	20 m	30 m	35 m	50 m
100x100 µm	2338019	2338020	2338021	2338022	2338023	2338024	2338025
200x200 µm	2338026	2338027	2338028	2338029	2338030	2338031	2338032
400x400 µm	2338033	2338034	2338035	2338036	2338037	2338038	2338039
600x600 µm	2338040	2338041	2338042	2338043	2338044	2338045	2338046
800x800 µm	2377155	2377156	2377157	2377158	2377159	2377160	2377161
1000x1000 µm	2377162	2377163	2377164	2377165	2377166	2377167	2377168

Customized lengths and dimensions are available upon request.

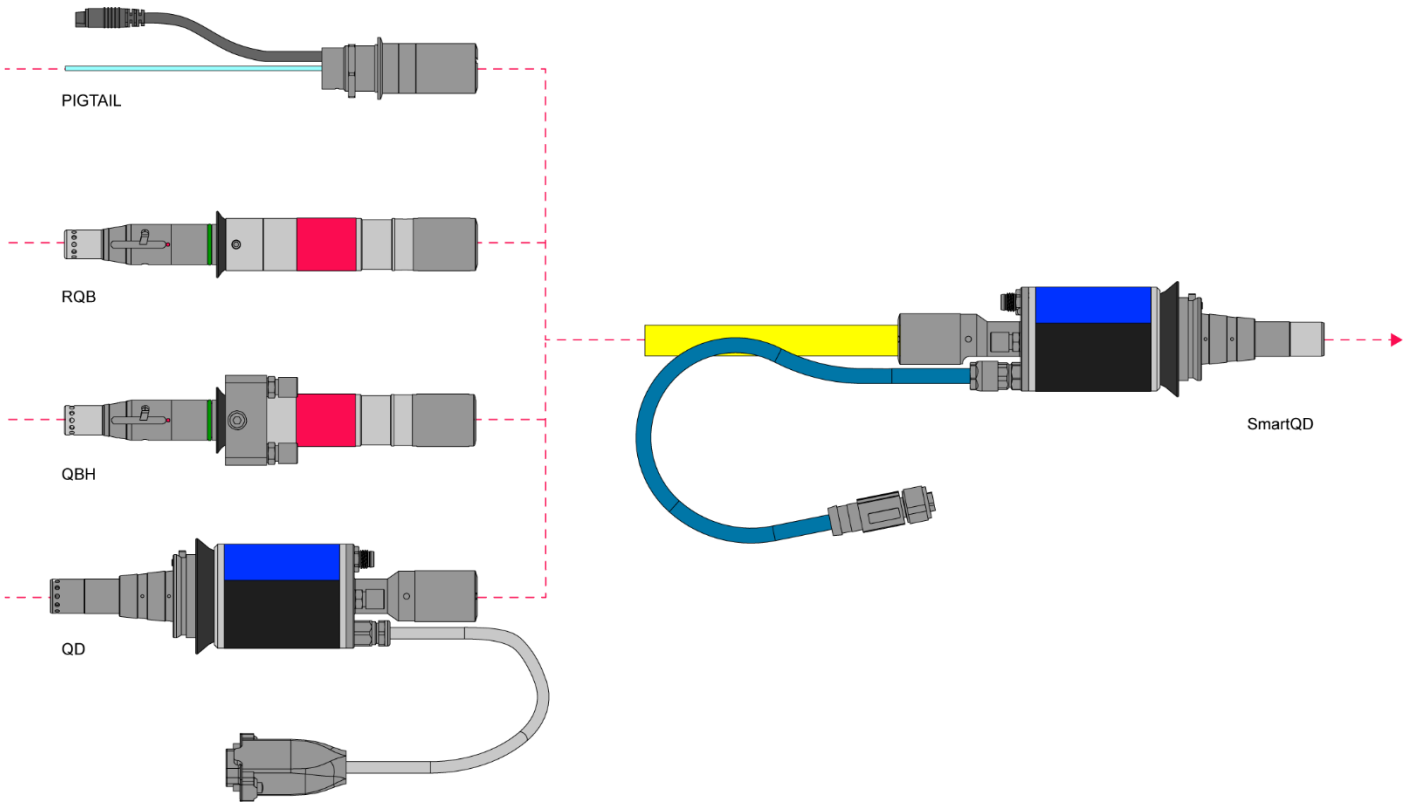
Fiber Optic Cable Accessories

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.



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