



1030 nm to 1090 nm

Fiber-to-Fiber Coupler

High-Power Beam Delivery

The Fiber-to-Fiber Coupler (FFC) makes it possible to couple a laser beam from one fiber optic cable to another. This can be used for extending the range of an existing fiber cable installation, to change the beam quality by connecting a larger fiber core diameter, or to connect different mechanical fiber cable interfaces together. It can also be used to minimize down-time for laser sources with fixed output fibers that are not plug-and-play replaceable. Using the FFC it is possible to receive an exchangeable process fiber for the laser source.

FEATURES & BENEFITS

- Up to 15 kW (CW)
- High-resolution fiber adjustment
- Fiber alignment feedback
- Eye-safe, stand-alone
- Certified safety electronics (PL e)

APPLICATIONS

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



Fiber-to-Fiber Coupler: 1030 nm to 1090 nm Datasheet

SPECIFICATIONS	FFC wc	FFC ac	
Maximum Power (kW)	15	4.5	
Wavelength (nm)	1030 to 1090		
Magnification, $M=f_{roc}/f_{coll}$	0.6, 1.0, and 1.2		
Maximum NA	0.14 (M = 1.0 and M = 1.2), 0.12 (M = 0.6)	0.18 (M = 1.0 and M = 1.2), 0.09 (M = 0.6)	
COUPLING MARGINS			
Min. Fiber Diameter increase (μm at x kW)	<6 kW	6 to 10 kW	>10 kW
M = 1.0	≥ 50	≥ 50	≥ 100
M = 1.2	≥ 50	≥ 100	≥ 150
M = 0.6	Single-mode to multi-mode ¹		
COOLING			
Cooling Method	Water	Air (passive)	
Flow Rate (l/min.)	1.0	N/A	
Pressure Drop (bar at 1 l/min.)	Coll unit: 0.5, FCU: 0.7	N/A	
Maximum Input Pressure (bar)	6	N/A	
Water Temperature ($^{\circ}\text{C}$)	15 to 40 (non-condensing)	N/A	
FIBER DELIVERY SYSTEM			
Fiber Interfaces	QBH / QD / LLK-B (Q5)		
DIMENSIONS & WEIGHT			
Dimensions	See page 3	See page 4	
Weight (kg)	4.5	2.3-2.5	
ELECTRONICS			
Supply Voltage (V DC)	24		
Maximum Current ² (mA)	100		
Fieldbus	CANopen		
Certified Safety Function	ISO 13849-1:2006 Category 3 PL e		
ENVIRONMENTAL CONDITIONS			
Humidity (% RH)	<80		
Operating Temperature ($^{\circ}\text{C}$)	5 to 50 (non-condensing)		
Storage Temperature ($^{\circ}\text{C}$)	-25 to 70		
COMPLIANCE INFORMATION			
RoHS	Directives 2011/65/EU and 2015/863/EU		
REACH	Directive EC no 1907/2006		

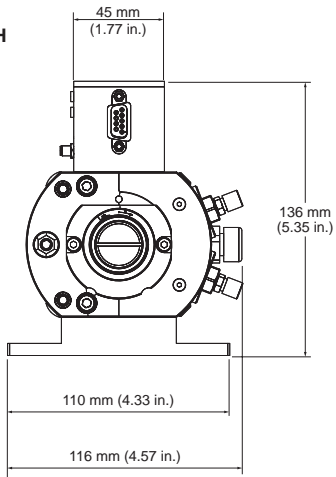
¹ M = 0.6 is recommended for single-mode to multi-mode fiber coupling. With M = 0.6 the NA increase by a factor 1/0.6 which lead to a better mode-mix in the multi-mode fiber. M = 0.6 is typically not recommended for multi-mode to multi-mode fiber coupling due to the large increase of NA.

² The power supply source should be protected by a max. 1 A slow blow fuse.

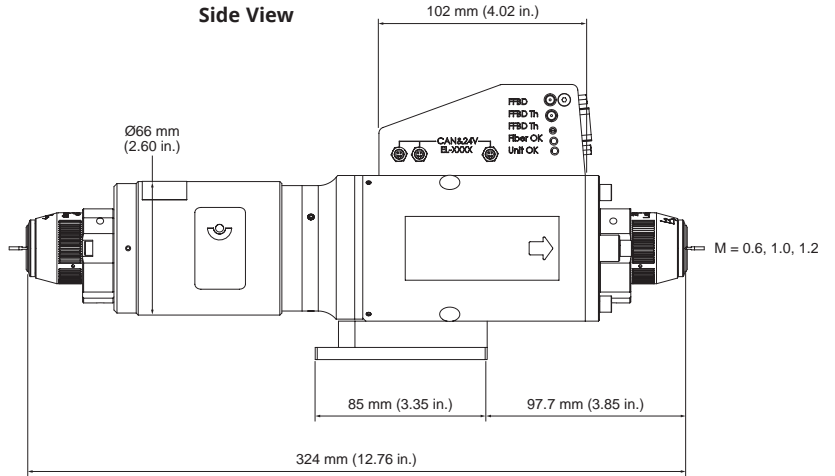
MECHANICAL SPECIFICATIONS

Fiber-to-Fiber Coupler Water-Cooled (FFC wc)

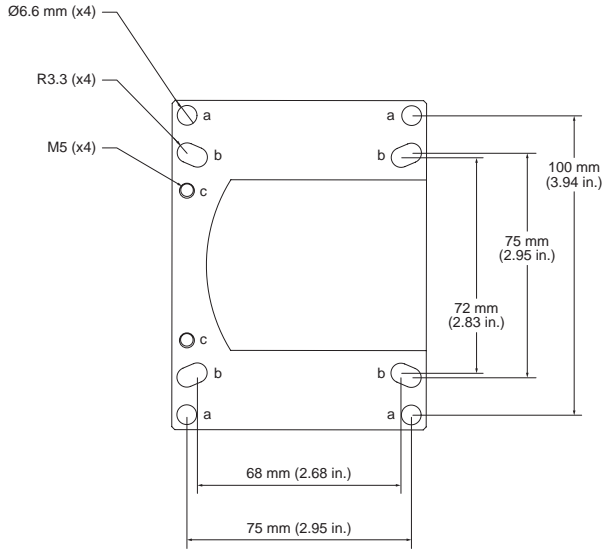
Front View
(design with QBH
Fiber Interface)



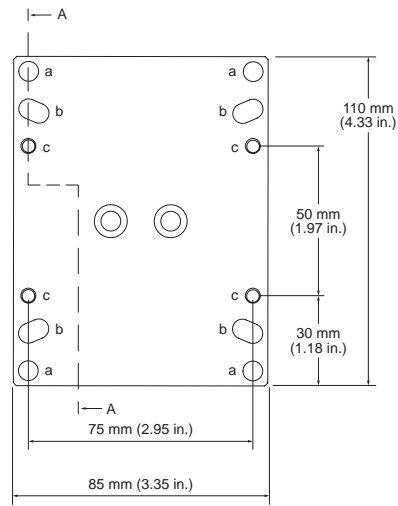
Side View



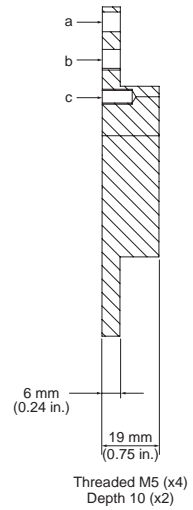
Mounting Plate



Above View
(without the FFC House)



Below View
(without the FFC House)

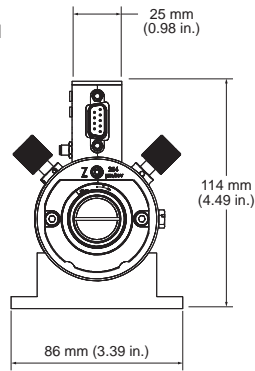


Threaded M5 (x4)
Depth 10 (x2)

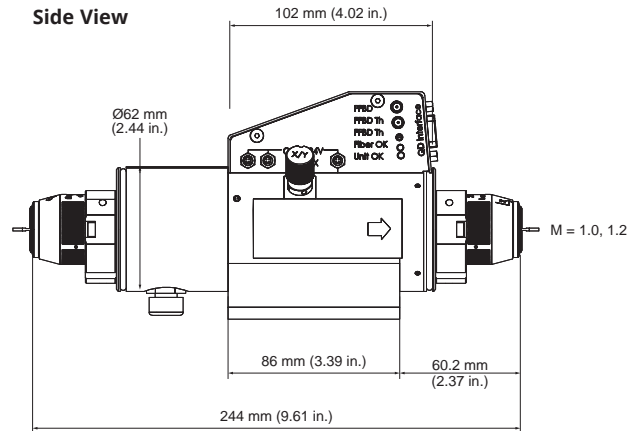
MECHANICAL SPECIFICATIONS

Fiber-to-Fiber Coupler Air-Cooled (FFC ac)

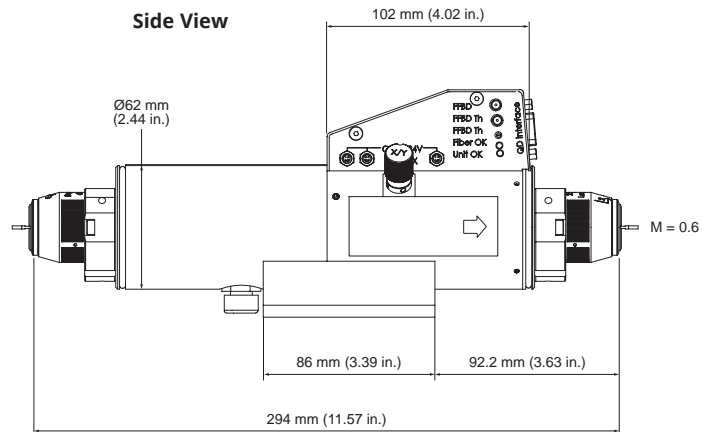
Front View
(design with QBH
Fiber Interface)



Side View

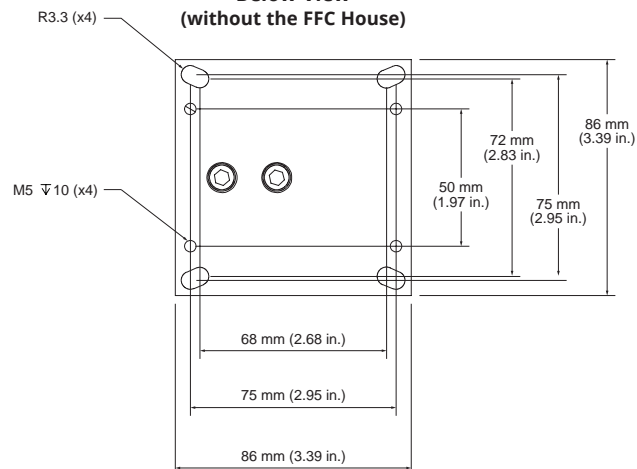


Side View



Mounting Plate

Below View
(without the FFC House)



PART NUMBERS

Fiber-to-Fiber Coupler Water-Cooled (FFC wc)

Input interface	Output interface	M=0.6	M=1.0	M=1.2
QBH-	QBH	101623X06	101623X10	101623X12
	QD	101623X24	101623X26	101623X28
QD-	QD	103336X06	103336X10	103336X12
	QBH	103336X24	103336X26	103336X28

Fiber-to-Fiber Coupler Air-Cooled (FFC ac)

Input interface	Output interface	M=0.6	M=1.0	M=1.2
QBH-	QBH	3-9022X06	3-9022X10	3-9022X12
	QD	3-9191X06	3-9191X10	3-9191X12
QD-	QD	3-9232X06	3-9232X10	3-9232X12
	QBH	1428774	1428775	1428776

Note: LLK-B (Q5) interface and customized combinations are available upon request.

Accessories

Accessory	Part Number
Power & Communication cable angled, 24V & CAN	2-5053X01
Extension cable M5-M5	2-5054X01
FFBD cable MCX (and DLD)	1-5135X01



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