



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 ( $\mu\text{m}$ at x kW)	<6 kW	6 to 10 kW	>10 kW
M = 1.0	$\geq 50$	$\geq 50$	$\geq 100$
M = 1.2	$\geq 50$	$\geq 100$	$\geq 150$
M = 0.6	Single-mode to multi-mode <sup>1</sup>		
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 <sup>2</sup> (mA)	100		
Fieldbus	CANopen		
Certified Safety Function	ISO 13849-1:2015 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		

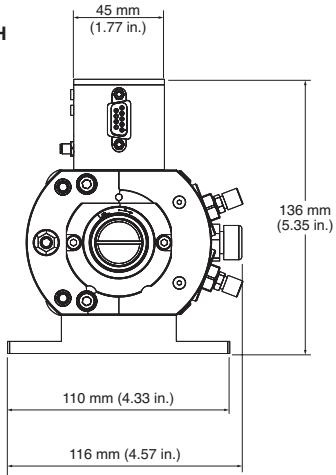
<sup>1</sup> M = 0.6 is recommended for single-mode to multi-mode fiber coupling. With M = 0.6 the NA increase by a factor 1/0.6 which lead to a better mode-mix in the multi-mode fiber. M = 0.6 is typically not recommended for multi-mode to multi-mode fiber coupling due to the large increase of NA.

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

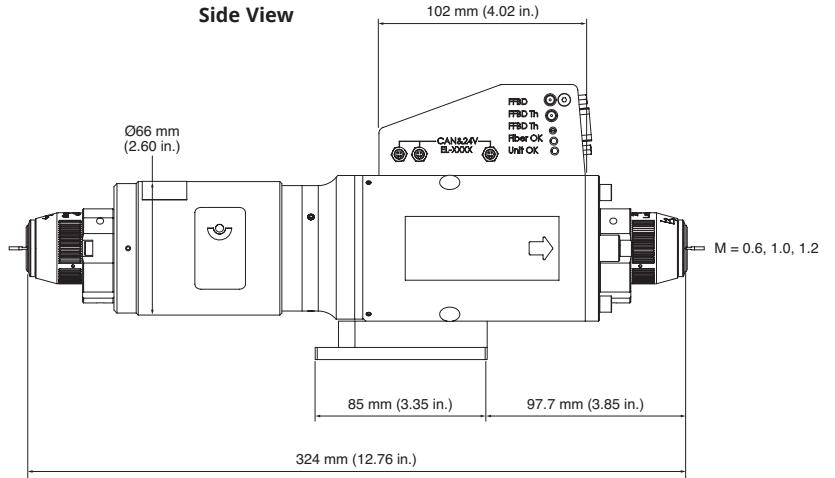
**MECHANICAL SPECIFICATIONS**

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

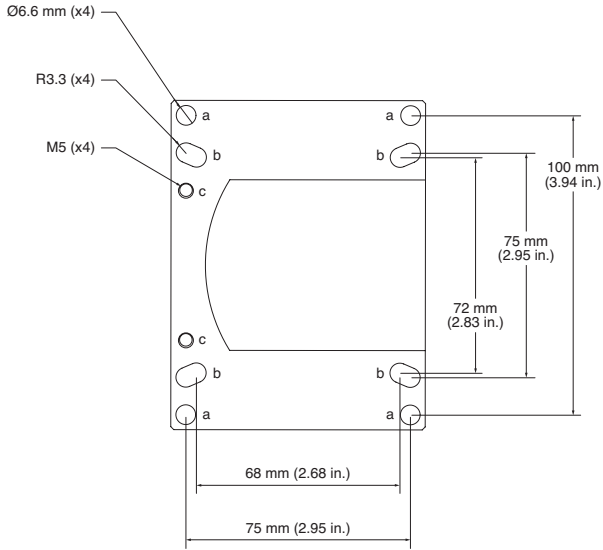
**Front View**  
(design with QBH  
Fiber Interface)



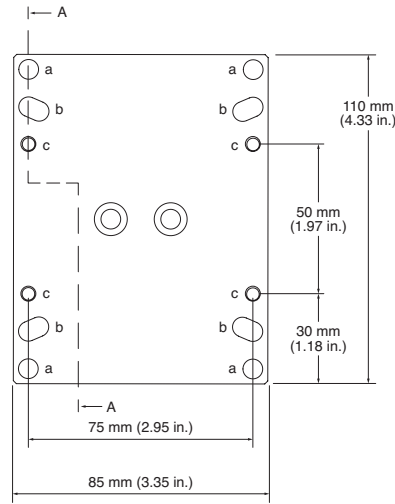
**Side View**



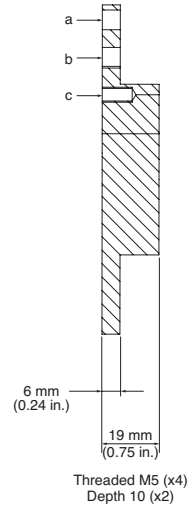
**Mounting Plate**



**Above View**  
(without the FFC House)



**Below View**  
(without the FFC House)

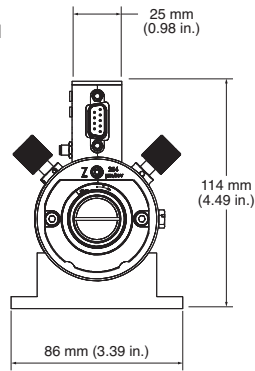


Threaded M5 (x4)  
Depth 10 (x2)

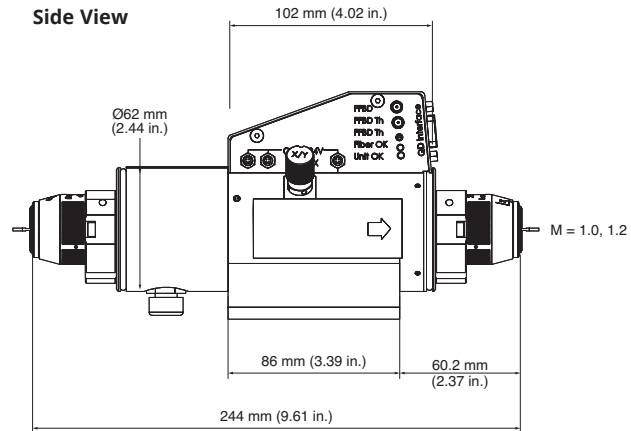
## MECHANICAL SPECIFICATIONS

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

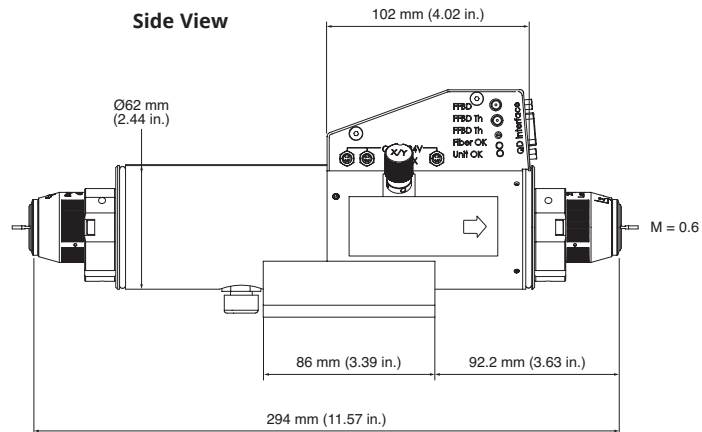
**Front View**  
(design with QBH  
Fiber Interface)



**Side View**

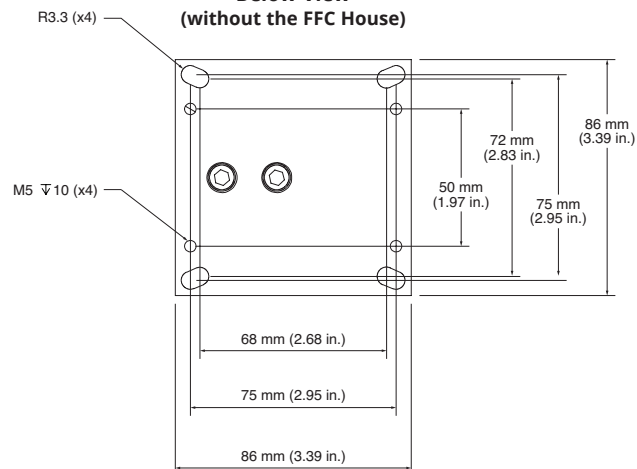


**Side View**



### 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, 5 m	2-5053X01
Power & Communication cable angled, 10 m	2-5053X02
FFBD cable MCX (and DLD), 1500 mm	1-5135X01



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