



1x2 Fiber-optic Rotary Joint

User Manual

Version 1.1.1

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Overview

1.1 1x2 Fiber-optic Rotary Joint

The Doric 1x2 Fiber-optic Rotary Joint (Fig. 1.1) allows free fiber-to-fiber rotation while maintaining light transmission. It consists of high precision bearings and a lens system that allows rotation-insensitive optical intensity transfer. It is composed of a **Stator**, which stays immobile, and a **Rotor** that moves (Fig. 1.2).

There are two different models of the 1x2 Fiber-optic Rotary Joint.

- The **i model** allows intensity division, sending half of the input light into each of the two output receptacles. This is particularly useful for bilateral stimulation experiments, where the illumination intensities must be the same in each channel.
- The **w model** splits the spectral band originating from the input receptacle and sends each band to the corresponding rotating fiber receptacles. In some optogenetics experiments, it can be used for instance to separate the 473-488 nm blue light (activation signal) and the 590 nm orange light (inhibition signal).

The **w model** can be used reversibly (as a 2x1 rotary joint) to combine two wavelengths with minimal intensity losses. It is not recommended to use the **i model** in reverse, as significant intensity losses (> 50%) will occur.



Figure 1.1: 1x2 Fiber-optic Rotary Joint - Intensity division



Figure 1.2: 1x2 Fiber-optic Rotary Joint Elements; Stator (Black) and Rotor (Yellow)

1.2 1x2 Fiber-optic Rotary Joint Holders

The standard *Holder_FRJ_large* (Table 1.1) is included with the rotary joint. The gimbal mount holder *GH_FRJ* (Table 1.1) can be purchased separately. It allows the rotary joint to be held while still allowing swivel movement on other axes of rotation.

Table 1.1: 1x2 Fiber-optic Rotary Joint Holders

Holder_FRJ_large	
Gimbal Holder (GH_FRJ)	

Operations Guide

2.1 Rotary Joints Holders

2.1.1 Holder_FRJ_large

If using the *Holder_FRJ_large* standard holder, thread the FRJ into position to secure it to the holder (Fig. 2.1). The holder can be mounted into an experimental set-up using 1/4 (or M6) screws.



Figure 2.1: Installation of the Holder_FRJ_large



Figure 2.2: 1x2 Fiber-optic Rotary Joint, Standard Holder

2.1.2 Gimbal Holder

If using the *GH-FRJ* gimbal mount, thread the FRJ into position to secure it to the holder (Fig. 2.3). The holder can be mounted into an experimental set-up using #8-32 screws.



Figure 2.3: 1x2 Fiber-optic Rotary Joint, Gimbal Mount Holder

2.2 Input and Output Patch Cords

Remove the protective caps and clean the connector end tips of the patch cords before connecting them to the rotary joint. Use isopropyl alcohol or a similar cleansing solution. When not in use, place the plastic caps on the connectors for protection and cleanliness. With an FC connector, the connector key must be oriented to enter within the receptacle slot to ensure good connection (Fig. 2.4).

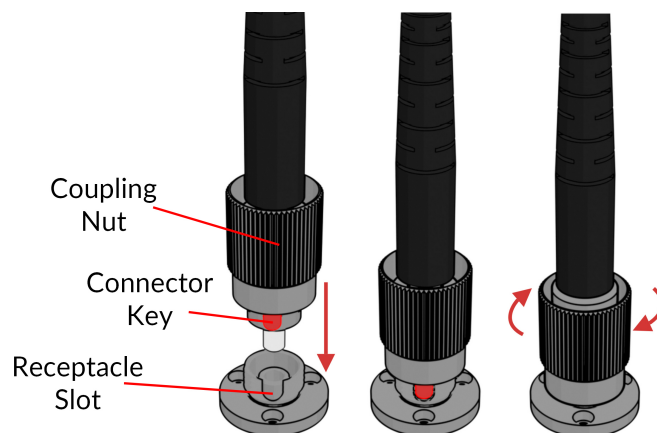


Figure 2.4: FC Connector, Fiber Installation

- ⚠ To reduce the risk of eye injury, **it is sound practice to AVOID LOOKING DIRECTLY AT THE CONNECTOR OPENINGS** when the light source is turned on.

Specifications

Table 3.1: General Specifications

SPECIFICATIONS	VALUE	NOTES
Transmission (<i>i</i> model)	>40% per channel	Tested with 200 μ m core, NA 0.22 fiber
Wavelength Range (<i>i</i> model)	450-650 nm	Others available on request
Transmission (<i>w</i> model)	>75% per spectral band	Tested with 200 μ m core, NA 0.22 fiber
Wavelength Range (<i>w</i> model)	450-520 nm & 560-650 nm 450-490 nm & 510-560 nm	473/590 nm model (others on request) 473/532 nm model (others on request)
Input NA	0.22	
Output NA	0.22	Output NA 0.5 on request
Power variation in rotation	\pm 3% of the mean	Tested with 200 μ m core, NA 0.22 fiber
Fiber Type	core 200 to 600 μ m, NA 0.22 to 0.37	Works with other fiber types, but transmission can be affected
Start Up Torque	30 μ N·m	Typical Value
Outer diameter	31.0 mm	-
Length	53.0 mm	-
Mass	56.0 g	-

Table 3.2: Recommended Environmental Specifications

DESCRIPTION	OPERATION	STORAGE
Use	Indoor	Indoor
Temperature	0-40 ° C	0-40 ° C
Humidity	40-60% RH, non condensing	40-60% RH, non condensing

Support

4.1 Maintenance

The product does not require any maintenance. Do not open the enclosure. Contact Doric Lenses for return instructions if the unit does not work properly and needs to be repaired.

4.2 Warranty

This product is under warranty for a period of 12 months. Contact Doric Lenses for return instructions. This warranty will not be applicable if the unit is damaged or needs to be repaired as a result of improper use or operation outside the conditions stated in this manual. For more information, see our [Website](#).

4.3 Contact us

For any questions or comments, do not hesitate to contact us by:

Phone 1-418-877-5600

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