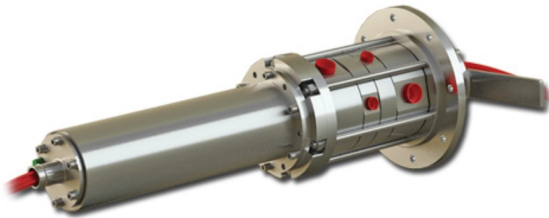


# Multi-Pass Fluid Rotary Union with an Electrical Slip Ring or Fiber Optic Rotary Joint

Model 173

**Focal Technologies Corporation, a Moog Inc. company, has over 30 years of expertise in supplying standard and custom marine products for harsh environments and is a leading manufacturer of high performance and high quality fluid rotary unions, slip rings and fiber optic rotary joints. Contact Focal for any assistance in selecting the best solution for your requirements.**



The Model 173 is a multi-pass Fluid Rotary Union (FRU) combined with an Electrical Slip Ring (ESR) and can also include any Moog Components Group Fiber Optic Rotary Joint (FORJ). Moog electrical optical fluid swivels have served the marine industry for over 30 years.

The ESR portion is comprised of electrical power and signal passes. Highly configurable, it can be customized to meet customer specific needs providing superior performance and reliability in demanding operating environments. For the hazardous area environment, there is an option for a fully certified flame-proof enclosure. When underwater operational capability is required, it can also be adapted for use as a fluid-filled pressure compensated unit.

The FRU portion is typically configured with up to 13 passes. Inter-port mixing is prevented through the use of double seals and an intermediate vent between passes. It is available in several standard port configurations or types. It is available with the standard seal technology or with a low leakage seal option. In its standard configuration, it is rated for 1000 psi [68 bar] at 10 rpm continuous service and up to 30 rpm intermittent service.

The FORJ portion can be configured with any of Moog's single channel or multi-channel singlemode or multimode catalog fiber joints. Our FORJs are capable of working with all fiber types, sizes and the wavelengths and meet insertion loss performance typical of customer requirements. In addition to FORJs operating at standard wavelengths for data communication, FORJ versions have been developed to work with optical sensors with enhanced optical loss and return loss over a broader range of wavelengths. Moog has been the leading supplier of FORJ products to the marine industry for over 20 years with many thousands of products delivered to the oil and gas markets. For the oilfield market, products are designed to be robust and weatherproof with all models being shock and vibration tested and options for operating fluid-filled and pressure compensated.

[www.moog.com/focal](http://www.moog.com/focal)

## Features

- Electrical passes rated to 7200 V / 20 A
- Up to 52 fiber optic channels in a very small form factor
- Configurable with up to 13 fluid ports as standard
- 1/4, 1/2, 5/8 and 1 inch SAE straight thread o-ring ports standard
- Corrosion resistant materials suitable for hot sea water and other harsh chemicals
- Rated to 1000 psi [68 bar] at 10 rpm continuous service
- Maximum speed 30 rpm intermittent
- Polymer bearings eliminate the need for periodic service
- Optional rolling element bearing design available
- Sealed housing design tested to IP 66 standards
- Can accommodate a variety of wire and cable types
- Hazardous area certification available
- Stainless steel construction
- Rugged design
- Reliable operation under shock and vibration

## Benefits

- Low leakage

## Applications

- Remote Operated Vehicles (ROVs)
- Diving umbilical winches
- Seismic survey winches
- Mine countermeasures
- Towed instrument arrays
- Hydraulic and electric control winches

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# Specifications

## Fluid Rotary Union (FRU) Specifications

Mechanical	
<b>Rotational Speed</b> <sup>1</sup>	10 rpm max continuous 30 rpm max intermittent (dependent on configuration)
<b>Torque</b> <sup>2,3</sup>	Consult product specific installation drawing. Operating torque varies based on number of passes, shaft diameter, pressure, speed, medium and seal type
<b>Weight</b>	Dependent on configuration
<b>Pressure</b> <sup>1</sup>	1000 psi (3000 psi optional)
<b>Nominal Port Size</b>	SAE straight thread O-ring thread size
<b>1/4 inch</b>	7/16-20 UNF
<b>1/2 inch</b>	3/4-16 UNF
<b>5/8 inch</b>	7/8-14 UNF (passage size suitable for 3/4" nominal, 1-1/16-12 UN adapter)
<b>1 inch</b>	1-5/16-12 UN
Environmental	
<b>Ambient Temperature</b>	-40° C to +60 °C
<b>Gases</b>	-40 °C to +100 °C
<b>Liquids</b>	0 °C to +60 °C
Leakage	
<b>Leakage, Standard Seal</b>	50 std. mL / min N <sub>2</sub> gas per seal rotating @ 1000 psi max Typically less than 10 std. mL / min N <sub>2</sub> gas per seal rotating @ 1000 psi
<b>Leakage, Reduced Leakage Seal</b>	2 std. mL / min N <sub>2</sub> gas per seal rotating @ 1000 psi max Typically less than 0.05 std. mL / min N <sub>2</sub> gas per seal rotating @ 1000 psi

- <sup>1</sup> Operational life is dependent on pressure, temperature, rotational speed duty cycle and size of assembly. Maximum values do not apply concurrently. Please consult the factory for actual value.  
<sup>2</sup> Break-in torque may be higher  
<sup>3</sup> Flexible conduit should be used to couple to the rotating component. The torque arm must be loose coupled.

## Electrical Slip Ring (ESR) Specifications

Electrical	
<b>Voltage</b>	Maximum 7200 VAC
<b>Current</b>	Maximum 20 A per pass Maximum 720 A total current, dependent on duty cycle, ambient temperature and specific configuration. Consult factory to ensure configuration is suitable for application
<b>Contact Resistance</b>	20 mΩ nominal
<b>Insulation Resistance</b>	Typical > 500 MΩ @ 1 kVDC

## Fiber Optic Rotary Joint (FORJ) Specifications

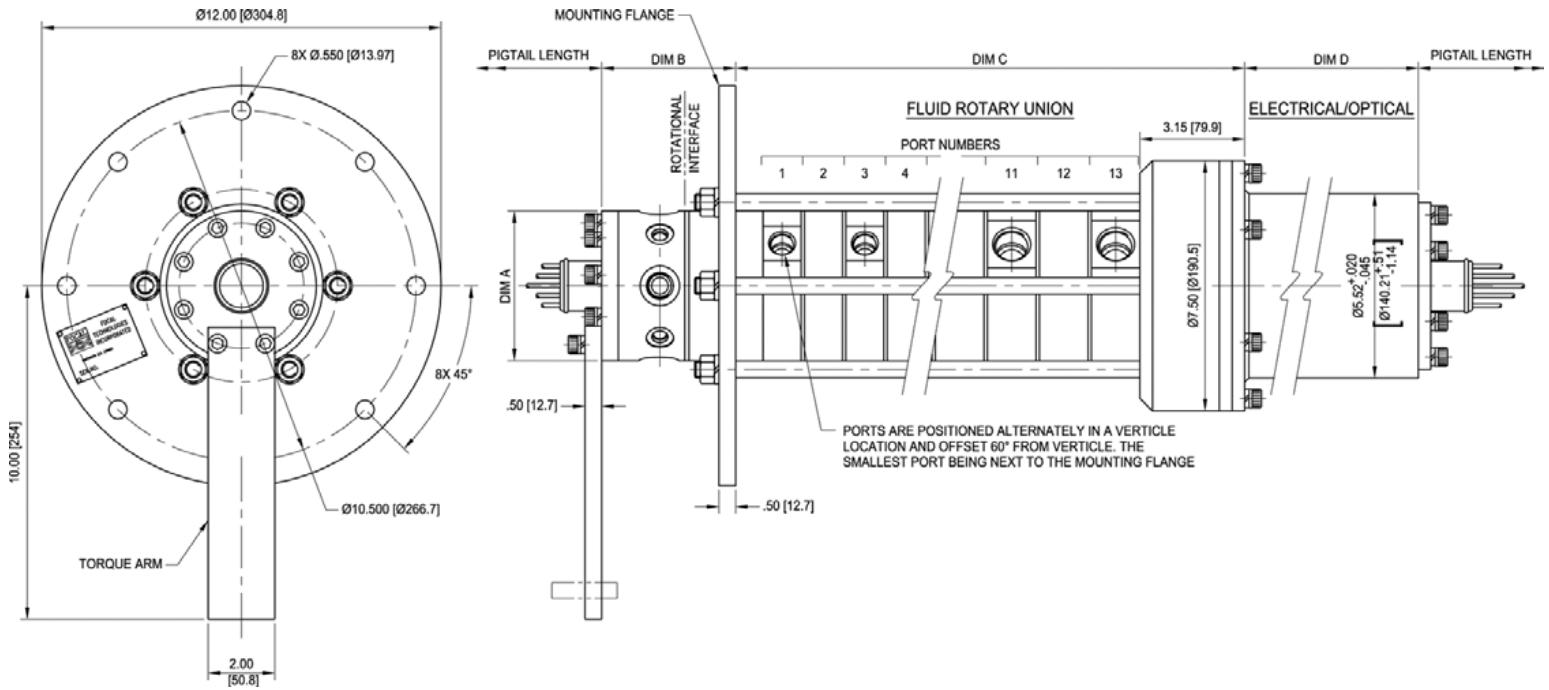
Product	Fiber Type	No. Channels
FO197	MM	1
FO286	MM	1
FO206	SM	1
FO285	SM	1
FO292	MM	2
FO190	MM	2 - 17
FO291	SM	2 - 9
FO300	SM & MM	2 - 52

## Unit Specifications

Mechanical	
<b>Rotational Speed</b>	Maximum 10 rpm continuous, contact factory for higher speeds
<b>Protection Class</b>	IP66
<b>Operating Temperature</b>	-20°C to +55°C (standard)
<b>Housing</b>	Stainless steel (304)
<b>Length "L"</b>	Varies with number of electrical passes
<b>Terminations</b>	Wire & fiber pigtails, custom lengths
Options	
<b>Design Certification</b>	ABS, DNV, BV, LRS
<b>Submersed Applications</b>	Factory filled or field fillable. Consult factory
<b>Other Devices</b>	RF Rotary Joints, shaft encoder, sensors, customer supplied product
<b>Ingress Protection</b>	IP68 to 'x' m, contact factory for other ratings
<b>Certification</b>	ETL (CAN, US), ATEX, IECEx
<b>Termination</b>	Supply and installation of connectors, terminals, conduit, cable, glands, junction boxes

All specifications and information are subject to change without notice. Please contact Focal for the latest updates.

# Specifications



## Sample Configurations

Type	0-0-1-2-2	3-0-0-0-0	0-9-0-0-2	0-0-5-0-5	0-4-0-2-7
Port Size	Number of Ports	Number of Ports	Number of Ports	Number of Ports	Number of Ports
1"	0	3	0	0	0
3/4"	0	0	9	0	4
5/8"	1	0	0	5	0
1/2"	2	0	0	0	2
1/4"	2	0	2	5	7
DIM "A"	Ø4.450 [Ø113.03]	Ø5.00 [Ø127]	Ø6.25 [Ø158.8]	Ø4.50 [Ø114]	Ø5.50 [Ø139.7]
DIM "B"	Ø4.42 [Ø112.2]	Ø4.05 [Ø102.8]	Ø4.61 [Ø117]	Ø4.53 [Ø115]	Ø4.52 [Ø114.9]
DIM "C"	Ø6.04 [Ø153.3]	Ø9.15 [Ø232.3]	Ø20.462 [Ø519.7]	Ø15.81 [Ø401]	Ø19.57 [Ø497.1]
DIM "D"	See Note*	See Note*	See Note*	See Note*	See Note*

\*Please note that dimension "D" vary with number of electrical and fiber passes required. Please contact factory for dimension details.