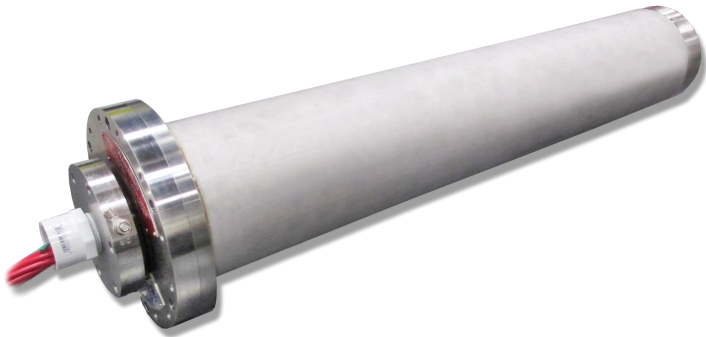


# 5.52" Diameter Electrical Slip Ring with Fiber Optic Rotary Joint

Model 176 with FORJ

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 electrical slip rings and fiber optic rotary joints. Contact Focal for assistance in selecting the best solution for your requirement.



The Model 176 is comprised of electrical power and signal passes, and provides superior performance and reliability in demanding operational environments. The Model 176 may be used for high voltage and high current applications, customized to meet customer specific needs. The slip ring is waterproof rated to IP66, with the option for greater ingress protection.

The Model 176 may be constructed for subsea use where underwater operation is required. The slip ring may be fluid-filled, and pressure compensated. Additional options are available for high voltage use in submerged applications. For the hazardous locations, the Model 176-X variant is fully certified, as a flameproof and explosion proof enclosure.

The electrical slip ring (ESR) is comprised of electrical power and signal passes. Highly configurable, it is customized to meet customer specific needs, providing superior performance and reliability in demanding operating environments. For hazardous area environments, there is an option for a fully certified, flameproof enclosure.

The fiber optic rotary joint (FORJ) can be configured with many of Moog Focal's single-channel or multi-channel, singlemode or multimode fiber joints. Our FORJs are capable of working with all fiber types, sizes and wavelengths, and meet insertion loss performance typical of customer requirements.

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

## Features

- Electrical passes rated up to 7200 V / 20 A
- Pigtail exits are capable of being sealed
- Sealed housing design tested to IP66 standards
- Can accommodate a variety of wire and cable types
- Maintained type certification for Hazardous locations
- Stainless steel construction
- Rugged design intended for harsh environments
- Reliable operation under shock and vibration
- Underwater designs available
- Combined with Fluid Rotary Unions (FRU), see Model 173

## Benefits

- Compliance with the highest quality standards for design, manufacture and test
- Maintenance free operation
- More than 30 years of proven field performance
- Integration with fiber optic rotary joints (FORJ) and fluid rotary unions (FRU) to provide a complete rotating interface solution

## Applications

- Seismic survey winches
- Remotely Operated Vehicles (ROVs)
- Winch and TMS applications
- Mine countermeasures
- Towed instrument arrays
- Oceanographic winches (surface and subsea)

# FOCAL™

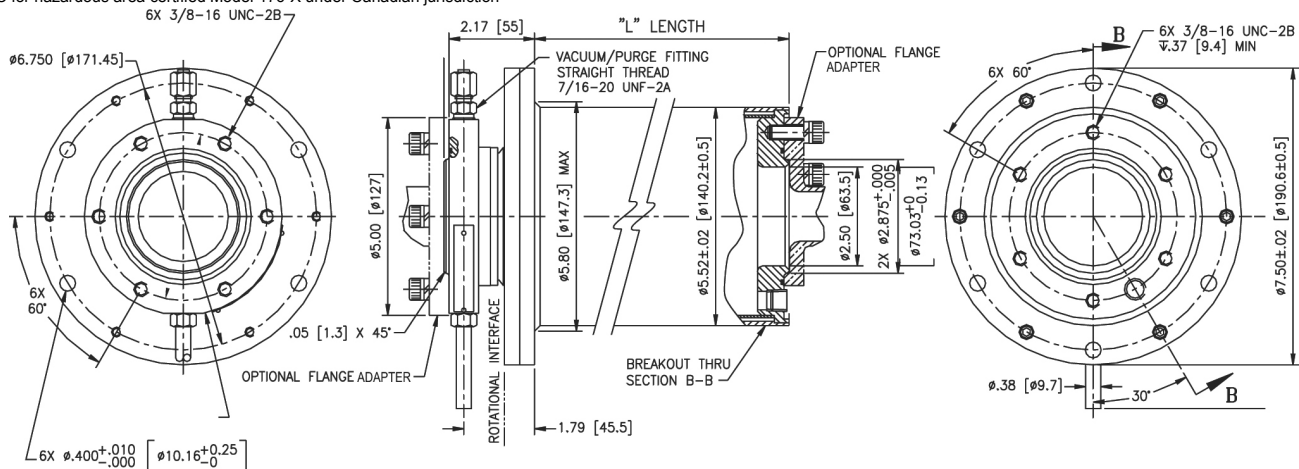
# Electrical Slip Ring (ESR) Component Specifications

Electrical	
<b>Voltage</b>	Maximum 7200 VAC
<b>Current</b>	Maximum 20 A per pass Maximum 720 A total current *
	* Maximum total current is dependent on duty cycle, ambient temperature and specific configuration. Consult factory to ensure configuration is suitable for application.
Electrical Performance	
<b>Contact Resistance</b>	20 mΩ nominal
<b>Insulation Resistance</b>	Typical > 500 MΩ @ 1 KVDC
<b>Short Circuit Rating</b>	1.5 kA / 1s, 3.7 kA peak
<b>Signal Types</b>	Analog video, CAN Bus, Profibus, Device Net, 10 Base-T Ethernet, SHDSL, RS-485
Mechanical	
<b>Rotation Speed</b>	Maximum 50 RPM continuous
<b>Ingress Protection</b>	Sealed to IP66, except for pigtail exits
<b>Operating Temperature</b>	-20 °C to +55 °C <sup>1</sup>
<b>Housing</b>	Stainless steel (304)
<b>Insertion Length "L"</b>	Varies with number of electrical passes
Environmental Test	
<b>Temperature</b>	Tested to MIL-STD-810F, methods 501.4 and 502.4
<b>Vibration</b>	Tested to MIL-STD-167-1
<b>Shock</b>	Tested to MIL-STD-810D, method 516.3
<b>Humidity</b>	Tested to MIL-STD-810F, method 507.4

Hazardous Area Option: Model 176-X	
<b>Certification</b>	<b>US:</b> Class I, Division 1, Group C & D, T5 Class I, Zone 1, AEx d IIB T5 ETL ATM 4007859
	<b>CAN:</b> Class I, Division 1, Group C & D, T5 Class I, Zone 1, Group IIB T5 ETL ATM 4007859
	<b>ATEX:</b> C€ 0334 Ⓢ II 2 G Ex db IIB T5 Gb KEMA 04ATEX2084X
	<b>IECEx:</b> Ex db IIB T5 Gb ETL 13.0013X
Terminations	
<b>Standard</b>	Wire pigtails, 10 ft [3.0 m]
<b>Flange and Cable Covers</b>	Various entry threads and orientations available
<b>Special</b>	Supply and installation of connectors, terminals, conduit, cable, glands, junction boxes, sealed pigtail exits.
Additional Options	
<b>Fiber Optics</b>	Fiber Optic Rotary Joint (FORJ) or optical converter
<b>Covered Pigtails</b>	Tinned copper braid and heat shrink installed
<b>Other Devices</b>	RF Rotary Joint, shaft encoder, sensors, Fluid Rotary Union (FRU), slip ring sensors, customer
<b>Ingress Protection</b>	IP67 or IP68
<b>Housing Material</b>	316 stainless steel

<sup>1</sup> -20°C to +40°C for hazardous area certified Model 176-X under Canadian jurisdiction

Please contact factory with your application details



# Fiber Optic Rotary Joint (FORJ) Component Specifications

Model Number Reference	No. Optical Channels	Fiber Type	Insertion Loss (dB)	FORJ Selection Notes. See individual datasheets for more details
FO197	1	MMF	≤ 3.0	Industry standard MMF FORJ for marine winch applications
FO206	1	SMF	≤ 3.5	Industry standard SMF FORJ for marine winch applications
FO292	2	MMF / SMF	≤ 6.0	2 channels MMF <u>or</u> 1 ch MMF/1 ch SMF
FO291	2 – 9 <sup>Note 5</sup>	SMF	≤ 6.5	Industry standard multichannel SMF FORJ for marine winch applications. Can be supplied with 1 channel as MMF.
FO300A	2 – 17 <sup>Note 5</sup>	MMF / SMF	≤ 4.0	Provides a mix of multiple MMF/SMF channels

**Notes:**

- 1 SMF = Singlemode fiber | MMF = Multimode fiber.
- 2 Pigtail lengths as defined by customer.
- 3 Standard connector options include ST, FC, SC, LC. Contact factory for others.
- 4 Optical values shown for MMF FORJs based on use with sources defined per IEC 61280-4-1.
- 5 Junction boxes, fiber and electrical wire size, and the number of electrical wires may limit number of possible optical channels. Please contact factory for higher channel count requirements to discuss options.

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

Manufactured in an ISO 9001:2008 registered facility.

All specifications and information are subject to change without prior notice.

Please contact the factory for the latest updates.

**Focal Technologies Corporation | A Moog Inc. Company**

77 Frazee Avenue, Dartmouth

Nova Scotia, Canada B3B 1Z4

Tel: 1- 888-302-2263 or +1-902-468-2263 | Fax: +1-902-468-2249

Email: [focal@moog.com](mailto:focal@moog.com) | Web: [www.moog.com/focal](http://www.moog.com/focal)

© 2017 Moog Inc. DS176F-V3.0

**FOCAL**<sup>TM</sup>