

# 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. Contact Focal for assistance in selecting the best solution for your requirement.



The Model 176 with FORJ combination has served the marine industry for over 30 years and is ideal for applications where voltages exceed the 1000 V / 7 A capabilities of our Model 180.

The ESR portion 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 the hazardous area environment, there is an option for a fully certified, flameproof enclosure. When underwater operational capability is required, it can also be adapted for use as a fluid-filled, pressure compensated unit.

## Features

- Electrical passes rated to 7200 V / 20 A
- Up to 52 fiber optic channels in a very small form factor
- Pigtail exits are capable of being sealed to IP66 standards
- Sealed housing design tested to IP66 standards
- Can accommodate a variety of wire and cable types
- Hazardous area certification available
- Stainless steel construction
- Rugged design intended for harsh environments
- Reliable operation under shock and vibration
- 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 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)

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## Electrical Slip Ring (ESR) Component Specifications

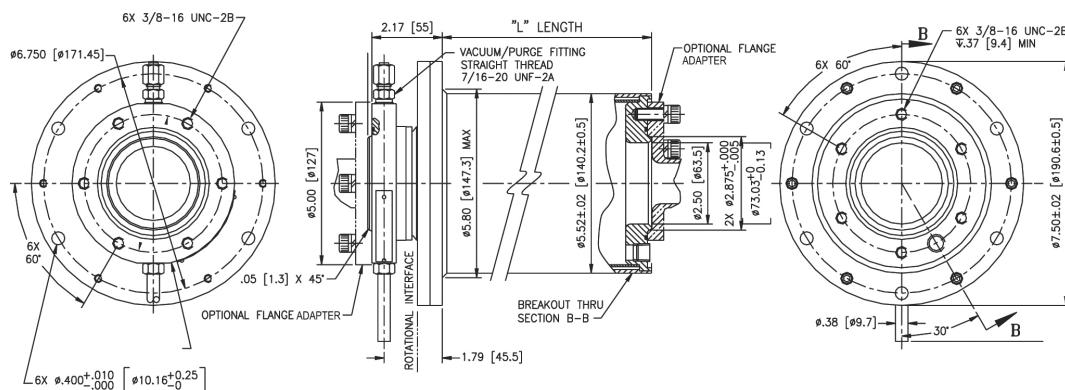
Electrical	
<b>Voltage</b>	Maximum 7200 VAC
<b>Current</b>	Maximum 20 A per pass Maximum 720 A total current *
	*Maximum total current is dependent on duty cycle, ambient temperature and specific configuration. Consult factory to ensure configuration is suitable for application.
Electrical Performance	
<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, CanBus, 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> (see drawing below)	Varies with number of electrical passes
Environment 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

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

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> CE 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 over loose wire pigtails
<b>Other Devices</b>	RF Rotary Joint, shaft encoder, sensors, Fluid Rotary Union (FRU), slip ring sensors, customer supplied product
<b>Ingress Protection</b>	IP 67 or IP 68
<b>Housing Material</b>	316 stainless steel

Please contact factory with your application details

## Model 176 Slip Ring with Integrated Fiber Joint Dimensions



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## Fiber Optic Rotary Joint (FORJ) Component Specifications

Model Number Reference	Optical Channels	Fiber Type	Insertion Loss (dB)	FORJ Selection Notes. See individual datasheets for more details
FO197	1	MMF	≤ 2.5	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
FO190	2-21	MMF	≤ 5.5	Industry standard multichannel MMF FORJ for marine winch applications. Can be supplied with 1 channel as SMF.
FO291	2-9	SMF	≤ 6.0	Industry standard multichannel SMF FORJ for marine winch applications. Can be supplied with 1 channel as MMF.
FO300A	2-17 <sup>Note 6</sup>	MMF/SMF	≤ 4.0	Applications requiring higher channel count or a mix of multiple MMF/SMF channels. (Note FO300C is currently SMF only).
FO300B	2-31 <sup>Note 6</sup>	MMF/SMF	≤ 5.0	
FO300C	2-52 <sup>Note 6</sup>	SMF	≤ 5.0	

### Notes:

1 SMF = Singlemode fiber| MM = 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 Legacy FO242 SMF FORJs are replaced by the newer Model FO291

6 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

MOOG

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.

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