

SPINNER Swivels for FPSO Applications



Up to 109 Channels:
Unprecedented Possibilities

HIGH FREQUENCY PERFORMANCE WORLDWIDE
www.spinner-group.com



The SPINNER Group

SPINNER has been setting new standards in radio-frequency technology worldwide for over 75 years. Based in Munich with production facilities in Germany, Hungary, and China, the company currently has 1,000+ employees. A steadily growing international network of subsidiaries and distributors supports customers in more than 40 countries.

SPINNER Rotary Joints

SPINNER has become one of the leading manufacturers in **rotary joints** thanks to its innovative approach, technical expertise, and high standards of quality. Our products are used in **maritime applications (both above and below water), on land, in the air, and in space.**

Across all applications, the trend toward digitalization and faster data transmission rates is accelerating. Our contactless modules for rotating systems deliver benefits whenever slip rings are inadequate due to large outer diameters and/or high data transmission rates.



OFFSHORE/SUBSEA



WIND ENERGY



SATCOM



INDUSTRIAL
AUTOMATION



SPACE



RADAR

SPINNER Fiber Optic Rotary Joints (FORJs)

SPINNER is one of the world's leading producers of high-performance rotary joints. Fiber optic rotary joints (FORJs) in particular call for extremely exacting assembly of all optical and mechanical components in cleanroom environments. SPINNER provides both from a single source.

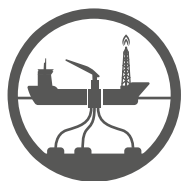
We also supply combinations of fiber optic rotary joints with radio frequency (RF) rotary joints, contactless power transmission modules, slip rings, multimedia joints, and

contactless data transmission. Our specialties also include integrated data and power transmission solutions with a small form factor.

SPINNER Fiber Optic Swivels for the FPSO Market and Others

SPINNER FORJs are completely passive and therefore feature a very high MTBF value while being highly stable and robust. Recently we have sold 52-channel, 64-channel, 8-channel, and 109-channel FORJs in the FPSO market. As an OEM, SPINNER has supplied assemblies for multi-

channel applications in the floating production and storage offshore (FPSO) market since 2006. Especially for this sector, we have enhanced our tried-and-proven multichannel rotary couplings to support up to 109 channels, thus considerably surpassing the traditional ceiling of 52 channels.



FPSO



Defense
Applications



Mobile
Cranes



Mining

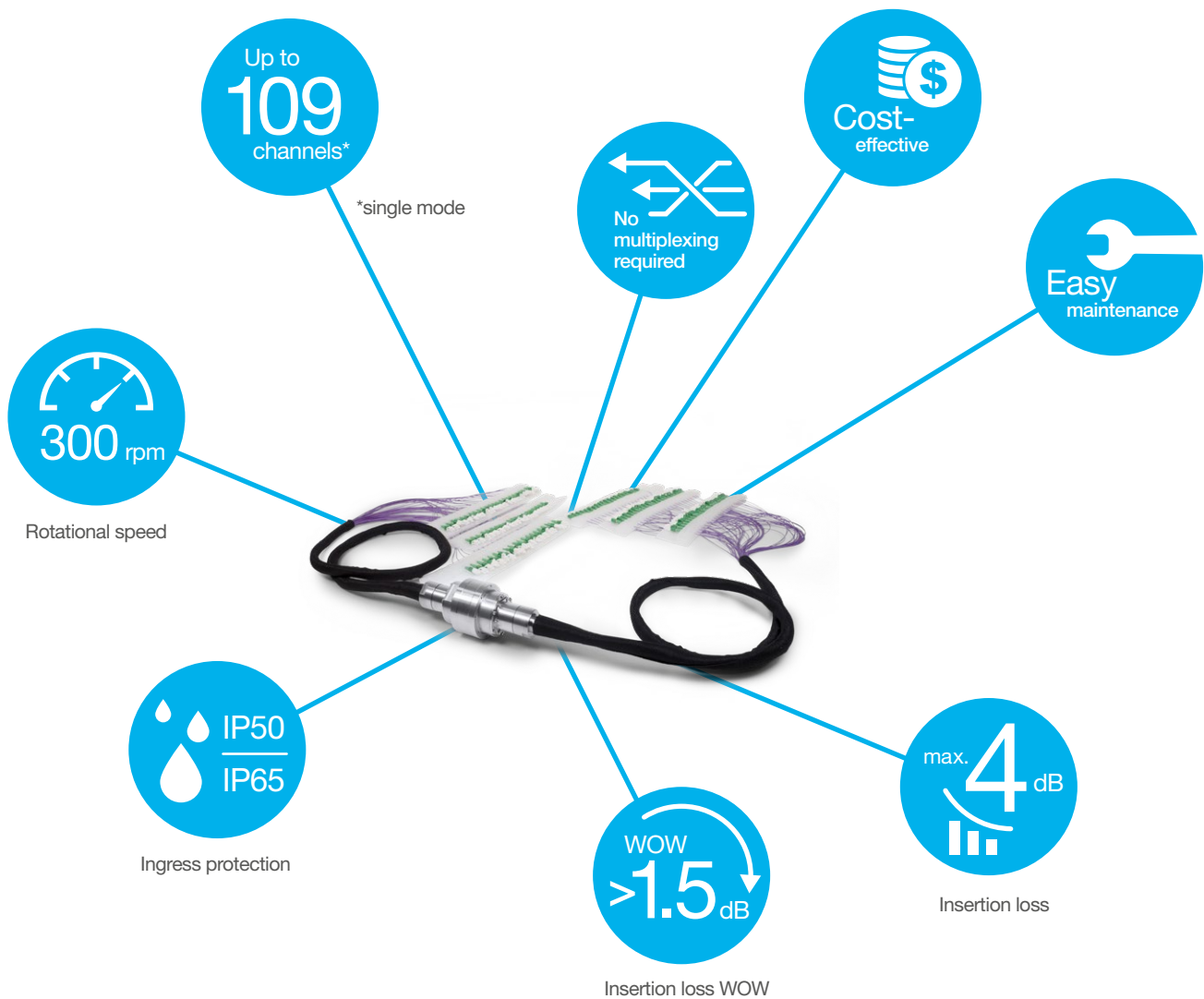


Military
Radar



Gimbals

SPINNER Swivels for FPSO Applications



Features and Benefits

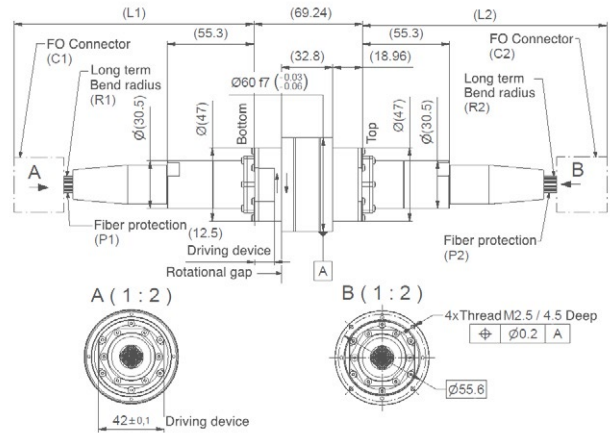
- ✓ Up to 109 channels
- ✓ No multiplexing required
- ✓ Cost-effective
- ✓ Easy maintenance and high MTBF
- ✓ Ingress protection classes: IP50, IP65 (IP68 also available)
- ✓ Fiber types: single-mode (SM)
- ✓ Max. variation of insertion loss while rotating: < 1.5 dB
- ✓ Min. return loss: 45 dB (typ. 50 dB)
- ✓ Rotational speed: up to 300 rpm
- ✓ Wavelengths: 1310 nm and 1550 nm
- ✓ Weight (w/o connectors): 1.5 kg
- ✓ Low torque
- ✓ Recommended temperature range: -40°C to +85°C
- ✓ Crosstalk > 50 dB
- ✓ GigE with BER $\leq 1 \times 10^{-12}$
- ✓ Shock- and vibration-tested



On request, we'll be happy to provide you with test protocols indicating the precise values.

SPINNER FORJ Multi-Channel

SPINNER FORJ Type x.60

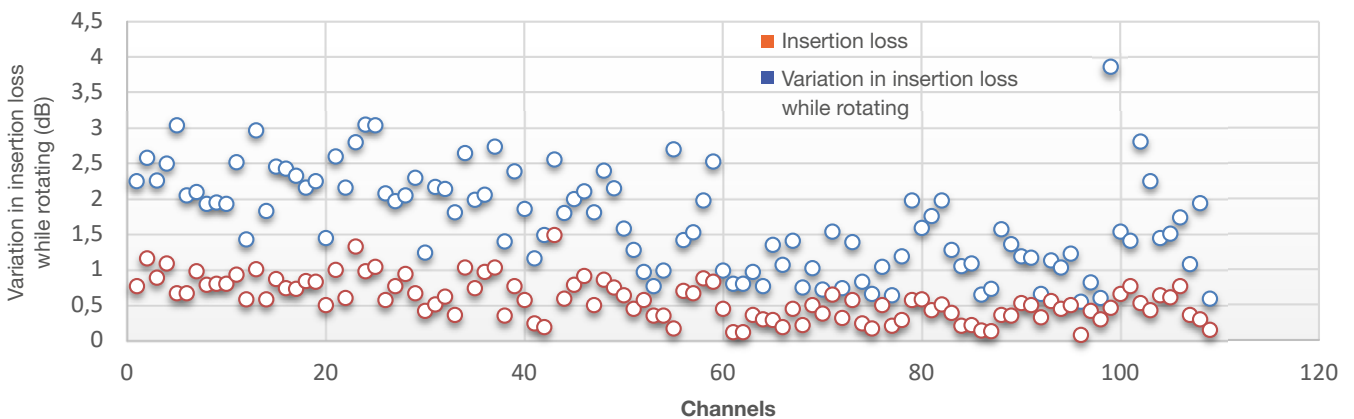


Thanks to a new technology, SPINNER's x.60 type can be configured with up to 109 channels in a diameter of up to 60 mm. In near future, 120 and more channels will become available. No other FORJ features this many channels in a comparable housing size. SPINNER's fiber optics department works continually to improve the FORJs, also by incorporating new technologies and taking different alignment approaches.

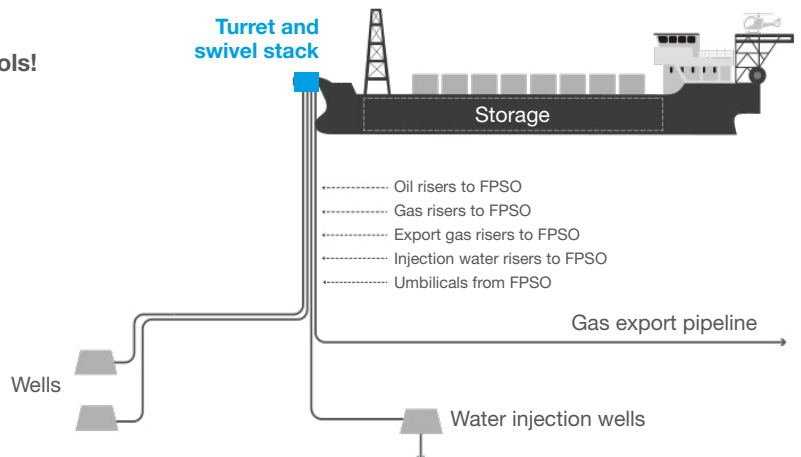
As a result, the x.60 paves the way for unprecedented new possibilities and applications.

SPINNER can also manufacture customized FLEXIFLANGES for easy integration in your setup. This unit is designed to withstand extremely harsh conditions.

Insertion Loss/Variation vs. Channels Tested on a 109 CH SLAT FORJ



Please ask **SPINNER** for test protocols!



SPINNER Fiber Optic Swivels for FPSO Applications

SPINNER has a complete portfolio of fiber optic rotary joints for the swivel stacks of floating production systems (FPS).

Applications include:

- External turret production (ETP)
- Ship-integrated turrets (SITs)
- Flexible turret mooring system
- Buoy turret loading
- Conventional and turret mooring systems for deepwater applications
- Internal and external turret mooring systems

Up to 109 channels:
No multiplexing required!





HIGH FREQUENCY PERFORMANCE WORLDWIDE

SPINNER designs and builds cutting-edge radio frequency systems, setting performance and longevity standards for others to follow. The company's track record of innovation dates back to 1946, and many of today's mainstream products are rooted in SPINNER inventions.

Industry leaders continue to count on SPINNER's engineering excellence to drive down their costs of service and ownership with premium-quality, off-the-shelf products and custom solutions. Headquartered in Munich, Germany, the global frontrunner in RF components remains the first choice in simple-yet-smart RF solutions.

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