

DEUBLIN[®]
Engineered for Performance



ELECTRICAL SLIP RINGS

DEUBLIN Company is the proven leader for the manufacture of rotary unions in rugged industrial and wind turbine applications. Based on decades of experience with harsh rotary union applications, *DEUBLIN* developed Electrical Slip Rings to serve similar environments.

DEUBLIN electrical slip rings optimize the latest technology to obtain long-term operation and unrestrained connection of signals and power.

DEUBLIN slip rings are developed in response to industrial manufacturers' demand for longer service life. The integrated system has been optimized

with special material configurations that are tested and proven for hundreds of millions of cycles, which translates into many years of trouble-free operation with unsurpassed performance.

DEUBLIN has focused on superior reliability, which in turn, significantly reduces down-time and maintenance costs.

As with all *DEUBLIN* products, our slip ring product line is 100% tested prior to installation in the field and manufactured using high performance production methods. The long-life slip ring technology will provide consistent, reliable service and maintenance-free performance.



Off-shore wind turbine union, slip ring and encoder. A complete DEUBLIN solution providing hydraulics, electrical power, EtherCAT and position.

On-Shore and Off-Shore Wind Energy Farms

- Power supply up to 250 A
- Transmission of Ethernet and Profibus signals
- Resistant to shock and vibration
- Protection class IP 54 - IP 66

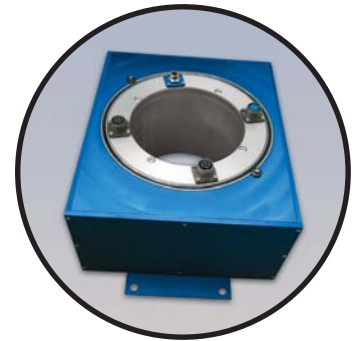
Custom slip ring designs and applications have been a staple of *DEUBLIN's* slip ring design team. Our design team has an extensive group of building blocks to use in the development of any new slip ring requirement. Design challenges such as RF shielding, mixed signal handling, high frequency impedance matching, reduced temperature generation, and miniaturization are commonly solved by *DEUBLIN's* knowledgeable staff.

For those customers who require both electrical connection and hydraulic/air/gas from a stationary connection to a rotating connection, *DEUBLIN* can supply the complete solution. Rotary union and slip ring combinations are developed to assure the customer receives an optimized design and mounting of the entire structure. *DEUBLIN* has available a unique plug and play slip ring and union combination. This design reduces installation and maintenance time

since the rotor electrical and hydraulic connections are plugged or unplugged as part of the installation or removal process rather than having to disconnect those cable connections and hose fittings separately.

Integrated slip ring and union packages have been developed for reduced overall package size. This reduces risk in our customer's initial product development stage as well as on a production basis. Our *DEUBLIN* slip ring design team has the experience and tools required to custom design a highly reliable slip ring for even the most challenging requirements.

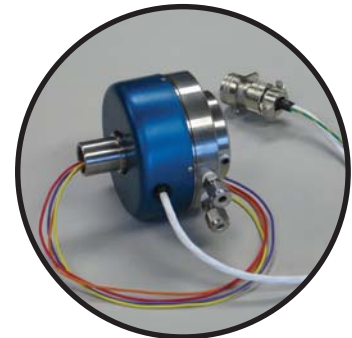
DEUBLIN's design capability includes the incorporation of absolute or incremental encoders, optical rotary joints for fiber optical connection, internal heater for use in cold weather conditions and any other special customer needs.



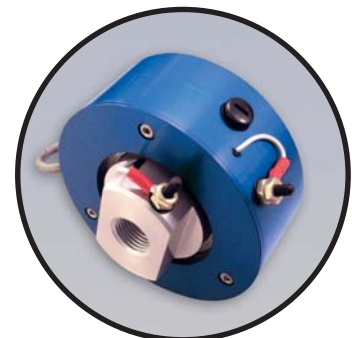
Industrial control slip ring for mounting around a 165mm shaft



DEUBLIN'S custom graphite power brush holder



Slip ring and union combination in one integrated assembly



Rugged 1 channel slip ring with thru bore for construction industry

SLIP RING APPLICATIONS

Tooling Machines

Plastic Molding Machines

Wind Energy

Winding Machines

Centrifuges

Semi Conductor Production

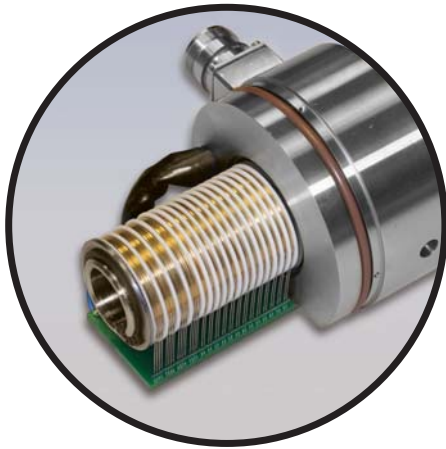
Directional Drilling Machines

Handling Machines

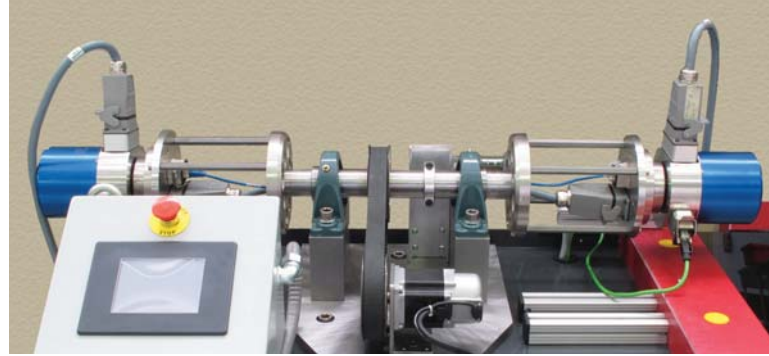
Robotics

Pick & Place Machines

Turntables



Slip ring without cover, using wires on gold-plated rings



DEUBLIN slip rings undergoing life cycle tests

SLIP RING INDUSTRIES



Wind Turbines



Semiconductor



Plastic Molding



Construction Equipment



Industrial



Food Processing

ELECTRICAL SLIP RING OVERVIEW

DEUBLIN Electrical Slip Rings – Features and Benefits

Features	Benefits
Integrated hydraulic union and slip ring assembly	Single source for integrated union/slip ring assembly
DEUBLIN Slip Rings offer replacement of existing slip ring brands	Easy to replace at end user or OEM
Custom mounting configurations from 1 channel to an infinite number of channels	Flexible engineering to support unique requirements
Push pin, solder or custom connector configurations	Simple installation and maintenance

SLIP RING CAPABILITIES

Voltage:	Up to 1000 Volts AC (single or three phase) or DC.
Current:	Up to 250 Amperes AC or DC.
Signal types:	Analog signals such as sensors, thermocouples, audio, video, etc. Digital signals such as Ethernet, PROFIBUS, CANbus, RS-232, RS-422, RS-485 and other logic control.
EMI shielding:	Shielding of analog, digital, RF and Microwave signals to prevent crosstalk with other signals and/or AC/DC power.
Slip ring brush technology:	Monofilament or multi-fiber precious metal (Palladium, Silver or Gold). Carbon based (Graphite, Copper/Graphite, Silver/Graphite). Actual brush material and technology is selected based on power or signal requirements.
Electrical Connection:	Cables/leads (length as specified by the customer), circular industrial or military connectors, modular industrial connectors, RJ45, screw or spring terminal blocks, etc.
Mounting:	Flanged rotor mount, threaded rotor mount, or hollow rotor mount. Through bore slip ring (hollow rotor mount) is optional to allow line(s) for other media to be routed through the center of the slip ring.
Rotational speed:	Up to 10,000 rpm.
Operating life:	Up to 200,000,000 cycles (rotations).
Ingress protection rating:	Up to IP66 or NEMA 12

DEUBLIN designs slip rings to a variety of EMI, operating temperatures, storage temperatures, acceleration, mechanical vibration, and mechanical shock requirements as required by the customer application.



Since its establishment in 1945, **DEUBLIN** has consistently adhered to a policy of producing the best product of its kind in the market. The result of this policy has been constant growth through the years. For this progress we are grateful to our many loyal customers. We cordially invite you to visit our modern manufacturing facilities in Waukegan, Illinois; Hofheim-Wallau, Germany; Monteveglio, Italy and Dalian, China.

Sincerely,

Donald L. Deubler
Chairman of the Board



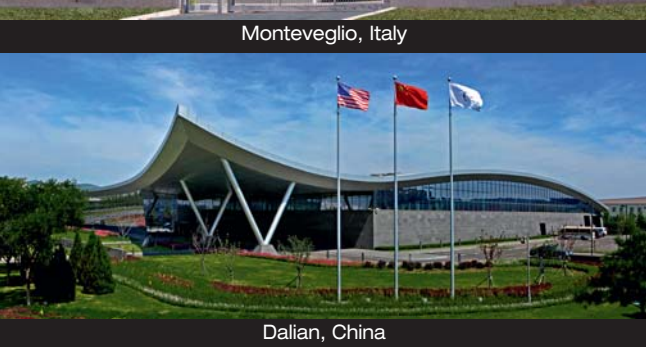
Global Headquarters in Waukegan, Illinois, U.S.A.



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