



ONSHORE & OFFSHORE **ROTARY SOLUTIONS** FOR WIND

Slip Ring Systems | FORJs | Rotary Unions |
Brush Holders | Spares & Repairs



Over 1 Million Rotary Solutions
Sold Into The Wind Industry



BGB were the first slip ring manufacturer to design a dedicated wind turbine slip ring for hub control systems.

By far our main industry expertise, we have been delivering engineering solutions to the wind industry since the early 1990's. With over 1 million wind products situated in over 77 countries worldwide, BGB is the number one wind turbine slip ring solutions provider in the world.

We remain at the forefront of turbine technology and work closely with major wind turbine manufacturers such as Vestas, GE, ABB, Siemens Gamesa and other well known OEMs, as well as regional O&M service providers.



Power & Signal

Slip ring assemblies are used for the transfer of power and data between the hub/blades and the nacelle via the slow speed main shaft.

BGB can manufacture custom units that combine power slip rings with signal/optical/hydraulic rotary joints.

Power channels utilise Phosphor Bronze rings in conjunction with either Copper graphite or Silver graphite brushes. Signal channels make use of silver to silver contacts, or where applicable, fibre optic rotary joints (FORJs).

Silver provides the best material for reliable signal transfer, and very low signal noise.

In most cases, sealed enclosures are used to prevent the ingress of liquids or dust.

BGB can use in-house testing to meet customers required IP rating.



Hub Control

BGB are at the forefront in slip ring design for a dedicated wind turbine slip ring for hub control systems.

As leaders in the field BGB are always innovating and improving products to suit customers in the wind turbine industry.

Units can be supplied with matched looms complete with quick disconnect/connect systems for ease of service.



Pitch Control (Blade Feathering)

BGB products can cater for RS232, RS485, bus systems and ethernet range up to 1gb.

BGB units can transfer high integrity digital and analogue signals including (but not limited to); thermocouples, tachometers, strain measurement, proximity switches and relay circuits in all harsh environmental conditions (heavy vibrations, high altitude, humidity and sub-zero temperatures).

Units can be designed to incorporate encoders to determine





High Voltage Power Slip Rings

BGB provide slip ring and brush holder solutions for varying current and voltage applications.

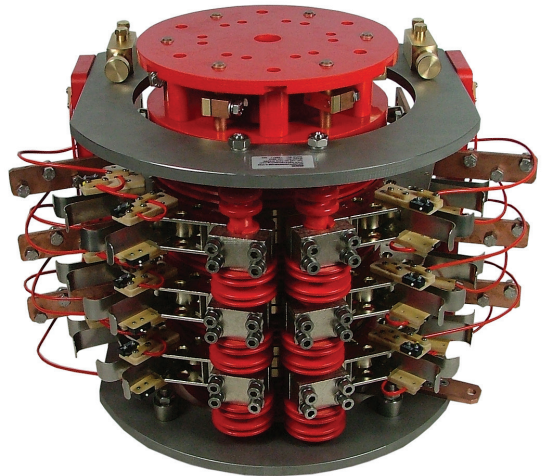
Products can be supplied with a rating to 2.5kAmps, 22.0kV & to ISO & Ansi Standards. These products can be supplied solely or as part of a packaged solution.

High power units are primarily used for power take off from the wind turbine generators.

Helical grooved slip rings are used in applications that have higher rotational speeds. The benefits of which are;

- Better commutation
- The build up of gas is expelled between the working faces
- more uniform current distribution between brushes

BGB can develop slip ring systems for new generator designs or repair solutions for existing platforms to *"as good as new"* condition.

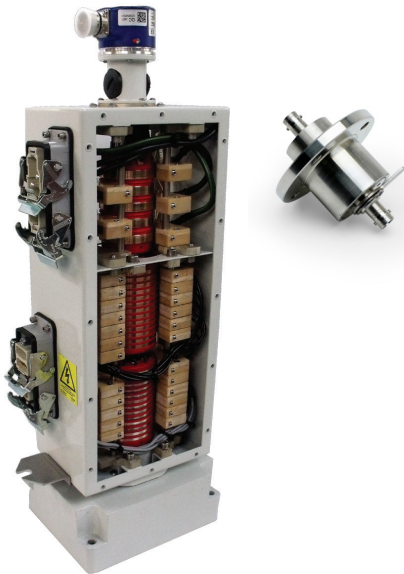


Fibre Optic Rotary Joints (FORJ)

The BGB range of FORJs and accompanying electronic devices are adaptable for the most demanding of applications.

Made to withstand the harsh environments of offshore wind farms, our FORJs have exceptional durability, protecting the units from dust and water ingress to IP67.

The FORJ range are fully tried and tested in leading wind turbine manufacturers development suits.

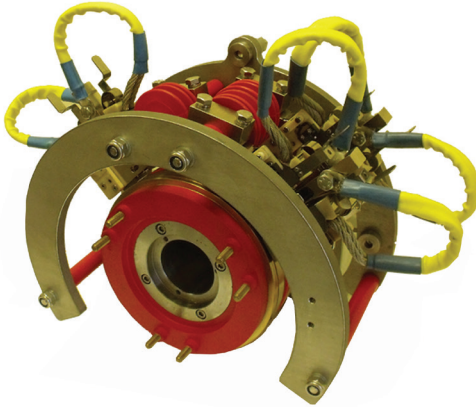


Power Slip Ring Assemblies Incorporating FORJ's

As well as stand alone media converters and WDMs, BGB can build all FORJ products into bespoke slip ring solutions incorporating connections to suit each individual requirement.

Slip ring assemblies with Fibre Optic Rotary Joints for data would not be susceptible through data loss due to low resistance contact on an infrequently used low power data ring.

The official FORJ E-brochure is available to download through the BGB website.



Bespoke Assemblies

BGB can design and manufacture total rotary solutions developed to customer specification or retrofit current solutions.

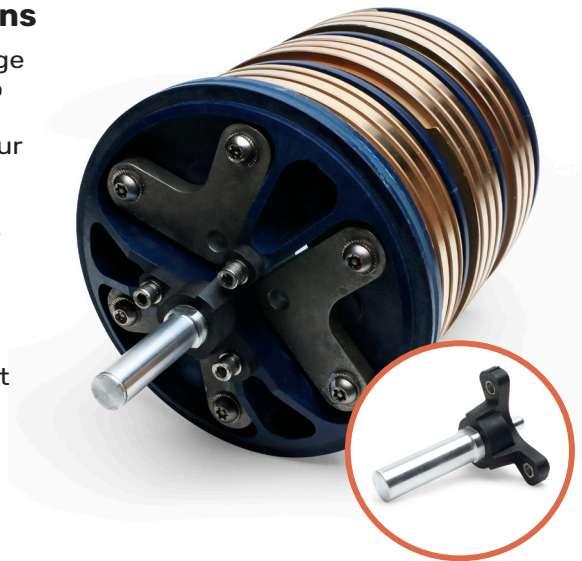
The design office use the latest 3DCAD technology and work with world leading wind turbine design engineers to produce innovative solutions and bespoke assemblies.

Testing can include; dynamic electrical tests, IP, EMC, HALT, Thermal shock, Vibration and Surge tests. Dynamic/static balancing is also standard practice.

Upgrades & Smart Solutions

We not only develop our own range of smart rotary solutions, we also retrofit and improve existing slip ring packages whether they be our own or competitors.

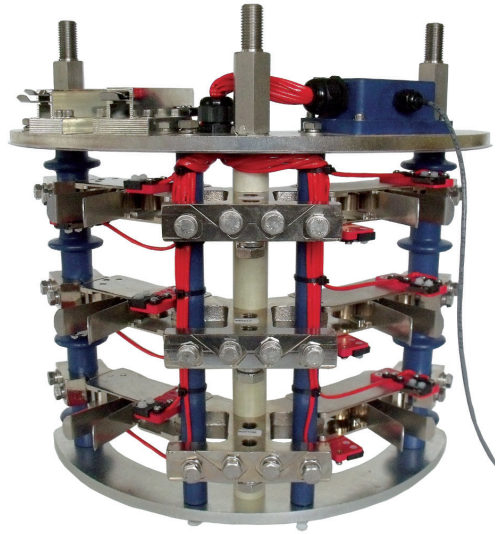
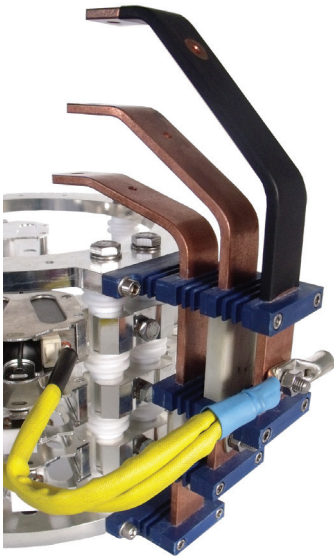
We listen and talk to wind turbine technicians to see where we can help with common problems, reduce costly repairs, improve their time spent on site, avoid unnecessary breakages and most importantly reduce their carbon footprint.



Preset Cage Assemblies

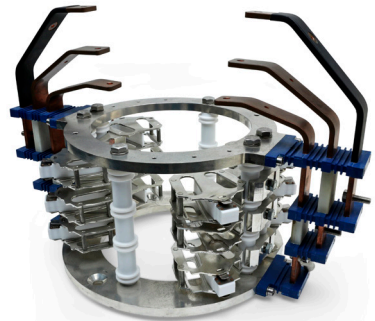
Cage assemblies are mounted to the stator side of the application and are used to mount brush holders in the correct position relative to the slip ring.

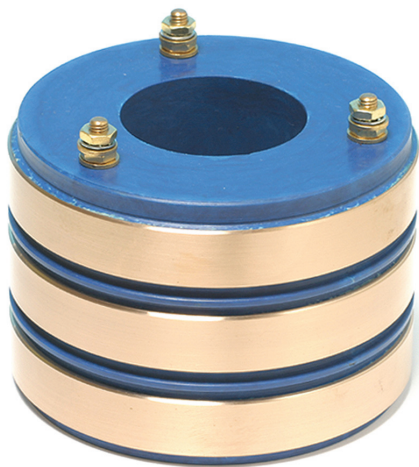
Brush holders can be pre-positioned to speed up assembly on the turbine. As brush positioning is critical relative to the slip ring surface, correct alignment of the brush is imperative. This allows for optimum surface contact from day of installation.



Bus-bar Assemblies

Bus-bar assemblies are used for the termination of brushes to generator main stator cables. These are normally incorporated as part of the cage assembly.





Small Wind Turbine Slip Ring Units

BGB have designed and manufactured post top slip rings to accommodate the yawing of a turbine to many of the 3Kw-20Kw wind turbine manufacturers.

These units are primarily used in remote locations, farms and small businesses to independently generate electricity in the absence of mains grid supply.

As with the larger slip ring assemblies, units can be designed and manufactured to suit any customer requirements.

Slip rings can be made with protective covers to protect from extreme elements up to an IP rating of 67.



Yaw Control

BGB offer a selection of slip ring assemblies designed specifically for the yaw of wind turbines, enabling full 360 degree rotation of the yaw system.

Yaw Slip Rings feature:

- Bi-directional device
- Replaces traditional cable swag
- No limitation on the number of rotations
- Very low maintenance required
- Units can be supplied for kW to MW power transfer
- All signal types transferred, Bus, Ethernet, Encoder, Optical

BGB have provided assemblies to many of the major small, medium and large wind turbine manufacturers.





Gold Wire

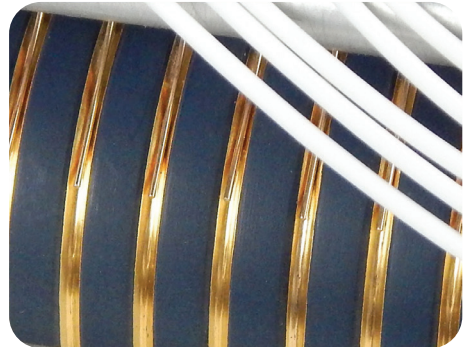
Gold to gold technology in the wind industry is typically suited for low speed / low power applications. It allows high data transfer and low noise to be transmitted.

Gold technology is used in wind turbines for a range of compact pitch control slip rings, allowing a combination of low power and signals to be passed through the rotor and into the main electrical cabinets.

A high number of revolutions and low maintenance is achievable with such units in this specific industry.

In addition to our world class carbon and fibre optic slip ring systems, BGB has been developing gold to gold technology over a number of years.

Thanks to long standing research and recent accomplishments, we are now able to offer gold to gold contacts for various industries.



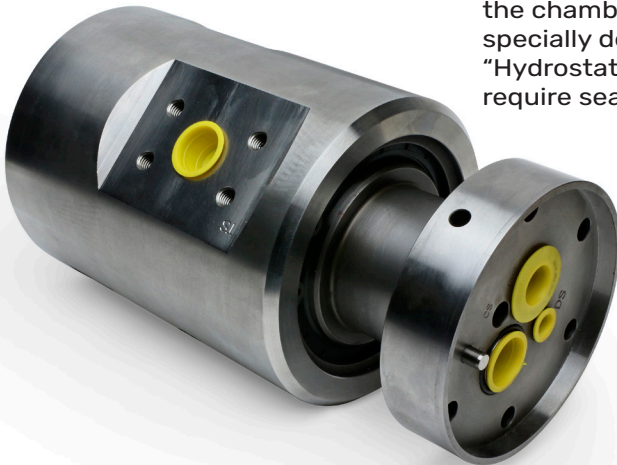
Hydraulic Unions

Rotary Joints, also known as rotary couplings or Swivels, are a mechanical device used to transfer fluid (usually hydraulic oil) from a stationary system, to a rotary system.

Rotary Joints are used in wind turbines to deliver hydraulic fluid to the blade pitch actuators. Rotary Joints are also used in various industrial and manufacturing processes to transfer fluid.



BGB have designed and manufactured two variants of joint, the "Sealed" type where the chambers are separated with specially designed seals, and the "Hydrostatic" type, that does not require seals between chambers.



Generator Brush Holders

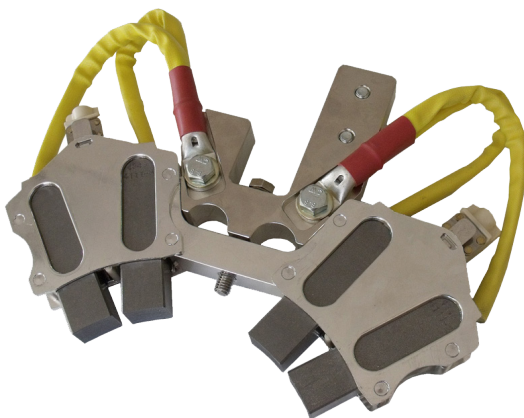
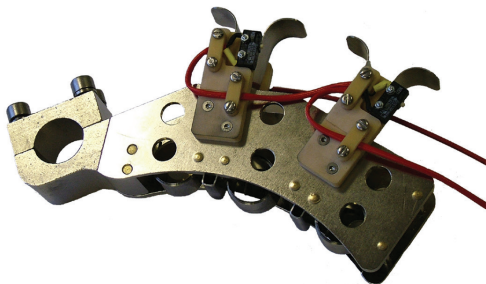
BGB offer a wide range of standard brush holders to suit all applications. Single or multi brush designs are available for generators and high power applications.

Brush holders can be custom designed to suit specific customer requirements.

We use constant force springs and non ferrous materials where appropriate. Various forms of wear detection are also available.

Brush holders provide housing for the static side of the rotational electrical contact.

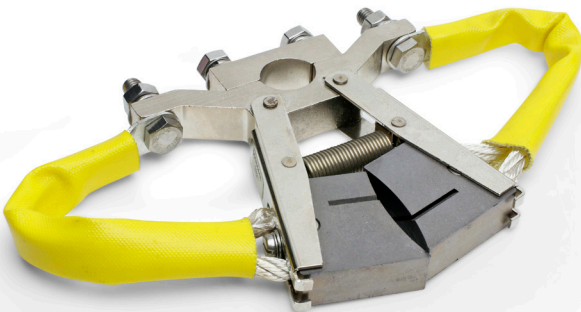
Generator brush holders are primarily used in high rotational speed / high current density applications.



Standard Brushes & Holders

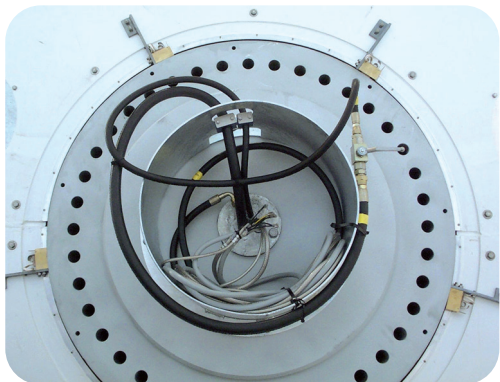
The range of standard brush holders are very adaptable and lend themselves to both fast and slow moving applications.

Standard construction is brass with copper foil or braid connections (although variations can be requested). Double spring versions and brushes are available where specified.



The range varies from simple callipers and cartridges to advanced fixed box holders with constant force springs and 22KV collectors.

BGB brush holders are uniquely designed to be adaptable and easily replaced when they reach the end of their usable life.



120 Amp Brush Holder

BGBs Lightning Brush holders are robust units that are designed to dissipate lightning energy and thus defend critical components (typically main shaft and yaw bearings).

The 120 amp brush holders, when used as part of a total lightning and surge protection system, play a very important role in the protection of buildings, structures and equipment against direct lightning strikes.

Arc propagation brackets are also available to act as backup for overload conditions.

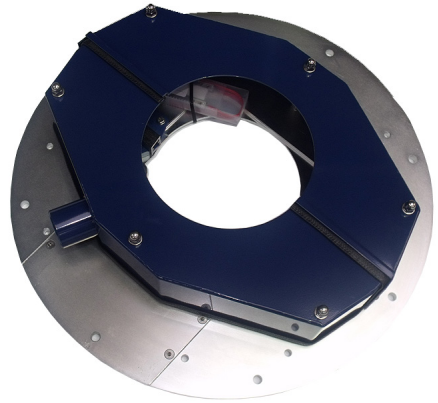
A low impedance path is created through the rotational interface (hub to nacelle) from the lightning protection conductor to the ground, therefore protecting the main bearing.



Electrostatic Charge Dissipation System

One of the main problems OEM's experience on a wind turbine is the gradual build up of electrostatic charge, if this issue is not addressed with a professional solution the electrostatic energy can cause detrimental damage to key nacelle components.

It is not uncommon for energy to be discharged through the main shaft bearings. Over time this creates defects in the main bearing races leading to a turbine failure and in offshore environments, changing main shaft bearings can be a very costly exercise.



BGB have many years of assisting major OEM's eliminate any electrostatic generation, and in turn, protecting the key components ensuring the turbine stays in operation. BGB have been able to do this by developing a specific brush composition that discharges any electrostatic energy down to earth operating on the main shaft and providing a reliable solution.

The Ground Contact design is retro-fittable to the main shaft of a turbine. Partner this product with BGBs dedicated lightning brush holders to help protect sensitive components within the nacelle.





Paratec®

Paratec is a BGB designed parallel action brush system that provides high contact integrity and system stability for both signal and power applications.

The non-metallic body ensures suitability for operation in corrosive environments (such as marine) whilst captive screws improve serviceability.

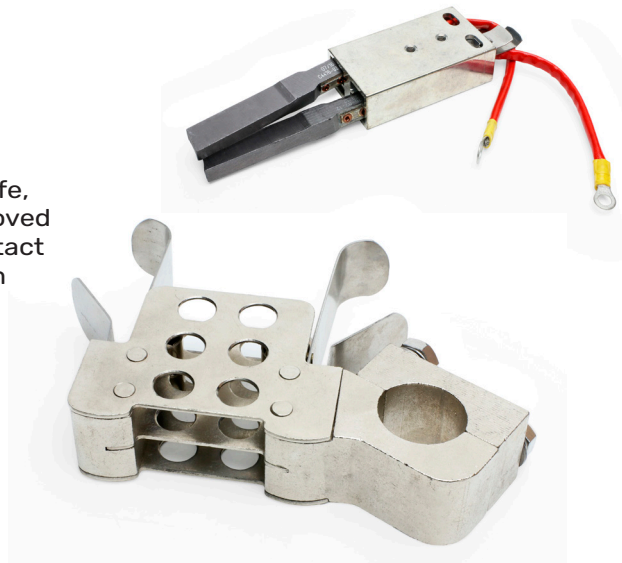
BGB now fit this product as standard for specific applications to eliminate the problem of fretting corrosion which can occur with conventional metallic brush holders.

Paratec's success has warranted it's name to be trademarked.

Custom Brush Holders

BGB work closely with global customers to develop more efficient, cost effective brush holder solutions.

Benefits include longer brush life, reduction in service time, improved cooling and minimal brush contact face area by using the optimum brush compound.



Cable Looms & Harnesses

Looms and harnesses for transmission of power/signals/fibre optic can be manufactured using customer specified cables and connectors.

BGB can supply low quantity prototype loom assemblies, through to production batches.

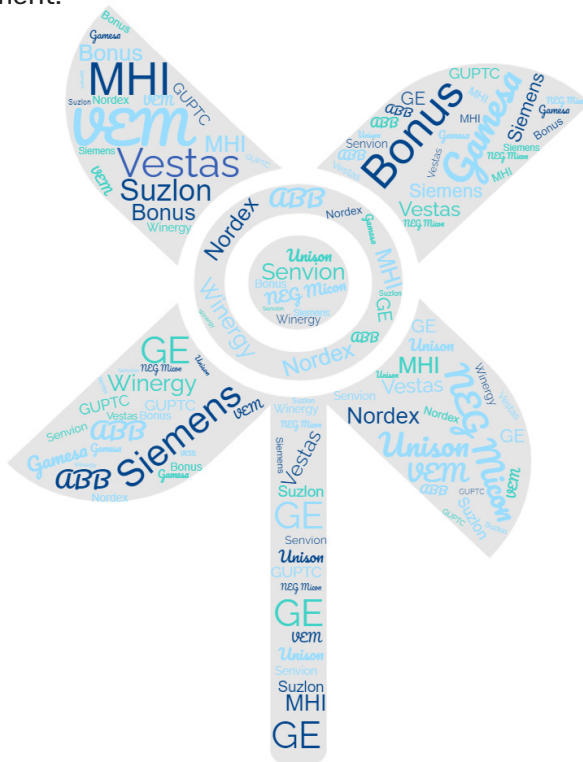
An extensive range of cable looms and connector systems are available to provide complete rotary solutions.



Spares

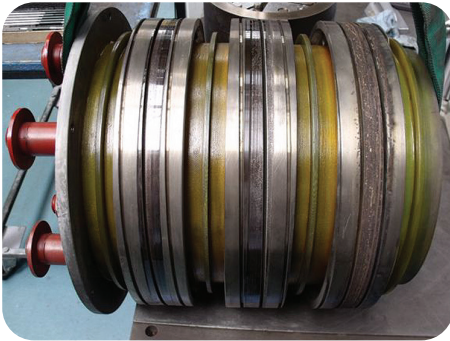
In 2022 we expanded our capacity to test, evaluate, and where possible refurbish or repair worn or damaged slip ring assemblies to meet customer requirements by opening a designated area at our Turnpike Close site in the UK. From single units to large batches, the aim is to offer an economical, efficient way to extend the life of slip ring assemblies, thereby reducing waste and with a subsequent reduction of demand on resources.

If the assembly is beyond repair, we can offer advice on suitable new alternatives at competitive prices. We can offer a 12-month or an extended 24-month warranty for the repair depending on the unit and your requirement.



REPAIRS, REFURBISHMENTS & REPLACEMENTS

Before....



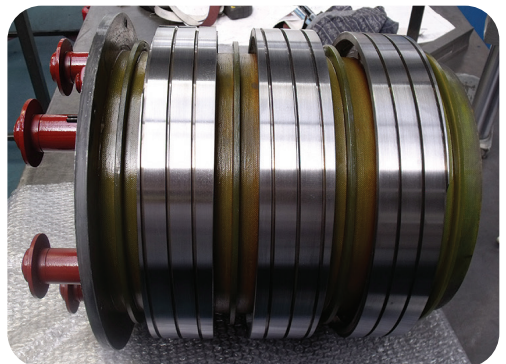
BGB can repair, refurbish or replace all types of slip rings. The refurbished slip ring will be returned to a similar “as new” condition, even if the slip ring is physically damaged.

If the unit is beyond repair, BGB can provide brand new slip rings complete with new brush gear (if damaged or functioning incorrectly) to the same spec as originally designed.

BGB can perform the following tasks:

- Electrically test for any faults, including flash test @ 13kV and load test to check for any build up of resistance in the slip ring.
- Fully clean to remove excess carbon dust build up.
- Machine rings back to correct surface finish and address any concentricity issues (scrolls are also cleaned during this process).
- Re-apply anti-tracking varnish to maintain correct electrical ratings.
- Re-balance slip rings
- Strip, clean and rebuild

After....



WHY BGB?...

As the world's most trusted brand in Slip Ring Systems for Wind Energy, we have a longevity of quality and service life history for our rotary assemblies in major OEMs around the globe.

Our Vision:

"To be a trusted leader in smart rotary transfer solutions supporting global sustainability"

Our Purpose:

"An exceptional company to work for and with, attracting and developing great people, sharing success whilst staying true to our values"

Our Mission:

"We are tenacious in our pursuit to engineer & deliver innovative Products and Services with our selected partners worldwide"







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