

SIEMENS & BONUS

Wind Turbine **Pitch Control** Slip Rings

SWT1.3CS, SWT2.3CS and SWT2.3VS Versions
+ Legacy Solutions



www.bgbinnovation.com

- > Approved and **Trusted Solutions**
- > Over **30 Years** in the Wind Industry
- > Development and Supply Partner for **Multiple OEM's**
- > Over **1 Million** BGB Wind Rotary Solutions Installed Globally



Are you experiencing problems with your Slip Rings?...

Cleaning too much? Sticky black residue inside?
Waiting on units to arrive? Paying too much for parts?...

Resulting in...

CLIMBING towers too much & adding safety risks
Turbine **DOWNTIME**
Increased dept. **COSTS**

BGB Upgrade Solutions

Aftermarket innovation: Addresses the failures of the previous units while still fulfilling the Siemens specification

Reduce O&M costs: Modular design means that manufacturing costs are lower and parts are common to all versions of the unit

Always have the **right part:** Available in all variants of CS and VS

No maintenance: No dust generation or cleaning requirements due to silver fibre technology

Work with a **trusted technology partner:** Incorporates successful design and experience from BGB's successful Vestas units

Improved seal: End access and no maintenance means the concentricity of the cover does not change over time. The weep holes prevent oil ingress into the main body

Reduce component lead times: Made in the USA and stocked in the UK

No communication errors: BGB's slip ring is bi-directional which means if the rotor counter rotates during idle conditions the slip ring is able to maintain communication connections with the hub.

Designed to **IP65**

Made in the UK and stocked in both the **UK and USA**



BGB's improved seal offers greater protection against hydraulic oil ingress from the hydraulic joint

(Pictures left & right show oil ingress in competitor products)



BGB Design Advantages:

Signal and Power channels utilise the same brush and ring interface to: reduce unit cost, reduce temperature and increase transmission safety factor



Pitch Control Slip Ring



Did You Know?

BGB has included weep holes to allow oil to escape the system prior to having a chance to infiltrate the slip ring (*a common problem among electric slip rings mounted to hydraulic unions*).

BGB Solutions For Siemens Turbines:

A9B10053437

BGB Part: **GA100274-8**

SWT-2.3MW-93, WTC3 2.3MW VS
Pitch Control Slip Ring 8/9 way

A9B00400458

BGB Part: **GA100274-10-1.3**

SWT-1.3-62, WTC3 1.3/0.25 MW
Pitch Control Slip Ring 10/11 way

A9B10051701

BGB Part: **GA100274-10-2.3**

SWT-2.3MW, WTC3 2.3MW VS
Pitch Control Slip Ring 10/11 way

A9B10020762

BGB Part: **GA100274-10-3.6**

SWT-3.6
Pitch Control Slip Ring 10/11 Way

A9B00518720

BGB Part: **GA4852-05**

Bonus 1.3/2,0MW
Pitch Control Slip Ring 20 way unit

Specification:

Weight:	10 lbs
Brush Material:	Silver Fibres
Data Ring Material:	Silver-plated Brass
Slip Ring Life:	100M Revolutions
Lubrication:	None
Maintenance Period:	No Scheduled Maintenance Required
Power Circuit Rating:	10Amps @ 230V
Data Lines:	100Mbps
Operating Temp:	-20°C to +70°C
Cables	OEM Spec 2.85m Exposed
Sealing:	IP65



Origins...

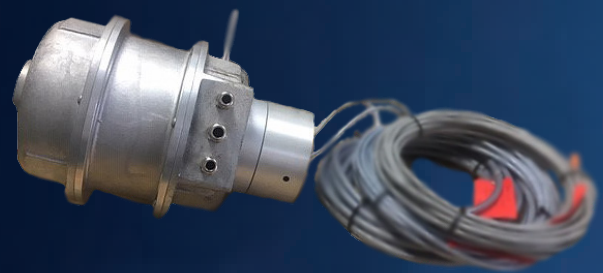


Did you know?

BGB has been producing slip rings for Bonus turbines since the Bonus 1MW which was first produced in 1996. While having a relatively low production volume, it had the characteristics typical of the Siemens turbines of today, such as the iconic nacelle shape and three stage asynchronous gearboxes that served as a foundation of design for the Siemens Bonus turbines after the Siemens takeover in 2004.

AN Bonus 1.0MW

- Spare part provision
- Legacy support
- Repair and refurbishment



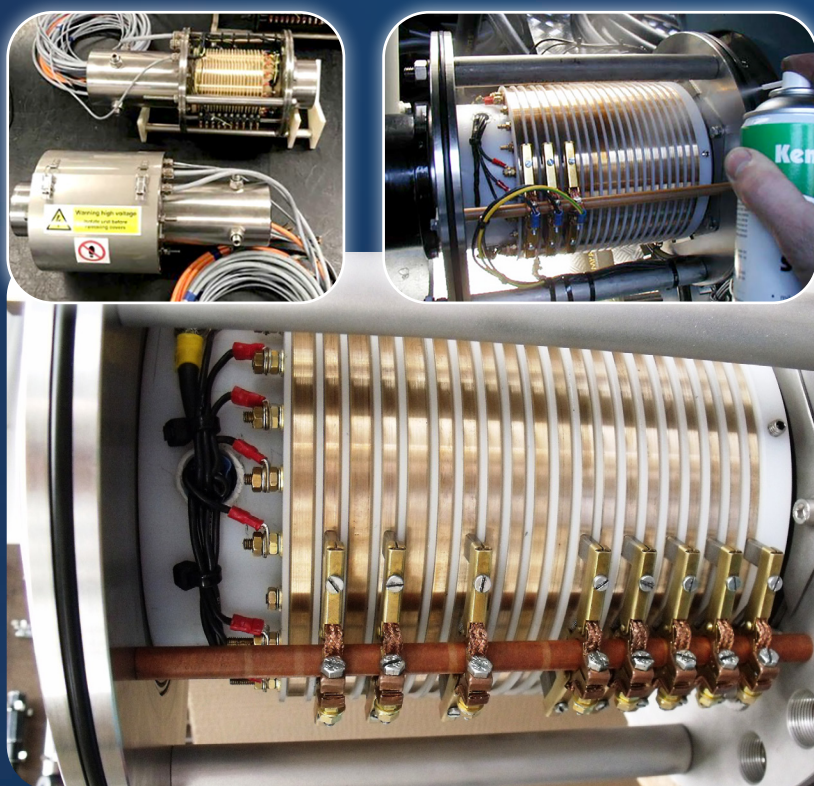
BGB Legacy Products For Siemens / Bonus Turbines Include:

AN Bonus 2MW WCT2: Pitch Control Slip Ring 20 way, Paratec Upgrade

AN Bonus 1MW: Pitch Control Slip Ring 10 way, Paratec Upgrade
Lightning Brush Holder & Lightning Brush (32 x 16 x 50)

AN Bonus 1.3/2.0MW WCT2 **Paratec** upgrade

- Around this time BGB supported Bonus in their failure investigation
- Issues addressed with flashing, contamination, and brush degradation
- Upgrade retrofits available
- Wiring diagrams and service information available on request



Lightning Brush Holder

- BGB's Lightning Protector Brush Holders are robust units that are designed to dissipate lightning energy and thus defend critical components (typically main shaft and yaw bearings)
- 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

Lightning Solutions For Siemens Turbines:

A9B00080778

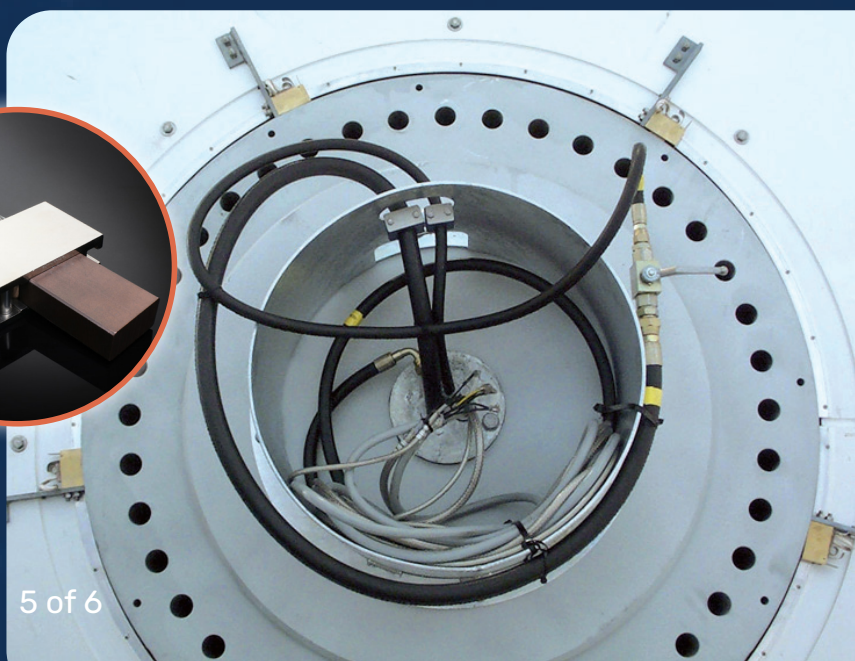
SWT1.3

Lightning Brush Holder

A9B00080857

SWT1.3

Lightning Brush (32 x 16 x 50)





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