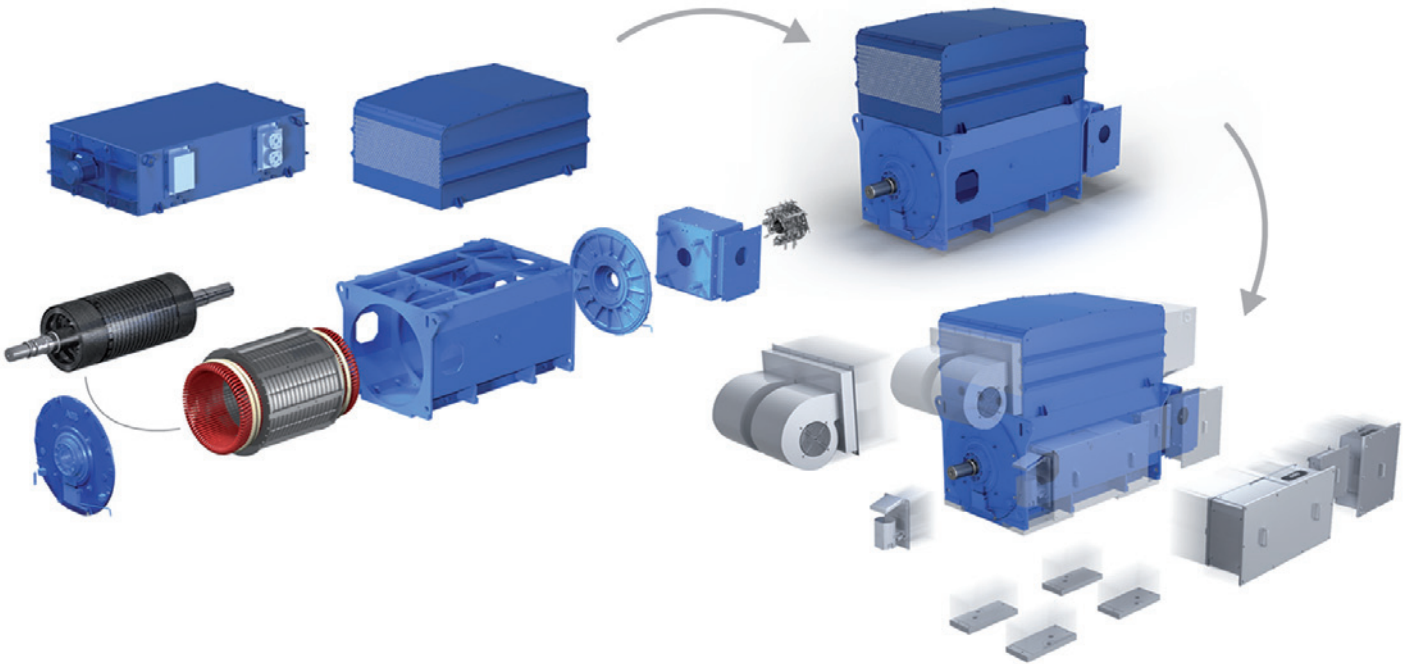


Brochure

# Generators for wind turbines

## Standard slip ring generator series for doubly-fed concept from 1.5-3.5 MW

Featuring a new innovative slip ring unit (SRU) series  
 ABB's well proven standard DF product family  
 expands with the main stream to the 3 MW turbine class.

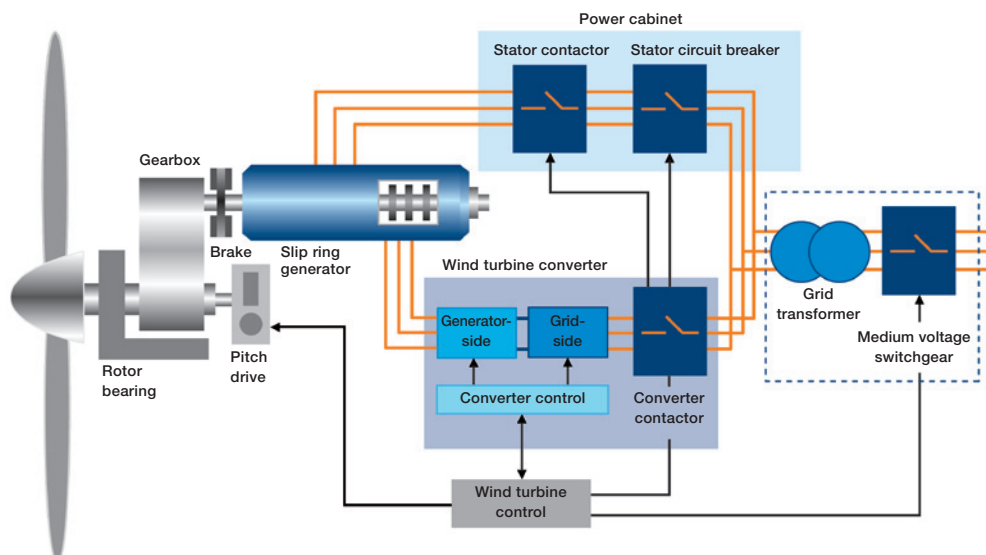


- New low maintenance SRU design – reliability from leading manufacturer
- Modular component structure – with both air or water cooling
- Customer specific modifications – to fit in most turbines used today
- Proven rotor design – for overspeeds and converter voltage stresses

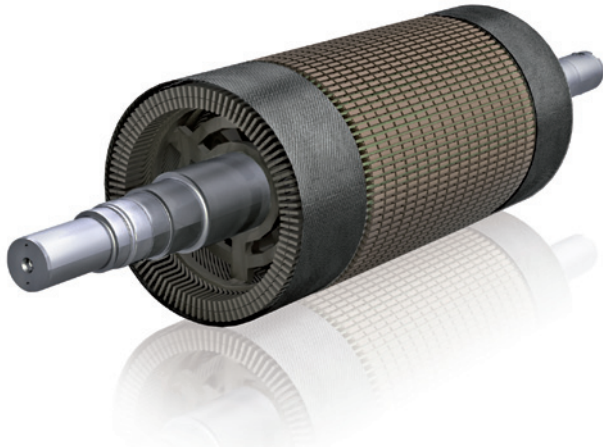
**The doubly-fed (DF) generator concept**

The DF generator is a wound rotor asynchronous machine, with the rotor windings connected to a small converter via slip-rings and brushes. The generator feeds power both from the directly connected stator (approx. 2/3 of  $P_n$ ) and the

rotor (approx. 1/3 of  $P_n$ ). The converter enables control of the generator speed, power and power factor, thus giving a wider speed range for production and providing the ability to feed reactive power to support the grid.



Proven ABB solutions provide continuous operation for maximum energy production with lowest lifetime cost.



**Proven ABB rotor design:**

Patented carbon-fiber winding-end support rings  
 – to withstand sudden uncontrolled overspeeds

Increased, mica based insulation (2.5 kV)  
 – to withstand converter induced voltage stresses

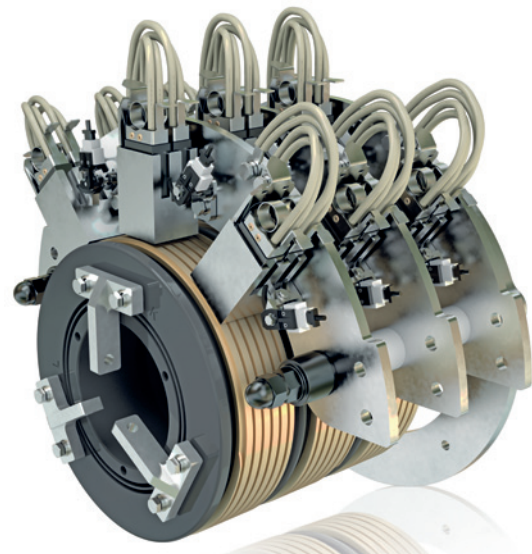
Minimized Total Harmonic Distortion (THD)  
 – especially 5<sup>th</sup> and 7<sup>th</sup> order

Clever cooling arrangement  
 – for demanding reactive power production

**Typical performance characteristics of the AMK series < 3.5 MW:**

Frame/power	500: up to 2.2 MW 560: up to 3.2 MW
Efficiency at rated speed	appr. 97...97.5%
Cooling (air or water)	IC 616/666, IC81/86W, SRU IC01/06
Mounting and protection	IM1001 (inclined 4...8 deg), IP54, SRU IP23
Voltage	690-1000 V +/-10%, 50 or 60 Hz
Locked rotor voltage	approx. 1800 V or 2000 V
Rated speed (typical)	1750 rpm, 1200 rpm
Operation speed range	1000...2000 rpm/670...1330 rpm
Max. overspeed	3000/2300 rpm depending on size
Power factor	p.f. 0.90 cap ...1.0 ... 0.90 ind
Insulation class/ Temp. rise	F/B (at Un, p.f. 0.95 cap and 40°C), or F/F
Temperature range	-20°C...+40°C; extended -30°C...+50°C
Dimensions and weight (depending on power)	500: L3150 x W1600 x H1850 mm, 6-6.7 tn 560: L3300 x W1650 x H2050 mm, 7-10 tn

**Compatible with the MACHsense-R condition monitoring system, designed for the complete turbine shaft line.**



**New innovative, low maintenance SRU design:**

Reliability from leading SRU manufacturer  
 – ABB’s experience based on best practices

Robust and straight-forward construction  
 – for demanding reactive power production  
 – high endurance for overspeeds

Modular setup for load optimization  
 – effective cooling and easy servicing  
 – brush grade proven for most environments

**Your reliable partner**

ABB is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 150,000 people.

In the wind power sector, ABB is the largest worldwide supplier of electrical solutions and the market and technology leader in generators, converters, motors, circuit breakers & contactors, transformers and HVDC.

Over the last 30 years ABB has delivered 35,000 generators to leading wind turbine customers all over the world – corresponding to a total of 45 GW of power.

ABB built its first megawatt class doubly-fed generator in 1997, based on more than 120 years of experience in electric motors and generators.

For more information: [www.abb.com/motors&generators](http://www.abb.com/motors&generators)

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