



Brochure

Modular Systems wind portfolio

Power Collection and Grid Connection products

Power and productivity
for a better world™



Wind portfolio

Background

ABB is one of the few suppliers that has been deeply involved in wind power segment development, while also leading it. As the largest supplier of electrical components, systems and services to the wind power industry, ABB has decades of experience and has installed more equipment in wind parks than any other supplier.

Collecting power from turbines and connecting to the grid requires specialized, high-quality equipment as the wind parks can be located in remote and harsh climate environments including sea side and high altitude locations. But, just as important as the equipment selection is the solution. The equipment must be provided quickly and be simple to install on site. ABB has pre-engineered products which reduce engineering costs and time and are pre-tested at the factory to be dropped into place on site quickly and with a minimum amount of effort.

Solutions

Wind renewable energy is rapidly growing globally. Lower rating turbines are upgraded to higher power and ultra high power turbines are moved from onshore to offshore.

Power is generated at low voltage DC levels and transformed to medium voltage levels for network distribution. ABB's wide global experience and R&D capabilities have supported the development of eco-efficient product designs that can meet the demands of wind park conditions.

ABB's product portfolio is also flexible enough to meet power generation needs by providing both Power Collection and Grid Connection products. These meet most global standards with robust, arc-tested solutions, reliability, and high levels of safety for people, while minimizing operational costs.

Whether looking for simple Power Collection solutions or a Grid Connection, ABB has pre-engineered products to meet your needs. They are designed to be pre-tested at a factory close to the installation site and easily dropped into place to reduce labor costs and risks on site. If a pre-engineered product cannot be applied, ABB has the expertise to quickly customize a solution for a particular application.

These units also can be built and tested in a factory close to the installation to reduce transportation, labor costs and time on site.



Plug-and-play

Productized solutions can reduce lead times, downtime and connection efforts. These solutions work reliably across a wide range of power and voltage levels. Harsh and demanding conditions are taken into consideration during development.

Safety in mind

ABB solutions and equipment are designed and prepared with safety in mind. The products are designed with many built-in safety features, some are also available to meet the higher safety requirements in public areas.

In-house knowledge

All major components that are critical for wind solutions are built in-house. This assures compatibility between products and provides very high reliability for solutions.

Service capability

ABB can provide site installation, site supervision and/or commissioning to assure that solutions are installed in the correct manner. This will allow systems to provide a long and trouble free life-cycle.

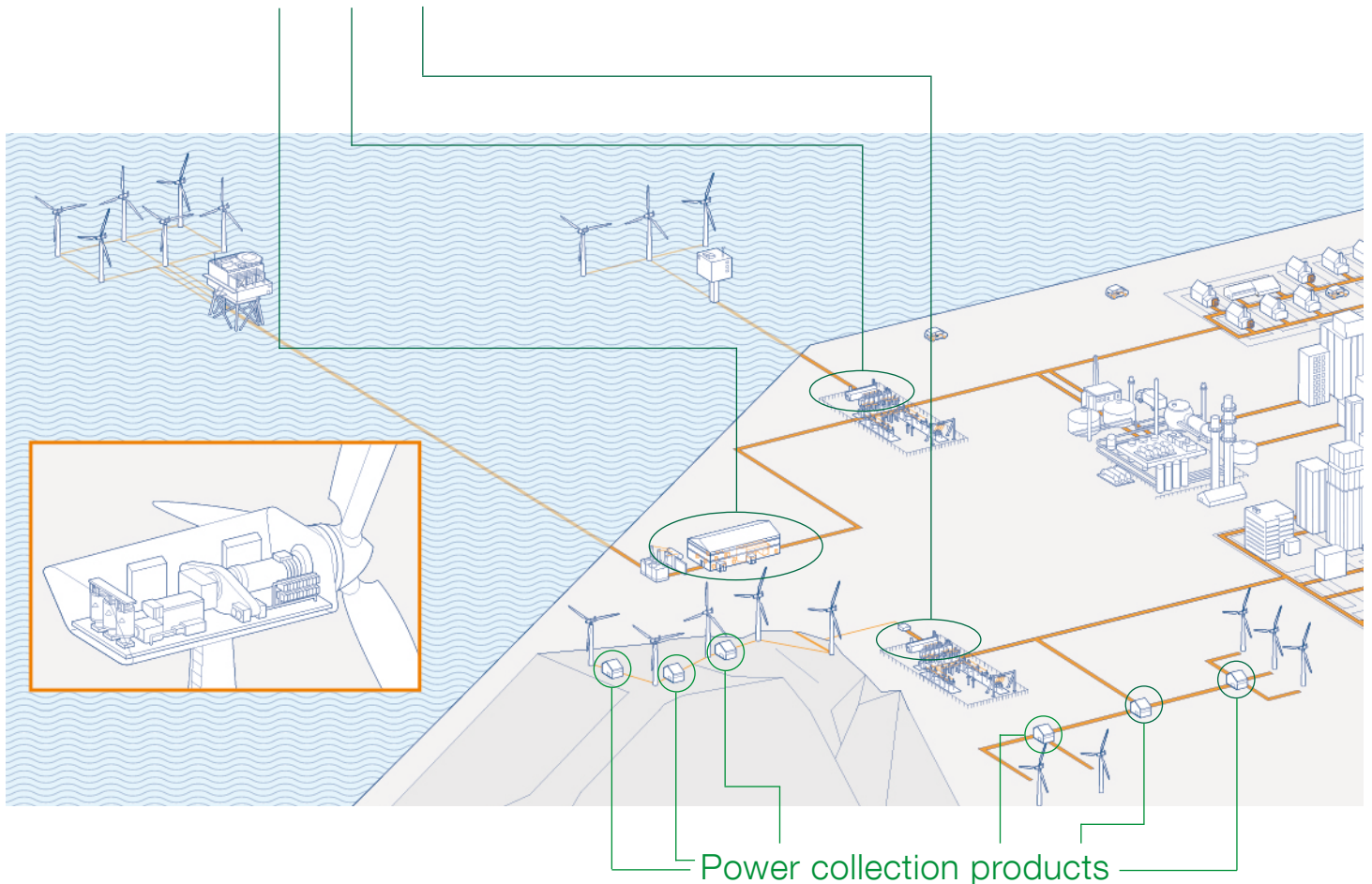
Product portfolio

Grid Connection products for wind power usually include MV protection. To connect to a HV grid, a step-up transformer and HV protection are also required. They are designed to connect to the utility power grid safely and easily. Protection and communication can be easily included, if required. The most common types are:

- E-houses (metal-enclosed substations)
- Skid-mounted substations (Open air substations)

ABB's wide range of products are the right choice for applications where all components are installed in a package.

Grid Connection products



Power Collection products for a wind park usually include a step-up transformer and MV protection. They are placed as close to the turbines as possible. Solutions can be combination from elements: low voltage switchboard, step up transformer and transformer. They are designed for quick and easy transportation to site, fast integration on site and safety of personnel. The most common types are:

- Secondary Skid Units (most economical)
- Secondary Enclosed Unit (typically required when robustness is required)
- Compact Secondary Substations (highest functionality)

Power Collection products

Standard features

- Simple and quick installation – pre-test units at the factory, drop in place and connect cables
- Pre-engineered products to reduce time to quote and supply, while reducing risks
- Engineered for efficient cooling in order to extend the life of the equipment
- All ABB designs are green to support the environment
- No exposed live parts, more safe for operator and personnel
- SCADA ready
- All equipment contained in the wind solutions are type tested according to their relevant standards

Secondary Skid Units (SSU)

Skid-mounted substations are the most economical solution. They are the easiest to transport and install on most sites, making them ideal for remote locations. Pre-engineered designs are available consisting of all of the needed electrical elements for wind park systems. Skid mounted units are equipped with the step up transformer and medium voltage switchgear.

Secondary Enclosed Units (SEU)

SEU is portfolio range for wind Power Collection. Typically, SEU includes a step up transformer and medium voltage switchgear for protection. As an option, the SEU can accommodate an low voltage switchboard. The design of the SEU range is robust and reliable and easy to transport with standard transport equipment. The enclosed design can include an oil collection pit and locking against unintentional entry.

Compact Secondary Substations (CSS)

A CSS is made of concrete, glass-reinforced polymer or steel enclosure and manufactured per the latest standards: IEC 62271-202, GB 17467-2010 AS 62171-202. The preferred material is GRP, since it is light to transport, strong and most resistant to environmental conditions. Designs are available for AC Power Collection consisting of a low voltage switchboard step up distribution transformer and medium voltage switchgear. The CSS includes an internal arc tested enclosure to provide the highest safety level for any service or public personnel close to

the substation, highly recommended when installed in a public area. It also includes an oil collection pit to protect the environment from oil leakage.

SSU product features

- Easy access to equipment for visual inspection and service
- Open-air cooling for maximum efficiency
- Compact and easily transportable
- Economic solution
- MV compartment locking system prevents unauthorized entry

SEU product features

- Robust and reliable-proven components from a single source
- Compact and easily transportable
- Optional oil collection pit for environmental protection
- Internal maintenance available
- Equipment protected from environment
- Economic solution
- All doors are lockable to prevent unauthorized entry
- Any inverter can be installed internally or connected externally, as required

CSS product features

- High level of reliability and safety for equipment and personnel (internal arc tested IAC-AB)
- Type tested according to IEC/AS/GB standards for prefabricated substations, IEC 62271-202 or applicable
- Fully enclosed solutions
- Most enclosure materials available in industry
- All doors are lockable to prevent unauthorized entry
- Concrete enclosure with increased corrosion resistance
- Glass Reinforced Polyester (GRP) housings to meet demanding environmental conditions
- Enclosures are compartmented and electrically segregated for safety
- CSS designs include an oil collection pit for environmental protection in case of oil leakage
- Walk in option for ease of service
- Separate access entries to MV and transformer

Secondary Skid Unit



Secondary Enclosed Unit



Compact Secondary Substation



Grid Connection products

Metal-enclosed electrical houses

The E-House is manufactured per the latest applicable standards. Enclosures are walk-in to ease maintenance. Air conditioning and humidity control are options to meet the environmental conditions. Safety equipment, such as eye wash, fire and smoke sensors, alarms, etc can be included. Stations to connect a wind park to the grid usually contain primary medium voltage switchgear fully equipped with all protection relays, measurement, monitoring and control systems. A step-up transformer and HV equipment are usually installed separately.

Skid-mounted substations

Skid-mounted substations are an economical solution for Grid Connections, mounted on a heavy duty, welded skid. The unit is easy to lift or drag into place on site, plus very quick to connect. Designs usually include primary medium voltage switchgear fully equipped with all protection relays, measurements, monitoring and control systems. Optionally, transformers and HV equipment can be mounted on the same base.

Grid Connection product features

- High level of reliability and safety for equipment and personnel
- Simple and quick installation – pre-test units at the factory, drop in place and connect cables
- All ABB designs are green to support the environment
- Safety interlocking designs available
- SCADA ready packages available
- All equipment contained in the wind solutions are type-tested according to their relevant standards
- Minimized engineering time
- Products designed specifically for the local utility applications and standards

Common options

Grid Connection products can be combined from different network components. Most common is to use air insulated primary switchgear in solutions. In occasions SF6 insulated switchgears can also be used. GCPs can also be equipped with step up transformers, the most common ratings are 15, 25, and 40 MVA. Solutions with step up transformers can be equipped with high voltage Grid Connection devices.

Metal-enclosed electrical houses



Skid-mounted substations



Pre-engineered Power Collection solutions

Pre-engineered solutions are available for optimized designs and quicker delivery. Power ratings are aligned with the most common turbine power ratings. The solutions are equipped with medium voltage switchgear SafeRing CCV configuration

(cable loop with breaker and relay protection). The transformer includes standard integrated protection for pressure and gas (RIS). Product datasheets are available with an overview of other options available. Pre-designed solutions for Power Collection are shown below:

	Secondary Skid Unit		Secondary Enclosed Unit		Compact Secondary Substation				
Style number	SSU-S-1510-0CCV-4000	SSU-S-3010-0CCV-3000	SEU-S-1510-0CCV-4000	SEU-S-3010-0CCV-3000	CSS-S-1510-0CCV-4000	CSS-S-3010-0CCV-3000	CSS-G-1510-0CCV-4000	CSS-G-3010-0CCV-3000	CSS-G-0000-0CCV-4000
Enclosure type	Skid	Skid	Steel enclosed	Steel enclosed	Steel	Steel	GRP	GRP	GRP
Overall parameters									
Length x width x height, mm	3400 x 2550 x 2800	3400 x 2550 x 2800	6100 x 2600 x 2440	6100 x 2600 x 2440	3950 x 2200 x 2700	3950 x 2200 x 2700	4500 x 2470 x 2810	4500 x 2470 x 2810	2000 x 2470 x 2800
Approx. weight (metric tons)	8	12	13.0	16.0	11.5	14.0	12.0	12.0	3
MV switchgear									
Switchgear type	SafeRing CCV		SafeRing CCV		SafeRing CCV				
Protection Relay	REJ603	REJ603	REJ 603	REJ 603	REJ603	REJ603	REJ603	REJ603	REJ603
Transformer									
Transformer type	oil immersed		oil immersed		oil immersed				N/A
Power rating, kVA	1500	3000	1500	3000	1500	3000	1500	3000	N/A
LV Voltage level, V	690	690	690	690	690	690	690	690	N/A
MV Voltage level, kV max	13.8	40.5	13.8	40.5	13.8	40.5	13.8	40.5	N/A
Standard protection	RIS		RIS		RIS				N/A

Components

Wind segment products are an integration of power equipment such as low voltage switchboard, transformers, medium voltage switchgear together with automation equipment in a complete package. These designs provide quick and simple installation, with a high level of safety for the equipment as well as for people around them.

Transformer

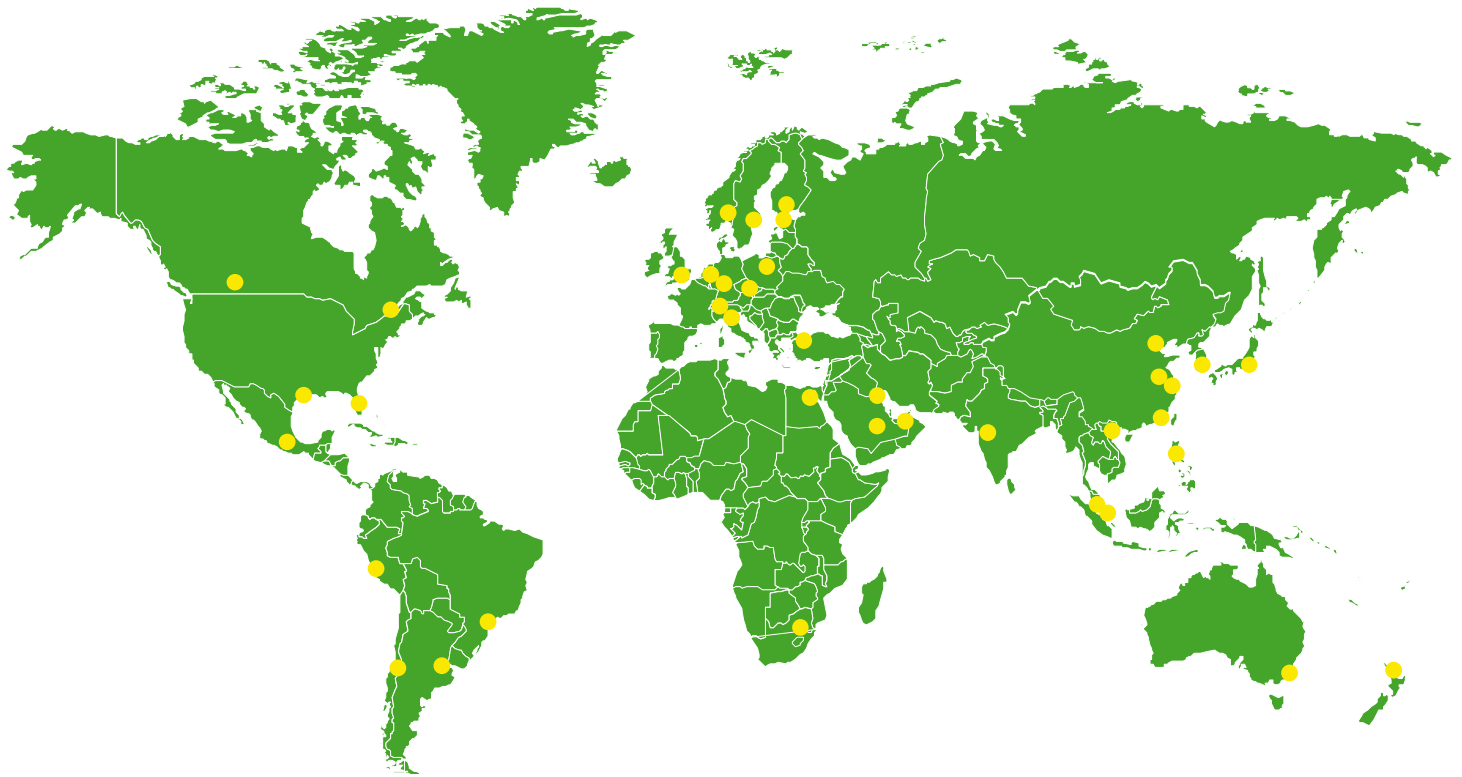
The transformer can be dry or oil type. Oil types are most common and economical. For safety, harmonics, to support the environment or for fully enclosed buildings, dry type transformers are available.

Medium voltage switchgear

MV switchgear can be chosen from several ABB technologies: air insulated switchgear (UniSec) and SF6 insulated (SafeRing). Voltage levels can go up to 40,5 kV with very compact footprints. Switching and interrupting can be done with vacuum technology assuring high reliability. Switchgear can be equipped with relays for simplified transformer protection or with feeder terminals for more complex automation. Sensors, measuring, or remote control can also be added. Units are designed with an automation migration path, for future improvement as required.

1 Dry type transformer | 2 SafeRing/SafePlus | 3 Oil type transformer | 4 UniSec





Footprint: ABB has a global footprint to serve your needs all over the world. We have service locations in most countries and multiple factories which can produce the wind portfolio.

Experience

ABB has years of experience in wind park installations, with over 100,000 compact substations produced, the world's largest single unit E-House ever produced, and over 100 years of engineering experience in electrical equipment.

ABB's wind portfolio can reduce your project time, risk, and costs while providing high quality equipment that will operate efficiently for many years.

- Individual modules up to 3.5 MW
- Output voltage range of 120 volts to 40.5 kV at 50 or 60 Hertz, single or three phase systems
- Individually type-tested equipment to satisfy different standards and system requirements
- Enclosure designs with different temperature classes and degrees of protection are available according to the application and size

Contact us

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<http://new.abb.com/medium-voltage/by-customer-segment/wind>

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