1522

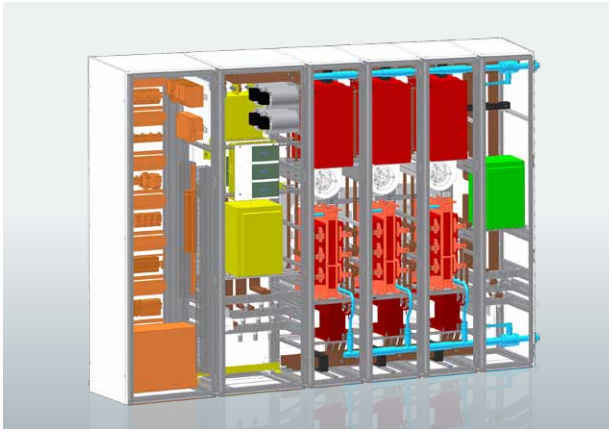
Compact Power Converter for Wind Turbines with Synchronous Generator.

The optimized PCS Green Line 1522 has a modular and durable design. It is extremely flexible, even in small spaces – with outstanding performance specifications.

The PCS Green Line 1522 power converter has been developed for wind turbines using synchronous generators with or without a gearbox. Both permanently and separately excited generators can be used.

The PCS Green Line 1522 is a pulsed, four-quadrant IGBT power converter. As a full-scale converter, it reliably feeds all of the wind energy converted by the generator into the power grid. In the process, the generator voltage with variable amplitude and frequency is converted into a three-phase system with fixed voltage and frequency.

To facilitate this functionality, the PCS Green Line 1522 comprises a line-side converter and a generator-side converter, which are connected to each other by a voltage link. All kinds of grid malfunctions can be treated dynamically and flexibly, thanks to appropriate power control and a regulated generator cut-off from the grid, supporting compliance with grid codes.



Feed-in Power converter Liquid cooling
Feed-in generator Control

Properties

- For permanently or externally excited synchronous generators
- Performance class 1500 kW
- Liquid cooling
- IGBT-based four-quadrant power converter
- Generator control with or without external speed sensor
- Variable grid and generator connection options
- Flexible installation in the tower and the nacelle
- EMC-compliant cabinets to protect against water, dirt and vibration
- Conforms to technical directives (CE) and grid connection requirements
- Fault ride-through capability

PCS
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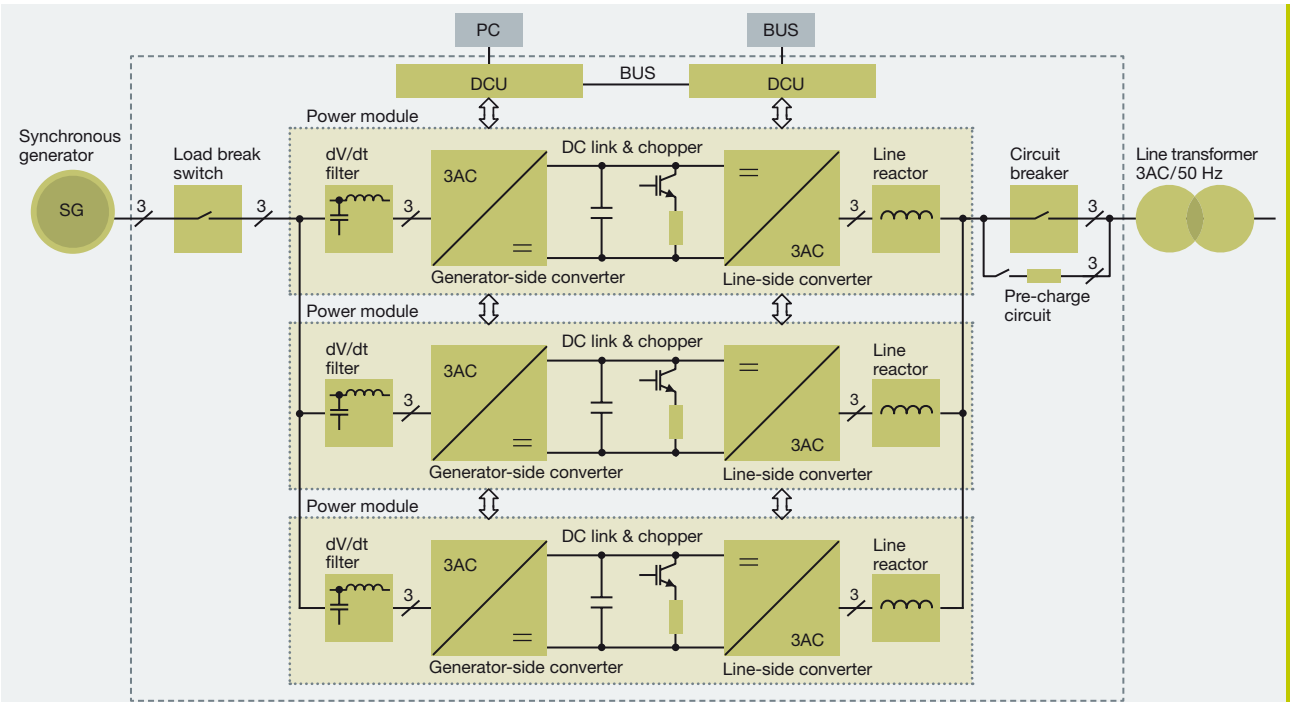
PCS Green Line

Block diagram of PCS Green Line 1522



Technical data

Line voltage	690 V
Line frequency	50 Hz/60 Hz
Nominal power	1500 kW
DC link voltage	1100 V
Power factor, line side	0.90 ind. – 0.90 cap.
Short circuit current rating	55 kA
Line current	1550 A
Generator current	1550 A
Generator voltage	690 V
Pulse frequency, line side	3.0 kHz
Pulse frequency, generator side	1.5 kHz/3 kHz[1]
Ambient temperature	-25° C to+50° C/-13° F to +122° F
Coolant	Liquid
Water supply	max. +45° C/+113° F
Water quantity	5.0 m³/h
Protection rating	IP54
dV/dt generator side	< 1 kV/µs
Power efficiency	> 96 %
Dimensions side by side[2]	2200/600/2000 mm (L/D/H)
Dimensions back to back[2]	1200/1200/2000 mm (L/D/H)

[1] depending on the frequency of the fundamental mode

[2] without control cabinet (600/600/2000 mm L/ D/ H)

For decades, PCS has developed and produced highly reliable power converters and electrical equipment for challenging environments. Benefit from our cutting-edge solutions, project management expertise and service options.

Highlights

- Modular system design
- Excellent control response
- Safe-to-operate, durable design
- High power efficiency for a long working life
- Maximal noise immunity and minimal electromagnetic emissions
- Simple integration using field bus systems
- Reliable operation and detailed diagnostics
- Low maintenance and easy to service

The PCS Green Line 1522 excels thanks to its optimized, efficiently cooled IGBT Powermodul. Featuring a modular design and compact liquid cooling, it has a high power density and a high power efficiency. The integrated PCS drive control unit, DCU, is the converter's intelligence for control, protection and supply. The design of the DCU is compact, functional and EMC-compliant.

With the PCS Green Line 1522 all scans and service settings can be carried out using the appropriate interface. The higher level master control of the wind power system is connected conventionally by binary and analog input/outputs or via field bus systems such as CAN bus, Profibus DP or EtherCAT.

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