

ABB low voltage wind turbine converters ACS800 0.6 to 6 MW



ABB low voltage wind turbine converters are designed to increase turbine energy production through high availability, grid code compliance and long life cycles.

Doubly-fed and full converters

ABB low voltage wind turbine converters are available for doubly-fed and full power converter electrical drivetrain concepts. In case of grid faults, full converters decouple the generator from the grid and provide dynamic and flexible response to fault conditions. Both full power and doubly-fed converters provide active and reactive power control, and have very low total harmonic distortion (THD) levels.

The converters are available with air or liquid cooling and are suitable for nacelle or tower installation.

Designed for high availability

ABB wind turbine converters are designed for reliable operation in the harshest environments. The ACS800 full power converter over 2 MW offers a redundancy design option for parallel connected sub-converters.

Fast generator control

The converters use ABB's direct torque control (DTC) for generator control. DTC monitors generator torque 40,000 times per second, ensuring immediate reaction and control.

Advanced grid code compliance

ABB's low voltage wind turbine converters are subjected to comprehensive fault ride-through and power quality tests in ABB's multi-megawatt grid code laboratory before being shipped to the customer. This simplifies turbine certification and reduces on-site testing costs.

Global manufacturing and service

ABB's converters are designed for long life and ease of maintenance. A complete set of life cycle services including pre-purchase engineering, training, spare part management and preventive maintenance plans helps turbine manufacturers and wind farm operators produce more kilowatt-hours.

ABB manufacturing capacity ensures that global products are produced locally according to the same high quality standards. This provides the high-volume, high-quality production supporting customers around the world.

Highlights

- Converters for doubly-fed and full power electrical drivetrain concepts
- Air or liquid cooling
- All components installed inside an IP54 cabinet
- Grid side contactor or breaker for safe connection and disconnection
- IGBT power modules with integrated DC capacitors and control electronics
- Very low total harmonic distortion
- Full generator control with DTC
- Optional parallel connected sub-converter configuration for redundancy
- Global manufacturing, service and support

Technical data

Converter model	ACS800-67	ACS800-67LC	ACS800-77LC	ACS800-87LC
Converter type	Converter for doubly-fed induction generator (DFIG)		Full power converter for permanent magnet and asynchronous generators	
Generator power range	0.9 to 2.2 MW	1 to 3.8 MW	0.6 to 3.3 MW	1.5 to 6 MW
Optional sub-converter configuration			Available from 1.9 MW	Available from 3.6 MW
Cooling	Air cooling with enclosed cabinet	Liquid cooling with totally enclosed cabinet		
Control principle	direct torque control (DTC)			
Electrical data				
Rated grid voltage	525 to 690 V AC, 3 ph, ±10%			
Rated generator voltage	According to generator, up to 12 kV		0 to 750 V AC	
Nominal frequency	50 ± 3 Hz / 60 ± 3 Hz			
Rotor connection	3-phase symmetrical AC, 0 to max 750 V, frequency 0 to 100 Hz			
Efficiency at converter's rated point	≥ 98%	≥ 97%	≥ 96.5%	
Generator side du/dt	1.0 to 1.4 kV/μs			
Grid harmonics	Max 3%		Max 4%	
Total harmonic current distortion (n = 2 to 40)	with DFIG generator current			
Environmental limits				
Ambient temperature	Transport -40 to +70 °C Storage -40 to +70 °C Operation -30 to +40 °C		Transport -40 to +70 °C Storage -40 to +70 °C Operation -30 to +50 °C	
Optional high ambient temperature	Up to 50 °C			
Coolant inlet temperature		+5 to +45 °C	+5 to +50 °C	+5 to +45 °C
Optional high coolant inlet temperature		Up to +50 °C		Up to +55 °C
Altitude	0 to 1,000 m			
Optional high altitude	Up to 4,000 m			
Degree of protection	IP54R / UL type 12 with air outlet duct IP23	Totally enclosed cabinet IP54 / UL type 12		
Cabling connections	Bottom		Top or bottom	
Cooling connections	Left or right side			
Cabinet configuration	In-line	In-line, back-to-back or several separate		
Control				
Field bus interface	EtherCAT, PROFINET IO, PROFIBUS-DP, CANopen and Modbus, ControlNet, InterBus-S, DeviceNet			
Ethernet interface	Ethernet interface with PC browser is included			
Control tool link	Optical DDCS communication link for communication with PC tools as standard			
Converter supports wind turbine to comply with grid code requirements				
Transmission code 2007, Germany	FRT Grid support*	FRT Grid support*	FRT Grid support	FRT Grid support
REE P.O. 12.3, Spain	FRT Grid support*	FRT Grid support	FRT Grid support	FRT Grid support
Technical regulations TF 3.2.6, Denmark	FRT ***	FRT ***	FRT ***	FRT ***
National Grid Electricity Transmission, Issue 3, Revision 21, July 2007, USA	FRT Grid support* Active current/power**	FRT Grid support* Active current/power**	FRT Grid support Active current/power	FRT Grid support Active current/power
111 FERC 61,252	FRT ***	FRT ***	FRT ***	FRT ***
111 FERC 61,353, USA	FRT ***	FRT ***	FRT ***	FRT ***
CEPRI WED-QR-C01-E-06, China	FRT ***	FRT ***	FRT ***	FRT ***
Product compliance				
Product markings	CE UL Classified with IEC standard 61400-1		CE	
Optional		UL508A, UL508C, CSA C22.2 No 14-05		
EMC EN 61800-3/ A11 (2000), EN 61800-3 (2004)	2 nd environment, unrestricted distribution, category C3			
Quality assurance system	ISO 9001			
Environmental system	ISO 14001			

* when $U_{dip} > 20\% U_n$

** with symmetrical fault when $U_{dip} > 50\% U_n$

*** grid code does not require grid support

FRT = fault ride-through

Full power converters



ACS800-77LC, 0.8 to 3.3 MW

- Liquid cooled
- In-line configuration
- Robust grid code compliance
- Nacelle or tower installation
- Redundant configuration available at higher ratings

Typical generator rating kW	Rated generator current A	Rated grid current A	Rated grid apparent power kVA	Module setup	Cabinet width mm	Cooling flow rate l/min	Cabinet weight kg
800	898	720	860	2 + 2	2,300	100	2,000
1,050	1,143	941	1,120	2 + 2	2,300	100	2,000
1,150	1,143	1,397	1,670	2 + 3	2,600	125	2,300
1,300	1,334	1,397	1,670	3 + 3	2,800	140	2,500
1,600	1,697	1,397	1,670	3 + 3	2,800	140	2,500
1,800	1,697	1,843	2,200	3 + 4	3,300	170	3,000
1,900	2,286	1,882	2,240	2 x (2 + 2)	2 x 2,300	2 x 100	2 x 2,000
2,200	2,286	2,338	2,790	(2 + 2) + (2 + 3)	2,300 + 2,600	100 + 125	2,000 + 2,300
2,200	2,286	2,794	3,340	2 x (2 + 3)	2 x 2,800	2 x 125	2 x 2,500
2,400	2,668	2,338	2,790	(3 + 2) + (3 + 3)	2,600 + 2,800	125 + 140	2,300 + 2,500
2,600	2,668	2,794	3,340	2 x (3 + 3)	2 x 2,800	2 x 140	2 x 2,500
3,100	3,394	2,794	3,340	2 x (3 + 3)	2 x 2,800	2 x 140	2 x 2,500
3300	3,394	3,240	3,870	(3 + 3) + (3 + 4)	2,870 + 3,300	140 + 170	2,500 + 3,000
3,300	3,394	3,686	4,400	2 x (3 + 4)	2 x 3,300	2 x 170	2 x 3,000

Cabinet height 2,000 mm and depth 600 mm

Cooling circuit pressure loss 150 kPa with hydrostatic pressure included



ACS800-87LC, 1.75 to 6 MW

- Liquid cooled
- Back-to-back configuration
- Compact size
- Robust grid code compliance
- Optimized for tower base installation

Typical generator rating kW	Rated generator current A	Rated grid current A	Rated grid apparent power kVA	Module setup	Cabinet width mm	Cooling flow rate l/min	Cabinet weight kg
1,750	1,697	1,843	2,200	3 + 4	1,600	185	3,000
2,000	2,230	1,843	2,200	4 + 4	1,800	197	3,250
2,300	2,230	2,330	2,740	4 + 5	1,800	210	3,400
2,400	2,230	2,736	3,270	4 + 6	2,200	222	3,650
2,800	2,785	2,736	3,270	5 + 6	2,200	235	3,800
3,000	2,785	3,192	3,810	5 + 7	2,600	247	4,350
3,200	3,324	3,192	3,810	6 + 7	2,600	260	4,500
3,600 to 6,000	Contact ABB for ratings						

Cabinet height 2,000 mm and depth 1,300 mm

Doubly-fed converters



ACS800-67, 0.6 to 2.2 MW

- Air cooled
- Small and light weight
- Lowest harmonics and highest efficiency at rated point

Typical generator rating kW	Rated generator current A	Rated grid current A	Rated grid apparent power kVA	Module setup	Cabinet width with 690 V power cabinet mm	Cabinet weight with power cabinet kg
1,000	486	400	478	1 + 1	2,200	1,800
1,500	645	400	478	1 + 2	2,500	1,900
2,200	953	400	478	1 + 2	2,500	1,900

Cabinet height 1,800 mm and depth 600 mm



ACS800-67LC, 1.7 to 3.8 MW

- Liquid cooled
- Small and light weight
- Lowest harmonics and highest efficiency at rated point

Typical generator rating kW	Rated generator current A	Rated grid current A	Rated grid apparent power kVA	Module setup	Cabinet width with 690 V power cabinet mm	Cooling flow rate with power cabinet l/min	Cabinet weight with power cabinet kg
1,700	898	480	570	1 + 2	2,200	92	2,000
2,250	1,143	480	570	1 + 2	2,200	92	2,000
2,600	1,143	941	1,125	2 + 2	2,400	100	2,200
3,000	1,334	720	860	2 + 3	2,600	113	2,500
3,800	1,697	941	1,120	2 + 3	2,600	113	2,500

Cabinet height 2,000 mm and depth 600 mm

Converter options

- Removable cabinet doors
- Cabling direction
- Cooling connections
- Low voltage ride-through options
- Redundancy (parallel) sub-converter connections
- Pulse encoder interface
- Power cabinet including stator contactor and stator breaker

For more information please contact your local ABB representative or visit:

www.abb.com/converters-inverters
www.abb.com/windpower

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