Versatile and Powerful

Liduro Wind Frequency Converter System

LIEBHERR

Liduro Wind LCW300-series

The liquid-cooled Liduro Wind frequency converter systems from Liebherr have been specially developed for reliable operation in onshore and offshore wind turbines and harsh ambient conditions. The Liduro Wind frequency converter system is based on a platform architecture that is fully adapted to the needs of the wind turbines. The heart of the new system are the high-power power modules of the LCU300 series.

Maximum safety and quality

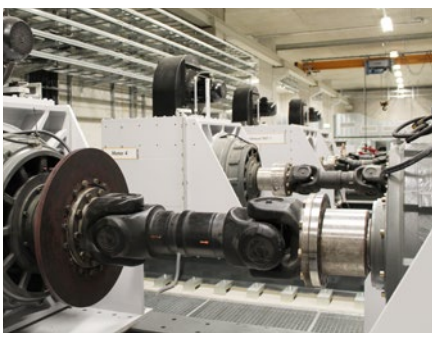
Efficiency and service life
Modern wind turbines require extremely reliable frequency converter systems in order to reliably feed in the constantly increasing power from wind turbines into the supply grid. In addition, increased safety requirements and service life expectations are required for wind turbines. To meet these requirements, Liebherr has equipped the Liduro Wind frequency converter system with an innovative cooling concept that keeps the temperatures of the individual components low. This increases the service life expectancy of the components and considerably increases their availability. The frequency converter cabinets are completely closed and can be used independently of environmental influences in very hot or very cold regions without changing the mechanical design. Due to the high degree of protection and effective liquid cooling, the cooling power requirement for the frequency converter is considerably reduced.

Safety and quality
The intelligent control system supervises all internal and external processes with high precision and reacts to unexpected failures within milliseconds. Possible failures are quickly detected and the source of the failure will be isolated. The fast disconnection of the failure source will reduce collateral damages. The newly developed Liduro Fast Protection system is part of the protection system. The Liduro Fast Protection System allows additional redundancy after detection and disconnection of the defective component. All components are running through an intensive test procedure to achieve highest quality and reliable functions of all components combined with maximum availability.

High efficient
The liquid cooling system is a special developed system, to achieve maximum lifetime and smallest installation room.

Intelligent control
The custom developed control system enables fast, precise control processes and reliable protective functions.

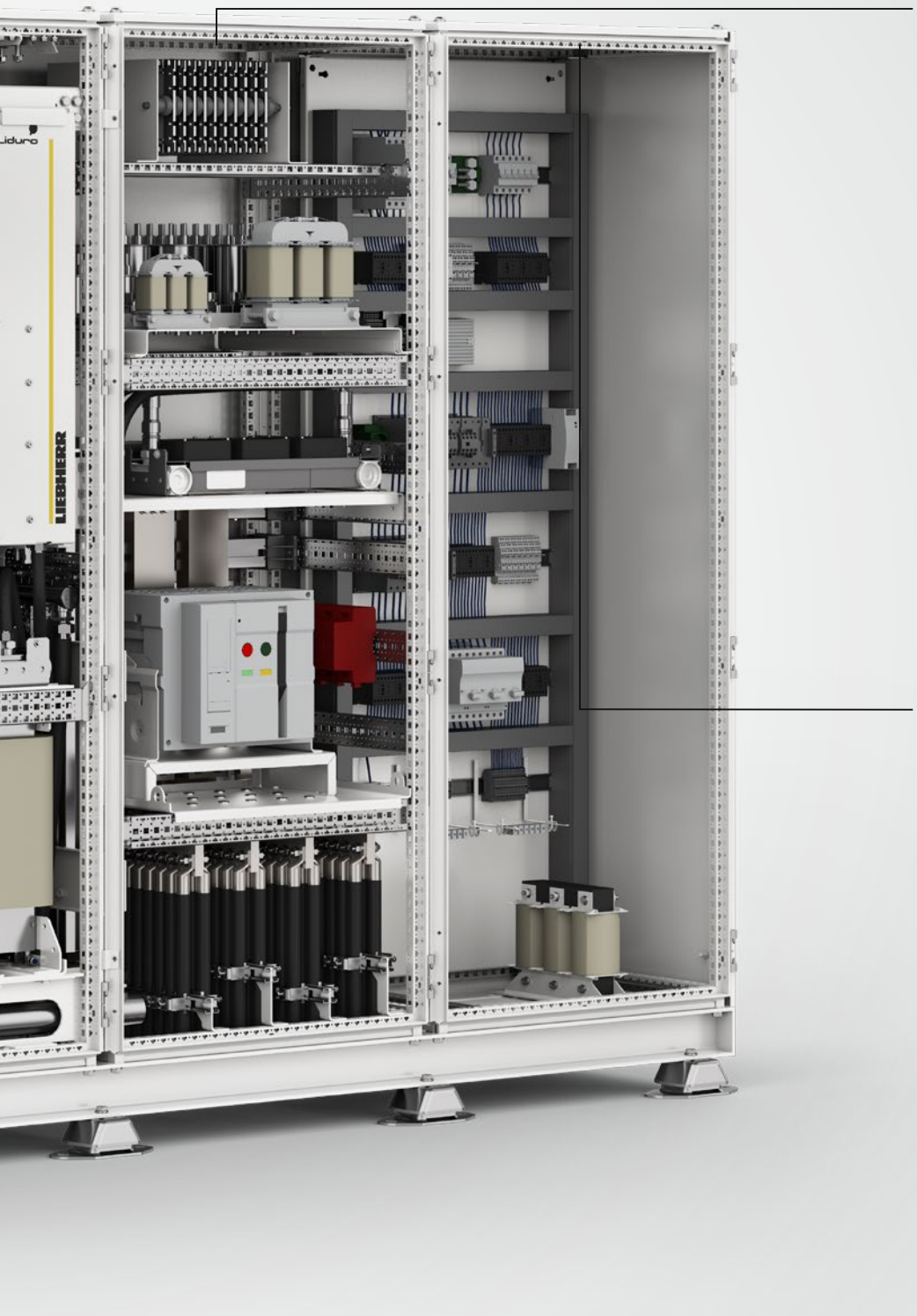
High durability
All components of the system are subjected to extensive test and quality assurance procedures.



LCW300 Wind –
The new generation converter technique

Converter Unit
- Power electronic modules
- Control module
- Air / water heat exchanger
- dU / dt filter
- Cable connection terminal

Active Rectifier Unit
- Power electronic modules
- Control module
- Air / water heat exchanger
- Line filter choke



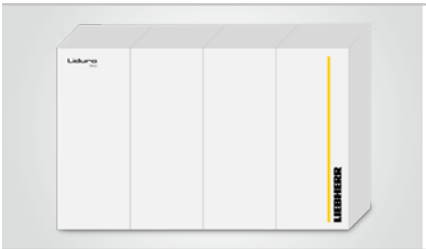
Power Supply Infeed Unit
- Cable connection terminal
- Main circuit breakers
- Mains filter unit
- Braking resistor

Control
- Auxiliary power supply
- Communication
- Optional control units

Liduro LCW300 configuration

The flexible platform architecture of the Liduro frequency converter system enables a customer-specific configuration of the control cabinets in the nacelle in-line or on a tower platform in back-to-back arrangement. Power levels can be configured flexibly within the control cabinets by the modular power electronic modules of the LCU300 series.

LCW300-1500-06 to LCW300-4000-06 in-line configuration



Power range	1,500 kW - 4,000 kW
Nominal output current	1,400 A - 3,800 A
Power electronic modules	LCU300
Configuration	AC / AC
Dimension (W x H x D)	3,200 mm x 2,000 mm x 600 mm
Weight	2,250 kg to 3,000 kg

LCW300-2000-06 to LCW300-4000-06 back-to-back configuration

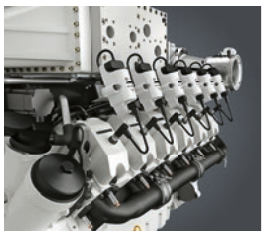
Power range	2,000 kW - 4,000 kW
Nominal output current	1,900 A - 3,800 A
Power electronic modules	LCU300
Configuration	AC / AC
Dimension (W x H x D)	1,600 mm x 2,000 mm x 1,200 mm
Weight	3,000 kg to 4,500 kg

LCW300-4000-06 to LCW300-8000-06 back-to-back configuration

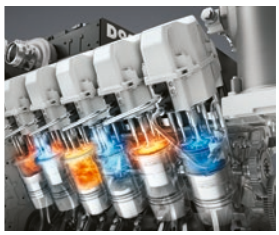
Power range	4,000 kW - 8,000 kW
Nominal output current	4,000 A - 8,000 A
Power electronic modules	LCU300
Configuration	AC / AC
Dimension (W x H x D)	2,800 mm x 2,000 mm x 1,200 mm
Weight	4,500 kg to 7,000 kg

Converter configuration	LCW300 in-line	LCW300 back-to-back
Converter type	Full Power Converter	
Generator power range	1.5 to 4MW	2.0 to 8MW
Cooling	Liquid Cooling	
Control principle	Space vector	
Power modules	LCU300	
Control unit	LCF300	
Electrical data grid	**Active Front End**	
Rated grid voltage	690 VAC, 3phase, +/- 10 %	
Nominal frequency	50 Hz / 60 Hz	
Power factor	0.90 ind. / 0.90 kap.	
Total harmonic distortion	BDEW / IEEE	
Reactive power compensation	Dynamic mode, voltage control, power factor control	
Electrical data generator	**Converter unit**	
Rated generator voltage	0 to 690 VAC	
Nominal frequency	50 Hz / 60 Hz	
Power factor	0.85 ind	
Environmental conditions		
Ambient temperature	-40 to 50°C	
Coolant temperature range	+5 to 50°C	
Altitude	0 to 1,000 m	
Protection class	Totally enclosed cabinet IP 54	
Mechanical conditions		
Installation	Tower or nacelle	
Cabinet configuration	In-line or back-to-back	
Cable entry	bottom	
Coolant connection	Left or right bottom	
Dimensions L x H x D	3,200 x 2,000 x 600	1,600 to 2,800 x 2,000 x 1,200
Control		
Field bus interface	PROFINET, CAN open, EtherCAT, PROFIBUS-DP, Interbus-S; Modbus TCP/IP	
Grid codes	Comply with most stringent grid code requirements	
Configuration tools	Liebherr OPAL	
Remote control	Via Ethernet	
Product compliance		
Product markings	CE	
Grid codes	Comply with most stringent grid code requirements	
EMC	2nd environment, unrestricted distribution, cat. C3	
Product options		
Partly redundancy	Active Front End / Converter unit	
External brake chopper resistor	Standard cabinet 800 x 2,000 x 600 or roof cabinet	
High altitude	up to 4,000 m	
High coolant inlet temperature	up to 55°C	
Electrical excitation system	Stand alone unit or converter DC link supply	
Rotor positioning	Position set point or manual by push button	
Inrush free trafo synchronisation	Transformer precharging unit	

Liebherr Components



Gas engines



Diesel engines

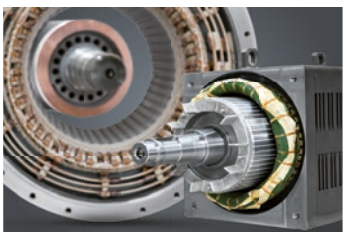
Fuel injection systems

Axial piston hydraulics

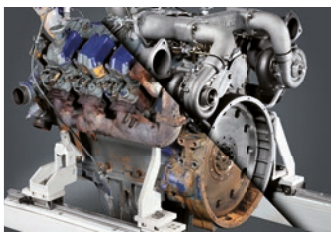
Hydraulic cylinders

Slewing bearings

Gearboxes and winches

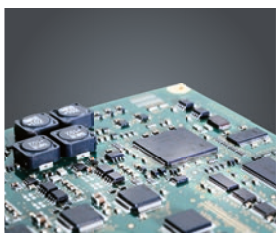


Electric machines



Remanufacturing

Human-machine interfaces and gateways



Control electronics and sensor technology

Power electronics

Control cabinets

Software

From A to Z – the components division of the Liebherr Group offers a broad range of solutions in the area of mechanical, hydraulic, electric and electronic drive system and control technology. The efficient components and systems are produced at a total of ten production sites around the world to the highest standards of quality. Central contact persons for all product lines are available to our customers at Liebherr-Components AG and the regional sales and distribution branches.

Liebherr is your partner for joint success: from the product idea to development, manufacture and commissioning right through to customer service solutions like remanufacturing.

components.liebherr.com

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