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wind error grid
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Feed-in Converter
aeocon

Bornay

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aeocon – The Smart All-rounder

The feed-in converter aeocon for small wind turbines has been developed based on a concept SIEB&MEYER has applied a patent for. aeocon combines the rectifier, the inverter and the ballast circuit in one compact housing. This concept allows triggering the external ballast resistor directly. The „brain“ of aeocon is the control especially adapted to the requirements of small wind turbines. This allows excellent control of the different operating modes under consideration of the characteristic curve of the turbine. The control ensures smooth start-up of the wind turbine at every time and selection of the optimum operating point during different wind conditions. Thanks to the Maximum Power Point Tracking (MPPT) the best possible efficiency is reached particularly during partial-load conditions. The rated electric power of the device to be connected to a single-phase 230 V mains is specified with 4.6 kW. Besides the control tasks the maintenance-free device fulfills various protective functions during operation – for example the controlled load of the rotor in the event of an AC power failure by means of an external ballast resistor.

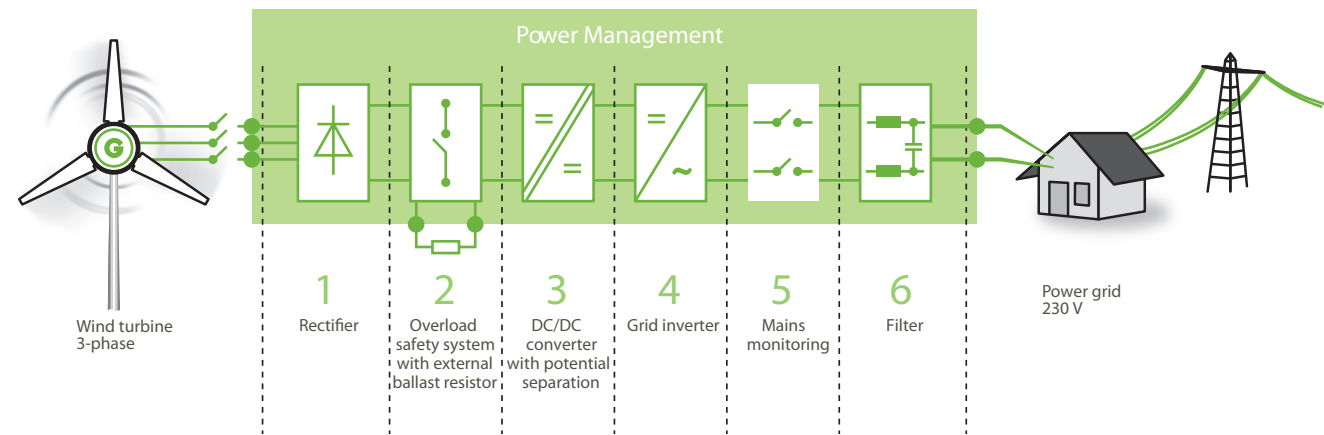


Why aeocon?

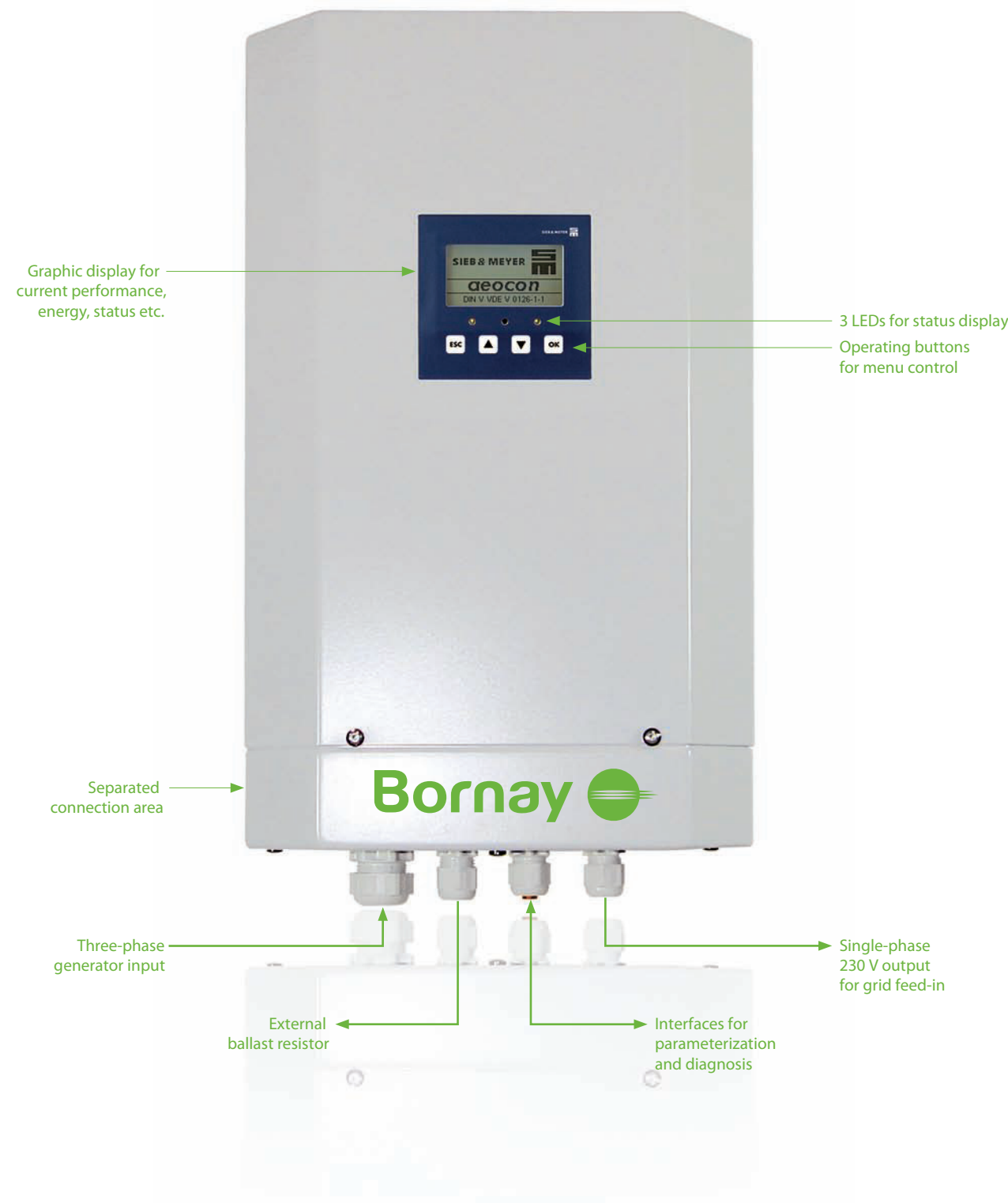
aeocon extracts the maximum of the small wind turbine. The converter is a real expert for the operation of wind turbines. The control speed meets the high demands of small wind turbines. aeocon monitors the rotor speed by using the generator frequency. Together with the 8 interpolation points used for precise adjustment of the control curve aeocon reaches excellent control performances. Furthermore, the control curve automatically adapts to the current wind conditions and thus compensates mechanical construction tolerances of the wind turbine. The wide input voltage range allows effective operation also at low wind speeds. When the small wind turbine not generate power aeocon shuts down and does not use power from the grid.

As soon as the small wind turbine supplies aeocon with power, aeocon switches on and controls the turbine. Since small wind turbines often operate under partial-load, aeocon is optimized to reach high efficiency also in this range. This in turn has positive effects on the energy yield. But what happens, if the wind turbine generates more power than can be fed into the electric mains or if mains power fails? aeocon activates the load resistor and safely discharges surplus power up to 5 kW. This energy – converted into heat – can for example be used to support the heating system. The integrated galvanic separation allows parallel connection of the devices ensuring an optimal field of application also in three-phase feed-in small wind turbines at powers up to 14 kW.

Block Diagram for aeocon



The Interfaces of aeocon



Monitor the Wind!

aeocon comes with a data logger including a real-time clock which continuously records the performance of the wind turbine. The memory is equipped with a battery, ensuring that no data will be lost during windless conditions. The graphic display integrated in the device front provides all relevant information on the operating state of the system. The following values can be displayed:

- Mains power P_{Mains}
- Mains energy E_{Mains}
- Power of the heating resistor P_{Heat}
- Energy of the heating resistor E_{Heat}
- Speed of the wind turbine n_{WT}
- Generator voltage U_{WT}
- Converter temperature T_{aeocon}
- Mains voltage U_{Mains}
- Mains current I_{Mains}
- Mains frequency f_{Mains}

Via the terminal parameters in the data logger are shown and the real time clock can be set. Switching between English, German or French is possible.



Input (3-phase)	
Generator type	Permanently excited synchronous generator
Operating voltage range	40 V _{AC} to 340 V _{AC}
Maximum voltage	400 V _{AC}
Optimum generator voltage at rated power	300 V _{AC}
Ballast circuit	
Switching threshold	480 V _{DC} (corresponds to 340 V _{AC} generator voltage)
External ballast resistor	22 – 46 ohms, 5 kW
Output (1-phase)	
Rated voltage	230 V _{AC}
Rated power aeocon 4600	4.6 kW
Rated current aeocon 4600	20 A
Mains frequency	50 Hz / 60 Hz
Mains monitoring	DIN V VDE V 0126-1-1 EN 50438 Ireland EN 50438 France EN 50438 Netherlands EN 50438 Portugal EN 50438 Spain EN 50438 Bulgaria ER G83/1-1 Others in preparation.

General data	
Weight	25 kg
Dimensions (h x w x d)	533 x 305 x 205 mm
IP Code	IP40
Type of cooling	Natural convection
Admissible ambient temperature	-20°C to +40°C

The stated current and voltage values are rms values.