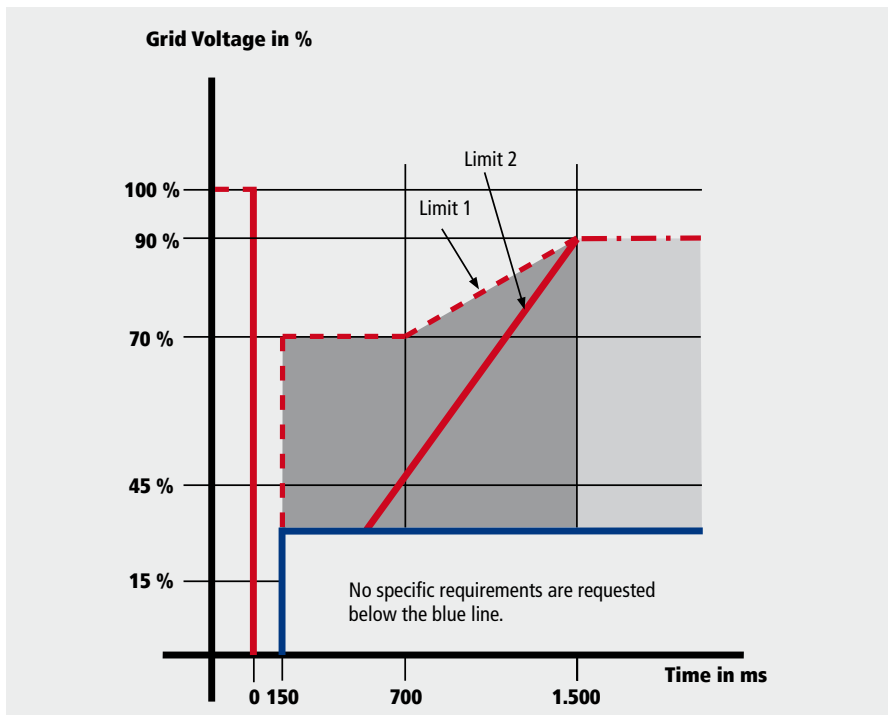


With the marked growth in the clean energy markets, the demands on the technical response of photovoltaic power plants are also increasing. Ever since large-scale development of wind power started, Converteam has continually used its innovative converter technology to improve grid compatibility of wind turbines. With the new ProSolar inverters a further milestone has now been reached. ProSolar is the optimum solution for grid-connected photovoltaic power plants and meets the requirements of the current BDEW medium-voltage directive in Germany.



| Low voltage ride through (LVRT) requirements according to BDEW

- Grid support in the event of frequency fluctuations
- Control of the reactive power: 0,95 ind ...1...0,95 cap
- Grid support in the event of balanced and unbalanced short circuits in the power grid - low voltage ride through (LVRT)
- Standardised response in terms of power quality

### ProSolar Meets Current Grid Connection Requirements

Using active closed-loop control of the DC link voltage, the ProSolar series ensures the grid requirements of network operators – a key prerequisite for grid stability. The requirements are

#### Features

- Space-saving installation in the converter
- Maximum flexibility thanks to modular hard- and software for optimisation of systems for specific applications

The incoming supply of electric power, particularly in weak grids or from remote locations, is currently one of the key challenges facing all grid operators. Newly installed photovoltaic plants, with more than 100 kW, must in future guarantee system stability of the grids comparable to conventional power plant

technology. This means that grid operators must be capable to reduce the active power of the photovoltaic systems on predefined values in the event of a grid overload condition within 60 seconds by way of remote control. For this the photovoltaic power plants must have the following characteristics:



| ProSolar central inverter for large photovoltaic power plants

defined in the latest medium-voltage directive of the BDEW - German Association of the Energy and Water Industry. By means of IGBT power semiconductors, the time-lag free discharge circuit in the inverter ensures continued operation of the photovoltaic system at all times, allowing defined effective and reactive power values to be tuned to requirements even in the case of grid voltages of up to 0%. With its ProSolar inverters, Converteam has the optimum solution. It stands out particularly on account of its rapid control capability, high efficiency and its modular design concept, which meets the various photovoltaic power plant needs.

#### Key Requirements

- No immediate disconnection of the wind turbine from the supply grid in the event of grid faults
- Requirement-compliant response if balanced or unbalanced grid faults arise in the event of under voltages

- Controlled grid support by means of defined incoming supply of reactive and active current during and after a fault
- Active support of the grid protection technology in the event of faults in the grid

#### Maximum Flexibility Due to Innovative Test Stand Technology

Validation of the required characteristics in actual photovoltaic power plant operation was preceded by simulation analyses and intensive tests on the Grid code test stand in Berlin. Grid short circuits can be simulated on this test stand in a reproducible manner. Simulations at the high-performance test stand enable us to test international requirements and to convert them directly into high-performance system solutions. Thanks to this innovative test stand technology and our committed team Converteam is always flexible in responding to new customer requirements.

#### Benefits for developer and operators of PV power plants

- Maximum energy yield at all operating points
- Technical solution for various grid requirements
- No increase to the unit volume of the converter
- High reliability and availability
- Simulation of grid code requirements at powerful test stands
- Optional: Grid measurements and -analysis

Converteam is the supplier of inverters or complete electrical systems for photovoltaic power plants. Building on over a century of experience, Converteam designs, develops and manufactures tailored drives and automation solutions. Serving specialized sectors as well as our core markets in Marine, Oil & Gas, Offshore, Energy and Industry. The scope of services often includes the entire electrical equipment from medium-voltage supply through to visualisation and simulation.

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