

## HS120

### HIGH EFFICIENCY 120 KW CENTRAL INVERTER

The central inverter HS120 is a special development for photovoltaic power plants. The inverter was designed using the newest efficiency-optimised technology in order to get higher returns from the solar installation. Right from the start, all devices to be installed were chosen with respect to loss reduction:

- The power part was realised using Trench-IGBTs of the newest generation.
- It was intentionally oversized to increase efficiency.
- The combination of filter inductor and transformer was optimised to reduce power losses under partial as well as full load condition.
- Large heat sinks allow the use of small fans with low power consumption.

The sum of these measures leads to a maximum efficiency of 97.1 %. Even under partial load of only 10 % an efficiency of 94,0 % is achieved. The EU efficiency reaches outstanding 96.5 %. This high efficiency is unique for inverters of this technology and offers multiple advantages to the user:

- More energy from the photovoltaic array is fed to the grid, therefore a higher rate of return is obtained.
- Less waste heat has to be dissipated out of the already warm operating room.
- The reduction of losses increases the lifetime of the internal components.

The system is designed for low maintenance and long lifetime. Within the development process of the HS120, a major design criterion was the simpleness and safety of the operating system for the inverter. This was achieved by a touch screen with a menu-based graphic user interface. Up to one year, the inverter stores all relevant measured values. These values as well as current operating data can be monitored online or downloaded via the Ethernet interface. In the unlikely case of an inverter fault, the control software automatically sends a message with a failure report.

The inverter operates completely stand-alone and the first start-up requires no adjustments of the system. In large photovoltaic power plants the inverter can also operate in parallel with several inverters without problems



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## Technical Data HS120

### Electrical Data

Rated AC-power at $\pm 10\%$ of rated grid voltage	120 kW
Rated apparent power	155 kVA
Rated grid voltage other voltage levels and frequencies on request	400 V, 3~, 50 Hz, TN-grid
Short circuit level	36 kA
Maximum AC-current	224 A
Line power factor (cos $\Phi$ ) at 20% rated power	> 0,99
AC-current distortion (THD) at rated power	< 3 %
Rated PV-power within $\pm 10\%$ of rated grid voltage	124 kW
Maximum PV-power at rated grid voltage	137 kW
Maximum PV-current	304 A
Maximum PV no-load-voltage	900 V=
MPP-area at rated PV-power	450 V= to 820 V=
Control strategy MPP-	MPP-Tracking
Efficiency at (10 30 50 75 100) % power	(94,0 97,0 97,1 96,9 96,5) %
EU efficiency incl. transf. losses / inductor and auxiliary losses	96,5%
EU efficiency incl. transf. losses / inductor, excl. auxiliary losses	96,3%
EU efficiency excl. auxiliary losses	-
Feed-in starting at	560 W
Standby losses / at night	< 30 W
Maximum auxiliary power	< 250 W

### General Data

Ambient temperature (Others on request)	0 °C to 50 °C
Relative humidity non-condensing	< 95 %
Maximum altitude without derating in power	1500 m above sea level
Cooling type	Forced air cooling 1500 m <sup>3</sup> /h
Minimum air quality acc. to EN60721-3-3	Class 3S2
Protection class	IP20
Dimensions H x W x D	1900 mm x 1000 mm x 850 mm
Weight	1100 kg
Container surface	-
Colour of cabinet / colour of container (others on request)	RAL7035
EMI	Complies EN 6100-6-2, EN 61000-6-4
Grid quality requirements	Complies EN 50178
Approval	TÜV
Grid monitoring	Complies VDEW requirements
CE-conformity	Complies

### Features

DC-disconnector	DC-disconnector
AC-disconnector	Circuit breaker with access from the front + grid contactor
Emergency stop switch	Yes
Display	Touch screen with numerical and graphical display
Earth leakage detection	Earth leakage monitor
Surge arresters	With monitoring on AC- and DC-side
Secured DC-input	-

### Options

LVRT-Handling	Earthing of solar field ( positive or negative is grounded )
Separately secured DC-inputs	Measuring and monitoring of single input currents
Communication Cabinet Standard	Heating incl. thermostat
Sensor ( interface for radiation sensor => features )	