



Sinpower has been developing and manufacturing 400Hz solid state Frequency Converters for more than a decade now.

Our policy, has always been, to offer the best designed products that are environmentally friendly, simple to use, easy to maintain and exceptionally well manufactured thus meeting our clients requirements as well as complying with all standards and legislation.

Sinpower ensures high quality, efficient and secure electrical power supplies.



CHARGER INPUT

- 400V/415V AC (± 10)
- 50Hz / 65Hz ($\pm 1\%$)
- Input current harmonics ($< 3\%$ @ Full Load)
- Power Factor Correction (PF=0.99)



CHARGER OUTPUT

- Constant voltage (0V - 800V)
- Constant Current (0A - 120A)



NORMS AND STANDARDS

AVIATION • ISO 6858 - Aircraft ground support electric supplies
 • SAE ARP 5015 - Ground equipment 400 Hz ground power performance requirement

MILITAR • MIL-STD-704 - Aircraft electric power characteristics

EMC • EN61000-6-4 - Electromagnetic compatibility - Generic emission standard
 • EN61000-6-2 - Generic immunity standard

SAFETY • IEC 60529 - Degrees of protection provided by enclosures (IP Code)
 • IEC 62477-1 - Safety requirements for power electronic converter systems and equipment

ENVIRONMENTAL • Dry heat test (steady state) IEC 60068-2-2:2007 subclause 5.3
 • Damp heat test IEC 60068-2-78:2012 subclause 6
 • Vibration test IEC 60068-2-6:2007 subclause 6
 • Salt mist test IEC 60068-2-52:1996 subclause 6
 • Dust and sand test Test Lc1 of IEC 60068-2-68

CHARGER • IEC 61851-1
 • IEC 61851-23:AA (CHAdeMO)
 • IEC 61851-23:CC (CCS)



GPU OUTPUT

- Voltage compensation (Load Dependent or via Remote Feedback – Real PLUG &PLAY. Connect GPU to aircraft and voltage compensation is done automatically, no user adjustment required or additional accessories)
- 4 Quadrant Operation (better response of the system and safer operation for NBPT)
- Vector control Inverter for better response and higher efficiency.



EFFICIENCY

- Up to 97% - 90kVA @ load PF=0.8 to 1.0
- Green Standby Function - losses: 20 W
- No load losses: $< 1\%$.



TECHNOLOGY

- Enclosure Protection class up to IP55
- No break power transfer compatibility (NBPT)
- Over/under voltage at output
- Overload capability designed for:
 - Power stage 150% - Continuous
 - Magnetics 120% - Continuous
- Regulator Overload protections set at:
 - 120% for 600seconds
 - 150% for 60 seconds
 - 200% for 2 seconds
- Variable fan speed for internal temperature control
- Over temperature protection
- Short circuit proof by electric current limiting and shutdown
- 90° switch interlock

GPU SPECIFICATIONS

OUTPUT

- 3 phase 200V AC -400Hz | $\pm 1\%^*$
- Overall Efficiency | 97%
- Max. Crest Factor | 1.4:1

INVERTER

- Static Regulation 0 - 100% load | $\pm 1\%$
- Dynamic regulation 100% | 10%, recovering to 1% within 20ms
- Total harmonic distortion | Better than 2% (Linear Load)
- Electronic Limit Overload | 120% @ 600s; 150% @ 60s; 200% @ 5s*
- Overload Capacity (IGBTs) | 150% Continuous
- Frequency stability | $\pm 0.01\%$ Crystal Controlled
- Load power factor | 0-1
- Efficiency | 97%
- Short circuit proof by electric current limiting and shutdown

* Other voltages and frequencies available on request

* Other Electronic Overload limits available on request

CHARGER SPECIFICATIONS

INPUT / RECTIFIER - 4Q

- 3P+PE 400V/415V AC | $\pm 10\%^*$
- 50Hz / 60Hz | $\pm 1\%$
- Input current harmonics | <3% @ Full Load
- High Efficiency

OUTPUT / DC-DC CONVERTER

- 0-800 VDC | $\pm 1\%$
- 0-120 ADC | $\pm 0.25A$
- High efficiency buck IGBT Converter, constant voltage, constant current

* Other voltages and frequencies available on request

BATTERY SPECIFICATIONS

CELL CONFIGURATION

- Cell Type | LiFePo4 280Ah CATL
- Capacity Ah | 280
- Vnominal | 3.2
- Vmax | 3.65
- Vmin | 3
- kW | 0.896

MODULE CONFIGURATION

- Serie | Parallel | 16 | 1
- Capacity Ah | 280
- Vnominal | 51.2
- Vmax | 58.4
- Vmin | 48
- kW | 14.336

RACK CONFIGURATION

- Serie | Parallel | 13 | 1
- Capacity Ah | 280
- Vnominal | 665
- Vmax | 760
- Vmin | 620
- kW | 186

RACK CHARGING TIME

- 125A | <3h

NUMBER OF CYCLES PER CHARGE

Base on average measure consupcion. Subject to aircraft configuration		Time at the gate 60 minutes
1x90kVA unit (186kWh)	CRJ-900LR	12
	A320-200	11
	A321-200	6
	B373-800	7
2x90kVA unit (372kWh)	A340	6
	A350	6
	B777-200	6

ENVIRONMENTAL CONDITIONS

- Coolant temperature (max) | Forced air up to 40°C
- Ambient temperature (min/max) | -40°C to +40°C
- Relative humidity (min/max) | 0% to 90% without condensation

- Pollution degree | 2
- OVC (Overvoltage Category) | 3
- Altitude | Up to 2000m

TECHNICAL DRAWING

