

400Hz SOLID STATE FREQUENCY CONVERTERS EL-SERIES For Aircraft Maintenance Hangars and ground power duty



The EL series, solid state frequency converters are outcome of a long experience in the design and manufacture of rectifiers, inverters, UPS systems and frequency converters.

To complete our range of products for airfield applications, we also supply constant current regulators for runway lighting systems, 28.5V DC systems for the engine starting and battery charging and automatic cable reeling systems for storing the cables that deliver the 400Hz power to the aircraft .

All of our products distinguish themselves by the employment of advanced technology components assuring excellent reliability and life expectancy and the design layout of the systems allows for easy maintenance.

Aircraft when on the ground cannot use the normal 50Hz (or 60Hz in America) power when they are parked at an airport so instead of running the on board turbo generator APU producing much noise and pollution, our new EL series compact dimensioned ground power units can be fixed to the gantry of a passenger loading bridge or can be hung underneath the walkway or simply fixed to a convenient place close to the aircraft.

Our ground power unit is connected to the normal 3 phase mains power source and delivers an output of 200V 3 phase 400 Hz power to the aircraft through a special flexible cable. The converter is only switched on when the aircraft needs the power, it also has a built in feature that allows the converter to synchronise with the on board aircraft power system so the lights, air conditioning system and the avionics continue operating during the change over from aircraft power to the external converter power.

This form of "point of use" ground power system is very energy efficient,

the converter is only switched on when needed and is more

flexible than the earlier generation concepts of centralised 400Hz systems on older airports that operate large converters in parallel drawing continuous power from the mains in anticipation of an incoming aircraft docking to connect to the distribution circuit.

Our new product goes one step further, we now can deliver a dual system comprising two 90kVA systems

built into a single enclosure with two output circuits so the new generation of wide bodied aircraft can pick up power with two cables from a single location.

We can also provide a combination system in a single enclosure with a 3 phase 200V 400Hz output and with a secondary output of 28V DC for helicopter engine starting and battery charging in a vertical configured compact dimensioned assembly that can be installed in a maintenance hangar or on the apron of an airport, the combination unit can also be built in the horizontal format for mounting under the passenger loading bridge and operate in conjunction with our automatic cable reeling unit.



400Hz SOLID STATE FREQUENCY CONVERTERS EL-SERIES

For Aircraft Maintenance Hangars and ground power duty



TECHNICAL SPECIFICATION

1. INPUT DATA

Rated voltage:	3 x 400V +-15%
Frequency:	50Hz +-5%, 60Hz option available
Input current at full load:	see table
Power factor:	0.94
Total Current Harmonic Distortion:	11%
Inrush current:	soft start.

2. OUTPUT DATA

Rated power kVA capacity:	see table
Rated voltage:	3 x 200V 4w Y
Frequency:	400Hz \pm 0.1%
Power factor:	rated at 0.8 ind.
Waveform:	sinusoidal
Total Harmonic Distortion (linear load):	3%
Voltage regulation:	+/- 1%
Voltage transient, for load step 0 to100% and back:	+/- 8%
Recovery time:	2 msec.
Overload 10 minutes:	1.25 x full load
Overload 1 minute:	1.5 x full load.
Overload 10 seconds:	2 x full load
Voltage symmetry with balanced load:	+/- 1%
Voltage symmetry with 30% unbalanced load:	\pm 2%

3. SYSTEM PARAMETERS

Dimensions, Width x Depth x Height (mm):	see table
Weight (Kg):	see table.
Efficiency:	>90%
Audible noise:	68dBA at 1 metre.
Operating temperature:	-25°C to +50°.
Relative humidity, non-condensing:	0 to 95%
Altitude without derating:	1000m above sea level
Enclosure ingress protection:	IP 20, IP42 and IP54 options available.
Cooling:	Fan ventilated heat sinks and extractor fan.



400Hz SOLID STATE FREQUENCY CONVERTERS EL-SERIES

For Aircraft Maintenance Hangars and ground power duty

4. STANDARDS

- CE compliant.
- ISO 6858: Ground support electrical supplies
- EN 2282: Characteristics of aircraft electrical supplies – General requirements
- MIL-STD-704E
- EN50091-1
- EN 61000-6-2: Electromagnetic compatibility, emission
- EN 61000-6-4: Electromagnetic compatibility. immunity.

5. CIRCUIT BREAKERS, OPERATOR CONTROLS, METERING, INDICATORS

- Input circuit breaker, interlocked with front door.
- Output switch
- ON/OFF switch for operator
- Metering:
 - Output voltage
 - Output current
 - Output frequency
- Indicators:
 - Frequency converter running
 - Frequency converter alarm
- Remote control
- Converter ON/OFF.

6. OPTIONAL ADDITIONAL FEATURES

- Other voltages and frequencies.
- Other output voltages.
- Military class rugged construction.
- Ingress protection, IP42, IP54 and IP55
- Extended temperature range: from -40°C to +50°C
- Dual output for connecting two cables and aircraft connectors
- UPS version, converter provided with batteries
- Parallel load sharing configuration for multi-modules.
- Output contactor for control from the aircraft connector.
- Aircraft interlock circuits
- Line drop compensation for long cables.
- Remote voltage sensing and control for very long cables
- Output voltage fine regulation by potentiometer.
- Output frequency fine regulation by potentiometer.
- 400Hz Distribution boards.
- Mobile version on trolley or trailer
- Horizontal style for mounting under passenger loading bridge.
- Secondary output of 28Vdc voltage for battery charging and helicopter starting



400Hz SOLID STATE FREQUENCY CONVERTERS EL-SERIES For Aircraft Maintenance Hangars and ground power duty

7. Selection table.

Rated power	Input current	Dimensions	Weight
5kVA/4kW	1.5 A	400x700x700mm	100 Kg
7.5kVA/6	11.25 A	400x700x700mm	110 Kg
10kVA/8	15 A	400x700x700mm	120 Kg
12.5kVA/10	18.5 A	400x700x700mm	150 Kg
15kVA/12	22.5 A	400x700x700mm	180 Kg
20kVA/16	30 A	600x800x1200mm	250 Kg
25kVA/20	37.5 A	600x800x1200mm	270 Kg
30kVA/24	45 A	600x800x1200mm	300 Kg
40kVA/32	60 A	800x600x1500mm	400 Kg
45kVA/36	67.5 A	800x600x1500mm	450 Kg
60kVA/48kW	90 A	1200x600x1500mm	550 Kg
80kVA/64kW	120 A	1200x600x1800mm	650 Kg
90kVA/72kW	135 A	1200x600x1800mm	700 Kg
120kVA/96kW	180 A	1200x600x1800mm	900 Kg
150kVA/120kW	225 A	1200x600x1800mm	950 Kg
180kVA/144kW	270 A	1200x600x1800mm	1300 Kg
270kVA/216kW	405 A	1500x950x1850mm	2170 Kg
315kVA/252kW	472 A	1500x950x1850mm	2250 Kg



POWER SYSTEMS INTERNATIONAL LIMITED

Chiltern House, High Street, Chalfont St. Giles, Bucks HP8 4QH. England
Tel: +44 (0)1494 871 544 Fax: +44 (0)1494 873 118
www.powersystemsinternational.co.uk info@powersystemsinternational.com