



400Hz STATIC FREQUENCY CONVERTERS



ELIT Srl designs and manufactures 400Hz static frequency converters since 1987. To complete the airfield range of products are available 28Vdc and 270Vdc power supplies, constant current regulating units (CCR) for ground lighting and control systems for commercial and military airports. All the equipment is distinguished by the use of technologically advanced components, reliability, and ease of maintenance.

PRINCIPLES OF WORKING

The unit converts the input voltage at 50 / 60Hz to an output voltage (galvanically isolated from the input) at 400Hz; The output voltage is stabilized in voltage, frequency with quartz and low harmonic voltage.

The magnitude of the rectifier depends on the harmonic current that the network (THDi) is able to withstand: For strong networks (> 10Pn) THDi can be 25%, while for medium or weak networks THDi must be 10% up to 3%. The full-load cosphi varies from 0.95 to 0.98 depending on the chosen input magnetic configuration. The PWM modulated IGBT inverter supplies the voltage adaptation transformer, its output is fitted with a filter to contain the distortion within 2%

FEATURES

- Galvanic input / output isolation
- Three-phase input voltage without neutral.
- High performance.
- High overload capacity.
- Analyzer with 128x112 pixel graphic LCD, touchscreen, harmonic analysis.
- Automatic voltage compensation (DLC) optional.
- Remote Point of Reaction (POR) (optional).
- Interlock with bypass option (optional).
- Remote control (optional).
- Emergency Power Off.
- UPS mode with battery (optional)
- 28Vcc additional module (optional)
- Power history (optional)
- RS485, RS232, SNMP and I / O communication interface (optional)

CONTROL PANEL

The converter is equipped with a backlit liquid crystal display, optional touch screen. The display is divided into four menus, accessible with the corresponding function keys. Additional LCD are available for additional outputs.



The main measures are:

voltage (phase voltage, phase-to-neutral and neutral ground), main voltage (only for DC power supply), phase current, neutral current calculated and real power (active, reactive and apparent phase and total) P.F. (Power factor of each phase and total), Cosphi of each phase and total frequency (frequency measurement of the voltage measured), asymmetry of voltage and current, total harmonic distortion (THD) of voltages and currents, analysis of voltage and current up to the 63rd harmonic function max. (HIGH) and the min. (LOW) for the acquisition and storage of the instantaneous values of voltage, current, power, PF, Con. and frequency averaging function peak values (maximum demand) power and current flow direction of the power harmonics energy meters for active, reactive, apparent (partial and total functions with programmable tariff) counter (total and partial programmable) texts in 5 languages (Italian, English, French, Spanish and Portuguese).

accuracy for IEC / EN 50470-3 (MID Class B).

Signaling:

- mains presence
- converter running
- alarm

SWITCHES AND OPERATOR CONTROL

The static frequency converters F400 are provided with the following protections and controls:

- Input switch isolator with door lock
- Output switch isolator (optional output contactor)
- START / STOP converter buttons
- ON / OFF output buttons (optional)
- Local or Remote control selector (optional)
- ON / BYPASS interlock selector (optional)
- Voltage drop compensation max 8% (optional)
- LCD touchscreen display (optional)
- Remote command ON / OFF converter (optional)
- Optional interfaces SNMP, RS485, RS232, USB

STANDARDS

CE Compliant.

MIL STD 704F: Aircraft Electric Power Characteristics

ISO 6858: Ground support electrical supplies

EN 2282: Characteristics of aircraft electrical supplies

– General requirements

EN 61000-6-2: Electromagnetic compatibility.

Emission

EN 61000-6-4: Electromagnetic compatibility.

Immunity.

EN 13849-1: Safety of machinery - Safety-related parts of control systems.

DFS400 Specification for 400 Hz aircraft power

BS 2G 219: General requirements for ground support equipment

SAE ARP 5015: Ground equipment 400 Hz ground power performance requirement

CUSTOM VERSIONS

Custom configurations and features are provided on request:

- Version with anti-vibration and/or customized dimensions,
- Mobile on trolley, under-bridge mounting and shelter versions,
- PCB tropicalization treatment,
- Additional 400Hz outputs,
- Additional power module 28Vdc 200-400-600-800A,
- Customized voltages and frequencies.



Model	FC400 100	FC400 120	FC400 160	FC400 180
Rated power	100kVA/90kW	120kVA/108kW	160kVA/144kW	180kVA/162kW

INPUT				
Nominal voltage	400V 3Ph (208V, 440V 480V and 575V on request)			
Voltage tolerance	+10% -15%			
Power factor	0.95 at full load (0.98 on request)			
Nominal frequency	50Hz/60Hz ±5%			
Current distortion THDI	<25% standard (<10% o <3% opzionale)			
Inrush current	Absent			
Input current @ full load	150 A	180 A	240 A	270 A

OUTPUT				
Voltage	200V 3Ph+N (115V, 440V, 480V and 575V on request)			
Frequency	400Hz ± 0.01%			
Power factor	Inductive – capacitive			
Waveform	Sinusoidal			
THD	<3% with linear load (2% on request)			
Static stability	±1%			
Dynamic stability	±8%			
Recovery time	10 msec.			
Overload 10 min.	1.25 In			
Overload 1 min.	1.5 In			
Overload 30 sec.	2 In (on request)			
Overload 10 sec.	3 In (on request)			
Overload 1 sec.	4 In (on request)			
Crest factor	1.414 ±3%			
Voltage modulation	<1%			
Voltage phase shift	±1° el. with balance load ±2° el. with 30% unbalance load			

BATTERY (OPTIONAL)				
Nominal voltage	408Vdc			
Floating voltage	456Vdc			
Minimum voltage	340Vdc			

MISCELLANEOUS				
Dimensions	800x800x1800 or 800x1000x1800		800x1000x1800 or 1300x1000x1800	
Weight	800kgs	900kgs	950kgs	1100kgs
Efficiency	>90%			
Operating temperature	from -10°C to +45°C (-20°C/+55°C -40°C/+60°C on request)			
Relative humidity	from 0 to 95% without condensing			
Altitude	1000m above sea level without derating			
Protection degree	IP 20 (IP31, IP41, IP44, IP54, IP60 on request)			
Cooling	Forced air			

Model	FC400 200	FC400 250	FC400 270	FC400 300
Rated power	200kVA/180kW	250kVA/225kW	270kVA/243kW	300kVA/270kW

INPUT				
Nominal voltage	400V 3Ph (208V, 440V 480V and 575V on request)			
Voltage tolerance	+10% -15%			
Power factor	0.95 at full load (0.98 on request)			
Nominal frequency	50Hz/60Hz ±5%			
Current distortion THDI	<25% standard (<10% o <3% opzionale)			
Inrush current	Absent			
Input current @ full load	300 A	375 A	405 A	450 A

OUTPUT	
Voltage	200V 3Ph+N (115V, 440V, 480V and 575V on request)
Frequency	400Hz ± 0.01%
Power factor	Inductive – capacitive
Waveform	Sinusoidal
THD	<3% with linear load (2% on request)
Static stability	±1%
Dynamic stability	±8%
Recovery time	10 msec.
Overload 10 min.	1.25 In
Overload 1 min.	1.5 In
Overload 30 sec.	2 In (on request)
Overload 10 sec.	3 In (on request)
Overload 1 sec.	4 In (on request)
Crest factor	1.414 ±3%
Voltage modulation	<1%
Voltage phase shift	±1° el. with balance load ±2° el. with 30% unbalance load

BATTERY (OPTIONAL)	
Nominal voltage	408Vdc
Floating voltage	456Vdc
Minimum voltage	340Vdc

MISCELLANEOUS				
Dimensions	1300x1000x1900	1300x1000x1900 or 2100x1000x1900		
Weight	1200kgs	1500kgs	1650kgs	2150kgs
Efficiency	>90%			
Operating temperature	from -10°C to +45°C (-20°C/+55°C -40°C/+60°C on request)			
Relative humidity	from 0 to 95% without condensing			
Altitude	1000m above sea level without derating			
Protection degree	IP 20 (IP31, IP41, IP44, IP54, IP60 on request)			
Cooling	Forced air			

Model	FC400 350	FC400 400	FC400 450	FC400 500
Rated power	350kVA/315kW	400kVA/360kW	450kVA/405kW	500kVA/450kW

INPUT				
Nominal voltage	400V 3Ph (208V, 440V 480V and 575V on request)			
Voltage tolerance	+10% -15%			
Power factor	0.95 at full load (0.98 on request)			
Nominal frequency	50Hz/60Hz ±5%			
Current distortion THDI	<25% standard (<10% o <3% opzionale)			
Inrush current	Absent			
Input current @ full load	525 A	600 A	675 A	750 A

OUTPUT	
Voltage	200V 3Ph+N (115V, 440V, 480V and 575V on request)
Frequency	400Hz ± 0.01%
Power factor	Inductive – capacitive
Waveform	Sinusoidal
THD	<3% with linear load (2% on request)
Static stability	±1%
Dynamic stability	±8%
Recovery time	10 msec.
Overload 10 min.	1.25 In
Overload 1 min.	1.5 In
Overload 30 sec.	2 In (on request)
Overload 10 sec.	3 In (on request)
Overload 1 sec.	4 In (on request)
Crest factor	1.414 ±3%
Voltage modulation	<1%
Voltage phase shift	±1° el. with balance load ±2° el. with 30% unbalance load

BATTERY (OPTIONAL)	
Nominal voltage	408Vdc
Floating voltage	456Vdc
Minimum voltage	340Vdc

MISCELLANEOUS				
Dimensions	2600x1000x1900mm		3400x1000x1900mm	
Weight	2250kgs	2800kgs	3100kgs	3500kgs
Efficiency	>90%			
Operating temperature	from -10°C to +45°C (-20°C/+55°C -40°C/+60°C on request)			
Relative humidity	from 0 to 95% without condensing			
Altitude	1000m above sea level without derating			
Protection degree	IP 20 (IP31, IP41, IP44, IP54, IP60 on request)			
Cooling	Forced air			

ELIT Srl reserves his right to do modifications to his products without notice.