

**60Hz STATIC FREQUENCY CONVERTERS**

ELIT Srl designs and manufactures 60Hz static frequency converters since 1987.

All our equipment is distinguished by the use of technologically advanced components, for excellent reliability, and simple maintenance. The simplicity of operation is the main feature of all our equipment.

PRINCIPLES OF WORKING

The apparatus converts the input mains voltage, at 50Hz, into an output voltage (galvanically isolated from the input) at 60Hz; the output voltage is stabilized in voltage and frequency and with low harmonic content in voltage.

The rectifier configuration depends on the harmonic current that the network (THDi) is able to withstand: for strong networks ($> 10P_n$) the THDi can be 25%, while for medium or weak networks the THDi must be 10% or up to 3%. The full load cosphi varies from 0.95 to 0.98 depending on the selected 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, touch-screen, 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)
- Multi voltage and multi frequency (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.



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), Cosφ 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 CONTROLS

The static frequency converters F60 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 1399: Department of Defence Interface standard section 300B Electric Power, alternating current

EN 62040-1-2. General and safety requirements for UPS used in restricted access locations.

EN 62040-3. UPS. Method of specifying the performance and test requirements.

EN 61000-6-2: Electromagnetic compatibility (EMC). Generic standards – Immunity for industrial environments.

EN 61000-6-4: Electromagnetic compatibility (EMC). Generic standards – Emission standard for industrial environments.

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

2004/30/EC EMC Directive

2014/35/EC Low Voltage Directive

CUSTOM VERSIONS

Custom configurations and features are provided on request:

- Version with anti-vibration and / or customized dimensions,
- Mobile version on trolley,
- PCB tropicalization treatment,
- Customized voltages and frequencies.



Model	FC60 100	FC60 120	FC60 160	FC60 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 $\pm 5\%$			
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	60Hz $\pm 0.1\%$			
Power factor	Inductive – capacitive			
Waveform	Sinusoidal			
THD	<3% with linear load (2% on request)			
Static stability	$\pm 1\%$			
Dynamic stability	$\pm 8\%$			
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 $\pm 3\%$			
Voltage modulation	<1%			
Voltage phase shift	$\pm 1^\circ$ el. with balance load $\pm 2^\circ$ el. with 30% unbalance load			

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

MISCELLANEOUS				
Dimensions	800x800x1800mm or 800x1000x1800mm		800x1000x1800mm or 1300x1000x1800mm	
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	FC60 200	FC60 250	FC60 270	FC60 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	60Hz ± 0.1%			
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	1300x1000x1900mm or 2100x1000x1900mm		
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	FC60 350	FC60 400	FC60 450	FC60 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 $\pm 5\%$			
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	60Hz $\pm 0.1\%$			
Power factor	Inductive – capacitive			
Waveform	Sinusoidal			
THD	<3% with linear load (2% on request)			
Static stability	$\pm 1\%$			
Dynamic stability	$\pm 8\%$			
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 $\pm 3\%$			
Voltage modulation	<1%			
Voltage phase shift	$\pm 1^\circ$ el. with balance load $\pm 2^\circ$ 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.