



**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 (> 10Pn) the THDi can be 25%, while for medium or weak networks the THDi must be 10% or up at 3%. The full load cosφi 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), Cosφi 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 FC60 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 5	FC60 10	FC60 15	FC60 20
Rated power	5kVA/4.5kW	10kVA/9kW	15kVA/13.5kW	20kVA/18kW

<b>INPUT</b>				
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	7.5 A	15 A	22 A	30 A

<b>OUTPUT</b>				
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			

<b>BATTERY (OPTIONAL)</b>				
Nominal voltage	408Vdc			
Floating voltage	456Vdc			
Minimum voltage	340Vdc			

<b>MISCELLANEOUS</b>				
Dimensions	600x950x1200mm or 850x800x1100mm			
Weight	100kgs	120kgs	180kgs	250kgs
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 25	FC60 30	FC60 40	FC60 45
Rated power	25kVA/22.5kW	30kVA/27kW	40kVA/36kW	45kVA/40.5kW

<b>INPUT</b>				
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	37 A	45 A	60 A	67 A

<b>OUTPUT</b>				
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			

<b>BATTERY (OPTIONAL)</b>				
Nominal voltage	408Vdc			
Floating voltage	456Vdc			
Minimum voltage	340Vdc			

<b>MISCELLANEOUS</b>				
Dimensions	600x950x1200mm or 850x800x1600mm			
Weight	270kgs	300kgs	350kgs	400kgs
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.