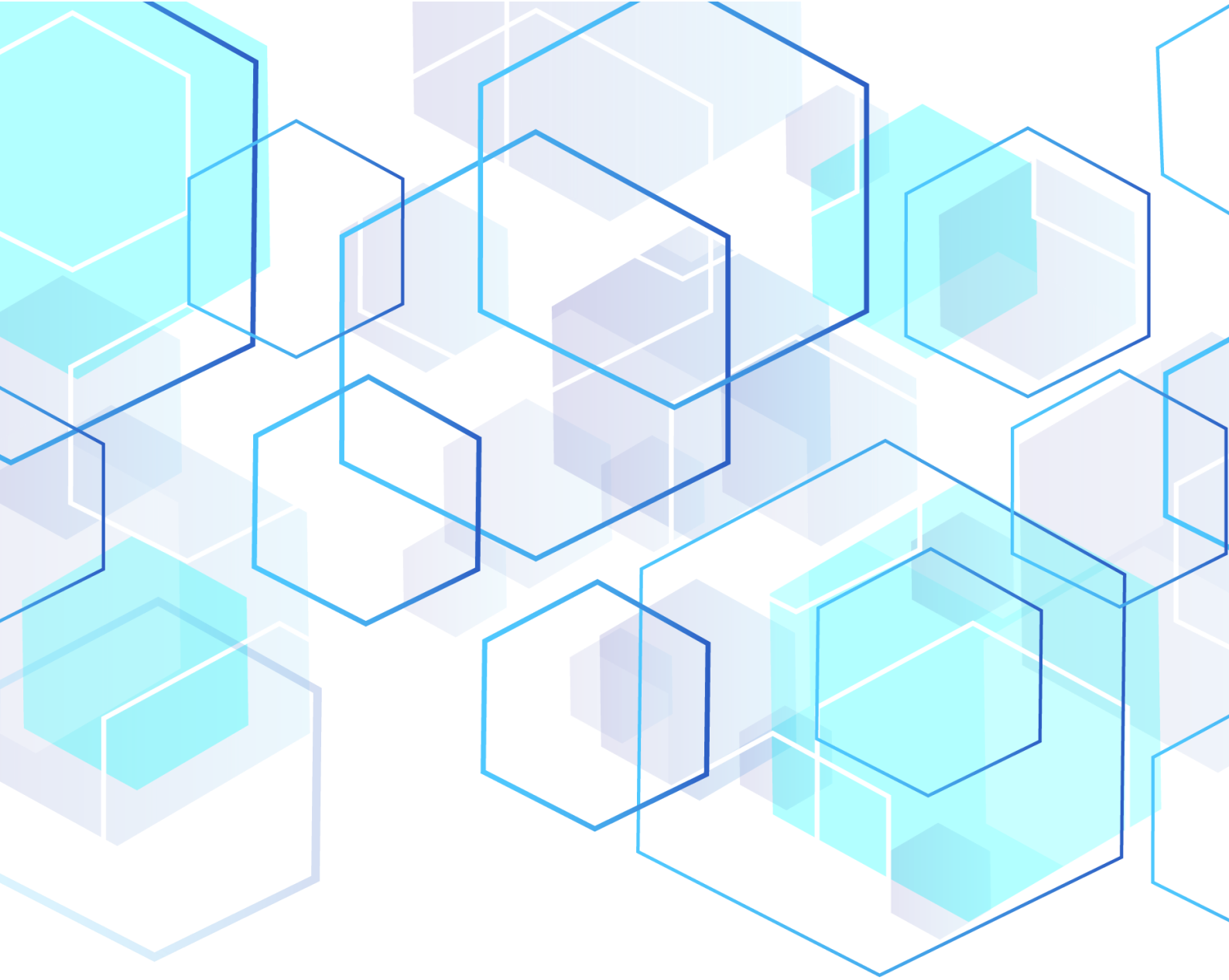

ELIT®

ELECTRONIC FREQUENCY CONVERTER

The company

Founded in 1987, ELIT specializes in the design, production, sales, and support of medium and high-power static frequency converters, delivering power systems up to 2000 kVA.

ELIT design and manufacture:

- 400Hz and 60Hz static frequency converters for airport and maritime applications
- 28Vdc and 270Vdc static power supplies for avionics applications
- Constant current regulators (CCR) for public lighting and airport runways
- Medium and high-power Uninterruptible Power Systems (UPS) tailored to customer specification
- Ship & Shore-to-ship converters
- Test systems for multi-voltage/multi-frequency railway carriages
- Railway inverters

ELIT®
ELECTRONIC FREQUENCY CONVERTER

Via Croce Rossa, 11 - 29122 Piacenza (Italy)
www.elit-ups.com - info@elit-ups.com
Tel. +39 0523 497119 - +39 0523 497902
VAT IT01312320334 - C.F. 08881330156

Accreditation & References

ELIT SRL is proudly certified according to **ISO 9001:2015** and **ISO 14001:2015** standards.

Recognized and trusted both nationally and internationally, ELIT has been awarded several key accreditations:

- **NATO NCAGE Code** (since 2005) for the quality of military-grade supplies
- **D-U-N-S® Number** for international business recognition
- **SAM (System for Award Management)** registration since 2014
- Integrated into the **PIEE** and **WAWF** procurement systems of the **U.S. Air Force and Navy** since 2019

Below some significant references:

Alenia Aeronautica	Leonardo
Thales Alenia Space	Otomelara Finmeccanica
ANAS SpA	Sydney International Airport
Barcelona International Airport	London Gatwick International Airport
Atene International Airport	Italian Air Force
Italian Navy	US Air Force
French Air Force	French Navy
Spanish Air Force	Jordanian Royal Air Force
Bahrain Air Force	Vietnamese Air Force
Vietnamese Navy	Lufthansa Airlines
Airbus Industries	Palermo Municipality
Qatar Emiri Air Force	A2A SPA
Royal Malasyan Navy	Iarnod Eireann (Irish Rail)
Egyptian Armament Authority	MN—PN—Greece Military Navy
Royal Air Force — UK	Oman Navy

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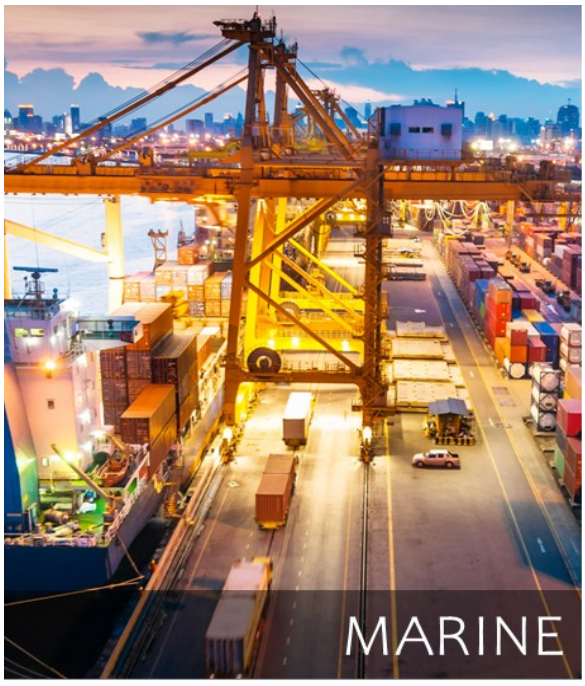
Applications

AEROSPACE

- 400Hz Static Frequency Converter
- 28Vdc GPU
- 270Vdc GPU

MARINE

- 50-60Hz shore-to-ship Static Converter
- 50-60Hz ship Static Converter
- 400Hz Static Frequency Converter
- 60Hz Static Frequency Converter



AVIATION

- 400Hz GPU
- AC/DC Power Station
- 400Hz Uninterruptible Frequency Converter (UFC) with battery for back-up

LIGHTING

- Constant Current Regulators (CCR) up to 100kW
- Central Power Supply (CPS) System:
  - Public lighting
  - Road tunnels
  - Railway tunnels
  - Highways
  - Squares
  - Energy saving

RAILWAYS

- Revamping railways carriage:
  - 400Vdc
  - 1500Vdc
  - 1000Vac
  - 1000Vac 16 2/3Hz
- 83,3Hz inverter for light signaling

CRITICAL UTILITY

- Naval UPS Uninterruptible Power Supply
- DC/AC Inverter
- Rectifier Power Supply

SFC 400Hz

Principle of working

The **Static Frequency Converters** (SFC) transformrs the input voltage at 50/60Hz into a galvanically isolated output at 400Hz.

The output voltage is stabilized in both voltage and frequency through quartz control and features low voltage harmonic distortion. The rectifier design depends on the harmonic current capacity (THDi) of the mains: For strong networks (> 10Pn) THDi can be 25%, while for medium or weak networks THDi must remain between 10% and 3%. The system achieves a power factor (cos φ) from 0.95 to 0.98, depending on the input magnetic configuration. The PWM-modulated IGBT inverter powers a voltage adaptation transformer, and the output filter ensures harmonic distortion remains below 2%.

Features

- Galvanic input / output isolation
- Three-phase input voltage without neutral
- Rugged construction
- High performance / High overload capacity
- Drop line compensation
- Output interlock circuit
- Local/remote control

Options

Custom configurations and features upon request:

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

Standards Available

CE Compliant; **EN 62040-1-2** Part 1-2: General and Safety requirements for UPS used in operator access locations; **EN 62040-3** Part 3:Method of specifying the performance and test requirements; **EN 60951-1**: Information technology equipment-Safety; **MIL STD 704F**: Aircraft Electric Power Characteristics; **ISO 6858**: Ground support electrical supplies; **EN 61000-6-2**: Electromagnetic compatibility. Emission; **EN 61000-6-4**: Electromagnetic compatibility-Immunity; **DFS400**: Specification for 400 Hz aircraft power; **BS 2G 219**: General requirements for ground support equipment; **2014/30/EC**: The EMC Directive; **2014/35/EC**: The Low Voltage Directive; **2006/42/EC**: The Machinery Directive.

SFC 50/60Hz

Principle of working

ELIT Static Frequency Converters (SFC) 50/60Hz transforms the input mains voltage at 50Hz into a stabilized, galvanically isolated output at 60Hz with minimal harmonic distortion.
The rectifier configuration depends on network's THDi tolerance: for strong networks (> 10Pn) the THDi can be 25%, while for medium to weak networks the THDi should be 10% or below (down to 3%).
The full-load power factor (cos φ) ranges from 0.95 to 0.98, based on the magnetic configuration.
A PWM-modulated IGBT inverter drives a voltage adaptation transformer, with an output filter limiting harmonic distortion to under 2%.

Features

- Galvanic input / output isolation
- Three-phase input voltage without neutral
- Emergency Power Off
- High performance
- High overload capacity
- Output contactor
- Emergency Power Off
- Optional UPS mode with battery

Options - Custom configurations & features upon request:

- Anti-vibration version and/or customized dimensions
- Mobile version on trolley
- PCB tropicalization treatment
- Customized voltages and frequencies output
- Multi voltage and multi frequency
- Automatic voltage compensation (DLC)
- Remote Point of Reaction (POR)
- Bypass interlock
- Remote monitoring and control
- Power history logging
- RS485,RS232,SNMP and I/O communication interface

Standards Available

CE Compliant;
EN 62040-1-2 Part 1-2: General and Safety requirements for UPS used in operator access locations;
EN 62040-3 Part 3: Method of specifying the performance and test requirements;
MIL STD 1399: Department of Defence Interface standard section 300B Electric Power, alternating current (optional);
EN 61000-6-2: Electromagnetic compatibility (EMC). Generic standards – Immunity for industrial environments.

625kVA Shore-to ship

EUROPEAN RAILWAYS CARRIAGE REVAMPING

Principle of working

ELIT's revamping solutions for European railway carriages provide advanced control and optimization of auxiliary circuits such as air conditioning and heating. These devices also enable the precise calibration of line voltage selectors across various configurations, ensuring maximum adaptability to different railway requirements. Available individually or in combination, these units offer reliable performance with nominal power ratings of 60kW and 100kW, contributing to enhanced energy efficiency and onboard safety.

Features

- Galvanic input / output isolation
- Three-phase input voltage without neutral
- Emergency Power Off
- High performance
- High overload capacity
- Output contactor
- Emergency Power Off

Nominal voltages:

- 1000V AC 16.66Hz; single-phase; adjustable from 1100VAC to 6000VAC
- 1500V AC 50Hz; single-phase; adjustable from 1140VAC to 1760VAC
- 1500V DC; adjustable from 810VDC to 2155VDC
- 3000V DC; adjustable from 1620VDC to 4255VDC

Options - Custom configurations upon request

- Anti-vibration version / customized dimensions
- Customized voltages and frequencies
- Automatic voltage compensation (DLC)
- Remote Point of Reaction (POR)
- RS485,RS232,SNMP and I/O communication interface
- Mobile version on trolley
- PCB tropicalization treatment
- Remote control
- Interlock with bypass option
- Multi voltage and multi frequency
- Power history

Nominal power ratings:

- 60kW
- 100kW

The devices can be supplied separately or combined.

Standards Available

CE Compliant;

EN 62040-1-2 Part 1-2: General and Safety requirements for UPS used in operator access locations;

EN 62040-3 Part 3: Method of specifying the performance and test requirements;

MIL STD 1399: Department of Defence Interface standard section 300B Electric Power, alternating current (optional);

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

The image depicts a 100kW device that provides all four voltages.

RAILWAY INVERTER 3kV

Principle of working

ELIT's **3kV-380/220V** static **Railway signaling inverter** is specifically designed to power the air conditioning system of MDVC/MDVE railway carriages. The converter operates at a nominal voltage of 3000V DC and provides an output of 400/230V 50Hz. It is primarily used by railway companies and refurbishment specialists involved in the modernization and upgrading of heating and air conditioning systems. The purpose of the converter is to deliver a stabilized three-phase alternating voltage with low harmonic distortion, ensuring an optimal power supply for railway carriage air conditioning systems.

Features

- Input contactor
- Control logic
- Inverter bridge
- Transformer and filter capacitor
- Output converter unit

Protection

- Overvoltage protection
- Overtemperature protection
- Overload protection
- Short circuit protection
- Soft start

Performance Enhancements

- Graphic LCD display (128×112 pixels) with touch-screen interface
- Harmonic analysis for precise monitoring
- Communication interfaces: RS485, RS232, SNMP, and I/O (optional)
- Automatic voltage compensation (DLC) for stability
- High energy efficiency (>90%) to minimize losses
- High overload capacity and low harmonic distortion in voltage
- Galvanic isolation between input and output for enhanced safety

Options

- UPS mode with battery backup
- Remote control and monitoring via RS485, RS232, SNMP
- Programmable tariff energy meters for active, reactive, and apparent power
- 24Vdc auxiliary battery voltage power supply
- Emergency Power Off (EPO)

Standards

CE Compliant;

IEC/EN 50470-3 (MID Class B): specific accuracy class for electricity meters that complies with the European Measuring Instruments Directive (MID) ;

EN 62040-1-2 Part 1-2: General and Safety requirements for UPS used in operator access locations;

EN 62040-3 Part 3: Methods of specifying the performance and test requirements;

EMC - Electromagnetic Compatibility (89/336/EEC; 92/31/EEC; 93/68/EEC; 93/97/EEC)

CCR

Principle of working

The ELIGHT CCR **Constant Current Regulator** is designed to supply series circuits with a stable and sinusoidal current, ideal for lighting systems in airports, tunnels, and public infrastructures. The rectifier converts AC input into DC voltage, while an IGBT inverter - using PWM (Pulse Width Modulation) - transforms it into an alternating sinusoidal output. This ensures stable brightness regardless of line drops, temperature changes, or lamp aging.

Features

- Input power factor at full load > 0.95
- Efficiency > 90%
- Energy saving with reduction of luminous flux
- Reduced cabling cross-section of plant system (up to 100kVA at 9.6A or 20A):
- No electrode stress at ignition
- Certificated Insulation controller
- 1% output current stabilization

Protections

- Circuit interruption detected and shut down in
- Overcurrent (>10%) shutdown within 1 sec
- Smooth ignition ramp protects lamp electrodes
- Programmable restart delay (0–10 minutes)
- Self-test system

Options

- Voltage/current display for each regulator
- Start-up and shutdown management
- Operating mode with reduced luminous flux
- Alarm and fault detection (access, temperature, steam, etc.)
- Power history: start up, shutdown, mains fault, flux reduced periods, max temperature.

Standards

CE Compliant; CEI 64-7 1998-07: Electrical systems for public lighting. Insulation level to earth (system group E) ; **CEI EN 609501 2004-05:** Information Technology Equipment-Security. Chap.5.2 Dielectric strength. Test procedures. Test voltages for dielectric strength tests. For working voltage 1.41kV<U<50kV. Test voltage for dielectric strength according to table 2 (10kV); **EN 60071-1/2** (CEI 28-5).

TRU 28V

Principle of working

The **Transformer Rectifier Unit** (TRU) 28V is a high-efficiency transformer rectifier unit, designed to deliver a stabilized 28Vdc output for avionics applications, both in hangars and on airport runways. It utilizes a fully controlled thyristor rectifier to convert 50/60Hz AC mains into a galvanically isolated, low-ripple DC output (ripple < 1%).
The control logic ensures precise voltage stabilization, both in static and dynamic conditions. The system is available in fixed, mobile, under-bridge mounting versions, or as an additional 28Vdc module integrated into 400Hz converters.

28V 600A

Features

- Galvanic input / output isolation
- Three-phase input voltage without neutral
- High performance / High overload capacity
- Output measurements V, A
- Drop line compensation
- Output interlock circuit
- Local/remote control

Protections

- Cut off regulator within 1 second for series circuit interruption (Series circuit open)
- Cut off regulator within 1 second for overcurrent higher than 10% of set up value
- No stress on lamp electrode during the ignition with ramp starting
- Programmable delay to restart from 0 to 10 minutes
- Self test system

Options

- Automatic drop line compensation (DLC)
- Remote Point of Reaction (POR)
- Interlock with possibility of EF bypass
- Remote control
- Emergency Power Off
- Second additional output 28Vcc
- Power history
- RS485, RS232, SNMP and I / O communication interface
- Mobile or fixed version
- Version with anti-vibration and / or customized dimensions
- PCB tropicalization treatment
- Additional output power module 28Vdc 200A – 400A – 600A – 800A
- Customized voltages and frequencies
- Mobile Version


28V 600A + 400Hz

Standards Available

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 62040-3 Part 3:** Method of specifying the performance and test requirements**; EN 13849-1**: Safety of machinery – Safety-related parts of control systems; **BS 2G 219**: General requirements for ground support equipment; **SAE ARP 5015**: Ground equipment 400 Hz ground power performance requirement; **2014/30/EC**: The EMC Directive.

NAVAL UPS

Principle of working

The Uninterruptible Power Supply (**UPS**) range extends from small model (commercial UPS) to unit up to 1200kVA (NAVAL UPS), with optional parallel redundancy and dedicated battery cabinets.

NAVAL UPS systems are essential to ensure continuous electrical power supply onboard ships, even under challenging conditions. Naval UPS systems play a crucial role in ensuring uninterrupted power supply on-board ships, meeting a variety of important needs.

One of their key functions is protecting critical equipment. These systems ensure that essential instruments, such as those for navigation, communication, and safety, remain operational at all times,even during power disruptions. They also shine in emergency situations, stepping in immediately during blackouts or electrical faults to provide the necessary power to maintain vital operations.

This fast response ensures the ship's systems remain functional without any downtime. Additionally, naval UPS systems are built to handle the unique challenges of the marine environment. Designed to withstand vibrations, shocks, high temperatures, and confined spaces, they are specifically tailored to perform reliably onboard

Features

- Galvanic input / output isolation
- Three-phase input voltage without neutral
- Output measurements: volt, current, frequency, energy, power, running time...
- Remote indications via volt-free changeover contact for common fault alarms
- ON/OFF switch operations
- Front access only & Wall-mountable
- Anti-vibration

Protections

- Input, output, battery, circuit breaker
- Surge protection
- Fast-acting rectifier fuses
- Input voltage monitoring
- Power failure, overload, and over-temperature with trip
- Overvoltage, overcurrent, and short circuit with inverter shutdown
- Emergency mushroom-head push button
- Audible alarm with silencing switch
- Led diagnostic for IGBT

Options

- PCB tropicalization treatment
- Customized voltages and frequencies
- Automatic voltage compensation (DLC)
- Remote Point of Reaction (POR)
- Remote control
- Multi voltage and multi frequency outputs
- Power history
- RS485 and I/O communication interface

Standards Available

CE Compliant;

EN 62040-1-2 Part 1-2: General and Safety requirements for UPS used in operator access locations;

EN 62040-3 Part 3: Method of specifying the performance and test requirements;

MIL STD 1399: Department of Defence Interface standard section 300B Electric Power, alternating current (optional);

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

75kVA

ELIT®

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www.elit-ups.com
info@elit-ups.com
+39 0523 497119
+39 0523497902

ELIT SRL
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C.F. 08881330156
VAT IT01312320334