BDF DIGITAL

MARINE SOLUTION

100% ITALIAN TECHNOLOGY MADE IN ITALY

BDF DIGITAL

SHORE POWER CONVERTER
FREQUENCY CONVERTER
ONBOARD GRID MANAGEMENT
POWER CONVERSION SYSTEM
ONBOARD SMART FORNITURE AUTOMATION

MARINE SOLUTION

"BDF Digital is a cutting-edge Italian company with over 50 years of experience in the design and production of power electronics, automation systems, energy conversion and storage systems. Thanks to our in-house know-how and proprietary technologies, we develop fully customizable solutions to meet the most complex needs. We combine innovation and reliability to deliver tailor-made technologies designed for those who live by and respect the sea."

MARINE DIVISION
BDF DIGITAL

CALIPSO

Shore power converter

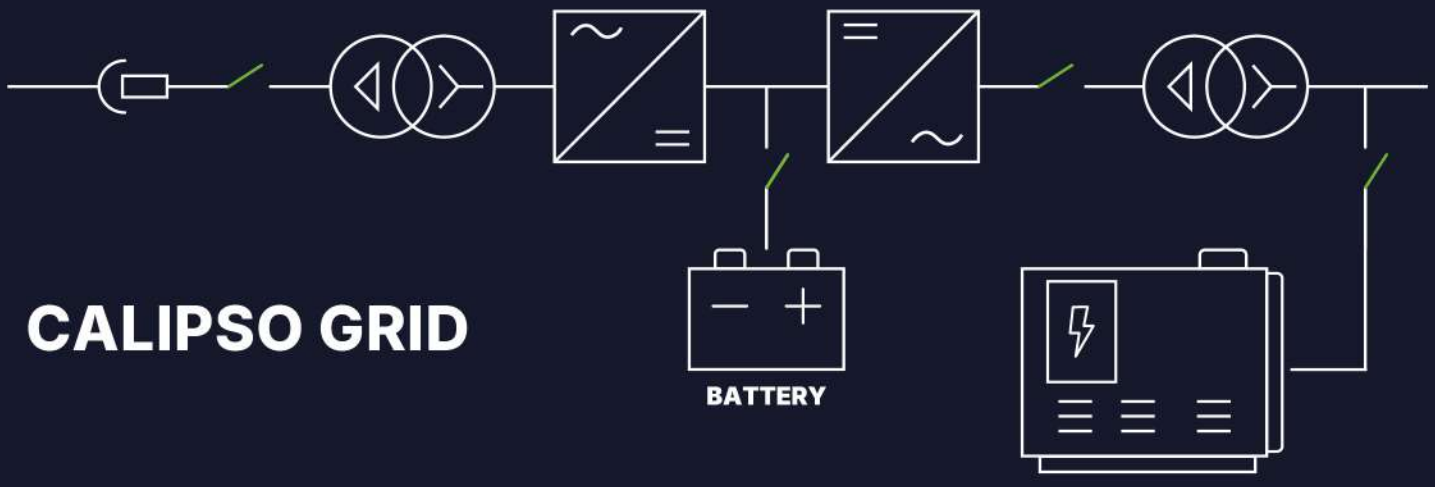
Safe, clean, reliable. Uncompromising power on board.

CALIPSO is designed to provide stable, safe, and clean power at all times, whether underway or docked, combining advanced technology with onboard comfort. Thanks to its state-of-the-art modular design, the system maximizes power availability, allowing multiple inputs to be connected simultaneously without interruption.

Every device on board, from utility services to entertainment systems, and navigation instruments, operates flawlessly.

Engineered to convert any shore power input, regardless of voltage or frequency, from ports anywhere in the world, the integration of Active Front-End (AFE) technology optimizes energy transmission, while high-quality transformers ensure complete galvanic isolation and protection from possible shore power irregularities.

The pure sine wave output guarantees stable, silent current, perfect for sensitive loads.



CALIPSO GRID

MORE THAN A SHORE POWER CONVERTER

CALIPSO natively integrates the following technologies:

STO: Seamless Tranfer Option

Uninterrupted Power for Luxury Yachts. On a yacht, electrical power is fundamental to ensuring both operational functionality and guest comfort. Every system, from navigation to entertainment, depends on a stable and reliable energy source. For this reason, we developed the **Seamless Mode** within Calipso Shore Power, a cutting-edge solution designed to ensure efficient power transitions. These transitions between different energy sources are part of daily yacht management, whether docking, switching between generators, or adapting to generators and batteries varying shore power configurations in different ports. With **Seamless Mode** is guaranted a continuous flow of power, preventing interruptions, and protecting all onboard systems. Transitions occur automatically and imperceptibly, significantly enhancing the overall reliability of your yacht.

Power Quality

The quality of the distributed power is fundamental to the safety and reliability of onboatrd systems.

While the vessel is connected to shore power, CALIPSO converts and supplies the entire yacht with the required energy in a stable and secure manner. During traditional or hybrid navigation, however, CALIPSO can operate in parallel with the yacht's generators and/or batteries, functioning as an **Active Harmonic Filter (AHF)** to enhance onboard power quality:

- ACTIVE HARMONIC FILTERING
- INTELLIGENT POWER FACTOR CORRECTION TO OPTIMIZE ENERGY CONSUMPTION
- ELIMINATION OF HARMONICS TO REDUCE LOSSES AND IMPROVE ONBOARD NETWORK EFFICIENCY
- INCREASED RELIABILITY AND LIFESPAN OF ALL ELECTRONIC EQUIPMENT
- VOLTAGE AND FREQUENCY STABILIZATION
- CONTINUOUS MONITORING OF DISTORTIONS AND TRANSIENTS

Touchscreen

CALIPSO is equipped with an intuitive interface for comprehensive system monitoring and management.

- **PLC WITH TOUCHSCREEN:**
  An integrated PLC with a front touchscreen and status indicators allows real-time visualization of power flows, operational mode selection, and data logging.
- **CONTROL FUNCTIONS:**
  - Real-time display of power flows
  - Selection of operating modes
  - Logging of shore-imported energy
  - Alarm history
- **REMOTE ACCESS:**
  Capability to interface with other onboard systems/PLCs via standard industrial communication protocols such as Profinet, EtherCAT, and Modbus (RTU/TCP-IP).

Battery Energy Storage

The integration with Battery Energy Storage Systems (BESS) is one of the key elements of hybrid and fully electric vessels.

CALIPSO interfaces natively with the onboard batteries, enabling:

- OPTIMIZED CHARGING DURING NAVIGATION OR FROM SHORE
- CONTROLLED DISCHARGING TO SUPPLY PROPULSION OR AUXILIARY LOADS
- SUPPORT TO THE ONBOARD GRID DURING PEAKS OR EMERGENCIES (PEAK SHAVING)

Thanks to advanced control logic, the system autonomously determines when and how much energy to draw from the batteries, maximizing both efficiency and battery lifespan.

INPUT

Type: 3F – single cable (optional dual power cable)
Voltage: 180 – 520 VAC (reduced)
Current: when supplied from shore power (340–528 Vac), current is reduced from 178 Arms to 115 Arms
Frequency: 40 – 70 Hz

OUTPUT

Type: Single or 3 phase, neutral, isolated output
Voltage: 208 – 480 VAC
Frequency: 50 - 60 Hz
Overload Max: 150% x 30 sec.

TECHNICAL FEATURES

Power: 100 kVA
Dimensions: 1374 × 786 × 1010 mm (H × W × D)
Acoustic noise: <75 dBA @ 2 m
Temperature range: -10 to 55 ºC, with power derating beyond limits
Protection rating: IP55 (higher IP rating available on request)
Humidity: 0–95%
Cooling: forced ventilation (OPT water cooling)
Interface: 7" Touchscreen with event log (Modbus TCP/IP – Profinet)
Colour: Pure white RAL 9010
(other options available on request)

EFYN

Every Frequency You Need

EFYN Frequency Converters / Every Frequency You Need

EFYN are frequency converters capable of handling conversion between different grid standards.
This allows powering equipment, accessories, and small appliances for guests and crew without the need for external adapters. Thanks to the integrated Active Front End (AFE) technology, EFYN not only convert frequency but also improve the power quality drawn from the yacht's main bus, ensuring

PURE SINE WAVE OUTPUT:
Provides clean and stable energy, protecting sensitive electronic devices.

GALVANIC ISOLATION:
The output is fully isolated to protect equipment from interference and potential ground faults.

INTERFERENCE REDUCTION:
AFE minimizes power disturbances and harmonics, ensuring interference-free operation.

The freedom to connect anywhere

Key Advantages and Features

EFYN combine high performance and reliability, offering a complete solution for onboard frequency management:

- **RELIABILITY AND PERFORMANCE:**
  Designed to provide stable power supply even in the presence of voltage or frequency disturbances.
- **OPERATIONAL EFFICIENCY:**
  High AFE efficiency helps reduce operating costs.
- **SAFETY:**
  RFI protection, galvanic isolation, and low earth leakage safeguard sensitive equipment and users.
- **ROBUSTNESS:**
  High overload capacity and robust air cooling in an IP43-rated cabinet allow continuous and reliable operation up to 45°C.
- **INTUITIVE CONTROL:**
  Digital touchscreen displays enable immediate system monitoring and management.
- **QUIET OPERATION:**
  Optimized design ensures silent performance, enhancing onboard comfort

18 KW EFYN MODEL

Dimensions: 1200 x 400 x 400 mm (H x W x D)
Input: 400 Vac 50 Hz (3F)
Output: 120 Vac 60 Hz (3F+ N)
Power: 18kVA
Three-phase copper-wound transformer:
I1 38A @270 v , I2 87A @120 V

THECHNICAL SHEET

Power: From 12Kv
Input: Frequency: 50 or 60 Hz
Output Frequency: 50 or 60 Hz
Input Voltage: 120–480 Vac, 3-phase, 50/60 Hz
OutPut Voltage: 120–480 Vac, 3-phase, 50/60 Hz
Cooling: Forced
Out Isolation Trasformer: Yes
Connection: Terminal Block
Display and Alarm: Led or LCD
(other options available on request)

100% ITALIAN TECHNOLOGY MADE IN ITALY

BDF DIGITAL

POWER ELECTRONICS SOLUTIONS

We design and manufacture high-performance products and solutions for the most demanding and sensitive marine applications, ensuring maximum efficiency and reliability.

When standard products do not fully meet application requirements, our expertise in power electronics, combined with extensive know-how, flexibility, and long-standing experience in the marine industry, enables us to develop highly customized solutions.

We design and build tailor-made systems for applications such as propulsion, gyroscopic and stabilization systems, and special electric motors.

We control and manage different motor types:

- **PMSM-IPM** (Permanent Magnet Synchronous Motor – Internal Permanent Magnet)
- **IM** (Induction Motor)
- **SynRM** (Synchronous Reluctance Motor)

CUSTOM GYROSCOPE DRIVE

OPDEPLUS

Our drives incorporate advanced control algorithms such as MTPA (Maximum Torque per Ampere) and MTPV (Maximum Torque per Volt), maximizing motor torque efficiency under all operating conditions.

Application Fields: ideal for systems requiring high torque, precision, and dynamic response, such as main or auxiliary propulsion systems, thrusters, and variable-speed generators.

TECHNICAL FEATURES:

- **Air or liquid cooling**
- **Single-phase or three-phase configurations**
- **Single-phase PFC stage**
- **230V - 380V - 690V**
- **Power rating up to 1 MW**
- **FIELDBUS: Profinet, Ethercat, CAN Open, ModBusTCP/IP**
- **FEEDBACK: Resolver, Endat, SinCos, SinCos Incremental, SinCos Absolute, Biss-B/C, Tamagawa, TLL, TLL + Hall, Hiperface DSL**

Onboard Grid Management

At the heart of modern marine propulsion lies the Onboard Power Distribution system, an intelligent grid that manages, controls, and optimizes energy throughout the vessel. With the advancement of electric and hybrid technologies, this system has evolved from simple wiring into a digital, flexible, and efficient infrastructure designed to adapt to every type of operation at sea.

AC or DC Grid Configuration

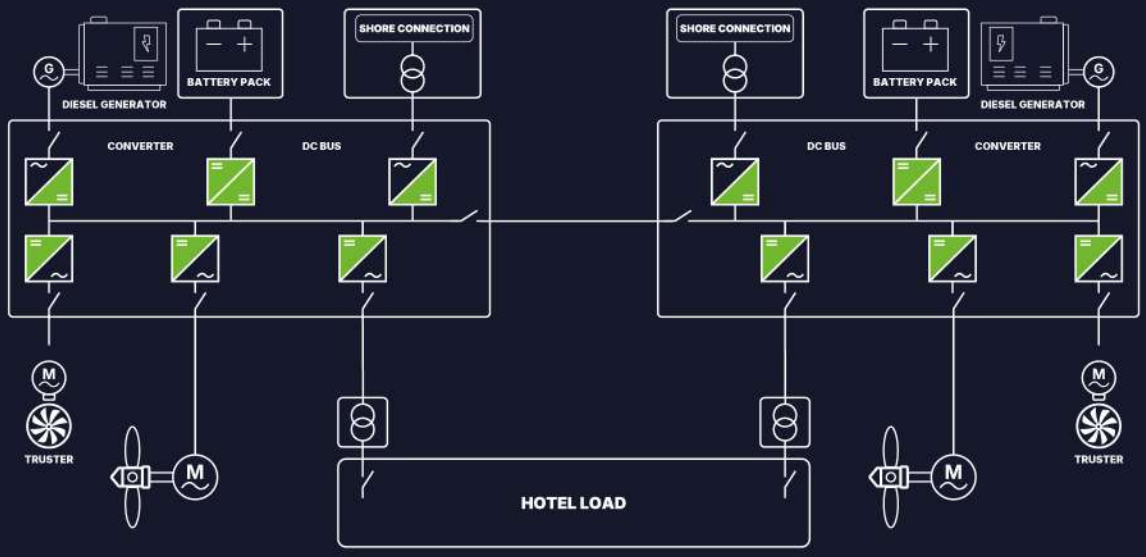
Every vessel has unique requirements, which is why we design electrical architecture in AC (Alternating Current), DC (Direct Current), or hybrid AC/DC configurations, depending on the operational profile.

- AC grids are robust and traditionally used for heavy loads and shore connections.
- DC grids, on the other hand, offer greater efficiency in fully electric systems and facilitate integration with batteries, fuel cells, and solar panels, reducing conversion losses.

Our technology enables custom configurations that optimize performance, weight, and onboard space.tt

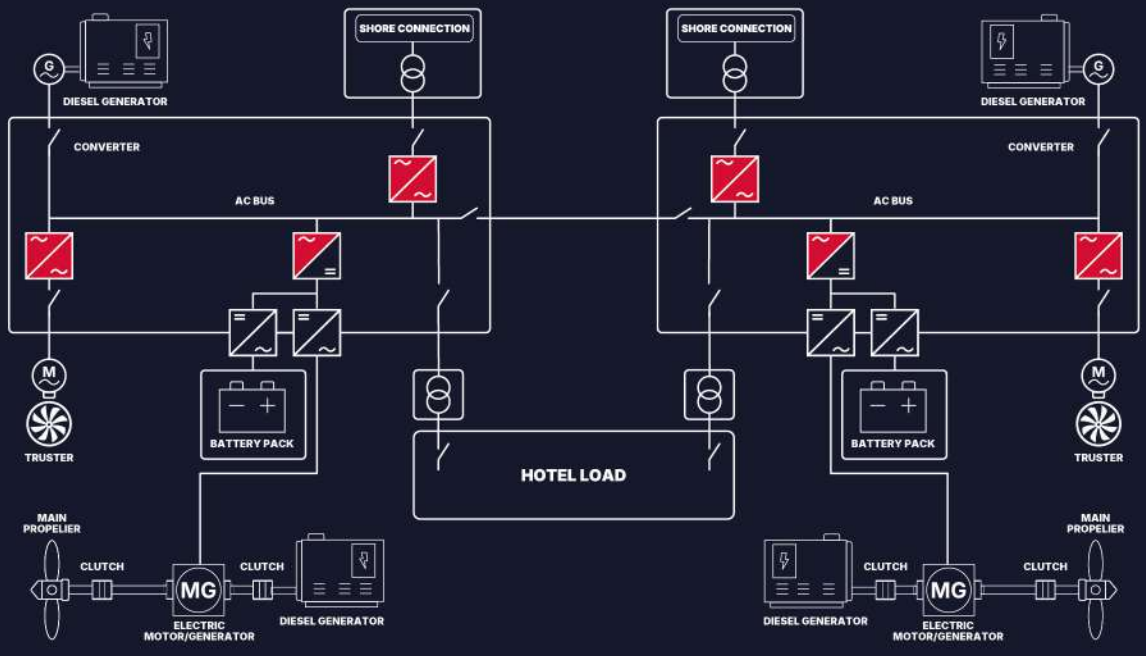
DC Architecture:

Reduces conversion losses and increases overall efficiency. It is ideal for integration with batteries, fuel cells, and solar panels, offering greater flexibility in component sizing and dynamic load management.



AC Architecture:

Ensures compatibility with traditional electrical infrastructures and provides robust power distribution management for high-load applications.



BDF DIGITAL

www.bdfdigital.com
info@bdfdigital.it

VICENZA **HEADQUARTER**
Via dell'Oreficeria, 41
36100 Vicenza (VI), Italy
Tel. +39 0444 343555