

SHOREMASTER

SERIES

10-1000 kVA **3:3**

PHASE

FREQUENCY CONVERTER



Advanced Design For Highest Safety In Marine Industry

- + Latest high performance 3 Level IGBT Inverter and rectifier technology design controlled by DSP micro controller which provides a perfect output sinewave with no distortion.
- + The **SHOREMASTER** converter has been designed with a small footprint to operate in the most harsh marine environments such as high humidity and ambient temperature. The marine engineered product has been tested to ensure that no fluctuations of the output power when large motor loads start.



- + Compatible With Worldwide Marine Power Sources
- + Stable Regulated Frequency and Voltage
- + IP 21 to IP66 Alternative Enclosures



The **SHOREMASTER** Series is certified by TÜV SÜD with regard to product safety (EN 62040-1)



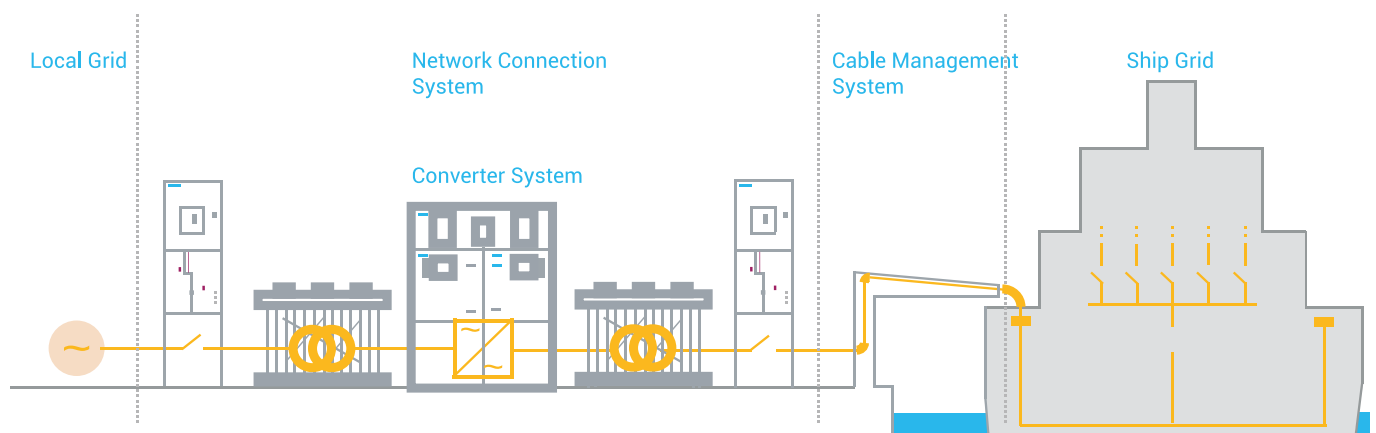
The **SHOREMASTER** Series is attested by Bureau Veritas with regard to performance (EN 62040-3)



Shoremaster Converter for Portside Applications (Shore to Ship)

The environmental footprint of port areas is under close observation. Governments, port authorities and ship owners are seeking different solutions to reduce emissions from ships while they are engaged in port operations. One solution to this problem has been identified as connecting ships in port to an onshore power supply, where electricity from the shore-based grid is used to power ships' infrastructure used for hosting crew and passengers while docked, and for cargo-handling activities.

Many of the port and marina operators are now offering vessels the opportunity to "plug into" the local city power supply grid on the dockside so the vessel can turn off its engines while at port. However many countries have their own local power distribution grid voltages.



Also when a ship is at berth, the engines are turned off but would normally continue to run its diesel engine generators to power all of the on board auxiliaries such as air conditioning, heating, lighting, battery charging, communications, water pump and other utility services.

These power diesel generators produce noise; vibrations; exhaust smoke; air pollution; gases; and CO2 emissions, as well as consume vast amounts of unpleasant smelling diesel fuel.

Ensmart ShoreMaster Series Frequency Converter offers solution to this challenge. shutting down the vessel's engine driven auxiliary power generators and regulates output voltage and frequency according to the needs of the ship with voltages and frequencies similar to the input.

Benefits

- Full galvanic isolation from shore
- Quick and easy connection for crew
- Exceeds shore supply quality regulations
- Extra power availability on low voltage shore supplies
- Protection from shore supply faults
- No interference with sensitive equipment
- Ventilation design prevents heat recirculation
- Real-time data logging and event access through display
- Reliable with low maintenance
- Lower operating cost with better efficiency
- Quiet, trouble-free operation.



Fuel Saving

Reduces Consumption of Diesel Fuel



Save Environment

Reduces Air Pollution



Better Working Conditions

Reduces Noise and Vibrations



Maximum Power Availability

with Active Front-End Technology
Maximum Power Transfer from Shore
and Stable Clean Output Power



Total Flexibility

Customized IP21 To IP42 or Outdoor
IP66 Enclosures and Containerized
Systems Available



Worldwide Operation

Connection to any Worldwide
Shore Supply



Maximum Plug and Play Power for The Ships at Berth

Ensmart ShoreMaster Series Frequency Converters in sizes from 10-1000kVA three phase 50Hz and 60hz output offers solution:

- Shutting down the vessel's engine driven auxiliary power generators,
- Regulating output voltage and frequency according to the needs of the ship with voltages and frequencies similar to the input.



Features

- Wide input voltage range (180-520V)
- Frequency Range 40-70Hz
- 380-400-415-440-460-480V 50-60Hz Output Voltage Options
- Regulated Voltage to $\pm 1\%$
- Seamless Power Transfer Between Converter and Generator
- RFI protection to prevent on board and shore supply disturbances
- Parallel load share with generators for extra power
- Reliable connection to new generation pedestals with built-in RCD protection; no nuisance tripping caused by earth leakage
- Single/Dual Shore Cord
- With active front-end technology maximum power transfer from shore supply to yacht
- Back feed and Phase Protection
- Short Circuit, Overload, Low/Over Voltage, Over Temperature Protection
- Parallel Ready
- Auto restart
- Static Bypass Option



High Efficiency & Low Total Cost of Ownership

- Less energy consumption to supply the loads thanks to high efficiency up to 96%.
- IGBT based power factor correction technology provides input power factor close to 1 ($\geq 0,99$). The high input power leads to reduced electricity pay-out, minimizes cable, investment cost.
- Low input current total harmonic distortion (THDi) less than 3% helps to avoid the disturbance and expensive harmonic filters.
- Small footprint and easy maintenance

Worldwide Compatibility

- ShoreMaster Converter is available with single power modules from 10kVA to 1000kVA and parallelable up to 8MW. It is fully compatible with all types of marina power source and all shore supply regulations, it converts the shore power and frequency to a highly reliable and safe onboard power supply

Maximum Protection

- Shoremaster provides protection against marina voltage transients and precise output voltage and frequency regulation. The regulation remains stable even at unbalanced loads. Thanks to high overload capability, generators do not need to operate during peak times. Output power stays stable even when high output loads are supplied.

Maximum Availability

- Parallel configuration up to 8 units per redundancy (N+1) and power increase.
Loop connection helps the converter system to continue the operation when the connection cable is interrupted.

Flexibility

- Customized IP21 to IP42 or outdoor IP66 enclosures and containerized systems.
- With or without battery, single or parallel unit configurations.
- Isolation transformers to vary neutral connectivity in the event of separate power sources or for galvanic isolation between input and output.
- Available versions as Shore Power Converter for Ports and Static Converter for Ships



3x600kVA Parallel Containerized Shore Power Converter with HVAC, Control Panels and Communication options.

Shoremaster Converter for Onboard Applications

- Ensmart Frequency Converters can be installed on board and used to power on-board equipment with supply requirements different to that found on the ship's AC distribution.

On board applications, Ensmart Shore Power Converters provide a galvanic isolation between city grid power pick up point and the on board vessel power distribution network. The ShoreMaster Series converter can regulate and condition the dockside power and eliminate spikes, dips, voltage surges and instability problems often encountered on supply networks connecting simultaneously to a number of vessels.

Benefits

- Fully galvanic isolated output supply
- Pure sinusoidal clean and stable output supply
- Protects sensitive all on board marine equipments from voltage distortion, voltage sags or frequency instability
- No fluctuations of the output power when large motor loads start
- Rugged Overload capability
- Small footprint to operate in the most harsh marine environments
- Low maintenance requirement



Turn Your Ship to a Global Vessel

Ensmart **ShoreMaster** Series Frequency Converters Provide Maximum Protection for All On Board Marine Equipments and Worldwide Connectivity.



Our on board **ShoreMaster** series frequency converters are available in sizes from 10kVA to 1000kVA with three phase 50Hz or 60Hz .The "Shoremaster" series converters are suitable for installation on board vessels of all types. Providing them with an ability to connect to any shore based power supply anywhere in the world.

MODEL																			
Capacity		10kVA	15kVA	20kVA	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	160kVA	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA
Power Watt		10kW	15kW	20kW	30kW	40kW	60kW	80kW	100kW	120kW	160kW	200kW	225kW	270kW	360kW	450kW	540kW	720kW	900kW
INPUT																			
Nominal Voltage		180 to 520 VAC 3 Phase-Phase																	
Frequency Tolerance		50 / 60 Hz ±20% (Selectable)																	
Power Factor		>0.99																	
Total Harmonic Distortion		THDi <3%																	
OUTPUT																			
Power Factor		0.9 (1 Optional)																	
Nominal Voltage		380/400/415/440/480 VAC 3 P (N Optional) (115/690 VAC Optional)																	
Voltage Tolerance		Static ±1%, Dynamic ±3%																	
Frequency Tolerance		50Hz / 60Hz ±0,01%																	
Output THD		Linear Load <1% / Non-Linear Load <3%																	
Crest Factor		3:1																	
Overload Capacity*		At 125% Load 10min, at 150% Load 1min																	
Efficiency (Online Mode)		93%																	
Efficiency (Eco Mode)		Up to 99%																	
BYPASS																			
Nominal Voltage		380/400/415 VAC 3 Phase + N																	
Voltage Tolerance		15% (Configurable from 10% to 30%)																	
Frequency Tolerance		±5 (Selectable)																	
ENVIRONMENTAL																			
Operating Temperature		0°C / +40°C																	
Storage Temperature		-15°C / +45°C																	
Protection Class		IP20																	
Humidity		0-95% Without Condensation																	
Altitude		<1000m, Correction Factor 1. <2000m, Correction Factor >0.92, <3000m; Correction Factor >0.84																	
Noise Level		<53 dBA		<55 dBA		<60 dBA		<65 dBA		<72 dBA				<74 dBA			<75 dBA		
COMMUNICATION																			
Communication Port		RS232 (Standart), RS485, MOD-Bus, J-Bus, Web, Tel-Net, GPRS, CAN-Bus, SNMP (Option)																	
STANDARDS																			
Quality		ISO 9001, ISO 14001, ISO 18001, TSE-HYB																	
Performance		EN62040-3 (VFI-SS-111, Bureau Veritas Certified)																	
EMC/LVD		EN62040-2, EN62040-1, EN60950, (TÜV SÜD Certified)																	
DIMENSIONS & WEIGHT																			
Cabinet Dimensions (mm)	Width	490					763		810		830			1250			2345		
	Depth	805					771		820		870			845			485		
	Height	1190					1555		1705		1800			2102			2003		
Net Weight (kg)		125	126	131	146	173	323	331	353	368	475	490	553	850	850	850	1740	1740	1990
Packaging Dimensions (mm)	Width	600					900		900		900			1370			2445		
	Depth	900					970		970		970			870			585		
	Height	1400					2040		2040		2040			2120			2250		
Gross Weight (kg)		145	146	151	166	193	353	361	383	398	505	520	583	890	890	890	1820	1820	2070

* under certain conditions.

3 Phase in / 1 Phase Out Version is Available. (10 to 30kVA)

Ensmart reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Ensmart products previously or subsequently sold.

Ensmart does not guarantee the items of the accuracy and completeness.