PRAXIS
AUTOMATION TECHNOLOGY

High Power Inverter

High Power Inverter

Features

The Mega-Guard High Power Inverter (HPI) is an advanced and compact inverter system covering the following drive applications:

- Electric Propulsion Motor drive from DC bus
- DC bus Generator drive to DC bus
- AC grid generation from DC bus
- Shore power to DC bus conversion
- DC/DC conversion

The Mega-Guard HPI's consume or supply power from/to the Electric Energy Storgare as well. A single Mega-Guard High Power Inverter is able to control up to 450kW at a DC bus voltage of 960VDC. Multiple HPI's can be put in parallel in order to increase power up to 2,2MW

The Mega-Guard High Power Inverter has the following unique features:

- able to handle DC bus voltages up to 960VDC nominal
- highest power to weight and volume ratio
- built-in DC bus contactor and Safe Torque Off
- built-in touchscreen Operator Panel
- built-in emergency stop switch
- large cable glands supporting long cable distance
- designed for marine environment

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The Mega-Guard High Power Inverter is built-up with two independent controllers and an independent safety system. The 1700V IGBT's are controlled by a dedicated digital signal processor for four quadrant motor and generator control. In addition, a Control Processor is built-in with four Ethernet ports for programming PLC functions in accordance with IEC61131 standard. The 5" touchscreen Operator Panel is connected as well to the Control Processor. Most relevant parameters such as power, current and voltage are continuously displayed on the touchscreen. The HPI includes independent safety systems such as Safe Torque Off on AC side and DC bus contactor on DC side. The contactor also supports pre-charging and discharging in order to safely connect and disconnect the HPI from DC bus.

The High Power Inverter is water/glycol cooled and has a IP67 rating. External magnetics are added to the High Power Inverter for following applications:

- DC/DC conversion
- AC Grid generation

High Power Inverter

High Power Inverter specification	
DC bus voltage and current DC bus = 384VDC / 470A DC bus = 576VDC / 470A DC bus = 768VDC / 470A DC bus = 960VDC / 470A	Rated power and coolant flow (10°C rise) 180kW / flow = 10l/min 270kW / flow= 15l/min 360kW / flow= 20l/min 450kW / flow= 25l/min
Efficiency	98%
Control Software	Four quadrant control for simultaneous motor and generator application
Switching frequency	1 – 10kHz
Output frequency	0 – 1000Hz
DC bus pre-charge and discharge	✓
DC termination	2x up to 240mm² with EMC cable glands
AC termination	3x up to 185mm² with EMC cable glands
External encoder	Not required Resolver input for special applications
Potentiometer input	2x (or SIN/COS)
Motor temperature inputs	3x
Emergency IO	EM stop, brake and Non Follow Up
Power supply	24VDC (-25% ~ +30%)
Power consumption	10W
Mounting	Bulkhead
Weight	18kg
Dimensions	215x495x177mm (WxHxD)
Protection	IP67
Coolant medium and temperature	Water/glycol up to 35°C inlet temp. Derating above 35°C: 2% per °C
Coolant pressure drop	0.1 bar at flow of 10l/min 0.25 bar at flow of 25l/min
Ambient temperature	-25 ~ +70°C
Environmental conditions	IEC60945
Class approval	LRS, DNV-GL, ABS and risk based assessment

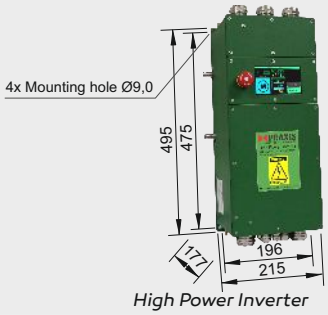
Specification

High Power Inverter PLC	
PLC programming	IEC61131 loop up to 0.1sec
Touchscreen	5"
Graphic editor	✓
Local operation	✓
Ethernet ports	4x
J1939 or CAN open port	1x
NMEA in and output	1x
Relay outputs	2x
Analog output 4-20mA	1x
Analog input 4-20mA	1x
PT100 inputs	2x
Digital inputs	2x
Cable feed through	6x EMC cable glands

High Power Inverter safety	
AC short circuit protection	✓ Safe Torque Off
DC short circuit protection	✓ Safe Torque Off
DC bus contactor	✓
Overvoltage protection	✓
Overspeed protection	✓
Overtemperature protection	✓
Earth fault	✓

HPI - 5" touchscreen

Mounting & dimensions



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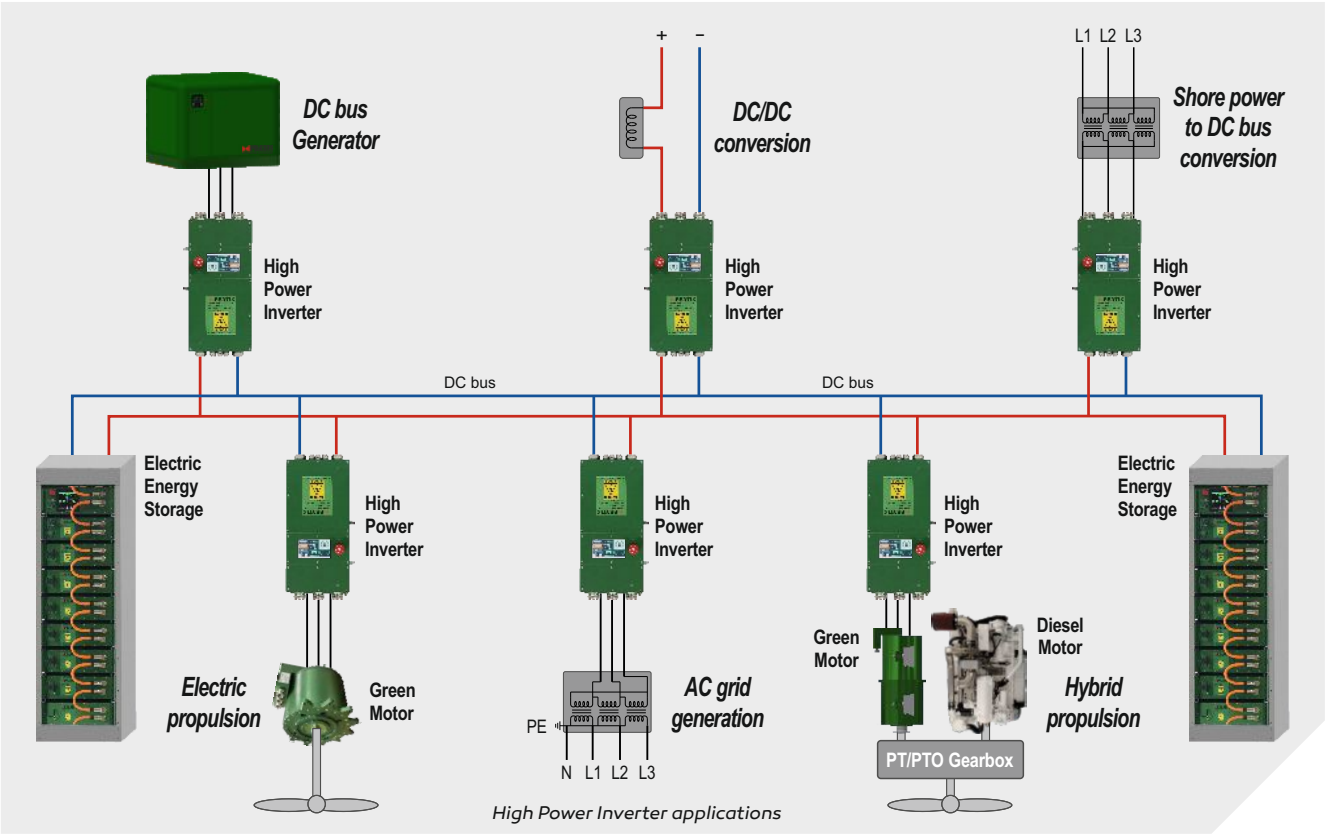

High Power Inverter applications

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Vessel Management System

Power Management System

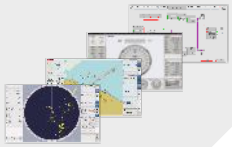
Fire Alarm System

CCTV Video Distribution

Ship Performance Monitor

Fleet Management System

Integrated Navigation System



Heading Control System

Propulsion Control System

Dynamic Positioning System

BNWAS Watch Alarm System

Navigation Light Control

Wiper Control System

Energy Management System

Electric Propulsion Motor

Electric Steerable POD

High Power Inverter

DC bus Generator

Electric Energy Storage

Electric Fin Stabilizer

Ship automation, navigation and electric propulsion

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