a brand of
NPS Diesel
Engine Applications

ZENORO

Zenoro Hybrid Marine Generator

Model: ZAJDRA408VHESE

6135SFM85 Variable Speed Marine Generator Set

371 / 408 kWe / 1200...2000 rpm

DIMENSIONS
2750 x 1330 x 1480 mm

WEIGHT
dry weight 2750 kg

SOUND REDUCTION
equal or > than 20 dba at 1 meter
free field conditions

VIBRATIONS
low

POWER
371 / 408 kWe

EMISSION
IMO 2 / IMO 3 OPTIONAL

COLOURS
RAL 9010 or custom

ENCLOSURE
aluminium modular design

GENERATOR RATINGS PRIME

Variable speed 1200-2000 rpm
100% power 371 kWe (rated genset power output)
110% power 408 kWe (overload, unlimited)

JOHN DEERE ENGINE SPECIFICATION

INLINE 6 CYLINDERS, 4 CYCLE-DIESEL

Engine type	6135SFM85
Prime Power	429 kWm
Emissions	IMO Tier 2
Firing order	1-5-3-6-2-4
Displacement	13.5 L (824 cu. in.)
Rated engine speed	2000 rpm
Bore	132 mm (5.2 in.)
Stroke	165 mm (6.5 in.)
Aspiration	Turbocharged-aftercooled
Combustion	Direct injection
Governor	Electronic
Cooling system	Heat exchanged Refill capacity
- Cooling system	43 L (11.35 US GAL)
- Lube oil system	41 L (10.83 US GAL)
Coolant change interval	Up to six years or 6000 hours of operation with John Deere COOL-GARD™ II Premix, COOL-GARD II PG Premix and COOL-GARD II Concentrate
Oil change interval	375 hours with John Deere Plus-50 II Oil & use of Low Sulphur fuel < 1000 ppm
Rotation (from flywheel end)	Counter clockwise
Engine crankcase ventilation system	Closed to eliminate room contamination

ENGINE ELECTRICAL

Battery voltage	24 Volt isolated ground
Battery charging	100 A
Battery recommendation	Min. 24V@32 °F (0 °C) 750 A

COOLING SYSTEM

Seawater pump	Gear driven
Max. seawater pump suction lift	3.0 m(10ft)
Seawater pump flow	339 L/m (93 US GAL)
Seawater temp maximum engine in	32 °C
Ambient temperature max.	50 °C

FUEL

Fuel recommended	EN 590 or ASTM D975
Fuel injection system	Unit Injection
Recommended fuel line Inside diameter	9 mm
Max. fuel Inlet Restriction	20 kPa
Total fuel flow	187 L/hr
Maximum fuel height above transfer pump	2.4 m
Fuel pre-filter yard supply	Min. 30 micron, recom. 10 micron

OPERATION REQUIREMENTS

AIR REQUIREMENTS

Engine combustion air	38 m3/min Max air
intake restriction(dirty)	6.25 kPa
Ventilation air flow required	62 m3/min
Exhaust flow	82.66 m3/min
Exhaust temperature	388°C
Maximum exhaust backpressure	7.5 kPa

FUEL CONSUMPTION

L/hr diesel fuel at % load	
100%	111

All above values at rated speed and power at standard conditions per SAE J1995 unless otherwise noted.

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ZENORO STANDARD FEATURES

- Engine marine white painted
- Single service side (oil filter, fuel filter & air filter)
- Double walled fuel lines + leak detection
- Steel foundation frame to support engine & Electrical Machine
- Integrated electrical ventilation fan
- Double pass air intake & outlet muffler boxes
- Approved vibration isolators
- Wet elbow through enclosure
- Emergency button
- ABS classification, other classification societies by option

STANDARD ENGINE SAFETY SYSTEM

- Engine oil pressure low warning & shutdown
- Engine coolant temperature high warning & shutdown
- Engine coolant level low warning
- Wet exhaust elbow temperature high warning & shutdown
- Fuel oil leakage from double walled fuel lines warning
- Over speed shutdown
- Belt guard

STANDARD INTERCONNECTIONS

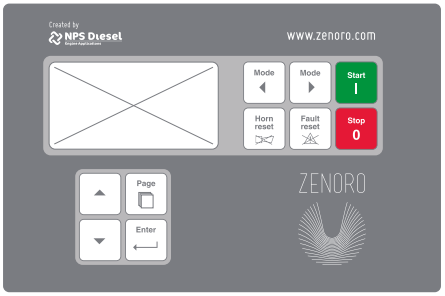
- Fuel connections, fuel inlet/outlet
- Seawater inlet pipe hose connection
- Seawater outlet via wet elbow
- Oil drain
- Opening for Electrical Machine leads
- Opening for battery cables

STANDARD HIGH QUALITY HEAVY DUTY SOUND ENCLOSURE

- High quality modular sound enclosure with aluminium extrusion profiles
- RAL 9010 standard color , 2 layers Powder coating, 70% gloss, minimum total layer thickness 120 micron measured according ISO 2808
- Easy built up & dismantle
- Heavy duty service panels, easily removable
- Non-combustible insulation material according IMO (oil & vapour proof)

ENGINE CONTROLLER PLATFORM FEATURES

- Certified Marine Engine Controller with redundant microprocessor based control for complete engine protection and control Certified Marine Engine



DISPLAY / USER INTERFACE

- Graphic 128 × 64 pixels display
- 2 languages, user changeable from PC; default English
- Buttons with mechanical feedback

COMMUNICATION INTERFACES

- Generator ready to start (pot. free contact)
- Engine running (pot. free contact)
- Common warning (pot. free contact)
- Common shutdown (pot. free contact)
- External Variable speed setpoint command
- Modbus (RS 232)

ENGINE CONTROL & PARAMETERS

- Engine fault code descriptions and codes
  Black out start, 3 start attempts
- Remote start & stop

Engine parameters are visualized on display and or Modbus RS 232 as:

- Engine running hours
- Oil pressure
- Rpm
- Battery voltage
- Engine status
- Coolant temperature
- Engine load %
- Fuel consumption

HISTORY LOGS

- Event based history (200 records)
- Reason, date and time + all important values are stored
- Battery backed-up RTC

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PERMANENT MAGNET MACHINE

Manufacturer	Randax
Pole number	8
Back-emf Voltage	440 V @ 2000 rpm
Rated Current	619 A
Winding connection	Star-inside
Efficiency	up to 97%
Min. PWM converter freq.	3 kHz
Coolant flow	12 L/min
Max. coolant temperature	45 °C
Insulation Class	H
Bearing	Double bearing design
Coupling	Flexible coupling
IP	55
Space heater*	2 x 65 W

*To be connected by yard

PERMANENT MAGNET MACHINE FEATURES

- Water cooled
- Interior Permanent Magnet design
- High efficiency
- Compact & low weight
- One insulated bearing and grounded shaft
- Pt100 temperature sensor and 2 x PTC thermistor per winding
- Configurable as one 3 phase winding or two galvanically separated 3 phase windings
- Permanently greased bearings

GENERAL

- Plastic wrap packing
- Manuals supplied in cd rom format with instruction, Operation and Maintenance Manual (in PDF format only)
- Factory Quality Report

OPTIONAL

- Dry exhaust + exhaust compensator with exhaust insulation
- Drip pan underneath oil & fuel filter(s)
- Engine coolant level low warning by Murphy gauge
- Engine oil temperature sensor warning & display
- Duplex fuel oil filter switchable
- Engine oil drain with hose & hand pump
- Sea water flow sensor
- Modbus converter for RS 485 protocol
- Optional Internet/Ethernet connection for remote monitoring
- Electric cable penetrations with Roxtec
- Outside muffler & water separator
- Other Classification societies as Lloyds, GL-DNV, RINA
- Unit certificates for certain notations
- Manuals in hard copy format
- Electrical Machine fitted with resolver or encoder
- Other Electrical Machine winding configuration to match different DC bus voltage level
- Integrated Electrical Machine cooling system with sea water heat exchanger

OPTIONAL EXHAUST AFTERTREATMENT SYSTEM

- XEAMOS DPF Soot filter with electrical or fuel burner regeneration
- IMO Tier 3 compliant emissions with XEAMOS SCR (Selective Catalytic Reduction) system or combined SCR & DPF system

REFERENCE CONDITIONS

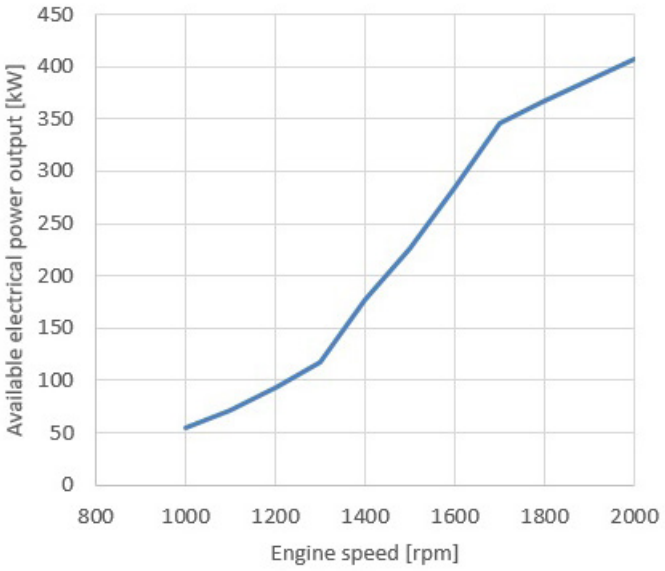
- Rated speed and power
- Gross Power guaranteed within +/-5% at SAE J1995 and ISO3046
- J1995 and ISO 1346 conditions
- 25 °C (77 °F)air inlet temperature
- 99 kPa (29.31 in. Hg) barometric pressure
- 40 °C (104 °F) fuel inlet temperature
- 0,853 fuel specific gravity @ 15 °C (60 °F)

Ambient air temperature is defined to be the temperature of ambient air close to operating vessel that is not influenced at any manner by operating characteristics of the vessel (free field temperature).

All values from current available data. Subject to manufacturing and measurement variations and to change without notice. Actual performance is subject to application and operation conditions outside of Zenoro control.

RATINGS

Propeller-law-operated main or auxiliary engine. Suitable for applications that typically operate between 2,000-4,000 hours per year and have load factors up to 55 percent with respect to the rated genset output. This rating is for applications that use full power for no more than 4 hours out of each 12 hours of operation. Certified according to ISO 8178 E3 test cycles.



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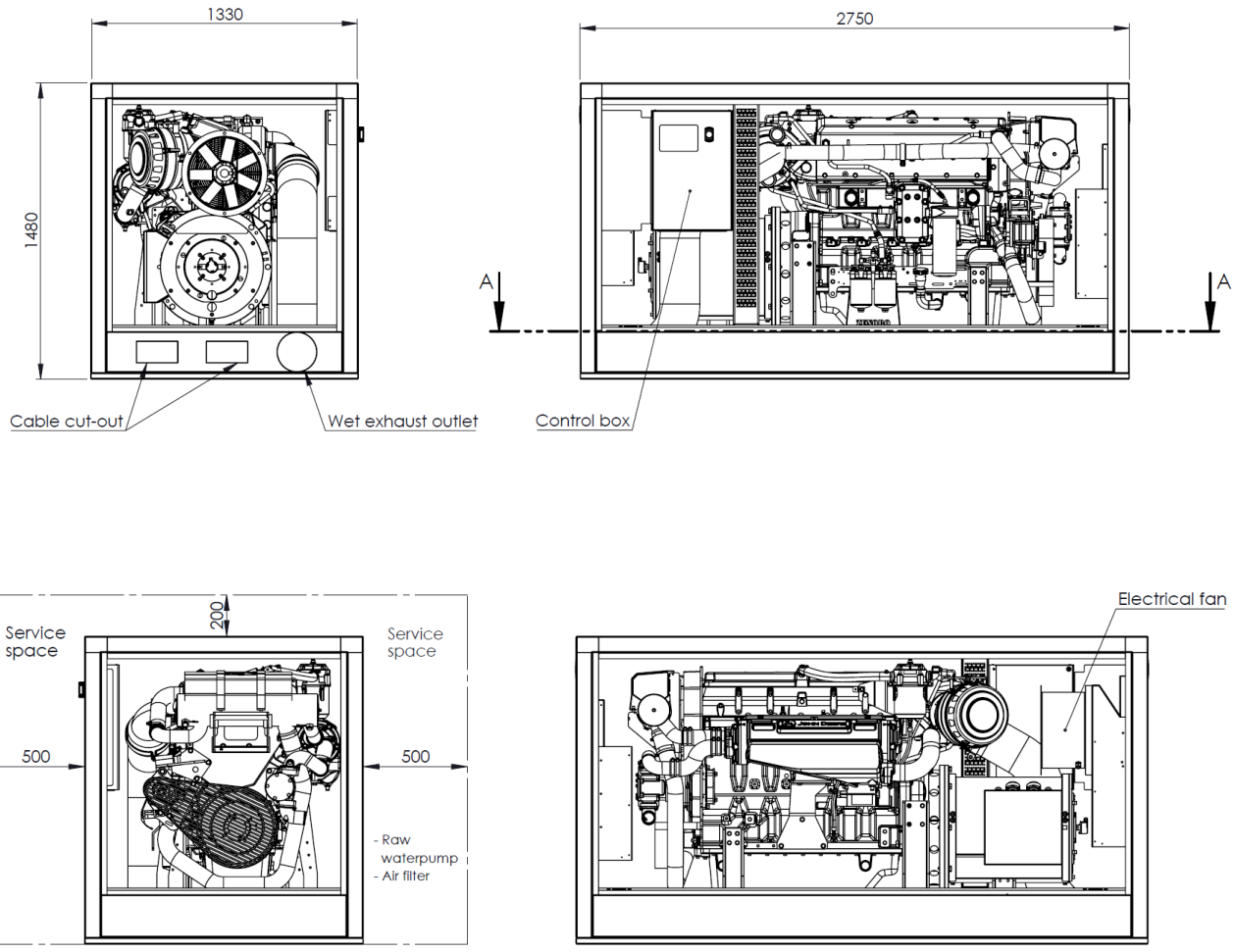
DIMENSIONS



NOTE: This drawing is provided for reference only and is not intended for installation purpose.
Contact us either your local distributor for detailed information

ZENORO | De Hammen 1 | 5371 MK Ravenstein | The Netherlands | +31 (0)486 201 600 | info@zenoro.com | www.zenoro.com

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Hybrid