

# 16CM32C

## Offshore Production Generating Set

7,680 kWe (9,600 kVA) • 60 Hz @ 720 rpm

7,680 kWe (9,600 kVA) • 50 Hz @ 750 rpm



### Engine Specifications

#### 16CM32C, 4-Stroke-Cycle-Diesel

Emissions .....	IMO Tier II
Bore .....	320 mm (12.60 in.)
Stroke .....	460 mm (18.1 in.)
Displacement .....	592 L (36,126 cu. in.)
Aspiration .....	Turbocharged-Aftercooled
Governor .....	Electronic
Rated Speed	
60 Hz .....	720 rpm
50 Hz .....	750 rpm
Module Weight, net dry (approx) .....	140 t (308,647.2 lb)
Rotation (from flywheel) .....	Counterclockwise
System Capacity	
Cooling System .....	2,900 L (766 gal)
Lube Oil System (refill)	
8,000 kW .....	8,800 L (2,325 U.S. gal)

### Features

#### Engine Design

- World-class reliability and durability  
– Incorporates years of proven component reliability and durability in marine industry
- Medium speed long-stroke engine design
- Ideal configuration for dynamically positioned semi-submersible rigs and drillships
- Compact cylinder head design
- Nodular cast-iron block with integrated ducts for lubricating oil and charge air
- Segmental camshaft design
- 25° tilt capability in all directions
- Engine design based on the higher requirements of heavy fuel oil
- High efficiency turbocharger
- Cylinder liner, only cooled outside the engine block
- Engine control terminal with analog instrumentation in robust cast casing
- Connecting rod, split-off design
- Compact module for lower valve drives and injection pump drives with cam followers
- Flexible Camshaft Technology (FCT), optional

#### Ease of Installation

- Standard modular design allows for ease of installation and reduced complexity
- Installation-friendly, due to pumps and filters installed on the engine
- Cooling water system with simple plug-in connections
- Full range of factory-installed engine attachments allows customization and reduction in installation time

#### Packaging Concept

- Assembled, tested, and validated as a package to minimize package vibration and maximize component life

#### Improved Serviceability

- Large inspection openings allow for convenient access to core engine internals for easier serviceability
- Core engine components designed for reconditioning and reuse at overhaul
- Worldwide dealer network with factory-trained technicians means that parts and support are never out of reach
- Simplified parts spectrum by using single-pipe exhaust gas ducting

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## Engine

- Motor-driven barring gear, fitted on engine
- Reversing contractor and pushbutton switch with cable
- Electronic speed setting equipment with actuator and speed pick-up
- Emergency shutdown equipment with pushbutton, separate, for manual emergency stop

## Engine Indicators

- Gauge board with set liquid damped pressure gauges for: fuel, lubricating oil, fresh water, starting air, and charge air.
- On-engine thermometers for fuel, lubricating oil, fresh water, and charge air
- Electric remote speed indicator
- Turbocharger and remote speed indicator
- Exhaust gas temperature indicator

## Control

- Manual control on engine, including: control panel with start/stop key, speed setting device, mechanical shutdown device, change over of control functions from engine to remote control
- Starting solenoid valve on engine, 24 V DC
- Separate electronic speed governor

## Monitoring for Unattended Operation

*Pressure switches, mounted on engine, for:*

- Lube oil pressure at full load below danger level
- Low lube oil pressure
- Lube oil pressure below danger level
- Lube oil pressure prelubrication failed
- Low fresh water pressure at engine inlet
- Fresh water pressure at engine inlet below danger level
- Low fresh water pressure in LT circuit
- Low starting air pressure
- Low control air pressure engine/shutdown air pressure
- Low fuel pressure at engine inlet

*Switches for:*

- High lube oil temperature at engine inlet
- Lube oil temperature at engine inlet above danger level
- High water temperature at engine inlet
- Water temperature at engine outlet above danger level
- High charge-air temperature at engine inlet
- Detection of water in charge-air duct
- Leak fuel level
- Alarm contact for high differential pressure at fuel filter
- Alarm contact for high differential pressure at lube oil back flushing filter
- Set of thermocouples after each cylinder, before and after turbocharger
- Crankcase oil mist detector

*Control Cabinet with housings for wall mounting, including:*

- Protection equipment designed for automatic and manual stop input signals, starting interlock input signals, monitoring for the wire break of the input signal units and the emergency shutdown solenoid
- Speed recording system for overspeed, firing speed and minimum speed
- Start/stop logic, controlled by engine automatic start (optional)
- Service hour counter
- Noris alarm system, cassette type, designed for alarm inputs for the engine including exhaust mean-value monitoring equipment as well as alarm inputs for the propulsion plant
- Group alarm panel for the bridge and with optional and acoustical alarm equipment

## Starting Air System

- Separate non-return valve for the starting air pipe to the engine

## Air Intake System

- Air intake filter, fitted on the turbocharger
- Air bottles, separate

## Diesel Oil System

- Separate circulating pump driven by electric motor, horizontal or vertical
- Duplex filter with differential pressure indication

## Exhaust System

- Turbocharger at free end with transition nozzle (0 degrees from the vertical and away from engine), with compressor cleaning device
- Expansion joint separate
- Separate silencer and spark arrester, unlagged 35 dB(A)

## Fresh Cooling Water System

- HT pump, fitted on engine
- LT pump, separate, vertical design, electric motor driven
- HT thermostat, not powered and separate
- Engine preheating equipment, fitted on base frame

## Lubricating Oil System

- Plate cooler, fitted on engine
- Force pump, fitted on engine
- Prelubrication pump, fitted on base frame, electric motor driven
- Boll and Kirch automatic backflushing filter, separate
- Duplex filter with differential pressure indication, separate
- Pressure control valve, fitted
- Thermostat, not powered, separate

## Connecting Parts – Engine

- Set of connecting parts between flange coupling and flywheel
- Flexible flange coupling between engine and generator
- Base frame with flywheel guard and incorporating lube oil sump tank, for engine and generator
- Mounting of engine and generator on the base frame
- Set of bonded rubber rails for resilient mounting of the base frame
- Set of flexible pipe connections

## Tools

- Set of tools for the engine including hydraulic tightening tools and nozzle tester
- Set of tools for turbocharger
- Inside micrometer for cylinder liners
- Ruler for cylinder liner

## Spare Parts

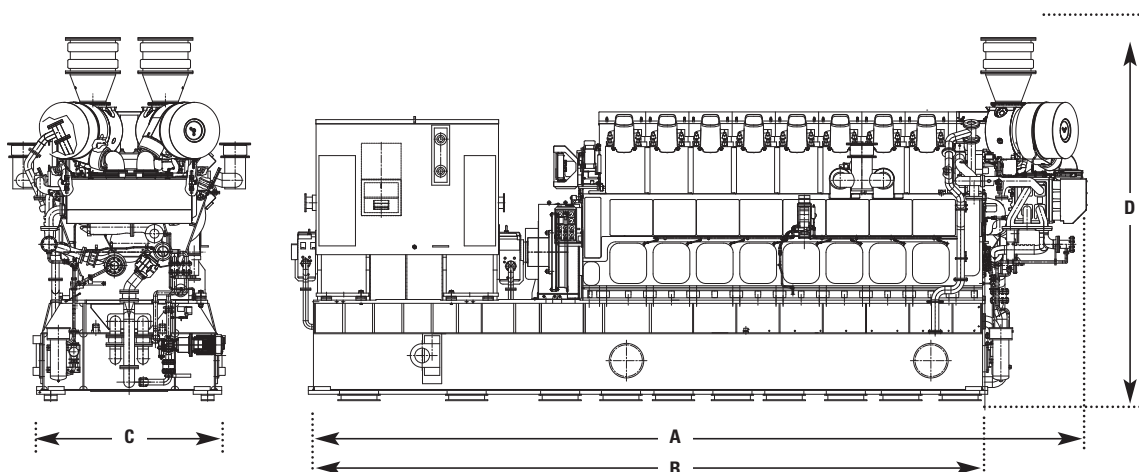
- Set of engine spare parts for unrestricted operation
- Set of spare flexible pipe connections



# Technical Data 16CM32C Offshore Production Generating Set

	60 Hz	50 Hz
<b>Engine Power</b>	8,000 kW (10,728 bhp)	8,000 kW (10,728 bhp)
<b>Generator Set Rating*</b>	7,680 kWe (9,600 kVA)	7,680 kWe (9,600 kVA)
<b>BMEP @ Rated</b>	22.5 bar (326.3 psi)	21.6 bar (313.3 psi)
<b>BSFC @ Rated</b>	178 g/kWh (0.292 lbs/bhp-hr)	179 g/kWh (0.294 lbs/bhp-hr)
<b>Maximum Allowable Fuel Temperature to Engine (MDO)</b>	25°C (77°F)	25°C (77°F)
<b>Air Demand</b> Based on 20°C Inlet Temperature and 101.3 kPa Inlet Pressure	46,135 m <sup>3</sup> /h (27,154 cfm)	47,050 m <sup>3</sup> /h (27,692 cfm)
<b>Maximum Allowable Air Temperature to Air Filters</b>	45°C (113°F)	45°C (113°F)
<b>Exhaust Flow</b> Based on 310°C Stack Temperature and 105 kPa Stack Pressure	57,020 kg/h (125,707 lbs/hr)	58,160 kg/h (128,221 lbs/hr)
<b>Maximum Allowable Backpressure</b>	3 kPa (12 in. H <sub>2</sub> O)	3 kPa (12 in. H <sub>2</sub> O)
<b>LT SCAC Heat Rejection</b>	501 kW (28,491 Btu/min)	650 kW (39,965 Btu/min)
<b>HT SCAC Heat Rejection</b>	2,732 kW (155,366 Btu/min)	2,875 kW (163,499 Btu/min)
<b>Maximum Charge Air Cooler (LT-stage) Inlet Temperature</b>	38°C (100°F)	38°C (100°F)
<b>JW Heat Rejection</b>	1,115 kW (63,409 Btu/min)	1,115 kW (63,409 Btu/min)
<b>Radiative Convective Heat Rejection</b>	347 kW (19,733 Btu/min)	347 kW (19,733 Btu/min)

\* Assumes 96% efficiency and a power factor of 0.8



Note: Do not use for installation design. See general dimension drawings for detail.

Package Dimensions		
<b>Length (A)</b>	12,060 mm	475 in.
<b>Length (B)</b>	10,510 mm	414 in.
<b>Width (C)</b>	3,000 mm	118 in.
<b>Height (D)</b>	5,661 mm	222.87 in.
<b>Package Weight (dry)*</b>	140 t	308,647 lb

\* Dependent on generator type

## Rating Definitions and Conditions

Engine Performance is corrected to inlet air standard conditions of 99 kPa (29.31 in. Hg) dry barometer and 25°C (77°F) temperature. These values correspond to the standard atmospheric pressure and temperature as shown in SAE J1995.

Performance measured using a standard fuel with fuel gravity of 35 degrees API having a lower heating value of 42,780 kJ/kg (18,390 BTU/lb) when used at 29°C (84.2°F) where the density is 838.9 g/L (7.001 lb/U.S. gal).

The corrected performance values shown for Cat® engines will approximate the values obtained when the observed performance data is corrected to SAE J1995, ISO 3046-2, ISO 8665, ISO 2288, ISO 9249, ISO 1585, EEC 80/1269, and DIN 70020 standard reference conditions.



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