PYROBAN®

C9 HazPak®

210 bkW ± 3% with fan
(282bhp ± 3% with fan)
2200 rpm

Image shown may not reflect actual engine configuration

CAT® PACKAGE SPECIFICATIONS

I-6, 4-Stroke-Cycle Diesel

Emissions	IMO Tier II, EPA Marine Tier 2, EPA non-road Tier 3
Peak Torque at Speed with fan	1391 N•m (1030.4 lb-ft) @ 1500 rpm
Bore	112 mm (4.4 in)
Stroke	149 mm (5.9 in)
Displacement	8.82 L (537.96 in^3)
Aspiration	Turbocharged-Aftercooled
Governor and Protection	Electronic ADEM™ A4
Package Weight, Net Dry (approx)	3480 kg (7673 lbs)
Capacity for Liquids	
Lube System (refill)	34 L (36 U.S. qts)
Cooling System	198 L (209 U.S. qts)
Oil Change Interval	250 hours
Rotation (from flywheel end)	Counterclockwise
Flywheel and Flywheel Housing	SAE No. 1
Flywheel Teeth	113 (SAE No. 1)

FEATURES

Improving Workforce Efficiency

- Standard factory certifications improve worksite safety
  - Class I Division 2 (NEC 500) engine only
  - Class I Zone 2 (NEC 505)
  - ATEX Directive (2014/34/EU) Group II Category 3G (Zone 2), Gas Group IIA and Temperature Class T3
- Electrical harness and connectors are certified as safe for Zone 2 and for protection against flame propagation
- Certified flameproof intake and exhaust systems to prevent any internal explosions from propagating to external atmosphere
- Industry-standard ADEM A4 control system improves operator interface
- Fully certified engine package for easy integration to additional certified components and systems
- Additional NEC/ATEX components available for auxiliary system monitoring
- Certified optional components for skid integration
  - Class 1 Division 2 alternator, Zone 2 ATEX-approved alternator, ATEX-approved battery packs, and belt-driven air compressor
  - ATEX/NEC certified air shut-off valve
  - Messenger display, hand throttle control, normal stop and emergency stop buttons

Making Your Investment Work Harder

- Optimized for demanding well service applications
  - Workover, pumping, cementing, blending, and acidizing
- Maintains high power over broad range of operating speeds, improving performance
- Steady torque rise provides superior load acceptance
- Optimized ambient and altitude capabilities for operating flexibility
  - Engine certified to maintain T3 skin temperatures for up to 45°C ambient applications

Emissions

- IMO Tier II, EPA Marine Tier 2, non-road Tier 3, EU Stage IIIA

Driving Down Total Cost of Ownership

- World-class reliability and durability
- Factory-certified packages reduce OEM's overall certification costs
- Improved serviceability versus the competition
- Industry-leading component overhaul life

Advanced Digital Engine Management

ADEM A4 control system provides integrated speed governing, alarms and shutdowns, and injection timing control. ADEM A4 has improved: user interface, display system, shutdown controls, and system diagnostics.

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STANDARD EQUIPMENT

Air Inlet System
Dry-type two element air filter with restriction indicator, separate circuit aftercooler with ATEX-approved air shutoff valve, inlet flame arrestor

Control System
Industry-standard ADEM A4 control system, inlet air shutoff valve for integration with supervisory safety system, electronic governing, automatic altitude compensation, power compensation for fuel temperature, programmable low and high idle and top engine speed limit, electronic diagnostics and fault logging, engine monitoring and protection system (speeds, temperature, pressure), J1939 broadcast (diagnostic, engine status and control), wiring suitable for Class 1 Zone 2 or ATEX Zone 2 areas

Cooling System
Cooling package designed for 45°C ambient capability; separate cooling circuit for aftercooler; offshore-capable radiators for jacket water and aftercooler circuits are manufactured using steel fabrications, galvanized solder-dipped cooling elements and all stainless steel nuts and bolts; water pumps are gear driven, centrifugal; engine-mounted fan with ATEX-compliant fan drive and guarding; all guards designed, manufactured, and fitted in accordance with the Machinery Directive 2006/42/EC.

Exhaust System
Exhaust gas cooler, plenum, and outlet box assembly; ATEX-compliant – designed to limit the exhaust gas and exhaust duct surface temperatures to T3 (200°C); exhaust gas flametraps suitable for Gas Group IIA; designed and tested in accordance with the recommendations of EN 1834 and EN 13463; wet and dry exhaust flexibles; ship-loose ATEX-compliant spark arresting muffler

Flywheel and Flywheel Housing
SAE No. 1 cast iron housing, industrial-style flywheel for SAE-1 housing, pilot bore for 80 mm diameter bearings, provides RH and LH starter pocket

Fuel System
Electronic unit injector; upward-angled fuel priming pump, primary filter and water separator; engine-mounted secondary fuel filter

General
Package ambient capability is -10°C to 45°C; designed for Gas Group IIA and temperature class T3 (200°C limit); engine and exhaust system fitted to sub-frame; air filter, fuel/water separator, remote oil filter installed and mounted; earth bonding per standard EN 60079-14

Lube System
Oil cooler, LH oil gauge, remote-mounted oil filters for easy service

OPTIONAL EQUIPMENT

Air Compressor
Bendix Tu-flo 550, belt-driven; two cylinder, single-stage, belt-driven, reciprocating with a rated displacement of 13.2 cfm at 1250 rpm; includes an
SAE "A" hydraulic pump drive 11T, pitch 16/32, drive ratio 1:1

Charging System
ATEX-certified deep discharge battery pack, 24V 55Ah

Control System
- Air, electric, or hydraulic shutdown system input options available
- *Throttle knob speed control* – ATEX-approved 24V operation; twist knob
- *Messenger display* – electronic display unit for monitoring key engine operation data and diagnostic information on a full graphic LCD screen
- *PCS2 control board* – provides supervisory safety system function and overspeed shutdown control; includes shipped loose start button, run/stop switch, emergency stop button for integration in customer control panel; switches and sensors for exhaust gas temperature, coolant temperature, oil pressure, and engine speed shutdowns; user configurable alarm and shutdown relay inputs
- *ExSCS* - a configurable PLC-based gas detection shutdown system, for the protection of offshore diesel engines operating in hazardous zone 2 area applications. The Ex SCS shutdown system will quickly and reliably trigger a safety shutdown on detection of a diesel engine over speed, high exhaust gas and coolant temperatures, low oil pressure, flammable gas detection in the engine air inlet and manual emergency stop activation.

  There are three variants of the Ex SCS shutdown system:
  - Ex SCS - FG (Fire & Gas)
  - Ex SCS - Single
  - Ex SCS - Twin

  All three variants have a touchscreen Human Machine Interface (HMI) that displays the current status of the safety shutdown system. The Ex SCS FG has the additional capability to monitor an infrared fire & smoke detection sensors and has a voltage free relay output signal for the activation of a 3rd party fire deluge system.

  The Ex SCS Single, enables the system to be applied to single engine applications. The Ex SCS Twin enables the system to be applied to twin engine applications.

Fuel System
Fuel cooler, installed, maintains acceptable fuel temperature when running from day tank

Starting System
Pneumatic and hydraulic starters

Paint
Offshore 3-coat epoxy paint system, 325 micron thickness

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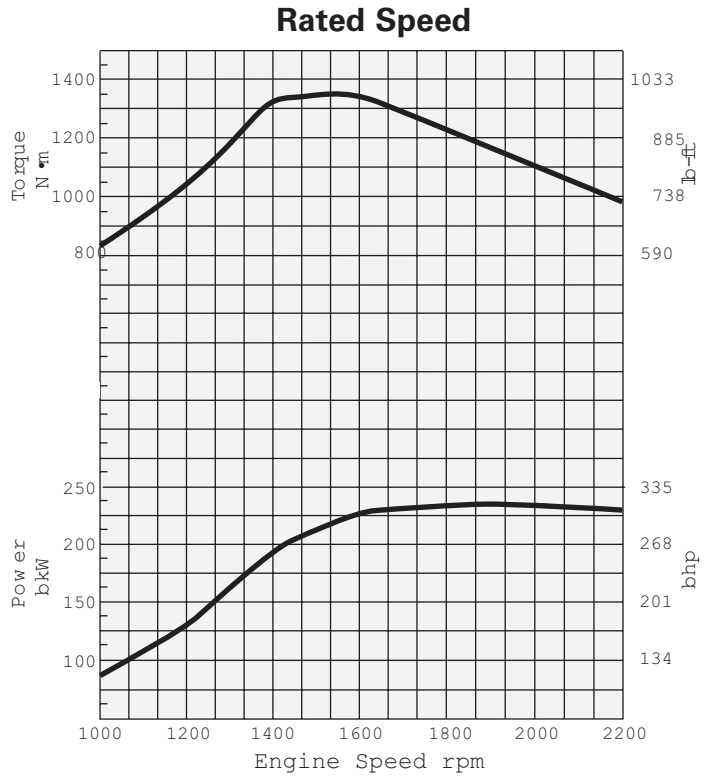
PERFORMANCE DATA

Turbocharged-Aftercooled — 2200 rpm



Performance Data				
Engine Speed rpm	Engine Power		Engine Torque	
	bkW	bhp	N•m	lb-ft
2200	227	304.4	985	726.7
2100	231	309.1	1048	773.1
2000	234	313.4	1116	823.0
1900	237	317.3	1189	877.1
1800	234	314.1	1243	916.4
1700	231	309.2	1295	955.1
1600	226	302.6	1347	993.2
1500	219	294.3	1397	1030.4
1400	196	262.9	1337	986.3
1300	157	211.1	1156	852.9
1200	129	172.5	1024	754.9
1100	107	143.0	926	682.7
1000	87	116.6	830	612.5

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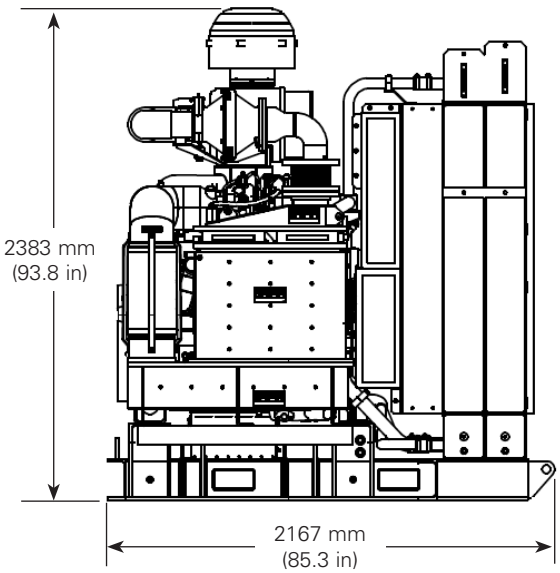
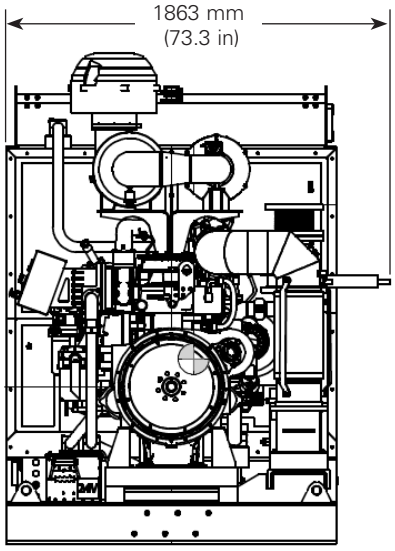
DIMENSIONS

RIGHT SIDE VIEW



FRONT VIEW



DIMENSIONS*		
Length	mm (in)	2167 (85.3)
Width	mm (in)	1863 (73.3)
Height	mm (in)	2383 (93.8)
Package Weight	kg (lb)	3480 (7673)

*Maximum dimensions are shown. Dimensions may be less depending on option groups selected.