

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 .....	891 N•m (657 lb-ft) @ 1650 rpm
Bore .....	110 mm (4.3 in)
Stroke .....	127 mm (5 in)
Displacement .....	7.2 L (442 in <sup>3</sup> )
Aspiration .....	Turbocharged-Aftercooled
Governor and Protection .....	Electronic ADEM™ A4
Package Weight, Net Dry (approx) .....	3390 kg (7475 lbs)
Capacity for Liquids	
Lube System (refill) .....	34 L (36 U.S. qts)
Cooling System .....	144 L (152 U.S. qts)
Oil Change Interval .....	250 hours
Rotation (from flywheel end) .....	Counterclockwise
Flywheel and Flywheel Housing .....	SAE No. 1
Flywheel Teeth .....	156 (SAE No. 1)

### FEATURES

#### Improving Workforce Efficiency

- Standard factory certifications improve worksite safety
  - 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 fail- safe 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
- Optional Certified automatic engine shutdown system

#### 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

#### 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, air/fuel ratio controls, and injection timing. ADEM A4 has improved: user interface, display system, shutdown controls, and system diagnostics.

### STANDARD EQUIPMENT

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#### 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 (3.15 in), right side starter location

#### Fuel System

Electronic unit injector; fuel priming pump; primary fuel filter and water separator; engine-mounted secondary fuel filter; fuel sample valve mounted on filter base

#### 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

Dual oil level gauge, LH and RH front, positive lock; remote-mounted oil filters for easy service

### OPTIONAL EQUIPMENT

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#### Air Compressor

Bendix Tu-flo 550, belt-driven; two cylinder, single-stage, 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

24V 35A EX d ATEX-compliant alternator for Gas Group IIB, temperature class T3; heavy-duty, brushless; 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

#### Starting System

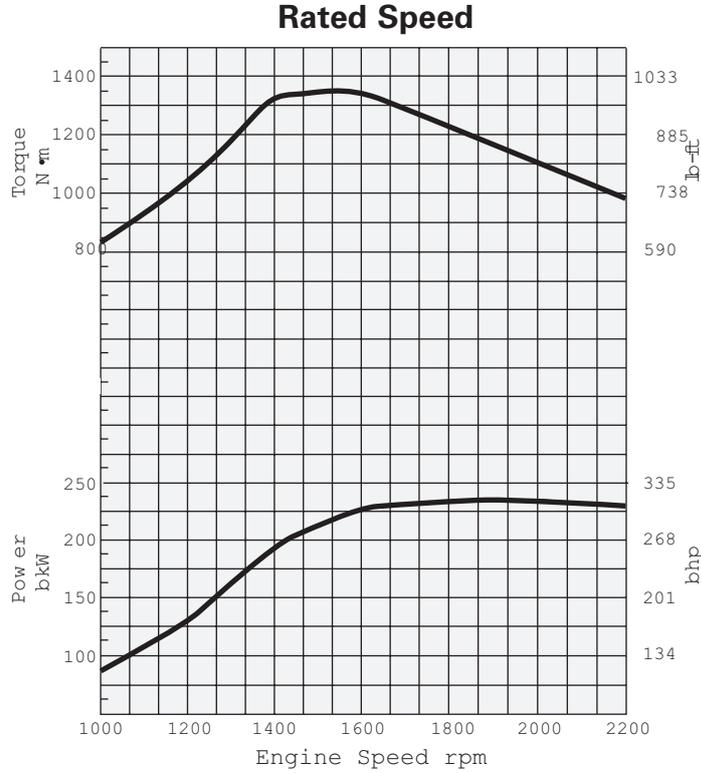
Pneumatic, electric, and hydraulic starters

#### Paint

Offshore 3-coat epoxy paint system, 325 micron thickness

## PERFORMANCE DATA

Turbocharged-Aftercooled — 2200 rpm (with fan)



Performance Data				
Engine Speed rpm	Engine Power		Engine Torque	
	bkW	bhp	N·m	lb-ft
2200	158	211.2	684	504.2
2100	157	210.7	714	527.0
2000	159	213.3	760	560.2
1900	160	214.7	805	593.4
1800	160	214.7	850	626.6
1700	156	208.6	874	644.4
1650	154	206.4	891	656.9
1500	125	167.8	797	587.7
1300	84	112.9	619	456.2
1100	67	90.3	585	431.3

## RATING DEFINITION

### C Rating (Intermittent)

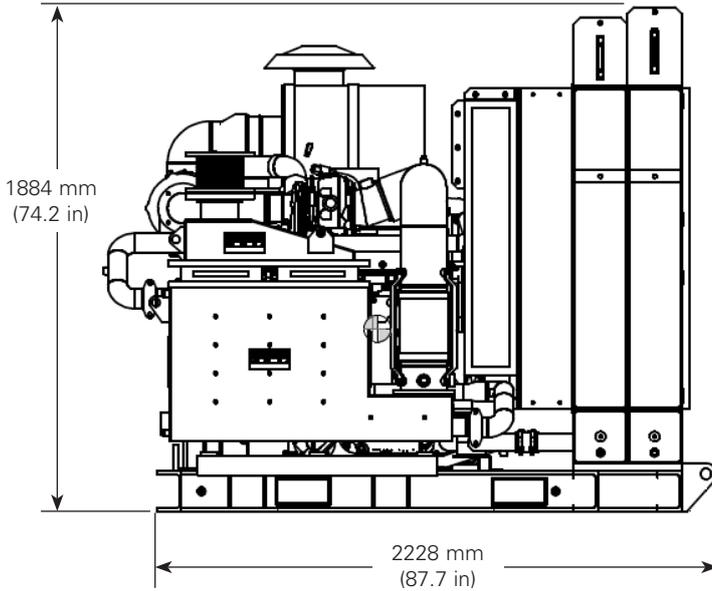
Intermittent service where maximum power and/or speed are cyclic. Typical service examples are: off-highway trucks, fire pump application power, oil field hoisting, nitrogen pumping, well service kill pumps, cementers, and electric drill rig power (also called Prime power). Typical load factor <70%.

### Engine Performance Diesel Engines – 7 liter and higher

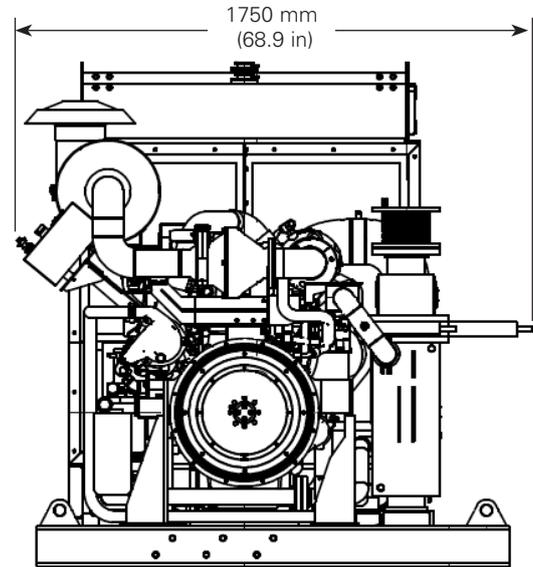
are based on SAE J1995, inlet air standard conditions of 99 kPa (29.31 in Hg) dry barometer and 25°C (77°F) temperature. Performance measured using a standard fuel with fuel gravity of 35° API having a lower heating value of 42 780 kJ/kg (18,390 btu/lb) when used at 29°C (84.2°F) with a density of 838.9 g/L.

## DIMENSIONS

**RIGHT SIDE VIEW**



**FRONT VIEW**



DIMENSIONS*		
Length	mm (in)	2228 (87.7)
Width	mm (in)	1750 (68.9)
Height	mm (in)	1884 (74.2)
Package Weight	kg (lb)	3390 (7475)

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