

ENGINE DATASHEET



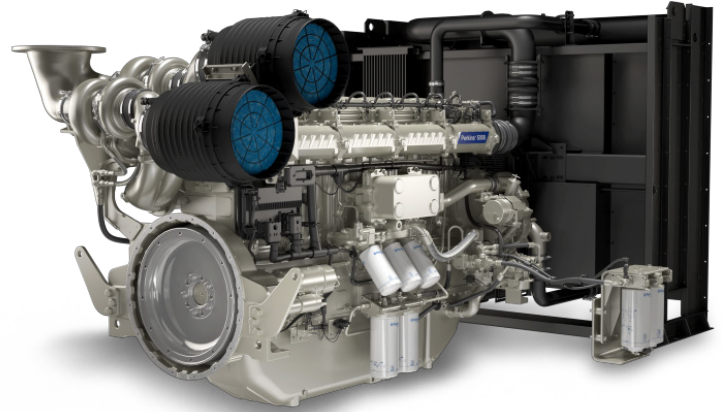
5008C-E30TAG Electric Power Engines

Power range 1800 rpm 907-1107 kW (engine gross power)

Emissions U.S. EPA Stationary Emergency-Use-Only (Tier 2)

The Perkins® 5008C-E30TAG has been designed to offer reliable power for the emergency standby and critical applications market, including data centres and hospitals among others.

Engineered and built specifically for the power generation market, the Perkins® 5000 Series is a power-packed engine range built to be dependable, versatile and offer lower emissions to meet regulatory standards.



Features and benefits

- The 5000 Series delivers **maximised productivity** through outstanding load acceptance, achieving NFPA110 Type 10 and ISO 8528-5 G2 and G3 performance class. The engine build and performance have been designed with ultimate productivity and dependability in mind, so customers can be confident that power will be available when required. They have been tested around the world, in the harshest environments, to deliver performance, no matter the conditions.
- A single point customer electronics connection supports **ease of integration and service accessibility** is provided from a single side with two year oil and fuel service intervals.
- Excellent oil consumption through dedicated piston, ring and liner assembly and improved fuel consumption deliver **low daily operating costs**.
- The 5000 Series utilises **advanced technology**, with full authority electronics, that easily integrate into the customer's chosen telematic solutions and are certified to U.S. EPA Tier 2 emission standards. We offer an optional closed crankcase ventilation system to reduce crankcase emissions further, if required.

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Specification

	Model	
	5008C-E30TAG4	5008C-E30TAG5
Configuration	Electro unit/ElectropaK	
Cylinders	8 vertical in-line	
Displacement, litres (in ³)	30.561 (1865)	
Aspiration	Turbocharged and air-to-air chargecooled	
Bore and stroke, mm (in)	160 x 190 (6.3 x 7.5)	
Combustion system	Direct injection	
Compression ratio	12.8:1	
Exhaust aftertreatment	N/A	
Rotation (viewed from flywheel)	Anti-clockwise, viewed from flywheel end	
Total lubricating oil capacity, litres (US gal)	153 (40.4)	
Cooling system	Watercooled	
Total coolant capacity, litres (US gal)	140 (37)	

Technical information

Model	Speed	Type of Operation	Engine Power		Typical Generator Output* (Net)		DCP Fuel Consumption			
			Gross	Net			ESP	DCP	75%	50%
	rpm		kWm (hp)	kWm (hp)	kVA	kWe	g/kWh	g/kWh	g/kWh	g/kWh
5008C-E30TAG4	1800	DCP	907 (1215)	853 (1143)	1012	810	210	218	227	218
		ESP	1001 (1342)	947 (1269)	1125	900				
5008C-E30TAG5	1800	DCP	1001 (1342)	947 (1269)	1125	900	209	211	226	221
		ESP	1107 (1485)	1053 (1412)	1250	1000				

*Generator powers are typical and based on typical alternator efficiencies and a power factor (cos θ) or 0.8.

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Standard equipment

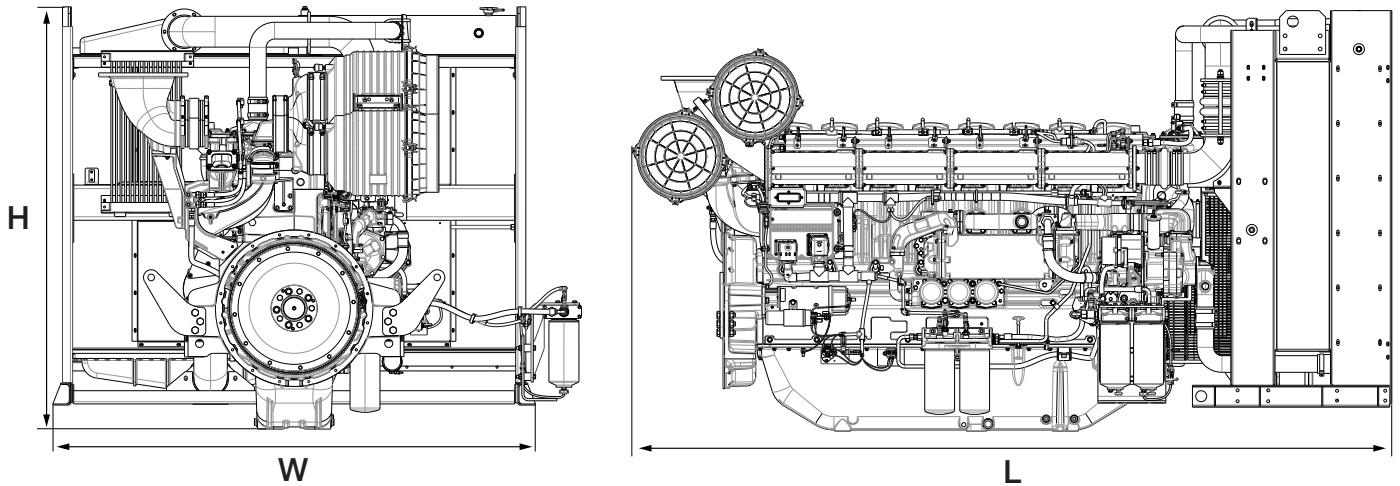
	Model	
	5008C-E30TAG4	5008C-E30TAG5
Electro unit or ElectropaK	Both	
Radiator fitted	Loose	
Fuel filter, engine mounted	✓	
Water separator	N/A	
Fuel priming pump (manual/electric)	Electric	
Fuel cooler (not required for most installations)	✓	
Air filter, engine mounted	✓	
Engine ECM, engine mounted	✓	
Wiring harness to ECM	✓	
Wiring harness (all connectors to single customer interface)	✓	
Starter motor	✓	
Battery charging alternator	✓	
Flywheel housing	✓	
Flywheel	✓	
Fan	✓	
Fan guard	✓	
Temp and oil pressure for automatic stop/alarm configurable	✓	

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Engine package weights and dimensions



	Model	
	5008C-E30TAG4 / 5008C-E30TAG5	
Configuration	ElectropaK	Electro unit
Dimensions, H x L x W, mm (in)	1919 x 3469 x 2194 (75.6 x 136.6 x 86.4)	1746 x 2717 x 1574 (68.7 x 107 x 62)
Dry weight, kg (lb)	4360 (9612)	3342 (7368)

Emergency standby power (ESP): Limited to 200 hours usage per year with an average load factor of 80 percent of the published ESP rating over each 24 hour period.

Data Centre Power (DCP): Power available for variable or continuous electrical loads in a data centre application. Up to 100 percent load factor is permitted for unlimited time. An overload of 10 percent permitted for 1 hour in every 12 hours of operation. DCP power definition relies on ISO8528-1 2018 standard to be followed by generator set manufacturer, and will support Tier I to Tier IV classifications of data centres as per UPTIME institute guidelines.

5008C-E30TAG5

1107 kW Gross @ 1800 rpm

Electropak

5000

Series

Basic technical data

Number of cylinders 8
Cylinder arrangement Inline
Cycle 4 stroke
Induction system Twin turbocharged, aftercooled
Compression ratio 12.8:1
Bore 160 mm
Stroke 190 mm
Displacement 30.56 litres
Direction of rotation (viewed from flywheel) Anticlockwise
Firing order (cylinder 1 furthest from flywheel) 1, 4, 7, 6, 8, 5, 2, 3

Weight of Electropak

Dry (estimated) 4360 kg
Wet (estimated) 4530 kg

Overall dimensions of Electropak

Height 1919 mm
Length 3469 mm
Width 2194 mm

Centre of gravity of Electropak

Wet, forward from rear of block 900 mm
Wet, above centre line of block 140 mm

Moments of inertia (mk²)

Engine rotational components (excluding flywheel) 7.04 kgm²
Flywheel and starter ring 6.59 kgm²

Operation

Steady state stability at constant load ISO 8528-5 Class G3
Cyclic irregularity for standby engine (110%) 1:193

Emissions capability

Emissions certification EPA Tier 2

Notes:

- Perkins maintains ISO9001:2000 certified quality management systems for engine test facilities to assure accurate calibration of test equipment
- all data based on operation to ISO 3046-1:2002 standard reference conditions
- for engines operating at increased ambient temperature and/or altitude conditions please refer to the relevant derate tables
- all data is subject to a tolerance of ±5% in addition to the stated power delivery tolerance
- unless otherwise stated all measurements and limits are quoted for Standby power conditions
- please refer to the relevant Operation and Maintenance Manual (OMM) for engine servicing details including coolant, fuel, oil and Diesel Exhaust Fluid (DEF) requirements where applicable
- for additional product information please contact Perkins Applications Engineering

Optional document version control

This document should be used as reference guide for installation purposes and where required can be submitted as part of business tender submissions. The table below may be used upon request to validate that this Technical Data Sheet is the latest version available.

Project name/tender name	Date	Perkins authorised sign

General installation

Designation	Units	Type of application	
		60Hz @ 1800 rpm	
		DCP	ESP
Gross engine power output	kW	1001	1107
Gross BMEP	kPa	2184	2415
Mean piston speed	m/s	11.4	
Nett mechanical power output	kW	947	1053
Combustion air flow	m ³ /min	78.7	83.1
Exhaust gas temperature at turbocharger outlet	°C	516	524
Exhaust gas flow at conditions stated above	m ³ /min	197.7	210.6
Overall thermal efficiency (gross)	%	39.9	40.4
Typical generator set electrical output (0.8pf)	kWe	900	1000
	kVA	1125	1250
Assumed alternator efficiency	%	95	95

Reference conditions for technical data

Air temperature 25°C
Barometric pressure 101.3 kPa

Relative humidity 35%
Fuel temperature (inlet pump) 40°C

Energy balance¹

Designation	Units	Type of application	
		60Hz @ 1800 rpm	
		DCP	ESP
Energy in fuel	kWt	2510.4	2742.4
Energy in power output (gross)	kW	1001	1107
Energy to cooling fan and battery charging alternator	kWm	54	
Energy to exhaust ²	kWt	941.6	1015.3
Energy to charge air	kWt	229.3	252.8
Energy to coolant radiator	kWt	288.2	308.8
Energy to radiation (atmosphere) ³	kWt	50.3	58.5

Rating definitions

Data Centre Power (DCP)⁴

Power available for variable or continuous electrical loads in a Data Centre application. Up to 100 percent load factor is permitted for unlimited time. An overload of 10 percent permitted for 1 hour in every 12 hours of operation. DCP Power definition relies on ISO8528-1 2018 standard to be followed by generator set manufacturer, and will support Tier I to Tier IV classifications of Data Centres as per UPTIME institute guidelines.

Emergency standby power (ESP)

Limited to 200 hours annual usage with an average load factor of 80 percent of the published Standby power rating over each 24-hour period. No overload is permitted.

Footnotes:

1. Data included in the energy balance table should not be used for combined heat and power (CHP) purposes.
2. Not to be utilised for heat recovery, does include energy input from combustion air.
3. Includes heat rejected to fuel via return to tank flow.
4. All Data Centre projects must be approved by Perkins, prior to tender submission. Project details must be submitted to Perkins sales representative to obtain approval.

Cooling system

ElectropaK coolant capacity (with radiator)	140 litres
Engine coolant capacity (without radiator)	48 litres
Maximum top tank temperature	98°C
Maximum static pressure head on pump	70 kPa
Coolant temperature rise across engine	8°C
Thermostat operation range (closed to fully open)	83 to 93°C
Water temperature switch or alarm setting	103°C

Specifications	Units	60 Hz @ 1800 rpm
Engine coolant flow at maximum restriction	litres/min	660
Engine coolant circuit - maximum allowed restriction	kPa	20
Charge air cooler restriction at full load (maximum)	kPa	10
Compressor outlet temperature at standard 25°C test condition	°C	199
Compressor outlet pressure at standard 25°C test condition	kPa	252
Charge air cooler outlet temperature at standard 25°C test condition	°C	50

Radiator

Radiator face area	2.6 m ²
Core material	Aluminium
Fins per inch	12
Width of matrix	1936 mm
Height of matrix	1347 mm
Weight of radiator	940 kg
Pressure cap setting	70 kPa

Fan type

Fan type	Mechanical, fixed
Configuration	Pusher
Diameter (tip to tip)	1250 mm
Number of blades	9
Material	Composite
Drive ratio	0.8:1

Duct allowance

	Units	60 Hz @ 1800 rpm		
		0	120	200
Duct allowance ⁵	Pa	0	120	200
Ambient clearance ⁶	DCP	°C	54	52.5
	ESP			
Resultant minimum airflow	m ³ /sec	17.7	16.7	16.3

Fuel system

Fuel injection pump	Unit injection
Fuel injector type	MEUI
Filtration media size	4 µm
Fuel lift pump type	Mechanical
Maximum low-pressure system fuel flow rate	840 litres/hr
Maximum low-pressure system pressure	750 kPa
Pressure measured at tertiary outlet	670 kPa
Maximum fuel temperature at rail	58 °C
Fuel return flow rate to fuel cooler	814 litres/hr
Governor type	Electronic
Fuel cooler included ⁷	Yes

Fuel specification

Recommended fuel conformity	ASTM D975 1D & 2D
Maximum sulphur in fuel limit	15 ppm

Fuel consumption⁸

DCP load condition %	1001 kW @ 1800 rpm
	DCP g/kWh
ESP	209
100	211
75	226
50	221

Load acceptance⁹

The engine speed governing complies with the requirements of classification 3 and 4 of ISO 8528-12 and to G2 and G3 operating limits stated under ISO 8528-5.

Footnotes:

- Maximum additional cooling airflow restriction.
- Ambient clearance allows for 5°C rise above ambient temperature at fan.
- Where fuel cooler is provided, component details can be found on GA drawing.
- For conversion to litres/hr use the following formula with the correct fuel density:

$$\frac{\text{SFC (kg/kWh)}}{\text{Fuel density (kg/litre)}} \times \text{Power (kW)} = \text{Fuel Consumption (litres/hr)}$$
- Please contact Perkins Applications Engineering for any further information.

Lubricating system

Total system capacity

Maximum sump capacity (maximum dipstick mark)	153 litres
Minimum sump capacity (minimum dipstick mark)	127 litres
Maximum oil temperature (continuous operation)	105°C
Maximum oil temperature (intermittent operation)	110°C

Lubricating oil

Relief valve opening pressure	300 kPa
Minimum oil pressure	200 kPa
Oil pressure at maximum no load speed	460 kPa
Oil flow at rated speed	3.7 litres/min
Oil consumption	0.12% of fuel
Oil grade	15W/40

Maximum engine operating angles

Front up, front down	5°
Right side up, right side down	10°

Induction system

Maximum air intake restriction (clean filter)	2.5 kPa
Maximum air intake restriction (dirty filter)	3.8 kPa
Maximum temperature rise to air filter	5°C
Air filter type	Dry
Number of air filters	2

Exhaust system

Number of exhaust outlets	1
Exhaust outlet diameter	406 mm
Exhaust outlet flange size and type	8x diameter 22 holes equally spaced on 356 mm PCD
Maximum back pressure at post turbine	10 kPa

Electrical system

Alternator output voltage	24 V
Alternator output current	55 amps
Starter motor input voltage	24 V
Starter motor power draw	8.2 kW
Number of teeth on flywheel	190
Number of teeth on starter pinion	12
Minimum average cranking speed	140 rpm
Engine stop method	Electronic

Engine mounting

Maximum static bending moment at rear face of block	1356 Nm
Maximum additional load applied to flywheel due to all rotating components	650 kg

Cold start recommendations¹⁰

Minimum starting temperature	Engine oil grade	Minimum battery cold cranking amps with block heaters
		CCA
°C		
-10	API C14 15W/40	2 x 12V x 810A
Maximum battery cold cranking amps (CCA)	API C14 15W/40	2 x 12V x 1400A

Footnotes:

10. Cold cranking amps as per SAEJ537.

Noise data

Noise data of the ElectropaK, this excludes exhaust outlet noise except where specifically stated, measured in a semi-anechoic environment. Measurements taken in accordance with ISO 6798-1:2020.

ElectropaK

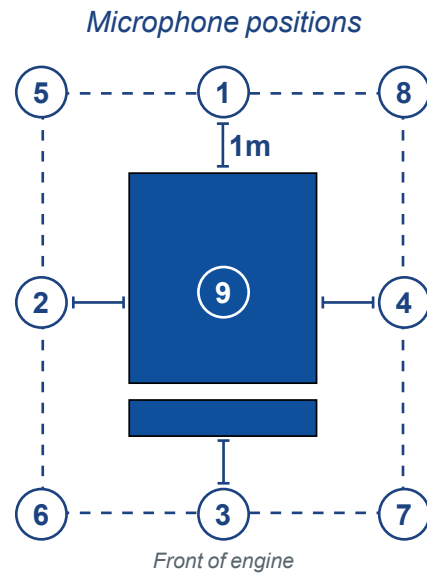
Average sound pressure level ^{11,12} (L _{pA}) at 1m (dBA)
60 Hz @ 1800 rpm
117.2

Raw exhaust outlet noise level at turbocharger outlet

Exhaust sound power level ¹³ (L _{WA}) (dBA)
60 Hz @ 1800 rpm
128.1

Sound distribution around ElectropaK

Position (reference diagram)	Sound pressure level (L _{pA}) at 1m (dBA)
	60 Hz @ 1800 rpm
1	116.9
2	114.7
3	116.9
4	119.8
5	112.7
6	113.8
7	119.0
8	118.7
9	117.5



Footnotes:

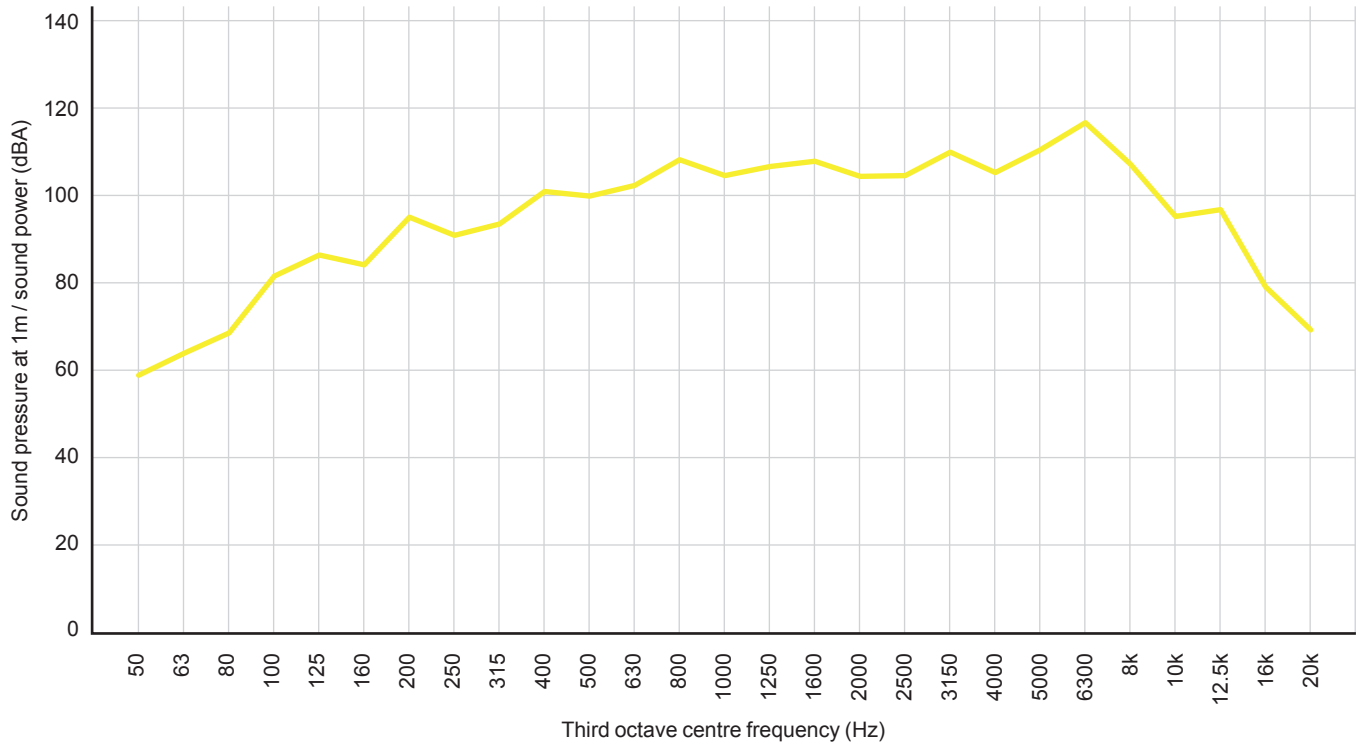
11. Sound pressure reference level: 20 µPa.
12. Average 1m sound pressure level to sound Power conversion add 15.1 dB.
13. Sound power reference level: 1pW.

Spectral data

1/3 Octave sound data for the ElectropaK and exhaust outlet noise level at turbocharger outlet.

	Third octave centre frequency (Hz)																										
	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8k	10k	12.5k	16k	20k
ElectropaK noise L _{pA} at 1m dBA 60 Hz at 1800 rpm	58.9	63.7	68.2	81.2	86.4	84.1	94.3	90.7	93.4	100.2	99.6	102.0	107.8	104.6	106.4	107.6	104.8	104.6	109.1	105.2	109.9	116.1	1107.1	94.9	96.4	79.0	69.4

Sound spectra



ElectropaK noise L_{pA} at 1m dBA
60 Hz at 1800 rpm