

ENGINE DATASHEET



2806C-E18TAG/TTAG Electric Power Engines

Power range 1500 rpm 532-584 kWm (engine gross power)

Power range 1800 rpm 568-821 kWm (engine gross power)

Emissions EU Stage II/ EPA Tier 2



The Perkins 2800 Series is a family of well-proven 6 cylinder 18 litre in-line diesel engines, designed to address today's uncompromising demands within the power generation industry with particular aim at the standby market sector. Developed from a proven heavy-duty industrial base, the engine offers superior performance and reliability.

The 2806C are parallel turbocharged and air-to-air charge cooled, 6 cylinder diesel engines of 18 litres capacity. Their premium features provide economic and durable operation, low gaseous emissions and advanced overall performance and reliability.

Features and benefits

- Developed and tested using the latest engineering techniques and finite element analysis for high reliability, low oil usage and low wear rates. High compression ratios also ensure clean rapid starting in all conditions **maximising productivity**.
- Exceptional power to weight ratio and compact size give allows **easier installation**, smaller canopy and cost effective transportation as compared to larger engines. Common engine core allows same mounting locations to lower canopy design cost whilst serving multiple markets.
- Mechanically operated unit fuel injectors with electronic control combined with carefully matched turbocharging give excellent fuel atomisation and combustion with optimum economy to deliver lower **cost of ownership**.
- Throughout the entire life of a Perkins engine, we provide access to genuine OE specification parts and service. We give 100% reassurance that you receive the very best quality for **lowest possible cost** wherever your Perkins powered machine is operating in the world. Robust engine design results in long service intervals which result in **lowest maintenance cost**.
- Through an experienced global network of distributors and dealers, fully trained engine experts deliver total service support around the clock, 365 days a year. They have a comprehensive suite of web based tools at their fingertips covering technical information, parts identification and ordering systems, all dedicated to **maximising the productive life** of your engine.
- Perkins takes pride in manufacturing all products globally to the same **high quality standard**. All of our products are manufactured in world class facilities to ensure highest quality for your peace of mind.

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Specification

	2806C-E18TA/TTA			
	TAG1A	TAG3	TTAG6	TTAG7
Configuration	ElectropaK			
Cylinders	6 vertical in-line			
Displacement, litres (in ³)	18.1 (1104)			
Aspiration	Parallel turbocharged and air-to-air chargecooled			
Bore and stroke, mm (in)	145 x 183 (5.7 x 7.2)			
Combustion system	Direct injection			
Compression ratio	14.5:1		14.0:1	
Exhaust aftertreatment	N/A			
Rotation (viewed from flywheel)	Anti-clockwise, viewed on flywheel			
Total lubricating oil capacity, litres (US gal)	62 (16.4)		68 (18)	
Cooling system	Watercooled			
Total coolant capacity, litres (US gal)	61 (16.1)		110 (29)	

Technical Information

Model	Speed	Type of Operation	Engine Power		Typical Generator Output* (Net)		Prime Fuel Consumption			
			Gross	Net			110%	100%	75%	50%
	rpm		kWm (hp)	kWm (hp)	kVA	kWe	g/kWh	g/kWh	g/kWh	g/kWh
2806C-E18TAG1A	1500	Prime	532 (713)	514 (689)	591	473	205	216	214	212
		Standby	584 (783)	565 (758)	650	520				
	1800	Prime	568 (762)	543 (728)	625	500	207	206	212	226
		Standby	623 (835)	598 (802)	687	550				
2806C-E18TAG3	1500	Prime	540 (724)	522 (700)	600	480	204	203	211	221
		Standby	584 (783)	565 (758)	650	520				
	1800	Prime	618 (829)	592 (794)	681	545	209	211	217	230
		Standby	678 (909)	652 (847)	750	600				
2806C-E18TTAG6	1800	Prime	716 (960)	685 (919)	813	650	212	212	212	215
		Standby	785 (1053)	754 (1011)	895	716				
2806C-E18TTAG7	1800	Prime	747 (1002)	716 (960)	850	680	208	210	215	214
		Standby	821 (1101)	790 (1059)	938	750				

*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

	2806C-E18TA/TTA			
	TAG1A	TAG3	TTAG6	TTAG7
Electro unit or electropaK	ElectropaK	ElectropaK	ElectropaK	ElectropaK
Radiator fitted	✓	✓	✓	✓
Fuel filter, engine mounted	✓	✓	✓	✓
Water separator	✓	✓	✓	✓
Fuel priming pump (manual/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	✓	✓	✓	✓

Photographs are for illustrative purposes only and may not reflect final specification.
 All information in this document is substantially correct at time of printing and may be altered subsequently.
 Final weight and dimensions will depend on completed specification.
 Information subject to selected configuration, and subject to change without notice.

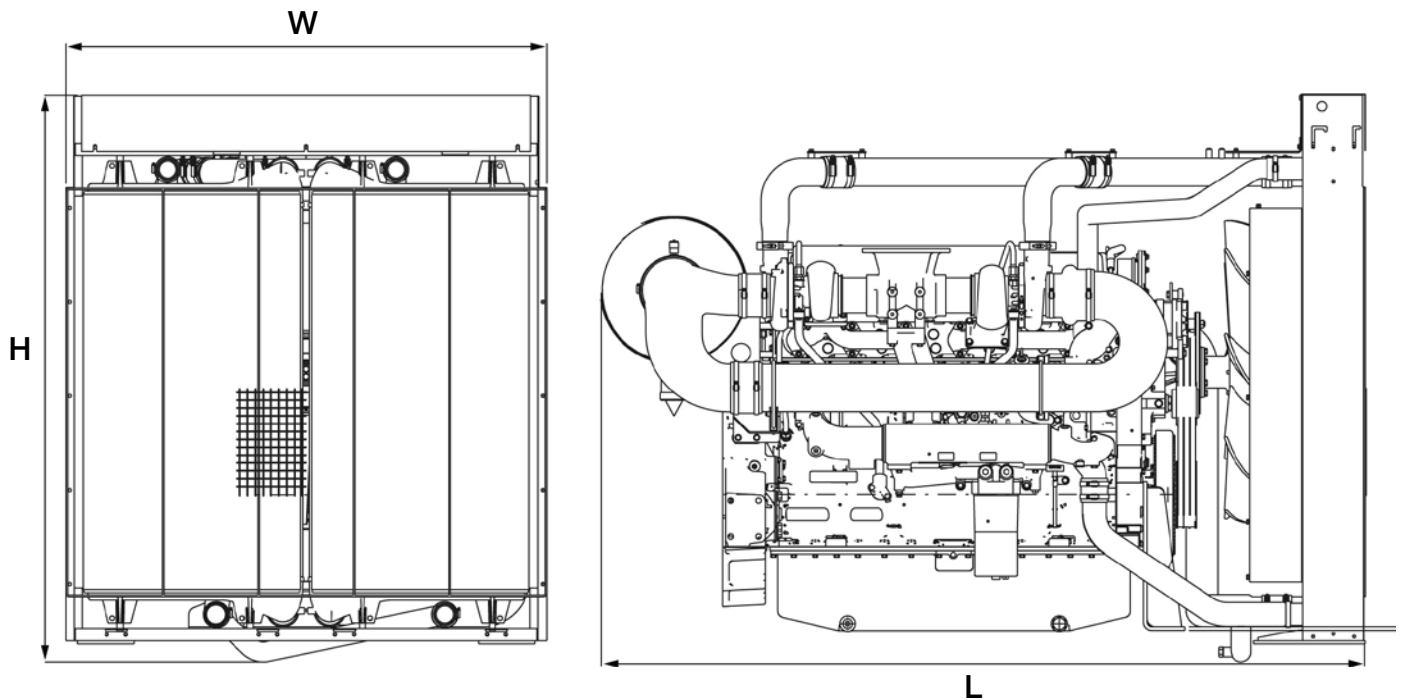
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Engine Package Weights and Dimensions



	2806C-E18TA/TTA			
	TAG1A	TAG3	TTAG6	TTAG7
Configuration	ElectropaK			
Dimensions, H x L x W, mm (in)	1808 x 2545 x 1536 (71 x 100 x 60)		2126 x 2538 x 1691 (84 x 100 x 67)	
Dry weight, kg (lb)	2050 (4520)		2361 (5206)	

Prime power: Power available at variable load in lieu of a main power network. Overload of 10% is permitted for one hour in every 12 hours of operation.

Standby (maximum): Power available at variable load in the event of a main power network failure. No overload is permitted.

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2806C-E18TTAG7

2800

821 kWm (Gross) @ 1800rpm

Series

Basic technical data

Number of cylinders	6
Cylinder arrangement	Vertical inline
Cycle	4 stroke
Induction system	Turbocharged, air-to-air charge cooling
Compression ratio	14:1
Bore	145 mm
Stroke	183 mm
Displacement	18.1 litres
Direction of rotation (when viewed from flywheel)	Counter clockwise
Firing order (number 1 cylinder furthest from flywheel)	1, 5, 3, 6, 2, 4

Weight of ElectropaK

Dry (estimated)	2361 kg
Wet (estimated)	2477 kg

Overall dimensions, ElectropaK

Height	2126 mm
Length	2538 mm
Width	1691 mm

Centre of gravity, ElectropaK

Forward from rear of block (dry)	607 mm
Above crankshaft centre line (dry)	238 mm

Moments of inertia

Engine rotational components	1.67 kgm ²
Flywheel	1.92 kgm ²

Cyclic irregularity for engine standby power

At 110%	0.201
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Ratings

Steady state speed capability at constant load	<1.5%
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Performance

Average sound pressure level for bare engine Without inlet and exhaust at 1 metre	104.3 dB(A)
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Note: All data based on operation to ISO 3046/1:2002 standard reference conditions.

Note: For engines operating in ambient conditions other than the standard reference conditions stated below, a suitable derate must be applied.

Note: Derate tables for increased ambient temperature and/or altitude are available, please contact Perkins Applications Department.

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	30%
Air inlet restriction at maximum power (nominal)	5 kPa
Exhaust back pressure at maximum power (nominal)	8.5 kPa
Aftercooler restriction at maximum power (nominal)	12 kPa
Fuel temperature (inlet pump)	40°C
All ratings certified to within	±3%

General installation

Designation	Units	1800 rpm	
		Prime power (60 Hz)	Standby power (60 Hz)
Gross engine power	kWb	747	821
Gross BMEP	kPa	2776	3053
Mean piston speed	m/s	11	
ElectropaK nett engine power	kW	716	790
Engine coolant flow against 95 kPa restriction	litres/min	485	
Combustion air flow	kg/h	4607	4744
Combustion air flow (air inlet)	m ³ /min	69	71
Exhaust gas flow (maximum) at atmospheric pressure	m ³ /min	157	166
Exhaust gas temperature (turbo out maximum)	°C	469	492
Overall thermal efficiency	%	37	37
Typical generator set electrical output (0.8 pf 25°C)	kWe	680	750
	kVA	850	938
Assumed alternator efficiency	%	95	

Energy balance

Designation	Units	1800 rpm	
		Prime power (60 Hz)	Standby power (60 Hz)
Energy in fuel	kWt	2024	2211
Energy in power output (gross)	kWb	747	821
Energy to cooling fan	kWM	31.5	
Energy in power output (nett)	kWM	716	790
Energy to aftercooler	kWt	267	284
Energy to coolant and oil	kWt	210	229
Energy to radiation	kWt	124	137
Energy to exhaust	kWt	677	741

Cooling system

Total coolant capacity

ElectropaK (with radiator)	109.5 Litres
ElectropaK (without radiator)	20.8 Litres
Maximum top tank temperature	97°C
Maximum static pressure head on pump	125 kPa
Temperature rise across engine	3°C
Maximum permissible external system resistance (60Hz)	95 kPa
Thermostat operation range	81°C to 92°C

Radiator

Radiator face area	1.496 m ²
Material and number of rows	1 Row, Aluminium
Material and fins per inch	8.5
Width of matrix	1651 mm
Height of matrix	1610 mm
Pressure cap setting	103 kPa

Fan

Type	Pusher
Diameter	1142 mm
Number of blades	6
Material	Composite
Drive ratio (60 Hz)	0.8:1
Airflow at rated speed (60 Hz)	899 m ³ /min

Recommended coolant

Recommended coolant: 50% anti freeze/50% water.

For details of recommended coolant specifications, please refer to the Operation and Maintenance Manual (OMM) for this engine model.

Duct allowance

Maximum additional restriction to cooling airflow and resultant minimum airflow		
Ambient clearance 50% Glycol	Duct allowance (Pa)	m ³ /sec
60 (Hz)	60 (Hz)	60 (Hz)
51	125	15

Fuel system

Type of injection	Unit injection
Fuel injection pump	Not applicable
Fuel injector	MEUI
Nozzle opening pressure	38 MPa
Maximum particle size	2 microns
Fuel lift pump type	Mechanical
Flow	420 litres/hr
Pressure	700 kPa
Maximum suction head	27 kPa
Maximum static pressure head	3.7 m
Maximum fuel temperature at lift pump inlet	79°C
Maximum fuel filter service interval	500 hours
Governor type	Electronic
Speed control conforms to	ISO 8528-5 class G3 steady state

Fuel specification

USA Fed Off Highway

Europe Off Highway

Note: For further information on fuel specifications and restrictions, refer to the OMM fuels section for this engine model.

Fuel consumption

Power rating %	747 kWm @ 1800 rpm Prime	
	g/kWh	litres/hr
25	230	59
50	214	100
75	215	146
100	210	189
110	208	205

Cold start recommendations

Minimum battery cold cranking amps

Minimum starting temperature	Grade of engine lubrication oil	SAEJ537 Cold Cranking amps	Starting Aids
-0°C	15W-40	1400	None
-5°C	15W-40	1400	Jacket Water Heater to 45°C
-10°C	15W-40	1400	Jacket Water Heater to 45°C
-15°C	0W-30	1400	Jacket Water Heater to 45°C
-20°C	0W-30	1400	Jacket Water Heater to 45°C
-25°C	0W-30	1400	Jacket Water Heater to 45°C

Notes:

- for cable sizes see applications and installation manual
- jacket water heater needed below 0°C

Lubrication system

Total system capacity

Minimum oil capacity in sump	56.0 litres
Maximum oil capacity in sump	68.0 litres
Maximum oil temperature (continuous operation)	97°C
Maximum oil temperature (intermittent operation)	110°C

Lubricating oil pressure

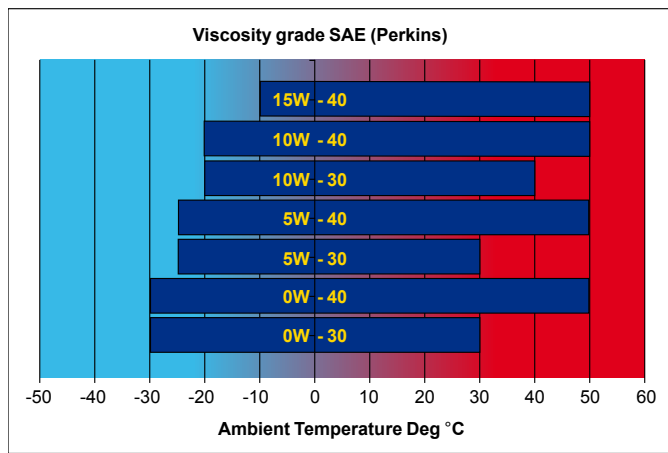
Relief valve opens	620 kPa
Minimum oil pressure	275 kPa
At maximum no-load speed	420 kPa
Oil flow at rated speed (1500 rpm)	209 litres/min

Maximum engine operating angles

Front up, front down, right side or left side	7°
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Recommended SAE viscosity

A multigrade oil which conforms to API-CH4 must be used, see illustration below:



Induction system

Maximum air intake restriction

Clean filter	3.7 kPa
Dirty filter	6.2 kPa
Air filter type	Dry/paper

Exhaust system

Exhaust outlet size	139.7 mm
Minimum back pressure	Not applicable
Maximum back pressure	10 kPa

Electrical system

Alternator	50 amps/24 volts
Starter motor	9 kW/24 volts
Number of teeth on the flywheel	113
Number of teeth on starter pinion	12
Engine stop method	Ground switch

Engine mounting

Maximum static bending moment at rear face of block	287.9 Nm
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Load acceptance

The figures below comply with the requirements of classification 3 and 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5.

Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank)		
Description	Unit	60 Hz
% of Prime power		49
Transient frequency deviation	%	10.00
Frequency recovery	sec	2.6

The figures shown in the table above were obtained under the following test conditions:

Engine block temperature	42°C
Ambient temperature	17°C
Governing mode	0%
Alternator inertia	10.41 kgm ²
Under frequency roll off (UFRO) point set to	59.8 Hz
LAM on/off	Off

All tests were conducted using and engine installed and services to Perkins Engines Company Limited recommendations.