

1104D-44TG1

64.0 kWm (Gross) @ 1800 rpm

Electropak

1100

Series

Basic technical data

Number of cylinders	4
Cylinder arrangement	In-line
Cycle	4 stroke
Induction system	Turbocharged
Combustion system	Direct injection diesel
Compression ratio	18,2:1
Bore	105.0mm
Stroke	127.0 mm
Cubic capacity	4,4 litres
Direction of rotation	Anticlockwise when viewed from flywheel
Direction of rotation	Clockwise when viewed from front
Firing order (number 1 cylinder furthest from flywheel)	1, 3, 4, 2
Estimated total weight of Electropak (dry)	474 kg

Overall dimensions

-height, including radiator support brackets	967 mm
-length, front of radiator to rear of air cleaner	1238 mm
-width	637 mm

Moments of inertia (mk²)

Engine rotational inertia (excluding, pulley, flywheel)	0.132 kgm ²
Crank pulley inertia (dependant on option code)	Refer to ESM
Flywheel inertia (dependant on option code)	1.2 kgm ²

Centre of gravity - Electropak

Forward from rear of block - wet	227.2 mm
Above crankshaft centre line - wet	160.4 mm
Offset to RHS of crankshaft centre line - wet	8.1 mm

Performance

Note: All data based on operation to ISO 3046-1:2002 standard reference conditions.

All ratings certified to within	+ 5%
Speed variation at constant load	+ 0,25%
Cyclic irregularity @ 110% stand-by power @ 1800 rpm	0.0118

Test conditions

-air temperature	25 °C
-barometric pressure	100 kPa
-relative humidity	31.5%
-air inlet restriction at maximum power (nominal)	5 kPa
-exhaust back pressure at maximum power (nominal)	15 kPa
-fuel temperature (inlet pump)	40 °C

Sound level

Average sound pressure level for Electropak... 106.5 dB(A)
If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

Emissions statement:

Certified against the requirements of EPA legislation for non-road mobile machinery, powered by constant speed engines (Tier 3).

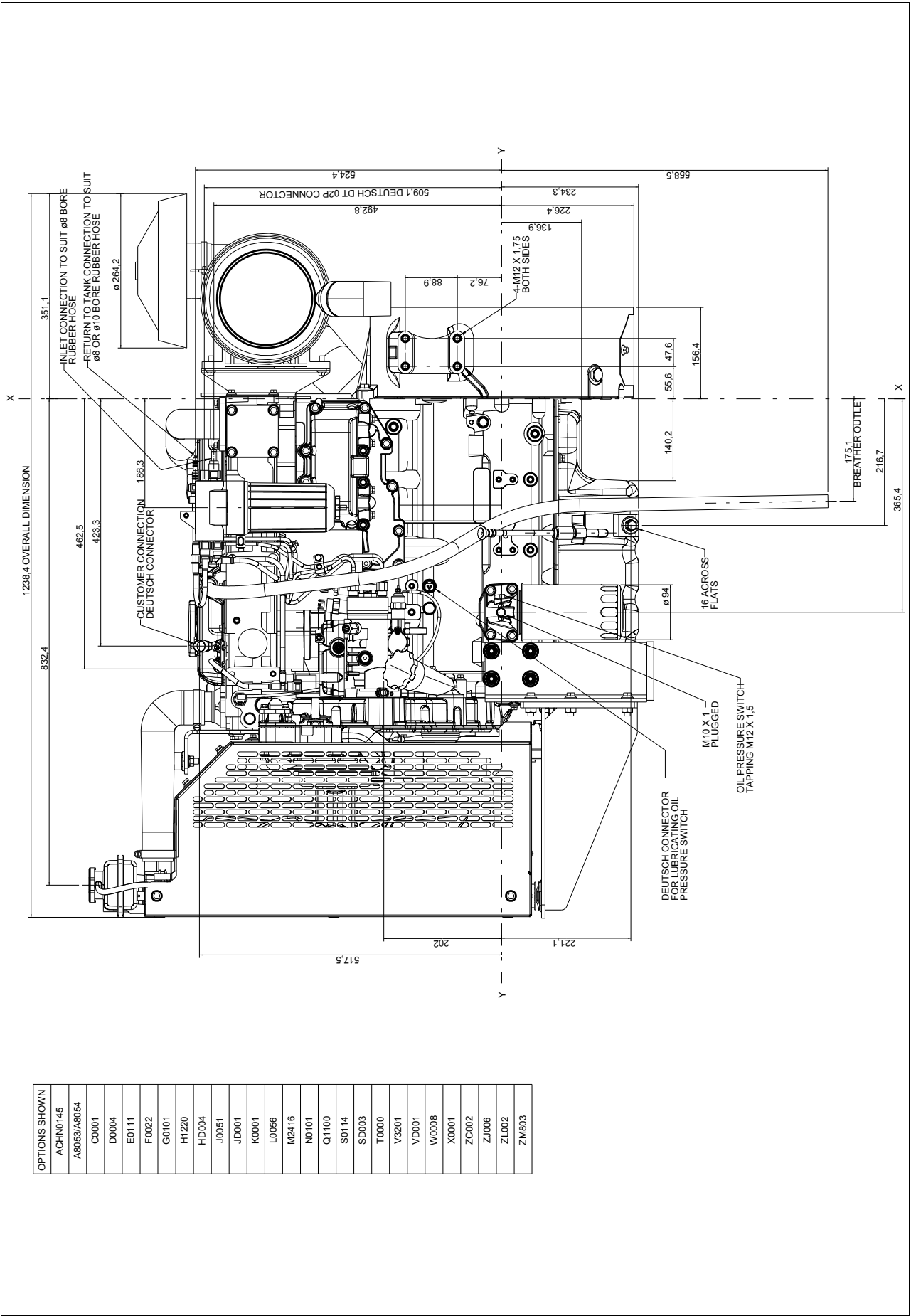
General installation

Designation	Units	1800 rpm
		Standby
Gross engine power (sales power)	kWm	64.0
Fan and battery charging alternator power	kW	TBA
Radiator core resistance	kPa	35
Fan power absorption	kWm	1
Net engine power	kWm	63
Brake mean effective pressure	kPa	971
Inlet air flow volume - wet	m³/min	
Exhaust gas flow - wet	m³/min	13.7
Exhaust gas temperature (ex. Manifold / turbo outlet)	°C	571
Overall thermal efficiency (net)	%	33
Assumed alternator efficiency	%	90.0
Regenerative power estimated	kW	TBA
Engine coolant flow - minimum against 35 kPa restriction	l/min	151
Typical GenSet electrical output (0.8pf)	kVA	70.9
	kWe	56.7

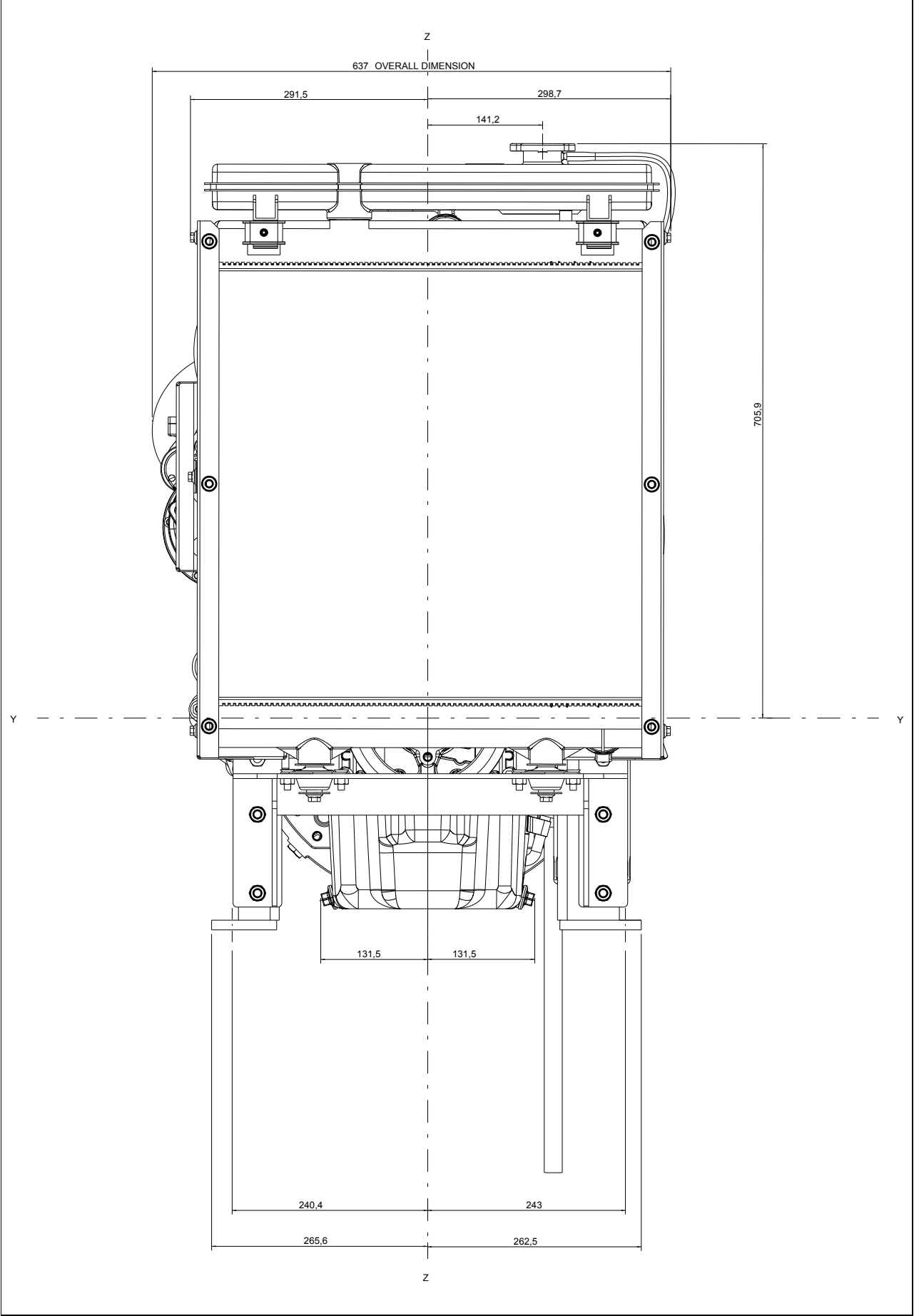
Energy balance

Designation	Units	1800 rpm
		Standby
Energy in fuel (fuel heat of combustion)	kWt	190.1
Energy to power (gross)	kWt	64.0
Energy to cooling fan pusher and battery charging alternator power	kWm	1
Energy to power (nett)	kWm	63
Heat rejection to radiator	kWt	46.1
Energy to exhaust	kWt	66.9
Energy to radiation	kWt	13.1

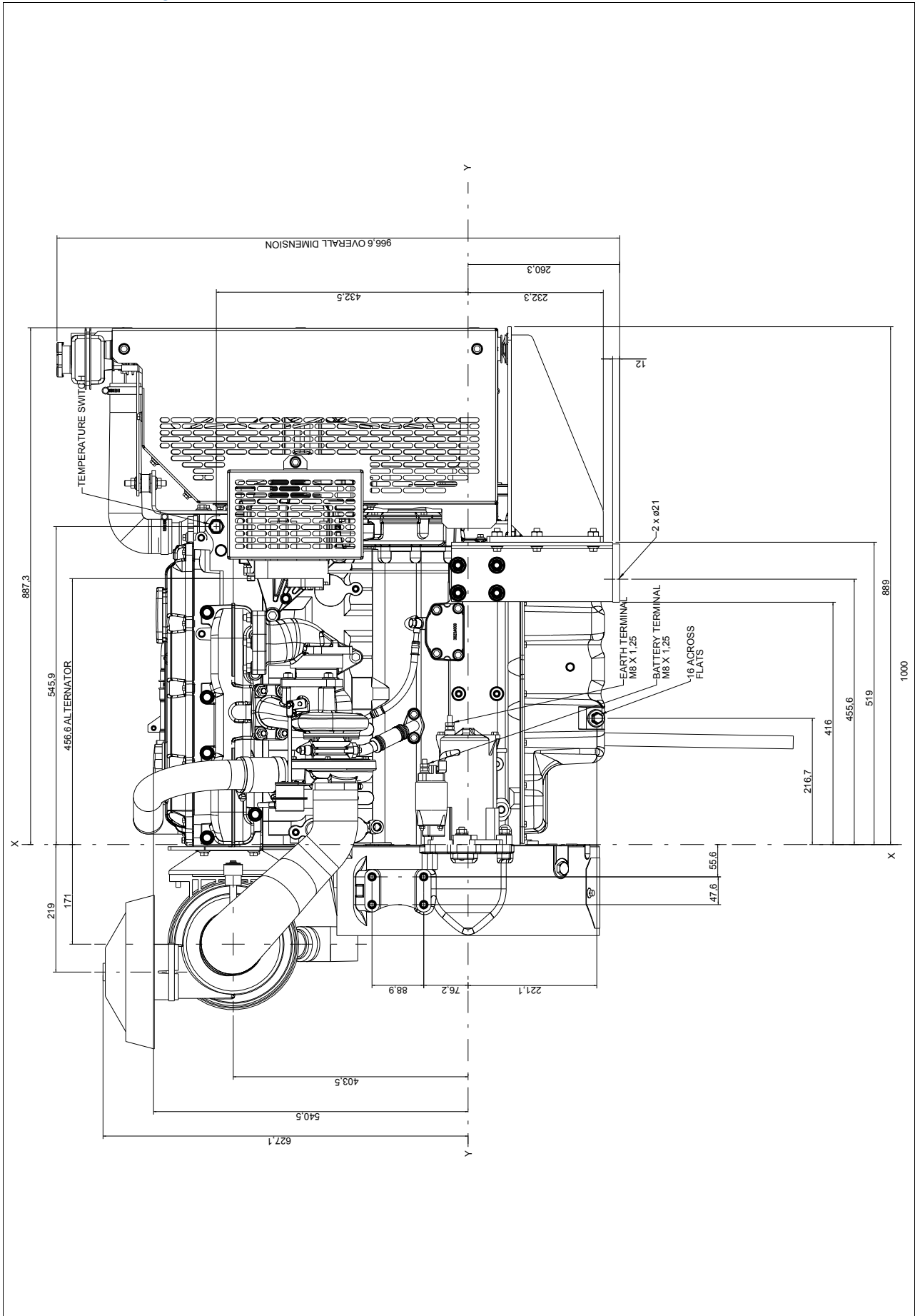
1104D-44TG1 - Left side view GAA0760



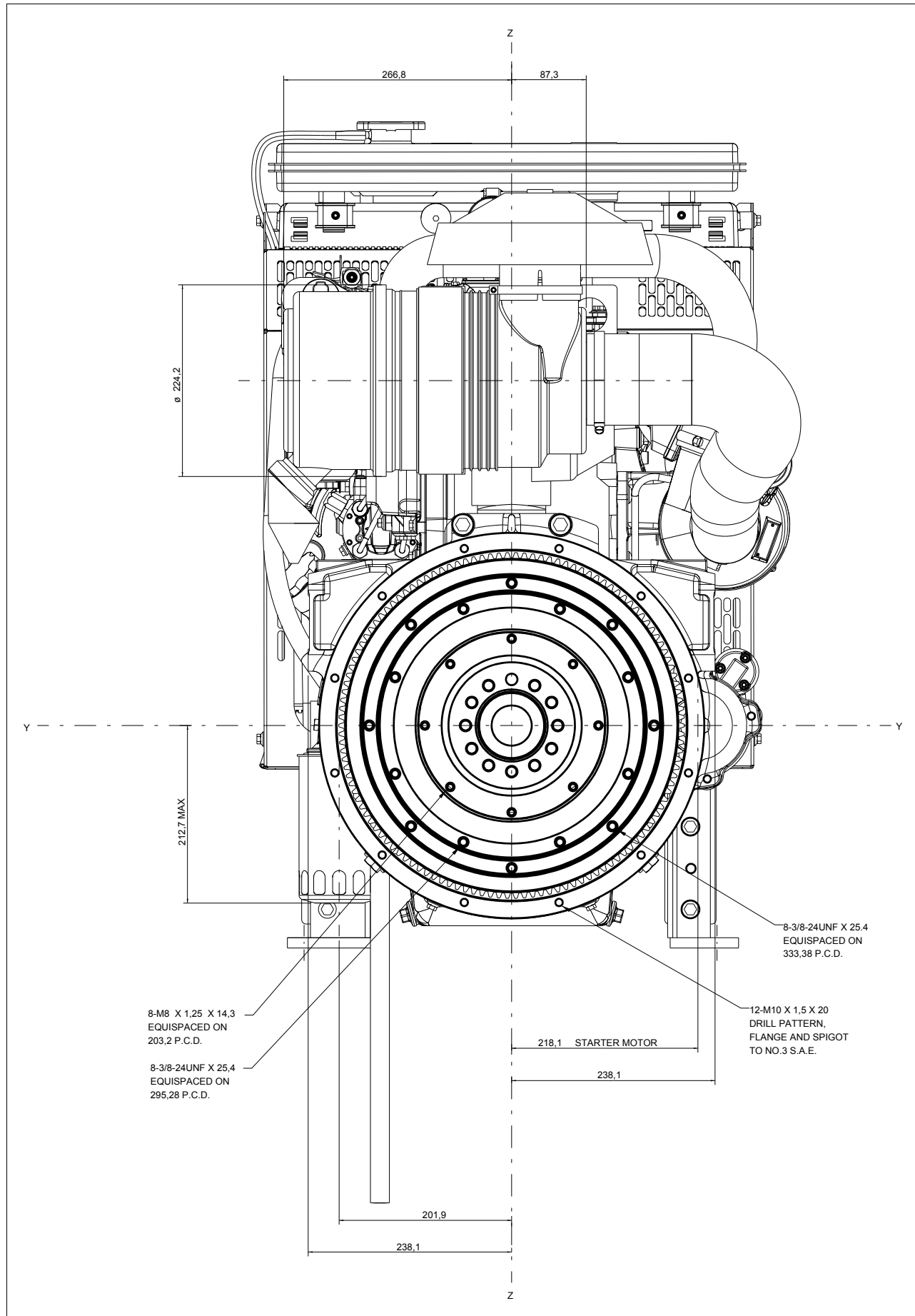
1104D-44TG1 - Front view GAA0760

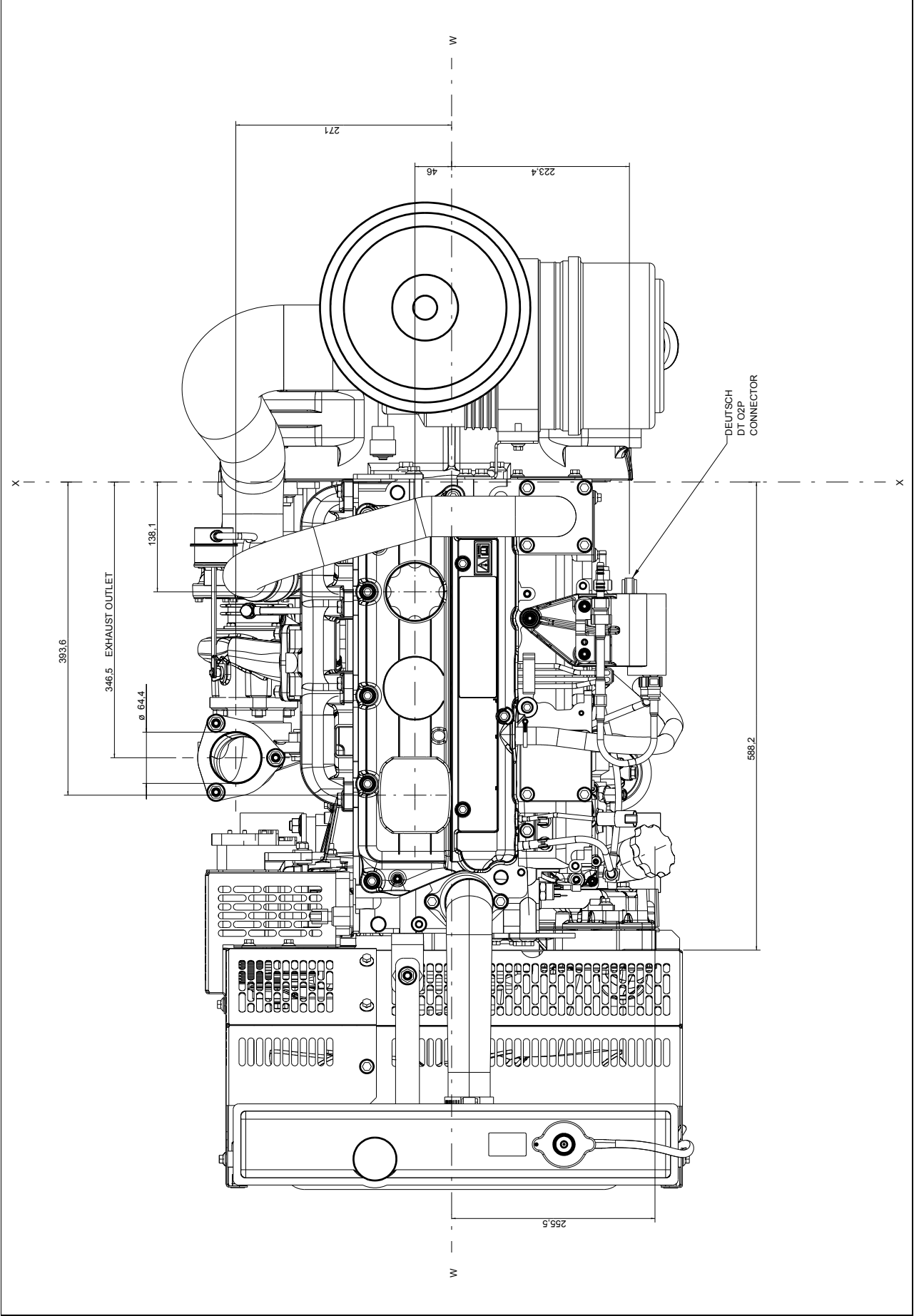


1104D-44TG1 - Right side view GAA0760



1104D-44TG1 - Rear view GAA0760





Cooling system

Cooling pack

Overall weight (wet)	71 kg
Overall face area	275834 mm ²
Width	550 mm
Height	762 mm

Radiator

Face area	275834 mm ²
Number of rows	2 rows, aluminium
Matrix density and material	12.7 fins/inch, Aluminium
Width of matrix	526.2 mm
Height of matrix	524.2 mm
Pressure cap setting	100.0 kPa

Fan

Type	Pusher
Diameter	457,2 mm
Drive ratio	1.25:1
Number of blades	7
Material	composite
Type	pusher
Cooling fan air flow @ 1800 rev/min	98,2 m ³ /min

Coolant

Total system capacity	16.5 litres
Bare engine capacity	7.0 litres
Maximum top tank temperature	112°C
Shutdown switch setting	118°C
Thermostat operation range	85 - 95°C
Temperature rise across engine (maximum)	6.6 - 7.0°C
Max. permissible external system resistance	35 kPa
Coolant pump drive	Gear driven
Coolant immersion heater rating (minimum)	0.75 kW

Recommended coolant

BS6580 - 1992, and ELC coolants to 1E1966

50% anti freeze / 50% water. For complete details of recommended coolant specifications, refer to the Operation and Maintenance Manual for this engine model.

Maximum additional restriction (Duct allowance) to cooling airflow and resultant minimum airflow.

Pusher

	Ambient clearance	Duct allowance	Cooling fan airflow	Radiator core resistance
Engine speed rpm	°C	Pa	m ³ /sec	Pa
1800	43	200	281	
1800	50	125	314	

Electrical system

Alternator	Unit	N0101
Alternator voltage	Volts	12
Alternator output	Amps	100

Starter	Unit	E0111
Starter motor voltage	Volts	12
Starter motor power	kW	4.0
Number of teeth on flywheel	(D0004)	126
Number of teeth on starter pinion		10
Minimum cranking speed	rpm	100 with glow plugs, 130 without glow plugs
Starter solenoid - Max. pull-in current @ -20°C	Amps	62
Starter solenoid - Max. hold-in current @ -20°C	Amps	14

Engine stop method

Electronic

Cold start recommendations

Minimum battery cold cranking amps

Cold start recommendation	Minimum battery Cold Cranking Amps	Minimum battery Cold Cranking Amps
	With glow plugs 12v	Without glow plugs 12v
-5 - 15W40	750	750
-10 - 15W40	850	950
-15 - 15W40	1125	Glow plugs must be used
-20 - 10W40	1125	
-25 - 5W30	1500	
Max. battery CCA.	2400	

Notes:

- Glow plugs needed below -10°C
- For cable sizes see Applications and Installation manual.

The table above shows the recommended battery sizes against starter model, temperature and oil viscosity and is based on the test results from starting a 'bare' engine with batteries at a 75% state of charge and with a cable resistance of 0,0017 Ohms.

Induction system

Maximum air intake restriction

Clean filter	5.0 kPa
Dirty filter	8.0 kPa
Induction indicator setting	5.0 kPa
Air filter type	Paper element

Exhaust system

Maximum back pressure

-1800 rpm	15.0 kPa
Exhaust outlet, internal diameter	90 mm

Fuel injection system

Injection components

Type of injection	Direct
Fuel injection pump	DP210EG
Fuel atomiser	Unit injector / multi-hole
Nozzle opening pressure	18,5 MPa
Fuel filter particle size (maximum)	2 microns

Fuel lift pump

-max flow through customer filter	2,2 litres/min
-max fuel supply restriction at lift pump	40 kPa
-max fuel return restriction @ low idle	50 kPa
-max fuel return flow	0,8 m³/min
Maximum suction head	17 kPa (1.7 m)
Maximum static pressure head	10 kPa (1.0 m)

Governor type

LCS electronic - speed control conforms to	ISO 8528, G3
Mechanical - speed control conforms to	ISO 8528, G2

Fuel specification

Perkins recommend the use of the following fuel specifications:

- DIN E 590 DERV Grade A, B, C, E, F, Class 0, 1, 2, 3 & 4
- BS2869 Class A2 Off-highway Gas Oil Red Diesel
- ASTM D975, Class 1D and Class 2D
- JIS K2204 Grades 1, 2 & 3 & Special Grade 3.

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

Fuel consumption (SFC)

Load	1800 rpm	
	g/kW.hr	litres/hr
25%	243	18.7
50%	240	16.6
75%	248	12.8
100% (Prime)	260	9.0
110% (Standby)	300	5.2

Note: Based on gross rated power.

Lubrication system

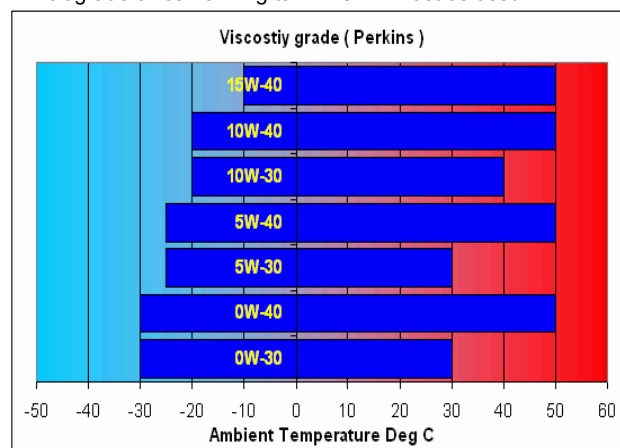
Maximum system capacity	8.4 Litres
Maximum capacity in sump	5.6 Litres
Minimum capacity in sump	6.9 Litres
Sump drain plug tapping size	3/4 - 16 UNF
Shutdown switch setting (where fitted)	ECM controlled
Maximum oil temperature continuous operation	125°C
Maximum oil temperature intermittent operation	135°C

Lubricating oil pressure

At rated speed	430 kPa
Relief valve opens	450 kPa
At maximum no-load speed	280 - 340 kPa
Oil temperature	
Continuous operation	125 °C
Oil consumption at full load as a % of fuel consumption	0.15%
Sump drain plug tapping size	
or hose connection size	3/4 UNF STOR port

Recommended SAE viscosity

A multigrade oil conforming to API-CH4 must be used.



Normal operating angles

Front and rear	24°
Side	24°

Load acceptance

The below complies 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)		
Descriptor	Units	1800 rpm (60 Hz)
% of Prime Power	%	80
Load (nett)	kWm (kWe)	45.6 (41.0)
Transient frequency deviation	%	≤ 3.8
Frequency recovery	seconds	0.6

The above figures were obtained under the following test conditions:

Minimum engine block temperature ... 45°C
 Ambient temperature ... 15°C
 Governing mode ... Isochronous
 Alternator inertia ... 8 kgm²
 Under frequency roll off (UFRO) point set to ... 1 Hz below rated
 UFRO rate set to ... 2% voltage / 1% frequency
 LAM on/off ... off

All tests were conducted using an engine which was installed and serviced to Perkins Engines Company Limited recommendations.

Note: The general arrangement drawings shown in this data sheet are for guidance only. For installation purposes, latest versions should be requested from the Applications Dept., Perkins Engines Stafford, ST16 3UB United Kingdom.

Mountings

Flywheel housing ... SAE3 156,4mm
 Maximum static bending moment at rear face of block. ... 1130 Nm

Note: Refer to “Applications and Installation Manual” for “Bending Moment approval requirements”.