

## Technical Data 1100C Series

## 1106C-E66TAG4

### Electropak

#### Basic technical data

Number of cylinders	6
Cylinder arrangement	in-line
Cycle	4 stroke
Induction system	Turbocharged and air charge cooled
Combustion system	Direct injection diesel
Compression ratio	16,2:1
Bore	105 mm
Stroke	127 mm
Cubic capacity	6,6 litres
Direction of rotation	Anticlockwise when viewed from flywheel
Firing order (number 1 cylinder furthest from flywheel)	1 5 3 6 2 4
Estimated total weight of Electropak (dry)	788 kg
Estimated total weight of Electropak (wet)	822 kg

#### Overall dimensions - Electropak

-height	1140.4 mm
-length (air cleaner fitted)	1763.2 mm
-width	788.3 mm

#### Moments of rotational inertia (mk<sup>2</sup>)

Engine rotational components	0.27 kgm <sup>2</sup>
Flywheel	1.26 kgm <sup>2</sup>

#### Centre of gravity - Electropak (wet)

Forward of rear face of cylinder block	476,3 mm
Above crankshaft centre line	176,4mm
Offset to RHS of crankshaft centre line	16 mm

#### Performance

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

All ratings certified to within  $\pm 3\%$   
Speed variation at constant load  $\pm 0,25\%$

#### Cyclic irregularity at 110% stand-by power

-1500 rev/min	0.028
-1800 rev/min	0.020

#### 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 at 1 metre

-@ 1500 rev/min	111,6 dB(A)
-@ 1800 rev/min	113,0 dB(A)

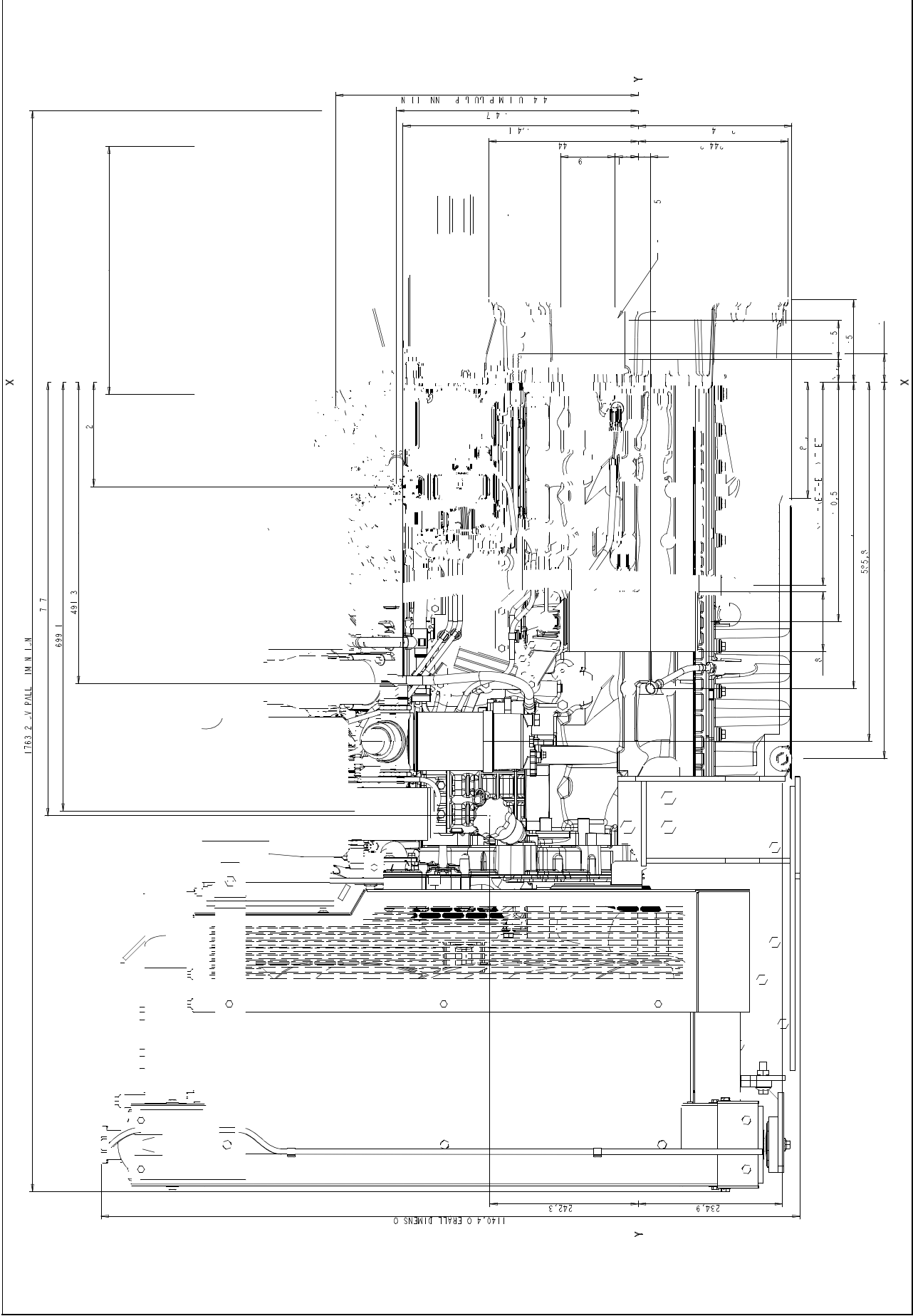
If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

Certified against the requirements of EU2007 legislation for non-road mobile machinery, powered by constant speed engines (EU97/68/EC Stage II)

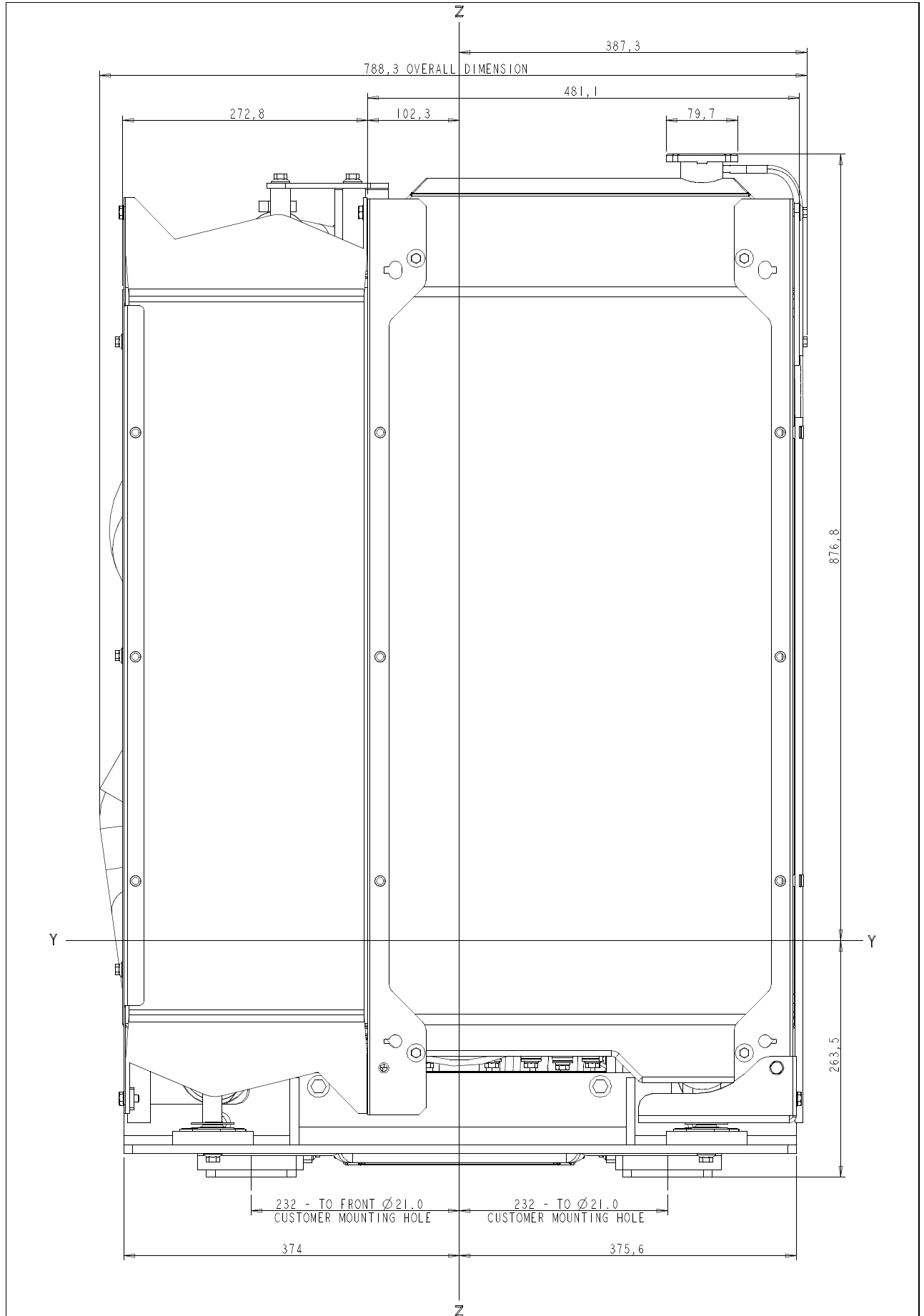
#### General installation

Designation	Units	Prime	Standby	Prime	Standby
		50Hz		60Hz	
Gross engine power	kWm	163,3	180,4	185,3	204,3
Electropak nett engine power	kWm	158,4	175,5	177,3	196,3
Brake mean effective pressure	kPa	1981,0	2189,0	1877,0	2065,0
Engine coolant flow (against 35 kPa restriction)	l/min	180,0		216,0	
Combustion air flow (at STP)	m <sup>3</sup> /min	11,3	11,7	13,3	13,4
Exhaust gas flow (Max.)	m <sup>3</sup> /min	29,4	31,0	33,4	34,8
Max. exhaust gas temperature in manifold after turbocharger	°C	480	499	485	509
Overall thermal efficiency (nett)	%	39,3	39,8	38,1	38,8
Typical genset electrical output (0.8pf 25 °C)	kWe	147,3	163,2	164,9	182,6
	kVA	184,1	204,0	206,1	228,2
Regenerative power (estimated)	kW	8,8		14,9	
Assumed alternator efficiency	%	93			
<b>Energy balance</b>					
Energy in fuel	kWt	403,8	442,3	467,5	508,0
Energy in power output (gross)	kWb	163,3	180,4	185,3	204,3
Energy to cooling fan	kWm	4,9		8,0	
Energy in power output (nett)	kWt	158,4	175,5	177,3	196,3
Energy to exhaust	kWt	125,0	135,7	148,3	160,4
Energy to coolant and oil	kWt	72,8	79,8	82,2	89,5
Energy to charge cooler	kWt	30,2	32,7	37,2	38,1
Energy to radiation	kWt	12,5	13,7	14,5	15,7

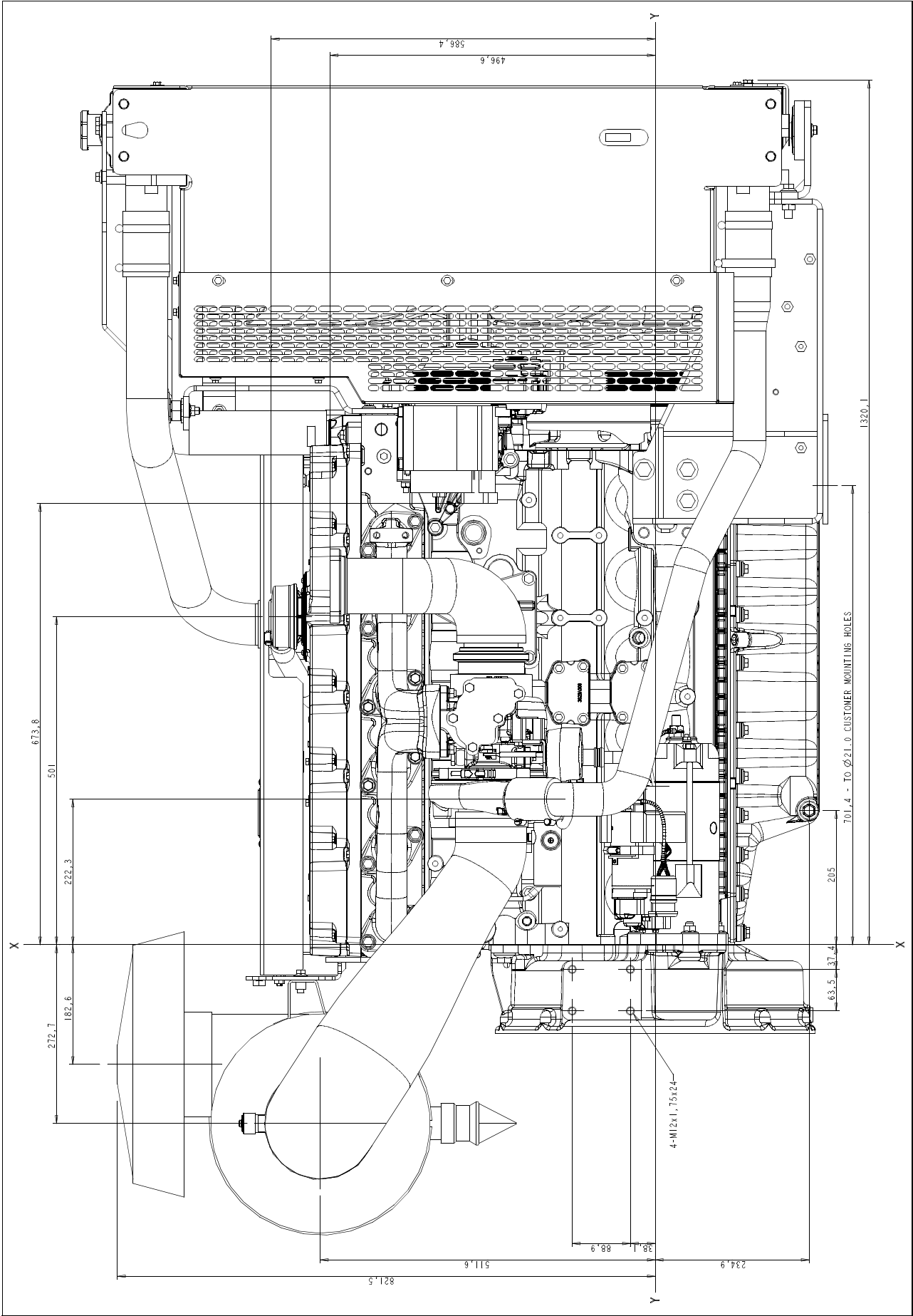
1106C-E66TAG4 - Left side view



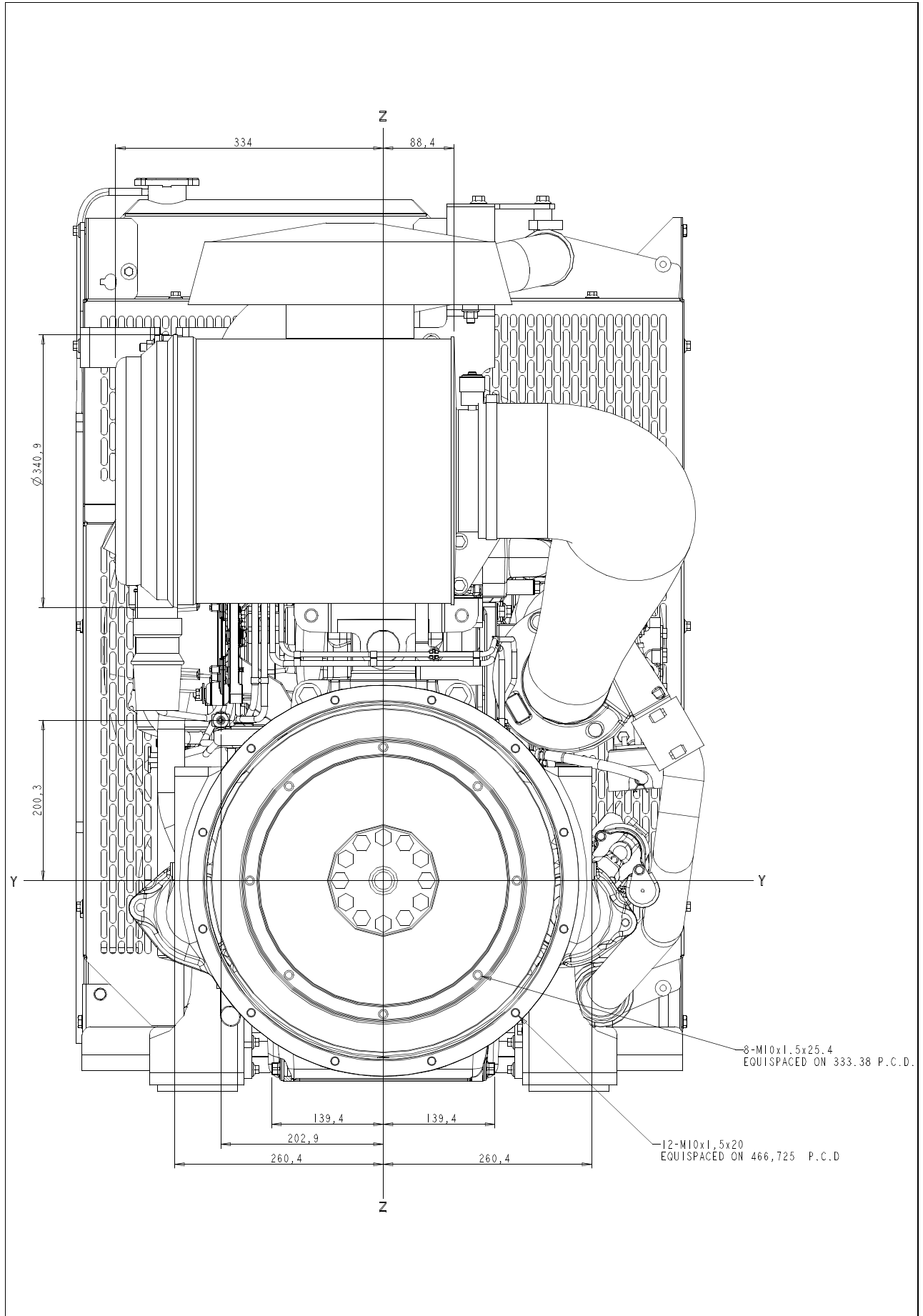
1106C-E66TAG4 - Front view



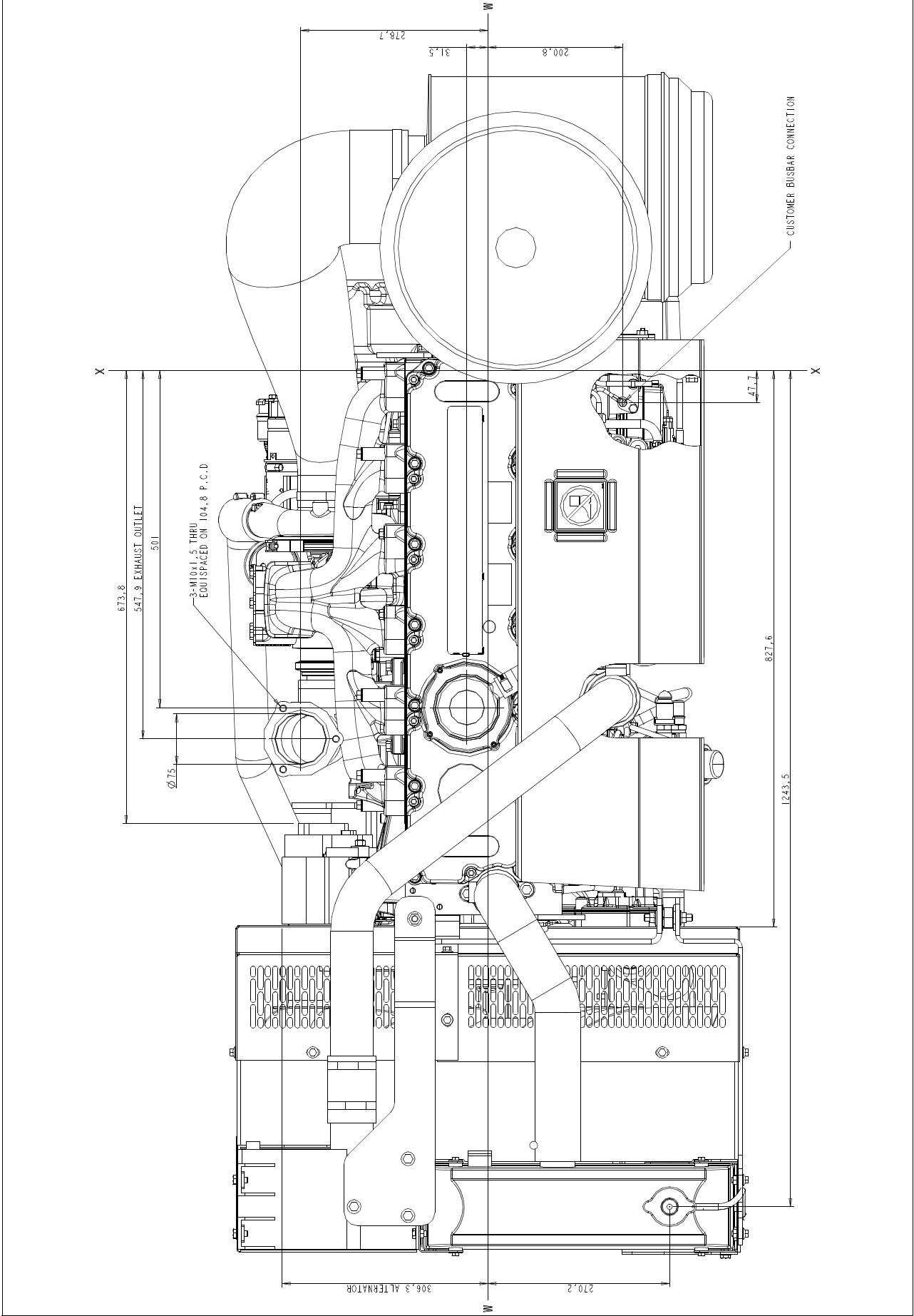
1106C-E66TAG4 - Right side view



# 1106C-E66TAG4 - Rear view



1106C-E66TAG4 - Plan view



## Cooling system

### Cooling pack

-overall weight (wet) ..... 71 kg  
 -overall face area ..... 554760 mm<sup>2</sup>  
 -width ..... 745 mm  
 -height ..... 1080 mm

### Radiator

Face area ..... 35120 mm<sup>2</sup>  
 Number of rows and materials ..... 5 rows, aluminium  
 Matrix density and material ..... 10 fins per inch, aluminium  
 Width of matrix ..... 439 mm  
 Height of matrix ..... 800 mm  
 Pressure cap setting (min) ..... 100 kPa

### Charge cooler

Face area ..... 203560 mm<sup>2</sup>  
 Number of rows and materials ..... 2 rows, aluminium  
 Matrix density and material ..... 10 fins per inch, aluminium  
 Width of matrix ..... 258 mm  
 Height of matrix ..... 789 mm

### Fan

Diameter ..... 686 mm  
 Drive ratio..... 1.2:1  
 Number of blades..... 7  
 Material ..... nylon  
 Type..... pusher

### Coolant

Total system capacity ..... 21 litres  
 System drawdown capacity ..... 10%  
 Engine capacity ..... 9.5 litres  
 Maximum top tank temperature ..... 112 °C  
 Temperature rise across engine  
 Max. rating dependent ..... 6.8 to 11.0 °C  
 Max. permissible external system resistance ..... 35 kPa  
 Thermostat operation range..... 85 to 95 °C  
 Shutdown switch setting ..... 118 °C  
 Coolant pump method of drive ..... gears  
 Recommended coolant immersion heater  
 rating (minimum) ..... 0.75 kW  
 Recommended coolant: 50% anti freeze / 50% water. For complete  
 details of recommended coolant specifications, refer to the  
 Operation and Maintenance Manual for this engine model

### Duct Allowance

1106C-E66TAG4 - Maximum additional restriction (Duct allowance to cooling airflow and resultant min. airflow (Standby power))			
Duct allowance with inhibited coolant at 50 °C			
Description	rev/min	kPa	m <sup>3</sup> /min
Duct allowance	1500	0,125	281
	1800	0,125	314
Duct allowance with inhibited coolant at 43 °C			
Minimum airflow	1500	0,200	281
	1800	0,200	314

## Electrical system

Alternator.....Denso A127i  
 Alternator voltage ..... 12 volts  
 Alternator output ..... 100 amps  
 Starter .....Iskra AZF  
 Starter motor voltage ..... 12 volts  
 Starter motor power ..... 4.0 kW  
 Number of teeth on the flywheel ..... 126  
 Number of teeth on the starter pinion ..... 10  
 Max. pull-in current of starter motor solenoid ..... 62 amps  
 Max hold-in current of starter motor solenoid @ 0°C ..... 14 amps

Engine stop method ..... via ECM

**Note:** All leads rated at 10 amps minimum.

### Cold start recommendations

Minimum required cranking speed over TDC ..... 100 rev/min

### Cold start recommendations

Starter Model	At Temp. °C	Oil viscosity limit	Minimum Battery CCA (Cold Cranking Amps)	
			With glow plugs (SAE)	Without glow plugs
AZF (i)	-5	15W40	750	750
AZF (i)	-10	15W40	850	950
AZF (i)	-15	15W40	1500	(ii)
AZF (i)	-20	10W	1500	(ii)
AZF (i)	-25	5W30	1900	(ii)

i.AZF starter - Battery must not exceed 2400 CCA.

ii.Glow plugs must be used.

**Note:** 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 kPa  
 -dirty filter .....8 kPa  
 -air filter type..... paper element

## Exhaust system

### Maximum back pressure

-1500 rev/min .....10.0 kPa  
 -1800 rev/min .....15.0 kPa  
 Exhaust outlet, internal diameter ..... 90 mm

## Fuel system

### Injection components

Injector ..... electronic  
 Fuel pump ..... CR200

### Fuel priming

Priming pump type ..... manual / electronic  
 Maximum priming time ..... 90 seconds

### Fuel feed

Maximum fuel flow..... 1.5 l/min  
 Maximum suction head at engine fuel pump inlet ..... 30 kPa  
 Maximum static pressure head ..... 600 kPa  
 Fuel temperature at engine fuel pump inlet ..... 80 °C  
 Tolerance on fuel consumption ..... 3%

### Fuel specification

Perkins recommend the use of the following fuel specifications:

- EN590 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

**Note:** For further information on fuel specifications and restrictions, refer to P.5 of the OMM Fuels section for this engine model

**Fuel consumption**

Load	Type of operation and application			
	1500 rev/min g/kWhr	1800 rev/min g/kWhr	1500 rev/min l/hr	1800 rev/min l/hr
Standby	204,9	207,5	44,0	50,5
110% prime	205,1	208,0	43,8	50,4
Prime	206,9	211,1	40,2	41,3
75% prime	212,7	222,7	31,0	36,8
50% prime	211,6	231,6	20,5	25,5

**Note:** Based on gross rated power

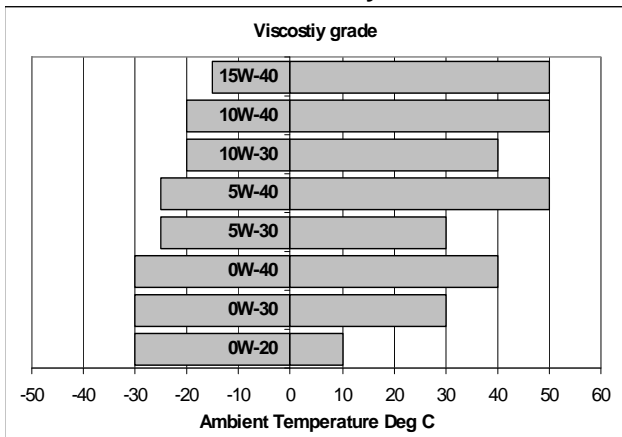
**Lubrication system**

Maximum total system oil capacity ..... 16.5 litres  
 Minimum oil capacity in sump ..... 12.5 litres  
 Maximum oil capacity in sump ..... 15.5 litres  
 Maximum engine operating angles -  
 front up, front down, right side, left side ..... 25 °  
 Sump drain plug tapping size. .... 3/4 - 16 UNF  
 Shutdown switch setting (where fitted) ..... ECM controlled

**Lubricating oil**

-relief valve opening pressure ..... 430 kPa  
 -pressure at maximum speed ..... 450 kPa  
 -maximum continuous oil temperature (in rail) ..... 125 °C  
 -oil consumption at full load (% of fuel) ..... < 0.1

**Recommended SAE viscosity**



A multigrade oil must be used which conforms to API-CH4/CI4.

**Mountings**

Maximum static bending moment at  
 -rear face of block ..... 1130 Nm  
 Maximum permissible overhung load  
 -on the flywheel ..... TBA Nm  
 Maximum bending moment at rear  
 -of flywheel housing in shock ..... +/-4200 Nm

**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	1500 rev/min (50 Hz)	1800 rev/min (60 Hz)
% of Prime Power	%	55	50
Load	kWe	81,0	82,4
Transient frequency deviation	%	≤ 10	≤ 10
Frequency recovery	seconds	5	5

The above figures were obtained under the following test conditions:

-minimum engine block temperature ..... 23°C  
 -alternator efficiency ..... 93 %  
 -ambient temperature ..... 23 °C  
 -governing mode ..... Isochronous  
 -alternator inertia ..... 1.32 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.



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