

Technical Data

400 Series

ElectropaK

404C-22G

20,3 kW @ 1500 rev/min

Basic technical data

Number of cylinders 4
 Cylinder arrangement... Vertical in-line
 Cycle Four stroke
 Induction system Naturally aspirated
 Compression ratio 23:3 : 1
 Bore.. . . . 84 mm (3.3 in)
 Stroke... 100 mm (3.9 in)
 Cubic capacity.. . . . 2,216 litres (135 in³)
 Direction of rotation... Clockwise viewed from front
 Firing order... 1, 3, 4, 2
 Estimated total weight (dry).. . . . 242 kg (533 lb)
 Estimated total weight (wet) TBA kg (TBA lb)

Overall dimensions

-height 840 mm (33.1 in)
 -length 915 mm (36.1 in)
 -width 477 mm (18.8 in)

Moments of inertia (GD²)

-engine TBA kg m²
 -flywheel 2,55 kg m²

Centre of gravity

-forward from rear of block... TBA mm (TBA in)
 -above centre line of block TBA mm (TBA in)
 -offset to Rhs of centre line TBA mm (TBA in)

Performance

Note: All data based on operation to ISO 14396 standard reference conditions.

Speed variation at constant load... ± 0.5%
 Cyclic irregularity

-at 110% stand-by power TBA

Test conditions

-air temperature. 25 °C (77 °F)

-barometric pressure 100 kPa (29.61 in hg)

Sound level

Average sound pressure level for bare engine (without inlet and exhaust) at 1 metre 76.4 dbA

-all ratings certified to within ± 5%

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.

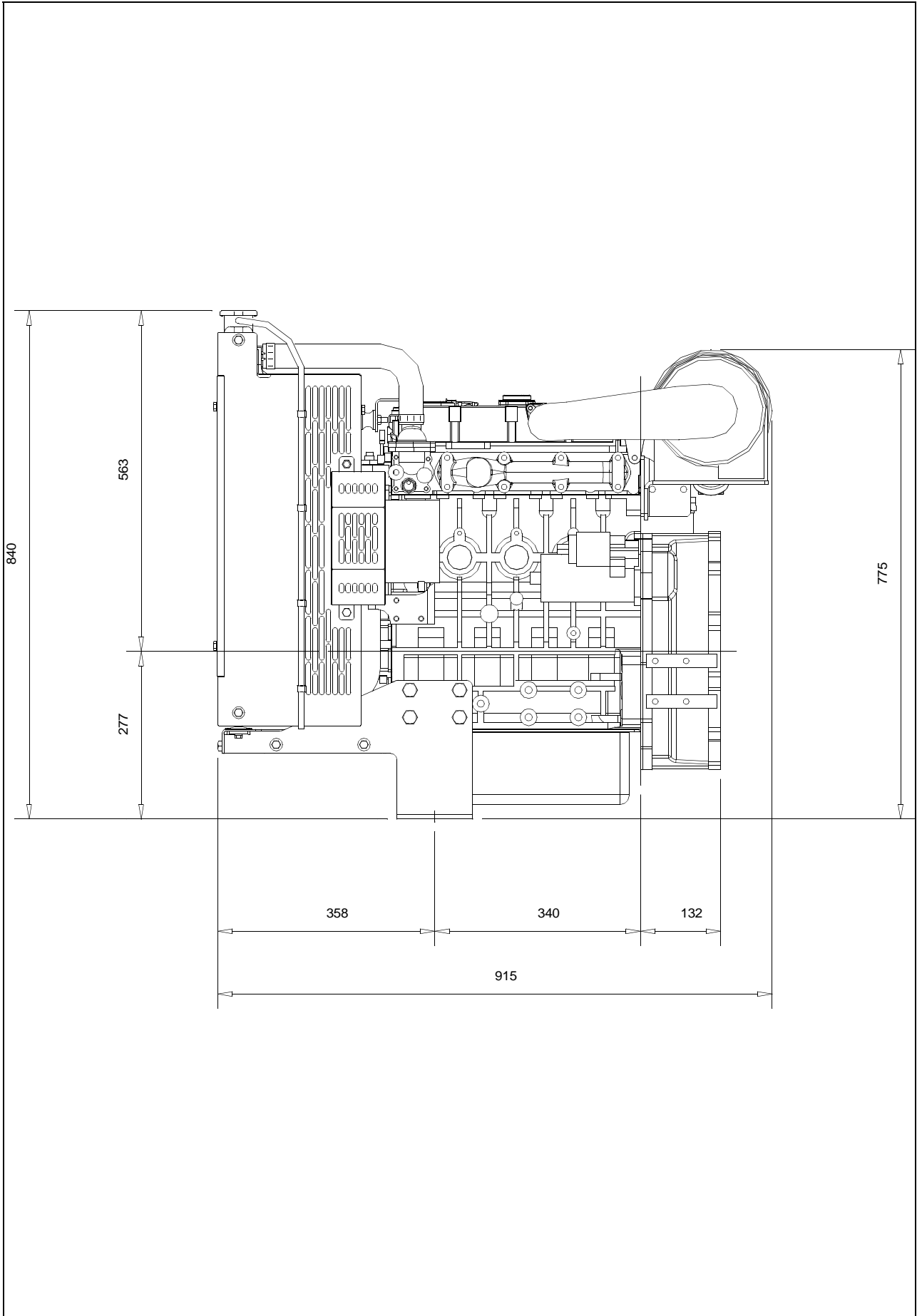
TBA% of the prime power rating can be applied 10 seconds after the starter motor is energised. The remaining TBA% can be applied 15 seconds after start if the ambient temperature is not less than 15 °C (59 °F). If it is less than 15 °C (59 °F), an immersion heater is recommended. For additional information, contact Perkins Technical Service Department.

General installation

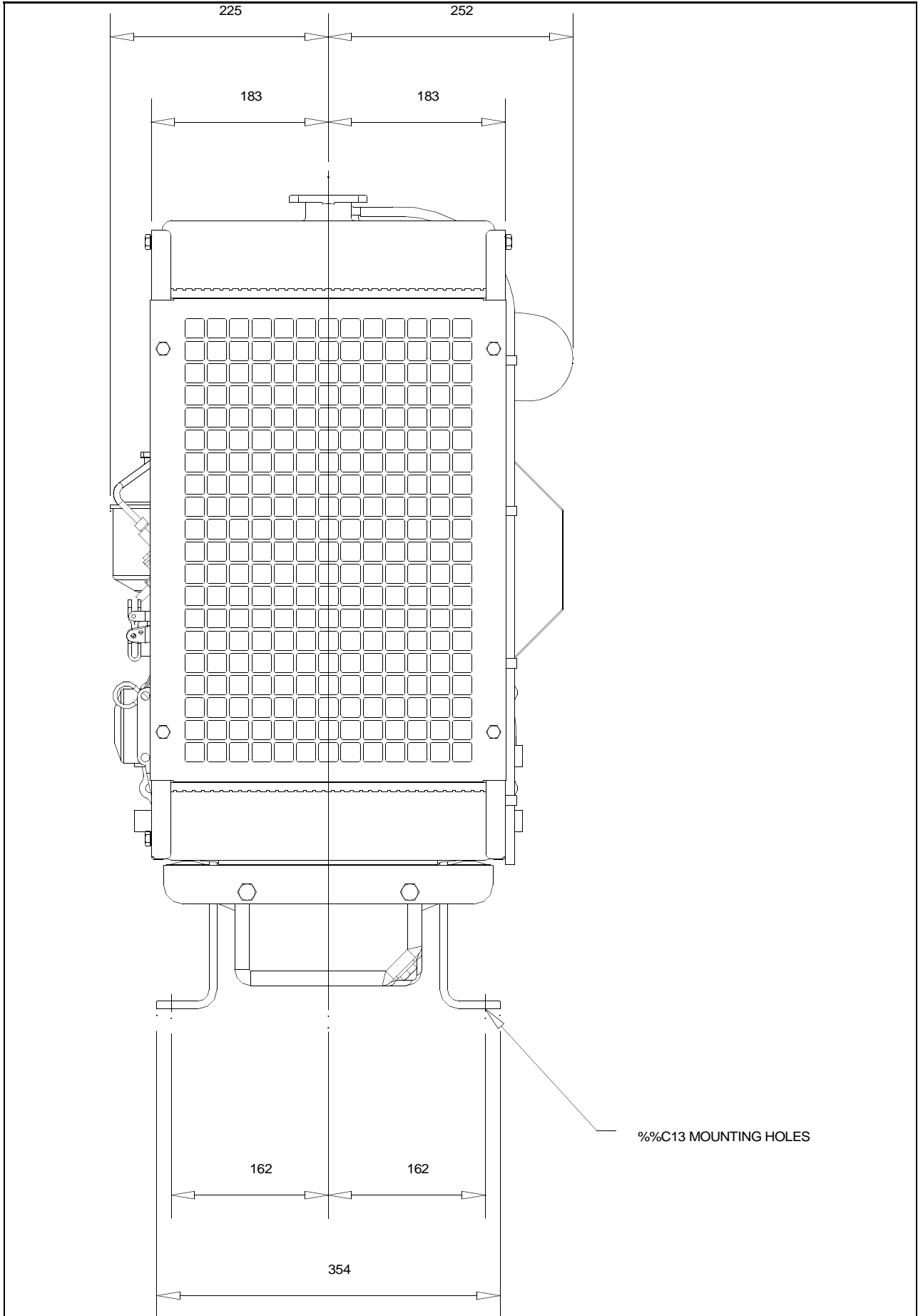
Designation	Units	Type of operation and application	
		Prime	Stand-by
		50Hz	50Hz
Gross engine power	kW (bhp)	18,7 (25.1)	20,6 (27.6)
Brake mean effective pressure	kPa (lbf/in ²)	669,3 (97.1)	743,7 (108)
Mean piston speed	m/s (ft/s)	5 (16.4)	5 (16.4)
ElectropaK net engine power	kW (bhp)	18,4 (24.6)	20,3 (27.2)
Engine coolant flow (coolant pump ratio 1.25:1)	l/min (UK gal/min)	40,3 (8.9)	40,3 (8.9)
Combustion air flow	m ³ /min (ft ³ /min)	1,45 (51.2)	1,45 (51.2)
Exhaust gas flow (max)	m ³ /min (ft ³ /min)	3,64 (128.5)	3,94 (139.1)
Exhaust gas temperature (max)	°C (°F)	445 (833)	505 (941)
Cooling fan air flow (zero duct allowance)	m ³ /min (ft ³ /min)	40,2 (1419)	40,2 (1419)
Cooling fan air flow (0.125 kPa duct allowance)	m ³ /min (ft ³ /min)	29,4 (1038)	29,4 (1038)
Energy balance			
Energy in fuel (heat of combustion)	kW (Btu/min)	53 (3013)	61,2 (3480)
Gross heat to power	kW (Btu/min)	18,7 (1064)	20,6 (1172)
Energy to coolant and lubricating oil	kW (Btu/min)	17 (964)	19,6 (1114)
Energy to exhaust	kW (Btu/min)	14 (796)	16,6 (944)
Heat to radiation	kW (Btu/min)	3,5 (199)	4,4 (250)

Caution: The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (115 °F) if a canopy is fitted with an air flow restriction of up to 0,125 kPa. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

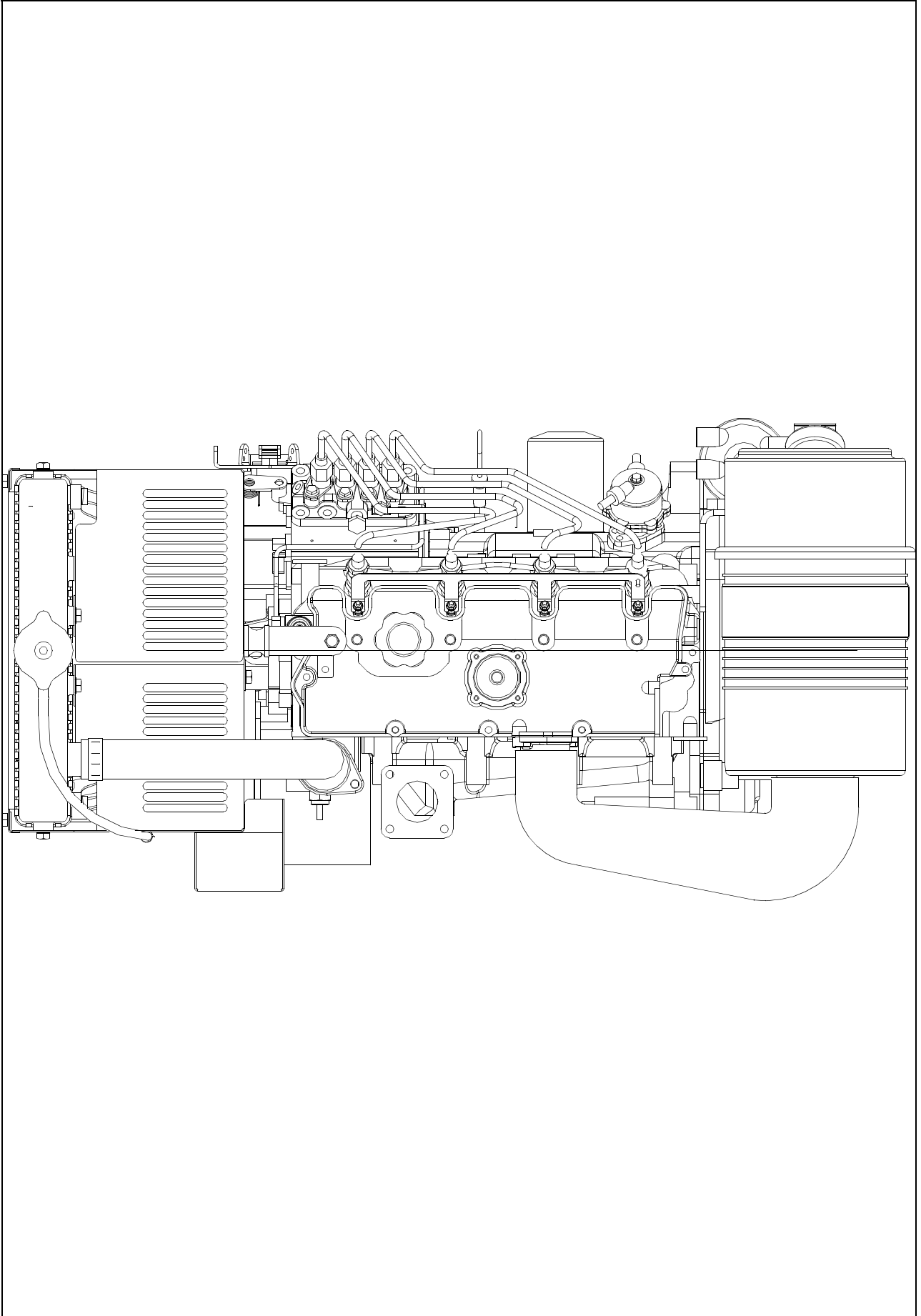
404C-22G ElectropaK, left side view



404C-22G ElectropaK, front view



404C-22G ElectropaK, plan view



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Cooling system

Radiator

- face area. 0,167 m² (1.79 ft²)
- rows and materials.. 2 rows, aluminium
- matrix density and material. 15.5 fins per inch, aluminium
- width of matrix. 334,2 mm (13.2 in)
- height of matrix 500 mm (19.7 in)
- pressure cap setting 90 kPa (13.05 lb/in²)
- Estimated cooling air flow reserve 0,125 kPa

Fan

- diameter 320 mm (12.6 in)
- drive ratio 1.25 : 1
- number of blades 7
- material Plastic
- type Pusher

Coolant

Total system capacity

- with radiator 6,98 litres (12.3 UK pints)
- without radiator 3,6 litres (6.3 UK pints)
- draindown capacity TBA litres (TBA UK pints)
- Maximum top tank temperature 110 °C (230 °F)
- Minimum temperature to engine TBA °C (TBA °F)
- Temperature rise across engine TBA °C (TBA °F)
- Max permissible external system resistance TBA kPa (TBA lbf/in²)
- Thermostat operation range. 82 - 95 °C (180 - 203 °F)

Recommended coolant:

50% ethylene glycol with a corrosion inhibitor (BS 6580 :1992 or ASTM D3306-89 or AS2108) and 50% clean fresh water.

Electrical System

- alternator. 55 A, 12 V
- starter motor 2 kW, 12 V

Cold start recommendations

Minimum cranking speed. TBA rev/min

Minimum starting temperature		Grade of engine lubricating oil	Battery specifications			
			BS3911 Cold start amps	SAEJ537 Cold cranking amps	Number of batteries needed	Commercial ref number
°C	°F					
0	32	20W	540	740	1	647
-15	5	10W	540	740	1	647
-20	-4	5W	600	780	1	655

Exhaust system

- Maximum back pressure 10,2 kPa (3.012 in Hg)
- Exhaust outlet size 42 mm (1.65 in)

Fuel system

- Type of injection Indirect injection
- Fuel injection pump Cassette type
- Fuel injector.. Pintle nozzle
- Nozzle opening pressure. 14,7 MPa (2133 lbf/in²)

Fuel lift pump (mechanical)

- flow/hour. 63 litres/hr (16.6 UK gals/hr)
- pressure 10 kPa (1.45 lbf/in²)
- Maximum suction head 0,8 m (2.6 ft)
- Maximum static pressure head 3 m (9.84 ft)

Governor type Mechanical

Fuel specification

Fuel specification	
Density (kg/l @ 15 °C)	0,835 - 0,855
Viscosity (mm ² /s @ 40 °C)	2,0 - 4,5
Sulphur Content	0.2% mass, maximum
Cetane Number	45 minimum

Fuel consumption g/kWh (litres/hr)

Power rating			
110%	100%	75%	50%
254 (6,2)	243 (5,4)	243 (4)	265 (2,9)

Induction system

Maximum air intake restriction

- clean filter. 3 kPa (0.435 in H₂O)
- dirty filter..... 6,4 kPa (0.928 in H₂O)
- air filter type..... Dry element type

Lubrication system

Lubricating oil capacity

- Total system 10,6 litres (18.6 UK pints)
- Minimum 8,9 litres (15.6 UK pints)

Maximum engine operating angles

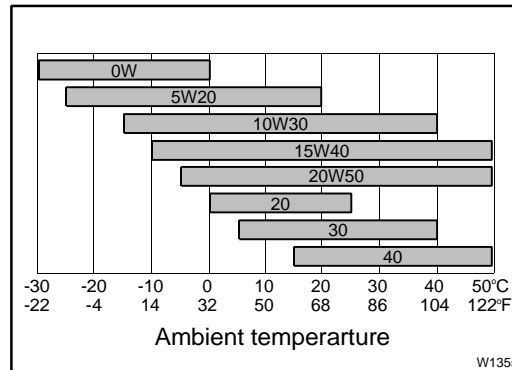
- front up, front down, right side or left side 35° continuous

Lubricating oil pressure

- relief valve opens. 352 - 448 kPa (51.1 - 64.9 lbf/in²)
- at maximum no-load speed..... TBA
- Normal oil temperature..... 125 °C (257 °F)

Recommended SAE viscosity

A single or multigrade oil must be used which conforms API-CH-4 or ACEA E5.



Maximum static bending moment

at rear face of block..... TBA Nm (TBA lb ft)



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