

Technical Data

400 Series

403C-11G

Electropak

9,3 kW @ 1500 rev/min

Basic technical data

Number of cylinders 3
 Cylinder arrangement Vertical in-line
 Cycle four stroke
 Induction system Naturally aspirated
 Compression ratio 23:1
 Bore 77 mm (3.03 in)
 Stroke 81 mm (3.19 in)
 Cubic capacity 1.131 litres (69 in³)
 Direction of rotation clockwise viewed from front
 Firing order 1, 2, 3
 Estimated total weight (dry) 129,2 kg (284.8 lb)
 Estimated total weight (wet) TBA kg (lb)

Overall dimensions

-height 700 mm (27.6 in)
 -length 776 mm (30.6 in)
 -width (including mounting brackets) 449 mm (17.7 in)

Moments of inertia (GD²)

-engine TBA kg m²
 -flywheel 1,51 kg m²

Centre of gravity

-forward from rear of block TBA mm (in)
 -above centre line of block TBA mm (in)
 -offset to RHS of centre line TBA mm (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 76,7 dB(A)
 -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.

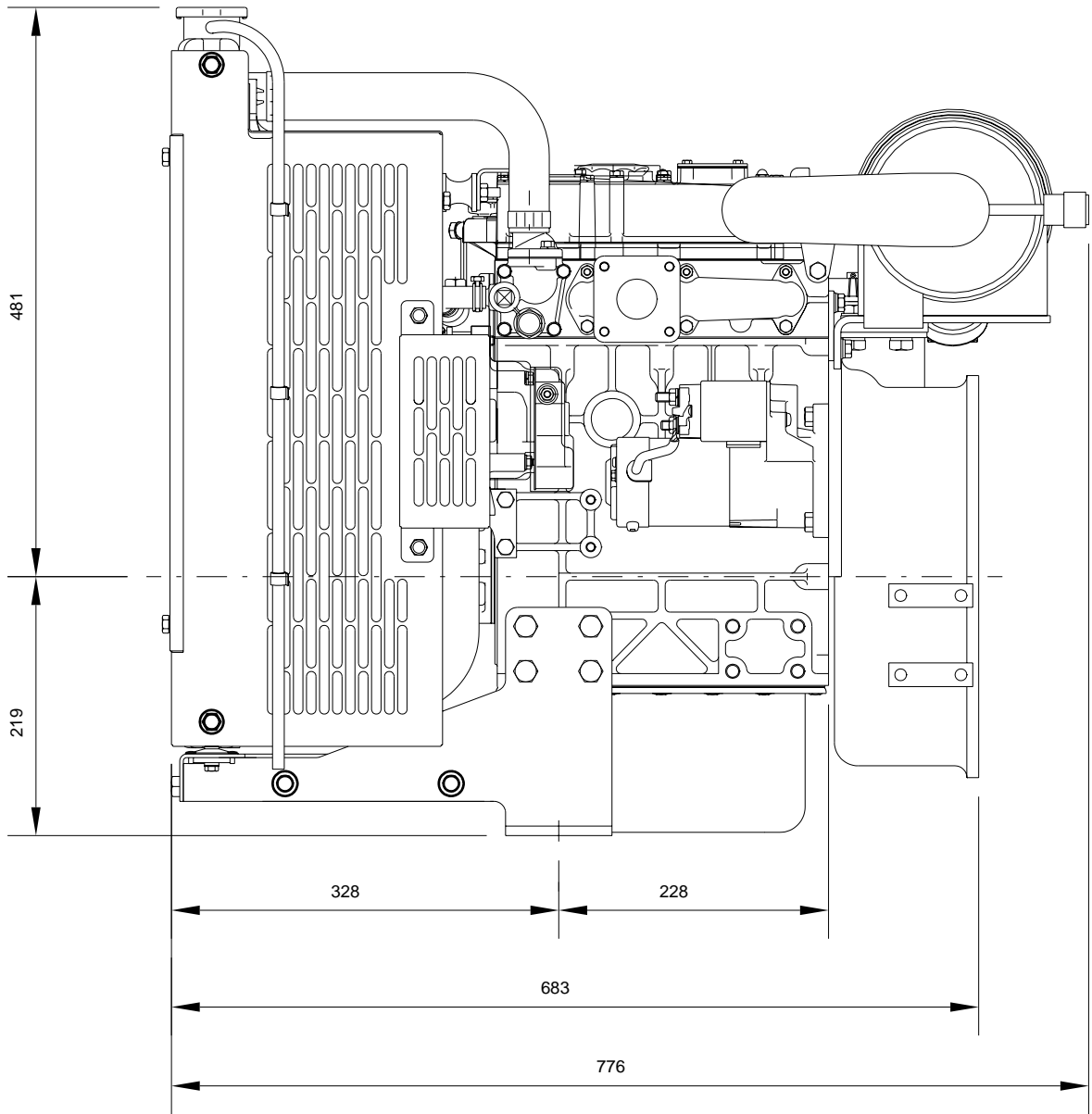
For details of load acceptance values, contact the applications department at Perkins Engines Company Limited, Stafford.

General installation

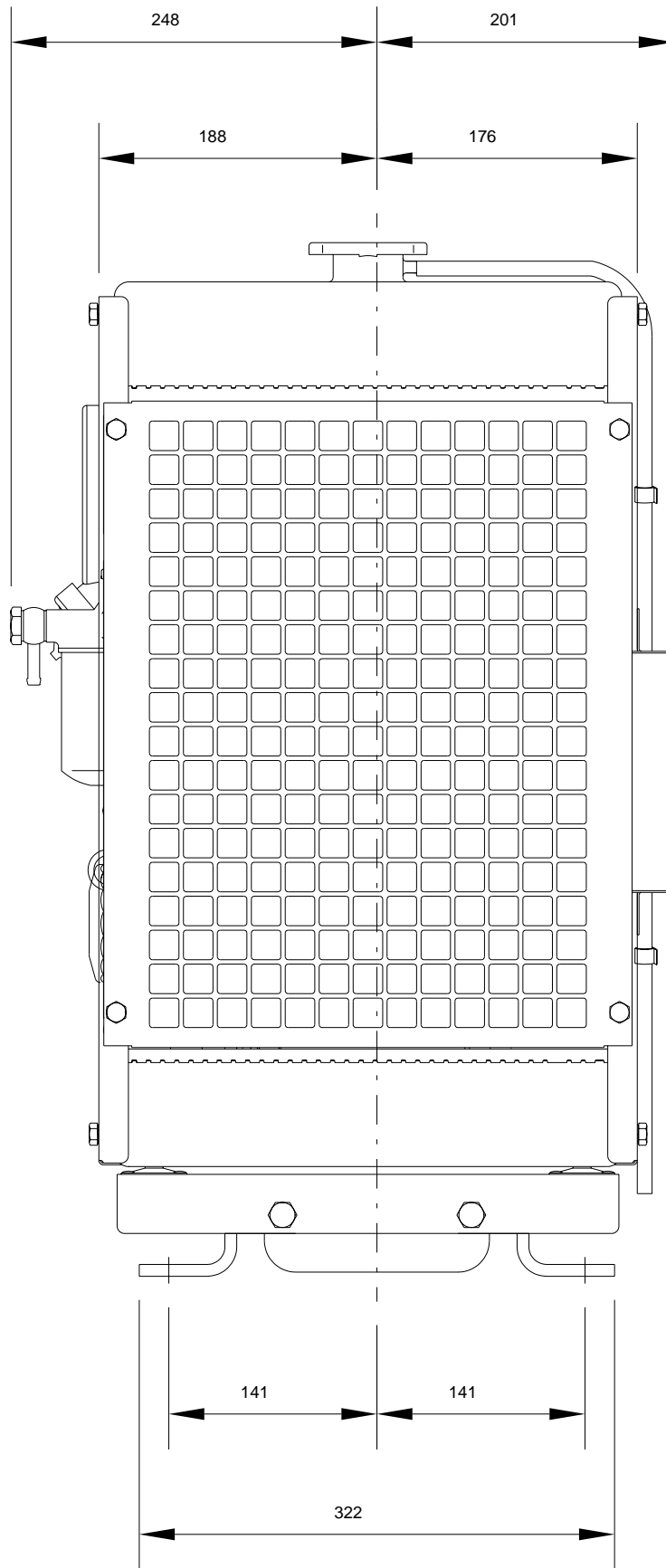
Designation	Units	Type of operation and application	
		Prime	Stand-by
		50Hz	50Hz
Gross engine power	kW (bhp)	8,6 (11.5)	9,5 (12.7)
Brake mean effective pressure	kPa (lbf/in ²)	TBA	TBA
Mean piston speed	m/s (ft/s)	4,1 (13.5)	
Electropak net engine power	kW (bhp)	8,4 (11.4)	9,3 (12.6)
Engine coolant flow (Water pump ratio 1.285:1)	l/min (UK gal/min)	27,3 (6.0)	
Combustion air flow	m ³ /min (ft ³ /min)	0,7 (26.1)	
Exhaust gas flow (max)	m ³ /min (ft ³ /min)	1,66 (58.6)	1,8 (63.3)
Exhaust gas temperature (max)	°C (°F)	368 (694)	420 (788)
Cooling fan air flow (Zero Duct Allowance)	m ³ /min (ft ³ /min)	40,2 (1420)	
Cooling fan air flow (0-125 kPa Duct Allowance)	m ³ /min (ft ³ /min)	26,4 (932)	
Energy balance			
Energy in fuel (heat of combustion)	kW (Btu/min)	25,9 (1474)	29,5 (1682)
Gross heat to power	kW (Btu/min)	8,2 (489)	9,5 (540)
Energy to coolant and lubricating oil	kW (Btu/min)	8,3 (473)	9,5 (538)
Energy to exhaust	kW (Btu/min)	7,3 (413)	8,0 (461)
Heat to radiation	kW (Btu/min)	2,1 (119)	2,5 (142)

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 0-125kPa. 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.

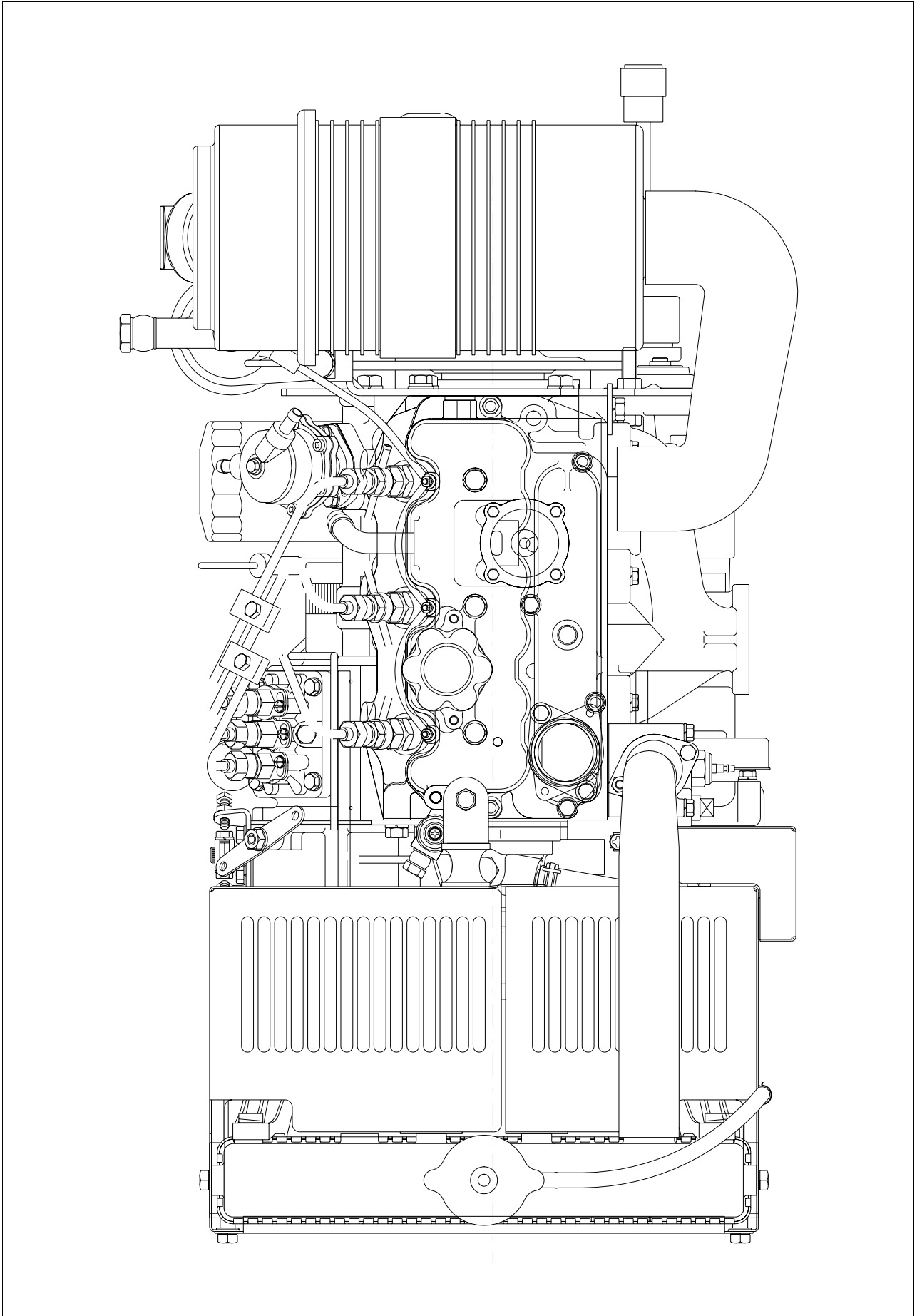
403C-11G ElectropaK, left side view



403C-11G ElectropaK, front view



403C-11G ElectropaK, plan view



Cooling system

Radiator

-face area ... 0,147 m² (1.58 ft²)
 -rows and materials ... 2 rows, Aluminium
 -matrix density and material ... 14,5 FPI Aluminium
 -width of matrix ... 334 mm (13.1 in)
 -height of matrix ... 440 mm (17.3 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 ... 1,285:1
 -number of blades ... 7
 -material ... Plastic
 -type ... Pusher

Coolant

Total system capacity
 -with radiator ... 5,2 litres (9.2 UK pints)
 -without radiator ... 1,9 litres (3.3 UK pints)
 -drain down capacity ... TBA litres (UK pints)
 Maximum top tank temperature ... 110 °C (230 °F)
 Minimum temperature to engine ... TBA °C (°F)
 Temperature rise across engine ... TBA °C (°F)
 Max permissible external system resistance ... TBA kPa (lbf/in²)
 Thermostat operation range ... 75 - 87°C (167 - 189 °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 ... 15 amps, 12 V
 -starter motor ... 1,1 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	No. of batteries needed	Commercial ref number
°C	°F					
0	32	20W	340	540	1	069
-15	5	10W	340	540	1	069
-20	-4	5W	420	590	1	072

Exhaust system

Maximum back pressure ... 10,2 kPa (3.0 in Hg)
 Exhaust outlet size
 -horizontal ... 34 mm (1.4 in)
 -vertical ... 40 mm (1.6 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

-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
 -diesel fuel to conform to ... See table below

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

Power rating			
g/kWh (litres/hr)			
110%	100%	75%	50%
261 (2.9)	252 (2.6)	258 (2.0)	286 (1.5)

Induction system

Maximum air intake restriction

- clean filter3,0 kPa (0.44 lbf/in²)
- dirty filter6,4 kPa (0.93 lbf/in²)
- air filter typeDry element type

Lubrication system

Lubricating oil capacity

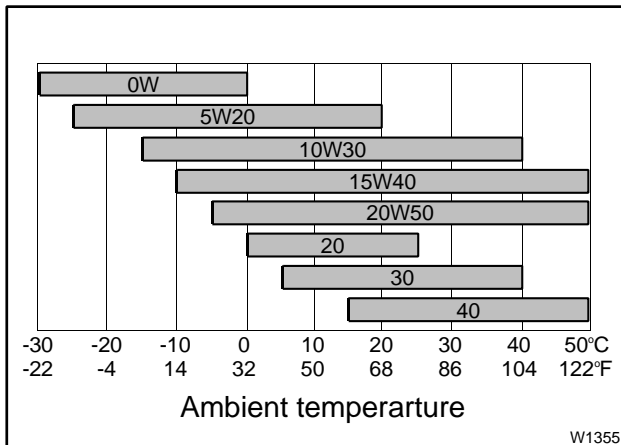
- Total system... ..4,9 litres (8.6 UK pints)
- Minimum... ..3,4 litres (6.0 UK pints)
- Maximum engine operating angles
- front up, front down, right side or left side... ..35° continuous

Lubricating oil pressure

- relief valve opens304 - 500 kPa (44.1 - 72.5 lbf/in²)
- at maximum no-load speed.TBA
- Normal oil temperature.125 °C (257 °F)

Recommended SAE viscosity

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



Maximum static bending moment

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

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