

# Technical Data

## 400 Series

ElectropaK

## 403C-11G

TBA kW @ 1800 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 in<sup>3</sup>)  
 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 (TBA lb)

### Overall dimensions

-height . . . . . 700 mm (27.6 in)  
 -length . . . . . 776 mm (30.6 in)  
 -width . . . . . 449 mm (17.7 in)

### Moments of inertia (GD<sup>2</sup>)

-engine . . . . . TBA kg m<sup>2</sup>  
 -flywheel . . . . . 1,51 kg m<sup>2</sup>

### 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 . . . . . 78.5 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.

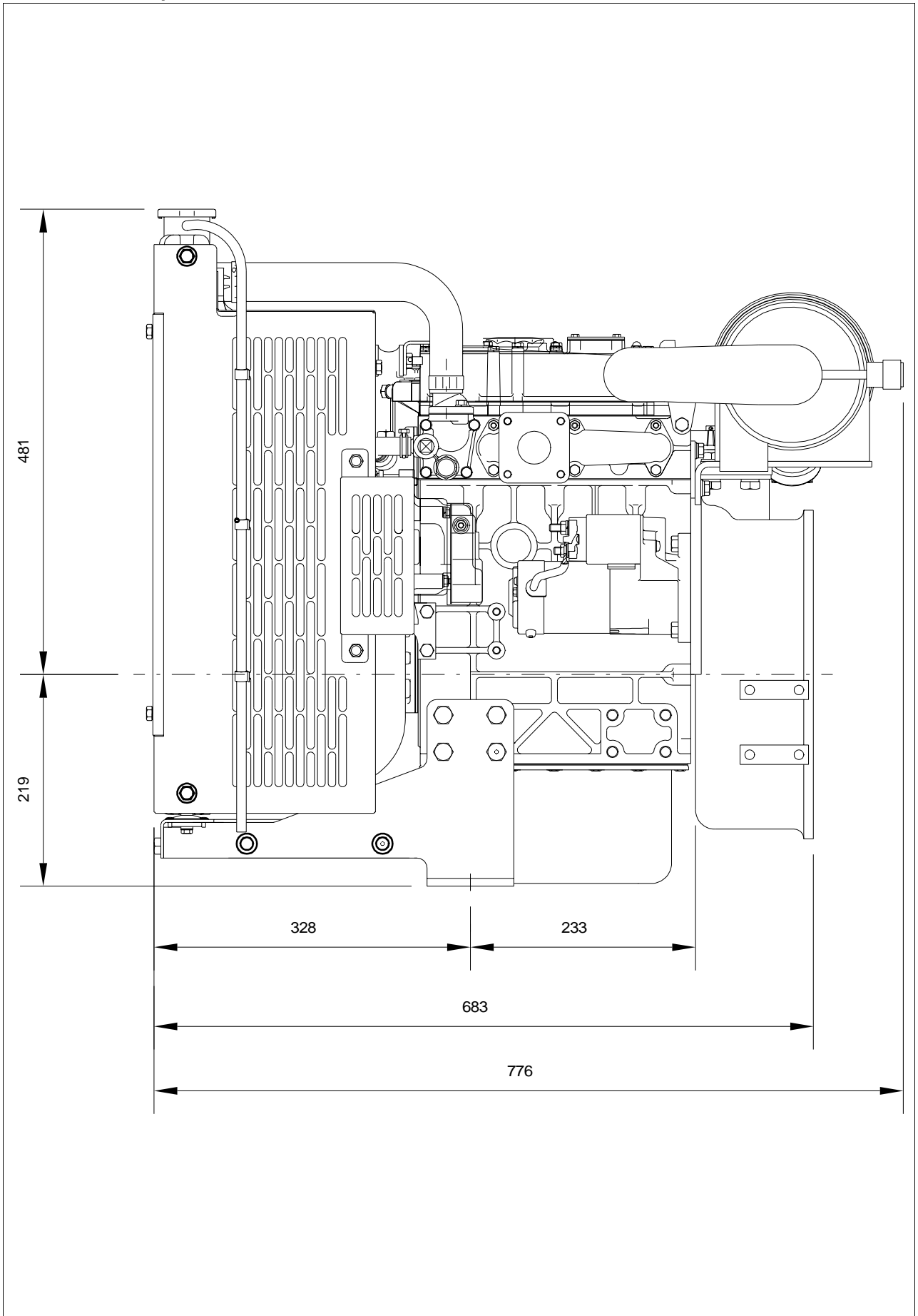
TBA% of the prime power rating can be applied TBA seconds after the starter motor is energised. The remaining TBA% can be applied TBA seconds after start if the ambient temperature is not less than TBA °C (TBA °F). If it is less than TBA °C (TBA °F), an immersion heater is recommended. For additional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

### General installation

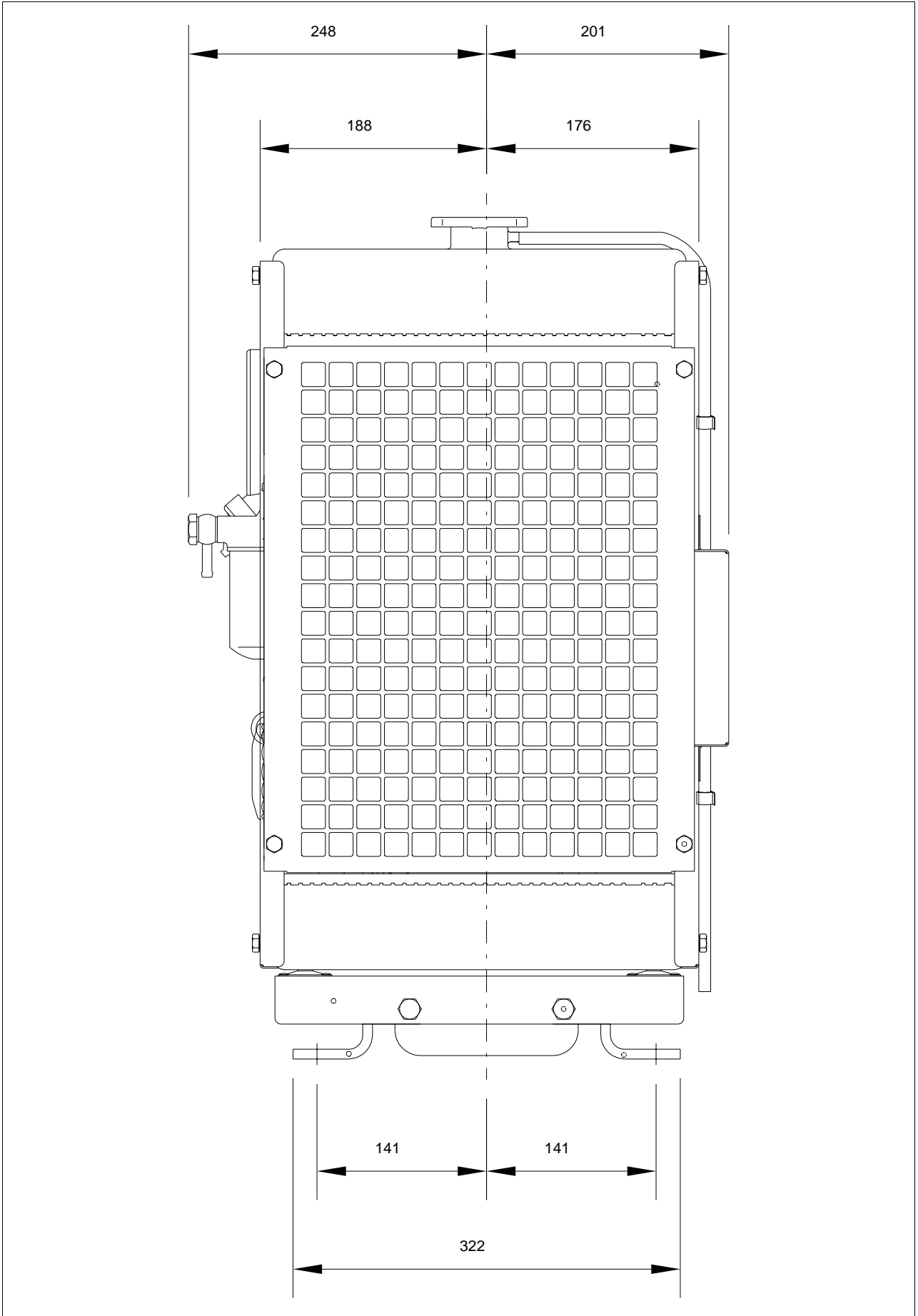
Designation	Units	Type of operation and application	
		Prime	Stand-by
		60Hz	60Hz
Gross engine power	kW (bhp)	10,7 (14.3)	11,8 (15.8)
Brake mean effective pressure	kPa (lbf/in <sup>2</sup> )	TBA (TBA)	TBA (TBA)
Mean piston speed	m/s (ft/s)	4.9 (16.1)	4.9 (16.1)
ElectropaK net engine power	kW (bhp)	TBA (TBA)	TBA (TBA)
Engine coolant flow (Water Pump Ratio 1.285:1)	l/min (UK gal/min)	32,5 (7.1)	32,5 (7.1)
Combustion air flow	m <sup>3</sup> /min (ft <sup>3</sup> /min)	0,9 (31.3)	0,9 (31.3)
Exhaust gas flow (max)	m <sup>3</sup> /min (ft <sup>3</sup> /min)	2.21 (78.0)	2,4 (86.4)
Exhaust gas temperature (max)	°C (°F)	437 (818)	515 (959)
Cooling fan air flow Zero Duct Allowance	m <sup>3</sup> /min (ft <sup>3</sup> /min)	46.8 (1653)	46.8 (1653)
Cooling fan air flow (0.125 kPG Duct Allowance)	m <sup>3</sup> /min (ft <sup>3</sup> /min)	35.4 (1250)	35.4 (1250)
<b>Energy balance</b>			
Energy in fuel (heat of combustion)	kW (Btu/min)	31.8 (1809)	37,8 (2149)
Gross heat to power	kW (Btu/min)	10.1 (576)	11,8 (671)
Energy to coolant and lubricating oil	kW (Btu/min)	10.2 (580)	12,1 (688)
Energy to exhaust	kW (Btu/min)	8.9 (507)	10,8 (614)
Heat to radiation	kW (Btu/min)	2.6 (146)	3,1 (176)

**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 (TBA mm H<sub>2</sub>O). 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.

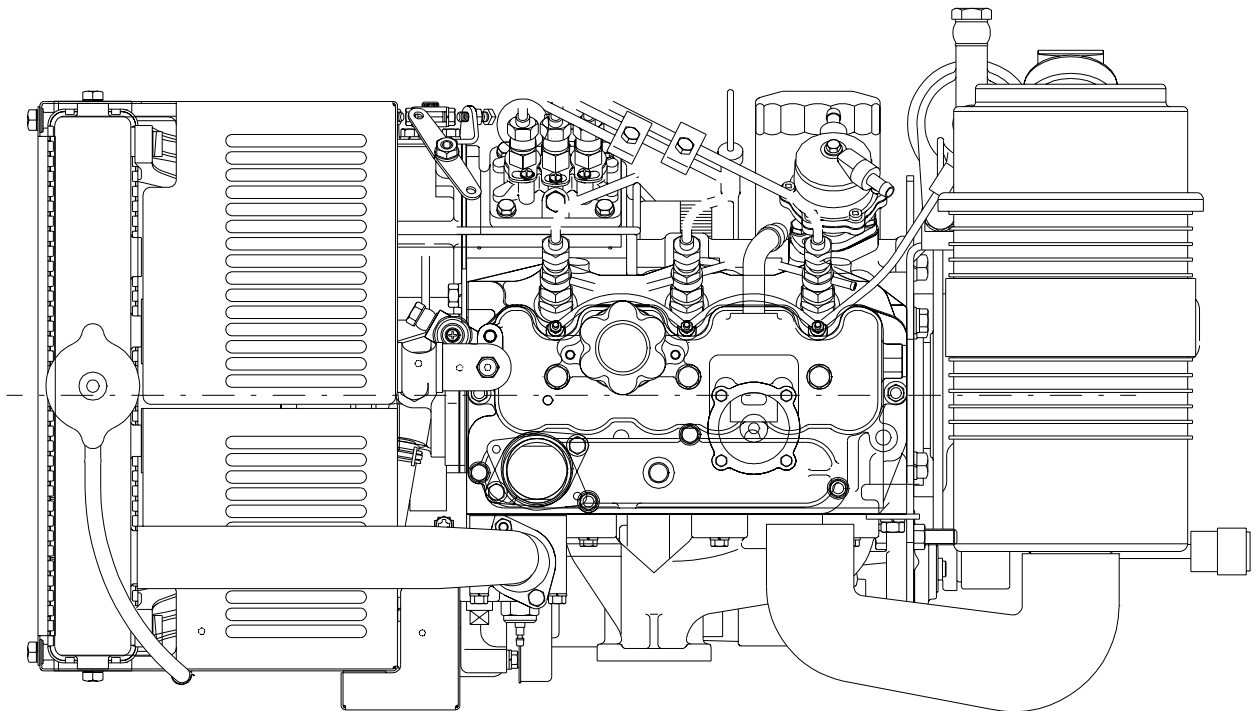
403C-11G ElectropaK, left side view



403C-11G ElectropaK, front view



403C-11G ElectropaK, plan view



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**Cooling system**

**Radiator**

- face area ... 0.147 m<sup>2</sup> (1.58 ft<sup>2</sup>)
- 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/in<sup>2</sup>)
- Estimated cooling air flow reserve... 0.125 kPa

**Fan**

- diameter... 320 mm (TBA in)
- drive ratio... 1.285 : 1
- number of blades... 7
- material... Plastic
- type... Pusher

**Coolant**

**Total system capacity**

- with radiator... TBA litres (TBA UK pints)
- without radiator... 1,9 litres (3.3 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/in<sup>2</sup>)
- 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 A, 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	Number 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 (3.012 in Hg)
- Exhaust outlet size Horizontal... 34 mm (1.4 in)
- Exhaust Outlet size Vertical... 4033 (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/in<sup>2</sup>)

**Fuel lift pump**

- flow/hour... 63 litres/hr (16.6 UK gals/hr)
- pressure... 10 kPa (1.45 lbf/in<sup>2</sup>)
- 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 <sup>2</sup> /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%
268 (3-8)	248 (3-1)	257 (2-4)	280 (1-8)

**Induction system**

**Maximum air intake restriction**

- clean filter... 3 kPa (12 in H<sub>2</sub>O)
- dirty filter... 6,4 kPa (25.6 in H<sub>2</sub>O)
- air filter type... Dry 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

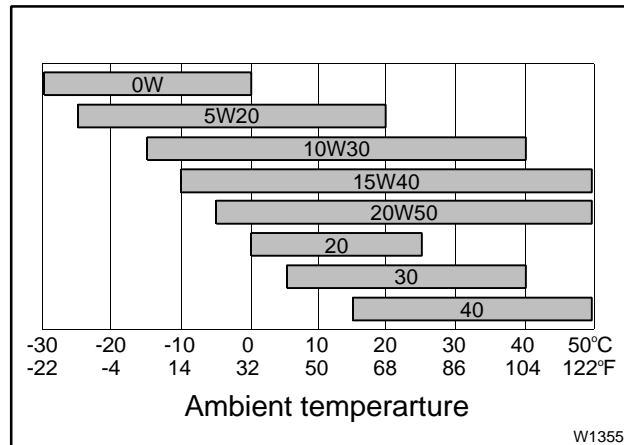
-front up, front down, right side or left side... 35° continuous

**Lubricating oil pressure**

- relief valve opens... 304 - 500 kPa (44.1 - 72.5 lbf/in<sup>2</sup>)
- 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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