Technical Data

404 Series

ElectropaK

404C-22G

20,3 kW @ 1500 rev/min

**Basic technical data**

- Number of cylinders: 4
- Cylinder arrangement: Vertical in-line
- 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): TBA kg (TBA 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.

**ElectropaK**

- Gross engine power: 18,7 (25.1) kW (20,6 (27.6) bhp)
- Brake mean effective pressure: 669,3 (97.1) kPa (743,7 (108) lbf/in²)
- Mean piston speed: 5 (16.4) m/s (16.4 ft/s)
- ElectropaK net engine power: 18,4 (24.6) kW (20,3 (27.2) bhp)
- Engine coolant flow (coolant pump ratio 1.25:1): 40,3 (8.9) l/min (8.9 UK gal/min)
- Combustion air flow: 1,45 (51.2) m³/min (51.2 ft³/min)
- Exhaust gas flow (max): 3,64 (128.5) m³/min (128.5 ft³/min)
- Exhaust gas temperature (max): 445 (833) °C (°F)
- Cooling fan air flow (zero duct allowance): 40,2 (1419) m³/min (1419 ft³/min)
- Cooling fan air flow (0.125 kPa duct allowance): 29,4 (1038) m³/min (1038 ft³/min)

**Energy balance**

- Energy in fuel (heat of combustion): 53 (3013) kW (Btu/min)
- Gross heat to power: 18,7 (1064) kW (Btu/min)
- Energy to coolant and lubricating oil: 17 (964) kW (Btu/min)
- Energy to exhaust: 14 (796) kW (Btu/min)
- Heat to radiation: 3,5 (199) kW (Btu/min)

**Caution:** The airflow 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.

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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 fms per inch, aluminium
- width of matrix ........................................ 334,2 mm (13,2 in)
- height of matrix ........................................ 500 mm (19,7 in)
- pressure cap setting ...................................... -0,90 kPa (13,05 lb/in²)
Estimate 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

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)
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

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Grade of engine lubricating oil</th>
<th>Battery specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
<td>Cold start amps</td>
</tr>
<tr>
<td>0</td>
<td>32</td>
<td>20W</td>
</tr>
<tr>
<td>-15</td>
<td>5</td>
<td>10W</td>
</tr>
<tr>
<td>-20</td>
<td>-4</td>
<td>5W</td>
</tr>
</tbody>
</table>

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)
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

<table>
<thead>
<tr>
<th>Fuel specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (kg/l @ 15 °C)</td>
</tr>
<tr>
<td>0,835 - 0,855</td>
</tr>
<tr>
<td>Viscosity (mm²/s @ 40 °C)</td>
</tr>
<tr>
<td>2,0 - 4,5</td>
</tr>
<tr>
<td>Sulphur Content</td>
</tr>
<tr>
<td>0,2% mass, maximum</td>
</tr>
<tr>
<td>Cetane Number</td>
</tr>
<tr>
<td>45 minimum</td>
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</tbody>
</table>

Fuel consumption g/kWh (litres/hr)

<table>
<thead>
<tr>
<th>Power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>110%</td>
</tr>
<tr>
<td>100%</td>
</tr>
<tr>
<td>75%</td>
</tr>
<tr>
<td>50%</td>
</tr>
<tr>
<td>254 (6,2)</td>
</tr>
<tr>
<td>243 (5,4)</td>
</tr>
<tr>
<td>243 (4)</td>
</tr>
<tr>
<td>265 (2,9)</td>
</tr>
</tbody>
</table>

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.

Power rating

<table>
<thead>
<tr>
<th>Ambient temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30</td>
</tr>
<tr>
<td>kW</td>
</tr>
<tr>
<td>10W</td>
</tr>
</tbody>
</table>

Maximum static bending moment
at rear face of block .................................. TBA Nm (TBA lb ft)

Distributed by

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