### Basic technical data

- **Number of cylinders**: 4
- **Cylinder arrangement**: In-line
- **Induction system**: Turbocharged
- **Combustion system**: Direct injection diesel
- **Compression ratio**: 18.2:1
- **Bore**: 105.0 mm
- **Stroke**: 127.0 mm
- **Cubic capacity**: 4.4 litres
- **Direction of rotation**: Anticlockwise when viewed from flywheel (clockwise when viewed from front)
- **Firing order**: 1, 3, 4, 2
- **Estimated total weight of Electropak (dry)**: 474 kg

### Overall dimensions

- **Height, including radiator support brackets**: 967 mm
- **Length, front of radiator to rear of air cleaner**: 1238 mm
- **Width**: 637 mm

### Moments of inertia (mk²)

- **Engine rotational inertia (excluding, pulley, flywheel)**: 0.132 kgm²
- **Crank pulley inertia (dependant on option code)**: Refer to ESM
- **Flywheel inertia (dependant on option code)**: 1.2 kgm²

### Centre of gravity - Electropak

- **Forward from rear of block - wet**: 227.2 mm
- **Above crankshaft centre line - wet**: 100.4 mm
- **Offset to RHS of crankshaft centre line - wet**: 8.1 mm

### Performance

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

- **All ratings certified to within**: ± 5%
- **Speed variation at constant load**: + 0.25%
- **Cyclic irregularity @ 110% stand-by power @ 1800 rpm**: 0.0118

### 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**: 106.5 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.

### Emissions statement:

Certified against the requirements of EPA legislation for non-road mobile machinery, powered by constant speed engines (Tier 3).
**General installation**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Units</th>
<th>1800 rpm</th>
<th>Standby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross engine power (sales power)</td>
<td>kWm</td>
<td>64.0</td>
<td></td>
</tr>
<tr>
<td>Fan and battery charging alternator power</td>
<td>kW</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>Radiator core resistance</td>
<td>kPa</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Fan power absorption</td>
<td>kWm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Net engine power</td>
<td>kWm</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Brake mean effective pressure</td>
<td>kPa</td>
<td>971</td>
<td></td>
</tr>
<tr>
<td>Inlet air flow volume - wet</td>
<td>m³/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust gas flow - wet</td>
<td>m³/min</td>
<td>13.7</td>
<td></td>
</tr>
<tr>
<td>Exhaust gas temperature (ex. Manifold / turbo outlet)</td>
<td>°C</td>
<td>571</td>
<td></td>
</tr>
<tr>
<td>Overall thermal efficiency (net)</td>
<td>%</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Assumed alternator efficiency</td>
<td>%</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td>Regenerative power estimated</td>
<td>kW</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>Engine coolant flow - minimum against 35 kPa restriction</td>
<td>l/min</td>
<td>151</td>
<td></td>
</tr>
<tr>
<td>Typical GenSet electrical output (0.8pf)</td>
<td>kVA</td>
<td>70.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>kWe</td>
<td>56.7</td>
<td></td>
</tr>
</tbody>
</table>

**Energy balance**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Units</th>
<th>1800 rpm</th>
<th>Standby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy in fuel (fuel heat of combustion)</td>
<td>kWt</td>
<td>190.1</td>
<td></td>
</tr>
<tr>
<td>Energy to power (gross)</td>
<td>kWt</td>
<td>64.0</td>
<td></td>
</tr>
<tr>
<td>Energy to cooling fan pusher and battery charging alternator power</td>
<td>kWm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Energy to power (nett)</td>
<td>kWm</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Heat rejection to radiator</td>
<td>kWt</td>
<td>46.1</td>
<td></td>
</tr>
<tr>
<td>Energy to exhaust</td>
<td>kWt</td>
<td>66.9</td>
<td></td>
</tr>
<tr>
<td>Energy to radiation</td>
<td>kWt</td>
<td>13.1</td>
<td></td>
</tr>
</tbody>
</table>
OVERALL DIMENSION 1238,4

BREATHER OUTLET

175,1

156,4

88,9

76,2

55,6

ø 264,2

351,1

ø 9

202

462,5

140,2

423,3

558,5

226,4

136,9

234,3

DEUTSCH DT 02P CONNECTOR 509,1

OPTIONS SHOWN

ACHN0145
A8053/A8054
C0001
D0004
E0111
F0022
G0101
H1220
HD004
J0051
JD001
K0001
L0056
M2416
N0101
Q1100
S0114
SD003
T0000
V3201
VD001
W0008
X0001
ZC002
ZJ006
ZL002
ZM803

4-M12 X 1,75 BOTH SIDES

M10 X 1 PLUGGED

CUSTOMER CONNECTION DEUTSCH CONNECTOR

INLET CONNECTION TO SUIT ø8 BORE RUBBER HOSE

RETURN TO TANK CONNECTION TO SUIT ø8 OR ø10 BORE RUBBER HOSE

16 ACROSS FLATS

OIL PRESSURE SWITCH TAPPING M12 X 1,5

DEUTSCH CONNECTOR PRESSURE SWITCH
**Cooling system**

**Cooling pack**
- Overall weight (wet): 71 kg
- Overall face area: 275834 mm²
- Width: 550 mm
- Height: 762 mm

**Radiator**
- Face area: 275834 mm²
- Number of rows: 2 rows, aluminium
- Matrix density and material: 12.7 fins/inch, Aluminium
- Width of matrix: 526.2 mm
- Height of matrix: 524.2 mm
- Pressure cap setting: 100.0 kPa

**Fan**
- Type: Pusher
- Diameter: 457.2 mm
- Drive ratio: 1.25:1
- Number of blades: 7
- Material: Composite
- Type: Pusher
- Cooling fan airflow @ 1800 rev/min: 98.2 m³/min

**Coolant**
- Total system capacity: 16.5 litres
- Bare engine capacity: 7.0 litres
- Maximum top tank temperature: 112°C
- Shutdown switch setting: 118°C
- Thermostat operation range: 85 - 95°C
- Temperature rise across engine: 6.6 - 7.0°C
- Max. permissible external system resistance: 0.35 kPa
- Coolant pump drive: Gear driven
- Coolant immersion heater rating (minimum): 0.75 kW

**Recommended coolant**
BS6580 - 1992, and ELC coolants to 1E1966
50% anti freeze / 50% water. For complete details of recommended coolant specifications, refer to the Operation and Maintenance Manual for this engine model.

**Pusher**

<table>
<thead>
<tr>
<th>Engine speed rpm</th>
<th>Ambient clearance</th>
<th>Duct allowance</th>
<th>Cooling fan airflow</th>
<th>Radiator immersion heater rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>43°C</td>
<td>200 Pa</td>
<td>281 m³/sec</td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td>50°C</td>
<td>125 Pa</td>
<td>314 m³/sec</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical system**

<table>
<thead>
<tr>
<th>Alternator</th>
<th>Unit</th>
<th>N0101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternator voltage</td>
<td>Volts</td>
<td>12</td>
</tr>
<tr>
<td>Alternator output</td>
<td>Amps</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Starter</th>
<th>Unit</th>
<th>E9111</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter motor voltage</td>
<td>Volts</td>
<td>12</td>
</tr>
<tr>
<td>Starter motor power</td>
<td>kW</td>
<td>4.0</td>
</tr>
<tr>
<td>Number of teeth on flywheel</td>
<td>(D0004)</td>
<td>126</td>
</tr>
<tr>
<td>Number of teeth on starter pinion</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Minimum cranking speed</td>
<td>rpm</td>
<td>1000 with glow plugs, 1300 without glow plugs</td>
</tr>
<tr>
<td>Starter solenoid - Max. pull-in current @ -20°C</td>
<td>Amps</td>
<td>62</td>
</tr>
<tr>
<td>Starter solenoid - Max. hold-in current @ -20°C</td>
<td>Amps</td>
<td>14</td>
</tr>
</tbody>
</table>

**Cold start recommendations**

<table>
<thead>
<tr>
<th>Cold start recommendation</th>
<th>Minimum battery Cold Cranking Amps With glow plugs 12v</th>
<th>Minimum battery Cold Cranking Amps Without glow plugs 12v</th>
<th>Glow plugs must be used</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5 - 15W40</td>
<td>750</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>-10 - 15W40</td>
<td>850</td>
<td>950</td>
<td></td>
</tr>
<tr>
<td>-15 - 15W40</td>
<td>1125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-20 - 10W40</td>
<td>1125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-25 - 5W30</td>
<td>1500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. battery CCA.</td>
<td>2400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Glow plugs needed below -10°C
- For cable sizes see Applications and Installation manual.

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 .............................................. 5.0 kPa
Dirty filter ......................................................... 8.0 kPa
Induction indicator setting ................................ 5.0 kPa
Air filter type: ........................................................ Paper element

Exhaust system

Maximum back pressure
-1800 rpm ......................................................... 15.0 kPa
Exhaust outlet, internal diameter .................................. 90 mm

Fuel injection system

Injection components
Type of injection ........................................ Direct
Fuel injection pump ........................................ DP210EG
Fuel atomiser ...................................................... Unit injector / multi-hole
Nozzle opening pressure ...................................... 18.5 MPa
Fuel filter particle size (maximum) ...................... 2 microns

Fuel lift pump
-max flow through customer filter 2.2 litres/min
-max fuel supply restriction at lift pump 40 kPa
-max fuel return restriction @ low idle 50 kPa
-max fuel return flow 0.8 m³/min
Maximum suction head ........................................ 17 kPa (1.7 m)
Maximum static pressure head ................................ 10 kPa (1.0 m)

Governor type
LCS electronic - speed control conforms to ISO 8528, G3
Mechanical - speed control conforms to ISO 8528, G2

Fuel specification
Perkins recommend the use of the following fuel specifications:
- DIN E 590 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
- JIS K2204 Grades 1, 2 & 3 & Special Grade 3.

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

Fuel consumption (SFC)

<table>
<thead>
<tr>
<th>Load</th>
<th>1800 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>g/kW.hr</td>
</tr>
<tr>
<td>25%</td>
<td>243</td>
</tr>
<tr>
<td>50%</td>
<td>240</td>
</tr>
<tr>
<td>75%</td>
<td>248</td>
</tr>
<tr>
<td>100% (Prime)</td>
<td>260</td>
</tr>
<tr>
<td>110% (Standby)</td>
<td>300</td>
</tr>
</tbody>
</table>

Note: Based on gross rated power.

Lubrication system

Maximum system capacity .............................................. 8.4 Litres
Maximum capacity in sump ........................................... 5.6 Litres
Minimum capacity in sump ........................................... 6.9 Litres
Sump drain plug tapping size ..................................... 3/4 - 16 UNF
Shutdown switch setting (where fitted) ...................... ECM controlled
Maximum oil temperature continuous operation: 125°C
Maximum oil temperature intermittent operation: 135°C

Lubricating oil pressure
At rated speed ......................................................... 430 kPa
Relief valve opens ...................................................... 450 kPa
At maximum no-load speed ......................................... 280 - 340 kPa

Oil temperature
Continuous operation ...................................................... 125 °C
Oil consumption at full load as a % of fuel consumption .................. 0.15%
Sump drain plug tapping size or hose connection size .................. 3/4 UNF STOR port

Recommended SAE viscosity
A multigrade oil conforming to API-CH4 must be used.

Ambient Temperature Deg C

Viscosity grade ( Perkins )

-50 -40 -30 -20 -10 0 10 20 30 40 50 60

Normal operating angles
Front and rear ........................................... 24°
Side .......................................................... 24°
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.

The above figures were obtained under the following test conditions:

- Minimum engine block temperature: 45°C
- Ambient temperature: 15°C
- Governing mode: Isochronous
- Alternator inertia: 8 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.

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Units</th>
<th>1800 rpm (60 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Prime Power</td>
<td>%</td>
<td>80</td>
</tr>
<tr>
<td>Load (nett)</td>
<td>kWm (kWe)</td>
<td>45.6 (41.0)</td>
</tr>
<tr>
<td>Transient frequency deviation</td>
<td>%</td>
<td>3.8</td>
</tr>
<tr>
<td>Frequency recovery</td>
<td>seconds</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Mountings

Flywheel housing: SAE3 156.4mm
Maximum static bending moment at rear face of block: 1130 Nm

Note: Refer to “Applications and Installation Manual” for “Bending Moment approval requirements”.