

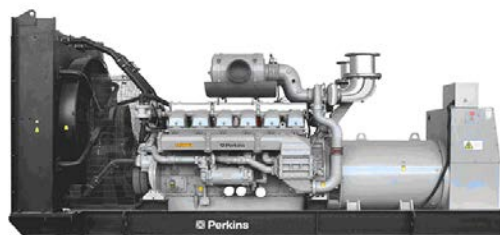
## DATA SHEET

DIESEL GENERATOR 8KW

MODEL#FDK-P8/H1

50HZ/1500RPM

PERKINS MODEL: 403D-11G



### General Features:

- ♦ All qualified generator sets are subjected to a comprehensive performance test which includes 50% load, 70% load, 100% load, 110% load and to check, verify that all control systems, alarm and shut-down protection.
- ♦ Equipped with battery charger and 24V high performance maintenance-free lead-acid starting batteries and connecting cables.
- ♦ Stainless galvanized zinc plates with strong corrosion-proof.
- ♦ Vibration isolators between the engine/alternator and base frame.
- ♦ Equipped with industrial silencer and flexible exhaust hose.
- ♦ Designed to comply with ISO8528/GB2820.
- ♦ Powered by Perkins engine and coupled with Stamford alternator.
- ♦ Water jacket preheater, oil heater and double air cleaner, etc. are available.

### FDK Diesel Generator Set Data

|                                |              |
|--------------------------------|--------------|
| Genset Model                   | FDK-P8/H1    |
| Prime Power                    | 7.3KW/7.9KVA |
| Standby Power                  | 8KW/10KVA    |
| Output Frequency / Rated speed | 50Hz/1500rpm |
| Rated Voltage                  | 230V/400V    |

|                  |                 |
|------------------|-----------------|
| Engine Make      | Perkins CHINA   |
| Engine Model     | 403D-11G        |
| Alternator model | Stamford PI044E |
| Control System   | DSE7320         |
| Phase            | Three           |

(1) **Prime power:** The rating is available for an unlimited of annual operating hours in variable load applications, in accordance with ISO8528-1.A 10% overload is available for a period of 1 hour within 12-hour period of operation, in accordance with ISO 3046-1.

(2) **Standby power:** The rating is applicable for supplying emergency power in variable load applications for up to 200 hours per year in accordance with ISO8528-1. Overload is not allowed.

(3) **Rated voltage:** available with customer requirement.

### Engine Specifications (DETAILED in APPENDIX)

|                      |               |
|----------------------|---------------|
| Engine Model         | 403D-11G      |
| Engine Manufacturer  | Perkins CHINA |
| Cylinder quantity    | 3             |
| Cylinder Arrangement | In-line       |
| Cycle                | 4             |
| Aspiration           | Naturally     |

|                               |            |
|-------------------------------|------------|
| Bore x Stroke (mm x mm)       | 77x81      |
| Displacement                  | 1.131L     |
| Compression Ratio             | 23:1       |
| Prime power / Speed (KW/RPM)  | 8.6kw/1500 |
| Standby power/ Speed (KW/RPM) | 9.5kw/1500 |
| Governor type                 | Mechanical |



ISO9001:2008

FDK reserves the right to change the specifications and designs without notice.

|  |        |  |        |
|--|--------|--|--------|
| Piston Speed                                   | 4.1m/s | Fuel Consumption at 100% load (L/HOUR) | 2.6L   |
| Typical genset electrical output (0,8 pf 25°C) | 7.2kw  | Starter motor                          | 12V    |
| Total Lubrication System Capacity (L)          | 4.9    | Alternator                             | 12V    |
| Coolant Capacity (L)                           | 1.9    | Minimum cranking speed.                | 150rpm |

## Alternator Specifications

|                          |   |                          |   |
|--------------------------|---|--------------------------|---|
| Alternator model         | PI044E                                  | Number of phase          | 3   |
| Alternator manufacturer  | STAMFORD                                | Rated voltage            | 400V (Available with custom requirements) |
| Exciter type             | Single bearing, Brushless, Self-excited | Power factor             | 0.8                                       |
| Rated output prime power | 10KVA                                   | Voltage regulation NL-FL | ≤±1%                                      |
| Rated speed              | 1500 rpm                                | Insulation grade         | H   |
| Rated frequency          | 50Hz                                    | Protection grade         | IP23                                      |

**Alternator option: Leroy Somer, MECC, Marathon, Engga, Faraday**

## Control System DSE7320 (DETAILED in INSTRUCTION)

DSE7320 is an advanced control module based on micro-processor, containing all necessary functions for protection of the genset and the breaker control. It can monitor the mains supply, breaker control and automatically start the engine when the mains are abnormal. Accurately measure various operational parameters and display all values and alarms information on the LCD. In addition, the control module can automatically shut down the engine and indicate the engine failure.

### FEATURES

- ♦ Microprocessor control, with high stability and credibility.
- ♦ Monitoring and measuring operational parameters of the mains supply and genset.
- ♦ Indicating operation status, fault conditions, all parameters and alarms.
- ♦ Multiple protections; multiple parameters display, like pressure, temp. etc.
- ♦ Manual, automatic and remote work mode selectable.
- ♦ Real time clock for time and date display, overall runtime display, 250 log entries.
- ♦ Overall power output display.
- ♦ Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
- ♦ Communication with PC via RS485 OR RS232 interface, using MODBUS protocol.

## Soundproof Enclosure Specification

FDK silent generator is designed by professional acoustic engineers based on years of experience. Now we can make the noise of the generator less than 80-85dB(A) at 1m, or 70-75dB(A) at 7m, 60-65dB(A) at 15m.

### FEATURES

- ♦ Multi-way air intake and exhaust guarantee the power performance of the generator.
- ♦ Large-scale impedance combined type silencer effectively reduce noise of the generator.
- ♦ Internal high performance rubber damper and flexible materials reduce vibration.
- ♦ Base mounted fuel tank supports the generator running for 8 hours.



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FDK reserves the right to change the specifications and designs without notice.

## Optional

| Generator set   | Alternator  | Low environment Temp  | ATS  |
|---|---|---|--|
| <input type="checkbox"/> Open generator set<br><input type="checkbox"/> Silent generator set<br><input type="checkbox"/> Trailer generator set<br><input type="checkbox"/> ABB MCCB circuit breaker | <input type="checkbox"/> Stamford<br><input type="checkbox"/> Marathon<br><input type="checkbox"/> Mecc Alte<br><input type="checkbox"/> Leroy Somer<br><input type="checkbox"/> Farady<br><input type="checkbox"/> Engga | <input type="checkbox"/> Water heater<br><input type="checkbox"/> Oil heater<br><input type="checkbox"/> Battery heater   | <input type="checkbox"/> CHINT<br><input type="checkbox"/> SCHNEIDER<br><input type="checkbox"/> ABB   |
| Fuel system   | Control system  | Voltage   | Synchronized system  |
| <input type="checkbox"/> 12hrs base tank<br><input type="checkbox"/> 24hrs base tank<br><input type="checkbox"/> Dual wall base fuel tank<br><input type="checkbox"/> Outside fuel tank             | <input type="checkbox"/> AMF function<br><input type="checkbox"/> ATS control cabinet<br><input type="checkbox"/> DSE7320<br><input type="checkbox"/> DSE7510<br><input type="checkbox"/> GU620A                          | <input type="checkbox"/> 415/240V<br><input type="checkbox"/> 400/230V<br><input type="checkbox"/> 380/220V<br><input type="checkbox"/> 220/127V<br><input type="checkbox"/> 200/115V | <input type="checkbox"/> CHINT Cabinet<br><input type="checkbox"/> SCHNEIDER Cabinet<br><input type="checkbox"/> DSE8610 Module<br><input type="checkbox"/> COMAQ Module<br><input type="checkbox"/> DEIF Module |

## Dimension & Weight

### Open

|                             |              |
|-----------------------------|--------------|
| Overall Size:<br>LxWxH (mm) | 1260x630x730 |
| Weight (kg)                 | 450          |

### Soundproof Version

|                             |                |
|-----------------------------|----------------|
| Overall Size:<br>LxWxH (mm) | 2500x1000x1400 |
| Weight (kg)                 | 500            |

## Sales Promises

- ◆ FDK provides a full line of brand new and high quality products. Each and every unit is strictly factory tested before shipment.
- ◆ Quality warranty is according to our standard conditions: 12 months from BL date or 1000 running hours, whichever comes first.
- ◆ Service and parts are available from FDK or distributors in your location.
- ◆ FDK guarantee use **BRAND NEW & GENUINE MACHINE.**



# Technical Data

## 400 Series

## 403D-11G

### Electropak

#### 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                               |
| Stroke                       | 81 mm                               |
| Cubic capacity               | 1-131 litres                        |
| Direction of rotation        | anti-clockwise viewed from flywheel |
| Firing order                 | 1, 2, 3                             |
| Estimated total weight (dry) | 129,2 kg                            |

#### Overall dimensions

|                                      |        |
|--------------------------------------|--------|
| -height                              | 700 mm |
| -length                              | 776 mm |
| -width (including mounting brackets) | 449 mm |

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

|                               |                        |
|-------------------------------|------------------------|
| -engine rotational components | 0,12 kg m <sup>2</sup> |
| -flywheel                     | 1,51 kg m <sup>2</sup> |

#### Centre of gravity

|                               |        |
|-------------------------------|--------|
| -forward from rear of block   | tba mm |
| -above crank centre line      | tba mm |
| -offset to RHS of centre line | tba mm |

#### Performance

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

Steady state speed stability at constant load

- G2 ... ± 0,75%

Cyclic irregularity

-at 110% stand-by power ... tba

#### Test conditions

-air temperature ... 25 °C

-barometric pressure ... 100 kPa

-relative humidity ... 31.5%

-air inlet restriction at maximum power (nominal) ... 3 kPa

-exhaust back pressure at maximum power (nominal) ... 10,2 kPa

-fuel temperature (inlet pump) ... 40 °C

#### Sound level

Average sound pressure level for bare engine (without inlet and exhaust) at 1 metre ... 76,7 dB(A)

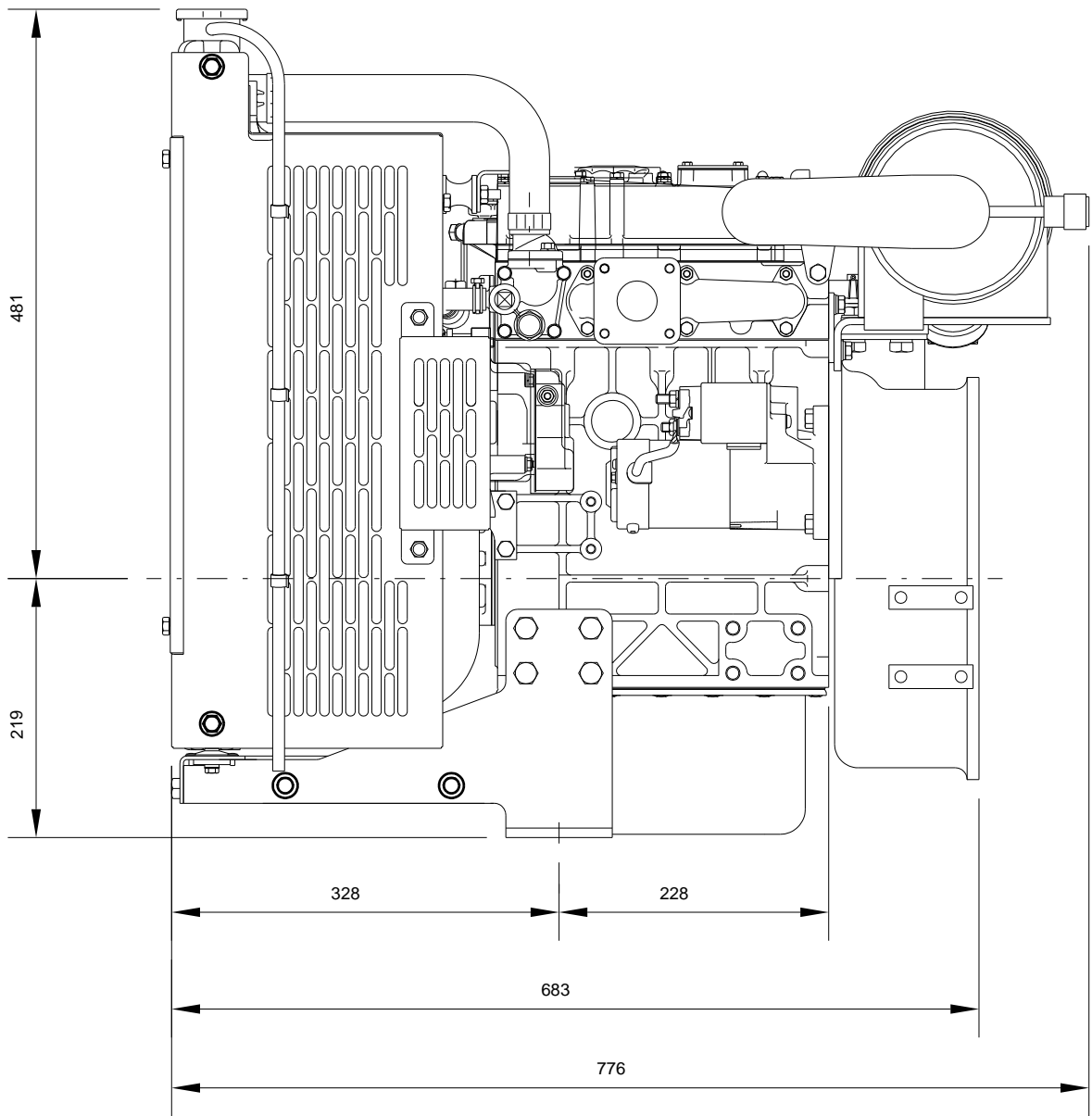
-all ratings certified to within ... ± 5%

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. **Emissions Statement:** Certified against the requirements of EU2007 (EU 97/68/EC Stage II) legislation for non-road mobile machinery, powered by constant speed engines.

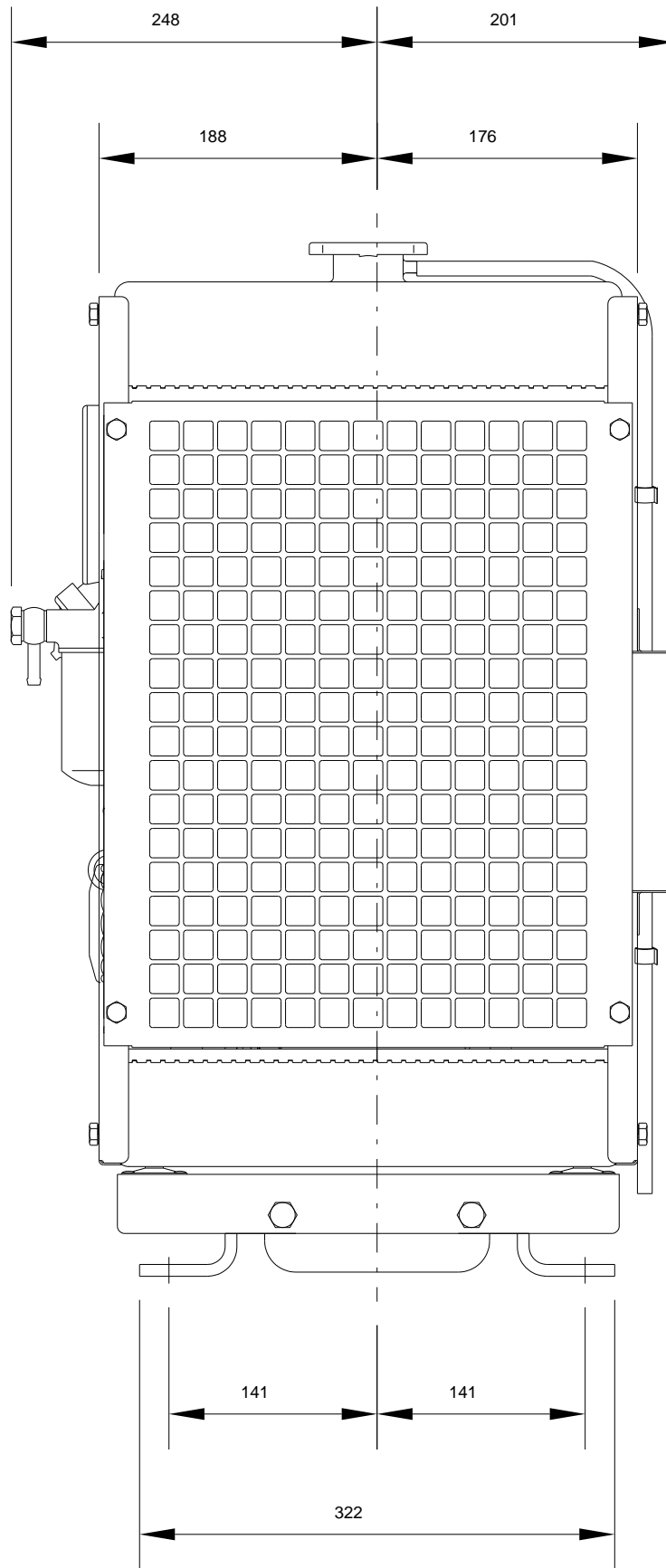
#### General installation

| Designation                                    | Units               | Type of operation and application |          |
|--|---------------------|-----------------------------------|----------|
|  |                     | Prime                             | Stand-by |
|  |                     | 50Hz                              | 50Hz     |
| Gross engine power                             | kWb                 | 8,6                               | 9,5      |
| Brake mean effective pressure                  | kPa                 | 610                               | 672      |
| Mean piston speed                              | m/s                 | 4,1                               |          |
| Engine coolant flow (Water pump ratio 1.285:1) | l/min               | 27,3                              |          |
| Combustion air flow                            | m <sup>3</sup> /min | 0,7                               |          |
| Exhaust gas flow (max)                         | m <sup>3</sup> /min | 1,66                              | 1,8      |
| Exhaust gas temperature outlet (max)           | °C                  | 368                               | 420      |
| Overall thermal efficiency (nett)              | %                   | 32                                | 31       |
| Typical genset electrical output (0,8 pf 25°C) | kWe                 | 7,2                               | 8,0      |
|  | kVA                 | 9,0                               | 10       |
| Assumed alternator efficiency                  | %                   | 86                                |          |
| <b>Energy balance</b>                          |                     |                                   |          |
| Energy in fuel (heat of combustion)            | kWt                 | 25,9                              | 29,5     |
| Energy in power output (gross)                 | kWb                 | 8,6                               | 9,5      |
| Energy to cooling fan                          | kWt                 | 0,2                               |          |
| Energy in power output (nett)                  | kWm                 | 8,4                               | 9,3      |
| Energy to coolant and lubricating oil          | kWt                 | 8,3                               | 9,5      |
| Energy to exhaust                              | kWt                 | 7,3                               | 8,0      |
| Heat to radiation                              | kWt                 | 1,7                               | 2,5      |

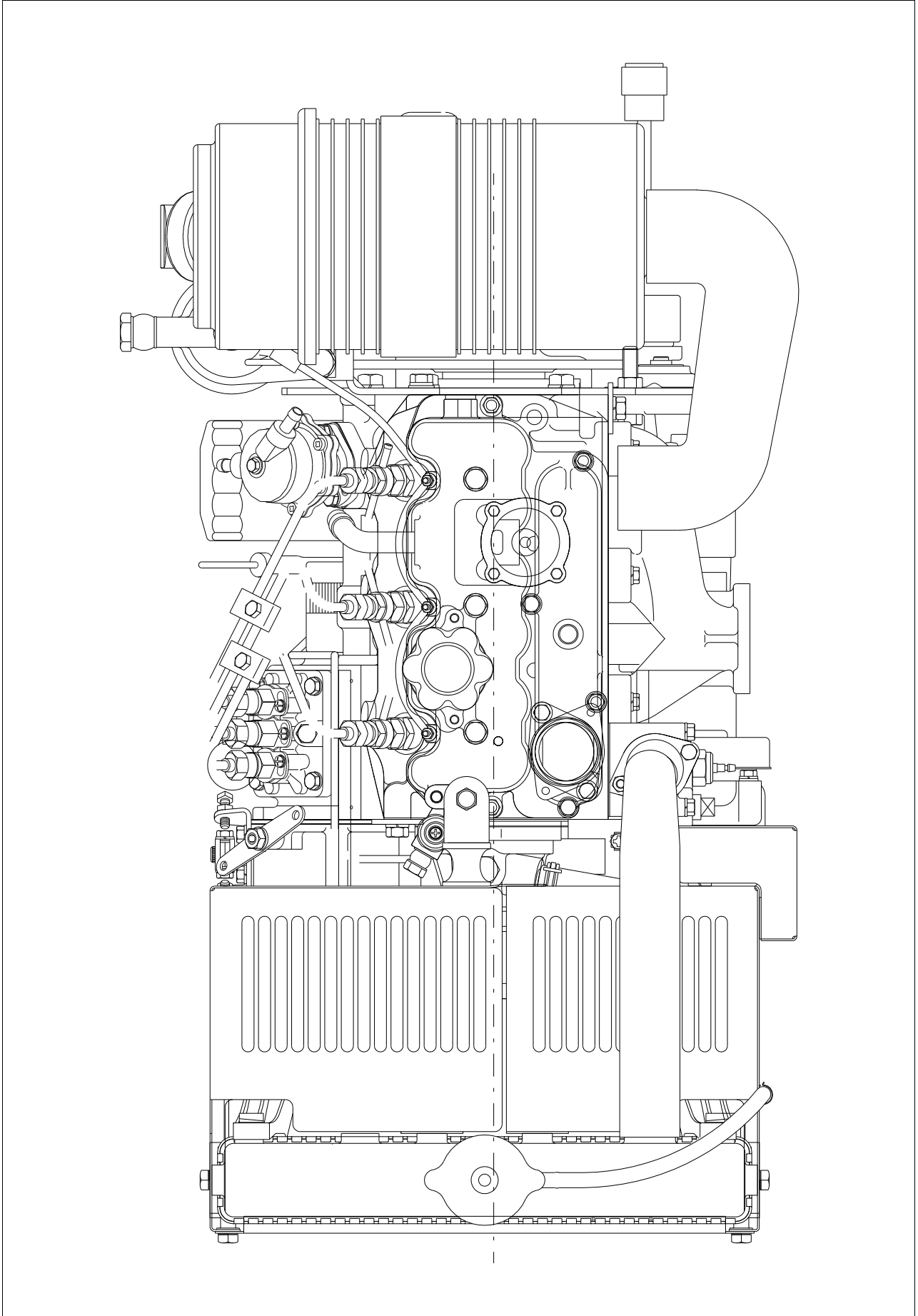
403D-11G ElectropaK, left side view



403D-11G ElectropaK, front view



403D-11G ElectropaK, plan view



## Cooling system

### Radiator

-face area ..... 0,147 m<sup>2</sup>  
 -rows and materials ..... 2 rows, Aluminium  
 -matrix density and material ..... 14,5 FPI Aluminium  
 -width of matrix ..... 334 mm  
 -height of matrix ..... 440 mm  
 -pressure cap setting ..... 90 kPa  
 Estimated cooling air flow reserve ..... 0,125 kPa

### Fan

-diameter ..... 320 mm  
 -drive ratio ..... 1,285:1  
 -number of blades ..... 7  
 -material ..... Plastic  
 -type ..... Pusher

### Coolant

Total system capacity  
 -with radiator ..... 5,2 litres  
 -without radiator ..... 1,9 litres  
 Maximum top tank temperature ..... 112 °C  
 Max static pressure head on pump ..... 30,4 kPa  
 Temperature rise across engine ..... tba °C  
 Max permissible external system resistance ..... tbatba kPa  
 Thermostat operation range ..... 75 - 87°C  
 Recommended coolant: 50% anti freeze / 50% water. For complete details of recommended coolant specifications, refer to the Operation and Maintenance Manual for this engine model

### Duct allowance

| Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow |                      |                     |
|--|----------------------|---------------------|
| Ambient clearance<br>50% Glycol  | Duct allowance<br>Pa | m <sup>3</sup> /sec |
| 53°C   | 0                    | 0,67                |
| 46°C   | 125                  | 0,44                |

## Electrical system

-alternator ..... 15 / 40 amps -12 V  
 -starter motor ..... Bosch 1,1 kW -12 V

### Cold start recommendations

Minimum cranking speed ..... 150 rev/min

| Minimum starting temperature<br>°C | Grade of engine lubricating oil | Battery specifications |                            |                         |                       |
|------------------------------------|---------------------------------|------------------------|----------------------------|-------------------------|-----------------------|
|                                    |                                 | BS3911 Cold start amps | SAEJ537 Cold cranking amps | No. of batteries needed | Commercial ref number |
| 0                                  | 20W                             | 340                    | 540                        | 1                       | 069                   |
| -15                                | 10W                             | 340                    | 540                        | 1                       | 069                   |
| -20                                | 5W                              | 420                    | 590                        | 1                       | 072                   |

**Note:** Additional information for battery and cable limits can be found in section 6 (Electrics) of 400D Engine Sales Manual.

## Exhaust system

Maximum back pressure ..... 10,2 kPa  
 Exhaust outlet size  
 -horizontal ..... 34 mm  
 -vertical ..... 40 mm

## Fuel system

Type of injection ..... Indirect injection  
 Fuel injection pump ..... Cassette type  
 Fuel injector ..... Pintle nozzle  
 Nozzle opening pressure ..... 14,7 MPa  
 Maximum particle size ..... 25 microns

### Fuel lift pump

-type ..... mechanical (camshaft driven)  
 -flow/hour ..... 63 litres/hr  
 -pressure ..... 10 kPa  
 Maximum suction head ..... 0,8 m  
 Maximum static pressure head ..... 3 m  
 Governor type ..... Mechanical

### Fuel specification

**USA Fed Off Highway - EPA2D 89.330-96**

**Europe Off Highway - CEC RF-06-99**

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

### 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 filter ... ..3,0 kPa
- dirty filter ... ..6,4 kPa
- air filter type ... ..Dry element type

**Lubrication system**

**Lubricating oil capacity**

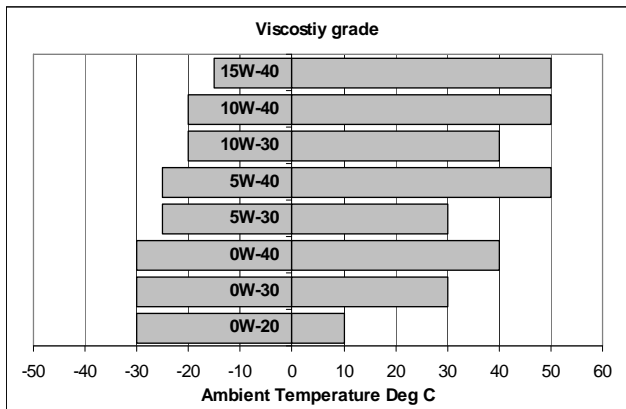
- Maximum sump capacity... ..4,4 litres
- Total system... ..4,9 litres
- Minimum... ..3,4 litres
- Maximum engine operating angles
- front up, front down, right side or left side... ..35° continuous

**Lubricating oil pressure**

- minimum oil pressure... ..120 kPa
- relief valve opens ... ..304 - 500 kPa
- at maximum no-load speed... ..tba
- Normal oil temperature... ..125 °C
- oil flow at rated speed... ..6,6 litres/min.

**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... ..500 Nm

**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

| Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank) |         |       |
|---|---------|-------|
| Descriptor  | Units   | 50 Hz |
| % of prime power  | %       | tba   |
| Transient frequency deviation   | %       | tba   |
| Frequency recovery  | Seconds | tba   |

The above figures were obtained under the following test conditions:

- minimum engine block temperature ... ..tba °C
  - ambient temperature ... ..25 °C
  - governing mode ... ..5 %
  - alternator inertia ... ..tba kgm<sup>2</sup>
  - under frequency roll off (UFRO) point set to 2% Volt / 1% frequency
  - UFRO rate set to ... ..1 Hz below rated speed
  - LAM on/off ... ..off
- All tests were conducted using an engine which was installed and serviced to Perkins Engines Company Limited recommendations.

**Derate Curves**

Derate curves for altitude and humidity can be found in section six (Ratings) of the 400D Engine Sales Manual

**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.



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