**DOOSAN INFRACORE GENERATOR ENGINE**

**P180LE**

<table>
<thead>
<tr>
<th>Ratings (kWm/PS)</th>
<th>Gross Engine Output</th>
<th>Net Engine Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standby</td>
<td>Prime</td>
<td>Standby</td>
</tr>
<tr>
<td>1500rpm (50Hz)</td>
<td>496/674</td>
<td>443/602</td>
</tr>
<tr>
<td>1800rpm (60Hz)</td>
<td>540/734</td>
<td>497/676</td>
</tr>
</tbody>
</table>

**Ratings Definitions**
The power ratings of Emergency Standby and Prime are in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046. Electric power (kWe) must be considered cooling fan loss, alternator efficiency, altitude derating and ambient temperature.

**STANDBY POWER RATING** is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. A standby rated engine should be sized for a maximum of an 70% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating.

**PRIME POWER RATING** is available for an unlimited number of hours per year in variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 24 hours. The Total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour withing a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

**◎ GENERAL ENGINE DATA**

- **Engine Model**: P180LE
- **Engine Type**: 4-Cycle, V-type, 10-Cylinder, Turbo charged & intercooled (air to air)
- **Bore x stroke**: 128 x 142 mm
- **Displacement**: 18.273 liters
- **Compression ratio**: 15 : 1
- **Rotation**: Counter clockwise viewed from Flywheel
- **Firing order**: 1-6-5-10-2-7-3-8-4-9
- **Injection timing**: 16˚±1˚ BTDC
- **Fly wheel housing**: SAE NO.1M
- **Fly wheel**: Clutch NO.14M
- **Number of teeth on flywheel**: 160

**◎ ENGINE MOUNTING**

- **Maximum Bending Moment at Rear Face to Block**: 1,325 N.m

**◎ EXHAUST SYSTEM**

- **Maximum Back Pressure**: 5.9 kPa

**◎ AIR INDUCTION SYSTEM**

- **Maximum Intake Air Restriction**
  - With Clean Filter Element: 2.16 kPa
  - With Dirty Filter Element: 6.23 kPa
- **Max. static pressure after Radiator**: 0.125 kPa

Printed in September 2015 Large Engine Design Team_P180LE_F
# COOLING SYSTEM

- **Cooling method**: Fresh water forced circulation
- **Coolant capacity**: Engine Only: Approx. 21 lit, With Radiator (standard): Approx 81 lit.
- **Coolant flow rate**: 600 liters / min
- **Pressure Cap**: 49 kPa
- **Water Temperature**:
  - Maximum for standby and Prime: 103°C
  - Before start of full load: 40.0°C
- **Water pump**: Centrifugal type driven by belt
- **Thermostat Type and Range**: Wax – pellet type, Opening temp. 71°C, Full open temp. 85°C
- **Cooling fan**: Blower type, plastic, 915 mm diameter, 7 blade
- **Max. external coolant system restriction**: Not available

# LUBRICATION SYSTEM

- **Lub. Method**: Fully forced pressure feed type
- **Oil pump**: Gear type driven by crank-shaft gear
- **Oil filter**: Full flow, cartridge type
- **Oil capacity**: Max. 35 liters, Min. 28 liters
- **Lub oil pressure**:
  - Idle Speed: Min 100 kPa
  - Governed Speed: Min 250 kPa
- **Maximum oil temperature**: 120°C
- **Angularity limit**: Front down 10 deg, Front up 10 deg, Side to side 22.5 deg
- **Lubrication oil**: Refer to Operation Manual

# FUEL SYSTEM

- **Injection pump**: Bosch in-line "P" type
- **Governor**: Electric type
- **Speed drop**: G2 Class (ISO 8528)
- **Feed pump**: Mechanical type in injection pump
- **Injection nozzle**: Multi hole type
- **Opening pressure**: 27.9 MPa
- **Fuel filter**: Full flow, cartridge type with water drain valve
- **Maximum fuel inlet restriction**: 10 kPa
- **Maximum fuel return restriction**: 60 kPa
- **Fuel feed pump Capacity**: 630 liters / hr
- **Used fuel**: Diesel fuel oil

# ELECTRICAL SYSTEM

- **Battery Charging Alternator**: 28.5V x 45A alternator
- **Governor**: Built-in type IC regulator
- **Starting motor**: 24V x 7.0 kW
- **Battery Voltage**: 24V
- **Battery Capacity**: 2 x 200 Ah (recommended)
- **Starting aid (Option)**: Block heater, Air Heater

Printed in September 2015 Large Engine Design Team_P180LE_F
## VALVE SYSTEM
- **Type**: Overhead valve type
- **Number of valve**: Intake 1, exhaust 1 per cylinder
- **Valve lashes at cold**: Intake 0.25 mm, Exhaust 0.35 mm
- **Valve timing**
  - Intake valve: 24 deg. BTDC, 63 deg. BBDC
  - Exhaust valve: 36 deg. ABDC, 27 deg. ATDC

## PERFORMANCE DATA

<table>
<thead>
<tr>
<th>asured Property</th>
<th>Prime Power</th>
<th>Standby Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governed Engine speed (rpm)</td>
<td>1500</td>
<td>1800</td>
</tr>
<tr>
<td>Engine Idle Speed (rpm)</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Over speed limit (rpm)</td>
<td>1650</td>
<td>1980</td>
</tr>
<tr>
<td>Gross Engine Power Output (kW)</td>
<td>443</td>
<td>497</td>
</tr>
<tr>
<td>Break Mean effective pressure (MPa)</td>
<td>1.94</td>
<td>1.91</td>
</tr>
<tr>
<td>Mean Piston Speed (m/s)</td>
<td>7.1</td>
<td>8.5</td>
</tr>
<tr>
<td>Friction Power (kW)</td>
<td>32</td>
<td>44</td>
</tr>
<tr>
<td>Specific fuel consumption (25% load) liters/hr</td>
<td>29.6</td>
<td>34.9</td>
</tr>
<tr>
<td>(50% load) liters/hr</td>
<td>54.8</td>
<td>63.3</td>
</tr>
<tr>
<td>(75% load) liters/hr</td>
<td>81.3</td>
<td>93.4</td>
</tr>
<tr>
<td>(100% load) liters/hr</td>
<td>111.6</td>
<td>128.2</td>
</tr>
<tr>
<td>Fan Power (kW)</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Sound Pressure at 1m from the each side of Cylinder Block (dB(A))</td>
<td>101.1</td>
<td>101.5</td>
</tr>
</tbody>
</table>

The all data and the specific fuel consumption are based on ISO 3046/1, Standard reference conditions are in accordance with 298 K(25° Celsius) air temperature, 100kPa(1000mbar) air pressure, 60% relative humidity, 110m(361ft) altitude.

**Operation At Elevated Temperature And Altitude:** The engine may be operated at:

- 1800 rpm & 1500rpm up to 750~1000m and 30°C without power deration
- For sustained operation above these conditions, derate by 3% per 304m, and 2% per 11°C

## Engine Data with Dry Type Exhaust Manifold
- Intake Air Flow (m3/min): 30.7, 39.2, 33.7, 41.6
- Exhaust gas temp. after turbo. (°C): 554, 475, 580, 505
- Exhaust Gas Flow (m3/min): 88.3, 101.5, 100.2, 112.3
- Heat Rejection to Exhaust (kW): 393.3, 451.8, 453.5, 509.6
- Heat Rejection to Coolant (kW): 171.0, 196.4, 197.2, 221.5
- Heat Rejection to Intercooler (kW): 91.2, 104.8, 105.2, 118.2
- Radiated Heat to Ambient (kW): 39.3, 45.8, 46.0, 51.7
- Cooling water circulation (liters/min): 535, 600, 535, 600
- Cooling fan air flow (m3/min): 522, 618, 522, 618

Printed in September 2015 Large Engine Design Team_P180LE_F
◆ ENGINE DIMENSION

◆ CONVERSION TABLE

<table>
<thead>
<tr>
<th>Conversion</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>in. = mm</td>
<td>in. = mm x 0.0394</td>
</tr>
<tr>
<td>PS = kW</td>
<td>PS = kW x 1.3596</td>
</tr>
<tr>
<td>psi = kg/cm²</td>
<td>psi = kg/cm² x 14.2233</td>
</tr>
<tr>
<td>in³ = lit.</td>
<td>in³ = lit. x 61.02</td>
</tr>
<tr>
<td>hp = PS</td>
<td>hp = PS x 0.98635</td>
</tr>
<tr>
<td>lb = kg</td>
<td>lb = kg x 2.20462</td>
</tr>
<tr>
<td>kW = kcal/ sec</td>
<td>kW = kcal/sec x 0.239</td>
</tr>
<tr>
<td>lb/ft = N.m</td>
<td>lb/ft = N.m x 0.737</td>
</tr>
<tr>
<td>U.S. gal</td>
<td>U.S. gal = lit. x 0.264</td>
</tr>
<tr>
<td>psi = kg/cm²</td>
<td>psi = kg/cm² x 14.2233</td>
</tr>
<tr>
<td>lb/PS.h</td>
<td>lb/PS.h = g/kW.h x 0.00162</td>
</tr>
<tr>
<td>cfm = m³/min</td>
<td>cfm = m³/min x 35.336</td>
</tr>
<tr>
<td>MPa = kPa</td>
<td>MPa = kPa x 1000 = bar x 10</td>
</tr>
<tr>
<td>kW = kcal/s</td>
<td>kW = kcal/sec x 0.239</td>
</tr>
</tbody>
</table>

Doosan Infracore Co., Ltd.
21st Floor, Doosan Tower, 18-12, Euljiro 6-ga, Jung-gu, Seoul, Korea.

TEL : +82-2-3398-8400 / FAX : +82-2-3398-8509
E-mail : enginesales@doosan.com
Web site : www.doosaninfracore.com

※ Specifications are subject to change without prior notice.