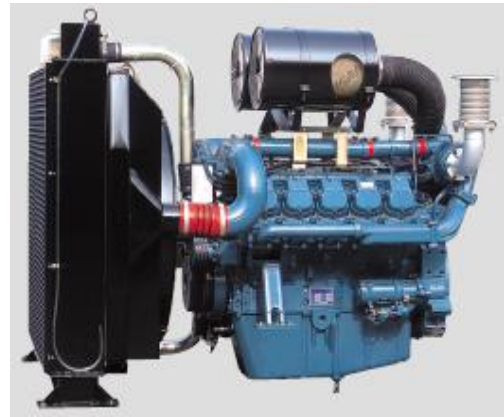


DOOSAN INFRACORE GENERATOR ENGINE

P180LE-1



| Ratings (kWm/PS) | Gross Engine Output | | Net Engine Output | |
|----------------------|---------------------|---------|-------------------|---------|
| | Standby | Prime | Standby | Prime |
| 1500rpm(50Hz) | 442/601 | 403/548 | 428/582 | 389/529 |
| 1800rpm(60Hz) | 498/677 | 454/617 | 475/646 | 431/586 |

Ratings Definitions

The power ratings of Emergency Standby and Prime are in accordance with ISO 8528.

Fuel Stop power in accordance with ISO 3046.

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 250 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 hous per year

◎ GENERAL ENGINE DATA

| | |
|-------------------------------|--|
| ○ Engine Model | P180LE-1 |
| ○ 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 |
| ○ Dry weight | 1,175 kg(with Fan) |
| ○ Dimension (LxWxH) | 1,540 x 1,388 x 1,252 mm |
| ○ 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 |

◎ COOLING SYSTEM

Water circulation by centrifugal pump on engine.

| | |
|--|--|
| ○ 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 | Max. 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

Force-feed lubrication by gear pump, lubricating oil cooling in cooling water circuit of engine.

| | |
|---------------------------|---|
| ○ 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

Bosch type in-line pump with integrated, electromagnetic actuator.

| | |
|-----------------------------------|---|
| ○ Injection pump | Bosch in-line "P" type |
| ○ Governor | Electric type |
| ○ Speed drop | G3 Class (ISO 8528) |
| ○ Feed pump | Mechanical type in injpump. |
| ○ 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 |
| ○ Voltage regulator | Built-in type IC regulator |
| ○ Starting motor | 24V x 7.0 kW |
| ○ Battery Voltage | 24V |
| ○ Battery Capacity | 2 x 100 Ah (recommended) |
| ○ Starting aid (Option) | Block heater, Air heater |

◎ 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 | Opening | Close |
| - Intake valve | 24 deg. BTDC | 36 deg. ABDC |
| - Exhaust valve | 63 deg. BBDC | 27 deg. ATDC |

◎ PERFORMANCE DATA

| | | Prime Power | | Standby Power | |
|---|-----------|-------------|-------|---------------|-------|
| ○ Governed Engine speed | rpm | 1500 | 1800 | 1500 | 1800 |
| ○ Engine Idle Speed | rpm | 800 | 800 | 800 | 800 |
| ○ Over speed limit | rpm | 1650 | 1980 | 1650 | 1980 |
| ○ Gross Engine Power Output | kW | 403 | 454 | 442 | 498 |
| | PS | 548 | 617 | 601 | 677 |
| ○ Break Mean effective pressure | MPa | 1.77 | 1.66 | 1.94 | 1.82 |
| ○ Mean Piston Speed | m/s | 7.1 | 8.5 | 7.1 | 8.5 |
| ○ Friction Horsepower | kW | 32 | 44 | 32 | 44 |
| | PS | 43.5 | 59.8 | 43.5 | 59.8 |
| ○ Specific fuel consumption | | | | | |
| 25% load | liters/hr | 26.6 | 32.7 | 29.0 | 35.7 |
| 50% load | liters/hr | 48.6 | 57.5 | 52.8 | 61.6 |
| 75% load | liters/hr | 71.4 | 80.1 | 78.4 | 87.6 |
| 100% load | liters/hr | 95.9 | 107.9 | 105.9 | 121.5 |
| ○ Maximum Lube oil consumptic | g/h | 384 | 432 | 421 | 474 |
| ○ Fan Power | kW | 14 | 23 | 14 | 23 |
| ○ Exhaust Noise at 1m Horizontally from Centerline of Exhaust Pipe distance | | | | | |
| (without Fan) | dB(A) | 101.1 | 101.5 | 101.1 | 101.5 |

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 :

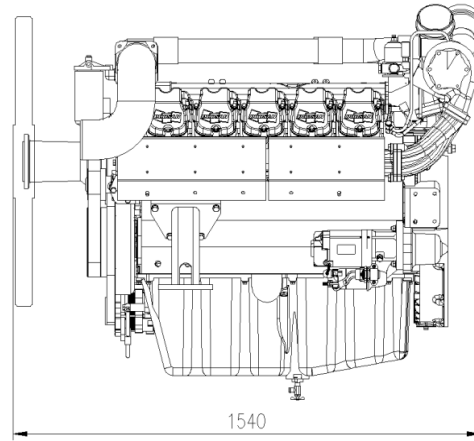
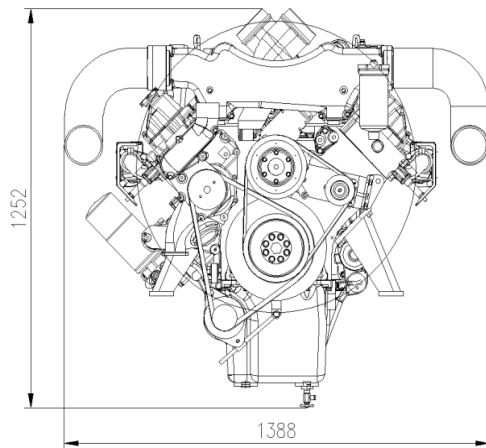
1800 rpm & 1500rpm up to 750~ 1000m and 30°C without power deration

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 | 28.5 | 36.7 | 30.7 | 39.2 |
| ○ Exhaust gas temp. after turbo. | °C | 550 | 530 | - | - |
| ○ Exhaust Gas Flow | m3/min | 75 | 93 | - | - |
| ○ Heat Rejection to Exhaust | kW | 337.9 | 380.2 | 373.2 | 428.2 |
| ○ Heat Rejection to Coolant | kW | 146.9 | 165.3 | 162.3 | 186.2 |
| ○ Heat Rejection to Intercooler | kW | 78.4 | 88.2 | 86.5 | 99.3 |
| ○ Radiated Heat to Ambient | kW | 34.3 | 38.6 | 37.9 | 43.4 |
| ○ Cooling water circulation | liters/min | 535 | 600 | 535 | 600 |
| ○ Cooling fan air flow | m3/min | 522 | 618 | 522 | 618 |

◆ ENGINE DIMENSION



◆ CONVERSION TABLE

in. = mm x 0.0394

PS = kW x 1.3596

psi = kg/cm² x 14.2233

in³ = lit. x 61.02

hp = PS x 0.98635

lb = kg x 2.20462

kW = kcal/sec x 0.239

lb/ft = N.m x 0.737

U.S. gal = lit. x 0.264

kW = 0.2388 kcal/s

lb/PS.h = g/kW.h x 0.00162

cfm = m³/min x 35.336

MPa = kPa x 1000 = bar x 10

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※ Specifications are subject to change without prior notice