

DATA SHEET

DIESEL GENERATOR 105KW

MODEL#FDK-D105/H1

50HZ/1500RPM

DOOSAN MODEL: D1146T



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 Doosan 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-D105/H1 |
| Prime Power | 95KW/119KVA |
| Standby Power | 105KW/131KVA |
| Output Frequency / Rated speed | 50Hz/1500rpm |
| Rated Voltage | 230V/400V |

| | |
|------------------|------------------|
| Engine Make | Doosan Korea |
| Engine Model | D1146T |
| Alternator model | Stamford UCI274D |
| 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 | D1146T |
| Engine Manufacturer | Doosan (Korea) |
| Cylinder quantity | 6 |
| Cylinder Arrangement | In-line |
| Cycle | Four stroke |
| Aspiration | Turbo charged |

| | |
|-------------------------------|----------|
| Bore x Stroke (mm x mm) | 111x139 |
| Displacement | 8.071L |
| Compression Ratio | 16.8:1 |
| Prime power / Speed (KW/RPM) | 107/1500 |
| Standby power/ Speed (KW/RPM) | 118/1500 |
| Speed governor | RSV |



ISO9001:2008

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

| | |
|---------------------------------------|---------|
| Piston Speed | 6.95m/s |
| Friction Energy Output | 18kw |
| Total Lubrication System Capacity (L) | 15.5 |
| Coolant Capacity (L) | 14 |

| | |
|---|-----------------|
| Fuel Consumption at 100% load (liters/hr) | 25.9 at 1500rpm |
| Starter motor | DC24V |
| Alternator | DC24V |
| Low idle | 800-1650RPM |

Alternator Specifications

| | |
|--------------------------|---|
| Alternator model | UCI274D |
| Alternator manufacturer | STAMFORD |
| Exciter type | Single bearing, Brushless, Self-excited |
| Rated output prime power | 120 KVA |
| Rated speed | 1500 rpm |
| Rated frequency | 50Hz |

| | |
|--------------------------|---|
| Number of phase | 3 |
| Rated voltage | 400V (Available with custom requirements) |
| Power factor | 0.8 |
| Voltage regulation NL-FL | ≤±1% |
| Insulation grade | H |
| 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.



ISO9001:2008

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Optional

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

Dimension & Weight

Open

| | |
|-----------------------------|---------------|
| Overall Size: LxWxH (mm) | 2350x850x1350 |
| Weight (kg) | 1560 |

Soundproof Version

| | |
|-----------------------------|----------------|
| Overall Size: LxWxH (mm) | 3300x1100x1900 |
| Weight (kg) | 2000 |

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.**



DOOSAN INFRACORE GENERATOR ENGINE

D1146T



| Ratings (kWm/PS) | Gross Engine Output | | Net Engine Output | |
|----------------------|---------------------|---------|-------------------|---------|
| | Standby | Prime | Standby | Prime |
| 1500rpm(50Hz) | 118/160 | 107/145 | 114/155 | 103/140 |
| 1800rpm(60Hz) | 138/187 | 125/170 | 131/177 | 118/160 |

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 80% 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 hours per year

◎ GENERAL ENGINE DATA

| | |
|-------------------------------|--|
| ○ Engine Model | D1146T |
| ○ Engine Type | 4-Cycle, In-line, 6-Cylinder Diesel, Turbo charged |
| ○ Bore x stroke | 111 x 139 mm |
| ○ Displacement | 8.071 liters |
| ○ Compression ratio | 16.8 : 1 |
| ○ Rotation | Counter clockwise viewed from Flywheel |
| ○ Firing order | 1-5-3-6-2-4 |
| ○ Injection timing | 16°±1° BTDC |
| ○ Dry weight | 780kg(with Fan) |
| ○ Dimension (LxWxH) | 1,276 x 823 x 1,079 mm |
| ○ Fly wheel housing | SAE NO.2M |
| ○ Fly wheel | Clutch NO.11 1/2M |
| ○ Number of teeth on flywheel | 140 |

◎ ENGINE MOUNTING

| | |
|--|------------|
| Maximum Bending Moment at Rear Face to Block | 1325 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. 14 lit., With Radiator : Approx 34 lit.(standard) |
| ○ Coolant flow rate | 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, steel , 590 mm diameter, 6 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. 15.5 liters , Min. 12 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 | Zexel in-line "AD" type |
| ○ Governor | RSV type (all speed control) |
| ○ Speed drop | G2 Class (ISO 8528) |
| ○ Feed pump | Mechanical type in injpump. |
| ○ Injection nozzle | Multi hole type |
| ○ Opening pressure | 21.0 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 | 175 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 4.5 kW |
| ○ Battery Voltage | 24V |
| ○ Battery Capacity | 100 Ah (recommended) |
| ○ Starting aid (Option) | Block heater |

◎ VALVE SYSTEM

| | | |
|------------------------|----------------------------------|--------------|
| ○ Type | Overhead valve type | |
| ○ Number of valve | Intake 1, exhaust 1 per cylinder | |
| ○ Valve lashes at cold | Intake 0.3mm , Exhaust 0.3mm | |
| ○ Valve timing | Opening | Close |
| - Intake valve | 16 deg. BTDC | 36 deg. ABDC |
| - Exhaust valve | 46 deg. BBDC | 14 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 | 107 | 125 | 118 | 138 |
| | ps | 145 | 170 | 160 | 187 |
| ○ Break Mean effective pressure | Mpa | 1.06 | 1.03 | 1.17 | 1.14 |
| ○ Mean Piston Speed | m/s | 6.95 | 8.34 | 6.95 | 8.34 |
| ○ Friction Horsepower | kW | 18 | 24 | 18 | 24 |
| | ps | 24.47 | 32.63 | 24.47 | 32.63 |
| ○ Specific fuel consumption | | | | | |
| 25% load | liters/hr | 8.2 | 11.4 | 8.6 | 11.9 |
| 50% load | liters/hr | 13.6 | 18.1 | 14.3 | 19.6 |
| 75% load | liters/hr | 19.5 | 24.9 | 20.4 | 27.3 |
| 100% load | liters/hr | 25.9 | 32.5 | 27.0 | 35.1 |
| ○ Maximum Lube oil consumptic | g/h | 101.5 | 119 | 112 | 130.9 |
| ○ Fan Power | kW | 4 | 7 | 4 | 7 |
| ○ Exhaust Noise at 1m Horizontally from Centerline of Exhaust Pipe dista (without Fan) | dB(A) | 93.9 | 95.5 | 93.9 | 95.5 |

The all data and the specific fuel consumption are based on ISO 3046/1, Standard reference conditions are in accordance with ISO 3046/1, 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 :

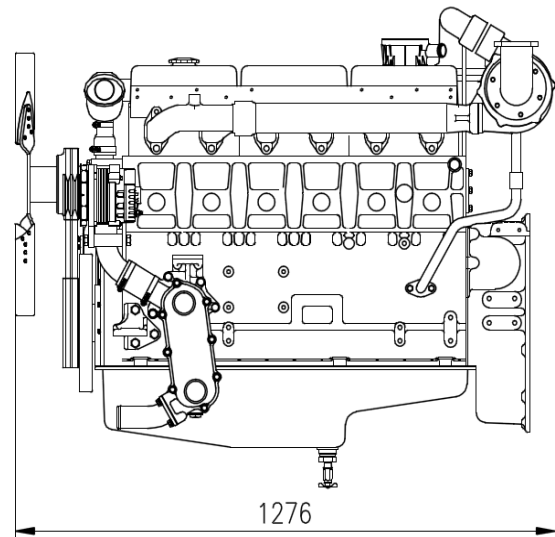
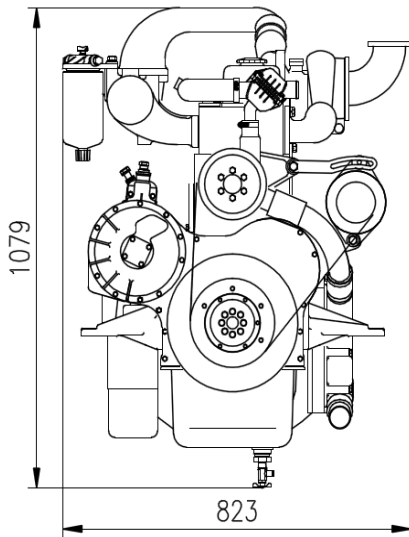
1800 rpm & 1500rpm up to 750~ 1000m and 30°C without power deration

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 | 11.78 | 17.71 | 12.40 | 18.43 |
| ○ Exhaust gas temp. after turbo. | °C | - | 470 | - | - |
| ○ Exhaust Gas Flow | m3/min | - | 25.7 | - | - |
| ○ Heat Rejection to Exhaust | kW | 91.3 | 114.5 | 95.1 | 123.7 |
| ○ Heat Rejection to Coolant | kW | 39.7 | 49.8 | 41.4 | 53.8 |
| ○ Heat Rejection to Intercooler | kW | - | - | - | - |
| ○ Radiated Heat to Ambient | kW | 9.3 | 11.6 | 9.7 | 12.5 |
| ○ Cooling water circulation | liters/min | 130 | 150 | 130 | 150 |
| ○ Cooling fan air flow | m3/min | 200 | 230 | 200 | 230 |

◆ 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 = Pa x 1000 = bar x 10

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※ Specifications are subject to change without prior notice