© POWER RATING

Engine Speed	Type of Speed		Engine Power		
rev/min	Operation	kWm	Ps		
1800	Continuous Power	87	118		
	Prime Power	96	130		
	Standby Power	105	143		
	Continuous Power	70	95		
1500	Prime Power	77	105		
	Standby Power	85	116		



Note : -. The engine performance corresponds to ISO 3046, BS 5514 and DIN 6271.

-. Ratings are based on ISO 8528.

 \rightarrow **Prime power** available at variable load. The permissible average power out put (during 24h period) shell not exceed 70% of the prime power rating.

 \rightarrow Standby power available in the event of a main power network failure. No overload is permitted.

© MECHANICAL SYSTEM

© MECHANICAL SYSTEM (© FUEL CONSUMPTION			
○ Engine Model	D1146	• Prime Power (lit/hr)	1,500 rpm	1,800 rpm	
O Engine Type	In-line 4 cycle, water cooled	25%	7.5	8.9	
	Naturally aspirated	50%	11.3	13.6	
Combustion type	Direct injection	75%	15.9	19.0	
○Cylinder Type	Replaceable dry liner	100%	20.6	24.7	
• Number of cylinders	6	• Standby Power (lit/h	1,500 rpm	1,800 rpm	
○Bore x stroke	111(4.37) x 139(5.47) mm(in.)	25%	7.7	9.2	
 Displacement 	8.071(492.49) lit.(in ³)	50%	11.6	14.9	
Compression ratio	17.5 : 1	75%	16.1	20.8	
• Firing order	1-5-3-6-2-4	100%	20.8	26.6	
 Injection timing 	15° BTDC				
 Compression pressure 	Above 28 kg/cm2(398 psi) at 200rpm	◎ FUEL SYSTEM			
• Dry weight Approx. 720 kg (1,587 lb)		O Injection pump	Zexel in-line "AD" type		
^O Dimension	1,224 x 727 x 973 mm	○ Governor	RSV type (all speed control)		
(LxWxH)	(48.2 x 28.6 x 38.3 in.)	• Feed pump Mechanical type		e	
^O Rotation	Counter clockwise viewed from Flywheel	○ Injection nozzle	Multi hole type		
○Fly wheel housing	SAE NO.2	^O Opening pressure	214 kg/cm^2 (3,0	44 psi)	
○ Fly wheel	Clutch NO.11 1/2	○ Fuel filter	Full flow, cartri	dge type	
		○ Used fuel	Diesel fuel oil		

© MECHANISM

○ Type	
○ Number of valve	
○ Valve lashes at cold	

© VALVE TIMING

○ Intake valve

• Exhaust valve

Over head valve Intake 1, exhaust 1 per cylinder Intake 0.30mm (0.0118 in.) Exhaust 0.30mm (0.0118 in.)

Opening

Fully forced pressure feed type ○ Lub. Method • Oil pump Gear type driven by crankshaft ○ Oil filter Full flow, cartridge type High level 15.5 liters (4.09 gal.) • Oil pan capacity Low level 12 liters (3.17 gal.) ○ Angularity limit Front down 25 deg. Close Front up 25 deg. 16 deg. BTDC 36 deg. ABDC Side to side 25 deg. 46 deg. BBDC 14 deg. ATDC Refer to Operation Manual

© LUBRICATION SYSTEM

○ Lub. Oil

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Tel: ° ۲1 – ۴ Λ ° ° ° ° Fax:∘۲1 – ۴۴۹۹۴۶۴۲ تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبروی پالایشگاه نفت پارس، پلاک ۱۲

FAMCU هايپرمىنعت

© COOLING SYSTEM

° Cooling method	Fresh water forced circulation	
○ Water capacity	14 liters (3.70 gal.)	
(engine only)		
○ Pressure system	Max. 0.9 kg/cm ² (12.8 psi)	
○ Water pump	Centrifugal type driven by belt	
• Water pump Capacity	150 liters (39.6 gal.)/min	
	at 1,800 rpm (engine)	
○ Thermostat	Wax – pellet type	
	Opening temp. 71°C	
	Full open temp. 85°C	
○ Cooling fan	Blower type, steel	
	590 mm diameter, 6 blade	

© ENGINEERING DATA

○ Water flow	130 liters/min @1,500 rpm		
	150 liters/min @1,800 rpm		
○ Heat rejection to coolant	16.5 kcal/sec @1,800 rpm		
○ Air flow	5.8 m ³ /min @1,500 rpm		
	6.9 m ³ /min @1,800 rpm		
○ Exhaust gas flow	18.8 m ³ /min @1,800 rpm		
○ Exhaust gas temp.	620 °C @1,800 rpm		
○ Max. permissible restriction	S		
 Intake system 	220 mmH ₂ O initial		
	635 mmH ₂ O final		
Exhaust system	$1,000 \text{ mmH}_2\text{O} \text{ max}.$		

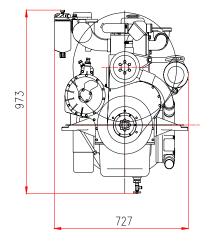
© ELECTRICAL SYSTEM

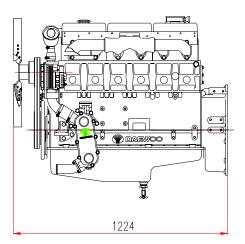
 Charging generator Voltage regulator Starting motor 	24V x 45A [or 12V x 26A] Aalternator Built-in type IC regulator 24V x 4.5kW [or 12V x 2.5kW]
 Starting motor Battery Voltage Battery Capacity 	24V [or 12V] 24V [or 12V] 100 AH [or 150 AH] (recommended)
• Starting aid (Option)	Block heater

♦ CONVERSION TABLE

in. $=$ mm x 0.0394
$PS = kW \ge 1.3596$
psi = kg/cm2 x 14.2233
in3 = lit. x 61.02
hp = PS x 0.98635
$lb = kg \ge 2.20462$

 $lb/ft = N.m \ x \ 0.737$ 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





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FAMCU هايپرمىنىت

D1146T

Ratings	Gross Engine Output		Net Engine Output	
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	118/160	107/145	114/155	103/140
1800rpm(60Hz)	800rpm(60Hz) 138/187		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.

Electric power (kWe) must be considered cooling fan loss, alternator efficiency, altitude derating and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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	D1146T
\circ Engine Type	4-Cycle, In-line, 6-Cylinder Diesel, Turbo charged
\circ 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
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

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© 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	49 kPa
• Water Temperature	
- Maximum for standby and Prime	103 ℃
- Before start of full load	40.0℃
• 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
Force-feed lubrication by gear pump, lubricating oil co	
○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℃
○ Angularity limit	Front down 10 deg , Front up 10 deg , Side to side 22.5 deg
○ Lubrication oil	Refer to Operation Manual
O FUEL SYSTEM	
Bosch type in-line pump with integrated, electromagne	etic actuator.
○ Injection pump	Zexel in-line "AD" type
○ Governor	RSV type (all speed control)
○ Speed drop	C2 Class (ISO 8528)
A Food num A	Machanical type in injection nump
○ Injection nozzle	Multi hole type
	24.0 MDa
○ Opening pressure ○ Fuel filter	Full flow, cartridge type with water drain valve
 ○ Maximum fuel inlet restriction 	10 kPa
• • • • • • • • • • • • • • • • • • • •	60 kPa
Maximum fuel return restriction	
• Fuel feed pump Capacity	
୦ Used fuel	Diesel fuel oil
© ELECTRICAL SYSTEM	
Battery Charging Alternator Veltage regulator	28.5V x 45A alternator
 Voltage regulator Starting motor 	Built-in type IC regulator 24V x 6.0 kW
 Starting motor Battery Voltage 	24V X 0.0 KW
· · ·	
○ Battery Capacity	100 Ah (recommended)

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی پالایشگاه نفت پـارس، پلاک ۱۲



OVALVE SYSTEM

⊙ Туре	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		

O PERFORMANCE DATA		Prime Pov	wer	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	Мра	1.06	1.03	1.17	1.14
○ Mean Piston Speed	m/s	6.95	8.34	6.95	8.34
○ Friction Power	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
○ Fan Power	kW	4	7	4	7
○ Sound Pressure at 1m from the each side of Cylinder Block					
(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 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 Exh	aust Manifol	<u>d</u>			
○ 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 Rejetion 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

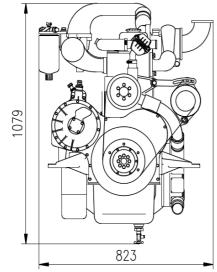
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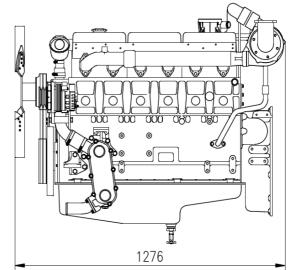
♦ ENGINE DIMENSION





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



Ib/ft = N.m x 0.737 U.S. gal = lit. x 0.264 kW = 0.2388 kcal/s Ib/PS.h = g/kW.h x 0.00162 cfm = m^3 /min x 35.336 Mpa = Pa x 1000 = bar x 10

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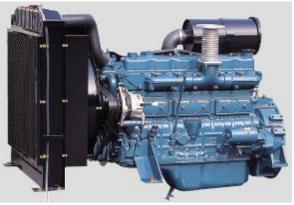
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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)



DB58

Ratings	Gross Eng	jine Output	Net Engine Output		
(kWm/PS)	Standby	Prime	Standby	Prime	
1500rpm(50Hz)	59/80	54/73	57/78	52/71	
1800rpm(60Hz)	70/95	64/87	68/92	62/84	



Ratings Definitions

The power ratings of Emergency Standby and Prime are in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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	DB58
○Engine Type	4-Cycle, In-line, 6-Cylinder Diesel, water cooled, Naturally aspirated
○Bore x stroke	102 x 118 mm
○ Displacement	5.785 liters
○ Compression ratio	
○ Rotation	Counter clockwise viewed from Elvwheel
○ Firing order	1-5-3-6-2-4
○ Injection timing	
○ Dry weight	450kg(with Fan)
○ Dimension (LxWxH)	1 144 × 705 × 836 mm
○ Fly wheel housing	
○ Fly wheel	Clutch NO 11 1/2M
 Number of teeth on flywheel 	129
Maximum Bending Moment at Rear Face to Block	1325 N • M
© EXHAUST SYSTEM	
Maximum Back Pressure	5.9 kPa
Maximum Intake Air Restriction	
. With Clean Filter Element	2.16 kPa
. With Dirty Filter Element	6.23 kPa
OMax. static pressure after Radiator	0.125 kPa

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© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 12 lit, With Radiator : Approx 31 lit. (standard)
○ Coolant flow rate	liters / min
○ Pressure Cap	Max. 49 kPa
 ○ Water Temperature 	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ Water pump	Centrifugal type driven by belt
○ Thermostat Type and Range	Wax – pellet type, Opening temp. 82°C , Full open temp. 95°C
• Cooling fan	Blower type, steel , 520 mm diameter, 6 blade
• Max. external coolant system restriction	Not Available
© LUBRICATION SYSTEM	
	cooling in cooling water circuit of ongine
Force-feed lubrication by gear pump, lubricating oil c	Fully forced pressure feed type
• Oil pump	Gear type driven by crank-shaft gear
• Oil filter	Full flow, cartridge type
• Oil capacity	Max. 19 liters , Min. 16 liters
• Lub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
Maximum oil temperature	120℃
○ 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, electromagn	etic actuator.
○ Injection pump	Zexel in-line "A" type
○ Governor	RSV type (all speed control)
○ Speed drop	G2 Class (ISO 8528)
○ Feed pump	
○ Injection nozzle	Multi hole type
• Opening pressure	21.6 MPa
○ Fuel filter	
	Full flow, cartridge type with water drain valve.
	Full flow, cartridge type with water drain valve.
An Annum fuel return restriction Annum fuel return restriction	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa
○ Maximum fuel return restriction	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa
Maximum fuel return restriction Fuel feed pump Capacity	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel © ELECTRICAL SYSTEM 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel ELECTRICAL SYSTEM Battery Charging Alternator 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil 28.5V x 45A alternator
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel ELECTRICAL SYSTEM Battery Charging Alternator Voltage regulator 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil 28.5V x 45A alternator Built-in type IC regulator
 Maximum fuel return restriction Fuel feed pump Capacity Used fuel ELECTRICAL SYSTEM Battery Charging Alternator Voltage regulator Starting motor 	Full flow, cartridge type with water drain valve. 10 kPa 60 kPa 175 liters / hr Diesel fuel oil 28.5V x 45A alternator Built-in type IC regulator 24V x 4.5 kW

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FAMCO هايپرمنعت

O VALVE SYSTEM

○ Туре	Overhead valve type		
 Number of valve 	Intake 1, exhaust 1 per cylinder		
○ Valve lashes at cold	Intake 0.4mm, Exhaust 0.4mm		
○ Valve timing			
	Opening Close		
Intake valve	28 deg. BTDC 62 deg. ABDC		
Exhaust valve	70 deg. BBDC 28 deg. ATDC		

O PERFORMANCE DATA		Prime Po	wer	Standby	y 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	54	64	59	70
	ps	73	87	80	95
OBreak Mean effective pressur	e Mpa	0.54	0.53	0.59	0.58
○ Mean Piston Speed	m/s	5.9	7.08	5.9	7.08
 Friction Horsepower 	kW	13	17	13	17
	ps	17.67	23.11	17.67	23.11
 Specific fuel consumption 					
25% load	liters/hr	4.8	5.7	5.9	6.4
50% load	liters/hr	7.6	8.4	8.8	9.8
75% load	liters/hr	10.5	12.2	11.7	13.1
100% load	liters/hr	13.9	16.4	15.3	18.1
• Maximum Lube oil consumpti	cg/h	51.1	60.9	56	66.5
○ Fan Power	kW	1.5	2	1.5	2
• Exhaust Noise at 1m Horizon	tally from Cente	rline of Exhaust Pipe d	ista		
(without Fan)	dB(A)	93.6	94.5	93.6	94.5

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

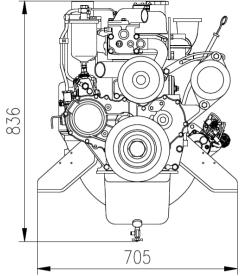
Operation At Elevated Temperature And Altitude: The engine may be operated at :

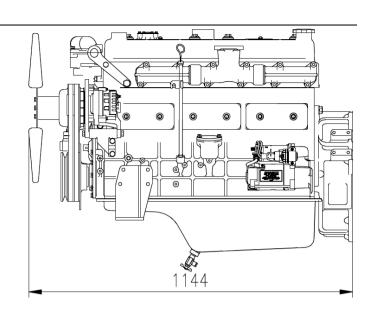
1800 rpm & 1500rpm up to 750~ 1000m and 30°C without power deration

For sustained operation above these conditions, derate by 3% per 304m , and 2% per 11 °C

Engine Data with Dry Type Ex	khaust Manifold	l			
 Intake Air Flow 	m3/min	8.80	14.19	9.09	14.53
O Exhaust gas temp. after turbo	o. °C	603	570	-	-
○ Exhaust Gas Flow	m3/min	–	8.46	–	8.46
 Heat Rejection to Exhaust 	kW	49.0	57.8	53.9	63.8
 Heat Rejection to Coolant 	kW	21.3	25.1	23.4	27.7
Heat Rejetion to Intercooler	kW	-	-	-	-
Radiated Heat to Ambient	kW	5.0	5.9	5.5	6.5
Cooling water circulation	liters/min	77	95	77	95
$^{\circ}$ Cooling fan air flow	m3/min	100	118	100	118

♦ 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 $lb/ft = N.m \times 0.737$ 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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DP158LC

Ratings	Gross Engine Output - without Cooling Fan		J. J	ne Output oling Fan
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	449/610	408/555	433/589	392/533
1800rpm(60Hz)	513/697	466/634	489/665	442/601

* 50Hz : DP158LCF, 60Hz : DP158LCS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> is available for an unlimited 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 within 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	DP158LC		
○Engine Type	4 Cycle V/ type 8 Cylinder Tyrbe charged 8 intercooled (air to air		
O Pore v etroko	128 x 142 mm		
○ Displacement	14 618 liters		
O Compression ratio	15 : 1		
○ Rotation	Counter clockwise viewed from Elvwheel		
○ Firing order	1-5-7-2-6-3-4-8		
	23°±1° BTDC @ 1800 rpm, 18°±1° BTDC @ 1500 rpm,		
○ Dry weight	1155 kg (with fan)		
	1,274 x 1,138 x 1,207 mm		
	SAE NO.1M		
○ Fly wheel	Clutch NO.14M		
	160		
© ENGINE MOUNTING			
$^{ m O}$ Maximum Bending Moment at Rear Face to Block	1,325 N.m		
© EXHAUST SYSTEM			
○ Maximum Back Pressure	5.9 kPa		
O AIR INDUCTION SYSTEM			
 Maximum Intake Air Restriction 			
. With Clean Filter Element	2.16 kPa		
. With Dirty Filter Element	6.23 kPa		
OMax. static pressure after Radiator	0.125 kPa		

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی پالایشگاه نفت پـارس، پلاک ۱۲

© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only : Approx. 20 lit, With Radiator(*Air On 43°C) : Approx 79 lit.
○ Coolant flow rate	660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm,
○ Pressure Cap	Max. 49 kPa
○Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ 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

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C

- ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied.

Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© 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. 22 liters , Min. 13 liters	
○ Lub oil pressure	Idle Speed : Min 100 kPa	
	Governed Speed : Min 250 kPa	
○ Maximum oil temperature	120℃	
○ Angularity limit	Front down 10 deg, Front up 10 deg, Side to side 22.5 deg	
○ Lubrication oil	Refer to Operation Manual	

© FUEL SYSTEM

○ Starting aid (Option)

Bosch type in-line pump with integrated, elec	ctromagnetic 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	28 MPa	
○ Fuel filter	Full flow, cartridge type with water drain valve.	
 Maximum fuel inlet restriction 	30 kPa	
○ Maximum fuel return restriction	60 kPa	
○ Fuel feed pump Capacity	315 liters / hr	
○ Used fuel	Diesel fuel oil	
 Battery Charging Alternator 	27.5V x 45A alternator	
○ Voltage regulator	Built-in type IC regulator	
○ Starting motor	24V x 7.0 kW	
○ Battery Voltage	24V	
○ Battery Capacity	2 x 200 Ah (recommended)	

Block heater



OVALVE SYSTEM

			ھاتىرمىيغىت
○ Туре	Overhead valve ty		
 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	

O 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
Oross Engine Power Output	kW	408	466	449	513
	PS	555	634	610	697
 Break Mean effective pressure 	MPa	2.34	2.12	2.45	2.33
○ Mean Piston Speed	m/s	7.1	8.5	7.1	8.5
○ Friction Power	kW	32	44	32	44
	PS	43.5	59.8	43.5	59.8
 Specific fuel consumption 					
25% load	liters/hr	27.6	32.3	29.6	34.9
50% load	liters/hr	48.9	57.7	53.4	62.7
75% load	liters/hr	72.9	83.4	80.5	91.4
100% load	liters/hr	99.6	111.5	110.9	123.8
○ Maximum Lube oil consumption	g/h	389	444	427	488
○ Fan Power	kW	16	24	16	24
○ Sound Pressure at 1m from the ea		Block			
(without Fan)	dB(A)	97.65	100.33	97.65	100.33

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.

© Engine Data with Dry Type Exhaust Manifold

○ Intake Air Flow	m3/min	28.1	32.3	30.1	34.5
○ Exhaust gas temp. after turbo.	°C	507	518	529	543
○ Exhaust Gas Flow	m3/min	81	93	88	101
 Heat Rejection to Exhaust 	kW	368	413	410	458
 Heat Rejection to Coolant 	kW	176	197	196	219
 Heat Rejetion to Intercooler 	kW	90	100	100	112
ORADIA REAL REAL REAL PROVIDENT OF A CONTRACT OF A CONTRACTACTACTACTACTACTACTACTACTACTACTACTACTA	kW	37	42	42	46
 Cooling water circulation 	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	700	850	700	850

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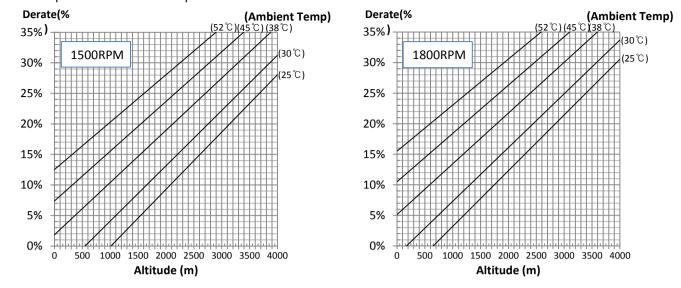
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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی پالایشگاه نفت پارس، پلاک ۱۲

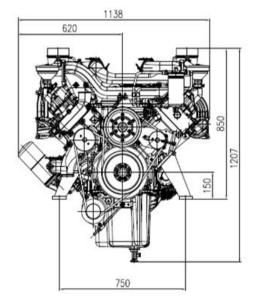
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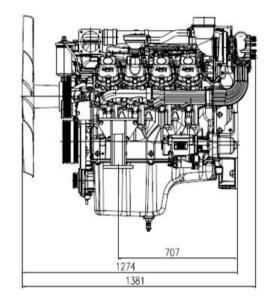
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air inlet temperature.



© 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 $lb/ft = N.m \ge 0.737$ U.S. gal = lit. ≥ 0.264 kW = 0.2388 kcal/s $lb/PS.h = g/kW.h \ge 0.00162$ cfm = m³/min ≥ 35.336 MPa = kPa ≥ 1000 = bar ≥ 1000



* Specifications are subject to change without prior notice.

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DP158LD

Ratings	Gross Engine Output - without Cooling Fan		Jan State St	ne Output oling Fan
(kWm/PS)	Standby Prime		Standby	Prime
1500rpm(50Hz)	510/693	464/630	494/672	448/609
1800rpm(60Hz)	556/756	505/687	552/750	481/654

* 50Hz : DP158LDF, 60Hz : DP158LDS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> is available for an unlimited 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 within a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

O GENERAL ENGINE DATA

○ Engine Model	DP158LD			
	4-Cycle, V-type, 8-Cylinder, Turbo charged & intercooled (air to air			
○Bore x stroke	128 x 142 mm			
○ Displacement	14.618 liters			
○ Compression ratio	15 : 1			
○ Rotation	Counter clockwise viewed from Flywheel			
○ Firing order	1-5-7-2-6-3-4-8			
 Injection timing 	23°±1° BTDC @ 1800 rpm, 18°±1° BTDC @ 1500 rpm,			
ODry weight ○ Dimension (LxWxH)	1155 kg (with fan)			
○ Dimension (LxWxH)	1,274 x 1,138 x 1,207 mm			
○ Fly wheel housing				
○ Fly wheel				
Number of teeth on flywheel	160			
© ENGINE MOUNTING				
$^{ m O}$ Maximum Bending Moment at Rear Face to Block	1,325 N.m			
© EXHAUST SYSTEM				
○ Maximum Back Pressure	5.9 kPa			
 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			

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© COOLING SYSTEM

Water circulation by centrifugal pump on engine.



○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only : Approx. 20 lit, With Radiator(*Air On 43℃) : Approx 79 lit.
○ Coolant flow rate	660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm,
○ Pressure Cap	Max. 49 kPa
○Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ 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

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C
 - ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied.
 Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© LUBRICATION SYSTEM

Force-feed lubrication by gear pump, lubric	ating 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. 22 liters , Min. 13 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, ele	ectromagnetic 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	28 MPa
○ Fuel filter	Full flow, cartridge type with water drain valve.
• Maximum fuel inlet restriction	30 kPa
• Maximum fuel return restriction	60 kPa
○ Fuel feed pump Capacity	315 liters / hr
○ Used fuel	Diesel fuel oil
© ELECTRICAL SYSTEM	
 Battery Charging Alternator 	27.5V x 45A alternator
○ Voltage regulator	Built-in type IC regulator
○ Starting motor	24V x 7.0 kW
○ Battery Voltage	24V
○ Battery Capacity	2 x 200 Ah (recommended)
○ Starting aid (Option)	Block heater

O VALVE SYSTEM

		• • • •	-
○ Туре	Overhead valve t		•
 Number of valve 	Intake 1, exhaust		
○ 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	

O 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
Oross Engine Power Output	kW	464	505	510	556
	PS	630	687	693	756
○ Break Mean effective pressure	MPa	2.53	2.30	2.78	2.53
○ Mean Piston Speed	m/s	7.1	8.5	7.1	8.5
○ Friction Power	kW	32	44	32	44
	PS	43.5	59.8	43.5	59.8
 Specific fuel consumption 					
25% load	liters/hr	30.3	35.2	32.3	37.4
50% load	liters/hr	55.1	62.3	60.9	68.1
75% load	liters/hr	83.4	92.9	91.1	101.0
100% load	liters/hr	115.1	127.1	127.8	139.6
• Maximum Lube oil consumption	g/h	441	481	485	529
○ Fan Power	kW	16	24	16	24
○ Sound Pressure at 1m from the ea	ch side of Cylinde	r Block			
(without Fan)	dB(A)	97.65	100.33	97.65	100.33

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.

© Engine Data with Dry Type Exhaust Manifold

 Intake Air Flow 	m3/min	30.8	34.2	33.1	36.6
○ Exhaust gas temp. after turbo.	°C	536	539	561	567
○ Exhaust Gas Flow	m3/min	90	100	98	108
○ Heat Rejection to Exhaust	kW	426	470	473	517
○ Heat Rejection to Coolant	kW	204	225	226	247
○ Heat Rejetion to Intercooler	kW	104	115	115	126
○ Radiated Heat to Ambient	kW	43	48	48	52
○ Cooling water circulation	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	700	850	700	850

Printed in November 2013_Large Engine F & A Part_DP158LD

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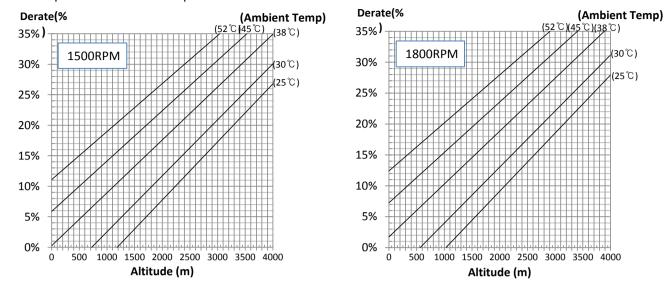
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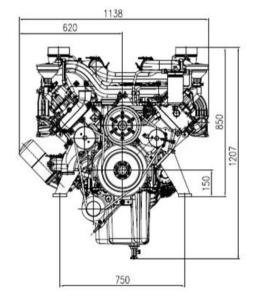
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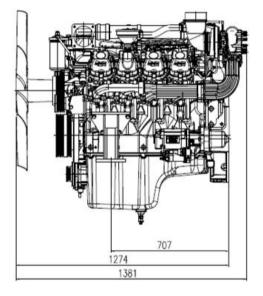
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air inlet temperature.



© ENGINE DIMENSION





CONVERSION TABLE

in. = mm x 0.0394 PS = kW x 1.3596 psi = kg/cm2 x 14.2233in3 = lit. x 61.02 hp = PS x 0.98635 lb = kg x 2.20462kW = kcal/sec x 0.239 $\label{eq:lb/ft} \begin{array}{l} \text{Ib/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \text{ kcal/s} \\ \text{Ib/PS.h} = g/\text{kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{MPa} = \text{kPa x } 1000 = \text{bar x } 10 \end{array}$



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

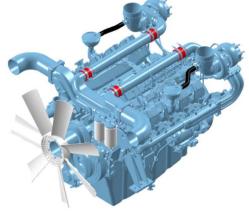
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* Specifications are subject to change without prior notice.

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DP180LA

Ratings	Gross Engine Output - without Cooling Fan		J. J	ne Output oling Fan
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	552/750	502/682	536/729	486/661
1800rpm(60Hz)	615/836	559/760	591/804	535/727



* 50Hz : DP180LAF, 60Hz : DP180LAS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> is available for an unlimited 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 within 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	DP180LA		
	4-Cycle, V-type, 10-Cylinder, Turbo charged & intercooled (air to air)		
○Bore x stroke	128 x 142 mm		
	18.273 liters		
○ Compression ratio	15:1		
O Rotation	Counter clockwise viewed from Flywheel		
	1-6-5-10-2-7-3-8-4-9		
○ Injection timing	21°, 1° PTDC @ 1900 rpm 10°, 1° PTDC @ 1500 rpm		
○ Dry weight	1 250 kg(with Ean)		
○ Dimension (LxWxH)	1 50/ v 1 380 v 1 223 mm		
○ Fly wheel housing			
o Fly wheel	Clutch NO.14M		
 Number of teeth on flywheel 			
$^{ m O}$ Maximum Bending Moment at Rear Face to Block	1,325 N.m		
© EXHAUST SYSTEM			
○ Maximum Back Pressure	5.9 kPa		
O AIR INDUCTION SYSTEM			
 Maximum Intake Air Restriction 			
. With Clean Filter Element	2.16 kPa		
. With Dirty Filter Element	6.23 kPa		
OMax. static pressure after Radiator	0.125 kPa		

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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی پالایشگاه نفت پارس، پلاک ۱۲

© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	
Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 21 lit, With Radiator(*Air On 43°C): Approx 91 lit.
○ Coolant flow rate	660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm
○ Pressure Cap	Max. 49 kPa
○Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0℃
○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 blades
 Max. external coolant system restriction 	Not available
* Two redictor options are provided, becad on alloweble requirement	Air temperature On redictor inlet (Air On) · Air On 4290 / Air On 5290

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C

- ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied. Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© LUBRICATION SYSTEM

Force-feed lubrication by gear pump, lubr	ricating 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. 34 liters , Min. 23 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, ele	
 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 	28 MPa
○ Fuel filter	Full flow, cartridge type with water drain valve.
 Maximum fuel inlet restriction 	30 kPa
 Maximum fuel return restriction 	60 kPa
 Fuel feed pump Capacity 	630 liters / hr
○ Used fuel	Diesel fuel oil

© ELECTRICAL SYSTEM

 Battery Charging Alternator 	27.5V x 45A alternator	
○ Voltage regulator	Built-in type IC regulator	
○ Starting motor	24V x 7.0 kW	
○ Battery Voltage	24V	
○ Battery Capacity	2 x 200 Ah (recommended)	
○ Starting aid (Option)	Block heater	

Printed in November 2013_Large Engine F & A Part_DP180LA

© VALVE SYSTEM

		ما يېر سندت
○ Туре	Overhead valve t	уре
 Number of valve 	Intake 1, exhaust	
 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

O PERFORMANCE DATA		Prime	Power	Standb	y 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	502	559	552	615
	PS	682	760	750	836
○ Break Mean effective pressure	MPa	2.20	2.04	2.42	2.24
OMean Piston Speed	m/s	7.1	8.5	7.1	8.5
 Friction Power 	kW	40	55	40	55
	PS	54.4	74.8	54.4	74.8
 Specific fuel consumption 					
25% load	liters/hr	35.4	38.6	38.3	42.0
50% load	liters/hr	64.8	72.6	70.7	79.4
75% load	liters/hr	94.2	106.6	103.0	116.7
100% load	liters/hr	123.6	140.5	135.4	154.1
 Maximum Lube oil consumption 	g/h	477	532	525	585
○ Fan Power	kW	16	24	16	24
Sound Pressure at 1m from the ea	ch side of Cylinder	Block			
(without Fan)	dB(A)	98.65	101.03	98.65	101.03

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.

© Engine Data with Dry Type Exhaust Manifold

○ Intake Air Flow	m3/min	30.9	40.1	33.2	43.0
○ Exhaust gas temp. after turbo.	°C	540	501	562	523
○ Exhaust Gas Flow	m3/min	96	118	106	130
 Heat Rejection to Exhaust 	kW	464	527	508	578
 Heat Rejection to Coolant 	kW	222	252	243	276
 Heat Rejetion to Intercooler 	kW	113	128	124	141
 Radiated Heat to Ambient 	kW	47	53	52	59
 Cooling water circulation 	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	700	850	700	850
	•••••••••••••••••••••••••••••••••••••••			•••••••••••••••••••••••••••••••••••••••	••••••

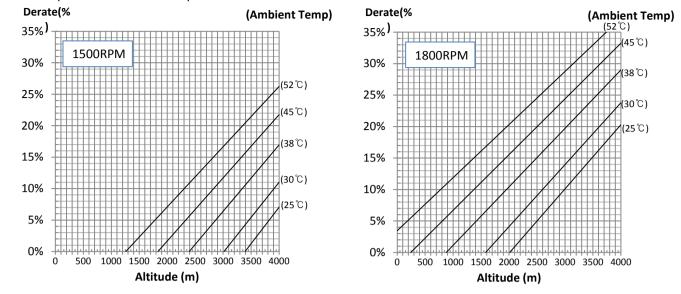
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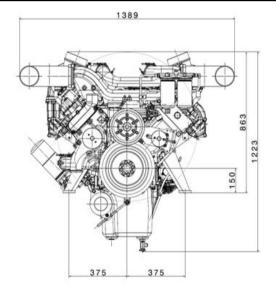
O DERATING FROM ISO 3046 STANDARD CONDITIONS

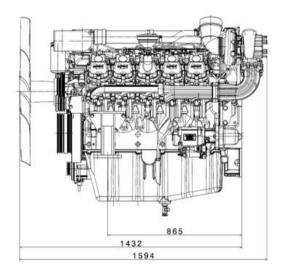
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air inlet temperature.



© 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 $lb/ft = N.m \times 0.737$ 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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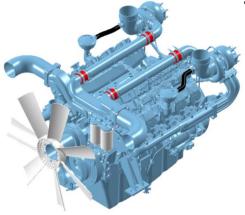
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DP180LB

Ratings	Gross Engine Output - without Cooling Fan		•	ne Output oling Fan
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	612/832	556/756	596/810	540/734
1800rpm(60Hz)	661/899	601/817	637/866	577/784



* 50Hz : DP180LBF, 60Hz : DP180LBS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude 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 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 within 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	DP180LB			
		Cylinder, Turbo charged & intercooled (air to air)		
○Bore x stroke	128 x 142 mm			
 Compression ratio 	15 : 1			
○ Rotation	Counter clockwise	viewed from Flywheel		
	1-0-3-10-2-7-3-0-4	I-9		
○ Injection timing	21°±1° BTDC @ 1	800 rpm, 19°±1° BTDC @ 1500 rpm,		
○Dry weight	1 250 kg/with Ean			
○ Dimension (LxWxH)	1,594 x 1,389 x 1,	223 mm		
○ Fly wheel housing	SAE NO.1M			
	160			
© ENGINE MOUNTING				
OMaximum Bending Moment at Rear Fac	ce to Block 1,325 N.m			
© EXHAUST SYSTEM				
OMaximum Back Pressure	5.9 kPa			
© AIR INDUCTION SYSTEM				
OMaximum Intake Air Restriction				
. With Clean Filter Element	2.16 kPa	DOOSAN		
. With Dirty Filter Element	6.23 kPa	6.23 kPa		
OMax. static pressure after Radiator	0.125 kPa			
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E-mail: info@famcocorp.com		ی، بینوسر۲۲ پرردره نستری (بخده محسوط درج) مع بالانه گاه نفت باست بالک ۲۲		

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نهرار روبروی پالایشگاه نفت پارس، پلاک ۱۲

© COOLING SYSTEM

 Cooling method Fresh water forced circulation 	
• Coolant capacity Engine Only : Approx. 21 lit, With Radiator(*Air On 43°C) : Approx 91	lit.
Coolant flow rate 660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm	
○ Pressure Cap Max. 49 kPa	
○Water Temperature	
- Maximum for standby and Prime $103^\circ\!\!\!\mathrm{C}$	
- 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	2
 Cooling fan Blower type, plastic , 915 mm diameter, 7 blades 	
Max. external coolant system restriction Not available	

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C

- ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied. Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© LUBRICATION SYSTEM

Force-feed lubrication by gear pump, lub	ricating 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. 34 liters , Min. 23 liters
○ Lub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
○ Maximum oil temperature	120 ℃
○ 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, ele	ctromagnetic 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	28 MPa	
○ Fuel filter	Full flow, cartridge type with water drain valve.	
• Maximum fuel inlet restriction	30 kPa	
OMaximum fuel return restriction	60 kPa	
○ Fuel feed pump Capacity	630 liters / hr	
○ Used fuel	Diesel fuel oil	DOOSAN

© ELECTRICAL SYSTEM

27.5V x 45A alternator	
Built-in type IC regulator	
24V x 7.0 kW	
24V	
2 x 200 Ah (recommended)	
Block heater	

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OVALVE SYSTEM

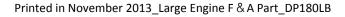
			مايپرست
○ Туре	Overhead valve t	/pe	
 Number of valve 	Intake 1, exhaust	1 per cylinder	
 Valve lashes at cold 	Intake 0.25 mm,	Exhaust 0.35 mm	
 Valve timing 			
	Opening	Close	
Intake valve	24 deg. BTDC	36 deg. ABDC	
Exhaust valve	63 deg. BBDC	27 deg. ATDC	

D PERFORMANCE DATA		Prime	Power	Standb	y 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
Oross Engine Power Output	kW	556	601	612	661
	PS	756	817	832	899
○ Break Mean effective pressure	MPa	2.44	2.19	2.68	2.41
O Mean Piston Speed	m/s	7.1	8.5	7.1	8.5
○ Friction Power	kW	40	55	40	55
	PS	54.4	74.8	54.4	74.8
 Specific fuel consumption 					
25% load	liters/hr	38.6	41.2	41.9	44.9
50% load	liters/hr	71.2	77.7	77.7	85.0
75% load	liters/hr	103.8	114.2	113.6	125.2
100% load	liters/hr	136.4	150.7	149.5	165.3
○ Maximum Lube oil consumption	g/h	529	572	582	629
○ Fan Power	kW	16	24	16	24
○ Sound Pressure at 1m from the ea	ch side of Cylinde	r Block			
(without Fan)	dB(A)	98.65	101.03	98.65	101.03

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.

© Engine Data with Dry Type Exhaust Manifold

 Intake Air Flow 	m3/min	33.4	42.3	36.0	45.5
○ Exhaust gas temp. after turbo.	°C	563	517	587	540
○ Exhaust Gas Flow	m3/min	107	127	118	141
 Heat Rejection to Exhaust 	kW	512	565	561	620
 Heat Rejection to Coolant 	kW	245	270	268	297
 Heat Rejetion to Intercooler 	kW	125	138	137	151
Radiated Heat to Ambient	kW	52	57	57	63
 Cooling water circulation 	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	700	850	700	850
		•••••••			





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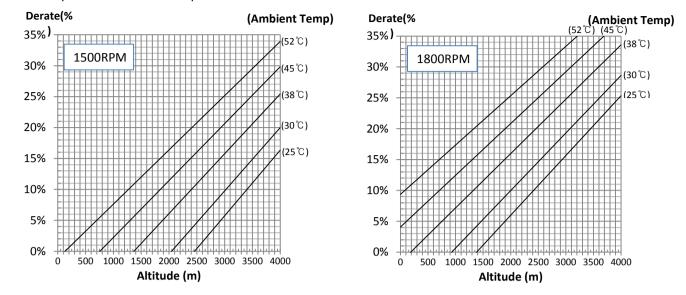
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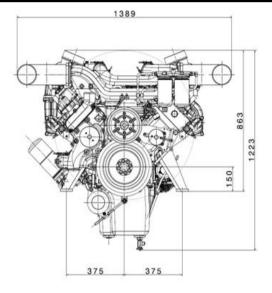
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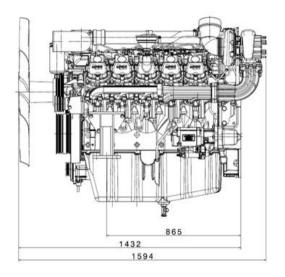
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air inlet temperature.



© 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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = \text{g/kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{MPa} = \text{kPa x } 1000 = \text{bar x } 10 \end{array}$



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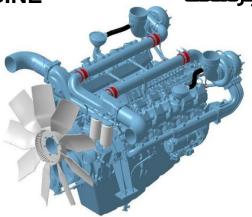
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DP222LB

Ratings	Gross Engine Output - without Cooling Fan		Net Engine Output - with Cooling Fan	
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	664/903	604/821	640/870	580/788
1800rpm(60Hz)	782/1063	711/967	744/1012	673/915



* 50Hz : DP222LBF, 60Hz : DP222LBS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> is available for an unlimited 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 within 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	DP222LB
○Engine Type	4-Cycle, V-type, 12-Cylinder, Turbo charged & intercooled (air to air)
○ Bore x stroke	128 x 142 mm
○ Displacement	21 927 liters
○ Compression ratio	
○ Rotation	Counter clockwise viewed from Elywheel
○ Firing order	1-12-5-8-3-10-6-7-2-11-4-9
Injection timing	21°±1° BTDC @ 1800 rpm, 19°±1° BTDC @ 1500 rpm,
○ Dry weight	
\cap Dimension (LV)(VH)	1,738 x 1,389 x 1,258 mm
○ Fly wheel housing	
○ Fly wheel	Clutch NO 14M
Number of teeth on flywheel	160
igodot Maximum Bending Moment at Rear Face to Block	1,325 N.m
O EXHAUST SYSTEM	DOOSAN
OMaximum Back Pressure	5.9 kPa
O AIR INDUCTION SYSTEM	
Maximum Intake Air Restriction	Printed in November 2013 Large Engine F & A Part DP222
. With Clean Filter Element	2.16 kPa
. With Dirty Filter Element	6.23 kPa
○Max. static pressure after Radiator	0.125 kPa

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© COOLING SYSTEM



Water circulation by centrifugal pump on engine.	
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 23 lit, With Radiator(*Air On 43°C): Approx 114 lit
○ Coolant flow rate	660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm
○ Pressure Cap	Max. 49 kPa
○ Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ 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, 9 blades
• Max. external coolant system restriction	Not available

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C
 - ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied.
 Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© LUBRICATION SYSTEM

Force-feed lubrication by gear pump, lubricatir	ng 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. 40 liters , Min. 27 liters	
○ Lub oil pressure	Idle Speed : Min 100 kPa	
	Governed Speed : Min 250 kPa	
○ Maximum oil temperature	120℃	
○ 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, ele	ectromagnetic 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	28 MPa	
○ Fuel filter	Full flow, cartridge type with water drain valve.	
Maximum fuel inlet restriction	30 kPa	
○ Maximum fuel return restriction	60 kPa	
○ Fuel feed pump Capacity	630 liters / hr	
○ Used fuel	Diesel fuel oil	
© ELECTRICAL SYSTEM		
 Battery Charging Alternator 	27.5V x 45A alternator	
○ Voltage regulator	Built-in type IC regulator	
○ Starting motor	24V x 7.0 kW	

○ Battery Voltage	24V
○ Battery Capacity	2 x 200 Ah (recommended)
○ Starting aid (Option)	Block heater

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OVALVE SYSTEM

		•		
○ Туре	Overhead valve typ	Overhead valve type		
 Number of valve 	Intake 1, exhaust 1	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		

O PERFORMANCE DATA		Prime	Power	Standb	y 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	604	711	664	782
	PS	821	967	903	1063
○ Break Mean effective pressure	MPa	2.20	2.16	2.42	2.37
○ Mean Piston Speed	m/s	7.1	8.5	7.1	8.5
○ Friction Power	kW	48	66	48	66
	PS	65.3	89.7	65.3	89.7
 Specific fuel consumption 					
25% load	liters/hr	39.2	46.9	42.5	51.0
50% load	liters/hr	73.0	87.1	80.1	95.0
75% load	liters/hr	109.2	127.7	120.4	140.4
100% load	liters/hr	147.1	172.7	162.7	192.8
 Maximum Lube oil consumption 	g/h	575	677	632	744
○ Fan Power	kW	24	38	24	38
○ Sound Pressure at 1m from the ea	ch side of Cylinde	r Block			
(without Fan)	dB(A)	100.14	102.11	100.14	102.11

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.

© Engine Data with Dry Type Exhaust Manifold

 Intake Air Flow 	m3/min	39.2	52.1	42.2	56.0
○ Exhaust gas temp. after turbo.	°C	459	460	481	480
○ Exhaust Gas Flow	m3/min	93	115	101	124
○ Heat Rejection to Exhaust	kW	544	639	602	713
 Heat Rejection to Coolant 	kW	260	306	288	341
○ Heat Rejetion to Intercooler	kW	133	156	147	174
 Radiated Heat to Ambient 	kW	55	65	61	72
• Cooling water circulation	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	860	1050	860	1050
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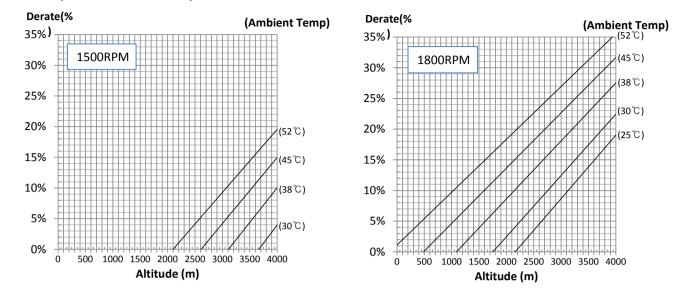
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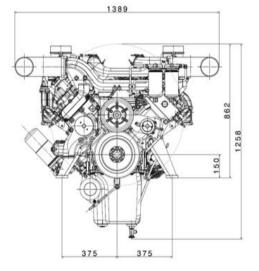
© DERATING FROM ISO 3046 STANDARD CONDITIONS

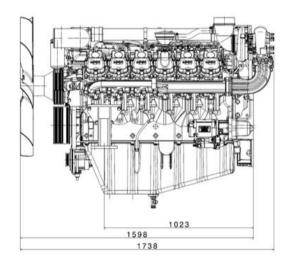
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air inlet temperature.



© 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 $\label{eq:lb/ft} \begin{array}{l} \text{Ib/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \text{ kcal/s} \\ \text{Ib/PS.h} = g/\text{kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{MPa} = \text{kPa x } 1000 = \text{bar x } 10 \end{array}$



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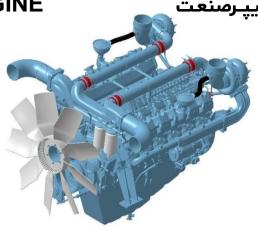
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DP222LC

Ratings	Gross Engine Output - without Cooling Fan		Net Engine Output - with Cooling Fan	
(kWm/PS)	Standby Prime		Standby	Prime
1500rpm(50Hz)	723/983	657/894	699/950	633/861
1800rpm(60Hz)	828/1126	753/1023	790/1074	715/972



* 50Hz : DP222LCF, 60Hz : DP222LCS

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) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and ambient temperature.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> is available for an unlimited 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 within 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	DP222LC		
○Engine Type	4-Cycle, V-type, 12-Cylinder, Turbo charged & intercooled (air to ai		
○ Bore x stroke	128 x 142 mm		
	21.927 liters		
○ Compression ratio			
○ Rotation	Counter clockwise viewed from Flywheel		
○ Firing order	1-12-5-8-3-10-6-7-2-11-4-9		
○ Injection timing	21°+1° BTDC @ 1800 rpm 19°+1° BTDC @ 1500 rpm		
○ Dry weight	1 420 kg(with Fan)		
○ Dimension (LxWxH)	1.738 x 1.389 x 1.258 mm		
○ Fly wheel housing			
○ Fly wheel	Clutch NO.14M		
 Number of teeth on flywheel 			
$^{ m O}$ Maximum Bending Moment at Rear Face to Block	1,325 N.m		
© EXHAUST SYSTEM	DOOSAN		
○ Maximum Back Pressure	5.9 kPa		
O AIR INDUCTION SYSTEM			
 Maximum Intake Air Restriction 			
. With Clean Filter Element	2.16 kPa		
. With Dirty Filter Element	6.23 kPa		
OMax. static pressure after Radiator	0.125 kPa		

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© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 23 lit, With Radiator(*Air On 43°C): Approx 114 lit.
○ Coolant flow rate	660 liters / min @ 1800 rpm, 550 liters / min @ 1500 rpm
○ Pressure Cap	Max. 49 kPa
○ Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0℃
○ 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, 9 blades
 Max. external coolant system restriction 	Not available

* Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet (Air On) : Air On 43°C / Air On 52°C

- ATB(Ambient Temperature before Boiling) of generator set varies depending on the engine room ventilation design, even if the same radiator applied. Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

© LUBRICATION SYSTEM

Force-feed lubrication by gear pump, lubricating oil cooling in cooling water circuit of engine. Club. Method Fully forced pressure feed type ○ Oil pump Gear type driven by crank-shaft gear Oil filter Full flow, cartridge type ○ Oil capacity Max. 40 liters , Min. 27 liters ○ Lub oil pressure Idle Speed : Min 100 kPa Governed Speed : Min 250 kPa Maximum oil temperature **120℃** Front down 10 deg , Front up 10 deg , Side to side 22.5 deg Angularity limit Refer to Operation Manual Lubrication oil

© FUEL SYSTEM

Bosch type in-line pump with integrated, ele	ectromagnetic 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	28 MPa
○ Fuel filter	Full flow, cartridge type with water drain valve.
• Maximum fuel inlet restriction	30 kPa
 Maximum fuel return restriction 	60 kPa
○ Fuel feed pump Capacity	630 liters / hr
○ Used fuel	Diesel fuel oil
© ELECTRICAL SYSTEM	
 Battery Charging Alternator 	27.5V x 45A alternator
○ Voltage regulator	Built-in type IC regulator
○ Starting motor	24V x 7.0 kW
○ Battery Voltage	24V
• Battery Capacity	2 x 200 Ah (recommended)
○ Starting aid (Option)	Block heater

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OVALVE SYSTEM

			هايپرست
○ Туре	Overhead valve t	уре	
○ Number of valve	Intake 1, exhaust	1 per cylinder	
\circ 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	

O 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
Oross Engine Power Output	kW	657	753	723	828
	PS	894	1023	983	1126
 Break Mean effective pressure 	MPa	2.39	2.29	2.63	2.52
○ Mean Piston Speed	m/s	7.1	8.5	7.1	8.5
○ Friction Power	kW	48	66	48	66
	PS	65.3	89.7	65.3	89.7
 Specific fuel consumption 					
25% load	liters/hr	42.1	49.1	45.6	53.3
50% load	liters/hr	79.3	91.3	86.4	99.3
75% load	liters/hr	119.1	134.4	129.1	147.2
100% load	liters/hr	161.0	183.2	172.8	203.8
○ Maximum Lube oil consumption	g/h	626	716	688	788
○ Fan Power	kW	24	38	24	38
○ Sound Pressure at 1m from the ea	ch side of Cylinde	r Block			
(without Fan)	dB(A)	100.14	102.11	100.14	102.11

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.

© Engine Data with Dry Type Exhaust Manifold

○ Intake Air Flow	m3/min	41.8	54.4	45.0	58.6
○ Exhaust gas temp. after turbo.	°C	478	472	502	493
○ Exhaust Gas Flow	m3/min	100	120	108	130
 Heat Rejection to Exhaust 	kW	596	678	639	754
 Heat Rejection to Coolant 	kW	285	324	306	361
○ Heat Rejetion to Intercooler	kW	145	165	156	184
Radiated Heat to Ambient	kW	60	69	65	77
 Cooling water circulation 	liters/min	590	660	590	660
○ Cooling fan air flow	m3/min	860	1050	860	1050

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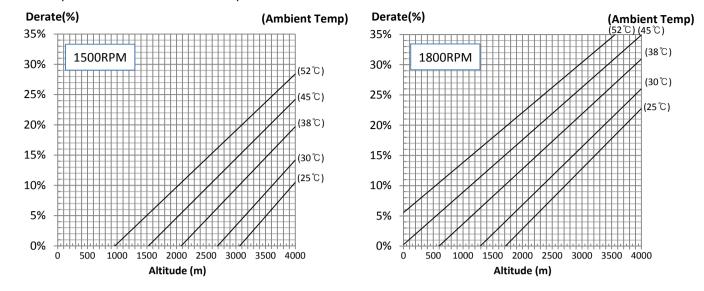
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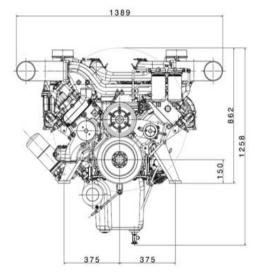
© DERATING FROM ISO 3046 STANDARD CONDITIONS

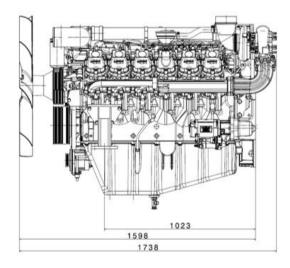
The maximum power is the STANDBY rating when assessing derate prameters.

Ambient temperature is air cleaner inlet temperature.



© ENGINE DIMENSION





CONVERSION TABLE

in. = mm x 0.0394 PS = kW x 1.3596 psi = kg/cm2 x 14.2233in3 = lit. x 61.02 hp = PS x 0.98635 lb = kg x 2.20462kW = kcal/sec x 0.239

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 $lb/ft = N.m \ge 0.737$ U.S. gal = lit. x 0.264 kW = 0.2388 kcal/s lb/PS.h = g/kW.h \ge 0.00162 cfm = m³/min x 35.336 MPa = kPa x 1000 = bar x 10



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P086TI

Ratings	Gross Engine Output		Net Engine Output	
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	199/270	177/240	194/263	172/233
1800rpm(60Hz)	223/303	205/279	215/292	197/268



Ratings Definitions

The power ratings of Emergency Standby and Prime are in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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

O GENERAL ENGINE DATA

P086TI
4-Cycle, In-line, 6-Cylinder Diesel, water cooled, Turbo charged & intercooled
111 x 139 mm
8.071 liters
16.4 : 1
Counter clockwise viewed from Flywheel
1-5-3-6-2-4
12°±1° BTDC
790kg(with Fan)
1,242 x 923 x 1,095 mm
SAE NO.1M
Clutch NO.14M
146
1325 N • M
5.9 kPa
2.16 kPa
6.23 kPa
0.125 kPa

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DOOSAN



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◎ 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 44 lit.(standard)
 Coolant flow rate 	166 liters / min
○ Pressure Cap	Max. 49 kPa
○ Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ 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 , 660 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 pan 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℃
○ Angularity limit	Front down 15 deg , Front up 15 deg , Side to side 15 deg
○ Lubrication oil	Refer to Operation Manual
© FUEL SYSTEM	
Bosch type in-line pump with integrated, electrom	nagnetic actuator.
○ Injection pump	Doowon in-line "P" type (Licensed by ZEXEL)
○ Governor	Electric type (all speed control)
○ Speed drop	G3 Class (ISO 8528)
○ Feed pump	
 Injection nozzle 	Multi hole type
○ Opening pressure	
○ Fuel filter	Full flow, cartridge type with water drain value.
 Maximum fuel inlet restriction 	10 kPa
 Maximum fuel return restriction 	60 kPa
○ Fuel feed pump Capacity	
○ Used fuel	Diesel fuel oil
© ELECTRICAL SYSTEM	
• Battery Charging Alternator	28.5V x 45A alternator
 ○ Voltage regulator ○ Starting mater 	Built-in type IC regulator
 Starting motor Battery Voltage 	24V x 6.0 kW 24V
Battery Capacity	100 Ah (recommended)

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DOOSAN



O VALVE SYSTEM

○ Туре	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		

O PERFORMANCE DATA		Prime Po	ower	Standb	y 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	177	205	199	223
	ps	240	279	270	303
• Break Mean effective pressur	е Мра	1.75	1.70	1.97	1.84
○ 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	11.3	13.8	12.7	15.2
50% load	liters/hr	21.1	25.1	23.7	27.7
75% load	liters/hr	31.7	37.7	35.5	41.6
100% load	liters/hr	43.1	50.6	48.4	56.8
 Maximum Lube oil consumpti 	cg/h	168	195.3	189	212.1
○ Fan Power	kW	5	8	5	8
• Exhaust Noise at 1m Horizon	tally from Center	line of Exhaust Pipe d	lista		
(without Fan)	dB(A)	98.3	100.7	98.3	100.7

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 Ex	khaust Manifo	old			
 Intake Air Flow 	m3/min	15.71	22.33	16.95	23.35
○ Exhaust gas temp. after turbo	o. °C	-	509	580	524
○ Exhaust Gas Flow	m3/min	-	40.9	33.9	44.6
 Heat Rejection to Exhaust 	kW	151.9	178.3	170.6	200.2
 Heat Rejection to Coolant 	kW	66.0	77.5	74.2	87.0
• Heat Rejetion to Intercooler	kW	35.2	41.3	39.5	46.4
 Radiated Heat to Ambient 	kW	15.4	18.1	17.3	20.3
 Cooling water circulation 	liters/min	130	150	130	150
○ Cooling fan air flow	m3/min	190	224	190	224

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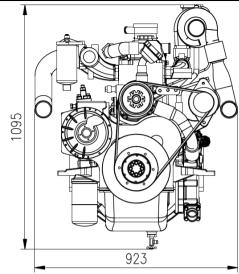


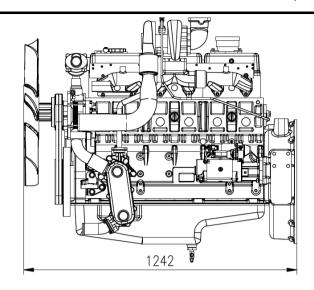
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♦ ENGINE DIMENSION





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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = \text{g/kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{Mpa} = \text{Pa x } 1000 = \text{bar x } 10 \end{array}$

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DOOSAN INFRACORE GENERATOR ENGINE

P086TI-1

Ratings	Gross Eng	jine Output	Net Engine Output		
(kWm/PS)	Standby	Prime	Standby	Prime	
1500rpm(50Hz)	164/223	149/203	159/216	144/196	
1800rpm(60Hz)	191/260	174/237	183/249	166/226	



Ratings Definitions

The power ratings of Emergency Standby and Prime are in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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

9 •	
○ Engine Model	P086TI-1
O Engine Type	4-Cycle, In-line, 6-Cylinder Diesel, water cooled, Turbo charged & intercooled
○ Bore x stroke	111 x 130 mm
○ Displacement	8 071 liters
	16.4 : 1
• Rotation	
 ○ Firing order ○ Injection timing 	1-5-3-6-2-4
○ Injection timing	
○ Dry weight	790kg(with Fan)
O Dimension (LxWxH) O Ely wheel housing	1,242 x 923 x 1,095 mm
○ Fly wheel housing	SAE NO.1M
○ Fly wheel	
 Number of teeth on flywheel 	146
Maximum Bending Moment at Rear Face to Block	1325 N • M
© EXHAUST SYSTEM	
Maximum Back Pressure	5.9 kPa
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

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FAMC

◎ 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 44 lit.(standard)
○ Coolant flow rate	166 liters / min
○ Pressure Cap	Max. 49 kPa
○Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ 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 , 660 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
	Max. 15.5 liters , Min. 12 liters
• Oil pan capacity	Idle Speed : Min 100 kPa
○ Lub oil pressure	
	Governed Speed : Min 250 kPa
Maximum oil temperature	120℃
Angularity limit	Front down 15 deg , Front up 15 deg , Side to side 15 deg
• Lubrication oil	Refer to Operation Manual
Bosch type in-line pump with integrated, electron	
 Injection pump 	Doowon in-line "P" type (Licensed by ZEXEL)
் Governor	Electric type (all speed control)
○ Speed drop	G3 Class (ISO 8528)
○ Feed pump	
\diamond Injection nozzlo	Multi hole type
	22.0 MPa
○ Fuel filter	Full flow, cartridge type with water drain valve.
	10 kPa
	60 kPa
• Fuel feed pump Capacity	
○ 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 6.0 kW
○ Battery Voltage	24V
• Battery Capacity	100 Ah (recommended)
 Starting aid (Option) 	Block heater

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FAMCO هايپرمنعت

OVALVE SYSTEM

○ Туре	Overhead valve type		
 Number of valve 	Intake 1, exhaust 1 per cylinder		
○ Valve lashes at cold	Intake 0.3mm, Exha	ust 0.3mm	
○ Valve timing			
	Opening Cl	ose	
Intake valve		deg. ABDC	
Exhaust valve		deg. ATDC	

O PERFORMANCE DATA		Prime Po	wer	Standb	y Power
Overned 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	149	174	164	191
	ps	203	237	223	260
 Break Mean effective pressur 	e Mpa	1.48	1.44	1.63	1.58
○ 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	10.1	12.2	10.9	13.3
50% load	liters/hr	18.7	22.1	20.3	24.0
75% load	liters/hr	26.7	31.6	29.2	34.7
100% load	liters/hr	35.4	42.4	39.0	46.7
• Maximum Lube oil consumpti	cg/h	142.1	165.9	156.1	182
○ Fan Power	kW	5	8	5	8
 Exhaust Noise at 1m Horizon 	tally from Center	line of Exhaust Pipe d	lista		
(without Fan)	dB(A)	98.3	100.7	98.3	100.7

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

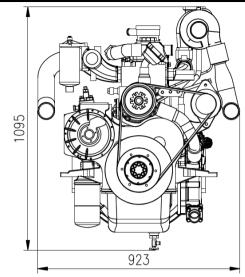
Engine Data with Dry Type Ex	khaust Manifold				
 Intake Air Flow 	m3/min	14.18	20.55	15.01	21.53
O Exhaust gas temp. after turbo	o. °C	-	-	-	500
○ Exhaust Gas Flow	m3/min	-	-	-	38.8
 Heat Rejection to Exhaust 	kW	124.7	149.4	137.4	164.6
 Heat Rejection to Coolant 	kW	54.2	65.0	59.8	71.6
• Heat Rejetion to Intercooler	kW	28.9	34.6	31.9	38.2
 Radiated Heat to Ambient 	kW	12.7	15.2	13.9	16.7
• Cooling water circulation	liters/min	130	150	130	150
○ Cooling fan air flow	m3/min	190	224	190	224

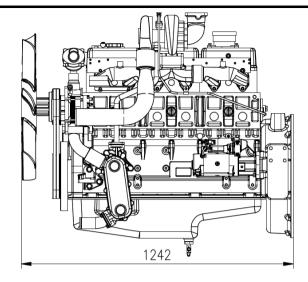
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ENGINE DIMENSION







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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = \text{g/kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{Mpa} = \text{Pa x } 1000 = \text{bar x } 10 \end{array}$

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

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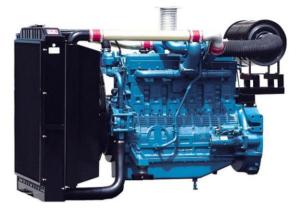
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FAMC هايپرمنعت

DOOSAN INFRACORE GENERATOR ENGINE

P126TI

Ratings	Gross Eng	jine Output	Net Engine Output		
(kWm/PS)	Standby Prime		Standby	Prime	
1500rpm(50Hz)	272/370	241/328	265/360	234/318	
1800rpm(60Hz)	298/405	278/378	287/390	267/363	



Ratings Definitions

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

Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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

O GENERAL ENGINE DATA

P126TI
4-Cycle, In-line, 6-Cylinder Diesel, water cooled, Turbo charged & intercooled
123 x 155 mm
11.051 liters
17.1 : 1
Counter clockwise viewed from Flywheel
1-5-3-6-2-4
16°±1° BTDC
910kg(with Fan)
1,384 x 1,109 x 1,195 mm
SAE NO.1M
Clutch NO.14M
152
1325 N • M
5.9 kPa
2.16 kPa
6.23 kPa
0.125 kPa

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◎ COOLING SYSTEM

Water circulation by centrifugal pump on engine	
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only : Approx. 19 lit., With Radiator : Approx. 51 lit. (standard
○ Coolant flow rate	liters / min
⊃ Pressure Cap	Max. 49 kPa
⊃ Water Temperature	
- Maximum for standby and Prime	103 ℃
- Before start of full load	40.0 ℃
⊃ Water pump	Centrifugal type driven by Gear
⊃ Thermostat Type and Range	Wax – pellet type, Opening temp. 71°C , Full open temp. 85°C
○ Cooling fan	Blower type, Plastic , 755 mm diameter, 7 blade
 Max. external coolant system restriction 	Not available
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. 23 liters , Min. 20 liters
Cub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
Maximum oil temperature	120 ℃
⊃ Angularity limit	Front down 10 deg , Front up 10 deg , Side to side 22.5 deg
⊃ Lubrication oil	Refer to Operation Manual
D FUEL SYSTEM	
Bosch type in-line pump with integrated, electron	nagnetic actuator.
○ Injection pump	Zexel in-line "P" type
Governor	Electric type (all speed control)
Speed drop	G3 Class (ISO 8528)
⊃Feed pump	Mechanical type in inipump.
⊃ Injection nozzle	Multi hole type
Opening pressure	
	Full flow, cartridge type with water drain valve.
Aximum fuel inlet restriction	10 kPa
○ Maximum fuel return restriction	60 kPa
• Fuel feed pump Capacity	
⊖ Used fuel	Diesel fuel oil
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	150 Ah (recommended)
○ Starting aid (Option)	Block heater

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FAMCU هايپرمىنىت

O VALVE SYSTEM

⊙ Туре		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	18 deg. BTDC	34 deg. ABDC	
Exhaust valve	46 deg. BBDC	14 deg. ATDC	

O PERFORMANCE DATA		Prime Po	wer	Standb	y 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	241	278	272	298
	ps	328	378	370	405
○ Break Mean effective pressu	е Мра	1.75	1.68	1.97	1.80
○ Mean Piston Speed	m/s	7.75	9.3	7.75	9.3
 Friction Horsepower 	kW	24	33	24	33
	ps	32.63	44.87	32.63	44.87
 Specific fuel consumption 					
25% load	liters/hr	16.4	20.3	18.3	21.5
50% load	liters/hr	30.0	36.2	33.4	38.7
75% load	liters/hr	43.6	52.3	49.1	56.3
100% load	liters/hr	58.1	70.3	66.2	76.5
• Maximum Lube oil consumpti	cg/h	229.6	264.6	259	283.5
○ Fan Power	kW	7	11	7	11
○ Exhaust Noise at 1m Horizon	tally from Center	line of Exhaust Pipe d	ista		
(without Fan)	dB(A)	96.5	97.5	96.5	97.5

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 Ex	xhaust Manifo				
 Intake Air Flow 	m3/min	19.35	26.53	21.09	27.68
○ Exhaust gas temp. after turbo	o. °C	560	510	593	540
○ Exhaust Gas Flow	m3/min	42.9	58.1	49.7	67.3
 Heat Rejection to Exhaust 	kW	204.7	247.7	233.3	269.6
○ Heat Rejection to Coolant	kW	89.0	107.7	101.4	117.2
○ Heat Rejetion to Intercooler	kW	47.5	57.4	54.1	62.5
 Radiated Heat to Ambient 	kW	20.8	25.1	23.7	27.3
 Cooling water circulation 	liters/min	265	320	265	320
○ Cooling fan air flow	m3/min	370	433	370	433

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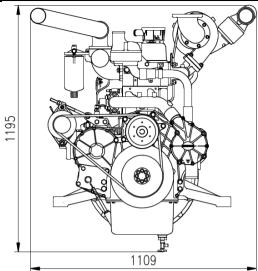
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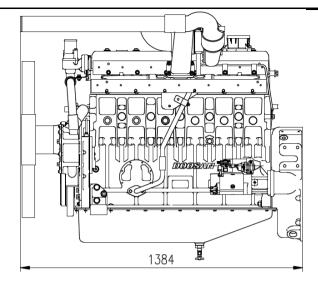
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♦ ENGINE DIMENSION





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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = \text{g/kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{Mpa} = \text{Pa x } 1000 = \text{bar x } 10 \end{array}$

Doosan Infracore Co., Ltd.

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی پالایشگاه نفت پـارس، پلاک ۱۲

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DOOSAN INFRACORE GENERATOR ENGINE

P126TI-II

Ratings	Gross Engine Output		Net Engi	ne Output
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	294/400	265/360	287/390	258/350
1800rpm(60Hz)	342/465	307/418	331/450	296/403



Ratings Definitions

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

Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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

O GENERAL ENGINE DATA

○ Engine Model	P126TI-
○ Engine Type	4-Cycle, In-line, 6-Cylinder Diesel, water cooled, Turbo charged & intercooled
○Bore x stroke	123 x 155 mm
○ Displacement	11.051 liters
• Compression ratio	
○ Rotation	Counter clockwise viewed from Flywheel
○ Firing order	1-5-3-6-2-4
○ Injection timing	16°±1° BTDC
○ Dry weight	780kg(with Fan)
	1,384 x 1,109 x 1,195 mm
○ Fly wheel housing	SAE NO.1M
○ Fly wheel	Clutch NO.14M
 Number of teeth on flywheel 	152
Maximum Bending Moment at Rear Face to Block	1325 N • M
© EXHAUST SYSTEM	
Maximum Back Pressure	5.9 kPa
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

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FAMCO هايپرصنعت

© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	
• Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 19 lit., With Radiator: Approx. 51 lit.(standard)
○ Coolant flow	liters / min
○ Pressure Cap	Max. 49 kPa
 Water Temperature Maximum for standby and Prime 	103℃
- Before start of full load	40.0℃
	Centrifugal type driven by Gear
• Water pump	
• Thermostat Type and Range	Wax – pellet type, Opening temp. 71°C , Full open temp. 85°C
○ Cooling fan	Blower type, Plastic , 755 mm diameter, 7 blade
○ Max. external coolant system restriction	Not Available
Force-feed lubrication by gear pump, lubricating	
○ 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. 23 liters , Min. 20 liters
○ Lub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
Maximum oil temperature	120 ℃
○ Angularity limit	Front down 10 deg , Front up 10 deg , Side to side 22.5 deg
○ Lubrication oil	Refer to Operation Manual
O FUEL SYSTEM	
Bosch type in-line pump with integrated, electrom	nagnetic actuator.
○ Injection pump	Zexel in-line "P" type
○ Governor	Electric type (all speed control)
○ Speed drop	G3 Class (ISO 8528)
⊙ Feed pump	Mechanical type in inipump.
○ Injection nozzle	Multi hole type
○ Opening pressure ○ Fuel filter	
• Maximum fuel inlet restriction	Full flow, cartridge type with water drain valve. 10 kPa
 Maximum fuel return restriction 	60 kPa
○ Fuel feed pump Capacity	
	Diesel fuel oil
© ELECTRICAL SYSTEM	28.5V x 45A alternator
 Battery Charging Alternator Voltage regulator 	28.5V X 45A alternator Built-in type IC regulator
• Starting motor	$24V \times 6.0 \text{ kW}$
• Battery Voltage	24V
• Battery Capacity	150 Ah (recommended)
• Starting aid (Option)	Block heater

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OVALVE SYSTEM

○ Туре	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	18 deg. BTDC 34 deg. ABDC
Exhaust valve	46 deg. BBDC 14 deg. ATDC

O PERFORMANCE DATA		Prime Po	wer	Standt	by 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	265	307	294	342
	ps	360	418	400	465
OBreak Mean effective pressu	ure Mpa	1.92	1.86	2.13	2.06
○ Mean Piston Speed	m/s	7.75	9.3	7.75	9.3
○ Friction Horsepower	kW	24	33	24	33
	ps	32.63	44.87	32.63	44.87
• Specific fuel consumption					
25% load	liters/hr	16.9	20.6	18.3	22.2
50% load	liters/hr	31.3	37.0	34.9	41.4
75% load	liters/hr	47.0	56.0	51.6	61.5
100% load	liters/hr	63.1	73.8	77.6	89.5
• Maximum Lube oil consump	tic g/h	252	292.6	280	325.5
○ Fan Power	kW	7	11	7	11
• Exhaust Noise at 1m Horizo	ntally from Center	line of Exhaust Pipe d	ista		
(without Fan)	dB(A)	97.1	98.3	97.1	98.3

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 Ex	<u>chaust Manifol</u>				
 Intake Air Flow 	m3/min	20.68	28.23	22.33	30.22
 Exhaust gas temp. after turbo 	о. °С	590	500	650	580
○ Exhaust Gas Flow	m3/min	47.4	61.6	51.2	64.2
○ Heat Rejection to Exhaust	kW	222.4	260.1	273.5	315.4
 Heat Rejection to Coolant 	kW	96.7	113.1	118.9	137.1
• Heat Rejetion to Intercooler	kW	51.6	60.3	63.4	73.1
 Radiated Heat to Ambient 	kW	22.6	26.4	27.7	32.0
 Cooling water circulation 	liters/min	265	320	265	320
○ Cooling fan air flow	m3/min	450	530	450	530

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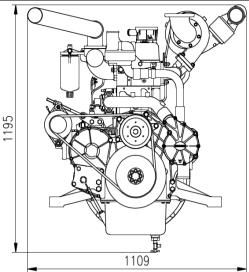
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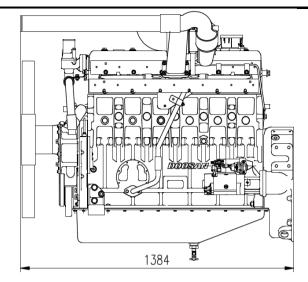
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ENGINE DIMENSION





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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = \text{g/kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{Mpa} = \text{Pa x } 1000 = \text{bar x } 10 \end{array}$

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DOOSAN INFRACORE GENERATOR ENGINE

FAMCO هايپرمنعت

P158LE

Ratings	Gross Engine Output		Net Engir	ne Output
(kWm/PS)	Standby	Prime	Standby	Prime
1500rpm(50Hz)	414/563	363/494	400/544	349/475
1800rpm(60Hz)	458/623	402/547	435/592	379/516



Ratings Definitions

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

Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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

O GENERAL ENGINE DATA

0	
○ Engine Model	P158LE
○ Engine Type	4-Cycle, V-type, 8-Cylinder, Turbo charged & intercooled (air to air)
○Bore x stroke	128 x 142 mm
○ Displacement	14 618 liters
	15 : 1
○ Rotation	Counter clockwise viewed from Flywheel
○ Firing order	1-5-7-2-6-3-4-8
○ Injection timing	16°+1° BTDC
○ Dry weight	950 kg (with fan)
○ Dimension (LxWxH)	4 202 x 4 202 x 4 242 mm
○ Fly wheel housing	SAE NO 1M
○ Fly wheel	
Number of teeth on flywheel	160
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
OMax. static pressure after Radiator	0.125 kPa

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج) روبـروی یالایشگاه نفت یـارس، یلاک ۱۲

FAMCU هاييـرمنعت

© COOLING SYSTEM

Water circulation by centrifugal pump on engine.	•
Cooling method	Fresh water forced circulation
Coolant capacity	Engine Only: Approx. 20 lit, With Radiator(standard): Approx 80 lit.
Coolant flow rate	600 liters / min
Pressure Cap	Max. 49 kPa
Water Temperature	
- Maximum for standby and Prime	103℃
Before start of full load	40.0 ℃
⊳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
UBRICATION SYSTEM	
Force-feed lubrication by gear pump, lubricating oil coc	ling 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. 21 liters , Min. 17 liters
Lub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
Maximum oil temperature	120℃
Angularity limit	Front down 10 deg , Front up 10 deg , Side to side 22.5 deg
Lubrication oil	Refer to Operation Manual
D FUEL SYSTEM	
Bosch type in-line pump with integrated, electromagneti	ic actuator.
Injection pump	Bosch in-line "P" type
Governor	Electric type
Speed drop	G3 Class (ISO 8528)
> Feed pump	Mechanical type in inipump.
Injection nozzle	Multi hole type
	27.9 MPa
	Full flow, cartridge type with water drain valve.
Maximum fuel inlet restriction	10 kPa
	10 kPa 60 kPa

○ Used fuel

© ELECTRICAL SYSTEM

Battery Charging Alternator
 Voltage regulator

• Starting motor

• Battery Voltage

• Battery Capacity

28.5V x 45A alternator Built-in type IC regulator 24V x 4.5 kW 24V 2 x 100 Ah (recommended)

Diesel fuel oil

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OVALVE SYSTEM

○ Туре	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			

O PERFORMANCE DATA		Prime	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	363	402	414	458	
	PS	494	547	563	623	
OBreak Mean effective pressur	e MPa	1.99	1.84	2.27	2.09	
○ 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	23.7	28.0	26.5	30.5	
50% load	liters/hr	43.9	50.6	49.6	57.6	
75% load	liters/hr	65.1	74.7	74.8	85.9	
100% load	liters/hr	89.3	102.5	102.9	118.6	
○ Maximum Lube oil consumpti	cg/h	346	383	394	436	
○ Fan Power	kW	14	23	14	23	
• Exhaust Noise at 1m Horizon	tally from Cente	erline of Exhaust Pipe d	istance			
(without Fan)	dB(A)	98.3	98.5	98.3	98.5	

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

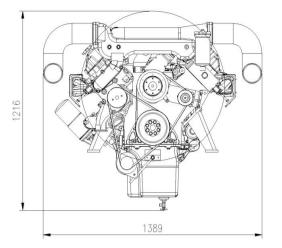
Engine Data with Dry Type Exhaust Manifold							
 Intake Air Flow 	m3/min	26.2	33.7	29.1	36.9		
○ Exhaust gas temp. after turbo	◦ Exhaust gas temp. after turbo. °C 580 606						
○ Exhaust Gas Flow	m3/min	78.3	91.3	-	-		
 Heat Rejection to Exhaust 	kW	314.7	361.2	362.6	417.9		
 Heat Rejection to Coolant 	kW	136.8	157.0	157.7	181.7		
• Heat Rejetion to Intercooler	kW	73.0	83.8	84.1	96.9		
 Radiated Heat to Ambient 	kW	31.9	36.6	36.8	42.4		
 Cooling water circulation 	liters/min	535	600	535	600		
○ Cooling fan air flow	m3/min	522	618	522	618		

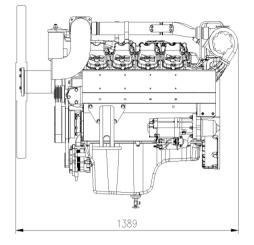
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CONVERSION TABLE

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 $\label{eq:lb/ft} \begin{array}{l} \text{lb/ft} = \text{N.m x } 0.737 \\ \text{U.S. gal} = \text{lit. x } 0.264 \\ \text{kW} = 0.2388 \ \text{kcal/s} \\ \text{lb/PS.h} = g/\text{kW.h x } 0.00162 \\ \text{cfm} = \text{m}^3/\text{min x } 35.336 \\ \text{MPa} = \text{kPa x } 1000 = \text{bar x } 10 \end{array}$

Doosan Infracore Co., Ltd.

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DOOSAN INFRACORE GENERATOR ENGINE

P158LE-1

Ratings	Gross Eng	jine Output	Net Engine Output		
(kWm/PS)	Standby	Prime	Standby	Prime	
1500rpm(50Hz)	362/492	327/444	348/473	313/425	
1800rpm(60Hz)	402/546	366/498	379/515	343/467	



Ratings Definitions

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

Fuel Stop power in accordance with ISO 3046.

<u>STANDBY POWER RATING</u> 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.

<u>PRIME POWER RATING</u> 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	P158LE-1
○ Engine Type	4-Cycle, V-type, 8-Cylinder, Turbo charged & intercooled (air to air)
○ Bore x stroke	128 x 142 mm
○ Displacement	14.618 liters
• Compression ratio	
○ Rotation	Counter clockwise viewed from Flywheel
	1-5-7-2-6-3-4-8
 Injection timing 	16°±1° BTDC
○ Dry weight	950 kg (with fan)
○ Dimension (LxWxH)	1 389 x 1 389 x 1 216 mm
○ Fly wheel housing	SAF NO 1M
○ Fly wheel	Clutch NO 14M
○Number of teeth on flywheel	160
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

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◎ COOLING SYSTEM

© COCEING STOTEM	
Water circulation by centrifugal pump on engine	Э.
○ Cooling method	Fresh water forced circulation
○ Coolant capacity	Engine Only: Approx. 20 lit, With Radiator(standard): Approx 80 lit
○ Coolant flow rate	600 liters / min
○ Pressure Cap	Max. 49 kPa
○ Water Temperature	
- Maximum for standby and Prime	103℃
- Before start of full load	40.0 ℃
○ Water pump	Centrifugal type driven by belt
○ Thermostat Type and Range	Wax – pellet type, Opening temp. 71° C , Full open temp. 85°
○ Cooling fan	Blower type, plastic , 915 mm diameter, 7 blade
 Max. external coolant system restriction 	Not available
Force-feed lubrication by gear pump, lubricating	g 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. 21 liters , Min. 17 liters
○ Lub oil pressure	Idle Speed : Min 100 kPa
	Governed Speed : Min 250 kPa
○ Maximum oil temperature	120℃
○ Angularity limit	Front down 10 deg , Front up 10 deg , Side to side 22.5 deg
○ Lubrication oil	Refer to Operation Manual
O FUEL SYSTEM	
Bosch type in-line pump with integrated, electror	magnetic actuator.
○ Injection pump	Bosch in-line "P" type
○ Governor	Electric type
○ Speed drop	G3 Class (ISO 8528)
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○ 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	315 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

Starting motor
Battery Voltage
Battery Capacity
Starting aid (Option)

28.5V x 45A alternator Built-in type IC regulator 24V x 4.5 kW 24V 2 x 100 Ah (recommended) Block heater, Air heater

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O VALVE SYSTEM

○ Туре	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	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	327	366	362	402	
	PS	444	498	492	546	
 Break Mean effective pressur 	e MPa	1.79	1.67	1.98	1.83	
○ 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	21.0	25.2	23.1	27.3	
50% load	liters/hr	40.0	46.5	43.7	50.3	
75% load	liters/hr	58.4	67.5	64.7	74.2	
100% load	liters/hr	78.7	91.3	88.3	101.0	
○ Maximum Lube oil consumpti	cg/h	311	349	344	382	
○ Fan Power	kW	14	23	14	23	
○ Exhaust Noise at 1m Horizon	tally from Cente	erline of Exhaust Pipe di	stance			
(without Fan)	dB(A)	98.3	98.5	98.3	98.5	

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.

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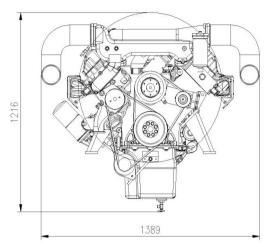
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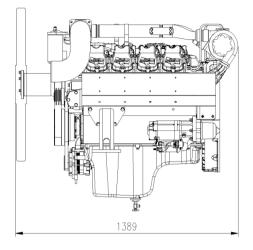
Engine Data with Dry Type Exhaust Manifold							
 Intake Air Flow 	m3/min	24.2	31.6	26.1	33.7		
○ Exhaust gas temp. after turbo	o. °C	520	500	-	-		
○ Exhaust Gas Flow	m3/min	59.5	73.5	-	-		
 Heat Rejection to Exhaust 	kW	277.3	321.7	311.2	355.9		
 Heat Rejection to Coolant 	kW	120.6	139.9	135.3	154.7		
• Heat Rejetion to Intercooler	kW	64.3	74.6	72.2	82.5		
 Radiated Heat to Ambient 	kW	28.1	32.6	31.6	36.1		
 Cooling water circulation 	liters/min	535	600	535	600		
○ Cooling fan air flow	m3/min	522	618	522	618		

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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
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