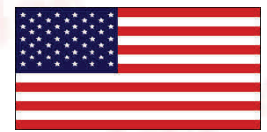




GeneratorJoe®



Made in the USA!



Shown with optional equipment

Defender 2 Series Model: 250 DF2 & DF2-3

Ratings Natural Gas

Single and/or Three Phase Available

		60 Hz	50 Hz
Standby:	kW	260.0	208.3
	kVA	325.0	260.8
Prime:	kW	234.0	187.5
	kVA	280.1	234.0

Features

- Single source responsibility for the generator set and accessories.
- Prototype and production tested to insure one step load acceptance per NFPA 110.
- Five year limited warranty on generator sets and accessories.
- Unit conforms to CSA, NEMA, EGSA, ANSI and other standards.
- Heavy duty 4 cycle industrial engine for reliability and fuel efficiency.
- Brushless rotating field generator with class H insulation.
- Heavy duty steel base with integral vibration isolators.
- Electronic Isochronous Governor.
- EPA Emissions Certified
- UL 2200 Available

Voltage L-N / L-L	Phase	Hertz	Natural Gas 130° Rise Standby Rating		LP Gas 130° Rise Standby Rating	
			kW / kVA	Amps	kW / kVA	Amps
277/480	3	60	260/325	391	170/213	256
139/240	3	60	260/325	782	170/213	511
127/220	3	60	260/325	853	170/213	558
240/416	3	60	260/325	451	170/213	295
120/208	3	60	260/325	902	170/213	590
120/240	3	60	260/325	782	170/213	511
220/380	3	60	260/325	494	170/213	323
120/240	1	60	200/200	833	170/170	708



RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor.

STANDBY RATINGS: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271.

PRIME POWER RATINGS: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. For limited running time and base load ratings consult the factory. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

GENERAL GUIDELINES FOR DERATION: Altitude: Derate 0.5% per 100m (328 ft.) elevation above 1000m (3279 ft.) Temperature: Derate 1.0% per 10°C (18°F) temperature above 40°C (104°F).

Engine Application Data

Basic Technical Data		Lubrication System	
Manufacturer	Doosan	Type	Full Pressure
Model	D146L	Oil pan capacity	42.3 qt (40 L)
Number of cylinders	8	Oil pan capacity with filter	49.7 qt (47.1 L)
Cylinder arrangement	Vertical in-line	Oil filter: qty and type	2, Cartridge
Cycle	4	Electrical System	
Induction system	Turbocharged, Aftercooled	Ignition system	N/A
Compression ratio	10.5:1	Battery charging alternator:	
Bore	5.04 in (128 mm)	Ground	negative
Stroke	5.59 in (142 mm)	Volts	24
Cubic capacity	892 cu in (14.6 L)	Ampere rating	45
Piston speed	1677 ft/min (511 m/min)	Starter motor rated voltage	24
Main bearings: qty and type	10, Precision Half-Shell	Battery, recommended cold cranking amps (CCA):	
Governor type	Electronic	Qty rating for -18 °C (0 °F)	Two, 1000
Rated rpm	1800	Battery voltage	12
Max power at rated rpm	402 hp (300 kW)	Operation Requirements	
Engine power at Standby rating	N/A	Radiator-cooled cooling air, m ³ /min (scfm) ‡	22500 scfm (638 m ³ /min)
Frequency regulation, -load to full-load	no Isochronous	Combustion air	532 cfm (1064 m ³ /min)
Frequency regulation, steady state	± 0.5%	Heat rejected to ambient air:	
Frequency	Fixed	Engine	3765 Btu/min (66 kW)
Air cleaner type	Dry	Alternator	1309 Btu/min (23 kW)
Exhaust System		Fuel System	
Exhaust manifold type	Wet	Fuel Type	LP Gas, Natural Gas or Dual Fuel
Exhaust flow at rated kW	1611 cfm (1131 kg/hr)	Fuel Consumption	
Exhaust temperature at rated kW	1112 °F (600 °C)	<u>Natural Gas</u>	
Maximum allowable back pressure	3.0 in (10.2 kPa)	100% Load	2782 cfm (78.8 m ³ /hr)
Exhaust outlet size at engine hookup	N/A	75% Load	2168 cfm (61.4 m ³ /hr)
		50% Load	1521 cfm (43.1 m ³ /hr)
		25% Load	928 cfm (26.3 m ³ /hr)
Cooling System		<u>LP Gas</u>	
Ambient temperature	122 °F (50 °C)	100% Load	926 cfm (26.2 m ³ /hr)
Engine jacket water capacity	9.5 gal (43.2 L)	75% Load	789 cfm (22.4 m ³ /hr)
Radiator system capacity, including engine	50 gal (227.3 L)	50% Load	532 cfm (15.1 m ³ /hr)
Engine jacket water flow	180 gpm (680 Lpm)	25% Load	335 cfm (9.5 m ³ /hr)
Heat rejected to cooling water at rated	3765 Btu/min (66 kW)		
Max restriction of cooling air, intake and discharge side of radiator	0.5 H ₂ O (0.125 kPa)		



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Generator Controller Options



Digital Control Panel

The DGC-2020 digital GenSet controller provides integrated engine-GenSet control, protection, and metering. Microprocessor based technology allows for exact measurement, set point adjustment, and timing functions. Front panel 3 position controls and indicators enable quick and simple operation. The panel is also equipped with a emergency stop push button and an Alarm Horn with silence button. A wide temperature-range liquid crystal display (LCD) with backlighting can be viewed under a wide range of ambient light and temperature conditions down to 40° C.

Features SAE J1939 Engine ECU communications, Multilingual capability, Remote RS-485 communications for Optional RDP-110 Remote Annunciator, Extremely rugged, fully encapsulated design with 4 programmable contact inputs and 10 contact outputs (2 ADC rated). It also features Modbus Communications with RS-485, Battery Backup for Real Time Clock, UL recognized, CSA certified, CE approved, HALT (Highly Accelerated Life Tests) tested, IP 54 Front Panel rating with integrated gasket, and NFPA 110 Level 1 Compatible.



Analog Top Mount Controller

This Generator control panel has analog instruments to monitor AC voltage, AC frequency, percent of load and, run time/hour meter. Safety shutdowns provide red LED indication for overspeed, overcrank, low oil pressure, and high coolant temperature. Provide green LED indication of engine running. Control switch is provided for local and remote starting with 3 position run/off/remote switch.

There is also an engine mounted emergency by-pass key switch with mechanical oil pressure and coolant temperature gauge.



Analog End Mount Controller

This Generator control panel has analog instruments to monitor AC voltage, AC frequency, and percent of load. The analog engine instruments monitor oil pressure, water temperature, battery voltage, fuel level, and run time/hour meter. Safety shutdowns provide red LED indication for overspeed, overcrank, low oil pressure, and high coolant temperature. Provide green LED indication of engine running. Control switch is provided for local and remote starting with 3 position run/off/remote switch.

There is also an engine mounted emergency by-pass key switch.

AC Alternator Specifications

STANDARDS

Stamford industrial generators meet the requirements of BS EN 60034 and the relevant section of other international standards such as 55000, VDE 0530, NEMA MG1-32, 1EC34, CSA C22.2-100, A51359.

Other standards and certifications can be considered on request.

VOLTAGE REGULATORS

MX341 AVR

This sophisticated AVR is incorporated into the Stamford Permanent Magnet Generator (PMG) control system.

The PMG provides power via the AVR to the main exciter, giving a source of constant excitation power independent of generator output. The main exciter output is then fed to the main rotor, through a full wave bridge, protected by a surge suppressor. The AVR has in-built protection against sustained over-excitation, caused by internal or external faults. This de-excites the machine after a minimum of 5 seconds.

An engine relief load acceptance feature can enable full load to be applied to the generator in a single step.

If three-phase sensing is required with the PMG system the MX321 AVR must be used.

We recommend three-phase sensing for applications with greatly unbalanced or highly non-linear loads.

(Optional) MX321 AVR

The most sophisticated of all our AVRs combines all the features of the MX341 with, additionally, three-phase rms sensing, for improved regulation and performance. Over voltage protection is built-in and short circuit current level adjustments is an optional facility.

WINDINGS & ELECTRICAL PERFORMANCE

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th ...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A frilly connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

SHAFT

The generator rotor is dynamically balanced to better than B56861:Part 1 Grade 2.5 for minimum vibration in operation.

INSULATION/IMPREGNATION

The insulation system is class H.

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

QUALITY ASSURANCE

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Standard Features and Optional Accessories

Standard Features

- Heavy duty steel base
- Vibration isolators
- Oil drain valve with extension
- Battery rack
- Battery cables
- Water jacket heater
- Owners manual
- Electronic Isochronous Governor

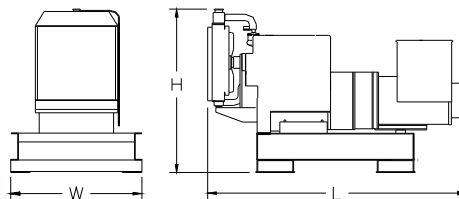
Optional Accessories

- Critical Exhaust Silencer
- Flex Exhaust Connector
- Top Mount Analog Control Panel
- End Mount Analog Control Panel
- DGC2020 Digital Control Panel
- Modem for DGC2020
- Enhanced Gen Protection for DGC2020
- Surface Mount Remote Annunciator Panel for DGC2020
- Flush Mount Remote Annunciator Panel for DGC2020
- Remote Mount Break Glass E-Stop Switch
- Line Circuit Breaker
- 3 phase sensing
- Generator strip heater
- Radiator duct flange for open unit
- Weather Enclosure with internal muffler
- Sound Attenuated weather enclosure
- Oil Pan Heater
- Battery
- Battery Charger
- Battery Heaters
- Fuel Switching, Manual & Automatic
- Flexible Fuel Lines
- Customize to Your Specifications

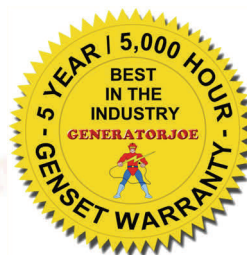
Weights and Dimensions

Overall Size, L x W x H, in.: 120 in. x 75 in. x 75 in.
Weight (Wet): 5,900 lbs.

Note: Dim and weights reflect standard open unit with no options



Note: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.



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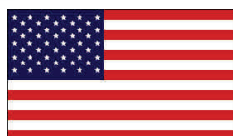
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A small business owned by service a connected disabled veteran.

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Model: 250 DF2 & DF2-3

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