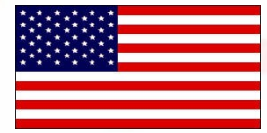




# GeneratorJoe



Made in the USA!



Shown with optional equipment

## Defender 2 Series Model: 200 DF2 & DF2-3

### Ratings

Single and/or Three Phase Available

Standby:	kW	60 Hz	50 Hz
	kVA	200.0	166.7
Prime:	kW	250.0	208.3
	kVA	180.1	150.0
		225.1	187.5

### Features

- Single source responsibility for the generator set and accessories.
- Prototype and production tested to insure one step load acceptance per NFPA 110.
- Two 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 Certified Engine.

Generator	Voltage	PH	Hz	Standby Rating		Prime Rating	
				kW/kVA	Amps	kW/kVA	Amps
UCI274J311	277/480	3	60	200/250	301	180/225	271
	139/240	3	60	200/250	602	180/225	542
	254/440	3	60	200/250	328	180/225	296
	127/220	3	60	200/250	657	180/225	591
	240/416	3	60	200/250	347	180/225	313
	120/208	3	60	200/250	695	180/225	625
	120/240	3	60	200/250	602	180/225	542
	219/380	3	60	200/250	380	180/225	219
	120/240	1	60	160/160	667	150/150	625
HCI444E06	120/240	1	60	200/200	833	160/160	667



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).

## Application Data

### Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Doosan	
Engine model	D111TIC	
Engine type	11.1 L, 4-Cycle, Turbocharged, Aftercooled	
Cylinder arrangement	6, Inline	
Displacement, L (cu. in.)	11.05 (674)	
Bore and stroke, mm (in.)	123 x 155 (4.84 x 6.10)	
Compression ratio	10.5:1	
Piston speed, m/min. (ft./min.)	558 (1831)	465 (1525)
Main bearings: quantity, type	7, Precision Half-Shell	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	225 (302)	195 (261)
Cylinder head material	Cast Iron	
Piston: type, material	—	
Crankshaft material	Forged Steel	
Valve material	—	
Governor: type, make/model	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.5%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

### Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Wet	
Exhaust flow at rated kW, m <sup>3</sup> /min. (cfm)	848 (420)	707 (350)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	677 (1250)	
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3)	

### Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	24	
Ampere rating	45	
Starter motor rated voltage (DC)	24	
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating each	Two, 1000	
Battery voltage (DC)	12	

### Fuel

Fuel System	60 Hz	50 Hz
Fuel type	LP Gas or Natural Gas	
Fuel supply line inlet	2.0 NPTF	
Natural gas/LPG fuel supply pressure, measured at the generator set fuel inlet downstream of any fuel system equipment accessories kPa, in. H <sub>2</sub> O)	1.74-2.74 (7.0-11.0)	

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	—
Ethane, % by volume	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume	0.1 max.	5.0 max.
C <sub>4</sub> and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass	25 max.	
Lower heating value, kJ/m <sup>3</sup> (Btu/ft <sup>3</sup> ), min.	26.6 (890)	67.5 (2260)

\* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

## Application Data

### Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	25 (26.4)	
Oil pan capacity with filter, L (qt.)	27 (28.8)	
Oil filter: quantity, type	1, Cartridge	
Oil cooler	Water-Cooled	

### Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F) *	50 (122)	
Engine jacket water capacity, L (gal.)	21 (5.5)	
Radiator system capacity, including engine, L (gal.)	116 (30.6)	
Engine jacket water flow, Lpm (gpm)	284 (75)	237 (63)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	142 (8100)	118 (6700)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	26.3 (1500)	25.4 (1450)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	965 (38)	
Fan, kWm (HP)	13.4 (18)	7.8 (10)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)	

Fuel Consumption ‡	60 Hz	50 Hz
Natural Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating	
100%	59.9(2115)	53.5(1889)
75%	46.7(1649)	40.9(1444)
50%	32.8(1158)	28.2 (996)
25%	20.0 (706)	17.1 (604)
Natural Gas, m <sup>3</sup> /hr. (cfh) at % load	Prime Rating	
100%	53.6(1893)	48.3(1706)
75%	41.7(1473)	37.0(1307)
50%	29.7(1049)	25.9 (915)
25%	17.6 (622)	15.3 (540)
LP Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating	
100%	19.9 (703)	16.8 (593)
75%	17.0 (600)	13.1 (462)
50%	11.5 (406)	9.7 (343)
25%	7.2 (254)	6.0 (212)
LP Gas, m <sup>3</sup> /hr. (cfh) at % load	Prime Rating	
100%	18.6 (657)	15.3 (540)
75%	15.1 (533)	12.0 (424)
50%	10.5 (371)	8.9 (314)
25%	6.4 (226)	5.4 (191)

‡ Fuel consumption is based on 1015 Btu/standard cu. ft. natural gas.

# 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 an 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

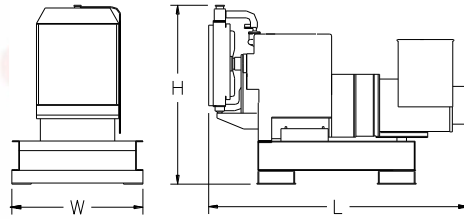
- **Heavy duty steel base**
- **Vibration isolators**
- **Oil drain valve with extension**
- **Battery rack**
- **Battery cables**
- **Water jacket heater**
- **Owners manual**
- **Electronic Isochronous Governor**

## 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
- Flexible Fuel Lines

## Weights and Dimensions

Overall Size, L x W x H, in.: 122 in. x 66 in. x 80 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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A small business owned by service a connected disabled veteran.

Cage 1U5V7 - TIN/EIN #943026355 - Duns #054590203



Made in the USA!



Model: 200 DF2 & DF2-3