SPECTRUM®

DETROIT DIESEL



Model: 1000DS-4

380-600 V

4 Cycle Diesel



Ratings Range

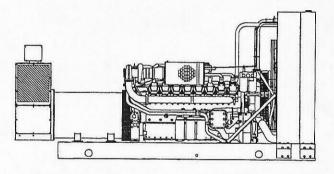
60 Hz

Standby:

kW

945-1020

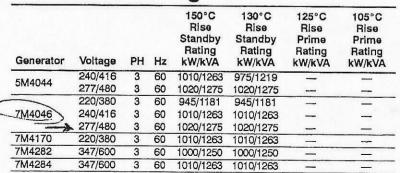
kVA 1181-1275



Standard Features

- Spectrum® product distributors provide one-source responsibility for the generating system and accessories.
- The generator set and components are prototype tested, factory built, and production
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Generator features:
 - Brushless, rotating-field generator has broadrange reconnectability.
 - Pilot-excited, permanent magnet generator (PMG) provides superior short-circuit capability.
- Other features:
 - o Controllers are available to meet all applications. See controller features
 - Low coolant level shutdown protects the generator set from overheating.
 - Electronic, isochronous governor provides precise frequency regulation.
 - Electronic engine controls and a generator microprocessor controller combine to make one of the most advanced control systems in today's generator market.

Generator Ratings



RATINGS: All three-phase units are rated at 0.8 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-3624/1, verification where the power ratings apply to installations where utility power is unavailable or one hour in twelve. Ratings are in accordance with ISO-3624/1, verification accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIS-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. NOTE: Inherent engine design and/or electronic engine controls prevent engine speed/generator set frequency conversion on this model. GENERAL GUIDELINES FOR DERATION: Attinué: Derate 1.5% per 305 m (1000 ft.) elevation above 1006 m (3300 ft.). Maximum attitude capability is 2288 m (7500 ft.) on 60 Hz. Temperature: Derate 0.4% per 5.5°C (10°F) temperature above 25°C (77°F). 5.5°C (10°F) temperature above 25°C (77°F). M5-165 (1000DS-4) 4/99a

Alternator Specifications

4-Pole, Rotating Field Type Exciter type Brushless Permanent Magnet Pilot Exciter Voltage regulator Solid State, Volts/Hz Insulation: NEMA MG1-1.66, Class H, Synthetic, Nonhygroscopic Temperature rise ... 130°C, 150°C Standby Bearing: number, type 1, Sealed Coupling Flexible Disc Amortisseur windings Full Rotor balancing 125% 60 Hz, 150% 50 Hz Voltage regulation, no load to full load (with <0.5% drift due to temp. variation) ±0.25% Unbalanced load capability 100% of rated standby current Peak motor starting kVA: (35% dip for voltages below) 480 V 5M4044 (4 bus bar) .. 3900 (60 Hz) 480 V 7M4046 (4 bus bar) ... 3900 (60 Hz) 380 V 7M4170 (4 bus bar) ... 2500 (60 Hz) 600 V 7M4282 (4 bus bar) .. 1850 (60 Hz)

7M4284 (4 bus bar) .. 3200 (60 Hz)

- Compliance with NEMA, IEEE, and ANSI standards for temperature rise.
- Transient performance meets the requirements of ISO 8528-5, Class G3.
- Sustained short-circuit current of up to 300% of rated current for up to 10 seconds.
- Sustained short-circuit capability enables downstream circuit breakers to trip without collapsing the generator field.
- Self-ventilation and drip-proof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine Electrical

Engine		
Engine Specifications	(60 Hz)	50 Hz
Manufacturer	Detroit Die	sel/MTU
Engine: model	16V2000 G81 R163-7K06	_
Engine: type	4-Cycle, Turl	bocharged
Cylinder head arrangement	16-V	
Displacement, L (cu. in.)	31.9 (1944)	
Bore and stroke, mm (in.)	130 (5.12) x 150 (5.91)	
Compression ratio	14.5:1	_
Piston speed, m/sec. (ft./min.)	9.0 (1772)	-
Main bearings: number, type	9, Precision Half Shells	
Rated rpm	1800	-
Max. power at rated rpm, kWm (BHP)	1115 (1495)	_
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Governor: type, make/model	DDEC Electronic Control	
Frequency regulation, no load to full load	Isochronous	
Frequency regulation, steady state	±0.25%	
Air cleaner type, all models	Dry	

Exhaust

600 V

Exhaust System	(60 Hz)	50 Hz
Exhaust flow at rated kW, m ³ /min. (cfm)	249 (8780)	_
Exhaust temperature at rated kW, dry exhaust, °C (°F)	546 (1015)	<u></u>
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)	_
Exhaust outlet size at engine hookup, mm (in.)	See ADV	drawing

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negat	ive
Volts (DC)	24	
Ampere rating	70	
Starter motor rated voltage (DC)	24	
Recommended battery cold cranking amps (CCA) rating	950 above 0°C (32°F) 1250 below 0°C (32°F)	
Quantity of batteries	2 above 0°C (32°F) 4 below 0°C (32°F)	
Battery voltage (DC)	12	
Fuel		
Fuel System	(60 Hz,	50 Hz
Fuel supply line, min. ID, mm (in.)	19 (0.	75)
Fuel return line, min. ID, mm (in.)	19 (0.75)	
Max. lift, engine-driven fuel pump, m (ft.)	2.1 (6.8)	
Max. fuel flow, Lph (gph)	1422 (376)	_
Max. fuel pump restriction with new/used filter, kPa (in. Hg)	20 (6)/4	1 (12)
Fuel filter	2, Primary/Secondary	
Recommended fuel	#2 Diesel	
Lubrication		
Lubricating System (60 Hz.)	50 Hz
Туре	Full Pressure	
Oil pan capacity, L (qts.)	96.5 (102)	
Oil pan capacity with filter, L (qts.)	107.9 (114)	

3, Cartridge

Water-Cooled

Oil filter: quantity, type

Oil cooler

Application Data

Cooling System \	60 Hz) 50 Hz
Ambient temperature °C (°F)	40 (104)	
Engine jacket water capacity, L (gal.)	76 (20)	-
Radiator system capacity, including engine, L (gal.)	261 (69)	_ (
Engine jacket water flow, Lpm (gpm)	1192 (315)	
Charge cooler water flow, Lpm (gpm)	432 (114)	
Heat rejected to cooling water at rated kW, dry exhaust kW (Btu/min.)	402 (22865)	
Heat rejected to charge cooling water at rated kW, dry exhaust kW (Btu/min.)	272 (15440)	_
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1372 (54)	-
Fan kWm (HP)	42 (56)	_
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)	
Remote Radiator System*	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet, mm (in.)	102 (4)	
Water outlet, mm (in.)	(2) 77 (3)	_
Intercooler inlet/outlet, mm (in.)	44.5 (1.75)	_
Static head allowable		

* Contact your local distributor for cooling system options and specifications based on your specific requirements.

149 (50)

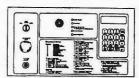
Operation Requirements

above engine, kPa (ft. H2O)

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m³/min. (scfm)†	1116 (39400)	
Cooling air required for genset when equipped with CWC or remote radiator, based on 14°C (25°F) rise and ambient temp. of 29°C (85°F), m³/min. (cfm)	682 (24100)	W
Combustion air, m3/min. (cfm)	87 (3075)	
Heat rejected to ambient air:		
Engine kW (Btu/min.)	132 (7490)	
Generator kW (Btu/min.)	84 (3050)	_
† Air density = 0.075 lbm/ft ³ or 1.20 kg/m ³	3	
Fuel Consumption	CO Un	E0.U-

(60 Hz)	50 Hz
Standby I	Rating
277.0 (73.2)	_
202.3 (53.4)	-
138.9 (36.7)	=
77.5 (20.5)	
	Standby I 277.0 (73.2) 202.3 (53.4) 138.9 (36.7)

Controllers



Available Controllers

Digital Controller

Audio/visual annuaciation with NFPA 110, Level 1 capability Programmable microprocessor logic with digital display Compatible with 12-volt or 24-volt engine electrical systems Remote start, prime power, remote annunciation, and remote communication capability

Microprocessor-Plus, 16-Light Controller

Audio/visual annunciation with NFPA 110, Level 1 capability Microprocessor logic with AC meters and engine gauges Compatible with 12-volt or 24-volt engine electrical systems Remote start, prime power, and remote annunciation capability

Microprocessor-Plus, 7-Light Controller

Audio/visual annunciation with NFPA 110, Level 2 capability Microprocessor logic with AC meters and engine gauges Compatible with 12-volt or 24-volt engine electrical systems Remote start, prime power, and remote annunciation capability

Engine Gauge Box Controller for Paralleling Switchgear Interfaces between generator set and switchgear for paralleling switchgear applications

Engine gauges with emergency stop switch

Compatible with 12-volt or 24-volt engine electrical systems

NOTE: See the respective controller spec sheet for additional controller features and accessories.

☐ Common Failure Relay Kit



SPECTRUM, N7650 County Trunk LS, Sheboygan, Wisconsin 53083 U.S.A. Phone 920-459-1877 Fax 920-459-1825 (U.S.A. Sales), Fax 920-459-1614 (International)

Additional Standard Features • Electronic, isochronous Governor • Old Drain Extension • Operation and Installation Liberature • Operation and Installation Liberature • Operation and Installation Liberature • Pillot-Excited Permanent Magnet Generator (PMG) Accessories Open Unit A Exhaust Silencer, Critical or Residential B Hookbe Exhaust Cornector, Stainless Steel Cooling System B Block Heater High Ambient Rediator B Remote Audio/Visual Alarm Panel Remote Panel Audior Duck Panel Remote Panel Panel Remote Panel Audior Duck Panel Remote Panel Panel Remote Panel Audior Duck Panel Remote Panel Audior Visual Alarm Panel Remote Panel Pan	Standard Features and Accessories		
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Oil Drain Extension Operation and Installation Literature Operation and Installation Literature Pilot-Excited Permanent Magnet Generator (FMG) Accessories Open Unit Exhaust Silonope, Critical or Residential Flexible Exhaust Silonope, Critical or Residential Flexible Exhaust Connector, Stainless Sisel Cooling System High Ambient Radiator Badiator Duct Flange Remote Radiator Cooling Fuel System Day Tanks Flexible Fuel Lines Fuel Filter High Ambient Radiator Battery Healther Battery Charger, Equalize/Float Type Battery Healther Battery Healther Battery Healther Battery Healther Battery Healther Battery Radiator On TM generators, 380-800 voit only) Generator Sitip Heater Unic Circuit Breaker (MEM kype 1 enclosure) Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure) NPPA 10 Literature Optional Generators Rated Power Ractor Testing Safeguard Breaker Spiring Isolators Parallaling System Load-sharing Module Reactive Deop Compensator Remote Speed Adjust Potentiometer/Electronic Governor Voltage Adjust Potentiometer (Electronic Gov	Electronic, Isochronous Governor		
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Pilot-Excited Permanent Magnet Generator (PMG) Accessories Open Unit Bitch Exhaust Connector, Stainless Steel Cooling System Day Tanks Accessories Open Unit Miscellaneous Accessories Open U		Dry Contact Kit (isolated alarm)	
Accessories Open Unit Description of Professional State of Profess	The state of the s	Engine Prealarm Sender Kit	
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□ Load-sharing Module □ Reactive Droop Compensator □ Remote Speed Adjust Potentiometer/Electronic Governor □ Voltage Adjust Potentiometer □ Voltage Regulator Relocation Kit Maintenance □ General Maintenance Literature Kit □ Maintenance Kit (includes air, oil, and fuel filters) □ Overhaul Literature Kit □ Production Literature Kit	Spring Isolators		
Reactive Droop Compensator NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. DISTRIBUTED BY: W	Paralleling System		
Remote Speed Adjust Potentiometer/Electronic Governor NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information. Voltage Regulator Relocation Kit DISTRIBUTED BY: Maintenance Maintenance Literature Kit Maintenance Literature Kit Maintenance Kit (includes air, oil, and fuel filters) DR FUEL TANK OR FUEL Production Literature Kit Production Literature Kit Production Literature Kit DR FUEL TANK OR FUEL Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production Literature Kit Production L	☐ Load-sharing Module		
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☐ Maintenance Kit (includes air, oil, and fuel filters) ☐ Overhaul Literature Kit ☐ Production Literature Kit	☑ General Maintenance Literature Kit		
☐ Overhaul Literature Kit ☐ Production Literature Kit ☐ P			
☐ Production Literature Kit		DR FUEL TANK OR FUEL	
	Controller (Digital and Microprocessor-Plus)		

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