SPECTRUM®

DETROIT DIESEL

Model: 1250DS-4

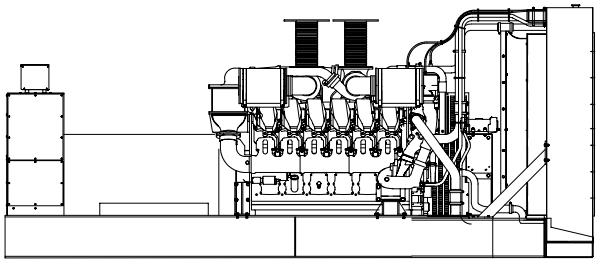
4 Cycle Diesel

380–4160 V

ISO 9001 INTERNATIONALLY REGISTERED SPECTRUM®

Ratings Range

		60 Hz	50 Hz
Standby:	**kW**	945–1250	976–1100
	kVA	1181–1563	1220–1375
Prime:	**kW**	860–1140	884–1000
	kVA	1075–1425	1105–1250



Standard Features

- Your Spectrum® product distributor provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- A UL-2200 listing is available on the 60 Hz generator set.
- At 60 Hz the generator set accepts rated load in one step.
- The generator set complies with ISO 8528-5, Class G3 requirements for transient performance.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA).
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Generator features:
  - The brushless, rotating-field generator has broadrange reconnectability.
  - The pilot-excited, permanent-magnet generator (PMG) provides superior short-circuit capability.
- Other features:
  - Controllers are available for all applications. See controller features inside.
  - The generator set-to-skid mounting options are either integral vibration isolation or direct mounting with spring isolators.
  - Electronic engine controls manage the engine.

Generator Ratings

				150°C Rise Standby Rating		130°C Rise Standby Rating		125°C Rise Prime Rating		105°C Rise Prime Rating	
Generator	**Voltage**	**Ph**	**Hz**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**	**kW/kVA**	**Amps**
7M4046	220/380	3	60	945/1181	1795	945/1181	1795	860/1075	1633	860/1075	1633
	240/416	3	60	1180/1475	2047	1110/1388	1926	1070/1338	1856	1010/1263	1752
	277/480	3	60	1250/1563	1879	1220/1525	1834	1140/1425	1714	1110/1388	1669
	220/380	3	50	1040/1300	1975	976/1220	1854	944/1180	1793	888/1110	1686
	230/400	3	50	1068/1335	1927	1000/1250	1804	968/1210	1746	912/1140	1645
	240/416	3	50	1020/1275	1770	976/1220	1693	928/1160	1610	884/1105	1534
7M4048	220/380	3	60	1030/1288	1956	1030/1288	1956	940/1175	1785	940/1175	1785
	240/416	3	60	1210/1513	2099	1180/1475	2047	1100/1375	1908	1070/1338	1856
	277/480	3	60	1250/1563	1879	1250/1563	1879	1140/1425	1714	1140/1425	1714
	220/380	3	50	1068/1335	2028	1008/1260	1914	968/1210	1838	912/1140	1732
	230/400	3	50	1088/1360	1963	1028/1285	1855	992/1240	1790	936/1170	1689
	240/416	3	50	1040/1300	1804	976/1220	1693	944/1180	1638	888/1110	1541
7M4050	220/380	3	60	1160/1450	2203	1160/1450	2203	1050/1313	1994	1050/1313	1994
	240/416	3	60	1250/1563	2169	1250/1563	2169	1140/1425	1978	1140/1425	1978
	277/480	3	60	1250/1563	1879	1250/1563	1879	1140/1425	1714	1140/1425	1714
	220/380	3	50	1100/1375	2089	1100/1375	2089	1000/1250	1899	1000/1250	1899
	230/400	3	50	1100/1375	1985	1100/1375	1985	1000/1250	1804	1000/1250	1804
	240/416	3	50	1100/1375	1908	1100/1375	1908	1000/1250	1735	1000/1250	1735
7M4052	220/380	3	60	1250/1563	2374	1250/1563	2374	1140/1425	2165	1140/1425	2165
	240/416	3	60	1250/1563	2169	1250/1563	2169	1140/1425	1978	1140/1425	1978
	277/480	3	60	1250/1563	1879	1250/1563	1879	1140/1425	1714	1140/1425	1714
	220/380	3	50	1100/1375	2089	1100/1375	2089	1000/1250	1899	1000/1250	1899
	230/400	3	50	1100/1375	1985	1100/1375	1985	1000/1250	1804	1000/1250	1804
	240/416	3	50	1100/1375	1908	1100/1375	1908	1000/1250	1735	1000/1250	1735
7M4172	220/380	3	60	1250/1563	2374	1250/1563	2374	1140/1425	2165	1140/1425	2165
7M4174	220/380	3	60	1250/1563	2374	1250/1563	2374	1140/1425	2165	1140/1425	2165
7M4288	347/600	3	60	1250/1563	1504	1250/1563	1504	1140/1425	1371	1140/1425	1371
7M4366	2400/4160	3	60	1250/1563	217	1250/1563	217	1140/1425	198	1140/1425	198
	1905/3300	3	50	1100/1375	241	1100/1375	241	1000/1250	219	1000/1250	219
7M4368	2400/4160	3	60	1250/1563	217	1250/1563	217	1140/1425	198	1140/1425	198
	1905/3300	3	50	1100/1375	241	1100/1375	241	1000/1250	219	1000/1250	219

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-8528/1, overload power in 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. GENERAL GUIDELINES FOR DERATION: *ALTITUDE:* Derate 1.5% per 305 m (1000 ft.) elevation above 1006 m (3300 ft.). Maximum altitude capability is 4572 m (15000 ft.) on 60 Hz and 6096 m (20000 ft.) on 50 Hz. *TEMPERATURE:* Derate 0.4% per 5.5°C (10°F) temperature above 25°C (77°F).

Alternator Specifications

Specifications		Generator
Type		4-Pole, Rotating Field
Exciter type		Brushless, Permanent-Magnet Pilot Exciter
Voltage regulator		Solid State, Volts/Hz
Insulation:		NEMA MG1
Material		Class H, Synthetic, Nonhygroscopic
Temperature rise		130°C, 150°C Standby
Bearing: quantity, 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
One-step load acceptance at 60 Hz		100% of Rating
Peak motor starting kVA:		(35% dip for voltages below)
480 V, 416 V	7M4046 (4 bus bar)	3900 (60 Hz), 3000 (50 Hz)
480 V, 416 V	7M4048 (4 bus bar)	3700 (60 Hz), 2500 (50 Hz)
480 V, 416 V	7M4050 (4 bus bar)	4500 (60 Hz), 3600 (50 Hz)
480 V, 416 V	7M4052 (4 bus bar)	5500 (60 Hz), 4700 (50 Hz)
380 V	7M4172 (4 bus bar)	2600 (60 Hz)
380 V	7M4174 (4 bus bar)	4200 (60 Hz)
600 V	7M4288 (4 bus bar)	5400 (60 Hz)
4160 V, 3300 V	7M4366 (6 lead)	3900 (60 Hz), 2450 (50 Hz)
4160 V, 3300 V	7M4368 (6 lead)	4900 (60 Hz), 2900 (50 Hz)

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the generator field.
- Self-ventilated and dripproof 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

Engine Specifications	60 Hz	50 Hz
Manufacturer	Detroit Diesel/MTU	
Engine: model	12V4000 (T123-7K36)	12V4000 (T123-7K16)
Engine: type	4-Cycle, Turbocharged, Intercooled	
Cylinder arrangement	12V	
Displacement, L (cu. in.)	49 (2975)	
Bore and stroke, mm (in.)	165 (6.5) x 190 (7.5)	
Compression ratio	13.7:1	
Piston speed, m/sec. (ft./min.)	11.4 (2244)	9.5 (1870)
Main bearings: quantity, type	—	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	1380 (1850)	1205 (1615)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve (exhaust) material	High Alloy Steel	
Governor: type, make/model	DDEC Electronic Control	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.25%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, m^3/min. (cfm)	288 (10160)	218 (7710)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	402 (755)	500 (932)
Maximum allowable back pressure, kPa (in. Hg)	5.1 (1.5)	
Exhaust outlet size at engine hookup, mm (in.)	2 @ 254 (10)	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	24	
Ampere rating	70	
Starter motor rated voltage (DC)	Dual, 24	
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating above 0°C (32°F)	4, 950	
Qty., CCA rating below 0°C (32°F)	8, 1250	
Battery voltage (DC)	12	

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, mm (in.)	25 (1.0)	
Fuel return line, min. ID, mm (in.)	19 (0.75)	
Max. lift, engine-driven fuel pump, m (ft.)	—	
Max. fuel flow, Lph (gph)	870 (230)	792 (209)
Max. fuel pump restriction with new/used filter, kPa (in. Hg)	20 (6)/41 (12)	
Fuel filter	2, Secondary	
Recommended fuel	#2 Diesel	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	200 (211)	
Oil pan capacity with filter, L (qt.)	220 (232)	
Oil filter: quantity, type	4, Spin-On	
Oil cooler	Water-Cooled	

Application Data

Cooling (Standard Radiator)

Cooling System	60 Hz	50 Hz
Ambient temperature, °C (°F)	45 (113)	50 (122)
Engine jacket water capacity, L (gal.)	123 (32.5)	
Radiator system capacity, including engine, L (gal.)	447 (118)	
Engine jacket water flow, Lpm (gpm)	1416 (374)	1060 (280)
Charge cooler water flow, Lpm (gpm)	568 (150)	606 (160)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	472 (26850)	529 (30090)
Heat rejected to charge cooling water at rated kW, dry exhaust, and at innercooler coolant inlet temperature <57°C (135°F), kW (Btu/min.)	361 (20550)	241 (13718)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1626 (64)	
Fan, kWm (HP)	48 (65)	40 (53)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H_2O)	0.125 (0.5)	

Cooling (Optional Systems)

Remote Radiator System*	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:	Class 150 ANSI Flange	
Water inlet, mm (in.)	191 (7.5) Bolt Circle	
Water outlet, mm (in.)	191 (7.5) Bolt Circle	
Intercooler inlet/outlet, mm (in.)	152 (6.0) Bolt Circle	
Static head allowable above engine, kPa (ft. H_2O)	149 (50)	
City Water Cooling (CWC) System	**60 Hz**	**50 Hz**
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet, mm (in.)	*	
Water outlet, mm (in.)	*	

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

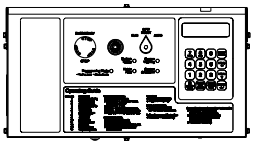
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m^3/min. (scfm)†	1500 (53000)	1440 (50900)
Cooling air required for gen. set when equipped with CWC or remote radiator, based on 14°C (25°F) rise and ambient temp. of 29°C (85°F), m^3/min. (cfm)	475 (16800)	408 (14400)
Combustion air, m^3/min. (cfm)	124 (4380)	85 (3000)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	49 (2775)	43 (2423)
Generator, kW (Btu/min.)	80 (4540)	67 (3840)

† Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption	60 Hz	50 Hz
Diesel, Lph (gph) at % load	Standby Rating	
100%	319.8 (84.4)	279.0 (73.5)
75%	240.0 (63.4)	208.8 (55.1)
50%	165.4 (43.7)	143.4 (37.9)
25%	95.8 (25.3)	75.6 (20.0)
Diesel, Lph (gph) at % load	Prime Rating	
100%	290.3 (76.7)	245.4 (64.9)
75%	219.6 (58.0)	187.8 (49.7)
50%	152.6 (40.3)	132.0 (34.9)
25%	89.7 (23.7)	73.8 (19.5)

Controllers



Available Controllers

Digital 550 Controller
Audiovisual annunciation with NFPA 110 Level 1 capability.
Programmable microprocessor logic and digital display features.
Safeguard circuit protection standard.
12- or 24-volt engine electrical system capability.
Remote start, remote annunciation, and remote communication options.
Refer to M6-46 for additional controller features and accessories.

Microprocessor-Plus, 16-Light Controller
Audiovisual annunciation with NFPA 110 Level 1 capability.
Microprocessor logic, AC meters, and engine gauge features.
12- or 24-volt engine electrical system capability.
Remote start, prime power, and remote annunciation options.
Refer to M6-30 for additional controller features and accessories.

Microprocessor-Plus, 7-Light Controller
Audiovisual annunciation with NFPA 110 Level 2 capability.
Microprocessor logic, AC meters, and engine gauge features.
12- or 24-volt engine electrical system capability.
Remote start, prime power, and remote annunciation options.
Refer to M6-30 for additional controller features and accessories.

Engine Gauge Box for Paralleling Switchgear
Generator set-to-switchgear interface for paralleling switchgear applications.
Engine gauges and emergency stop switch features.
12- or 24-volt engine electrical system capability.
Refer to M6-32 for additional controller features and accessories.

SPECTRUM, N7650 County Trunk LS, Sheboygan, Wisconsin 53083 U.S.A.
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Standard Features and Accessories

Additional Standard Features

- Alternator Protection (standard with Digital 550)
- Oil Drain Extension
- Operation and Installation Literature
- Pilot-Excited, Permanent-Magnet Generator (PMG)

Accessories

Open Unit

- ❑ Exhaust Silencer, Critical
  60 Hz kits: PA-361600-SD, PA-361617-SD
  50 Hz kits: PA-361600-SD, PA-361618-SD
- ❑ Exhaust Silencer, Hospital
  60 Hz kits: PA-361602-SD, PA-361619-SD
  50 Hz kits: PA-361603-SD, PA-361620-SD
- ❑ Exhaust Silencer, Industrial
  60 Hz kits: PA-361606-SD, PA-361623-SD
  50 Hz kits: PA-361606-SD, PA-361624-SD
- ❑ Exhaust Silencer, Residential
  60 Hz kits: PA-361604-SD, PA-361621-SD
  50 Hz kits: PA-361604-SD, PA-361622-SD
- ❑ Flexible Exhaust Connector, Stainless Steel

Cooling System

- ❑ Block Heater
- ❑ City Water Cooling
- ❑ Radiator Duct Flange
- ❑ Remote Radiator Cooling

Fuel System

- ❑ Day Tanks
- ❑ Flexible Fuel Lines
- ❑ Fuel Filter
- ❑ Fuel Pressure Gauge

Electrical System

- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Heater
- ❑ Battery Rack and Cables

Engine and Generator

- ❑ Air Cleaner, Heavy Duty
- ❑ Air Cleaner Restriction Indicator
- ❑ Bus Bar Kits (standard on 7M generators, 380–600 volt only)
- ❑ Generator Strip Heater
- ❑ Line Circuit Breaker (NEMA type 1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)
- ❑ NFPA 110 Literature
- ❑ Optional Generators
- ❑ Rated Power Factor Testing
- ❑ Safeguard Breaker (not available with Digital 550)
- ❑ Integral Vibration Isolation Mounting
- ❑ Direct Mounting
- ❑ Spring Isolators

Paralleling System

- ❑ Load-Sharing Module
- ❑ Reactive Droop Compensator
- ❑ Remote Speed Adjust Potentiometer/Electronic Governor
- ❑ Voltage Adjust Potentiometer
- ❑ Voltage Regulator Relocation Kit

Maintenance

- ❑ General Maintenance Literature Kit
- ❑ Overhaul Literature Kit

Controller (Digital 550 and Microprocessor-Plus)

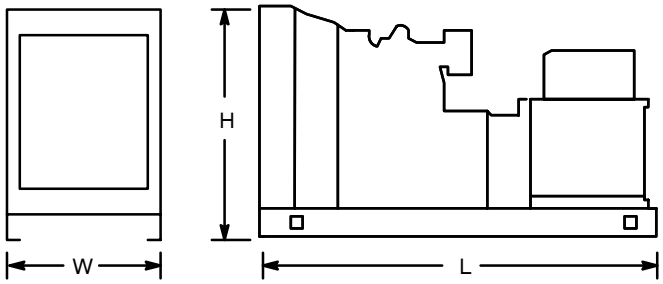
- ❑ Common Failure Relay Kit
- ❑ Communication Products and PC Software
  (Digital 550 controller only)
- ❑ Controller Cable, 12 m (40 ft.)
- ❑ Customer Connection Kit
- ❑ Dry Contact Kit (isolated alarm)
- ❑ Engine Prealarm Sender Kit
- ❑ Prime Power Switch
- ❑ Remote Annunciator Panel
- ❑ Remote Audiovisual Alarm Panel
- ❑ Remote Emergency Stop Kit
- ❑ Run Relay Kit

Miscellaneous Accessories

- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

Weights and Dimensions

Overall Size, L x W x H, mm (in.):	5644 x 2232 x 2433 (222.19 x 87.88 x 95.77)
Weight (radiator model), wet, kg (lb.):	13380 (29500)



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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