SPECTRUM™

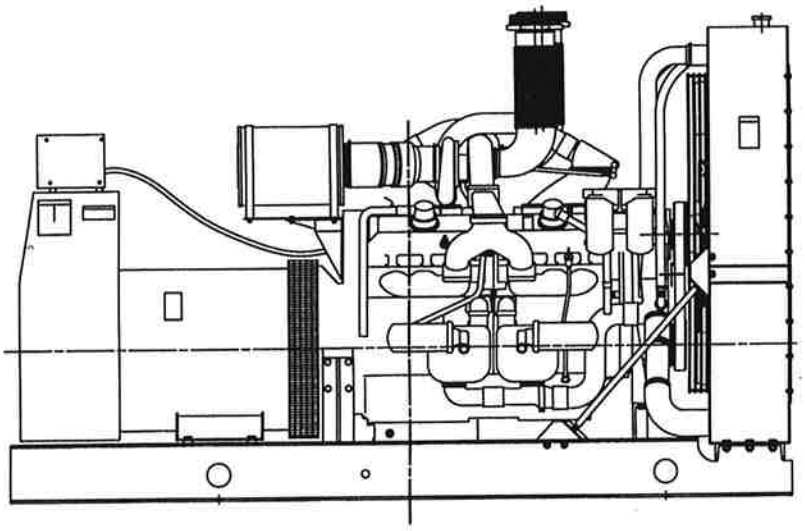
DETROIT DIESEL

Model: 500DS

Diesel

Standard Features:

- Instant Response to Load Changes
- Sustained Short Circuit Capability
- Superior Motor Starting
- Low Coolant Shutdown
- Radio Suppression to Commercial Standards
- 105°F (40°C) Ambient Radiator



Generator Ratings

Model Series	Voltage Code	Voltage	Standby Amps.	Phase	Hz	Generator 130°C Rise Rating	Generator 150°C Rise Rating	Standby kW/kVA	Prime kW/kVA
500DS60	51	139/240	1504	3	60	5M4027	5M4024	500/625	455/569
500DS60	51	127/220	1640	3	60	5M4027	5M4027	500/625	455/569
500DS60	71	227/480	752	3	60	5M4027	5M4024	500/625	455/569
500DS60	71	220/380	950	3	60	5M4162	5M4162	500/625	455/569
500DS60	71	240/416	867	3	60	5M4028	5M4027	500/625	455/569
500DS60	81	120/208	1735	3	60	5M4028	5M4027	500/625	455/569
500DS60	91	347/600	601	3	60	5M4270	5M4270	500/625	455/569
500DS50	51	110/190	1709	3	50	5M4028	5M4028	450/562	410/513
500DS50	71	220/380	855	3	50	5M4028	5M4028	450/562	410/513
500DS50	71	231/400	812	3	50	5M4028	5M4028	450/562	410/513
500DS50	71	240/416	781	3	50	5M4030	5M4028	450/562	410/513
500DS50	81	120/208	1561	3	50	5M4030	5M4028	450/562	410/513

* For other ratings, refer to Technical Bulletin #26.

RATINGS: Standby ratings are continuous for the duration of any power outage. No overload capacity is specified at this rating. Prime ratings are continuous per BS 5514, DIN 6271, ISO-3046, and IEC 34-1 with 10% overload capacity one hour in twelve hours. All single-phase units are rated at 1.0 power factor. All 3-phase units are rated at 0.8 power factor. Contact the factory for ratings of city water-cooled and remote radiator models. Larger generators may be used to meet special application requirements. Availability is subject to change without notice. The manufacturer of Spectrum™ products reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Availability can be determined by contacting your local Spectrum™ products Distributor. DERATION: Maximum altitude before generator deration, ft. (m): 3300 (1007). Altitude deration factor,% per 1000 ft. (305 m): 1.5%. Maximum intake air temperature before generator deration, °F (°C): 105 (40). Temperature deration factor, % per 10°F (5.5°C): 2.7%.

Alternator Specifications

Type	4-Pole, Rotating Field
Exciter type	Brushless Permanent Magnet Pilot Exciter
Voltage regulator	Solid State, Volts/Hz
Insulation: NEMA MG1-1.66,	
Material	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% (60Hz) 150% (50Hz)
Voltage regulation, no load to full load	± 0.5%
One-step load acceptance per NFPA-110	100% of rating
Peak motor starting kVA:	
5M4024 (10 lead)	1350 (60Hz), 1000 (50Hz)
5M4027 (12 lead)	1550 (60Hz), 1250 (50Hz)
5M4028 (10 lead)	1800 (60Hz), 1450 (50Hz)

- Alternator is built within NEMA, IEEE, and ANSI standards for temperature rise.
- Shielded ball bearing B-10 life is 40,000 hours.
- Uses skewed rotor for smooth voltage wave form.
- Alternator is self-ventilated by a cast iron fan.
- Generator test performed in accordance with MIL-STD 705B.
- Sustains short circuit current at 300% of rated current for up to 10 seconds.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Detroit Diesel	
Engine, Model, Type	12V-92TA,(8123-7405) 2-Cycle, Turbocharged, Aftercooled	
Cylinder head arrangement	12-V	
Displacement, cu. in. (cc)	1104 (18091)	
Bore and stroke, in. (mm)	4.84 (123) x 5.00 (127)	
Compression ratio	15.0:1	
Piston speed, ft/min. (m/sec.)	1500 (7.6)	1250 (6.3)
Main bearings: number, type	8, Precision Half Shells	
Rated rpm	1800	1500
Max. power at rated rpm, hp (kW)	830 (619)	700 (522)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve (exhaust) material	Cast Eatonite	
Governor, type, make/model	Electronic, Barber-Colman, Dyna 8000	
Frequency regulation, no load to full load	Isochronous	
Frequency regulation, steady state	± 0.25%	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, cfm (m^3/min.)	5080 (144)	4360 (123)
Exhaust temperature at rated kW, dry exhaust, °F (°C)	760 (404)	740 (393)
Maximum allowable back pressure, in. Hg (kPa)	2.0 (6.8)	1.4 (4.7)
Exhaust outlet size at hookup, in. (mm)	Dual, 8 (202)	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	24	
Ampere rating	65	
Starter motor rated voltage (DC)	24	
Minimum recommended battery cold cranking Amps. (CCA) rating for 0°F	630	
Quantity of batteries	4	
Battery Voltage (DC)	12	
Rolling current at 32°F	1170	

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, in. (mm)	0.75 (19)	
Fuel return line, min. ID, in. (mm)	0.75 (19)	
Max. lift, engine-driven fuel pump, ft. (m)	10 (3)	
Max. fuel flow, gph (Lph)	138 (522)	125 (473)
Fuel prime pump	N/A	
Fuel filter	2, Primary/Secondary	
Recommended fuel	#2 Diesel	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, qts. (L)	36 (34)	
Oil pan capacity with filter , qts. (L)	38 (36.1)	
Oil filter, quantity, type	2, Full Flow/Bypass	
Oil cooler	Water-Cooled	

Application Data

Cooling (Standard Radiator)

Cooling System	60 Hz	50 Hz
Ambient temperature °F °C	105 (40)	
Engine jacket water capacity, gal. (L)	12.75 (48)	
Radiator system capacity, including engine, gal. (L)	33.75 (128)	
Engine jacket water flow, gpm (Lpm)	232 (878)	189 (715)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	23625	19845
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	52 (1321)	
Fan hp (kW)	39 (29)	23 (17)
Maximum air restriction on discharge side of radiator, in. H_2O (in. Hg)	0.5 (0.037)	

Cooling (Optional Systems)

High Ambient Radiator System	60 Hz	50 Hz
Ambient temperature °F °C	125 (52)	
Engine jacket water capacity, gal. (L)	12.75 (48)	
Radiator system capacity, including engine, gal. (L)	-	
Engine jacket water flow, gpm (Lpm)	232 (878)	189 (715)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	23625	19845
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	-	
Fan hp (kW)	-	-
Maximum air restriction on discharge side of radiator, in. H_2O (in. Hg)	0.5 (0.037)	

Remote Radiator System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet, in. (mm)	4 (102) ID Hose	
Water outlet, in. (mm)	3 (76) OD Hose	
Remote radiator:		
Make	Modine	
Model	M20VR10	M30VR10
Mounting	Vertical	
Discharge	Horizontal	
Fan motor: phase, hp (kW)	3, 10 (7.5)	
Radiator capacity, gal. (L)	21 (79.5)	28.5 (107.9)
Static head allowable above engine, ft. (m)	50 (15.25)	
Tank top (inlet), in.	4 NPT	
Bottom tank (outlet), in.	4 NPT	
Dry weight, lb. (kg)	-	-

City Water Cooling System	60 Hz	50 Hz
Exhaust manifold type	Engineered Special	
System capacity, gal. (L)	Engineered Special	
City water consumption*, gpm (Lpm) at 50°F (10°C)	Engineered Special	
Connection sizes*:		
Water inlet, in.	Engineered Special	
Water outlet, in.	Engineered Special	

* Connection sizes and capacity are based on Modine C-820-438 heat exchanger with pipe threaded water connections, thermostatically controlled water saver valve, electric solenoid valve, and surge tank.

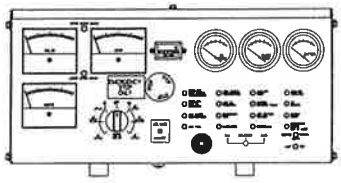
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, cfm (m^3/min.)	28996 (820)	23540 (666)
City water-cooled remote radiator cooling air, 25°F (14°C) rise, cfm (m^3/min.)	16900 (479)	
Combustion air, cfm (m^3/min.)	2235 (63)	1950 (55)
Heat rejected to ambient air:		
Engine BTU/min.	4100	
Generator BTU/min.	2475	1851

Fuel Consumption	60 Hz	50 Hz
Diesel, gph (Lph) at % load		
100%	41.0(155.2)	30.7(116.2)
75%	30.7(116.2)	22.9 (86.7)
50%	22.6 (85.5)	17.5 (66.2)
25%	14.7 (55.6)	10.1 (38.2)

Controllers

Standard Microprocessor Controller



Standard Controller Features:

- Type: 16-Light Microprocessor (NFPA-110, level 1)
- Power Source, with circuit protection: 24-Volt DC
- Size (HxWxD), in. (cm): 9 (22.9) x 17.8 (45.1) x 11.5 (29.2)
- Weight, lb. (kg): 19 (8.6)
- AC meters, 3.5 in. (89mm) 2% full scale accuracy (Volts, Amps., Frequency)
- Meter phase selector switch
- DC meters, 2 in.(51mm), 2% full scale accuracy (Volts, Engine, Water Temperature, Oil Pressure)
- Running time meter
- Alarm horn and silencing switch per NFPA-110
- Lamp test switch
- Local Emergency Stop button
- Front-mounted voltage adjusting rheostat
- Panel lamps (2)
- Cyclic cranking per NFPA-110
- Engine cooldown timer, 5-minute
- System Ready lamp (green)
- Not In Auto lamp (red)
- High Engine Temperature safety shutdown and lamp (red)
- Low Oil Pressure safety shutdown and lamp (red)
- Overspeed safety shutdown and lamp (red)
- Overcrank safety shutdown and lamp (red)
- Air Damper lamp (red)
- Auxiliary safety shutdown lamp (red)
- Emergency stop lamp (red) *
- Auxiliary Prealarm lamp (yellow) *
- Low Fuel lamp (red) *
- Battery Charger Fault lamp (red) *
- Low Battery Volts lamp (red) *
- Run Off/Reset Auto switch (engine start), Local/Remote two-wire

* Requires external sender.

Optional Controllers:

- Manual Controller
- Engine Gauge Box for Paralleling Controller
- 6-Light Controller (NFPA-110, level 2)
- Oversized Meter Box Controller

(For Optional Controller features, see controller spec sheet.)

SPECTRUM™
DETROIT DIESEL

SPECTRUM, N7650 COUNTY TRUNK LS, SHEBOYGAN, WISCONSIN 53083 U.S.A.
PHONE 414-565-3381, TELEX 26888
FAX 414-459-1646 (North America Sales), 414-459-1614 (International)

Accessories

Open Unit

- ○ Flexible Exhaust Connector, Stainless Steel
- ○ Exhaust Silencer, Critical or Residential

Cooling System

- ○ High Ambient Radiator
- ○ Remote Radiator Cooling
- ○ City Water Cooling
- ○ Block Heater
- ○ Radiator Duct Flange

Fuel System

- ○ Day Tanks
- ○ Flexible Fuel Lines
- ○ Subbase Fuel Tanks
- ○ Auxiliary Fuel Pump
- ○ Fuel Pressure Gauge

Electrical System

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

Engine and Generator

- ○ Air Cleaner, Heavy Duty
- ○ Oil Drain Kit
- ○ Air Cleaner Restriction Indicator
- ○ Safeguard Breaker
- ○ Line Circuit Breaker
- ○ Line Circuit Breaker with Shunt Trip
- ○ Generator Strip Heater
- ○ CSA Approval
- ○ Bus Bar Kits
- ○ Optional Generators
- ○ 1% Voltage Regulation
- ○ Rated Power Factor Testing
- ○ NFPA-110 Literature
- ○ Spring Isolators

Paralleling System

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

Maintenance

- ○ Overhaul Literature Kit
- ○ General Maintenance Literature Kit

Controller

- ○ Run Relay Kit
- ○ Tachometer Kit/Oversize Meterbox
- ○ Wattmeter Kit/Oversize Meterbox
- ○ Common Failure Relay Kit
- ○ Remote Annunciator Panel
- ○ FASTCHECK® Diagnostic Fault Detector
- ○ Extension Wiring Harness for Remote Mounting of Controller
- ○ Isolated Alarm Contact Kit
- ○ Overvoltage Protection
- ○ Remote Emergency Stop Kit
- ○ Remote Audio-Visual Alarm Panel
- ○ Pre-High Engine Temperature Sender and Lamp (yellow)/NFPA-110
- ○ Pre-Low Oil Pressure Sender and Lamp (yellow)/NFPA-110
- ○ Low Water Temperature Sender and Lamp (red)/NFPA-110

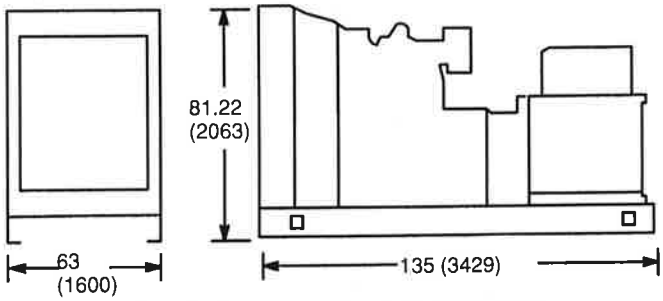
Miscellaneous Accessories

- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____
- ○ _____

WEIGHTS AND DIMENSIONS

Overall Size, L x W x H, in. (mm): 135 x 63 x 81.22 (3429 x 1600 x 2063)

Weight (Radiator Model), wet lb. (kg): 9069 (4115)



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

DISTRIBUTED BY:

recycled paper