

# Model 780 RD 780 kW Diesel Generator Set

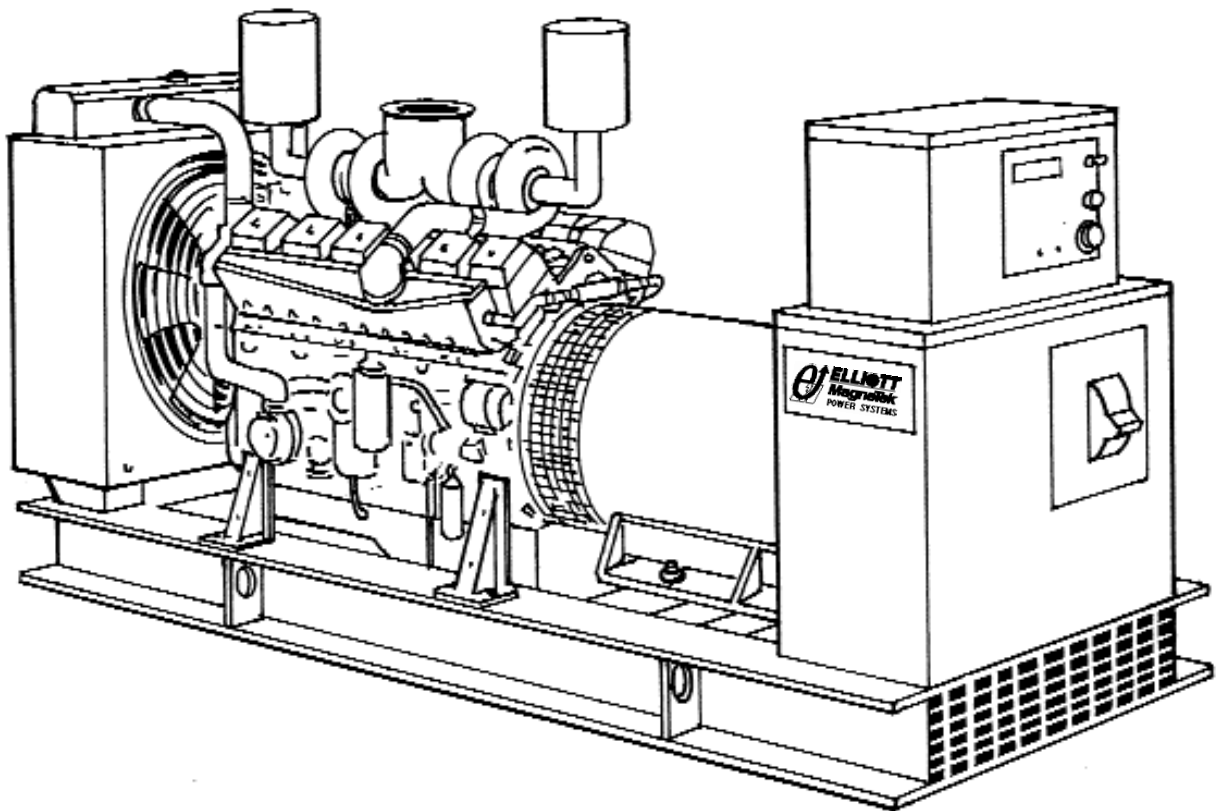
## Generator Set Rating

Three Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	780/975	690/863
Prime Power 105°C	695/869	625/781
Single Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	482/482	536/536
Prime Power 105°C	415/415	456/456

## Quality Power Producing Equipment

is our business at Elliott MagneTek Power Systems, Inc.. Our power systems offer solutions to requirements for reliable, quality electrical power.

- 100% full load tested.
- Performance supported by prototype testing.
- 12 lead re-connectable AC synchronous generators.
- Solid state automatic voltage regulator.
- 50 or 60 Hz operational.
- Standard Digital Control Panel meeting standards set by NFPA-110.



## Product Features

### System Reliability and Longevity

begin with design experience and integrity. EMPS was formed by two companies with over one hundred years experience producing state-of-the-art power generation equipment. This experience is designed into our generator sets.

### Single Source Responsibility:

Product service, support and parts available through EMPS network of distributors.

### Accessories and Flexibility

are designed into EMPS' generator sets at the factory level to meet specific application needs.

### Organizational Commitment

to innovative, leading edge technology and environmentally friendly electrical products and services.

# Generator Set Design Features

## Model 780 RD 780 kW Diesel Generator Set

### Standard Equipment

- \* 4 Cycle engine.
- \* AC synchronous 12 lead re-connectable brushless alternator.
- \* Structural "C" channel base.
- \* Generator mounted terminal and meter /control box.
- \* Circuit breaker-mounting provisions.
- \* Connection area for main AC terminals and all control wiring
- \* 24 volt DC engine electrical system.
- \* 24 volt starter motor.
- \* Battery charging alternator.
- \* Battery rack and cables.
- \* Flexible fuel lines.
- \* Most metallic parts incorporate our powder paint primer base coat with UV inhibitive enamel top coat.
- \* Single stage dry type air cleaner.
- \* Corrosion resistant hardware.
- \* Oil drain extension plumbed to base rail for convenient connection.
- \* Microprocessor based auto start meter/ control panel.
- \* Digital read out control system rated to operate from -30° C to 75° C with the following standard displays, shown continuously:
  - \*\* Generator AC voltage
  - \*\* AC amperage:
    - Phase 1-2
    - Phase 2-3
    - Phase 3-1
  - \*\* Frequency
  - \*\* Oil Pressure
  - \*\* Engine Temperature
  - \*\* Battery Voltage
  - \*\* Fuel Level (Diesel Only)
- \* The following can be displayed using the scroll lock function:
  - \*\* Run time
  - \*\* Safety set point for over speed
  - \*\* Over crank
  - \*\* High water temperature
  - \*\* Low oil pressure
- \* Voltage adjust rheostat
- \* Auto/ off /run switch

### Generator Specifications

**Manufacturer:** MagneTek

**Insulation:** The main stator, main rotor, exciter stator and exciter rotor are all insulated with Class H materials and rated Class F per NEMA MG1 -1.65 and 852757 definition. All materials are non-hygroscopic to prevent fungus growth. A polyester and epoxy combination offers maximum environmental protection.

**Main Stator:** Designed to minimize voltage harmonics and meets telephone influence factor (TIF) per NEMA MG1-22.43. Twelve lead re-connectable design. Coated with anti-abrasive sealer.

**Main Rotor:** Four pole single piece lamination with full amortisseur windings and coil supports. Winding is precision wet layer wound with epoxy resin and dynamically balanced to two mil in two planes. Production over speed tested at 125% for 15 minutes. All materials are non-hygroscopic to prevent fungus growth.

**Exciter:** Brushless, three phase, six-pole rotor, and production over speed tested at 125% operating speed.

**Rotating Diode:** Sealed full wave with metal oxide surge suppressor

**Bearing:** Double-sealed, permanently lubricated, 50,000 hour B-10 life including magnetic pull.

**Drive Coupling:** Positive alignment, flexible drive discs.

### Automatic Voltage Regulator Specifications

**Operation:** Volts per hertz, three phase sensing with overload and loss of sensing protection.

**Construction:** Solid state, modular: fully sealed and potted design provides component protection from corrosive environments and vibration.

**Voltage Regulation:** +/- 1% voltage regulation no load to full rated load: +/- 1/2% voltage regulation at steady state conditions.

**Radio Interference (RFI):** Integral filter provides suppression of conducted electromagnetic interference to levels meeting most commercial requirements.

### Voltage Selections and Full Load Amperages at Standby Rating

Three Phase

60 Hz Amperage	50 Hz Amperage
120/208 2706	110/190 2621
120/240 2345	120/208 2393
277/480 1173	230/400 1245
347/600 938	240/415 1200

\*Single Phase

60 Hz Amperage	50 Hz Amperage
120/240 2008	110/220 2436

All voltages listed are available and/or re-connectable with the exception of the three phase, 60 Hz, 347/600 volt generator which is application specific. For other voltages, contact your EMPS distributor. All output amperage ratings listed above are at standby rating.

\*Single Phase amperage based on standard generator and unity power factor.

### Application and Performance Data

MagneTek Alternator Model MTG55 Opt. is standard with this package. Larger generators may be required to meet certain application specific requirements such as Single Phase, Motor Starting and Non Linear Loads. The Maximum Generator rating available in this package is MTG81.

# Technical Specifications

## Model 780 RD 780 kW Diesel Generator Set

### Engine Specifications

Manufacturer	Mitsubishi	
Model	S12A2-PTA	
Type	In line 4 Stroke	
Aspiration Turbo/ Water to Air After cooled		
Cylinders	60° V12	
Displacement	2070 In <sup>3</sup> . (33.93L)	
Bore and Stroke,	5.91 in x 6.30 in. (150 mm x 160 mm)	
Compression Ratio	14.5:1	
Minimum C.C.A. at 5°C	300 Ah	
RPM	<b>1800 rpm</b>	<b>1500 rpm</b>
BHP Minimum REQ'D at Rated kW	1100	970
BMEP	233 psi	247 psi

### Generator Set Deration

#### Factors

Temperature:  
4% for every 18° F above 104° F  
4% for every 10°C above 40°C

#### Altitude

2.5% for every 383 feet above  
4918 feet  
2.5% for every 167 meters above  
1499 meters

### Cooling System

High Ambient 104°F (40°C) System  
Coolant Capacity with Radiator  
55.4 US gal. (210L)

Maximum restriction on discharge side of radiator  
.5 In wc (125 Pa)

	<b>1800 rpm</b>	<b>1500 rpm</b>
Coolant Flow		
	291 GPM (1102 LPM)	264 GPM (1000 LPM)
Heat Rejection to Coolant at Full Load	29797 Btu/min (3144 MJ/min)	25480 Btu/min (2688 MJ/min)
Heat Rejection to Room at Rated Full Load	3705 Btu/min (391 MJ/min)	3169 Btu/min (334 MJ/min)

### Air System

	<b>1800 rpm</b>	<b>1500 rpm</b>
Maximum		
Air Intake Restriction		25.0 In wc (6.2 kPa)
Radiator Cooling		
Air Flow	48278 cfm (1366 m <sup>3</sup> /min)	40253 cfm (1139 m <sup>3</sup> /min)
Combustion		
Air Flow	2613 cfm (73.9 m <sup>3</sup> /min)	2260 cfm (64.0 m <sup>3</sup> /min)
Generator Cooling		
Air Flow	5256 cfm (148.7 m <sup>3</sup> /min)	4380 cfm (124 m <sup>3</sup> /min)

### Exhaust System

Exhaust Manifold  
Outlet Size 8.35 in. dia. (21.2cm)  
Maximum Allowable Back Pressure  
17.7 In wc (5.9 kPa)

#### Exhaust Gas Flow

at Standby  
Rating 6956 cfm 5932 cfm  
(196.9 m<sup>3</sup>/min)(167.9 m<sup>3</sup>/min)

Exhaust Temp at  
Standby Rating

950°F (510°C)	842°F (450°C)
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### Fuel System

Consumption at Standby Rating:

Load	<b>1800 RPM</b>		
	kW	US gal/h	Litre/h
1/4	195	18.5	70
1/2	390	29.0	110
3/4	585	43.6	165
Full	780	58.1	220

Load	<b>1500 RPM</b>		
	kW	US gal/h	Litre/h
1/4	173	13.2	50
1/2	345	24.6	93
3/4	518	37.0	140
Full	690	48.9	185

**Governor Type** Electric  
**Governor Regulation:** +/- .2%

### Generator

Manufacturer	MagneTek
Model	MTG55 Opt.
Motor Starting KVA, 240/480 Volt WYE at 35% Voltage Dip, 100% Voltage Recovery	1744 SKVA
Maximum Motor Starting KVA, 35% Voltage Dip Oversized Generator MTG81	3833 SKVA

### Reactances

	480 V	400 V
at 105°C rise	60Hz	50Hz
Synchronous Xd	3.52	3.38
Direct Axis		
Transient X'd	.280	.269
Direct Axis		
Subtransient X'd	.190	.182
Zero Sequence Xo	.0107	.0103

### Lubrication System

Engine Oil Capacity with Filters  
26.4 US gal. (100L)  
Oil Filter Type Spin On

# Model 780 RD 780 kW Diesel Generator Set

## Options:

### Generator

- \* Upsized
- \* Tropical winding protection
- \* Space heater
- \* Series boost
- \* UL listed mainline circuit breaker

### Control

- \* Remote alarm annunciator
- \* Emergency stop
- \* Multi-point dry contact board.
- \* NFPA 110 Compliance
- \* Low Temperature Display Heater

### Engine

- \* Battery/Battery heater
- \* Battery charger
- \* Engine pre-heater
- \* Fuel/ water separator
- \* Isochronous governor

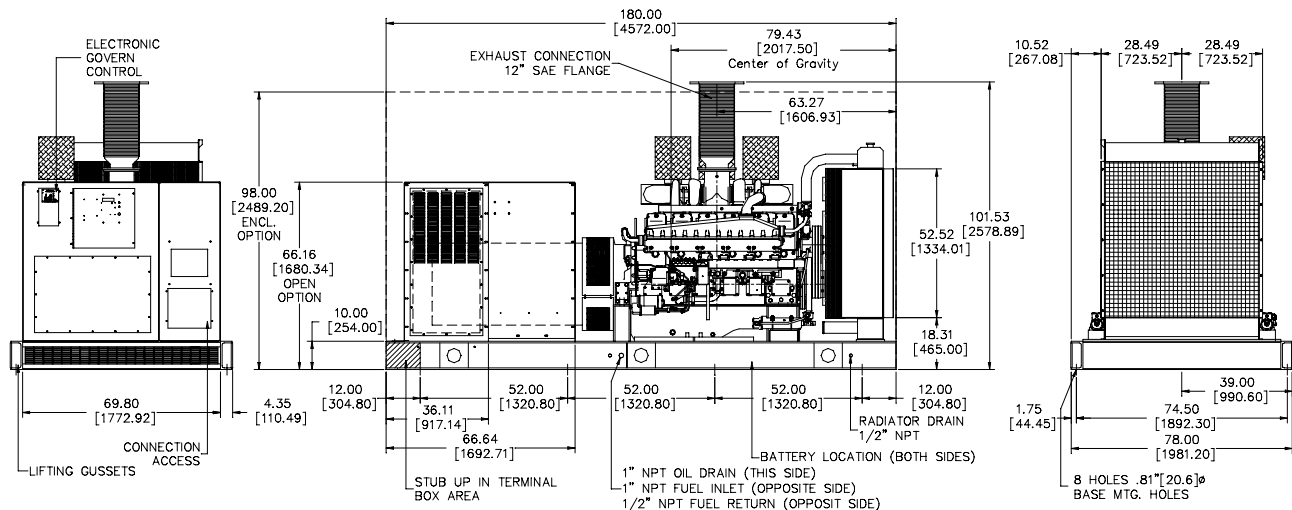
### Generator Set

- \* EMPS automatic transfer switch
- \* Industrial silencer
- \* Residential silencer
- \* Critical silencer
- \* Weather protective enclosure
- \* Sound attenuation
- \* Sub-base fuel tank

DOOR SWING:  
ENGINE DOOR: 28.75  
SECURITY DOOR: 27.12

MACHINE WEIGHT:  
OPEN DRY WEIGHT 15,000 LBS [1356 KG]  
ENCLOSED DRY WEIGHT 17,500 LBS [1356 KG]

NOTES:  
PRELIMINARY DRAWING DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE.



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