

# Model 450 RD 450 kW Diesel Generator Set

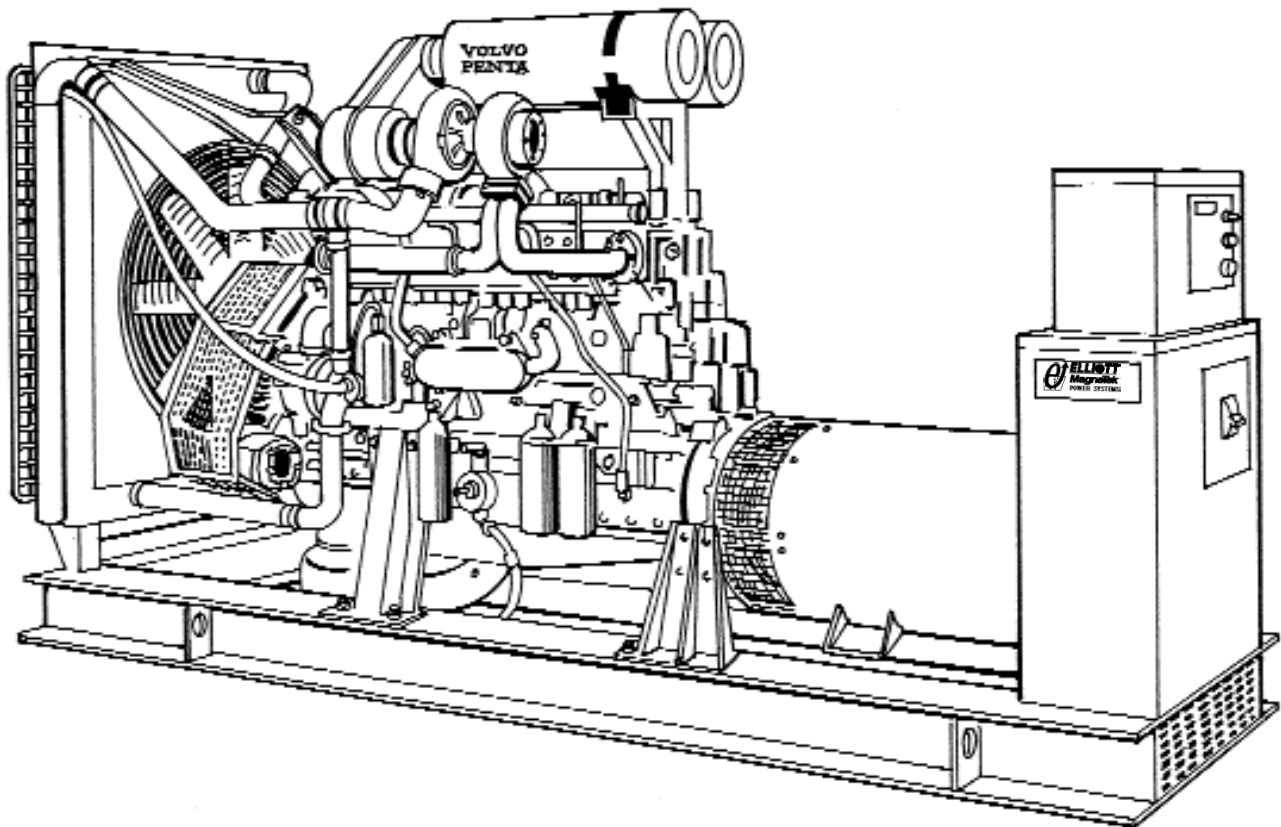
## Generator Set Rating

Three Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	450/562	400/500
Prime Power 105°C	400/500	360/450
Single Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	275/275	318/318
Prime Power 105°C	241/241	261/261

## 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

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### Standard Equipment

- \* 4 Cycle engine.
- \* AC synchronous 12 lead re-connectable brushless alternator.
- \* Steel base with vibration isolators between engine, generator and 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

**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:** 2/3 pitch and one slot skewing 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 1560	110/190 1519
120/240 1352	120/208 1388
277/480 676	230/400 722
347/600 541	240/415 696

\*Single Phase

60 Hz Amperage	50 Hz Amperage
120/240 1146	110/220 1445

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. For full single phase output use generator model MTG54 Opt.

### Application and Performance Data

MagneTek Alternator Model MTG48 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 MTG58.

# Technical Specifications

## Model 450 RD 450 kW Diesel Generator Set

### Engine Specifications

Manufacturer	Volvo	
Model	TAD 1630 GE	
Type	In line 4 Stroke	
Aspiration	Turbo/ Air to Air Inter cooled	
Cylinders	6	
Displacement	984 In <sup>3</sup> . (16.12L)	
Bore and Stroke,	5.67 in x 6.5 in. (144 mm x 165 mm)	
Compression Ratio	15.0:1	
Minimum Ah. at 5°C	2 X 110	
RPM	<b>1800 rpm</b>	<b>1500 rpm</b>
BHP Minimum REQ'D		
at Rated kW	667	592
BMEP	298 psi	318 psi

### Generator Set Deration Factors

Temperature:  
1.5% for every 10° F above 104° F  
1.5% for every 5.5°C above 40°C

Altitude  
6% for every 1650 feet above  
3300 feet  
6% for every 503 meters above  
1006 meters

### Cooling System

High Ambient 104°F (40°C) System  
Coolant Capacity with Radiator  
63.4 qt. (60.0L)

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

**1800 rpm**                      **1500 rpm**

Coolant Flow	166 GPM (628.4 LPM)	138 GPM (522.4 LPM)
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Heat Rejection to Coolant at Full Load	12739 Btu/min (1344 MJ/min)	10692 Btu/min (1128 MJ/min)
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Heat Rejection to Room at Rated Full Load	1710 Btu/min (180 MJ/min)	1540 Btu/min (162 MJ/min)
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### Air System

	<b>1800 rpm</b>	<b>1500 rpm</b>
Maximum Air Intake Restriction		20.1 In wc (5 kPa)
Radiator Cooling Air Flow	17800 cfm (504 m <sup>3</sup> /min)	14514 cfm (411 m <sup>3</sup> /min)
Combustion Air Flow	1473 cfm (42 m <sup>3</sup> /min)	1211 cfm (34 m <sup>3</sup> /min)
Generator Cooling Air Flow	3104 cfm (87.8 m <sup>3</sup> /min)	2587 cfm (73.2 m <sup>3</sup> /min)

### Exhaust System

Exhaust Manifold Outlet Size 4.09 in. dia. (10.4cm)  
Maximum Allowable Back Pressure  
28.1 In wc (5.0 kPa) 20.1(5.0 kPa)  
Exhaust Gas Flow at Standby Rating  
3577 cfm 3189 cfm  
(101.23 m<sup>3</sup>/min) (90.25 m<sup>3</sup>/min)

Exhaust Temp at Standby Rating  
915°F (491°C) 950°F (510°C)

### Fuel System

Consumption at Standby Rating:

<b>Load</b>	<b>1800 RPM</b>		
	kW	US gal/h	Litre/h
1/4	112.5	9	34.1
1/2	225	15.7	59.4
3/4	337.5	23.2	87.8
Full	450	32.3	122.3

<b>Load</b>	<b>1500 RPM</b>		
	kW	US gal/h	Litre/h
1/4	100	7.9	29.9
1/2	200	15.1	57.2
3/4	300	20.6	78
Full	400	29.1	110.2

**Governor Type** Isochronous  
**Governor Regulation:** +/- .25%

### Generator

Manufacturer MagneTek  
Model MTG48  
Motor Starting KVA, 240/480 Volt WYE at 35% Voltage Dip, 100% Voltage Recovery 1380 SKVA  
Maximum Motor Starting KVA, 35% Voltage Dip Oversized Generator MTG58 1824.3 SKVA

### Reactances

	480 V	400 V
at 105°C rise	60Hz	50Hz
Synchronous Xd	2.77	2.59
Direct Axis Transient X'd	.260	.244
Direct Axis Subtransient X'd	.144	.135
Zero Sequence Xo	.0034	.0032

### Lubrication System

Engine Oil Capacity with Filters 16.9 US gal. (64L)  
Oil Filter Type FF + BP

### Engine Exhaust Emissions Certification Values

<b>Exhaust Emissions (g/bhp-hr.)</b>	<b>*CARB</b>	<b>450RD</b>
HC:	1	.4
CO:	8.5	.4
NOx:	6.9	6.3
PM:	.4	.2

### Smoke Opacity (%)

Acceleration	20	N/A
Lugging	15	4
Peak	50	N/A

\* California Air Resources Board Standards.

# Model 450 RD 450 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

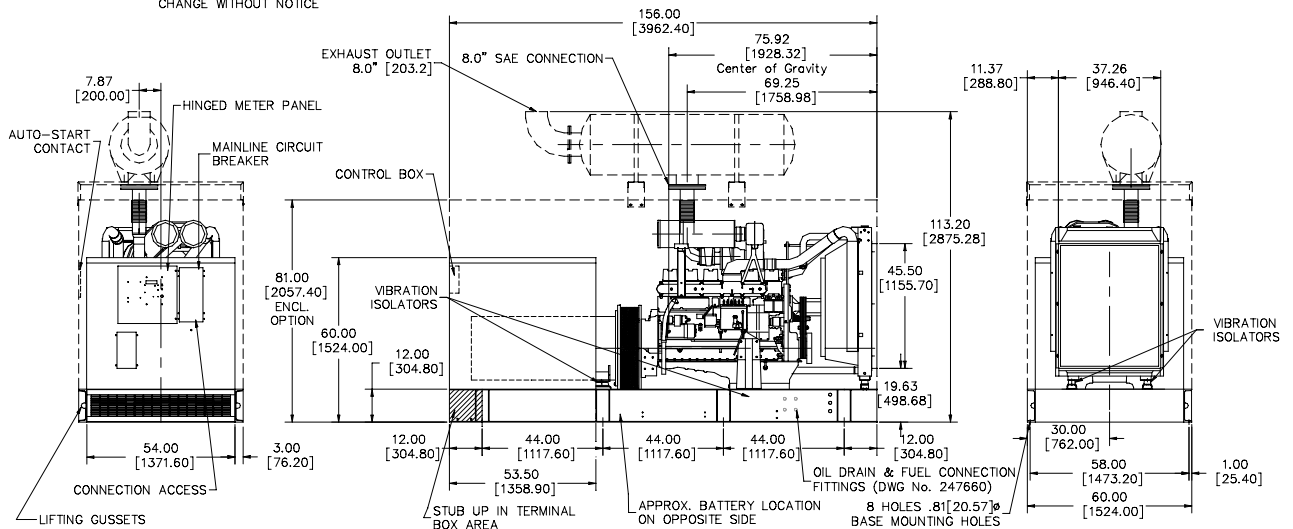
### Generator Set

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

DOOR SWING—  
ENGINE DOOR: 28.750  
SECURITY DOOR: 26.250

OPEN DRY WEIGHT 7172 LBS (3253 KG)  
ENCL. DRY WEIGHT 8447 LBS (3832 KG)

PRELIMINARY DRAWING  
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CHANGE WITHOUT NOTICE



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