



# Model 90 RD 90 kW Diesel Generator Set

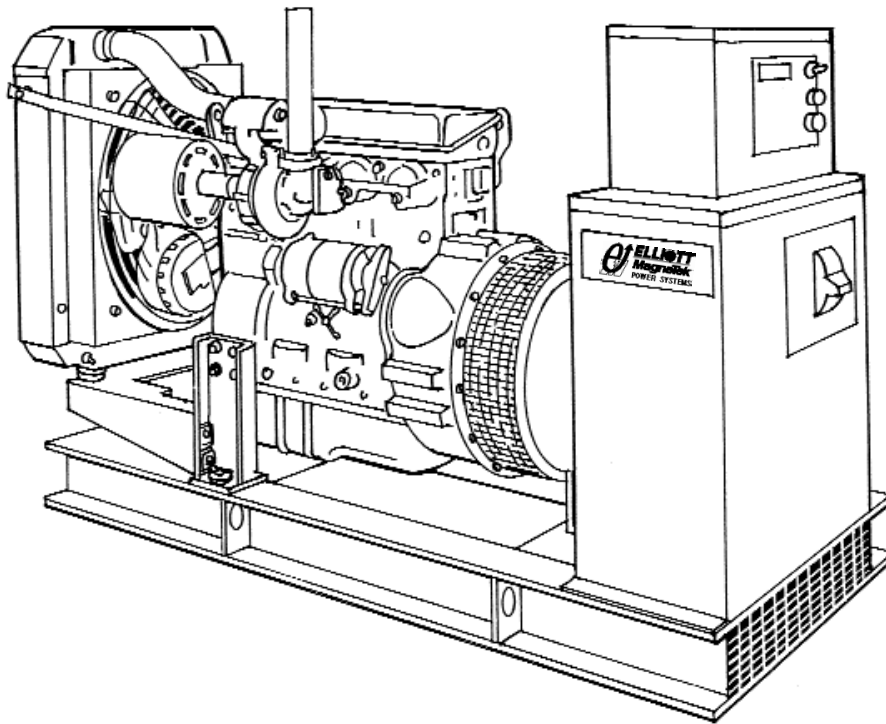
## Generator Set Rating

Three Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	90/112	81/101
Prime Power 105°C	81/101	73/91
Single Phase	60 Hz kW/KVA	50 Hz kW/KVA
Continuous		
Standby 150°C	54/54	58/58
Prime Power 105°C	46/46	54/54

## 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 90 RD 90 kW Diesel Generator Set

### 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
- \* 12 volt DC engine electrical system.
- \* 12 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:** 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	312 110/190 308
120/240	271 120/208 281
277/480	135 230/400 146
347/600	108 240/415 141

\*Single Phase

60 Hz Amperage	50 Hz Amperage
120/240	225 110/220 264

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 MTG38.

### Application and Performance Data

MagneTek Alternator Model MTG33 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 MTG44.

# Technical Specifications

## Model 90 RD 90 kW Diesel Generator Set

### Engine Specifications

Manufacturer	Isuzu	
Model	6BG1TQV	
Type	In line 4 Stroke	
Aspiration	Turbo	
Cylinders	6	
Displacement	396 In <sup>3</sup> . (6.5 L)	
Bore and Stroke,	4.13 in x 4.92 in. (105 mm x 125 mm)	
Compression Ratio	17.5:1	
Minimum C.C.A. at 5°C	780	
RPM	<b>1800 rpm</b>	<b>1500 rpm</b>
BHP Minimum REQ'D		
at Rated kW	137	121
BMEP	152 psi	161 psi

### Generator Set Deration Factors

Temperature:  
2.5% for every 5° F above 105° F  
2.5% for every 9°C above 41°C

Altitude  
2% for every 2000 feet above  
2000 feet  
2% for every 607 meters above  
607 meters

### Cooling System

High Ambient 105°F (41°C) System  
Coolant Capacity with Radiator  
24 qt. (22.7 L)

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

	<b>1800 rpm</b>	<b>1500 rpm</b>
Coolant Flow		
	57 GPM (215.8 LPM)	49 GPM (185.5 LPM)
Heat Rejection to Coolant at Full Load	4250 Btu/min (448 MJ/min)	3700 Btu/min (390 MJ/min)

### Air System

	<b>1800 rpm</b>	<b>1500 rpm</b>
Maximum Air Intake Restriction		30 In wc (7.5 kPa)
Radiator Cooling Air Flow	5600 cfm (158.5m <sup>3</sup> /min)	5040 cfm (142.6 m <sup>3</sup> /min)
Combustion Air Flow	240 cfm (6.8 m <sup>3</sup> /min)	175 cfm (5.0 m <sup>3</sup> /min)
Generator Cooling Air Flow	2348 cfm (66.4 m <sup>3</sup> /min)	1957 cfm (55.4 m <sup>3</sup> /min)

### Exhaust System

Exhaust Manifold Outlet Size 3.0 in. dia. (7.6 cm)  
Maximum Allowable Back Pressure 40.9 In wc (10.2 kPa)  
Exhaust Gas Flow at Standby Rating  
650 cfm 550 cfm  
(18.4 m<sup>3</sup>/min)(15.6 m<sup>3</sup>/min)

Exhaust Temp at Standby Rating 1090°F (588°C) 1090°F (588°C)

### Fuel System

Consumption at Standby Rating:

Load	<b>1800 RPM</b>		
	kW	US gal/h	Litre/h
1/4	22.5	1.53	5.8
1/2	45	2.97	11.2
3/4	67.5	4.5	17
Full	90	5.85	22.1

Load	<b>1500 RPM</b>		
	kW	US gal/h	Litre/h
1/4	20.25	1.26	4.8
1/2	40.5	2.43	9.2
3/4	60.75	3.69	14
Full	81	4.95	18.8

Governor Type Mechanical  
Governor Regulation: +/- 3-5% Steady State

### Generator

Manufacturer	MagneTek
Model	MTG33
Motor Starting KVA, 240/480 Volt WYE at 35% Voltage Dip, 100% Voltage Recovery	318 SKVA
Maximum Motor Starting KVA, 35% Voltage Dip Oversized Generator	346 SKVA

### Reactances

	480 V	400 V
at 105°C rise	60Hz	50Hz
Synchronous Xd	3.78	3.75
Direct Axis Transient X'd	.293	.291
Direct Axis Subtransient X"d	.198	.196
Zero Sequence Xo	.0032	.0032

### Lubrication System

Engine Oil Capacity with Filters 4.63 US gal. (17.6 L)  
Oil Filter Type Spin On

### Engine Exhaust Emissions Certification Values

Exhaust Emissions (g/bhp-hr.)	<b>*CARB</b>	<b>90RD</b>
HC:	1	.5
CO:	3.7	.5
NOx:	6.9	5.7
PM:	.52	.17

### Smoke Opacity (%)

Acceleration	20	11
Lugging	15	3
Peak	50	20

\* California Air Resources Board Standards.

# Model 90 RD 90 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

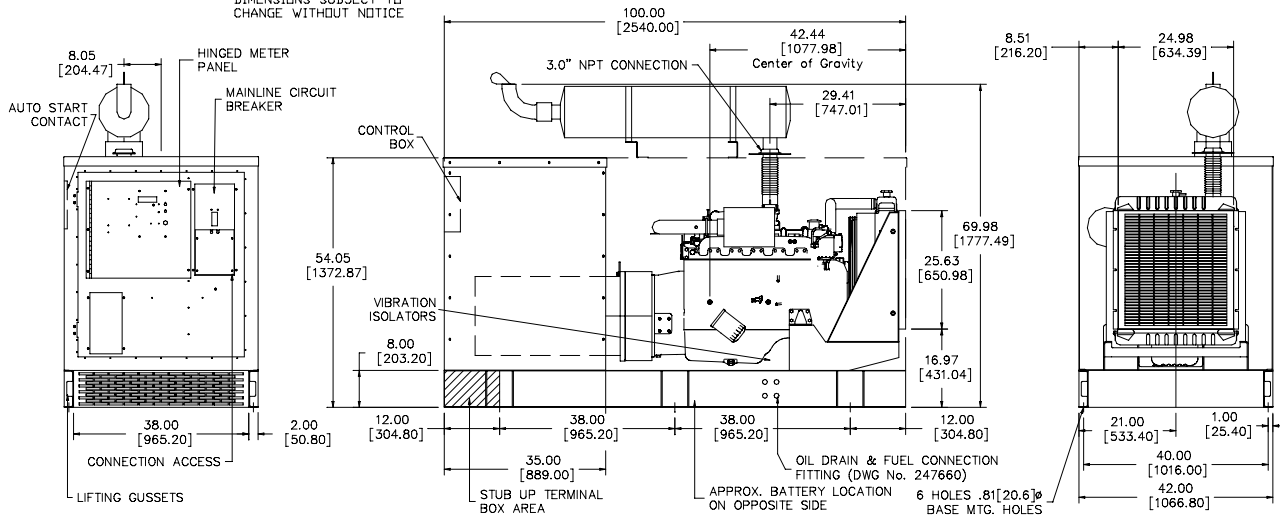
### Generator Set

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

OPEN DRY WEIGHT 2305 LBS (1045 KG)  
ENCL. DRY WEIGHT 2855 LBS (1295 KG)

DOOR SWING  
SECURITY DOOR: 35.62"  
ENGINE DOOR: 35.62"

PRELIMINARY DRAWING  
DIMENSIONS SUBJECT TO  
CHANGE WITHOUT NOTICE



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