



Model 400 RN 400 kW Natural Gas Generator Set

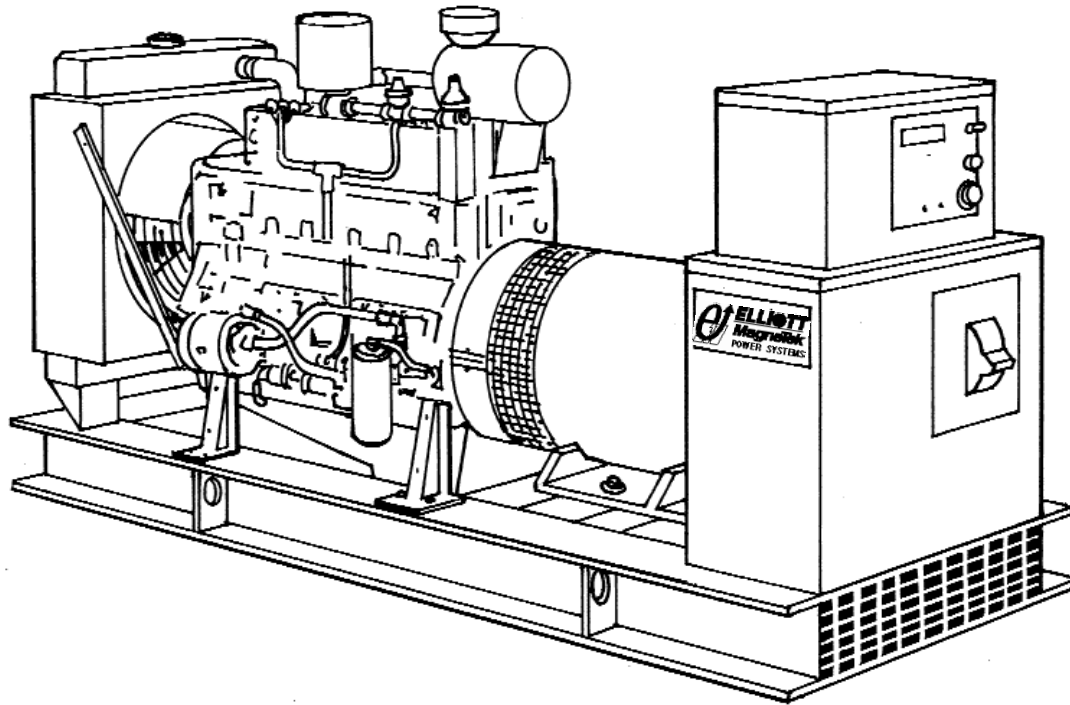
Generator Set Rating

Three Phase	60 Hz	50 Hz
	kW/KVA	kW/KVA
Continuous		
Standby 150°C	400/500	360/450
Prime Power 105°C	350/438	325/406
Single Phase	60 Hz	50 Hz
	kW/KVA	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

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 1388	110/190 1367
120/240 1203	120/208 1249
277/480 601	230/400 650
347/600 481	240/415 626

*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 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

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Engine Specifications

Manufacturer	Cummins	
Model	GTA 28	
Type	4 Stroke V-12	
Aspiration	Turbo/ After cooled	
Cylinders	6	
Displacement	1710 In ³ . (28 L)	
Bore and Stroke,	5.5 in x 6 in. (140 mm x 152 mm)	
Compression Ratio	10:1	
Minimum C.C.A. at 5°C	1800	
RPM	1800 rpm	1500 rpm
BHP Minimum REQ'D		
at Rated kW	593	541
BMEP	153 psi	167 psi

Altitude and Ambient

Temperature Requirements

The engine may be operated at the STANDBY RATING up to 3000 ft.(914m) altitude and 100°F (38°C) inlet air temperature and at the PRIME AND CONTINUOUS POWER RATING up to 5000 ft.(1524m) altitude and 100°F (38°C) inlet air temperature. For sustained operation at high load factor at higher altitudes and temperatures, please contact factory.

Cooling System

Coolant Capacity with Radiator	43.5 Gal. (165 L)	
Maximum restriction on discharge side of radiator	5 In wc (125 Pa)	
Coolant Flow	1800 rpm	1500 rpm
	214 GPM (810 LPM)	195 GPM (738 LPM)
Heat Rejection to Cooler at Rated		
Full Load	34540 Btu/min	31535 Btu/min
Nat. Gas	(3644 MJ/min)	(3327 MJ/min)
Heat Rejection to Room at Rated		
Full Load	4140 Btu/min	3780 Btu/min
Nat. Gas	(437 MJ/min)	(399 MJ/min)
Heat Rejection to Charge Air Cooler at Rated		
Full Load	5300 Btu/min	4839 Btu/min
Nat. Gas	(559 MJ/min)	(511 MJ/min)

Air System

	1800 rpm	1500 rpm
Maximum Air Intake Restriction	15 In wc (3.74 kPa)	14 In wc (3.49 kPa)
Radiator Cooling Air Flow	74000 cfm (2094 m ³ /min)	67562 cfm (1912 m ³ /min)
Combustion Air Flow	1232 cfm (88 m ³ /min)	1175 cfm (80 m ³ /min)
Generator Cooling Air Flow	3104 cfm (80 m ³ /min)	2834 cfm (80 m ³ /min)

Exhaust System

Exhaust Outlet Size	dual 4 in. dia. (101.6 cm)	
Maximum Allowable Back Pressure	2 in.wc Hg	
Exhaust Gas Flow at Standby Rating	4302 cfm (122 m ³ /min)	3928 cfm (111 m ³ /min)
Exhaust Temp at Standby Rating	1350°F (732°C)	1233°F (667°C)

Fuel System

Consumption at Standby Rating:		
Load	1800 RPM	
	Natural Gas	
	C.F.H.(Cu.M./Hr.)	
1/4	100	1979 (56.0)
1/2	200	3269 (92.5)
3/4	300	4423 (125.2)
Full	400	5551 (157.1)
Load	1500 RPM	
	Natural Gas	
	C.F.H. (Cu.M./Hr.)	
1/4	90	1807 (51.1)
1/2	180	2985 (84.5)
3/4	270	4038 (114.3)
Full	360	5068 (143.4)

Governor Type

Electronic
Governor Regulation:
+/- .25 % Steady State

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	2660SKVA

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	.244
Negative Sequence X ₂	.159	.149
Zero Sequence X ₀	.0034	.0032

Lubrication System

Engine Oil Capacity with Filters	29.7 qts. (28.22L)
Oil Filter Type	Spin On

Engine Exhaust Emissions

Per Cummins Emission Data Sheet #ES5750A

	@SB	@PRIME	@CONT
THC	4.50	3.11	3.11
NMHC	.73	.51	.51
NEHC	.37	.25	.25
NOX	16.4	26.51	28.82
CO	1.52	1.33	1.26
CO2	18.20%	19.60%	21.00%
O2	4.60%	3.50%	2.20%

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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
- * Single rate battery charger
- * Dual rate battery charger
- * Battery charger alarm packages
- * 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

**Consult Factory
for Design**

58 Elliott Power Drive
P.O. Box 403
Lexington, TN 38351
Tel: 901-967-9393
Fax: 901-968-0161

Distributed by:



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