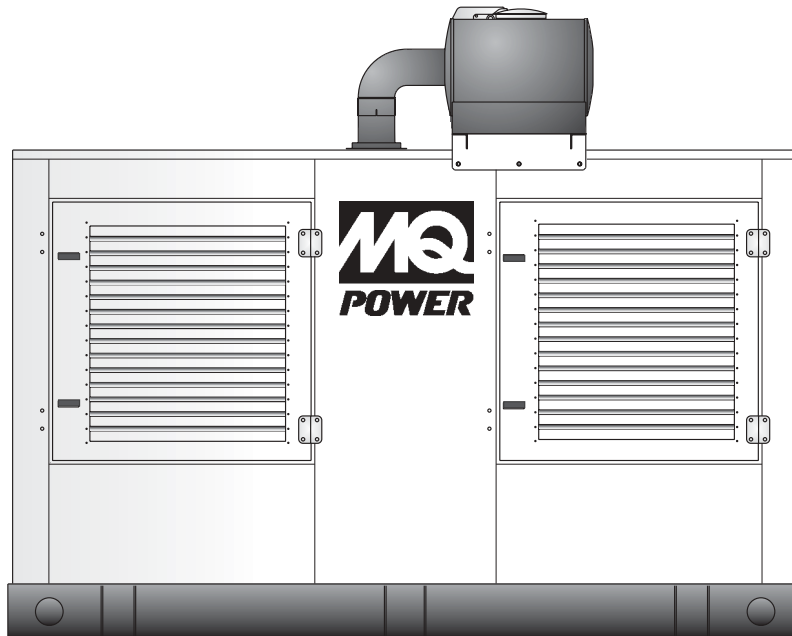




# 450kW Diesel On-Site Power Industrial Generator

Model	Emissions	Standby Rating		Prime Rating	
		60 Hertz	50 Hertz	60 Hertz	50 Hertz
MQP450VO	EPA Certified	450kW (562.50kVA)	400kW (500kVA)	400kW (500kVA)	360kW (450kVA)



## Standard Features

### Heavy Duty Engine

- Heavy duty, 4-cycle, diesel engine; direct injection.
- Electronic speed control governor.
- Meets EPA emissions standards for mobile off-highway.

### Alternator

- Brushless, 4-pole, synchronous, 12 lead design.
- Temperature rise standards meets Class H insulation system.

### Electronic Voltage Regulator

- Encapsulated electronic voltage regulator precisely regulates the current into the exciter field.
- Voltage regulation of  $\pm 1.0\%$  no load to full load.

### Full Load Acceptance

- Accepts 100% of standby nameplate rating in one step, in compliance with NFPA, para 5-13.2.6.

### Cooling System

- Closed circuit, pressurized system with ambient temperature rating of 40°C (104°F).
- Low coolant shutdown safety.

### Generator Control Panel

- ICS-50™ microprocessor-based, digital control panel; vibration isolated and NFPA110 compliant.
- Liquid crystal display screen with alphanumeric readout for display and programming.
- Self-diagnostic feature continuously verifies processing, memory circuits and input/output.

### Skid and Housing

- Generator available as skid-mount or sub-base tank mount design.
- Integral vibration isolators.
- Outdoor weather-protective or sound-attenuated housings.
- Steel battery rack and battery cables

### Warranty

- Engine-generator sets are covered by an express written 2-year/2000 hour (whichever occurs first) limited warranty.
- Optional extended warranties available.

### Agency Approval

- UL2200 - File No. AU3588.



# 450kW Diesel On-Site Power Industrial Generator

## Alternator Specifications

Manufacturer	Marathon, 572RSL4025
Type	4-Pole, Rotating Field
Exciter Type	Brushless, PMG
Number of Leads	12 Lead, Reconnectable
Voltage Regulator	DVR2000, Solid State, Volts-per-Hertz
Insulation	NEMA MGI-1.66
Material	Class H
Temperature Rise	125°C, Standby Rating
Bearing, Number, Type	Single, Sealed
Coupling	Flexible Disk Type
Amortisseur Windings	Full
Cooling Air Volume	1550CFM
Voltage Regulation (no load to full load)	+1%
Single Step Load Acceptance per NFPA 110	100% of Rating

- Compliant with NEMA MGI-22, BS5000, CSA-C22-2, IEC-34-1 standards for temperature rise.
- Sustained short-circuit current up to 300% of rated current for up to 10 seconds.
- Drip-proof, self-venting, amortisseur windings.
- Epoxy impregnated windings with tropical insulation for increased environmental protection and long life.
- Exceptional waveshape and voltage balance; 2/3 pitch winding to minimize harmonic distortion.
- Solid-state, volts-per-hertz voltage regulator with  $\pm 1\%$  no-load to full-load voltage regulation.

## Amperage

Voltage	Phase	Wire	Amperage
120/208 Volt	3	4	1561
120/240 Volt	3	4	1353
277/480 Volt	3	4	677

## Engine Specifications

	60 Hz	50 Hz
Manufacturer	Volvo	
Engine, Model, Type	TAD1631GE 4-cycle, Turbocharged, Air to Air Intercooled	
Cylinder Arrangement	6 In-Line	
Displacement	984in <sup>3</sup> (16.12liter)	
Bore	5.67in. (144mm)	
Stroke	6.50in. (165mm)	
Compression Ratio	15.0:1	
Piston Speed	32.5ft/sec (9.9m/sec)	27.2ft/sec (8.3m/sec)
Cylinder Block	Cast iron with wet, replaceable cylinder liners	
Cylinder Head	Cast iron	
Crankshaft	Forged steel; 7-main bearings	
Brake Mean Effective Pressure (BMEP)	305psi (2.1Mpa)	319psi (2.2Mpa)
Rated RPM	1800 RPM	1500 RPM
Max. Power At Rated RPM (with fan)	743hp (546kW)	650hp (478kW)
Governor: Type; Make/Model	Electronic, GAC #ACB275	
Frequency Regulation: No load to full load	Isochronous under varying loads from no load to 100% rated load	
Frequency Regulation: Steady State	$\pm 0.25\%$ of mean value for constant loads from no load to full load	
Air Cleaner Type	Single stage replacement paper cartridge	

## Fuel System

	60 Hz	50 Hz
Fuel Injection Pump Make	Bosch, R1500	
Recommended Fuel	ASTM-D975/No.1-D & No.2-D	
Maximum Fuel Flow	56.8 gal/hr (215L/hr)	54.1 gal/hr (205L/hr)
Feed Pump Maximum Suction Head	9.8 feet (3 meter)	
Fuel Filters	Replaceable primary/secondary	

## Fuel Consumption@60Hz

Diesel Fuel At % of Load	Standby-500kW		Prime-450kW	
	US gal/hr	L/hr	US gal/hr	L/hr
100%	36.8	139.3	32.5	123.0
75%	27.6	104.5	24.3	92.0
50%	18.4	69.6	16.2	61.3
25%	9.2	34.8	8.1	30.7

## Rating Guidelines

**STANDBY POWER:** Rating corresponds to ISO Standard Fuel Stop Power. It is applicable for supplying standby electrical power at variable load in areas with well established electrical networks in the event of normal utility power failure. No overload capability is available for this rating.

**PRIME POWER:** Rating corresponds to ISO Standard Power for continuous operation. It is applicable for supplying electrical power at variable load for an unlimited number of hours instead of commercially purchased power. A 10% overload capability is available for this rating.

**SINGLE PHASE OUTPUT:** Broad range alternators can supply single phase output up to 2/3 set rated 3-phase kW at 1.0 P.F. Refer to Amperage chart.

## Engine Electrical System

Battery Charging Alternator:	
Make	Valeo
Ground Type	Negative
Volts (DC)	24VDC
Ampere Rating	60A
Starter Motor Make/Model	Bosch KE
Starter Motor Rated Voltage	24VDC
Starter Motor Battery Capacity:	
Maximum	2 x 176 Ah
Minimum At $>+5^{\circ}\text{C}$ Ambient	2 x 110 Ah



# 450kW Diesel On-Site Power Industrial Generator

## Lubrication System

Type	Full Pressure System
System Capacity-Less Filter	15 gallons (57 liters)
System Capacity-With Filter	16.9 gallons (64 liters)
Oil Filter	Full flow disposable spin-on
Oil Cooler	Full flow integrated design
Oil Pressure At Rated Speed	43.5-72.5psi (300-500kPa)
Oil Temperature:	
Normal Range	221°F (105°C)
Maximum Range	248°F (120°C)

## Cooling System

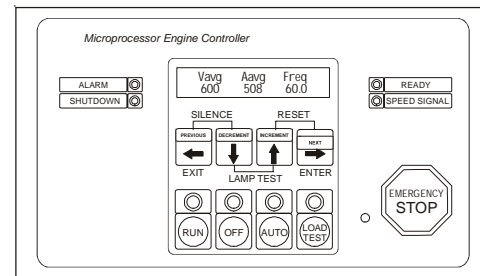
	60 Hz	50 Hz
Exhaust Manifold Type	Dry	
Radiator Design	Standard skid mount/ horizontal discharge	
Ambient Temperature Rating	104°F (40°C)	
Coolant Capacity:		
Engine Only	7.6 gallons (29 liters)	
Engine and Radiator	9.2 gallons (35 liters)	
Water Pump:		
Design	Gear driven	
Type	Centrifugal	
Coolant Flow	166.2 gal/min (630L/min)	137.4 gal/min (522L/min)
Radiator Cooling Air Consumption	14408cfm (408m³/min)	11018cfm (312m³/min)
Heat Rejection At Rated Load:		
To Coolant	13364 BTU/min	11089 BTU/min
Fan Diameter	35in. (890mm)	
Fan Horsepower	16hp (12kW)	10hp (7kW)
Maximum Static Pressure Head	7psi (50kPa)	
Maximum Top Tank Temperature	217°F (103°C)	

## Exhaust System

	60 Hz	50 Hz
Exhaust Flow at Rated kW	4117cfm (116.6m³/min)	3496cfm (99.0m³/min)
Exhaust Temperature at Rated kW	1035°F (560°C)	1045°F (565°C)
Maximum Allowable Backpressure	28.1in/wc (7kPa)	20.1in/wc (5kPa)
Heat Rejection To Exhaust	27410Btu/min (482kW)	23657Btu/min (416kW)

## Derating Factors

	Altitude	Ambient Temperature
The engine may be operated up to 1000m altitude and 40°C ambient temperature at the Standby rating, without derating. For operation at higher altitudes and ambient temperatures, the power should be derated according to the following factors:	50Hz	<3000m=4%/500m
	60Hz	>3000m=6%/500m
		1.5%/5°C>40°C



## GENERATOR CONTROLLER

- ICS-50™ microprocessor-based digital generator controller.
- 12 or 24 Volt DC compatible.
- Meets all NFPA 110 requirements for emergency power systems Level I installations.
- Backlit LCD display screen with alphanumeric readout.
- Front panel keypad provides password protected programming.
- Self diagnostic features continuously verify processing, I/O and memory circuits.
- Metering accurate to  $\pm 1\%$  within temperature range of 0°C to +50°C.
- EMI/RFI noise immunity and surge performance per IEEE C62.41.
- Certified to UL508 and CSA 22.2 #14 Industrial Control Equipment Standards

## Standard Controller Features

### AC Metering Display:

- Voltage / Amperage / Frequency
- Generator Phase Voltage / Current
- Generator Frequency

### Engine Information Display:

- Engine Temperature / Oil Pressure (psi)
- Battery Voltage (DC) / Tachometer
- Hourmeter

### Timer Countdown Display:

- Engine Start Delay
- Oil Bypass
- Overcrank
- Cycle Crank
- Rest Period
- Starter Re-engage Delay
- Bypass Delay

### Minor Fault Warning Display:

- Switch Not In Auto
- Low Fuel Level
- Low Oil Pressure Alarm
- Low Engine Temperature
- High Engine Temperature Alarm
- Low Battery Voltage
- High Battery Voltage
- Weak Battery Condition
- Battery Charger Input Fail
- Undervoltage
- Underfrequency
- Overfrequency
- Overcurrent

### Major Fault Shutdown Display:

- Overvoltage
- Emergency Stop

### Loss Of Speed

- Overcrank
- Overspeed
- Low Oil Pressure
- High Engine Temperature
- Low Coolant Level

### Switches And Operating Controls:

- Run / Off / Auto / Load Test Buttons
- Decrement / Increment / Previous (Exit) /Next (Enter) Program Buttons
- Emergency Stop Button
- Audible Alarm Horn – 80 dB(A) at 2 feet
- Alarm Horn Silence Button
- Lamp Test Button
- Fault Reset Function
- RJ45 Remote Communications, External Expansion Module Ports

### Control LED Indicators:

- Switch Position (Run, Off, Auto, Load Test)
- Common Alarm (Minor Fault)
- Common Shutdown (Major Fault)
- Generator Ready (When in Auto)
- Speed Signal
- Emergency Stop

### Diagnostic LED Indicators:

- Run Output Energized
- Crank Output Energized
- Remote Start Signal Initiated
- Common Fail Output Energized
- Watchdog -- CPU Running
- Programmable Output Contacts



# 450kW Diesel On-Site Power Industrial Generator

## Generator Set Options

### Alternator

- Generator Strip Heater

### Control Panel

- Remote Monitoring and Generator Network Communications Link
- Voltage Adjusting Rheostat
- Frequency Adjust Potentiometer

### Cooling System

- Coolant Heater
- Radiator Duct Flange

### Engine

- Engine Crankcase Ventilation Filter

### Enclosed Unit

- Outdoor Weather-protective Housing
- Outdoor Sound-Attenuated Housing
- Critical Grade Exhaust Silencer
- Exhaust Mounting Package
- Rain Cap

### Open Unit

- Critical Exhaust Silencer
- Exhaust Mounting Package

### Electrical System

- Battery
- Environmental Plastic Battery Box with Lid
- Battery Charger, Equalize/Float Type 3.5 Amperes
- Battery Charger w/Alarms, Equalize/Float Type, 10 Amperes

### Fuel System

- Fuel/Water Separator
- Sub-base Fuel Tank (12-hr / 500gal), Double Wall, UL142
- Sub-base Fuel Tank (24-hr / 1000gal), Double Wall, UL142

### Miscellaneous

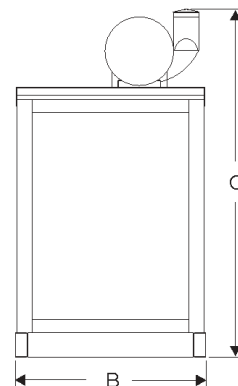
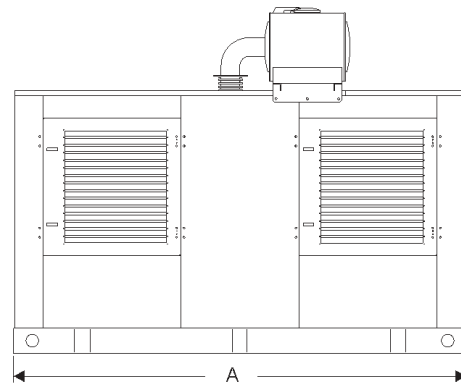
- Main Line Circuit Breaker
  - 120/208 Volt, 3 Phase, 3 Pole
  - 120/240 Volt, 3 Phase, Delta, 3 Pole
  - 139/240 Volt, 3 Phase, 3 Pole
  - 277/480 Volt, 3 Phase, 3 Pole
- Main Line Circuit Breaker Options
  - Auxiliary Contacts
  - DC Shunt Trip
- Remote Annunciator Panel
- Remote Emergency Stop Kit
- Vibration Isolators, Spring Type
- 5-Year Extended Warranty

### Automatic Transfer Switch

- Amperage \_\_\_\_\_
- No. Poles \_\_\_\_\_
- Type Enclosure \_\_\_\_\_
- Options \_\_\_\_\_

## Weights and Dimensions

	A	B	C
<b>OPEN</b>	145.00 inches 3683.0 mm	61.00 inches 1549.4 mm	78.39 inches 1991.1 mm
<b>STANDARD HOUSING</b>	145.00 inches 3683.0 mm	61.00 inches 1549.4 mm	111.63 inches 2835.4 mm
<b>SOUND HOUSING</b>	184.08 inches 4675.6 mm	61.00 inches 1549.4 mm	112.28 inches 2851.9 mm
<b>Weight: Dry</b>	7,387 lbs/3,351 kg		
<b>Weight: Wet</b>	7,645 lbs/3,468 kg		



Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device.

Your MQ Power dealer is:



### MQ POWER

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