450kW Diesel On-Site Power Industrial Generator

**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 ±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.

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Emissions</th>
<th>Standby Rating (60 Hz)</th>
<th>Prime Rating (50 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQP450VO</td>
<td>EPA Certified</td>
<td>450kW (562.50kVA)</td>
<td>400kW (500kVA)</td>
</tr>
<tr>
<td>MQP450VO</td>
<td>EPA Certified</td>
<td>400kW (500kVA)</td>
<td>360kW (450kVA)</td>
</tr>
</tbody>
</table>
450kW Diesel On-Site Power Industrial Generator

- 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 ±1% no-load to full-load voltage regulation.

**Alternator Specifications**

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

**Engine Specifications**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Volvo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine, Model, Type</td>
<td>TAD1631GE 4-cycle, Turbocharged, Air to Air Intercooled</td>
</tr>
<tr>
<td>Cylinder Arrangement</td>
<td>6 In-Line</td>
</tr>
<tr>
<td>Displacement</td>
<td>984in³ (16.12liter)</td>
</tr>
<tr>
<td>Bore</td>
<td>5.67in. (144mm)</td>
</tr>
<tr>
<td>Stroke</td>
<td>6.50in. (165mm)</td>
</tr>
<tr>
<td>Compression Ratio</td>
<td>15.0:1</td>
</tr>
<tr>
<td>Piston Speed</td>
<td>32.5ft/sec (9.9m/sec)</td>
</tr>
<tr>
<td>Cylinder Block</td>
<td>Cast iron with wet, replaceable cylinder liners</td>
</tr>
<tr>
<td>Cylinder Head</td>
<td>Cast iron</td>
</tr>
<tr>
<td>Crankshaft</td>
<td>Forged steel; 7-main bearings</td>
</tr>
<tr>
<td>Brake Mean Effective Pressure (BMEP)</td>
<td>305psi (2.1Mpa)</td>
</tr>
<tr>
<td>Rated RPM</td>
<td>1800 RPM</td>
</tr>
<tr>
<td>Max. Power At Rated RPM (with fan)</td>
<td>743hp (546kW)</td>
</tr>
<tr>
<td>Governor: Type, Make/Model</td>
<td>Electronic, GAC #ACB275</td>
</tr>
<tr>
<td>Frequency Regulation: No load to full load</td>
<td>Isochronous under varying loads from no load to 100% rated load</td>
</tr>
<tr>
<td>Frequency Regulation: Steady State</td>
<td>+0.25% of mean value for constant loads from no load to full load</td>
</tr>
<tr>
<td>Air Cleaner Type</td>
<td>Single stage replacement paper cartridge</td>
</tr>
</tbody>
</table>

**Amperage**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Phase</th>
<th>Wire</th>
<th>Amperage</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/208 Volt</td>
<td>3</td>
<td>4</td>
<td>1561</td>
</tr>
<tr>
<td>120/240 Volt</td>
<td>3</td>
<td>4</td>
<td>1353</td>
</tr>
<tr>
<td>277/480 Volt</td>
<td>3</td>
<td>4</td>
<td>677</td>
</tr>
</tbody>
</table>

**Fuel System**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Volvo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Injection Pump Make</td>
<td>Bosch, R1500</td>
</tr>
<tr>
<td>Recommended Fuel</td>
<td>ASTM-D975/No.1-D &amp; No.2-D</td>
</tr>
<tr>
<td>Maximum Fuel Flow</td>
<td>56.8 gal/hr (215L/hr)</td>
</tr>
<tr>
<td>Feed Pump Maximum Suction Head</td>
<td>9.8 feet (3 meter)</td>
</tr>
<tr>
<td>Fuel Filters</td>
<td>Replaceable primary/secondary</td>
</tr>
</tbody>
</table>

**Fuel Consumption@60Hz**

<table>
<thead>
<tr>
<th>Diesel Fuel At % of Load</th>
<th>US gal/hr</th>
<th>L/hr</th>
<th>US gal/hr</th>
<th>L/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>36.8</td>
<td>139.3</td>
<td>32.5</td>
<td>123.0</td>
</tr>
<tr>
<td>75%</td>
<td>27.6</td>
<td>104.5</td>
<td>24.3</td>
<td>92.0</td>
</tr>
<tr>
<td>50%</td>
<td>18.4</td>
<td>69.6</td>
<td>16.2</td>
<td>61.3</td>
</tr>
<tr>
<td>25%</td>
<td>9.2</td>
<td>34.8</td>
<td>8.1</td>
<td>30.7</td>
</tr>
</tbody>
</table>

**Engine Electrical System**

<table>
<thead>
<tr>
<th>Battery Charging Alternator:</th>
<th>Valeo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make</td>
<td></td>
</tr>
<tr>
<td>Ground Type</td>
<td>Negative</td>
</tr>
<tr>
<td>Volts (DC)</td>
<td>24VDC</td>
</tr>
<tr>
<td>Ampere Rating</td>
<td>60A</td>
</tr>
<tr>
<td>Starter Motor Make/Model</td>
<td>Bosch KE</td>
</tr>
<tr>
<td>Starter Motor Rated Voltage</td>
<td>24VDC</td>
</tr>
</tbody>
</table>

**Engine Specifications**

<table>
<thead>
<tr>
<th>Engine Specifications</th>
<th>60 Hz</th>
<th>50 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Volvo</td>
<td></td>
</tr>
<tr>
<td>Engine, Model, Type</td>
<td>TAD1631GE 4-cycle, Turbocharged, Air to Air Intercooled</td>
<td></td>
</tr>
<tr>
<td>Cylinder Arrangement</td>
<td>6 In-Line</td>
<td></td>
</tr>
<tr>
<td>Cylinder Block</td>
<td>Cast iron with wet, replaceable cylinder liners</td>
<td></td>
</tr>
<tr>
<td>Cylinder Head</td>
<td>Cast iron</td>
<td></td>
</tr>
<tr>
<td>Compartment</td>
<td>Forged steel; 7-main bearings</td>
<td></td>
</tr>
<tr>
<td>Brake Mean Effective Pressure (BMEP)</td>
<td>305psi (2.1Mpa)</td>
<td></td>
</tr>
<tr>
<td>Rated RPM</td>
<td>1800 RPM</td>
<td></td>
</tr>
<tr>
<td>Max. Power At Rated RPM (with fan)</td>
<td>743hp (546kW)</td>
<td></td>
</tr>
<tr>
<td>Governor: Type, Make/Model</td>
<td>Electronic, GAC #ACB275</td>
<td></td>
</tr>
<tr>
<td>Frequency Regulation: No load to full load</td>
<td>Isochronous under varying loads from no load to 100% rated load</td>
<td></td>
</tr>
<tr>
<td>Frequency Regulation: Steady State</td>
<td>+0.25% of mean value for constant loads from no load to full load</td>
<td></td>
</tr>
<tr>
<td>Air Cleaner Type</td>
<td>Single stage replacement paper cartridge</td>
<td></td>
</tr>
</tbody>
</table>

**Rating Guidelines**

- **STANDBY POWER:** Rating corresponds to ISO Standard Fuel Step 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 PF. Refer to Amperage chart.
### Lubrication System

<table>
<thead>
<tr>
<th>Type</th>
<th>Full Pressure System</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Capacity-Less Filter</td>
<td>15 gallons (57 liters)</td>
</tr>
<tr>
<td>System Capacity-With Filter</td>
<td>16.9 gallons (64 liters)</td>
</tr>
<tr>
<td>Oil Filter</td>
<td>Full flow disposable spin-on</td>
</tr>
<tr>
<td>Oil Cooler</td>
<td>Full flow integrated design</td>
</tr>
<tr>
<td>Oil Pressure At Rated Speed</td>
<td>43.5-72.5 psi (300-500 kPa)</td>
</tr>
</tbody>
</table>

**Cooling System**

| 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           |
| Water Pump: Type               | Centrifugal          |
| Coolant Flow                   | 166.2 gal/min (630L/min) |
| Exchanger Cooling Air Consumption | 14408 cfm (408m³/min) |
| Heat Rejection At Rated Load:  |                     |
| To Coolant                     | 13364 BTU/min (312m³/min) |
| Fan Diameter                   | 35in. (890mm)        |
| Fan Horsepower                 | 16hp (12kW) |
| Maximum Static Pressure Head   | 70 psi (50kPa) |
| Maximum Top Tank Temperature   | 217°F (103°C) |

### Exhaust System

| Exhaust Flow at Rated kW       | 41176 cfm (116.6 m³/min) |
| Exhaust Temperature at Rated kW| 1035°F (560°C) |
| Maximum Allowable Backpressure | 28.1 in wc (7 kPa) |
| Heat Rejection To Exhaust:     | 274108 Btu/min (482 kW) |

### Derating Factors

<table>
<thead>
<tr>
<th>Altitude</th>
<th>Ambient Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>50Hz &lt;3000m=4%/500m</td>
<td>1.5%/5°C&gt;40°C</td>
</tr>
<tr>
<td>60Hz &gt;3000m=6%/500m</td>
<td></td>
</tr>
</tbody>
</table>

**Generating Controller**

- ICS-50™ microprocessor-based digital generator controller.
- 12 or 24 Volt DC compatible.
- Meets all NFPA 110 requirements for emergency power systems Level 1 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 ±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
- Spare Programmable Digital Faults

**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
- 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
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

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN</td>
<td>145.00 inches</td>
<td>61.00 inches</td>
<td>78.39 inches</td>
</tr>
<tr>
<td></td>
<td>3683.0 mm</td>
<td>1549.4 mm</td>
<td>1991.1 mm</td>
</tr>
<tr>
<td>STANDARD</td>
<td>145.00 inches</td>
<td>61.00 inches</td>
<td>111.63 inches</td>
</tr>
<tr>
<td>HOUSING</td>
<td>3683.0 mm</td>
<td>1549.4 mm</td>
<td>2835.4 mm</td>
</tr>
<tr>
<td>SOUND HOUSING</td>
<td>184.08 inches</td>
<td>61.00 inches</td>
<td>112.28 inches</td>
</tr>
<tr>
<td></td>
<td>4675.6 mm</td>
<td>1549.4 mm</td>
<td>2851.9 mm</td>
</tr>
</tbody>
</table>

Weight: Dry
- 7,387 lbs/3,351 kg

Weight: Wet
- 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: