

**GGW400G | 21.9L | 400kW**

**INDUSTRIAL SPARK-IGNITED GENERATOR SET**

PRAMAC | Power Engineering Division



\*Assembled in the USA using domestic and foreign parts

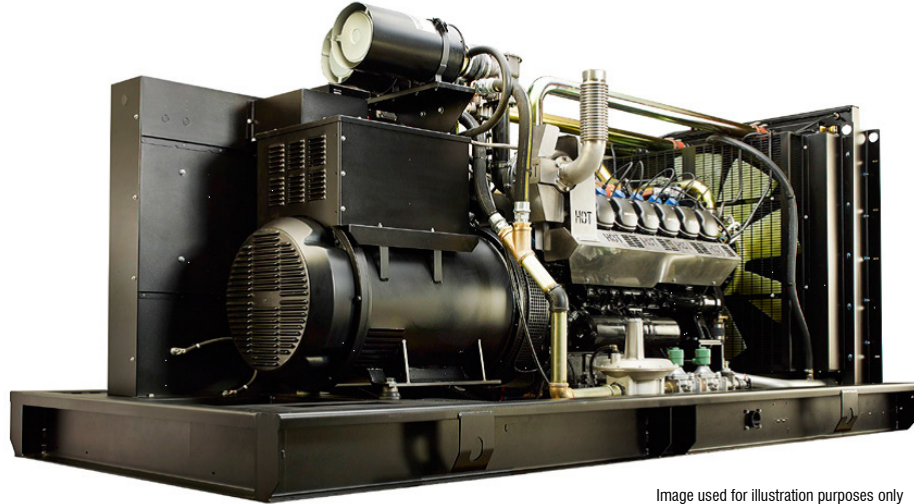


Image used for illustration purposes only

Power Ratings		
GGW400	Standby	400 kW/500 kVA
	Prime	360 kW/450 kVA

## Codes and Standards

PRAMAC products are designed to the following standards:



BS5514 and DIN 6271



SAE J1349



NFPA 37, 70, 99, 110



NEC700, 701, 702, 708



ISO 3046, 7637, 8528, 9001



NEMA ICS10, MG1, 250, ICS6, AB1



ANSI C62.41

## ENERGY GENERATION

PRAMAC ensures superior quality and performance by managing all aspects of production: from design to manufacturing.

PRAMAC can trace its roots back to 1966; from then onwards it has been expanding its activity in the energy and material-handling sector, continuously growing globally with a wide and flexible product range.

In the field of power generation, PRAMAC offers solutions for every kind of power supply demand: portable and industrial generators for stand by and prime power applications and mobile and towable lighting for outdoor needs.

PRAMAC operates through a wide distribution network and provides global coverage even in the most demanding markets.



**STANDARD FEATURES**

**ENGINE SYSTEM**

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Critical Exhaust Silencer

**Fuel System**

- Primary and Secondary Fuel Shutoff

**Cooling System**

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

**Electrical System**

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

**ALTERNATOR SYSTEM**

- GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Permanent Magnet Excitation
- Sealed Bearing
- Amortisseur Winding
- Full Load Capacity Alternator

**GENERATOR SET**

- Internal Genset Vibration Isolation
- Separation of Circuits-High/Low Voltage
- Wrapped Exhaust Piping (Enclosed Only)
- Standard Factory Testing
- 1 Year Limited Warranty or 1,000 Hours
- Silencer Mounted in the Discharge Hood (Enclosed Only)

**ENCLOSURE (If Selected)**

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuation Enclosures)
- Gasketed Doors
- Stamped Air-Intake Louvers
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

**CONTROL SYSTEM**



**Digital H Control Panel—Dual 4x20 Display**

**Program Functions**

- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- 3-Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)

- Auto/Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

**Full System Status Display**

- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level

- Engine Speed
- Battery Voltage
- Frequency

**Alarms and Warnings**

- Oil Pressure
- Coolant Temperature
- Coolant Level
- Low Fuel Pressure Alarm
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)



**CONFIGURABLE OPTIONS**

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**ENGINE SYSTEM**

- Engine Coolant Heater with Ball Valves
- Air Filter Restriction Indicator
- Stone Guard (Open Set Only)
- Oil Heater
- Flexible Fuel Line

**ELECTRICAL SYSTEM**

- 10A Battery Charger
- Battery Warmer

**ALTERNATOR SYSTEM**

- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Coating (480/600V Non-Upsized Only)

**CIRCUIT BREAKER OPTIONS**

- Main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breaker

**GENERATOR SET**

- GenLink Communications Software (English Only)
- Extended Factory Testing (3-Phase Only)
- 12 Position Load Center

**ENCLOSURE**

- Weather Protected Enclosure
- Level 1 Sound Attenuation
- Level 2 Sound Attenuation
- Level 2 Sound Attenuation with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure
- Up to 321 KMH Wind Load Rating\*
- AC/DC Enclosure Lighting Kit
- Door Open Alarm Switch

**CONTROL SYSTEM**

- 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Oil Temperature Indicator with Alarm
- Remote E-Stop (Break Glass-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- Remote Communication - Modem
- 10A Run Relay
- Ground Fault Indication and Protection Functions

\*Contact factory for availability.

**ENGINEERED OPTIONS**

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**ENGINE SYSTEM**

- Fluid Containment Pan
- Low Fuel Pressure System (7–11 in H<sub>2</sub>O / 1.7–2.7 kPa)

**ALTERNATOR SYSTEM**

- 3rd Breaker System

**CONTROL SYSTEM**

- Spare Inputs (x4) / Outputs (x4)
- Battery Disconnect Switch

**GENERATOR SET**

- Special Testing
- Battery Box

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### APPLICATION AND ENGINEERING DATA

#### ENGINE SPECIFICATIONS

##### General

Make	Generac
Cylinder #	12
Type	V
Displacement – in <sup>3</sup> (L)	1,336.42 (21.9)
Bore – in (mm)	5.03 (128)
Stroke – in (mm)	5.6 (142)
Compression Ratio	12.5:1
Intake Air Method	Turbocharged/Aftercooled
Number of Main Bearings	7
Connecting Rods	Steel Alloy
Cylinder Head	Cast Iron – OHV
Cylinder Liners	Cast Steel Alloy
Ignition	Electronic
Piston Type	Aluminum Alloy
Crankshaft Type	Forged Steel Alloy
Lifter Type	Solid
Intake Valve Material	High Temp Steel Alloy
Exhaust Valve Material	High Temp Steel Alloy
Hardened Valve Seats	High Temp Steel Alloy

##### Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

##### Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Twin Full-Flow with Intercooler
Crankcase Capacity – qt (L)	31.7 (30)

#### ALTERNATOR SPECIFICATIONS

Standard Model	Generac 520 mm
Poles	4
Field Type	Revolving
Insulation Class – Rotor	H
Insulation Class – Stator	H
Total Harmonic Distortion	<5%
Telephone Interference Factor (TIF)	<50

##### Cooling System

Cooling System Type	Pressurized Closed Recovery
Fan Type	Pusher
Fan Speed – rpm	1,404
Fan Diameter – in (mm)	44 (1,117)

##### Fuel System

Fuel Type	Natural Gas
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard (Dual)
Operating Fuel Pressure – in H <sub>2</sub> O (kPa)	11–15 (2.7–3.7)
Optional Operating Fuel Pressure – in H <sub>2</sub> O (kPa)	7–11 (1.7–2.7)

##### Engine Electrical System

System Voltage	24 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 10000016949
Battery Voltage	(2) - 12 VDC
Ground Polarity	Negative

Standard Excitation	Permanent Magnet
Bearings	Sealed Ball
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

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### OPERATING DATA

#### POWER RATINGS – NATURAL GAS

	Standby	Prime
Single-Phase 120/240 VAC @0.8pf	400 kW/400 kVA Amps: 1,667	360 kW/360 kVA Amps: 1,500
Three-Phase 120/208 VAC @0.8pf	400 kW/500 kVA Amps: 1,389	360 kW/450 kVA Amps: 1,250
Three-Phase 120/240 VAC @0.8pf	400 kW/500 kVA Amps: 1,204	360 kW/450 kVA Amps: 1,083
Three-Phase 277/480 VAC @0.8pf	400 kW/500 kVA Amps: 602	360 kW/450 kVA Amps: 542
Three-Phase 346/600 VAC @0.8pf	400 kW/500 kVA Amps: 481	360 kW/450 kVA Amps: 433

#### STARTING CAPABILITIES (sKVA)

##### sKVA vs. Voltage Dip

		277/480 VAC						208/240 VAC						
Alternator	kW	10%	15%	20%	25%	30%	35%	kW	10%	15%	20%	25%	30%	35%
Standard	400	387	581	775	968	1,162	1,356	400	345	570	835	1,100	1,450	1,710
Upsize 1	555	457	686	914	1,143	1,371	1,600	–	–	–	–	–	–	–
Upsize 2	642	471	707	943	1,179	1,414	1,650	642	543	814	1,086	1,357	1,629	1,900

#### FUEL CONSUMPTION RATES\*

##### Natural Gas – ft<sup>3</sup>/hr (m<sup>3</sup>/hr)

Percent Load	Standby	Prime
25%	1,856 (52.6)	1,670 (47.3)
50%	2,845 (80.5)	2,561 (72.5)
75%	3,833 (108.5)	3,450 (97.7)
100%	4,823 (136.6)	4,341 (122.9)

\* Fuel supply installation must accommodate fuel consumption rates at 100% load.

#### COOLING

	Standby	Prime	
Air Flow (Inlet Air Combustion and Radiator)	ft <sup>3</sup> /min (m <sup>3</sup> /min)	23,747 (672)	23,747 (721)
Coolant Flow	gal/min (L/min)	211 (800)	211 (800)
Coolant System Capacity	gal (L)	20.5 (77.6)	20.5 (77.6)
Heat Rejection to Coolant	BTU/hr (kW)	1,187,880 (348.1)	1,069,092 (313.3)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin 10000011339	
Maximum Radiator Backpressure	in H <sub>2</sub> O (kPa)	0.5 (0.12)	0.5 (0.12)

#### COMBUSTION AIR REQUIREMENTS

	Standby	Prime
Flow at Rated Power – cfm (m <sup>3</sup> /min)	750 (21.0)	672 (19.0)

#### ENGINE

	Standby	Prime	
Rated Engine Speed	rpm	1,800	1,800
Horsepower at Rated kW	hp	636	572
Piston Speed	ft/min (m/min)	1,680 (512.1)	1,680 (512.1)
BMEP	psi (kPa)	209 (1,441)	188 (1,296)

#### EXHAUST

	Standby	Prime	
Exhaust Flow (Rated Output)	cfm (m <sup>3</sup> /min)	2,513 (71.1)	2,252 (63.7)
Max. Allowable Backpressure	inHg (kPa)	0.75 (2.54)	0.75 (2.54)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	1,350 (732)	1,334 (723)

Deration – See Bulletin 10000011339

Standby – See Bulletin 10000018933

Prime – See Bulletin 10000018926

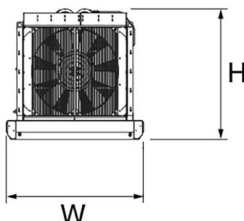
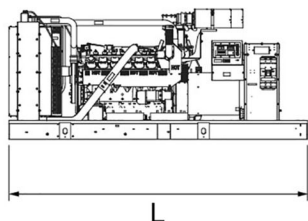
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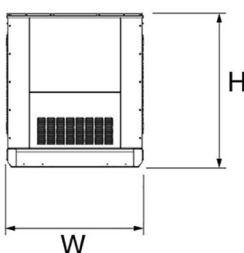
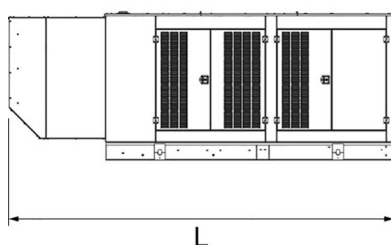


### DIMENSIONS AND WEIGHTS\*



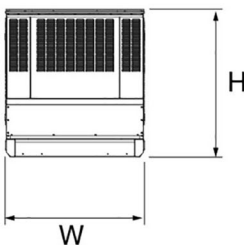
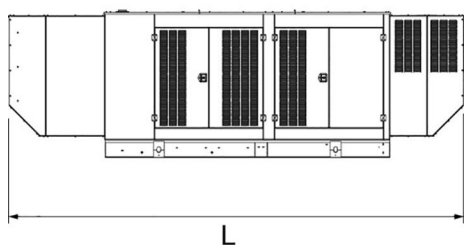
#### OPEN SET (Includes Exhaust Flex)

L x W x H – in (mm)	154.4 (3,923) x 71 (1,803) x 67 (1,702)
Weight – lbs (kg)	8,429 (3,823)



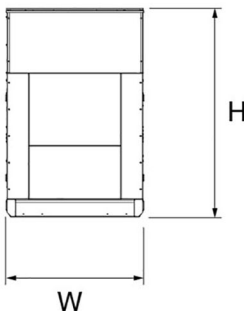
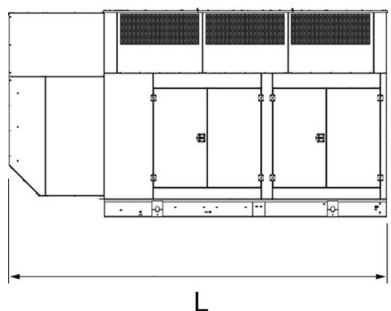
#### STANDARD ENCLOSURE

L x W x H – in (mm)	207.4 (5,268) x 71 (1,803) x 80 (2,032)
Weight – lbs (kg)	Steel: 10,428 (4,730) Aluminum: 9,298 (4,217)



#### LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H – in (mm)	247.5 (6,285) x 71 (1,803) x 80 (2,032)
Weight – lbs (kg)	Steel: 11,211 (5,085) Aluminum: 9,720 (4,409)



#### LEVEL 2 ACOUSTIC ENCLOSURE

L x W x H – in (mm)	207.4 (5,268) x 71 (1,803) x 114 (2,899)
Weight – lbs (kg)	Steel: 11,759 (5,333) Aluminum: 9,951 (4,513)

\* Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a PRAMAC Industrial Dealer for detailed installation drawings.