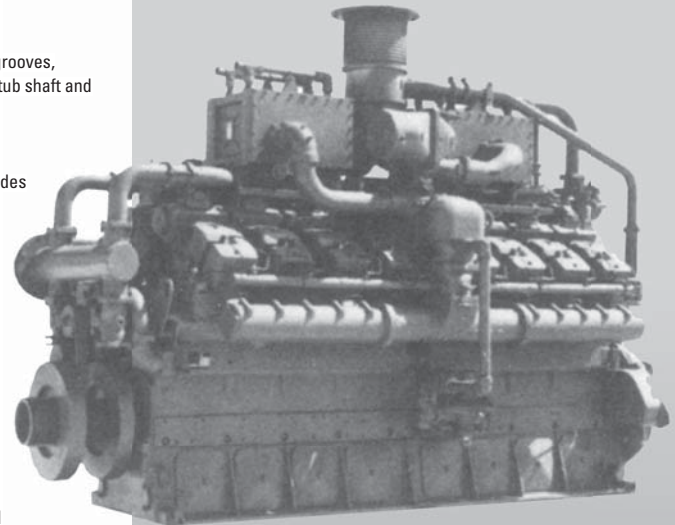


**STANDARD EQUIPMENT**

- AIR CLEANER** – Engine mounted. Dry type, including pad type precleaner and service indicator. For sheltered installation and average dust environment.
- BARRING DEVICE** – Manual.
- BEARINGS** – Heavy duty, replaceable, precision type.
- BREATHER** – Ejector type, extractor, plumbed into exhaust stream.
- CONNECTING RODS** – Drop forged steel, rifle drilled.
- CONTROL SYSTEM** – Pneumatic. Includes pilot operated valves for air start and prelube. Engine mounted control panel with two push button valves. Pilot operated air start valves omitted when starter is not furnished by Waukesha.
- CRANKCASE** – Integral crankcase and cylinder frame. Main bearing caps drilled and tapped for temperature sensors. Does not include sensors.
- CRANKSHAFT** – Counterweighted, forged steel, ten main bearings, and dynamically balanced.
- CRANKSHAFT PULLEY, FRONT SEGMENT** – Ten inch (254 mm) pitch diameter pulley, with six c-section drive grooves, front end drive assembly, and outboard bearing. Outboard bearing not mounted. Includes engine mounted stub shaft and coupling guard.
- CYLINDERS** – Removable wet type bainitic cast iron cylinder liners, chrome plated on outer diameter.
- CYLINDER HEADS** – Sixteen interchangeable. Two hard faced intake and two hard faced exhaust valves per cylinder. Hard faced intake and exhaust valve seat inserts. Roller valve lifters and hydraulic push rods. Includes prechamber and related fuel control valves.
- ENGINE ROTATION** – Counterclockwise when facing flywheel.
- EXHAUST OUTLET** – Single vertical at center. Flexible stainless steel connection with 14" (356 mm) pipe flange.
- EXHAUST THERMOCOUPLES** – 18 K-type thermocouples. One for each individual cylinder and one pre-turbine for each bank all factory wired to the exhaust thermocouple junction box.
- FLYWHEEL** – Approx. WR<sup>2</sup> = 155000 lb-in<sup>2</sup>; with ring gear (208 teeth), machined to accept two drive adapters; 31.88" (810 mm) pilot bore, 30.25" (768 mm) bolt circle, (12) .75" – 10 tapped holes, or 28.88" (734 mm) pilot bore, 27.25" (692 mm) bolt circle, (12) 0.625" – 11 tapped holes and (12) 0.75" – 10 tapped holes.
- FLYWHEEL GUARD**
- FUEL SYSTEM** – Dual natural gas, 4" (102 mm) duplex downdraft carburetors. Two mounted Mooney Flowgrid 250, 2" (51 mm) gas regulators, 43 – 60 psi (296 – 414 kPa) gas inlet pressure required. Prechamber fuel system and control logic.
- GOVERNOR** – Woodward UG-8LD hydraulic lever type, with friction type speed control. Mounted on right hand side.
- IGNITION** – Waukesha Custom Engine Control Ignition Module. Electronic digital ignition system. 24V DC power required.
- INSTRUMENT PANEL** – Engine mounted, includes jacket water temperature, lube oil pressure, lube oil temperature, intake manifold compound vacuum-pressure, intake manifold temperature gauges, and digital electronic tachometer. Selector switch and jack for reading exhaust temperature with a portable pyrometer. (Pyrometer not included.) Eighteen exhaust temperature thermocouples.
- INTERCOOLER** – Air-to-water.
- LEVELING BOLTS**
- LIFTING EYES**
- LUBRICATION** – Full pressure. Gear type pump. Full flow filter, 45 gallon (170 litres) capacity, not mounted. Includes lube oil strainer (mounted on engine) and flexible connections (shipped loose). Air/gas motor driven prelube pump. Requires final piping.
- MANIFOLDS** – Exhaust, (2) water cooled.
- OIL COOLER** – With thermostatic temperature controller and pressure regulating valve. Not mounted.
- OIL PAN** – Base type. 165 gallon (625 litres) capacity including filter and cooler.
- PAINT** – Oilfield orange primer.
- PISTONS** – Aluminum with floating pin. Oil cooled.
- SHIPPING SKID** – For domestic truck or rail.
- TURBOCHARGERS** – Two, dry type. Wastegate controlled.
- VIBRATION DAMPER** – Viscous type. Guard included with remote mounted radiator or no radiator.
- WATER CIRCULATING SYSTEM, AUXILIARY CIRCUIT** – Belt driven water circulating high capacity pump for intercooler and lube oil cooler. See S6535-16 performance curve for use with standard 10" diameter crankshaft pulley. Includes thermostatic valve.
- WATER CIRCULATING SYSTEM, ENGINE JACKET** – Belt driven water circulating pump, 175 – 180°F (79 – 82°C) individual cylinder thermostats, full flow bypass. Flange connections and mating flanges for (2) 4.5" (114 mm) inlets and (1) 6" (152 mm) outlet.

**VHP® Series Gas Engine**

1314 - 2063 BHP  
(980 - 1538 kWb)



**Model P9390GL**

Turbocharged and Intercooled, Lean Combustion, Sixteen Cylinder, Four-Cycle Gas Fueled Engine

**SPECIFICATIONS**

<b>Cylinders</b>	<b>Lube Oil Capacity</b>
V 16	165 gal. (625 L)
<b>Piston</b>	<b>Starting System</b>
<b>Displacement</b>	125 - 150 psi air/gas
9388 cu. in.	24V electric
(154 L)	<b>Dry Weight</b>
<b>Bore &amp; Stroke</b>	28,750 lb. (13040 kg)
9.375" x 8.5"	<b>Full Load Exhaust Emissions</b>
(238 x 216 mm)	NOx- .50 g/bhp-hr
<b>Compression Ratio</b>	CO-2.65 g/bhp-hr
10.5:1	NMHC-1.00 g/bhp-hr
<b>Jacket Water System Capacity</b>	
148 gal. (560 L)	



## POWER RATINGS: P9390GL VHP SERIES GAS ENGINES

Model	I.C. Water Inlet Temp. °F (°C) (Tcr)	C.R.	Brake Horsepower (kWb Output)				
			800 rpm	900 rpm	1000 rpm	1100 rpm	1200 rpm
High Speed Turbo <sup>1</sup>	85° (29°)	10.5:1	1345 (1003)	1547 (1154)	1719 (1282)	1891 (1410)	2063 (1538)
High Speed Turbo <sup>1</sup>	130° (54°)	10.5:1	1038 (774)	1478 (1102)	1642 (1224)	1806 (1347)	1970 (1469)
Low Speed Turbo <sup>2</sup>	85° (29°)	10.5:1	1375 (1025)	1547 (1154)	1719 (1282)	---	---
Low Speed Turbo <sup>2</sup>	130° (54°)	10.5:1	1314 (980)	1478 (1102)	1642 (1224)	---	---

<sup>1</sup>High speed turbocharger match - 1001 - 1200 rpm

<sup>2</sup>Low speed turbocharger match - 700 - 1000 rpm

**Rating Standard:** All models: Ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and auxiliary water temperature Tcr (clause 10.1) as specified above limited to ± 10° F (± 5° C). Ratings are also valid for SAE J1349, BS5514, DIN6271 and AP17B-11C standard atmospheric conditions.

**ISO Standard Power/Continuous Power Rating:** The highest load and speed which can be applied 24 hours a day, seven days a week, 365 days per year except for normal maintenance. It is permissible to operate the engine at up to 10% overload, or maximum load indicated by the intermittent rating, whichever is lower, for two hours in each 24 hour period.

All natural gas engine ratings are based on a fuel of 900 Btu/ft<sup>3</sup> (35.3 MJ/nm<sup>3</sup>) SLHV, with a 91 WKI®.

For conditions or fuels other than standard, contact the Dresser Waukesha Application Engineering Department.

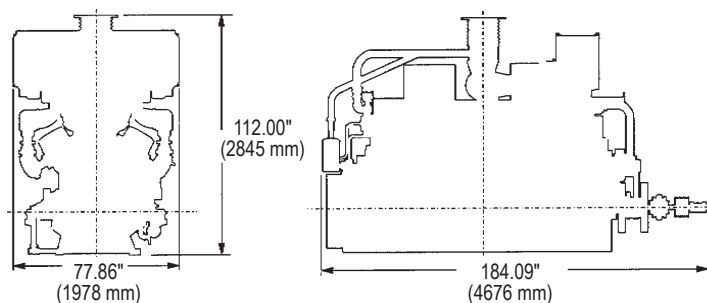
## PERFORMANCE: P9390GL VHP SERIES GAS ENGINES

	English	130° F ICW		85° F ICW		Metric	54° C ICW		29° C ICW		
	RPM	1200	1000	1200	1000		RPM	1200	1000	1200	1000
	Power (Bhp)	1970	1642	2063	1719	Power (kWb)	1470	1225	1539	1282	
Low NO <sub>x</sub> Settings	BSFC (Btu/bhp-hr)	7205	6860	7230	6885	Low NO <sub>x</sub> Settings	BSFC (kJ/kW-hr)	10195	9707	10230	9742
	NO <sub>x</sub> (grams/bhp-hr)	0.90	0.90	0.70	0.70		NO <sub>x</sub> (g/nm <sup>3</sup> )	0.37	0.37	0.29	0.29
	CO (grams/bhp-hr)	2.75	2.65	2.65	2.55		CO (g/nm <sup>3</sup> )	1.14	1.10	1.10	1.05
	NMHC (grams/bhp-hr)	1.00	1.00	1.10	1.10		NMHC (g/nm <sup>3</sup> )	0.41	0.41	0.45	0.45
Low Fuel Consumption Settings	BSFC (Btu/bhp-hr)	6960	6665	6985	6690	Low Fuel Consumption Settings	BSFC (kJ/kW-hr)	9848	9431	9884	9466
	NO <sub>x</sub> (grams/bhp-hr)	1.50	1.60	1.30	1.40		NO <sub>x</sub> (g/nm <sup>3</sup> )	0.62	0.66	0.54	0.58
	CO (grams/bhp-hr)	3.00	2.75	2.90	2.65		CO (g/nm <sup>3</sup> )	1.24	1.14	1.20	1.10
	NMHC (grams/bhp-hr)	0.70	1.00	0.80	1.10		NMHC (g/nm <sup>3</sup> )	0.29	0.41	0.33	0.45

Typical data is shown. Consult factory for guaranteed data.

### NOTES:

- Performance ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and Tcr limited to ± 10° F.
- Fuel consumptions based on ISO 3046/1-1995 with a +5% tolerance for commercial quality natural gas having a 900 Btu/ft<sup>3</sup> saturated low heat value.
- Data based on standard conditions of 77° F (25° C) ambient temperature, 29.53 inches Hg (100kPa) barometric pressure, 30% relative humidity (0.3 inches Hg /1 kPa water vapor pressure).
- Data will vary due to variations in site conditions. For conditions and/or fuels other than standard, consult the Dresser Waukesha Application Engineering Department.



Consult your local Waukesha Distributor for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

Bulletin 7006 1008

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