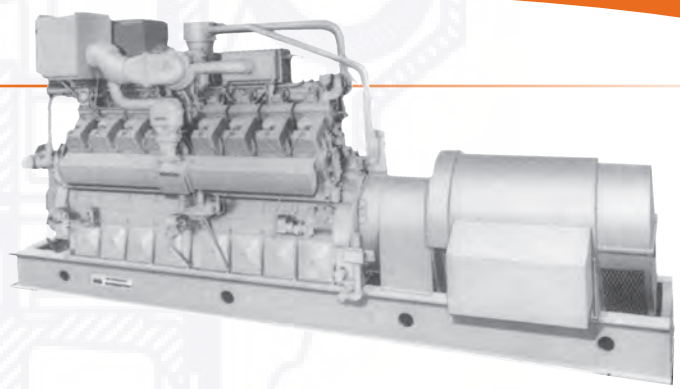
DRESSER Waukesha

VHP9500GSI/GSID

VHP® Series Gas Enginator® Generating System
1175 - 1825 kW

Specifications



Dresser Waukesha Engine: P9390GSI, Four Cycle, Overhead Valve
Cylinders: V16
Piston Displacement: 9388 cu. in. (154 L)
Bore & Stroke: 9.375" x 8.5" (238 x 216 mm)
Compression Ratio: 8:1
Jacket Water System Capacity: 148 gal. (560 L)
Lube Oil Capacity: 165 gal. (625 L)
Starting System: 150 psi air

Standard Equipment

AIR CLEANERS – Dry type with rain shield and service indicators.

BARRING DEVICE – Manual.

BEARINGS – Heavy duty, replaceable, precision type.

BREATHER – Closed system.

CONNECTING RODS – Forged steel, rifle drilled.

COOLING SYSTEM – Choice of heat exchanger with expansion tank, or connection for remote radiator cooling. (One shutdown level switch for each circuit included on heat exchange units).

CRANKCASE – Integral crankcase and cylinder frame.

CRANKSHAFT – Counterweighted, forged steel, hardened journals, dynamically balanced, with sealed viscous vibration damper.

CYLINDER HEADS – Interchangeable valve–in–head type. Two hard faced intake and two hard faced inconel exhaust valves per cylinder. Hard faced intake and exhaust valve seat inserts.

CYLINDERS – 9.375" (238 mm) bore x 8.5" (216 mm) stroke. Removable wet cylinder liners. Number of cylinders – Sixteen.

ENGINATOR BASE – Engine, generator and heat exchanger (if specified) are mounted and aligned on a welded steel, wide flange base, designed for solid mounting on an inertia block, with standard base lifting eyes.

ENGINE PROTECTION SHUTDOWN CONTACTS – For high water temperature, low oil pressure, high intake manifold temperature (GSI
units only) and overspeed (electronic speed switch – shipped loose).
Use in conjunction with a DC control panel for unit shutdown, (reference Engomatic® controls). Note: DC shutdown control panel is not supplied as standard.

EXHAUST SYSTEM – Water cooled exhaust manifold with single vertical exhaust at center. Flexible stainless steel exhaust connection 8" (203 mm) long with 14" (356 mm) flange on GSI.

FUEL SYSTEM – Two natural gas 4" downdraft carburetors, two Fisher 99 gas regulators, one 2" NPT flexible connection (shipped loose), and one 2" NPT Magnatrol gas solenoid valve (shipped loose). Fuel pressure – 30 PSIG minimum and 50 PSIG maximum. (207-414 kPa).

GENERATOR – Open, dripproof, direct connected, fan cooled, 2/3 pitch, A.C. revolving field type, two bearing generator with flexible coupling, brushless exciter, short circuit sustain (PMG type maintains 270% of
rated generator current for up to 10 seconds on 105° C temperature rise generators; maintains 250% of current on 130° C rise generators) and damper windings. TIF and Deviation Factor within NEMA MG-1.32. Voltage 480/277, 3 phase, 4 wire, Wye 60 Hz and 400/230, 3 phase, 4 wire, Wye 50 Hz. Other voltages are available, consult factory. Insulation material NEMA Class F. Temperature rise within NEMA (105° C) for continuous power duty, within NEMA (130° C) for standby duty. All generators are rated at 0.8 Power Factor. Includes space heater, 115/230 V, 1 phase.

GOVERNOR – Woodward Model EG10P electric actuator (mounted), magnetic pickup (mounted) and a separate electric governor control, Woodward Model 2301D (shipped loose).

IGNITION – Waukesha Custom Engine Control® Ignition Module. Electronic digital ignition system.

INSTRUMENT PANEL – Engine mounted, includes water temperature, oil temperature, oil pressure, intake manifold temperature, and intake manifold pressure-vacuum gauge. All temperature sensors have thermowells. Two engine mounted run-stop push buttons are supplied. Recommend optional Model 4000 free standing panel for continuous power installations.

INTERCOOLER – Air to water.

JUNCTION BOXES – Separate AC, DC and instrument/ thermocouple junction boxes for engine wiring and external connections.

LUBRICATION – Full pressure, positive displacement pump. Full flow oil filter (shipped loose) and flexible connections (shipped loose). 50 or 60 Hz, 230 volt AC, single phase electric motor driven intermittent prelube pump with motor starter (other voltages can be specified). Note: External control logic required to start/ stop prelube pump.

OIL COOLER – Shell and tube type (mounted).

OIL PAN – Cast alloy iron base type with removable doors.

PAINT – Oilfield Orange.

PISTONS – Aluminum with floating pin. Oil cooled.

STARTING EQUIPMENT – One air starter with strainer and lubricator. Includes 24 VDC solenoid valve for remote start provision and crank termination switch (shipped loose).

TURBOCHARGERS – Two with water cooled bearing housings. Wastegate controlled.

VOLTAGE REGULATOR (shipped loose) – SCR static automatic type providing 1% regulation from no load to full load, three phase sensing and automatic subsynchronous speed protection. Includes voltage adjustment rheostat (shipped loose).

WATER CIRCULATING SYSTEM, AUXILIARY CIRCUIT – Belt driven water circulating high capacity pump for intercooler and lube oil cooler. See S6535-14 performance curve for use with standard 10" diameter crankshaft pulley.

WATER CIRCULATING SYSTEM, ENGINE JACKET – Belt driven water pump, 175 – 180° F (79 – 82° C) thermostatic temperature regulation full flow bypass. Single ANSI flange connections for inlet and outlet on water connect units.

PERFORMANCE: VHP9500GSI Gas Enginator® Generating System

Heat Exchanger Cooling Intercooler Water: 85°F (29°C)		Continuous Power		Standby Power	
		1200 rpm 60 Hz	1000 rpm 50 Hz	1200 rpm 60 Hz	1000 rpm 50 Hz
	kW Rating	**1475**	**1225**	**1825**	**1520**
	BSFC Btu/bhp-hr (kJ/kW-hr)	7774 (10997)	7541 (10667)	7766 (10985)	7419 (10494)
	Fuel Consumption Btu/hr x 1000 (kW)	16039 (4701)	12963 (3799)	19881 (5827)	15832 (4639)
Heat Balance	Heat to Jacket Water Btu/hr x 1000 (kW)	5055 (1481)	4130 (1210)	6205 (1819)	4905 (1438)
Heat Balance	Heat to Lube Oil Btu/hr x 1000 (kW)	522 (153)	455 (133)	618 (181)	525 (154)
Heat Balance	Heat to Intercooler Btu/hr x 1000 (kW)	439 (129)	306 (90)	581 (170)	404 (118)
Heat Balance	Heat to Radiation Btu/hr x 1000 (kW)	818 (240)	735 (216)	859 (252)	775 (227)
Heat Balance	Total Exhaust Heat Btu/hr x 1000 (kW)	4250 (1325)	3475 (1018)	5920 (1734)	4445 (1303)
Intake/ Exhaust System	Induction Air Flow scfm (Nm^3/hr)	2945 (4524)	2375 (3654)	3630 (5583)	2885 (4433)
Intake/ Exhaust System	Exhaust Flow lb/hr (kg/hr)	13715 (6222)	11080 (5027)	16930 (7680)	13450 (6101)
Intake/ Exhaust System	Exhaust Temperature °F (°C)	1177 (636)	1124 (607)	1247 (675)	1189 (643)

Water Connection Cooling Intercooler Water: 130°F (54°C)					
	kW Rating	**1400**	**1175**	**1750**	**1450**
	BSFC Btu/bhp-hr (kJ/kW-hr)	7831 (11078)	7685 (10871)	7763 (10982)	7405 (10475)
	Fuel Consumption Btu/hr x 1000 (kW)	15428 (4521)	12619 (3698)	18997 (5568)	15099 (4424)
Heat Balance	Heat to Jacket Water Btu/hr x 1000 (kW)	4901 (1436)	4187 (1227)	5920 (1735)	4760 (1394)
Heat Balance	Heat to Lube Oil Btu/hr x 1000 (kW)	510 (150)	453 (133)	595 (174)	514 (151)
Heat Balance	Heat to Intercooler Btu/hr x 1000 (kW)	314 (92)	210 (61)	466 (136)	273 (80)
Heat Balance	Heat to Radiation Btu/hr x 1000 (kW)	715 (209)	638 (187)	846 (248)	777 (228)
Heat Balance	Total Exhaust Heat Btu/hr x 1000 (kW)	4527 (1327)	3404 (997)	5665 (1661)	4260 (1248)
Intake/ Exhaust System	Induction Air Flow scfm (Nm^3/hr)	3081 (4735)	2520 (3872)	3505 (5384)	2745 (4222)
Intake/ Exhaust System	Exhaust Flow lb/hr (kg/hr)	13713 (6220)	11216 (5086)	16320 (7403)	12810 (5810)
Intake/ Exhaust System	Exhaust Temperature °F (°C)	1177 (636)	1109 (599)	1250 (677)	1192 (644)
Emissions	NOx g/bhp-hr (mg/nm^3 @ 5% O_2)	13.00 (4815)	13.00 (4815)	13.00 (4815)	13.00 (4815)
Emissions	CO g/bhp-hr (mg/nm^3 @ 5% O_2)	9.00 (3333)	9.00 (3333)	9.00 (3333)	9.00 (3333)
Emissions	THC g/bhp-hr (mg/nm^3 @ 5% O_2)	2.00 (741)	2.00 (741)	2.00 (741)	2.00 (741)
Emissions	NMHC g/bhp-hr (mg/nm^3 @ 5% O_2)	0.30 (111)	0.30 (111)	0.30 (111)	0.30 (111)

Typical heat data is shown, however no guarantee is expressed or implied. Consult your Dresser Waukesha Application Engineering Department for system application assistance.

All natural gas engine ratings are based on a fuel of 900 Btu/ft^3 (35.3 MJ/nm^3) SLHV, with a 91 WKI®. For conditions or fuels other than standard, consult the Dresser Waukesha Application Engineering Department.

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).

Fuel consumption based on ISO3046/1-1995 with a tolerance of +5% for commercial quality natural gas having a 900 BTU/ft^3 (35.3 MJ/nm^3) SLHV.

Heat data based on fuel consumption +2%.

Heat rejection based on cooling exhaust temperature to 77°F (25°C).

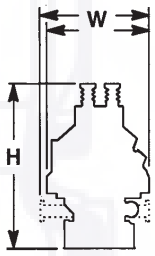
Rating Standard: The Waukesha Enginator ratings are based on ISO 3046/1-1995 with an engine mechanical efficiency of 90% and auxiliary water temperature Tcra as specified limited to ±10°F (±5°C). Ratings also valid for ISO 8528 and DIN 6271, BS 5514 standard atmospheric conditions.

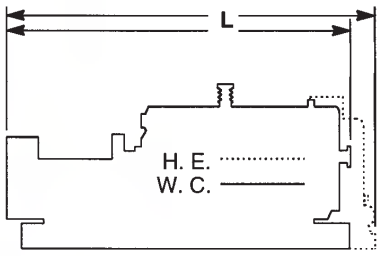
Continuous Power Rating: The highest electrical power output of the Enginator available for an unlimited number of hours per year, less maintenance. It is permissable to operate the Enginator with up to 10% overload for two hours in each 24 hour period.

Standby Power Rating: This rating applies to those systems used as a secondary source of electrical power. This rating is the electrical power output of the Enginator (no overload) 24 hours a day, for the duration of a power source outage.

Cooling

Equipment	L in (mm)	W in (mm)	H in (mm)	Avg. Wt. lb (kg)
Heat Exchanger	290 (7370)	92 (2340)	130 (3300)	48250 (21040)
Water Connection	265 (6730)	87 (2210)	130 (3300)	46750 (21200)





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