

Specifications

Cylinders: V 16

Engine Displacement: 17398 cu. in. (285 L)

Bore & Stroke: 10.83" x 11.81" (275 x 300 mm)

Compression Ratio: 9:1

Jacket Water System Capacity: 133 gal. (503 L)

Lube Oil Capacity: 275 gal. (1040 L)

Starting System: 150 psi (10.3 bar)

Dry Weight: 115,522 lb. (52,400 kg)



0.5 gm NOx / 1.8 gm CO / 0.7 gm NMHC Capability

Meets 2010 U.S. EPA Spark Ignited New Source Performance Standard (SI NSPS) for NOx, CO and NMHC's without emission aftertreatment

Standard Equipment

AIR INLET AND EXHAUST SYSTEMS

Air Cleaner – Two, dry panel type with mechanical gauge for remote mounting (shipped loose).

Air Inlet Connection – Two 14.17" (360 mm) outside diameter horizontal air inlets. Exhaust Manifold – Dry with protective insulation.

Exhaust Outlet – Two 18.75" B.C. (476.2 mm) horizontal outlet flanges. **BARRING DEVICE** – Manual.

BASE – Engine and generator are mounted and aligned on a structural steel fabricated base designed for mounting on an isolated concrete pad and suitable for lifting. Base must be fully grouted in place according to Waukesha recommendations.

CAMSHAFT – Consists of individual segments, one per cylinder, bolted together. **CONNECTING RODS** – Low alloy, forged, fully machined.

CONTROL SYSTEM – Waukesha Engine System Manager (ESM®) integrates spark timing control, speed governing, detonation detection, NOx control, air fuel ratio control, turbocharger wastegate control, turbocharger compressor bypass control, start-stop control, diagnostic tools, fault logging and engine safeties. Engine Control Unit (ECU) is central brain of the control system and main customer interface. Interface with ESM is through 25 foot (7.6 m) harness to local panel, through MODBUS RTU slave connection RS-485 multidrop hardware, and through the Electronic Service Program (ESP). Customer connections are only required to the local panel, fuel valve, and 24VDC power supply. Compatible with Woodward load sharing module. ESM meets Canadian Standards Association Class I, Division 2, A, B, C & D (Canada & US) hazardous location requirements.

CRANKCASE – Single piece, stress relieved, gray iron casting. Main bearing caps are retained with vertical studs and lateral tie bolts.

CRANKCASE PRESSURE RELIEF DOORS – Eight mounted on side of crankcase. **CRANKCASE**

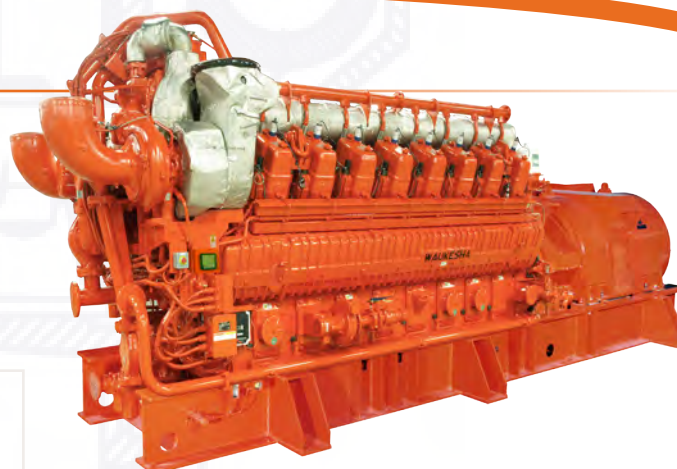
VENTILATION SYSTEM – Forced ventilation with 230V AC/1 ph blower, restriction valve, and check valve. 4" blower outlet for customer connection per local codes. Motor starter shipped loose. Optional 115V AC/1 ph electric motor. **CRANKSHAFT** – Low alloy, forged, fully machined, counterweighted with nine main bearing journals. The crankshaft is flanged for full power transmission from each end. Bearings are heavy duty, replaceable, precision aluminum type.

CYLINDER HEAD – Sixteen interchangeable, bore-cooled with two hard faced intake and two hard faced exhaust valves per head. Includes stainless steel intake and exhaust valve seats and prechamber fuel control valves. No head gaskets are required.

CYLINDER LINER – Removable wet type with intermediate jacket water guide. **ELECTRONIC SERVICE PROGRAM (ESP)** – Microsoft® Windows-based program provided on CD-ROM for programming and interface to ESM. Includes E-Help for troubleshooting any ESM faults. Serial harness is provided for connection of a customer supplied laptop to the ECU RS-232 port.

ENGINE MONITORING DEVICES – Factory mounted Display for NOx emissions with improved ESM user interface, display system and emissions controls. Wired sensors for NOx emissions, lube oil pressure and temperature, intake manifold temperature and pressure, overspeed; and jacket water temperature; all accessible through ESM. Sensors meet Canadian Standards Association Class 1, Division

2, Group A, B, C, & D (Canada & US) hazardous location requirements. ESM continually monitors combustion performance through accelerometers to provide detonation protection. Dual magnetic pick-ups are used for accurate engine speed monitoring. ESM provides predictive spark plug diagnostics as well as advanced diagnostics of engine and all ESM sensors and logs any faults into non-volatile flash memory. K-type thermocouples for individual cylinder exhaust temperatures and pre and post turbocharger temperatures are wired to a common bulkhead. Includes standard 25 foot (7.6m) exhaust thermocouple harness. Main bearing temperature sensors – Type K sensors are wired to bulkhead. Includes 25 foot (7.6 m) main bearing thermocouple harness. Waukesha pre-programmed HMI panel for engine and AFR control readout, 160x128 pixel display with backlight and heater for



operation from -40°F (-40°C) to 167°F (75°C). Five button navigation for multi-screen access. Provides direct interface for AFR setup and monitoring. Shipped mounted on engine. Can be off-engine mounted using optional HMI harness. All ESM and AFR information with alarm and shutdown faults are displayed. MODBUS RS485 communication with all ESM and AFR parameters.

ENGINE PROTECTION DEVICES – Engine emergency shutdown/starter lockout palm button (2) mounted, one wired on either side of the engine. Engine protection is also provided by ESM for: lube oil pressure and temperature, intake manifold temperature and pressure, overspeed, and jacket water temperature.

FLYWHEEL – Mounted, with 291 tooth ring gear. Machined for generator coupling. **FLYWHEEL**

GUARD – Fabricated steel guard for protection of the rotating components is mounted to the engine-generator base.

FUEL SYSTEM – Carburetor with precombustion circuit. Single fuel inlet connection, mounted main and prechamber gas supply regulators and 24V DC pilot operated prechamber fuel valve. Shipped loose 24V DC pilot operated main fuel valve. **GENERATOR** – Open dripproof, direct connected, fan cooled, 2/3 pitch, A.C. revolving field type, anti-friction grease lubricated bearing(s), with brushless PMG type exciter and damper windings. TIF and deviation factor within NEMA MG-1.32. Voltage: 4160 V or 13,800 V, 3 phase, 6 wire WYE, 60 Hz, and 3300 V, 6300

V or 11000 V 3 phase, 6-wire, WYE, 50 Hz. Insulation material NEMA Class F. Temperature rise within NEMA (105° C) for continuous power duty. All generators are rated at 0.8 power factor. Includes terminal standoff assembly and space heater, 115/230 V, 1 phase.

GOVERNOR – Electric throttle actuator controlled by ESM with throttle position feedback. Governor tuning is performed using ESP.

IGNITION SYSTEM – Ignition Power Module (IPMD) controlled by ESM, with spark timing optimized for any speed-load condition. Dual voltage energy levels automatically controlled by ESM to maximize spark plug life. Shielded ignition components meet Canadian Standard Association Class 1, Division 2, A, B, C & D (Canada & US) hazardous location requirements.

INTERCOOLER – Air-to-water, for 130° F (54° C) inlet water.

JUNCTION BOXES – Junction boxes for Enginotor wiring and external connections. **LUBRICATION**

SYSTEM – Gear driven, externally mounted gear type pump with pressure regulator and bypass circuit. Fully mounted and integrated plate type oil cooler and full flow lube oil filters. Includes centrifugal oil bypass filtration for maximum oil and filter life. Intercooler and lube oil cooler plumbed in series. Includes electric motor driven pre/post lube pump

PAINT – Oilfield orange.

PISTON – Single piece, aluminum alloy with integrally cast cooling passages. Four piston rings with the top two compression rings housed in a Ni-resist ring carrier. 9:1 compression ratio.

STARTING SYSTEM – Two TDI 112 turbine pneumatic starters with 24VDC starting valve and strainer. Requires 150 psig (10.3 bar) air/gas supply.

TURBOCHARGER – Two, exhaust driven. Wastegate and compressor bypass actuators controlled by ESM.

VIBRATION DAMPER – Enclosed, viscous type.

VOLTAGE REGULATOR – SCR static automatic type, providing 1% regulation from no load to full load with automatic subsynchronous speed protection. Three phase sensing. Includes voltage adjustment rheostat. All items are shipped loose. **WATER CIRCULATION SYSTEM**

Auxiliary Circuit – Includes mounted 130° F (54° C) auxiliary water temperature control valve with mounted bypass, gear driven water pump, mounted intercooler, and mounted oil cooler. Provides single customer inlet and single customer outlet connection.

Engine Jacket – Includes mounted 180°F (82°C) jacket water temperature control valve with mounted bypass and gear driven water pump. Provides single customer inlet and single customer outlet connection.

PERFORMANCE DATA: 16V275GL+ Gas Enginor® Generating System

Intercooler Water Temperature 130°F (54°C)		1000 RPM 50 Hz 0.5 gm NOx	900 RPM 60 Hz 0.5 gm NOx
	kWe Rating	3480	3110
	BSFC (LHV) Btu/bhp-hr (kJ/kWh)	6466 (9150)	6354 (8991)
	Fuel Consumption - Btu/hr x 1000 (kW)	31263 (9154)	27640 (8093)
Emissions	NOx g/bhp-hr (mg/Nm³ @ 5% O₂)	0.5 (235)	0.5 (240)
	CO g/bhp-hr (mg/Nm³ @ 5% O₂)	1.8 (845)	1.7 (810)
	NMHC g/bhp-hr (mg/Nm³ @ 5% O₂)	0.7 (325)	0.7 (325)
	THC g/bhp-hr (mg/Nm³ @ 5% O₂)	6.0 (2500)	6.5 (2700)
Heat Balance	Heat Rejection to Jacket Water Btu/hr*1000 (kW)	2913 (854)	2708 (793)
	Heat to Lube Oil Btu/hr*1000 (kW)	1059 (310)	967 (283)
	Heat Rejection to Intercooler Btu/hr*1000 (kW)	2988 (875)	2655 (778)
	Total Heat to Auxiliary Btu/hr*1000 (kW)	4047 (1185)	3622 (1061)
Intake/ Exhaust System	Induction Air Flow SCFM (Nm³/hr)	13102 (20138)	12333 (18956)
	Exhaust Gas Flow Rate lb/hr (kg/hr)	57346 (26019)	53980 (24492)
	Exhaust Stack Temperature °F (°C)	810 (433)	726 (386)

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/ft³ (35.3 MJ/nm³) 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).

Performance ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and T_{cr} limited to ± 10° F.

Fuel consumption based on ISO3046/1-1995 with a tolerance of +5% for commercial quality natural gas having a 900 BTU/ft³ (35.3 MJ/nm³) SLHV.

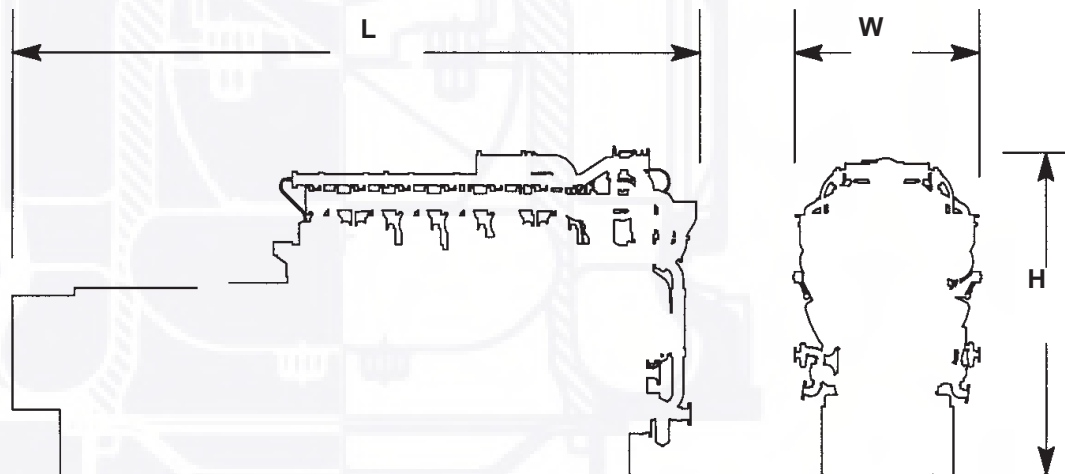
Heat rejected to auxiliary circuit is sum of heat rejected to intercooler and lube oil.

kWe ratings shown at 0.8 pf with 6.3 kV generator (50 Hz) and 13.8 kV generator (60 Hz).

Rating Standard: Ratings are based on ISO 3046/1-1995 with an engine mechanical efficiency of 90% and auxiliary water temperature T_{cr} as specified limited to ±5°C (±10°F). Ratings also valid for SAE J1349, DIN 627, BS 5514 and AP17B-11C standard atmospheric conditions.

ISO Standard Power/Continuous Power Rating: The highest load and speed which can be applied 24 hours per day, seven days per week, 365 days per year except for normal maintenance.

No overload available.



L in (mm)	W in (mm)	H in (mm)	Avg. Wt. lb (kg)
356 (9054)	101 (2565)	140 (3556)	115522 (52400)