

STANDARD EQUIPMENT

AIR INLET AND EXHAUST SYSTEMS

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.

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, 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 1, Division 2, Group D, 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 VENT CONNECTION – Single 3" (76.2 mm) round pipe.

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 and wired sensors for lube oil pressure and temperature; intake manifold temperature and pressure; overspeed; and jacket water temperature; all accessible through ESM®. 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 a standard 25 foot (7.6m) exhaust thermocouple harness.

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 – With 291 tooth ring gear. Machined for Thomas plate type coupling. Mounted. Flywheel guard not included.

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.

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 that meet Canadian Standard Association Class 1, Division 2, Group D hazardous location requirements.

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

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. Mounted pre-lube pump accepts common air or electric motor drives.

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.

WATER CIRCULATION SYSTEM

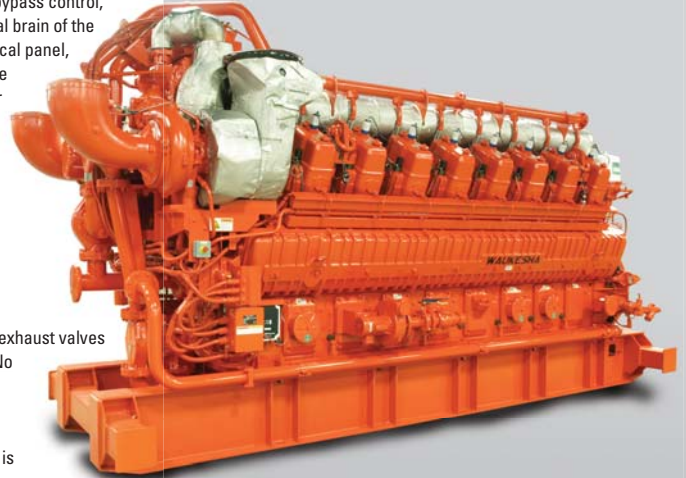
Auxiliary Circuit – Includes mounted 130° F (54° C) auxiliary water temperature control valve with mounted bypass, gear driven water pump, mounted intercooler, and mounted oil cooler. Provides single customer inlet and single customer outlet connection.

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.

275GL™ Series Gas Engine

Constant Torque

4050 - 4500 BHP



Engine shown with options.

Model 16V275GL

Turbocharged and Intercooled, Sixteen Cylinder, Gas Engine

SPECIFICATIONS

| | |
|-------------------------------------|--------------------------|
| Cylinders | Lube Oil Capacity |
| V-16 | 275 gal. |
| Piston Displacement | (1040 L) |
| 17398 cu. in. | Starting System |
| (285 L) | 150 psi |
| Bore & Stroke | (10.3 bar) |
| 10.83" x 11.81" | |
| (275 x 300 mm) | |
| Compression Ratio | |
| 9:1 | |
| Jacket Water System Capacity | |
| 133 gal. | |
| (503 L) | |



POWER RATINGS: 16V275GL GAS ENGINES - CONSTANT TORQUE

| Continuous Duty | | | | | Brake Horsepower (kWb) | |
|-----------------|------------------------|------|---------------------------|-------------------------|------------------------|-------------|
| Model | I.C. Water Inlet Temp. | C.R. | Bore & Stroke in. (mm) | Displ. cu. in. (litres) | 1000 rpm | 900 rpm |
| 16V275GL | 130° F (54° C) | 9:1 | 10.83 x 11.81 (275 x 300) | 17398 (285) | 4500 (3356) | 4050 (3020) |

PERFORMANCE DATA: 16V275GL GAS ENGINES

| | Intercooler Water Temperature 130°F (54°C) | |
|-------------------------------|------------------------------------------------------------------------|-------------------------|
| | 1000 rpm | 900 rpm |
| Low NO _x Settings | Power bhp (kWb) | 4500 (3356) 4050 (3020) |
| | BSFC (LHV) Btu/bhp-hr (kJ/kWh) | 6750 (9550) 6626 (9376) |
| | NO _x grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 0.75 (310) 0.75 (310) |
| | CO grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 2.5 (1100) 1.9 (800) |
| | NMHC grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 0.55 (250) 0.55 (250) |
| Low Fuel Consumption Settings | BSFC (LHV) Btu/bhp-hr (kJ/kWh) | 6450 (9126) 6390 (9040) |
| | NO _x grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 1.9 (800) 1.7 (750) |
| | CO grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 1.6 (700) 1.5 (650) |
| | NMHC grams/bhp-hr (mg/Nm ³ @ 5% O ₂) | 0.5 (225) 0.5 (225) |

Typical data is shown. Consult factory for guaranteed data.

NOTES:

- 1) Performance ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and T_{cr} limited to ± 10° F.
- 2) Fuel consumptions based on ISO 3046/1-1995 with a +5% tolerance for commercial quality natural gas having a 900 Btu/ft³ saturated low heat value.
- 3) 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).
- 4) Data will vary due to variations in site conditions. For conditions and/or fuels other than standard, consult the Dresser Waukesha Application Engineering Department.

** Charge air cooler and lube oil cooler plumbed in series

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.

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 7093 0509

Dresser Waukesha
1101 West St. Paul Avenue · Waukesha, WI 53188-4999
Phone: (262) 547-3311 · Fax: (262) 549-2795

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