

STANDARD EQUIPMENT

AIR INLET SYSTEM

Air Inlet Connection – Two 14.17" (360 mm) round tubes.
Air Cleaner - Two, dry panel type with mechanical gauge for remote mounting (shipped loose).

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.

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 tube.

NOTE: A crankcase ventilation blower is required. Order code 1135 or 1135A.

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 hardened stainless steel intake and exhaust valve seats and prechamber fuel control valves.

CYLINDER LINERS – Removable wet type with intermediate jacket water guide.

ENGINE INSTRUMENT CONNECTIONS – Thermocouples, K-type, for jacket water temperature, lube oil temperature, intake manifold temperature, individual cylinder exhaust temperatures and pre and post turbocharger temperatures wired to a common junction box. Pressure taps piped to a common bulkhead for intake manifold pressure, lube oil pressure, prechamber fuel pressure, main chamber fuel pressure and jacket water pressure. Instruments and panel are by others. Recommend optional Model 4000 Remote Engine Instrument Panel (reference Engomatic® controls).

ENGINE PROTECTION SHUTDOWN CONTACTS – For high water temperature, low oil pressure, high intake manifold temperature (standard engine mounted thermocouple with one thermocouple relay – shipped loose), overspeed (electronic speed switch – shipped loose), and engine detonation sensing, alarm and shutdown, (see separate description of Detonation Sensing Module). Two engine mounted emergency shutdown/starter lockout palm buttons are supplied, one on either side of the engine. Use all of the above in conjunction with a DC control panel for unit shutdown, (reference Engomatic controls).

NOTE: DC control panel is not supplied as standard.

EXHAUST SYSTEM

Exhaust Manifold – Dry with protective insulation.
Exhaust Outlet – Two 14" (356 mm) flanged, vertical outlets.

FLYWHEEL – With 291 tooth ring gear. Machined for direct connected, generator shaft or plate type coupling.

NOTE: Flywheel will be removed for shipment.

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. Pressure required; 45 – 60 psig (3.1 – 4.1 bar). Shipped loose 24V DC pilot operated main fuel valve. Mounted 24V DC pilot operated prechamber fuel valve. Includes adjustable speed switch for control of prechamber solenoid valve during start cycle.

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 4160/2400, 3 phase, 6-wire, WYE, 60 Hz or 3300/1905, 3 phase, 6-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. All generators are rated at 0.8 power factor. Includes terminal standoff assembly.

GOVERNOR – Woodward UG actuator, mounted, with 2301D load sharing speed control.

IGNITION SYSTEM – Waukesha Custom Engine Control Ignition Module with flange mounted coils. Ignition system meets Canadian Standards Association Class I, Division 2, Group D hazardous location requirements. Includes fuses for protection against reverse polarity. 24V DC power required.

INTERCOOLER – Air-to-water.

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

LUBRICATION SYSTEM – Gear driven, externally mounted gear type pump with pressure regulator and bypass circuit. Discharge side has flange for connection to remote oil cooler. Includes shell and tube type lube oil cooler sized for connection in series with intercooler. Not mounted. Includes full flow, 44 gallon (167 litre) capacity oil filter. Not mounted. Includes 175° F (79° C) lube oil temperature control valve shipped loose. Includes full flow filter strainer. Requires single customer lube oil inlet connection. Includes electric motor driven pre/post lube pump, 5 hp 230V AC/3ph/50 – 60 Hz, with motor starter (other voltages can be specified). Not mounted.

NOTE: External control logic is required to start/stop prelube pump.

PAINT – Oilfield orange paint.

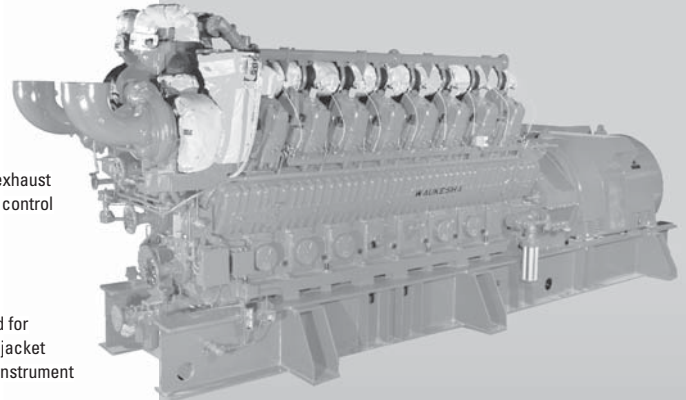
PISTON – Single piece, aluminum alloy with integrally cast cooling coils. Four piston rings with the top two compression rings housed in a Ni-resist ring carrier. 9:1 compression ratio.

STARTING SYSTEM – Two TDI 112 turbine pneumatic starters with 24V DC starting valve and strainer. Requires 150 psig (10.3 bar) air/gas supply. Crank termination switch is shipped loose.

NOTE: For starting and/or operation at or below 40° F (5° C) consult S9064 in the Technical Data Book under "Starting".

ATGL® Series Gas Enginator® Generating System

2960 - 3250 kW



Engine shown with options.

Model 16V-AT27GL

SPECIFICATIONS

ENGINE 16V-AT27GL, Four Cycle, Overhead Valve Cylinders V 16 Piston Displacement 17398 cu. in. (214 L) Bore & Stroke 10.83" x 11.81" (275 x 300 mm) Compression Ratio 9:1 Jacket Water System Capacity 130 gal. (492 L) Aux. Water Capacity 26 gal. (98 L) Starting System 150 psig (10.3 bar) Fuel Pressure Range 45-60 psig (3.1-4.1 bar) Fuel SLHV 900 Btu/ft ³ (35.3 MJ/m ³)	Lube Oil Capacity 313 gal. (1188 L) GENERATOR Power Factor for Ratings 0.8 Insulation Material NEMA Class F Temperature Rise Within NEMA (105°C) Voltage 4160/2400, 3 phase, 6 wire, Wye, 60 Hz* 3300/1905, 3 phase, 6 wire, Wye, 50 Hz* TIF and Deviation Factor Within NEMA, MG 1.22 *Additional voltages available
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TURBOCHARGER Two, exhaust driven, with Turbocharger Control Module (TCM), electronic controlled wastegate and air bypass. 24V DC required.

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. Single phase sensing. Includes voltage adjustment rheostat. All items are shipped loose.

WATER CIRCULATION SYSTEM

Auxiliary Circuit – Includes gear driven water pump with discharge piped to intercooler. Suction side has single flange for customer connection. Requires single customer outlet connection. Includes auxiliary water temperature control valve, not mounted.

Engine Jacket – Includes gear driven water pump with discharge to engine inlet. Suction side has single flange for customer outlet connection. Requires single customer outlet connection. Includes 180° F (82° C) jacket water temperature control valve, not mounted.

WAUKESHA CUSTOM ENGINE CONTROL DETONATION SENSING MODULE (DSM) –

Includes individual cylinder sensors, Detonation Sensing Module, and filter. Device is compatible with Waukesha CEC Ignition Module only. Sensors are mounted and wired to DSM filter. Detonation Sensing Module and filter are mounted. 24V DC power is required. The DSM meets Canadian Standards Association Class I, Division 2, Group D, hazardous location requirements.

WAUKESHA CUSTOM ENGINE CONTROL AIR FUEL MODULE (AFM) – Electronic air fuel ratio control. Includes air fuel module, main fuel gas regulator actuator, intake manifold pressure transducer, exhaust O2 sensor assembly, junction box, and wiring harness. All equipment is shipped loose for customer installation. Wiring harness allows connection of all engine mounted components to junction box. The module must be mounted off engine. 24V DC power is required. The AFM meets Canadian Standards Association Class I, Division 2, Group D, hazardous location requirements.

PERFORMANCE DATA: 16V-AT27GL GAS ENGINEATOR GENERATING SYSTEM

WATER CONNECTION COOLING Continuous Power*	I.C. WATER TEMP.: 130°F (54°C)	
	900 rpm 60 Hz	1000 rpm 50 Hz
kW RATING	2960	3250
Fuel Consumption x 1000 Btu/h (kW)	26705 (7824)	29980 (8778)
Jacket Water x 1000 Btu/h (kW)	2862 (839)	3108 (910)
Intercooler x 1000 Btu/h (kW)	1796 (526)	2042 (598)
Lube Oil x 1000 Btu/h (kW)	1483 (435)	1696 (497)
Heat Radiated x 1000 Btu/h (kW)	1246 (365)	1400 (410)
Exhaust Heat** x 1000 Btu/h (kW)	8700 (2549)	9945 (2912)
Exhaust Flow lb/h (kg/h)	50100 (22725)	51957 (23567)
Exhaust Temperature °F (°C)	744 (396)	810 (432)
Induction Air Flow scfm (m³/min)	11143 (315)	11531 (326)

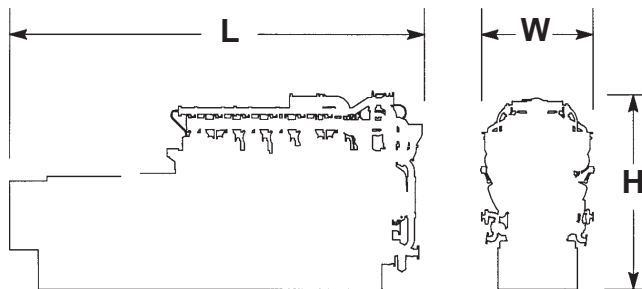
Typical heat balance data is shown. Consult factory for guaranteed data.

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

Rating Standard: The Waukesha Enginotor power rating descriptions are in accordance to ISO 8528, DIN6271 and BS5514. It is also valid for ISO 3046/1-1986 with an engine mechanical efficiency of 90% and auxiliary water temperature T_{cr} (clause 10.0) is limited to ±10° F (5° C).

**Heat rejection based on cooling exhaust gas to 85° F (29° C).

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.



Cooling Equipment	L in (mm)	W in (mm)	H in (mm)	Avg. Wt. lb (kg)
W.C.	396 (10060)	102 (2590)	132 (3350)	108000 (49000)

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.