



**Ratings Range**

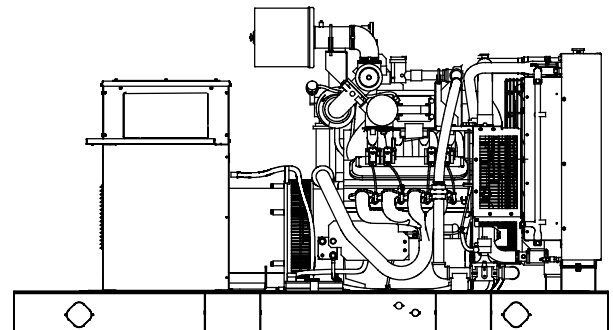
		60 Hz	50 Hz
Standby:	kW	106-150	91-135
	kVA	106-188	91-169

**Generator Set Ratings**

Alternator	Voltage	Ph	Hz	Natural Gas 130°C Rise Standby Rating		LP Gas 130°C Rise Standby Rating	
				kW/kVA	Amps	kW/kVA	Amps
4R13X	120/208	3	60	137/171	475	137/171	475
	127/220	3	60	143/179	469	137/171	449
	120/240	3	60	137/171	412	137/171	412
	120/240	1	60	107/107	446	107/107	446
	139/240	3	60	150/188	454	137/171	412
	220/380	3	60	124/155	235	124/155	234
	277/480	3	60	150/188	226	137/171	206
	110/190	3	50	116/145	441	109/136	414
	115/200	3	50	117/146	421	109/136	393
	120/208	3	50	116/145	402	109/136	377
4S12X	110/220	3	50	116/145	381	109/136	358
	110/220	1	50	98/98	445	98/98	445
	220/380	3	50	116/145	220	109/136	207
	230/400	3	50	117/146	211	109/136	196
	240/416	3	50	116/145	201	109/136	189
	120/208	3	60	150/188	520	137/171	475
	127/220	3	60	150/188	492	137/171	449
	120/240	3	60	150/188	451	137/171	412
	120/240	1	60	106/106	442	106/106	442
	139/240	3	60	150/188	451	137/171	412
4S13X	220/380	3	60	140/175	266	137/171	260
	277/480	3	60	150/188	226	137/171	206
	347/600	3	60	150/188	180	137/171	164
	110/190	3	50	132/166	503	110/138	418
	115/200	3	50	132/166	478	110/138	398
	120/208	3	50	132/166	459	110/138	383
	110/220	3	50	132/166	434	110/138	361
	110/220	1	50	106/106	482	103/103	468
	220/380	3	50	132/166	252	110/138	210
	230/400	3	50	132/166	239	110/138	199
4T13X	240/416	3	50	132/166	230	110/138	192
	120/208	3	60	150/188	520	139/174	482
	127/220	3	60	150/188	492	139/174	456
	120/240	3	60	150/188	451	139/174	418
	120/240	1	60	113/113	471	113/113	471
	139/240	3	60	150/188	451	139/174	418
	220/380	3	60	150/188	285	139/174	264
	277/480	3	60	150/188	226	139/174	209
	347/600	3	60	150/188	180	139/174	167
	110/190	3	50	135/169	514	112/140	425
4T13X	115/200	3	50	135/169	489	112/140	404
	120/208	3	50	135/169	470	112/140	389
	110/220	3	50	135/169	444	112/140	367
	110/220	1	50	113/113	514	105/105	477
	220/380	3	50	135/169	257	112/140	213
	230/400	3	50	135/169	244	112/140	202
	240/416	3	50	135/169	235	112/140	194
	120/240	1	60	144/144	600	134/134	557
	110/220	1	50	91/91	414	91/91	414

**Standard Features**

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all systems and components. Two- and five-year extended warranties are also available.
- Alternator features:
  - The unique Fast-Response™ X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator.
  - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
  - Kohler designed controllers for guaranteed system integration and remote communication. See Controllers on page 3.
  - The electronic, isochronous governor incorporates an integrated drive-by-wire throttle body actuator delivering precise frequency regulation.



RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. For dual fuel engines, use the LP gas ratings for both the primary and secondary fuels.  
G4-220 (150RZGC) 6/13d

# Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Rare-Earth Permanent Magnet
Leads: quantity, type	12, Reconnectable
4RX, 4SX	4, 110-120/220-240
4TX	Solid State, Volts/Hz
Voltage regulator	NEMA MG1
Insulation:	Class H
Material	130°C, Standby
Temperature rise	1, Sealed
Bearing: quantity, type	Flexible Disc
Coupling	Full
Amortisseur windings	Controller Dependent
Voltage regulation, no-load to full-load	100% of Rating
One-step load acceptance	100% of Rated Standby Current
Unbalanced load capability	(35% dip for voltages below)
Peak motor starting kVA:	540 (60 Hz), 425 (50 Hz)
480 V, 380 V 4R13X (12 lead)	480 (60 Hz), 380 (50 Hz)
480 V, 380 V 4S12X (12 lead)	570 (60 Hz), 463 (50 Hz)
480 V, 380 V 4S13X (12 lead)	440 (60 Hz), 396 (50 Hz)
240 V, 220 V 4T13X (4 lead)	

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and drip-proof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

## Application Data

### Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	PSI	
Engine: model, type	Industrial, 8.8 L, 4-Cycle, Turbocharged and Charge Cooled	
Cylinder arrangement	V-8	
Displacement, L (cu. in.)	8.8 (537)	
Bore and stroke, mm (in.)	110 x 114 (4.35 x 4.5)	
Compression ratio	10.1:1	
Piston speed, m/min. (ft./min.)	411 (1350)	343 (1125)
Main bearings: quantity, type	5, Bi-Metal Steel and Aluminum	
Rated rpm	1800	1500
Max. power at rated rpm (NG), kW (HP)	193 (259)	161 (216)
Max. power at rated rpm (LPG), kW (HP)	169 (227)	163 (219)
Cylinder head material	Cast Iron	
Piston type and material	Flat Top, Hypereutectic Cast Alum.	
Crankshaft material	Forged Steel, Induction Hardened, Tangential Fillet	
Valve (exhaust) material	Int.-A193 Exh. Inconel	
Governor type	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.5%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

### Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Exhaust flow at rated kW, m <sup>3</sup> /min. (cfm)	27.5 (971)	22.8 (805)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	649 (1200)	
Maximum allowable back pressure, kPa (in. Hg)	10.2 (3.0)	
Exhaust outlet size at engine hookup, mm (in.)	Flanged Outlet, see ADV drawing	

### Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Ignition system	Individual Coil Near Plug Ignition	
Battery charging alternator:	Negative	
Ground (negative/positive)	12	
Volts (DC)	70	
Ampere rating	12	
Starter motor rated voltage (DC)	12	
Battery, recommended cold cranking amps (CCA):	1, 630	
Qty., rating for -18°C (0°F)	12	
Battery voltage (DC)	12	

### Fuel

Fuel System	60 Hz	50 Hz
Fuel type	Natural Gas, LP Gas, or Dual Fuel	
Fuel supply line inlet	1.5 NPTF	
Natural gas fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.74-2.74 (7-11)	
LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.24-2.74 (5-11)	
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)	1.24 (5)	

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	1.2 max.
Ethane, % by volume	4.0 max.	10 max.
Propane, % by volume	1.0 max.	96 max.
Propene, % by volume	0.1 max.	3 max.
C <sub>4</sub> and higher, % by volume	0.3 max.	3 max.
Sulfur, ppm mass	25 max.	
Lower heating value, MJ/m <sup>3</sup> (Btu/ft <sup>3</sup> ), min.	33.2 (890)	78.8 (2116)

\* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

# Application Data

## Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, L (qt.)	8.0 (8.5)	
Oil pan capacity with filter, L (qt.)	8.5 (9.0)	
Oil filter: quantity, type	1, Cartridge	

## Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F) *	50 (122)	
Engine jacket water capacity, L (gal.)	13.4 (3.54)	
Radiator system capacity, including engine, L (gal.)	25.5 (5.61)	
Engine jacket water flow, Lpm (gpm)	125 (33)	102 (27)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	88.2 (5021)	62.5 (3560)
Heat rejected to charge cooling air at rated kW, dry exhaust, kW (Btu/min.)	11.3 (642)	9.4 (535)
Heat rejected to engine oil at rated kW, dry exhaust, kW (Btu/min.)	1.4 (81)	1.28 (73)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	711 (28.0)	
Fan, kWm (HP)	18.7 (25)	10.8 (14.5)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)	

\* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

## Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm) †	340 (12000)	258 (9100)
Combustion air, m <sup>3</sup> /min. (cfm)	8.9 (314)	7.4 (261)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	24.9 (1476)	18.7 (1063)
Alternator, kW (Btu/min.)	15.7 (893)	13.4 (763)

† Air density = 1.20 kg/m<sup>3</sup> (0.075 lbm/ft<sup>3</sup>)

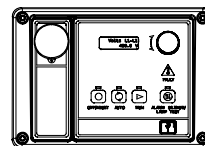
Fuel Consumption ‡	60 Hz	50 Hz
<b>Natural Gas, m<sup>3</sup>/hr. (cfh) at % load</b>	<b>Standby Ratings</b>	
100%	55.7(1965)	46.4(1638)
75%	43.3(1529)	36.1(1274)
50%	31.2(1102)	26.0 (918)
25%	19.5 (688)	16.2 (573)
0%	8.1 (286)	6.8 (238)

LP Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Ratings	
100%	20.2 (713)	16.8 (594)
75%	15.5 (547)	12.9 (456)
50%	11.3 (399)	9.4 (332)
25%	7.2 (254)	6.0 (211)
0%	4.6 (164)	3.9 (137)

‡ Nominal fuel rating: Natural gas, 37 MJ/m<sup>3</sup> (1000 Btu/ft.<sup>3</sup>)  
LP vapor, 93 MJ/m<sup>3</sup> (2500 Btu/ft.<sup>3</sup>)

LP vapor conversion factors:  
8.58 ft.<sup>3</sup> = 1 lb.  
0.535 m<sup>3</sup> = 1 kg.  
36.39 ft.<sup>3</sup> = 1 gal.

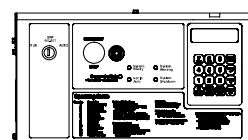
## Controllers



### Decision-Maker® 3000 Controller

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
  - Measurements are selectable in metric or English units
  - Remote communication thru a PC via network or serial configuration
  - Controller supports Modbus® protocol
  - Integrated hybrid voltage regulator with ±0.5% regulation
  - Built-in alternator thermal overload protection
  - NFPA 110 Level 1 capability
- Refer to G6-100 for additional controller features and accessories.

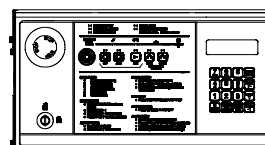


### Decision-Maker® 550 Controller

Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities.

- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-46 for additional controller features and accessories.



### Decision-Maker® 6000 Paralleling Controller

Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities for paralleling multiple generator sets.

- Paralleling capability with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays
- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-107 for additional controller features and accessories.

## Standard Features

- Alternator Protection
- Battery Rack and Cables
- Customer Connection  
(Standard with Decision-Maker® 6000 controller only)
- Electronic, Isochronous Governor
- Gas Fuel System (includes fuel mixer, electronic secondary gas regulator, gas solenoid valve, and flexible fuel line between the engine and the skid-mounted fuel system components)
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

## Available Options

### Enclosed Unit

- Sound Enclosure (with enclosed critical silencer)
- Weather Enclosure (with enclosed critical silencer)

### Open Unit

- Exhaust Silencer, Critical (kit: PA-324470)
- Flexible Exhaust Connector, Stainless Steel

### Fuel System

- Dual Fuel NG/LPG (automatic changeover)
- Flexible Fuel Line  
(required when the generator set skid is spring mounted)
- Gas Filter
- LP Liquid Withdrawal (vaporizer)
- Secondary Gas Solenoid Valve

### Controller

- Common Fault Relay
- Communication Products and PC Software
- Customer Connection  
(Decision-Maker® 550 and 6000 controllers only)
- Dry Contact (isolated alarm)  
(Decision-Maker® 550 and 6000 controllers only)
- Input/Output Module (Decision-Maker® 3000 controller only)
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel  
(Decision-Maker® 550 and 6000 controllers only)
- Remote Emergency Stop
- Run Relay

### Cooling System

- Block Heater, 1800 W, 110-120 V
- Block Heater, 2000 W, 190-240 V  
Recommended for ambient temperatures below 10°C (50°F)
- Radiator Duct Flange

### Electrical System

- Alternator Strip Heater
- Battery
- Battery Charger, Equalize/Float Type
- Battery Heater
- Line Circuit Breaker (NEMA1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)

### Miscellaneous

- Air Cleaner Restrictor Indicator
- Certified Test Report
- Crankcase Ventilation (CCV) Heater  
Recommended for ambient temperatures below 0°C (32°F)
- Engine Fluids Added
- Rated Power Factor Testing
- Rodent Guards

### Literature

- General Maintenance
- NFPA 110
- Overhaul
- Production

### Warranty

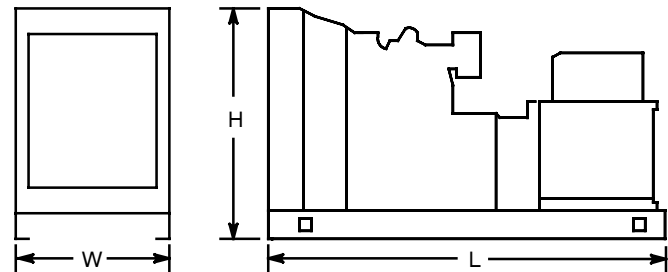
- 2-Year Basic
- 5-Year Basic
- 5-Year Comprehensive

### Other Options

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Dimensions and Weights

Overall Size, L x W x H, mm (in.): 2800 x 1120 x 1538  
 (110.2 x 44.1 x 60.6)  
 Weight (radiator model), wet, kg (lb.): 1440 (3175)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

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