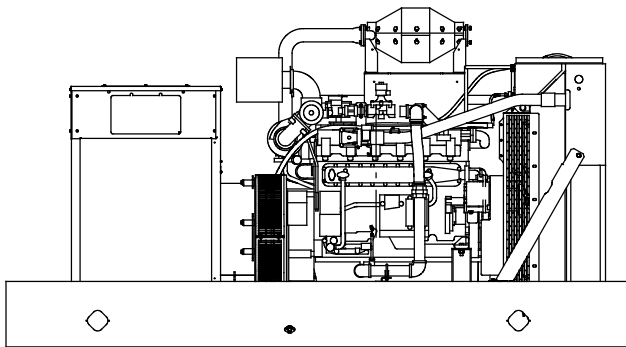




**EPA-Certified for Stationary and Mobile Emergency and Non-Emergency Applications**

## Ratings Range

		60 Hz	
Standby:	kW	125-190	
	kVA	125-238	
Prime:	kW	131-170	
	kVA	155-213	



## 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 60 Hz generator set offers a UL 2200 listing.
- 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 generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features (4S12X and 4S13X):
  - 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.

## Generator Set Ratings

Alternator	Voltage	Ph	Hz	Rich-Burn Natural Gas				Rich-Burn LP Gas (Vapor)	
				130°C Rise		105°C Rise		130°C Rise	
				Standby Rating	Prime Rating	Standby Rating	Prime Rating	Standby Rating	Prime Rating
				kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps
4S12X	120/208	3	60	154/193	534	144/180	500	130/163	451
	127/220	3	60	164/205	538	152/190	499	130/163	426
	120/240	3	60	154/193	463	144/180	433	130/163	391
	139/240	3	60	180/225	541	168/210	505	130/163	391
	220/380	3	60	140/175	266	131/164	249	130/163	247
	240/416	3	60	154/193	267	144/180	250	130/163	226
	277/480	3	60	180/225	271	168/210	253	130/163	195
4S13X	347/600	3	60	172/215	207	155/194	186	130/163	156
	120/208	3	60	184/230	638	170/213	590	130/163	451
	127/220	3	60	190/238	623	170/213	558	130/163	426
	120/240	3	60	184/230	553	170/213	511	130/163	391
	139/240	3	60	190/238	571	170/213	511	130/163	391
	220/380	3	60	168/210	319	170/213	300	130/163	247
	240/416	3	60	184/230	319	170/213	295	130/163	226
4M6226	277/480	3	60	190/238	286	170/213	256	130/163	195
	347/600	3	60	181/226	218	162/203	195	130/163	156

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.

# Alternator Specifications

Specifications	Alternator
Manufacturer (4SX)	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads: quantity, type	
4SX	12, Reconnectable
4M6226	4, 120/240 V
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load	Controller Dependent
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current
Peak motor starting kVA:	(35% dip for voltages below)
480 V	4S12X (12 lead) 480 (60Hz)
480 V	4S13X (12 lead) 570 (60Hz)
240 V	4M6226 (4 lead) 360 (60Hz)

- 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 dripproof construction.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

## Application Data

### Engine

Engine Specifications	
Manufacturer	Doosan
Engine model	D111TIC
Engine type	11.1 L, 4-Cycle, Turbocharged, Aftercooled
Cylinder arrangement	6, Inline
Displacement, L (cu. in.)	11.05 (674)
Bore and stroke, mm (in.)	123 x 155 (4.84 x 6.10)
Compression ratio	10.5:1
Piston speed, m/min. (ft./min.)	558 (1831)
Main bearings: quantity, type	7, Precision Half-Shell
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	225 (302)
Cylinder head material	Cast Iron
Piston: type, material	—
Crankshaft material	Forged Steel
Valve material	—
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	
Exhaust manifold type	Wet
Exhaust flow at rated kW, kg/hr. (cfm)	765 (1090)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	600 (1112)
Maximum allowable back pressure overall, kPa (in. Hg)	10.2 (3)
Maximum allowable back pressure after catalyst, kPa (in. Hg)	5.1 (1.5)
Engine exhaust outlet size, mm (in.)	Flanged Outlet at Catalyst, see ADV drawing

### Engine Electrical

Engine Electrical System		
Battery charging alternator:		
Ground (negative/positive)		Negative
Volts (DC)		24
Ampere rating		45
Starter motor rated voltage (DC)		24
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating each		Two, 1000
Battery voltage (DC)		12

### Fuel

Fuel System - Rich Burn		
Fuel type		Natural Gas, LP Gas, or Dual Fuel
Fuel supply line inlet		2.0 NPTF
Natural gas fuel supply pressure, kPa (in. H <sub>2</sub> O)		1.74-2.74 (7.0-11.0)
LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)		1.24-2.74 (5.0-11.0)
Dual fuel engine, LPG vapor withdrawal fuel supply pressure, kPa (in. H <sub>2</sub> O)		1.24 (5.0)
Fuel supply pressure, measured at the generator set fuel inlet downstream of any fuel system equipment accessories.		

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	—
Ethane, % by volume	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume	0.1 max.	5.0 max.
C <sub>4</sub> and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass		25 max.
Lower heating value, MJ/m <sup>3</sup> (Btu/ft <sup>3</sup> ), min.	33.2 (890)	84.2 (2260)

\* 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

Type	Full Pressure
Oil pan capacity, L (qt.) §	25 (26.4)
Oil pan capacity with filter, L (qt.) §	27 (28.8)
Oil filter: quantity, type §	1, Cartridge
Oil cooler	Water-Cooled
§ Kohler recommends the use of Kohler Genuine oil and filters.	

## Cooling

### Radiator System

Ambient temperature, °C (°F) *	50 (122)
Engine jacket water capacity, L (gal.)	21 (5.5)
Radiator system capacity, including engine, L (gal.)	116 (30.6)
Engine jacket water flow, Lpm (gpm)	284 (75)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	128 (7300)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	22.1 (1260)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	965 (38)
Fan, kWm (HP)	13.4 (18)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H <sub>2</sub> O)	0.125 (0.5)

\* Weather and sound enclosures with internal silencer reduce ambient temperature capability by 5°C (9°F).

## Operation Requirements

### Air Requirements

Radiator-cooled cooling air, m <sup>3</sup> /min. (scfm) †	510 (18000)
Combustion air, kg/hr. (cfm)	750 (366)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	54.3 (3090)
Alternator, kW (Btu/min.)	14.4 (820)

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

### Fuel Consumption‡

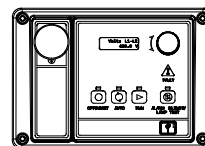
Natural Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating
100%	54.6 (1928)
75%	42.5 (1501)
50%	30.2 (1067)
25%	18.0 (636)
Natural Gas, m <sup>3</sup> /hr. (cfh) at % load	Prime Rating
100%	50.3 (1776)
75%	39.3 (1388)
50%	28.1 (992)
25%	16.4 (579)
LP Gas, m <sup>3</sup> /hr. (cfh) at % load	Standby Rating
100%	19.9 (703)
75%	17.0 (600)
50%	11.5 (406)
25%	7.2 (254)

‡ 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.

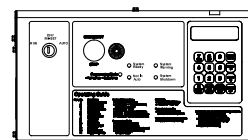
## Controllers



### APM402 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 G6-161 for additional controller features and accessories.

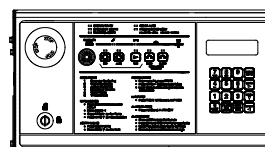


### Decision-Maker® 550 Controller

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.

Modbus® is a registered trademark of Schneider Electric.

## Standard Features

- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) with Filters
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature
- Three-Way Exhaust Catalyst

## Available Options

### Approvals and Listings

- CSA Certified
- IBC Seismic Certification
- UL 2200 Listing
- Hurricane Rated Enclosure

### Enclosed Unit

- Sound Enclosure with Internal Silencer (Aluminum)
- Sound Enclosure with Internal Silencer (Steel)
- Weather Enclosure with Internal Silencer (Steel)

### Open Unit

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

### Fuel System

- Dual Fuel, NG/LPG (Automatic Changeover)
- Flexible Fuel Lines  
(required when the generator set skid is spring mounted)
- Gas Filter
- Secondary Gas Solenoid Valve

### Controller

- Common Failure Relay
- Communications Products and PC Software
- Customer Connection (Decision-Maker® 550 controller only)
- Decision-Maker® Paralleling System (DPS)  
(Decision-Maker® 6000 controller only)
- Dry Contact Kit (isolated alarm)  
(Decision-Maker® 550 and 6000 controllers only)
- Two Input/Five Output Module (APM402 controller only)
- Prime Power Switch (Decision-Maker® 550 and 6000 only)
- Remote Audiovisual Alarm Panel  
(Decision-Maker® 550 and 6000 controllers only)
- Remote Emergency Stop
- Remote Serial Annunciator Panel
- Run Relay
- Manual Speed Adjust  
(Decision-Maker® 550 and APM402 controllers only)

### Cooling System

- Block Heater, 2500 W, 90–120 V, 1 Ph
- Block Heater, 2500 W, 190–208 V, 1 Ph
- Block Heater, 2500 W, 210–240 V, 1 Ph
- Block Heater, 2500 W, 380–480 V, 1 Ph  
Required for ambient temperatures below 10°C (50°F)
- Radiator Duct Flange

### Electrical System

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

### Miscellaneous

- Air Cleaner Restriction Indicator
- Certified Test Report
- Engine Fluids Added
- Rated Power Factor Testing
- Rodent Guards

### Literature

- General Maintenance
- NFPA 110
- Overhaul
- Production

### Warranty

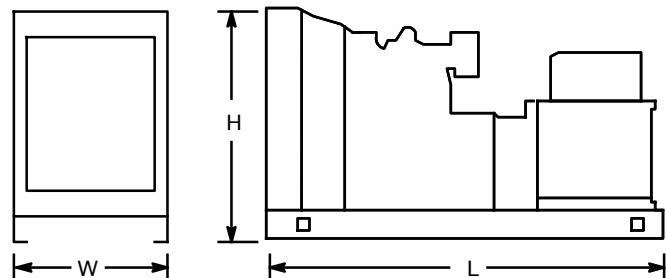
- 2-Year Basic Limited Warranty
- 2-Year Prime Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty

### Other Options

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

### Dimensions and Weights

Overall Size, L x W x H, max., mm (in.): 3575 x 1350 x 1908  
 (140.7 x 53.1 x 75.1)  
 Weight (radiator model), wet, max., kg (lb.): 2379 (5245)



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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