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Home Power Alternative

Hurricane “Beryl” July 2024

Westinghouse WGen12000

Presented By

WA6TQH Assisted by KI5FJS

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Generac Guardian® 22KW to 150KW Standby Generator System w/ (200A Service Disconnect) Plus Mounting Pad and Installation - $7,000 - $17,000

Which one best meets your needs?
Which one most cost effective?

Westinghouse Outdoor Power Equipment 15000 Peak Watt Dual Fuel Home Backup Portable Generator, Remote Electric Start, Transfer Switch Ready, Gas and Natural Gas - $2,400

(200A Service Disconnect) - Optional

Generator Foundation Installation

Hurricane Beryl hit Houston hard as a category “1” with flooding and more than 2.2 million power outages. CenterPoint was overwhelmed! It took weeks to restore power!

I had a generator on hand so this is the configuration That I started with.

- WGen12000 Generator
- Foundation
  - Generac Pad – Costs: $100.00
  - Wood Frame and gravel foundation.
  - Brick and Rock - $80
  - Generator cover is made of 600D durable polyester fabric with an added water-resistant laminated undercoating. 5 Sizes available. Can be used in storage.
  - Water-resistant backing keeps your generator completely dry. And full cover with seam sealing tape make it 100% waterproof.
  - Two stacks of fabric at one side make the cover weather resistant, with ventilated. Velcro at another side allow easy install and remove.
  - Elastic hem cord and bottom strap allows for a Custom secure fit, especially during high winds and severe weather.
  - Protect generator from rain, snow, UV rays, dust, tree sap

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Generator 50AMP Supply

Natural gas hook up became
A serious alternative for me.

I had enough gas to run for four Days. Tank holds 10 gallons. Fortunately power came Back on just at the right time.

The specified run time is about 11 hours. It was pretty close.

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Generator Control Panel

Brand	Westinghouse
Wattage	12000 Running watts
Fuel Type	electric
Power Source	Fuel Powered
Recommended Uses For Product	Commercial, Residential, Camping
Item Weight	406.7 Pounds
Voltage	240 Volts
Output Wattage	Max Watts 15000
Special Feature	Electric Start, Automatic Voltage Regulation, Dual Fuel, Fuel Gauge, Automatic Idle Control, Remote Start
Included Components	Manual
Color	Transfer Switch & RV Ready, CARB Compliant
Product Dimensions	35.4"L x 24.4"W x 33.5"H
Material	steel
Model Name	Open Frame Generators
Engine Type	OHV V-Twin
Ignition System Type	electric start
Tank Volume	10.5 Gallons
Engine Displacement	713 Cubic Centimeters
Runtime	11 hours

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Home Main Distribution Panel

Brand	GE
Current Rating	**50 Amps**
Voltage	240 Volts
Circuit Breaker Type	Standard
Mounting Type	Pole Mount
Number Of Poles	2
UPC	076335076553
Manufacturer	GE
Global Trade Identification Number	00076335076553
Part Number	GIDDS-608100
Item Weight	10.4 ounces
Product Dimensions	9.8 x 3.4 x 3.2 inches
Item model number	GIDDS-608100
Material	Copper

Cost $22.64

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50AMP Main Panel Connection

50AMP connection from Generator
To House Main Panel. **Green light**
On connector lights when Generator is
Supplying Power.

RVMATE 50 Amp Generator Cord 15FT and Pre-Drilled 50Amp Power Inlet Box Kit, 125/250Volts, NEMA 14-50P to SS2-50R Power Cord, ETL Listed, NEMA SS2-50P Inlet box Waterproof

Costs: $155.99

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Generator Interlock Switch

Required Custom Interlock Switch

To turn off Main line in order to turn on Generator Breaker which enables power from Generator.

Costs: $28.95

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AC Soft Start Specifications

Brand	MICRO-AIR
Power Source	Corded Electric
Recommended Uses For Product	Commercial, Residential
Item Weight	1.32 Kilograms
Voltage	230 Volts (AC)
Special Feature	Portable
Included Components	Charging Cable
Color	grey black
Product Dimensions	9"L x 4"W x 3"H
Model Name	MicroAir EasyStart 368-X48 Air Conditioner Soft Start
Engine Type	4 Stroke
Frequency	60 Hz
UPC	850049469043 806802942544
Manufacturer	Micro-Air
Part Number	ASY-368-X48
Item Weight	2.9 pounds
Item model number	ASY-368-X48
Style	X48 Bluetooth
Item Package Quantity	1
Special Features	Portable

Smart Phone interface

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AC Soft Start Installation

I bought this to add to my 3.5 ton central AC unit in Tomball Texas. My goal was to use my generator, attach it to my breaker panel, and run my house this way. One barrier is the amperage draw from a central AC unit. **This device dropped my initial amperage draw on startup from 77 amps to 29!**

•SPECIAL FEATURES: NEW BLUETOOTH feature allows you to Access with iphone app. Easystart is designed to be a 4-part start ramp sequence. It self-optimizes, resulting in the lowest possible startup current for all single-phase motors. EasyStart can support 19,000-48,000 BTU (2-3.5 ton) compressors and delivers a start current reduction of up to 75% of a compressor's LRA (locked-rotor amperage). It supports both 115 and 230 VAC motors.

Costs: $379.00

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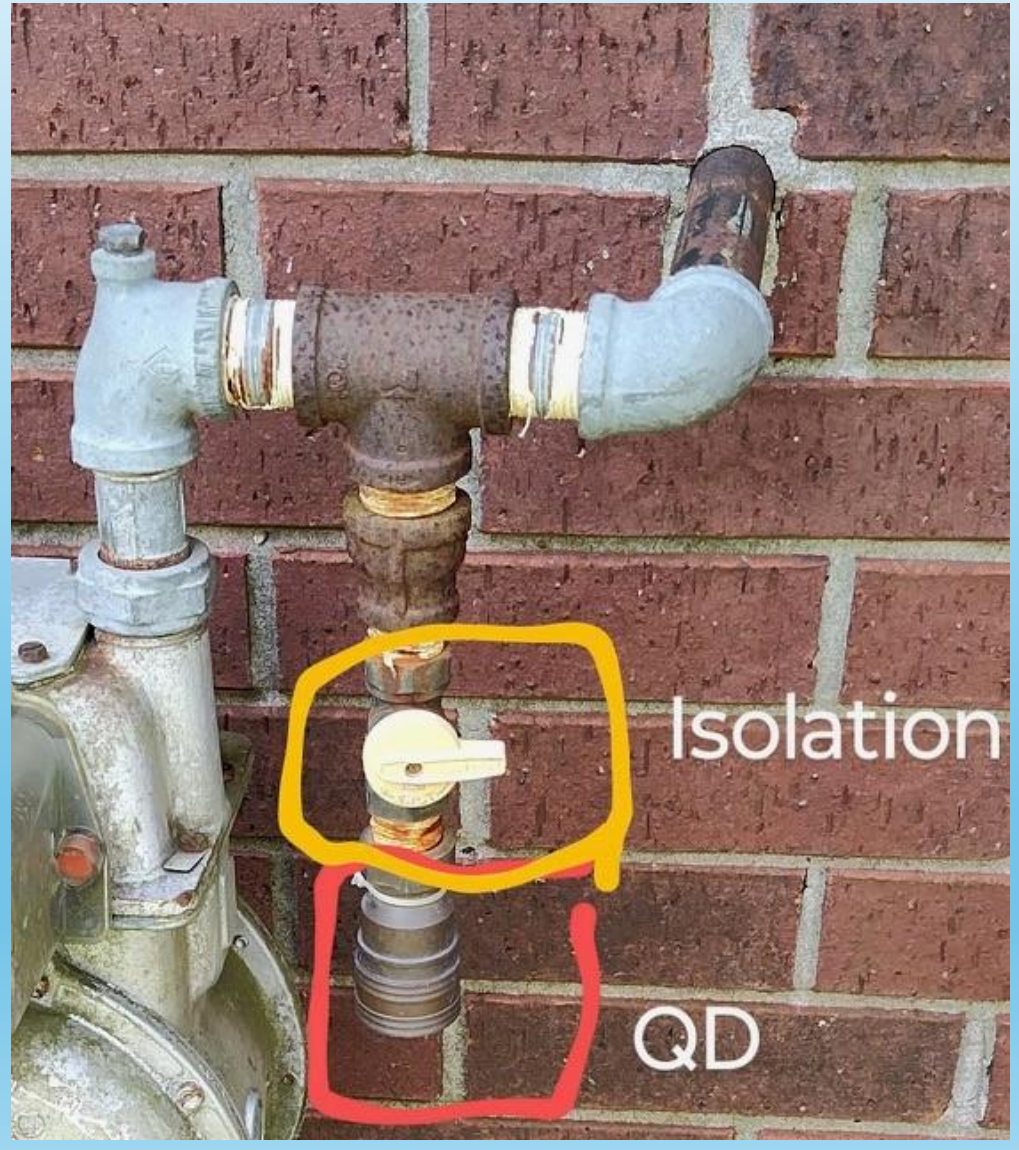
GAS Meter Modification



Be sure to consider the hose length and size from the gas meter to your generator. Typical Natural Gas pressure in many homes is regulated for 7 inches water column, or about 1/4 psi. You need to ensure sufficient fuel supply without excessive pressure drop based on generator's fuel flow at max load of 15kW. In my case, this is approximately 200cfh.

Using the Spitzglass formula for low pressure gas flow to confirm my generator needs:

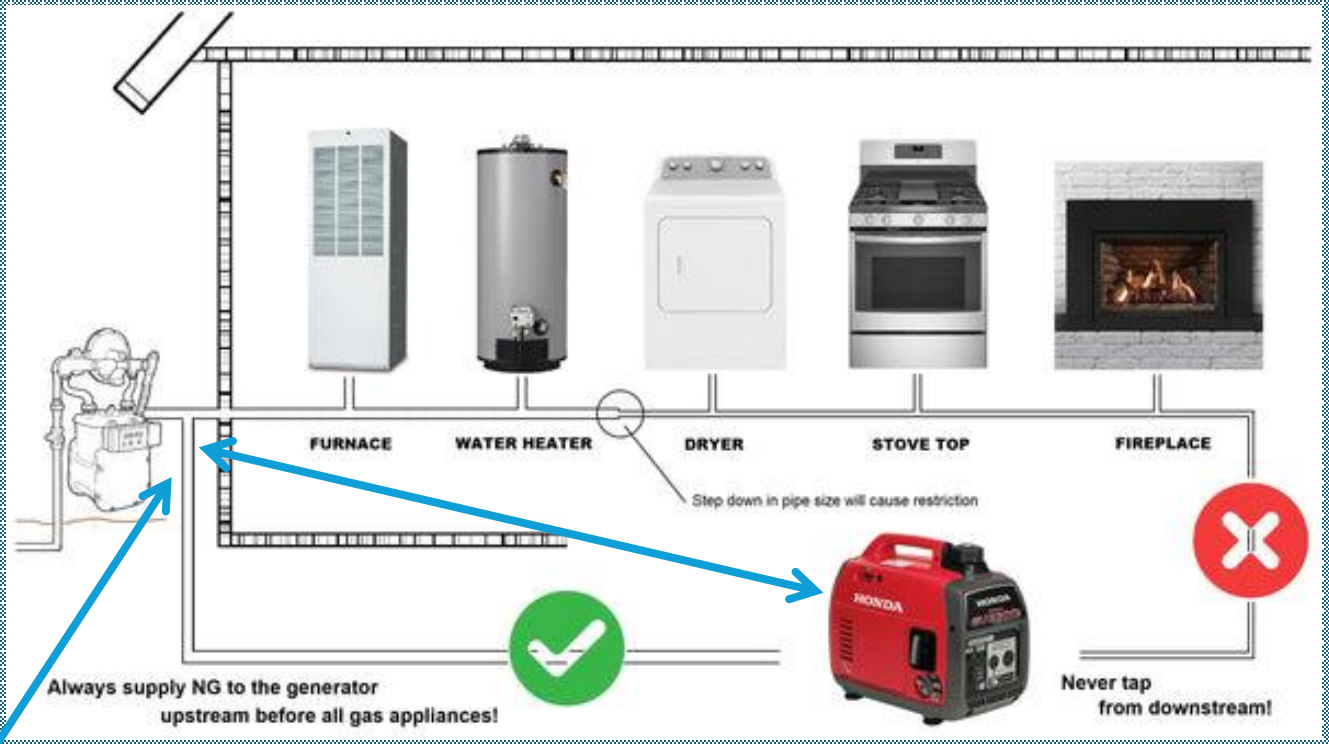
$q = 3550*k*(h/(l*SG))^{1/2}$ where

- q = natural gas volume (cfh) ~200 for my generator
- h = allowable pressure drop ~0.5 inches water column
- l = length of pipe/hose (ft) ~***60 ft in my case***
- d = inside pipe diameter (in) ~1in
- SG = specific gravity of Natural Gas typically 0.6-0.7

q = 194 cfh which confirms the hose size of 1 in.

OR: https://www.engineeringtoolbo.com/natural-gas-pipe-calculator-d_1042.html Costs: Fittings est $30.00

Natural Gas Connection



How far from the home will the generator be placed?

- You can use 3/8" ID hose up to 10ft, any longer up to 50ft will require 1/2" ID hose to keep the volume of fuel flow consistent.

Need more? 50-100ft will need 3/4" ID Hose, ***My Distance 60 ft+ or more will require 1" ID*** hose.

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Common Gas Line Sizes for Portable Generators

When setting up a **portable generator**, it's crucial to ensure that the **gas line size** is appropriate for seamless operation. The gas line delivers the necessary fuel to the generator, and choosing the right size prevents issues like insufficient fuel supply or pressure drops. Below is a table detailing common gas line sizes for portable generators:
It's crucial to consult both the generator manufacturer's specifications and a qualified professional to determine the optimal gas line size for your specific generator and installation requirements. Proper sizing ensures efficient performance and prevents potential damage to the generator due to inadequate fuel supply.

Costs: 1" inch 60' FT Natural Gas Custom Made hose including Quick Disconnects And 1" to ¾" adapter – Est: $400.00

Generator Size (Watts)	Minimum Gas Line Size (Inches)	Example
Up to 5,000 Watts	**3/8"**	For smaller generators, such as those used for camping or basic power needs, a 3/8-inch gas line is typically sufficient. This size ensures an adequate flow of fuel to meet the generator's demands.
5,000 to 10,000 Watts	**1/2"**	Medium-sized generators often require a 1/2-inch gas line to accommodate increased fuel needs. This size prevents restrictions and maintains optimal fuel flow.
10,000 to 15,000 Watts	**3/4"**	Larger generators in this range may necessitate a 3/4-inch gas line. This ensures a robust fuel supply, minimizing the risk of pressure drops during operation.
15,000 Watts and above	**1" or larger**	High-capacity generators, such as those used for backup power in homes or businesses, may require a 1-inch or larger gas line to deliver the substantial fuel volume needed for extended operation.

Are there any specific regulations or codes that dictate gas line sizing for portable generators?

Regulations and guidelines exist for gas line sizing to ensure the safe and efficient operation of portable generators. Considerations for gas line installation include factors such as pressure requirements, pipe diameter, and distance from the main gas source.

Potential Issues with Incorrect Gas Line Sizing

When it comes to setting up a gas line for your generator, ensuring the **proper sizing** is crucial. Incorrect gas line sizing can lead to various issues that might compromise the efficiency and safety of your standby generator.

- **Reduced Generator Performance:**
  - Inadequate gas supply restricts the generator's ability to produce the required power.
  - **This can result in reduced performance,** affecting the functionality of connected appliances and systems.
- **Overheating and Damage:**
  - An undersized gas line may cause the generator to overheat.
  - **Prolonged overheating can lead to internal damage,** affecting the generator's lifespan and reliability.
- **Incomplete Combustion:**
  - If the gas line is too small, it may not provide enough fuel for proper combustion.
  - **Incomplete combustion can produce carbon monoxide,** posing serious safety risks to your household.
- **Fluctuating Power Output:**
  - Incorrect gas line sizing can lead to inconsistent fuel supply.
  - **This results in fluctuating** power output**,** causing disruptions to connected devices and appliances.

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Pros and Cons of Using a Natural Gas Line for Your Portable Generator

When considering the fuel source for your **portable generator**, using a natural gas **line** has both advantages and disadvantages.

Pros

•Unlike finite fuel tanks, a natural gas line provides an uninterrupted and essentially limitless fuel source.
•No need for fuel storage or refueling; the generator runs as long as the gas supply is available.
•Natural gas is a cleaner-burning fuel, contributing to reduced emissions and environmental impact.

Cons

•Reliance on the gas infrastructure means that a disruption in the gas supply would affect the generator's operation.
•Initial setup costs can be higher due to the need for a dedicated natural gas line.
•Tethered to the gas line, the generator's mobility is restricted compared to units with onboard fuel tanks.

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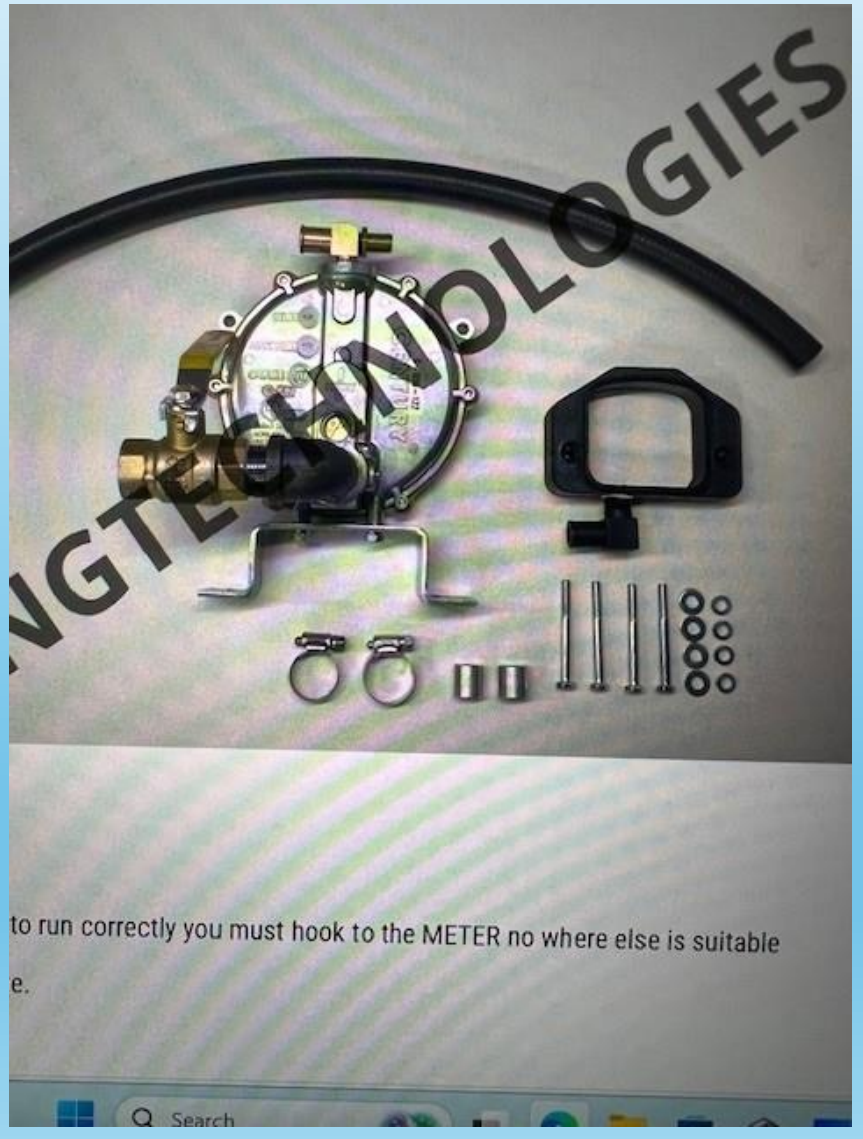
Generator Natural GAS Kit



PGN Technologies

Custom Propane and Natural Gas Kits for Generators and Inverters

This kit is for Westinghouse WGen15000

Our Contact Information
Monday - Friday 8:00 AM - 5:00 PM
Saturday – Closed
Sunday – Closed
Phone: 1-734-992-2648
Email: sales@pngtechnologies.com

Costs: $379.00

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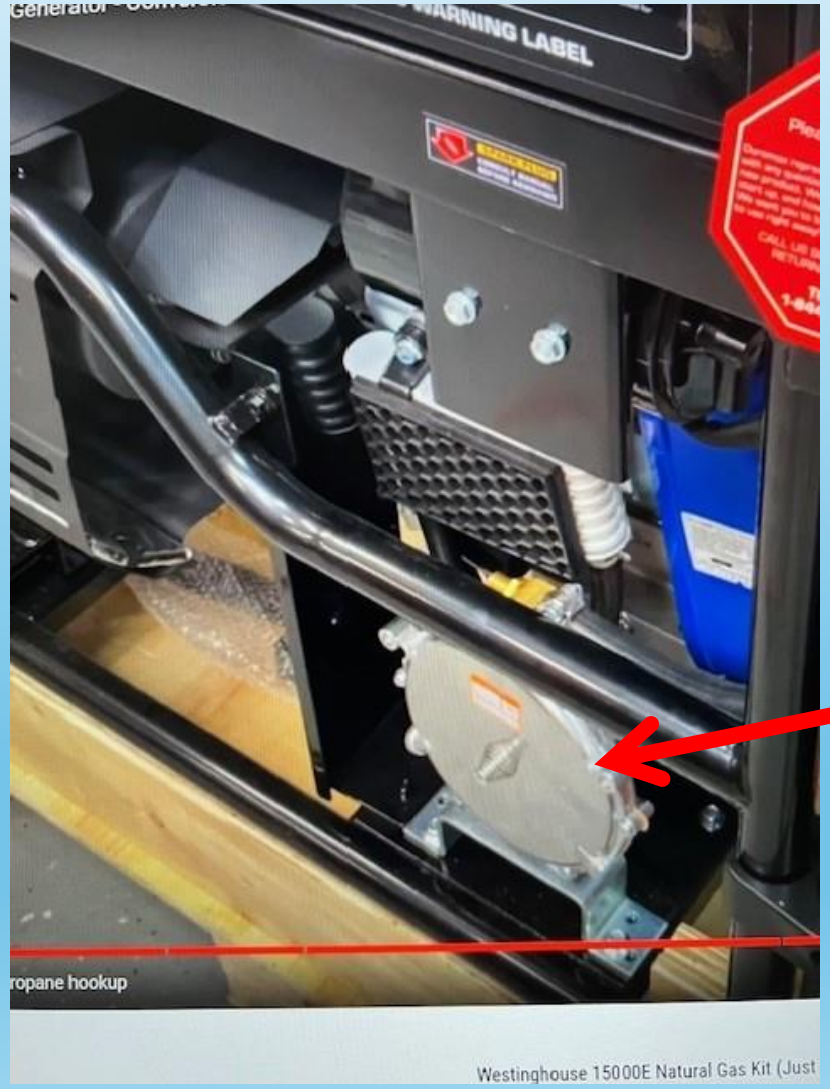
Generator Natural Gas Installation



To determine the right size of gas line for a generator, you need to know the generator's power count (in kW) and the total length of the pipe required. The more powerful the engine, the larger the hose size required. Additionally, you need to follow or exceed the minimum code requirements.

Installation of Regulator for Natural Gas
Most Regulators require ¾" inch connection.
In my case I am using 1" inch hose with ¾" inch adapter with quick disconnects.

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Generator Dual Conversion

Shown here is
Regulators for Propane
And Natural Gas

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Open Frame Generator Rain Tent

NOTE:

- It is recommended that Generators utilize a rain tent In the event of inclement Weather. ***Portable Generators Are NOT designed to operate In the rain***.

SAFELY RUN YOUR GENERATOR IN SEVERE WEATHER: This open frame Portable generator cover can Withstand up to 12 inches of rain Per day, up to 18 inches of snow per Day, and winds up to 70 mph

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Garage Air Circulation

Brand	Air King
Color	Black
Power Source	Corded Electric
Style	Industrial
Product Dimensions	10.5"D x 26.5"W x 29.5"H
Room Type	Warehouse, Garage
Special Feature	Oscillating
Recommended Uses For Product	Air Circulation
Wattage	245.00
Finish Type	Powder Coated
Number of Blades	3
Air Flow Capacity	7.45E+3 Cubic Feet Per Minute
Theme	Industrial
Voltage	120 Volts
Collection Name	Industrial Fans
Switch Type	Pull Chain
Included Components	Cord
Indoor/Outdoor Usage	Indoor

•WALL-MOUNT INDUSTRIAL FAN: Industrial grade wall-mounted indoor fan is great for warehouses, garage, and more; 30-inch fan blade creates powerful air circulation

•3-SPEED DESIGN: 3 speeds for customizable comfort, 1/4 HP, 120 Volts, 1 phase, totally enclosed, ball bearing, permanently lubricated, permanent split capacitor

•LONG-LASTING: Blades, guards, and mount are made from powder-coated steel for long-lasting use; Rear-mounted pull cord switch controls power and speed

•QUIET OPERATION: Quiet operation with 90-degree Oscillation; dB (High/Med/Low): 68 / 64 / 50

•SPECIFICATIONS: Compliance: ETL and OSHA certified

Costs: Depends upon model $200 - $350

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Questions

Following information provided by PGN Technologies

How much power loss will I lose by converting my generator to An alternative fuel?

**3-5% power loss because our custom kits are built around the generator, we have only seen about a 3-5% loss of power.

Can I still run my generator on gasoline after converting my Generator to an alternative fuel?

**YES, You can simply do this by switching off your alternative fuel source and run the engine until it stops to ensure all of your alternative fuel is out of the fuel lines and then turn on your gasoline fuel source.

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Questions

- What did you do to provide back up power to your home during Beryl (July 2024) Hurricane?
  - Whole home Generic Installation?
  - Portable Generator?
  - Battery Power/Solar?
  - Wind power?
  - Relocate out of area?
  - Local Hotel?

Portable Generator configured as shown - My Total Costs: $4295.57
Generic Depending upon size (22KW to 150 KW) **not** including Installation and pad - $7,000 to $17,000