

# Autopilot

## 4 Burner CO<sub>2</sub> Generator (LP or NG)

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**Specs**

Power Requirements	400 ma @ 24VDC
# of Burners / material	4 precision brass
BTU Rating	LP 9,052 NG 11,068
Cubic Ft CO2 per hour	11 SCFH
Natural Gas (NG) Pressure	4.5" WC / 1.15 kpa
Propane Gas (LP) Pressure	11" WC / 2.8 kpa
Weight	18 lbs
Dimensions	15" x 8.4" x 18"

**IMPORTANT MESSAGE**

**Read and understand this instruction manual  
BEFORE attempting to operate this product.**

**Failure to do so could result in personal injury and /  
or property damage.**

## **Natural gas or Propane**

There are 2 types of generators available, Natural Gas (NG) or Liquid Propane (LP). Both units come with the correct regulator and hose, along with pre-installed, clean-burning brass burners. Both units are equipped with features like a safety tip-over switch, to automatically turn off the unit completely should it tip over or fall and an electronic ignition, which eliminates the open pilot flame.

**Natural Gas** - or NG is provided from a major pipeline, directly piped into homes and businesses. Because the incoming gas pressure can vary from less than 1/4 PSI to more than 5 PSI, the provided regulator **MUST** be used. (Unless the natural gas pressure has been verified and is regulated at 4.5" WC) The natural gas supply to the NG generator must be a regulated to a very low pressure of 4.5" WC or 1/4 PSI.

**Liquid Propane** - or LP is stored in various sizes pressurized tanks. The supplied LP regulator, (which is designed to connect directly to portable LP tanks) **MUST** be used. The propane gas supply to the LP generator must be a regulated to a very low pressure of 11" WC or 1/2 PSI.

**Note: Large outside propane tanks can be used as long as the Propane gas pressure has been verified to be regulated at 11" WC**

***\*The standard for measuring low pressure is INCH / WC or inches of water column.***

**!!WARNING!! Installation and connection of the gas lines must be completed in compliance with local and national building codes. Consult your local authorities for detailed requirements.**

## Installation

Determine the best location for the generator. It must be hung level in an area that is adequately ventilated.

**!!Warning!! In closed spaces without adequate ventilation, CO2 levels can accumulate and become toxic (CO2 levels above 5000 PPM are toxic) Plants benefit from levels up to 1500PPM. Levels above 2500PPM can cause headaches and /or other feelings of being ill.**

The generator requires an unrestricted flow of air through the bottom and must be hung. DO NOT set the generator on top of anything such as a table, stand, etc.

Select an overhead support such as a ceiling joist to hang the generator from. The unit must have a 20" minimum space between the unit and wall, roof or any other possible obstruction.

Use the provided hardware (20" chains, screw hooks, and S hooks) to securely hang the generator.

Install the screw hooks into the overhead support. Use the S hooks to secure the chain to the unit and the screw hooks. Bend the S hooks so that they are secure.

Verify the APCG4 is hanging level. The APCG4 has a safety feature, the "tip over" switch, which will turn off the burners if it tips over or falls. The switch is like a pendulum and will turn off the unit if it is not level.

Verify the gas supply, and the regulator being used match the type of generator (NG or LP) selected.

Securely tighten the gas connection with 2 wrenches, using the included 12 foot hose, connect one end to the flare fitting and the other to the provided gas regulator. Verify connection is secured safely.

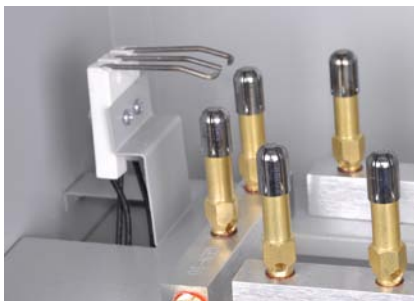
Pressurize the gas line after connections are verified. Use soapy water and a spray bottle to check for leaks by spraying it onto the gas connection (fittings) and watch for bubbles. If bubbles appear re-secure connection and repeat process.

Using the included power supply, connect the unit to a controller or timer that will determine the amount of time and how frequent the generator will operate. The APCG4 requires 24 volts DC. ***The unit should be operated only with appropriate controls and/or timers.***

The ignition module and firing sequence is activated by the main power switch located on the side of the APCG4. The generator has power and is in operation if the green “Power On” indicator light is on.

**Note: DO NOT turn on the generator. After the unit has been successfully installed, read the Start up Procedure to ensure safe and proper use of the GEN-4.**

**!! WARNING!! A spark is produced from a pair of electrodes near the tip of the brass burners to ignite the gas. Keep foreign objects away from electrodes.**



## **Start Up Procedure**

After completing the installation, follow this start up procedure.

Verify the power switch is off and the unit is not plugged in.

Verify there are no foreign objects or loose packing materials on the inside of the unit.

Make sure nothing appears damaged or out of place.

Check and confirm that the gas connections are connected properly.

Pressurize the gas lines by opening any of the shut off valves on the gas supply. Test for gas leaks especially if this is the first time the unit will be used,

Make sure there are no objects within 20" of the surface of the unit.

Plug in the 24 volt DC power supply into a 120 volt power source. Then connect the small power cable to the power inlet jack on the CO2 generator.

Turn the power switch ON. The green LED indicator light should illuminate next to "Main Power On".

Shortly after, the ignition module will attempt to ignite the burner(s) for approximately 5 seconds. The yellow LED indicator light should illuminate next to "Pilot Valve On"

If the burners fire, continue to next step. If this is the first time using this unit or the LP tank has been replaced recently, the burners may not fire the first attempt. After a 30 second pause, it will attempt to re-fire the burner(s) for 15 seconds. This cycle will repeat until it fires or for a maximum of 5 tries.

## Start Up Procedure (cont)

The unit should fire before 5 attempts however, after 5 unsuccessful attempts, the module will lock itself out and the LED light next to "Lock Out (error)" will be illuminated. Turn off the unit and wait 5 minutes to allow the gas to dissipate. Retry to start the generator.

**NOTE: If starting the unit for the first time or after a new tank is connected, make sure to "purge" the gas line of any air to ensure gas is flowing to the burners.**

Once the burners ignite, look under the unit and confirm the flame is blue and consistent and resembles a flower or 6 point star.

**!!WARNING!! Power the unit off immediately if the flame appears yellow or excessively large. DO NOT OPERATE with yellow, excessively large, or small "lazy" blue flames.**

If the flame appears yellow or too large, verify the correct gas supply is being used and that the supplied gas regulator is being used. High pressure or incorrect gas type may increase flames to dangerous heights.

If the flame is blue but appears small, verify the correct gas supply is being used (if LP, verify tank level is not low) and that the supplied gas regulator is being used. Low pressure or low LP tank may cause small or "lazy" blue flames.

After the generator has been tested at full capacity, connect the APCG4 to a compatible controller or timer.

**!!WARNING!! The APCG4 produces up to almost 11,000 BTU's of heat at full capacity. Verify the area around the APCG4 is not getting too hot for the surroundings.**

## High Altitude units

The standard brass burners have been designed to operate correctly at an altitude between sea level and 4500 Ft of elevation. If you are at an altitude higher than 4500 feet, do not use the standard unit if yellow flames are visible. HA (High Altitude) burners are available by contacting the factory.

If you are using the HA version of the APCG4, the burners are designed to run leaner so that the lower oxygen level at altitude will not affect the proper and complete combustion of the fuel. As a result of the leaner burner calibration, the HA version of the generator is going to produce lower CO<sub>2</sub> output

The standard NG and LP brass burners have been designed to produce approximately 3 Cu Ft of CO<sub>2</sub> per hour. When the HA (high-altitude) burners are used, the CO<sub>2</sub> output and BTU of each burner is reduced by approximately 15%.

The HA units be used at lower than 4500ft (down to as low as 2500ft) elevation as long as the burners are lighting (igniting) correctly. If you plan on using the HA unit at lower elevations, first ensure that all burners are lighting correctly and consistently before use.

**!!WARNING!! Verify that the burners are operating correctly.**

**\* A burner that is burning very yellow indicates a rich condition, or possibly low oxygen levels.**

**\* Burners that do not consistently ignite could be clogged or not be receiving enough gas pressure.**

**\* A burner that burns almost invisibly with a clean blue-white flame is running correctly.**



## **Electronic Ignition Control Module**

For safer operation, the APCG4 has an Electronic Ignition Control Module that eliminates the “open” pilot flame. The module creates a spark that lights the burner(s), providing consistent and controlled starts.

The dual redundant solenoid valves are controlled by the ignition controller. This provides twice the safety as a single solenoid CO2 generator.

## **LED Indicators**

There are 4 LED indicators located on the side of the generator near the power switch.

**Main Power On** - When lit, indicates the 24 volt power supply is connected or power is on.

**Lock Out (error)** - When flashing this indicates that the ignition controller shut off the solenoid valve(s) and the unit is locked out or will not operate until power has been cycled OFF then back ON.

**Main Valve On** – When lit, indicates the ignition controller has activated the main solenoid and the unit is in operation.

**Pilot Valve On** – When power is applied, the electronic ignition module will begin to provide a spark for 15 seconds while the “pilot” solenoid is energized. The indicator will remain lit while the solenoid is activated and should be lit during operation.

## Q & A

***Should there be a gas smell in the area? NO.*** Turn off the gas supply immediately, Do not turn on any electrical devices. Ventilate the area by opening vents, doors, or windows. Leave the area until the gas smell is no longer present. Once ventilated and the gas smell is gone, determine where the leak is by using soapy water. Spray the soapy solution on the gas connections and watch for bubbles. Bubbles will appear if the connection(s) are leaking. Seal the leaks. If this does not correct the problem, call the factory.

***The power is connected but not working and no indicator light is on.*** The “tip over” switch may be activated. Tilt the unit to one side and listen for a clicking noise. The switch is like a pendulum and will turn off the unit if it is not level.

***The burners are not lighting but the unit is trying.*** If the burners do not fire the first attempt, it will try again. After a 30 second pause the unit will attempt to re-fire the burner(s) for 15 seconds, This cycle will repeat until it fires or a maximum of 5 times. After 5 unsuccessful attempts, the module will lock itself for a 20 minute pause. The LED light next to “Lock Out (error)” will be illuminated. Verify that the spark is being generated and the position of the sparking electrodes is close to the burner to be lit.

***One or more of the burners is not lighting?*** Make sure the gas line is not kinked or twisted and the gas supply is adequate. Do not operate if yellow or large flames are present. If using propane, turn off the gas regulator for 30 seconds, and then try again.

***The CO2 level is not increasing to my desired PPM level.*** If both burners are operating, check for air leakage in the grow area and confirm that exhaust fans are not operating when the CO2 is being produced.

## Q & A

***The grow area is getting too humid or hot?*** Remove the left burner and replace with the supplied pipe plug. This will reduce heat and humidity.

***Should the APCG4 be buzzing and / or sparking?*** Yes, when the unit is firing you will hear “sparking” sounds. It will attempt this up to 5 times, before going into lock out mode. However it is not usual for the unit not to start after 5 times unless the gas flow has been interrupted.

***The indicator light beside the “Lock Out (error)” is flashing.*** The unit may be out of propane or the gas supply may have been interrupted. The safety mode or Lock Out (error) is an automatic built-in feature that will activate if the pilot does not fire after 5 attempts. Once the problem has been corrected, turning the power off for 30 seconds and back on will reset this function. It will also reset after 20 minutes and attempt to ignite the burners.

***How should the flame(s) appear?*** The flames should burn clean and blue with a resemblance to a flower or 6 point star. If the flame is yellow, extra large or a small blue dot not resembling a flower or 6 point star, DO NOT OPERATE THE GENERATOR... consult the factory

***Does it matter which burner I remove?*** Yes, the burner on the right located directly under the igniter must remain in place.

***How much CO2 does the unit produce?*** The brass burners are designed to produce approximately 3 cu ft per hr. If more CO2 production is required, select a CO2 generator with more burners.

**If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- \* Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- \* Installation and service must be performed by a qualified installer, service agency or the gas supplier.

#### WHAT TO DO IF YOU SMELL GAS

- \* Do not try to light any appliance.
- \* Do not touch any electrical switch: do not use any phone in your building.
- \* Open doors or windows to ventilate the area.
- \* Immediately call your gas supplier outdoors.
- \* If you cannot reach your gas supplier, call the fire department.



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