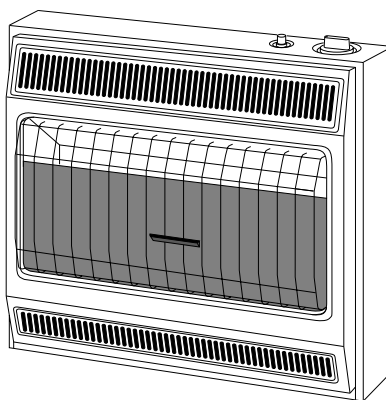


BLUE FLAME

VENT-FREE PROPANE AND NATURAL GAS GREENHOUSE CO₂ GENERATOR

OWNER'S OPERATION AND INSTALLATION MANUAL



RN30E-CAN - Natural Gas
RP30E-CAN - Propane/LP Gas

WARNING: 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.
- **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.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.

WARNING: Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual for correct installation and operational procedures. For assistance or additional information consult a qualified installer, service agency, or the gas supplier.

WARNING: This is an unvented gas-fired appliance. It uses air (oxygen) from the space in which it is installed. Provisions for adequate combustion and ventilation air must be provided. Refer to *Air for Combustion and Ventilation* section on page 3 of this manual.

WARNING: This appliance must not be washed. Use of a pressure washer, water or liquid cleaning solution on this appliance can cause severe personal injury or property damage due to water and/or cleaning solution:

- In electrical components, connections and wires causing electrical shock or component failure.
- On gas control components causing corrosion which can result in gas leaks and fire or explosion from the leak.

Appliance must be cleaned without being subjected to liquid spray or excessive wetting.

This appliance is only for use with the type of gas indicated on the rating plate.
This appliance is not convertible for use with other gases.
This appliance is not for residential use.

Save this manual for future reference.

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

SAFETY INFORMATION

WARNINGS

IMPORTANT: Read this Owner's Manual carefully and completely before trying to assemble, operate, or service this appliance. Improper use of this appliance can cause serious injury or death from burns, fire, explosion, electrical shock, and carbon monoxide poisoning.

DANGER: Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, or nausea. If you have these signs, the appliance may not be working properly. **Get fresh air at once!** Have appliance serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Propane/LP and Natural Gas: Propane/LP and Natural gas are odorless. An odor-making agent is added to both gases. The odor helps you detect a gas leak. However, the odor added to these gases can fade. Gas may be present even though no odor exists.

Make certain you read and understand all Warnings. Keep this manual for reference. It is your guide to safe and proper operation of this appliance.

GENERAL HAZARD WARNING: Failure to comply with the precautions and instructions provided with this appliance, can result in death, serious bodily injury and property loss or damage from hazards of fire, explosion, burn, asphyxiation, carbon monoxide poisoning, and/or electrical shock.

If you need assistance or appliance information such as

an instructions manual, labels, etc. Contact the manufacturer.

WARNING: Fire, burn, inhalation, and explosion hazard. Keep solid combustibles, such as building materials, paper or cardboard, feathers, straw and dust a safe distance away from the appliance as recommended by the instructions. Never use the appliance in spaces which contain or may contain volatile or airborne combustibles, or products such as gasoline, solvents, paint thinner, dust particles or unknown chemicals.

WARNING: Not for home or recreational vehicle use

WARNING: Any change to this appliance or its controls can be dangerous.

1. This appliance is only for use with the type of gas indicated on the rating plate. This appliance is not convertible for use with other gases.
2. Do not place propane/LP supply tank(s) inside any structure. Locate propane/LP supply tank(s) outdoors.
3. If you smell gas
 - shut off gas supply
 - do not try to light any appliance
 - do not touch any electrical switch; do not use any phone in your building
 - immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions
 - if you cannot reach your gas supplier, call the fire department
4. Never install the CO2 generator
 - in a home
 - in a recreational vehicle
 - where flammable objects are less than 36 inches from the front, top, or sides of the appliance
 - in high traffic areas
 - in windy or drafty areas
5. This appliance needs fresh, outside air ventilation to run properly. This appliance has an oxygen depletion sensor (ODS) pilot light safety system. The ODS shuts down the appliance if not enough fresh air is available. See *Air for Combustion and Ventilation*, pages 3 through 5.
6. Keep all air openings in the front and bottom of appliance clear and free of debris. This will insure enough air for proper combustion.
7. If appliance shuts off, do not relight until you provide fresh, outside air. If appliance keeps shutting off, have it serviced.
8. Do not run CO2 generator
 - where flammable liquids or vapors are used or stored
 - under dusty conditions
9. Never place any objects on the appliance.
10. Surface of appliance becomes very hot when running appliance. Keep children and adults away from hot surface to avoid burns and clothing ignition. CO2 generator will remain hot for a time after shutdown. Allow surface to cool before touching.
11. Make sure grill guard is in place before running appliance.
12. Carefully supervise young children when they are in same area with appliance.
13. Do not use appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.
14. Turn off appliance and let cool before servicing. Only a qualified service person should service and repair CO2 generator.
15. Operating appliance above elevations of 4,500 feet could cause pilot outage.
16. To prevent performance problems, do not use propane fuel tank of less than 100 lbs. capacity.
17. The CO2 generator should be inspected at least annually by a qualified service agency.
18. Do not operate appliance with front panel removed.

PRODUCT IDENTIFICATION

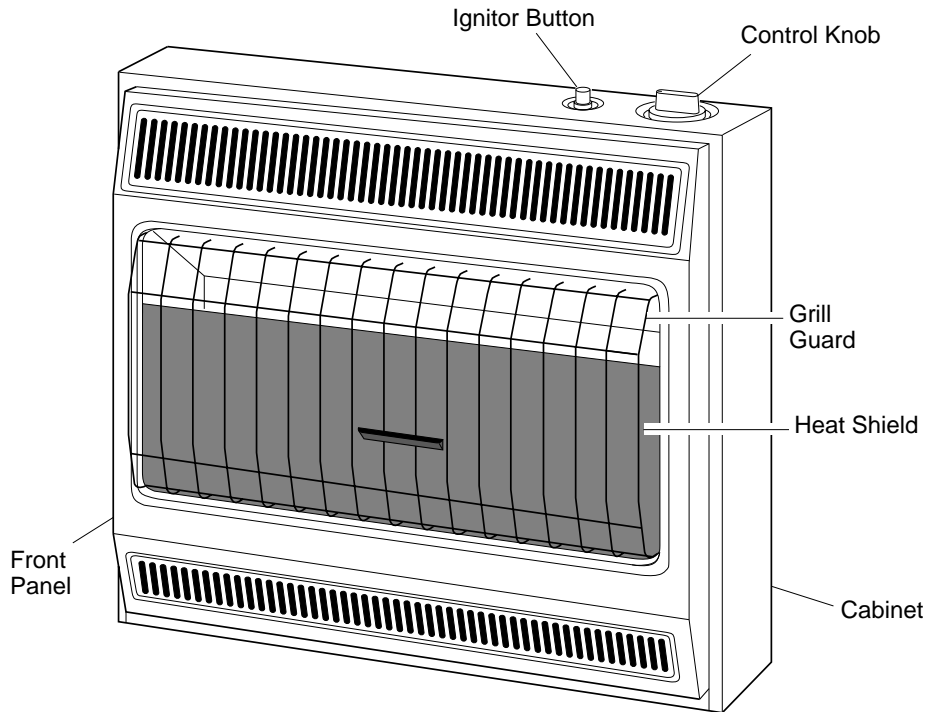


Figure 1 - Vent-Free Propane/LP or Natural Gas Appliance

LOCAL CODES

Install and use appliance with care. Follow all local codes. In the absence of local codes, use the latest edition of *National Fuel Gas Code ANSI Z223.1*, also known as NFPA 54* and *Canadian Gas Code B-149.1 and 2-M95, Section 6.3* gas installation code.

*Available from:

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

National Fire Protection Association, Inc.
Batterymarch Park
Quincy, MA 02269

UNPACKING

1. Remove CO₂ generator from carton.
2. Remove all protective packaging applied to CO₂ generator for shipment.
3. Check CO₂ generator for any shipping damage. If unit is damaged, promptly inform dealer where you bought it.

PRODUCT FEATURES

Safety Device

This appliance has a pilot with an Oxygen Depletion Sensor Shutoff System (ODS). The ODS/pilot is a required feature for vent-free CO₂ generators. The ODS/pilot shuts off the CO₂ generator if there is not enough fresh air.

Piezo Ignition System

This CO₂ generator has a piezo ignitor. This system requires no matches, batteries, or other sources to light appliance.

AIR FOR COMBUSTION AND VENTILATION

⚠ WARNING: This CO₂ generator shall not be installed in a confined space unless provisions are provided for adequate combustion and ventilation air. Read the following instructions to insure proper fresh air for this and other fuel-burning appliances in your greenhouse. Install in accordance with *Can Gas Code B-149.1 and 2-M95, Section 6.3* Gas Installation Code and/or local codes.

PROVIDING ADEQUATE VENTILATION

Unconfined Space

Can Gas Code B-149.1 and 2-M95, Section 6.3.3 states "An appliance installed for the production of carbon dioxide in a greenhouse may take its combustion air from inside the greenhouse when the rate of combustion does not exceed 20 Btuh per ft³ (0.2 kW per m³) of greenhouse volume and the concentration of carbon monoxide in the atmosphere does not exceed 35 ppm. The concentration of carbon dioxide and carbon monoxide shall be verified upon initial startup.

Confined Space

Ventilation air shall be supplied in accordance with *Can Gas Code B-149.1 and 2-M95, Sections 7.2 and 7.3* and/or local codes.

This CO₂ generator is intended for installation in a greenhouse only.

This appliance shall not be installed in a confined space or unusually tight construction unless provisions are provided for adequate combustion and ventilation air.

Produce Storage Areas

Can Gas Code B-149.1 and 2-M95, Section 6.3.2 states "An appliance used in a produce storage area shall take its combustion air from outside the storage area".

Continued

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

AIR FOR COMBUSTION AND VENTILATION

Continued

DETERMINING FRESH-AIR FLOW FOR APPLIANCE LOCATION

Determining if You Have a Confined or Unconfined Space

Use this worksheet to determine if you have a confined or unconfined space.

Space: Includes the room in which you will install appliance plus any adjoining rooms with doorless passageways or ventilation grills between the rooms.

1. Determine the volume of the space (length x width x height).

Length x Width x Height = _____ cu. ft. (volume of space)

Example: Space size 20 ft. (length) x 16 ft. (width) x 8 ft. (ceiling height) = 2560 cu. ft. (volume of space)

If additional ventilation to adjoining room is supplied with grills or openings, add the volume of these rooms to the total volume of the space.

2. Divide the space volume by 50 cubic feet to determine the maximum Btu/Hr the space can support.

_____ (volume of space) ÷ 50 cu. ft. = (Maximum Btu/Hr the space can support)

Example: 2560 cu. ft. (volume of space) ÷ 50 cu. ft. = 51.2 or 51,200 (maximum Btu/Hr the space can support)

3. Add the Btu/Hr of all fuel burning appliances in the space.

CO2 generator	_____	Btu/Hr
Gas water heater*	_____	Btu/Hr
Gas furnace	_____	Btu/Hr
Vented gas heater	_____	Btu/Hr
Other gas appliances* +	_____	Btu/Hr
Total	= _____	Btu/Hr

Example:

Gas water heater	+	40,000	Btu/Hr
CO2 generator	+	30,000	Btu/Hr
Total	=	70,000	Btu/Hr

* Do not include direct-vent gas appliances. Direct-vent draws combustion air from the outdoors and vents to the outdoors.

4. Compare the maximum Btu/Hr the space can support with the actual amount of Btu/Hr used.

_____ Btu/Hr (maximum the space can support)

_____ Btu/Hr (actual amount of Btu/Hr used)

Example: 51,200 Btu/Hr (maximum the space can support)

70,000 Btu/Hr (actual amount of Btu/Hr used)

The space in the above example is a confined space because the actual Btu/Hr used is more than the maximum Btu/Hr the space can support. You must provide additional fresh air. Your options are as follows:

- A. Rework worksheet, adding the space of an adjoining room. If the extra space provides an unconfined space, remove door to adjoining room or add ventilation grills between rooms. See *Ventilation Air From Inside Building*, page 5.
- B. Vent room directly to the outdoors. See *Ventilation Air From Outdoors*, page 5.
- C. Install a lower Btu/Hr appliance, if lower Btu/Hr size makes room unconfined.

If the actual Btu/Hr used is less than the maximum Btu/Hr the space can support, the space is an unconfined space. You will need no additional fresh air ventilation.

⚠ WARNING: If the area in which the CO2 generator may be operated is smaller than that defined as an unconfined space or if the building is of unusually tight construction, provide adequate combustion and ventilation air by one of the methods described in the *National Fuel Gas Code, ANSI Z223.1, 1992, Section 5.3, Canadian Gas Code B-149.1 and 2-M95, Section 7.2 and 7.3*, or applicable local codes.

Continued

AIR FOR COMBUSTION AND VENTILATION

Continued

VENTILATION AIR

Ventilation Air From Inside Building

This fresh air would come from an adjoining unconfined space. When ventilating to an adjoining unconfined space, you must provide two permanent openings: one within 12" of the ceiling and one within 12" of the floor on the wall connecting the two spaces (see options 1 and 2, Figure 2). You can also remove door into adjoining room (see option 3, Figure 2). Follow the *National Fuel Gas Code NFPA 54/ANSI Z223.1, Section 5.3, Air for Combustion and Ventilation* or *Canadian Gas Code B-149.1 and 2-M95, Section 7.2 and 7.3* and/or applicable local codes for required size of ventilation grills or ducts.

⚠ WARNING: Rework worksheet, adding the space of the adjoining unconfined space. The combined spaces must have enough fresh air to supply all appliances in both spaces.

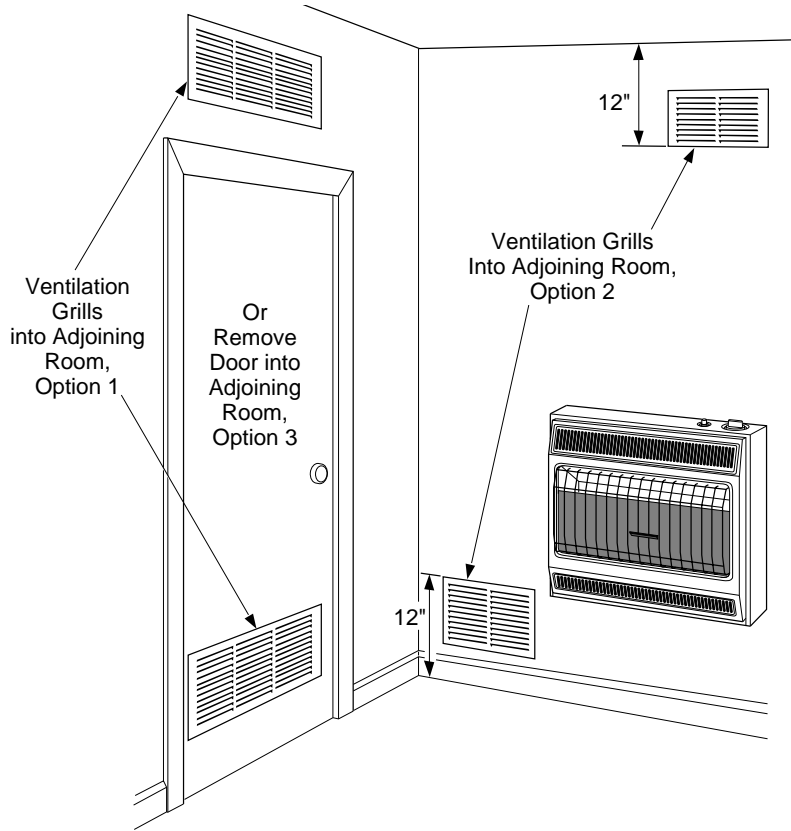


Figure 2 - Ventilation Air From Inside Building If Applicable

Ventilation Air From Outdoors

Provide extra fresh air by using ventilation grills or ducts. You must provide two permanent openings: one within 12" of the ceiling and one within 12" of the floor. Connect these items directly to the outdoors or spaces open to the outdoors. These spaces include attics and crawl spaces. Follow the *National Fuel Gas Code NFPA 54/ANSI Z223.1, Section 5.3, Air for Combustion and Ventilation* or *Canadian Gas Code B-149.1 and 2-M95, Section 7.2 and 7.3* and/or applicable local codes for required size of ventilation grills or ducts.

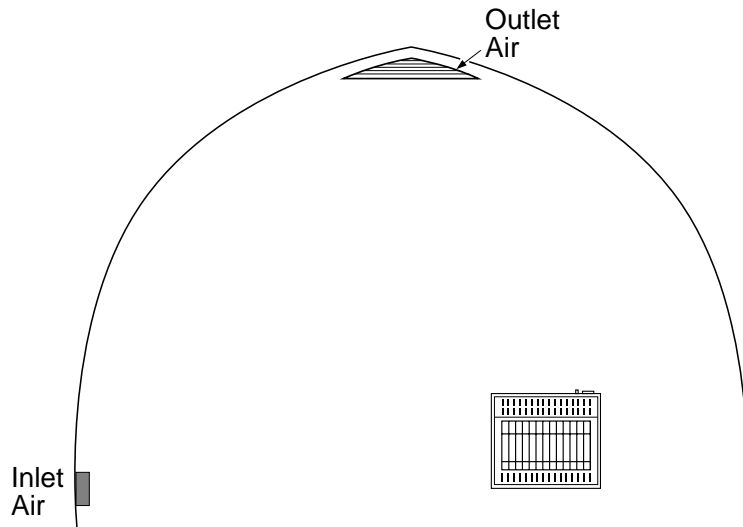


Figure 3 - Ventilation Air From Outdoors

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

INSTALLATION

NOTICE: The intended use of this appliance is the generation of carbon dioxide inside greenhouses for plant production.

NOTICE: A qualified service person must install appliance. Follow all local codes.

CHECK GAS TYPE

Only use gas type specified on rating plate. If your gas supply is different, do not install appliance. Call dealer where you bought appliance for proper type appliance.

INSTALLATION ITEMS

Before installing appliance, make sure you have the items listed below.

- external regulator (Propane/LP Only, supplied by installer)
- pipng (check local codes)
- sealant (resistant to propane/LP gas)
- manual shutoff valve *
- ground joint union
- test gauge connection * (see Figure 13, page 8)
- sediment trap
- tee joint
- pipe wrench

* An A.G.A. or C.G.A. design certified manual shutoff valve with 1/8" NPT tap is an acceptable alternative to test gauge connection. Purchase the optional A.G.A. or C.G.A. design certified manual shutoff valve from your dealer. See *Accessories*, page 15.

LOCATING APPLIANCE

This appliance is designed to be mounted on a wall.

WARNING: Maintain the minimum clearances shown in Figure 4. If you can, provide greater clearances from floor, ceiling, and joining wall.

WARNING: Never install the CO2 generator

- in a home
- in a recreational vehicle

- where flammable objects are less than 36 inches from the front, top, or sides of the appliance
- in high traffic areas
- in windy or drafty areas

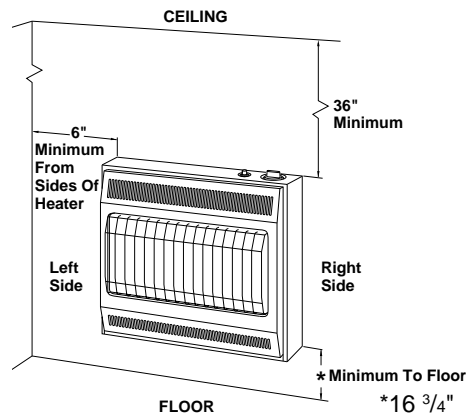


Figure 4 - Mounting Clearances As Viewed From Front of Appliance

IMPORTANT: Vent-free CO2 generators add carbon dioxide and moisture to the air.

- CAUTION:**
- appliance pilot and burner must be at least 18 inches above floor
 - locate appliance where moving vehicle will not hit it

For convenience and efficiency, install CO2 generator

- where there is easy access for operation, inspection, and service
- where strong wind gusts from an open door or ventilator can not blow directly into appliance.

INSTALLING APPLIANCE TO WALL

Mounting Bracket

The mounting bracket is located on back panel of appliance. It has been taped there for shipping. Remove mounting bracket from back panel.

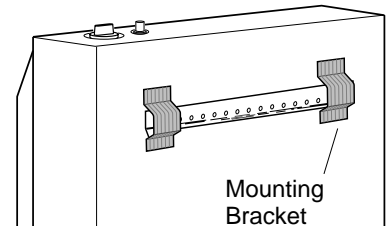


Figure 5 - Mounting Bracket Location

Removing Front Panel Of CO2 Generator

- Remove two screws near bottom corners of front panel.
- Lift straight up on grill guard until it stops. Grill guard will slide up about 1/4".
- Pull bottom of front panel forward, then down.
- Remove cardboard packing from grill and heat shield.

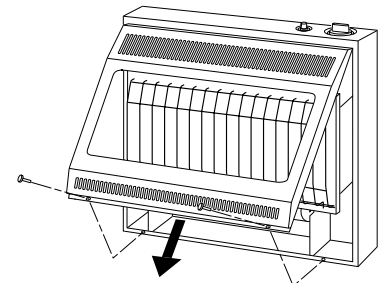


Figure 6 - Removing Front Panel Of CO2 Generator

Methods For Attaching Mounting Bracket To Wall

Only use last hole on each end of mounting bracket to attach bracket to wall. These two holes are 16 inches apart from their centers. Attach mounting bracket to wall in one of two ways.

- Attaching to wall stud
- Attaching to wall anchor

Attaching to Wall Stud: This method provides the strongest hold. Insert mounting screws through mounting bracket and into wall studs.

Attaching to Wall Anchor: This method allows you to attach mounting bracket to hollow walls (wall areas between studs) or to solid walls (concrete or masonry).

Decide which method better suits your needs. Either method will provide a secure hold for the mounting bracket.

Continued

INSTALLATION

Continued

Marking Screw Locations

1. Tape mounting bracket to wall where appliance will be located. Make sure mounting bracket is level.

⚠ WARNING: Maintain minimum clearances shown in Figure 7. If you can, provide greater clearances from floor and joining wall.

2. Mark screw locations on wall (see Figure 7).

Note: Only mark last hole on each end of mounting bracket. Insert mounting screws through these holes only.

3. Remove tape and mounting bracket from wall.

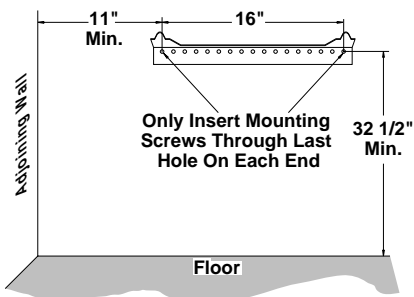


Figure 7 - Mounting Bracket Clearances

Attaching Mounting Bracket To Wall

Note: Wall anchors, mounting screws, and spacers are in hardware package. The hardware package is provided with appliance.

Attaching to Wall Stud Method

For attaching mounting bracket to wall studs

1. Drill holes at marked locations using 9/64" drill bit.
2. Place mounting bracket onto wall. Line up last hole on each end of bracket with holes drilled in wall.
3. Insert mounting screws through bracket and into wall studs.
4. Tighten screws until mounting bracket is firmly fastened to wall studs.

Attaching to Wall Anchor Method

For attaching mounting bracket to hollow walls (wall areas between studs) or solid walls (concrete or masonry)

1. Drill holes at marked locations using 5/16" drill bit. For solid walls (concrete or masonry), drill at least 1" deep.
2. Fold wall anchor as shown in Figure 8.
3. Insert wall anchor (wings first) into hole. Tap anchor flush to wall.
4. For thin walls (1/2" or less), insert red key into wall anchor. Push red key to "pop" open anchor wings.

IMPORTANT: Do not hammer key!

For thick walls (over 1/2" thick) or solid walls, do not pop open wings.

5. Place mounting bracket onto wall. Line up last hole on each end of bracket with wall anchors.
6. Insert mounting screws through bracket and into wall anchors.
7. Tighten screws until mounting bracket is firmly fastened to wall.

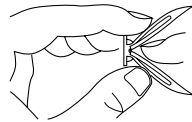


Figure 8 - Folding Anchor

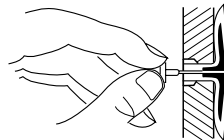


Figure 9 - Popping Open Anchor Wings For Thin Walls

Placing Appliance On Mounting Bracket

1. Locate two horizontal slots on back panel of appliance.
2. Place appliance onto mounting bracket. Slide horizontal slots onto stand-out tabs on mounting bracket.

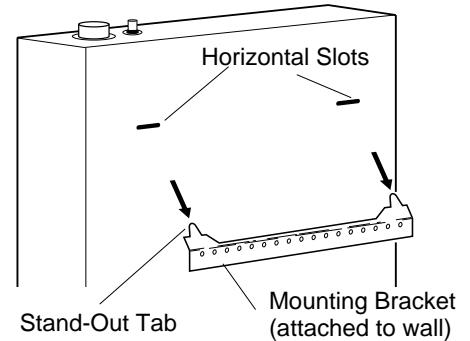


Figure 10 - Mounting Appliance Onto Mounting Bracket

Installing Bottom Mounting Screws

1. Locate two bottom mounting holes. These holes are near bottom on back panel of appliance (see Figure 11).
2. Mark screw locations on wall.
3. Remove appliance from mounting bracket.
4. If installing bottom mounting screws into hollow or solid wall, install wall anchors. Follow steps 1 through 4 under *Attaching To Wall Anchor Method*, column 1. If installing bottom mounting screw into wall stud, drill holes at marked locations using 9/64" drill bit.
5. Replace appliance onto mounting bracket.
6. Place spacers between bottom mounting holes and wall anchor or drilled hole.
7. Hold spacer in place with one hand. With other hand, insert mounting screw through bottom mounting hole and spacer. Place tip of screw in opening of wall anchor or drilled hole.
8. Tighten both screws until appliance is firmly secured to wall. Do not over tighten.

Note: Do not replace front panel at this time. Replace front panel after making gas connections and checking for leaks (see pages 8 and 9).

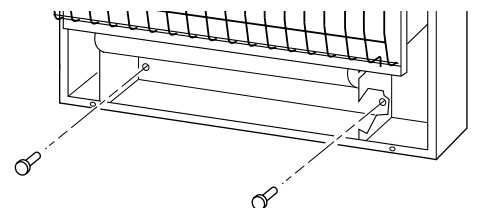


Figure 11 - Installing Bottom Mounting Screws

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

INSTALLATION

Continued

CONNECTING TO GAS SUPPLY

NOTICE: A qualified service person must connect CO2 generator to gas supply. Follow all local codes.

CAUTION: (Propane/LP Only) Never connect appliance directly to the propane/LP supply. This appliance requires an external regulator (not supplied). Install the external regulator between the appliance and propane/LP supply.

Propane/LP Only: The installer must supply an external regulator. The external regulator will reduce incoming gas pressure. You must reduce incoming gas pressure to between 11 and 14 inches of water. If you do not reduce incoming gas pressure, appliance regulator damage could occur. Install external regulator with the vent pointing down as shown in Figure 12. Pointing the vent down protects it from freezing rain or sleet. Minimum inlet pressure shall be no less than 11 inches of water.

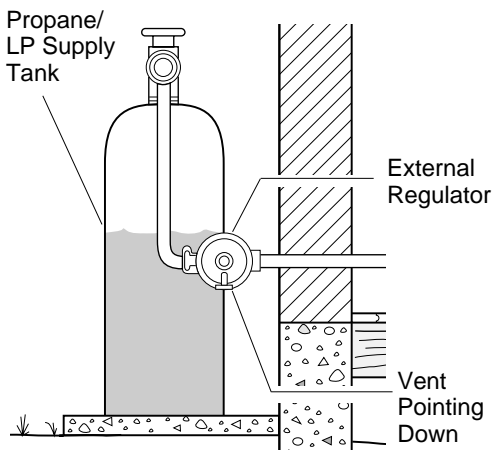


Figure 12 - External Regulator with Vent Pointing Down (Propane/LP Only)

WARNING: Never connect appliance to private (non-utility) gas wells. This gas is commonly known as wellhead gas.

Natural Gas Only: **IMPORTANT:** Check gas line pressure before connecting appliance to gas line. Gas line pressure must be no greater than 10.5 inches of water. If gas line pressure is higher, appliance regulator damage could occur. Minimum inlet pressure shall be no less than 4 inches of water.

CAUTION: Use only new, black iron or steel pipe. Internally-tinned copper tubing may be used in certain areas. Check your local codes. Use pipe of 1/2" diameter or greater to allow proper gas volume to appliance. If pipe is too small, undue loss of pressure will occur.

Typical Inlet Pipe Diameters

30,000 Btu/Hr models 1/2" or greater

Installation must include a manual shutoff valve, union, and plugged 1/8" NPT tap. Locate NPT tap within reach for test gauge hook up. NPT tap must be upstream from appliance (see Figure 13).

Apply pipe joint sealant lightly to male threads. This will prevent excess sealant from going into pipe. Excess sealant in pipe could result in clogged appliance valves.

CAUTION: Use pipe joint sealant that is resistant to liquid petroleum (LP) gas.

Install sediment trap in supply line as shown in Figure 13. Locate sediment trap where it is within reach for cleaning. Locate sediment trap where trapped matter is not likely to freeze. A sediment trap traps moisture and contaminants. This keeps them from going into appliance controls. If sediment trap is not installed or is installed wrong, appliance may not run properly.

IMPORTANT: Hold pressure regulator with wrench when connecting it to gas piping and/or fittings.

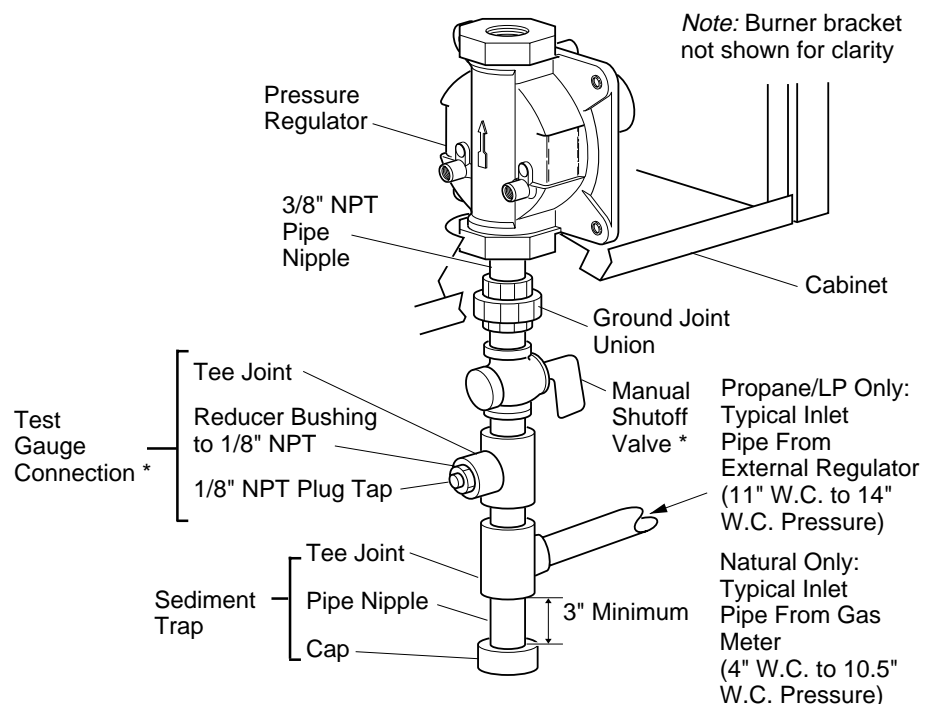


Figure 13 - Gas Connection

* An A.G.A. or G.G.A. design certified manual shutoff valve with 1/8" NPT tap is an acceptable alternative to test gauge connection. Purchase the optional A.G.A. or G.G.A. design certified manual shutoff valve from your dealer. See *Accessories*, page 15.

Continued

INSTALLATION

Continued

CHECKING GAS CONNECTIONS

⚠ WARNING: Test all gas piping and connections for leaks after installing or servicing. Correct all leaks at once.

⚠ WARNING: Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once.

⚠ CAUTION: (Propane/LP Only) Make sure external regulator has been installed between propane/LP supply and appliance. See guidelines under *Connecting to Gas Supply*, page 8.

Pressure Testing Gas Supply Piping System

Note: Pressure testing shall be performed in accordance with *Canadian Gas Code B-149.1 and 2-M95, Section 5.22.*

Test Pressures In Excess Of 1/2 PSIG

1. Disconnect appliance and its individual manual shutoff valve from gas supply piping system. Pressures in excess of 1/2 PSIG will damage appliance regulator.
2. Cap off open end of gas pipe where manual shutoff valve was connected.
3. Pressurize supply piping system by either using compressed air or an inert gas.
4. Check all joints of gas supply piping system. Apply mixture of liquid soap and water to gas joints. Bubbles forming show a leak.
5. Correct all leaks at once.

Test Pressures Equal To or Less Than 1/2 PSIG

1. Close manual shutoff valve (see Figure 14).
2. Pressurize supply piping system by either using compressed air or an inert gas.
3. Check all joints from propane/LP supply tank or main gas valve to manual shutoff valve (see Figure 15). Apply mixture of liquid soap and water to gas joints. Bubbles forming show a leak.
4. Correct all leaks at once.

Pressure Testing Appliance Gas Connections

1. Open manual shutoff valve (see Figure 14).
2. Open propane/LP supply tank valve (Propane/LP Only) or main gas valve (Natural Gas Only) located on or near gas meter.
3. Make sure control knob of appliance is in the OFF position.
4. Check all joints from manual shutoff valve to control valve (see Figure 15). Apply mixture of liquid soap and water to gas joints. Bubbles forming show a leak.
5. Correct all leaks at once.
6. Light appliance (see *Operating CO2 Generator*, page 10). Check the rest of the internal joints for leaks.
7. Turn off appliance (see *To Turn Off Gas to Appliance*, page 10).
8. Replace front panel.

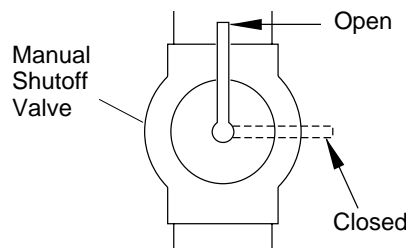
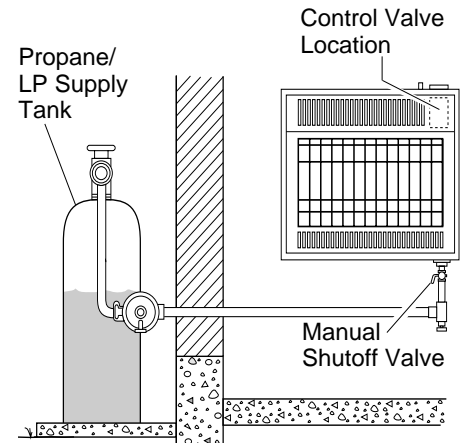


Figure 14 - Manual Shutoff Valve

PROPANE/LP



NATURAL GAS

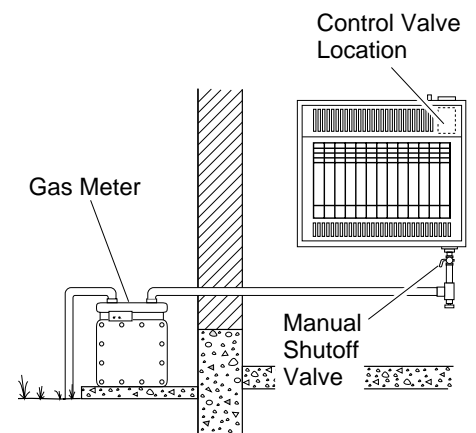


Figure 15 - Checking Gas Joints

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

OPERATING CO2 GENERATOR

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- This appliance has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- BEFORE LIGHTING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
 - Do not touch any electric switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician or gas supplier. Force or attempted repair may result in a fire or explosion.
 - Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

LIGHTING INSTRUCTIONS

- STOP!** Read the safety information above.
- Make sure manual shutoff valve is fully open.

- Turn control knob clockwise to the OFF position (see Figure 16).
- Wait five (5) minutes to clear out any gas. Then smell for gas including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information at left. If you don't smell gas, go to the next step.

- Press in control knob and turn counterclockwise to the PILOT position. Keep control knob pressed in for five (5) seconds (see Figure 16).

Note: You may be running this appliance for the first time after hooking up to gas supply. If so, the control knob may need to be pressed in for 30 seconds. This will allow air to bleed from the gas system.

- If control knob does not pop up when released, contact a qualified service person or gas supplier for repairs.

- With control knob pressed in, push down and release ignitor button. This will light pilot. The pilot is attached to the front of burner. The burner and pilot are located behind the heat shield. If needed, keep pressing ignitor button until pilot lights.

Note: If pilot does not stay lit, refer to *Troubleshooting*, pages 12 through 14. Also contact a qualified service person or gas supplier for repairs. Until repairs are made, light pilot with match. To light pilot with match, see *Manual Lighting Procedure*.

- Keep control knob pressed in for 30 seconds after lighting pilot. After 30 seconds, release control knob.

Note: If pilot goes out, repeat steps 3 through 7.

- Turn control knob counterclockwise to the LOW position. The main burner should light. Set control knob to any level between HIGH and LOW. To turn control knob from LOW to a higher setting, press in the control knob and turn counterclockwise.

Note: Both HIGH and LOW are locked positions. You must press in control knob before turning it from these positions.

CAUTION: Do not try to adjust high/low level by using the manual shutoff valve.

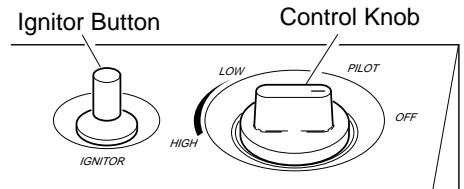


Figure 16 - Control Knob In The OFF Position

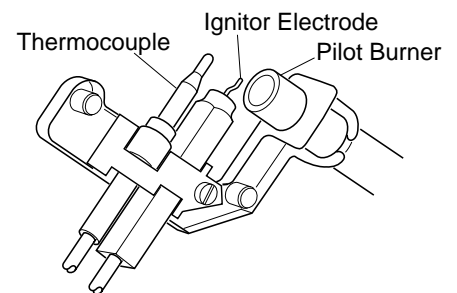


Figure 17 - Pilot

TO TURN OFF GAS TO APPLIANCE

Shutting Off Appliance

- Turn control knob clockwise to the PILOT position.
- Press in control knob and turn clockwise to the OFF position.

Shutting Off Burner Only (pilot stays lit)

Turn control knob clockwise to the PILOT position.

MANUAL LIGHTING PROCEDURE

- Remove front panel (see Figure 6, page 6).
- Follow steps 1 through 5 under *Lighting Instructions*.
- With control knob pressed in, strike match. Hold match to pilot until pilot lights.
- Keep control knob pressed in for 30 seconds after lighting pilot. After 30 seconds, release control knob.
- Replace front panel.

INSPECTING BURNER

Check pilot flame pattern and burner flame pattern often.

PILOT FLAME PATTERN

Figure 18 shows a correct pilot flame pattern. Figure 19 shows an incorrect pilot flame pattern. The incorrect pilot flame is not touching the thermocouple. This will cause the thermocouple to cool. When the thermocouple cools, the appliance will shut down.

If pilot flame pattern is incorrect, as shown in Figure 19

- turn appliance off (see *To Turn Off Gas to Appliance*, page 10)
- see *Troubleshooting*, pages 12 through 14

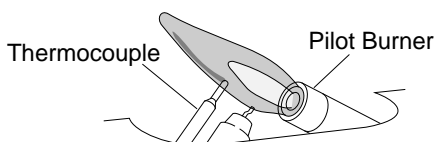


Figure 18 - Correct Pilot Flame Pattern

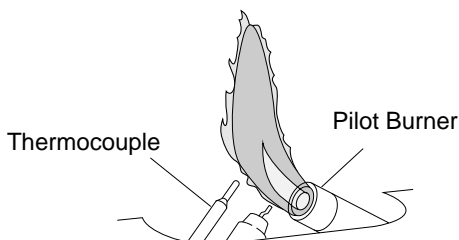


Figure 19 - Incorrect Pilot Flame Pattern

BURNER FLAME PATTERN

Figure 20 shows a correct burner flame pattern. Figure 21 shows an incorrect burner flame pattern. The incorrect burner flame pattern shows yellow tipping of the flame. It also shows the flame higher than 1/2 the heat shield height.

If burner flame pattern is incorrect, as shown in Figure 21

- turn appliance off (see *To Turn Off Gas to Appliance*, page 10).
- see *Troubleshooting*, pages 12 through 14

WARNING: If yellow tipping occurs, your CO2 generator could produce increased levels of carbon monoxide. If burner flame pattern shows yellow tipping, follow instructions at bottom of this page.

NOTICE: Do not mistake orange flames with yellow tipping. Dirt or other fine particles enter the appliance and burn causing brief patches of orange flame.

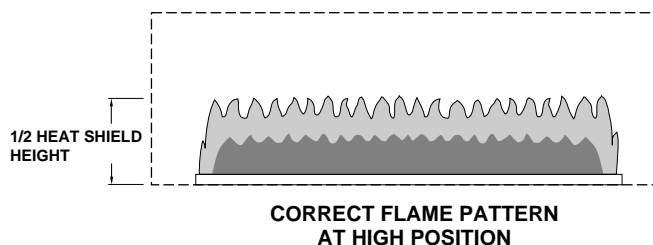


Figure 20 - Correct Burner Flame Pattern

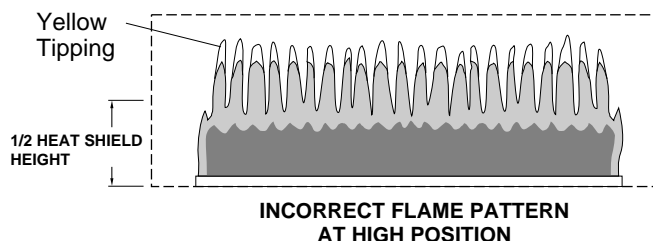


Figure 21 - Incorrect Burner Flame Pattern

CLEANING AND MAINTENANCE

WARNING: Turn off appliance and let cool before cleaning.

CAUTION: You must keep control areas, burner, and circulating air passageways of appliance clean. Inspect these areas of appliance before each use. Have CO2 generator inspected yearly by a qualified service person. Appliance may need more frequent cleaning due to excessive sawdust, cobwebs, etc.

ODS/PILOT AND BURNER

- Use a vacuum cleaner, pressurized air, or small, soft bristled brush to clean.

CABINET

Air Passageways

- Use a vacuum cleaner or pressurized air to clean.

Exterior

- Use a soft cloth dampened with a mild soap and water mixture. Wipe the cabinet to remove dust.

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

TROUBLESHOOTING

Note: All troubleshooting items are listed in order of operation.

⚠ WARNING: Turn off and unplug appliance and let cool before servicing. Only a qualified service person should service and repair appliance.

⚠ CAUTION: Never use a wire, needle, or similar object to clean ODS/pilot. This can damage ODS/pilot unit.

OBSERVED PROBLEM	POSSIBLE CAUSE	REMEDY
When ignitor button is pressed, there is no spark at ODS/pilot	<ol style="list-style-type: none"> Ignitor electrode positioned wrong Ignitor electrode broken Ignitor electrode not connected to ignitor cable Ignitor cable pinched or wet Broken ignitor cable Bad piezo ignitor 	<ol style="list-style-type: none"> Replace ignitor Replace ignitor Reconnect ignitor cable Free ignitor cable if pinched by any metal or tubing. Keep ignitor cable dry Replace ignitor cable Replace piezo ignitor
When ignitor button is pressed, there is spark at ODS/pilot but no ignition	<ol style="list-style-type: none"> Gas supply turned off or manual shutoff valve closed Control knob not in PILOT position Control knob not pressed in while in PILOT position Air in gas lines when installed Depleted gas supply (Propane/LP Only) ODS/pilot is clogged Gas regulator setting is not correct 	<ol style="list-style-type: none"> Turn on gas supply or open manual shutoff valve Turn control knob to PILOT position Press in control knob while in PILOT position Continue holding down control knob. Repeat igniting operation until air is removed Contact local propane/LP gas company Clean ODS/pilot (see <i>Cleaning and Maintenance</i>, page 11) or replace ODS/pilot assembly Replace gas regulator
ODS/pilot lights but flame goes out when control knob is released	<ol style="list-style-type: none"> Control knob not fully pressed in Control knob not pressed in long enough Manual shutoff valve not fully open Thermocouple connection loose at control valve Pilot flame not touching thermocouple, which allows thermocouple to cool, causing pilot flame to go out. This problem could be caused by one or both of the following: <ol style="list-style-type: none"> Low gas pressure Dirty or partially clogged ODS/pilot Thermocouple damaged Control valve damaged 	<ol style="list-style-type: none"> Press in control knob fully After ODS/pilot lights, keep control knob pressed in 30 seconds Fully open manual shut-off valve Hand tighten until snug, then tighten 1/4 turn more A) Contact local gas company B) Clean ODS/pilot (see <i>Cleaning and Maintenance</i>, page 11) or replace ODS/pilot assembly Replace thermocouple Replace control valve
Burner does not light after ODS/pilot is lit	<ol style="list-style-type: none"> Burner orifice is clogged Burner orifice diameter is too small Inlet gas pressure is too low 	<ol style="list-style-type: none"> Clean burner (see <i>Cleaning and Maintenance</i>, page 11) or replace burner orifice Replace burner orifice Contact local gas company

TROUBLESHOOTING

Continued

OBSERVED PROBLEM	POSSIBLE CAUSE	REMEDY
Delayed ignition of burner	<ol style="list-style-type: none"> 1. Manifold pressure is too low 2. Burner orifice is clogged 	<ol style="list-style-type: none"> 1. Contact local gas company 2. Clean burner (see <i>Cleaning and Maintenance</i>, page 11) or replace burner orifice
Burner backfiring during combustion	<ol style="list-style-type: none"> 1. Burner orifice is clogged or damaged 2. Inlet gas pressure is too low 3. Burner damaged 4. Gas regulator defective 	<ol style="list-style-type: none"> 1. Clean burner (see <i>Cleaning and Maintenance</i>, page 11) or replace burner orifice 2. Contact local gas company 3. Replace burner 4. Replace gas regulator
Yellow flame during burner combustion	<ol style="list-style-type: none"> 1. Not enough air 2. Inlet gas pressure is too low 3. Gas regulator defective 	<ol style="list-style-type: none"> 1. Check burner for dirt and debris. If found, clean burner (see <i>Cleaning and Maintenance</i>, page 11) 2. Contact local gas company 3. Replace gas regulator
Slight smoke or odor during initial operation	<ol style="list-style-type: none"> 1. Residues from manufacturing processes 	<ol style="list-style-type: none"> 1. Problem will stop after a few hours of operation
Appliance produces a whistling noise when burner is lit	<ol style="list-style-type: none"> 1. Turning control knob to HIGH position when burner is cold 2. Air in gas line 3. Air passageways on appliance blocked 4. Dirty or partially clogged burner orifice 	<ol style="list-style-type: none"> 1. Turn control knob to LOW position and let warm up for a minute 2. Operate burner until air is removed from line. Have gas line checked by local gas company 3. Observe minimum installation clearances (see Figure 4, page 6) 4. Clean burner (see <i>Cleaning and Maintenance</i>, page 11) or replace burner orifice

Continued

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

TROUBLESHOOTING

Continued



WARNING: If you smell gas

- Shut off gas supply.
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

IMPORTANT: Operating appliance where impurities in air exist may create odors. Cleaning supplies, paint, paint remover, cigarette smoke, cements and glues, new carpet or textiles, etc., create fumes. These fumes may mix with combustion air and create odors.

OBSERVED PROBLEM	POSSIBLE CAUSE	REMEDY
Appliance produces a clicking/ticking noise just after burner is lit or shut off	1. Metal expanding while heating or contracting while cooling	1. This is common with most CO2 generators. If noise is excessive, contact qualified service person
Appliance produces unwanted odors	1. Appliance burning vapors from paint, solvents, glues, etc. See IMPORTANT statement above 2. Low fuel supply (Propane/LP Only) 3. Gas leak. See Warning statement at top of page	1. Ventilate room. Stop using odor causing products while appliance is running 2. Refill supply tank 3. Locate and correct all leaks (see <i>Checking Gas Connections</i> , page 9)
Appliance shuts off in use (ODS operates)	1. Not enough fresh air is available 2. Low line pressure 3. ODS/pilot is partially clogged	1. Open window and/or door for ventilation 2. Contact local gas company 3. Clean ODS/pilot (see <i>Cleaning and Maintenance</i> , page 11)
Gas odor even when control knob is in OFF position	1. Gas leak. See Warning statement at top of page 2. Control valve defective	1. Locate and correct all leaks (see <i>Checking Gas Connections</i> , page 9) 2. Replace control valve
Gas odor during combustion	1. Foreign matter between control valve and burner 2. Gas leak. See Warning statement at top of page	1. Take apart gas tubing and remove foreign matter 2. Locate and correct all leaks (see <i>Checking Gas Connections</i> , page 9)
Moisture/condensation noticed on windows	1. Not enough combustion/ventilation air.	1. Refer to <i>Air for Combustion and Ventilation</i> requirements (page 3)

SPECIFICATIONS

	RP30E-CAN	RN30E-CAN
Btu (Variable)	15,000/30,000	15,000/30,000
Type Gas	Propane/LP Only	Natural Only
Ignition	Piezo	Piezo
Pressure Regulator Setting	8" W.C.	3" W.C.
Inlet Gas Pressure (inches of water)		
Maximum	14"	10.5"
Minimum	11"	4"
Dimensions, Inches (H x W x D)		
Appliance	23.5 x 25.9 x 8.0	23.5 x 25.9 x 8.0
Carton	26 x 27.75 x 9.63	26 x 27.75 x 9.63
Weight (pounds)		
Appliance	30	30
Shipping	35	35

TECHNICAL SERVICE

You may have further questions about installation, operation, or troubleshooting. If so, contact DESA International's Technical Service Department at 1-800-323-5190.

SERVICE HINTS

When Gas Pressure Is Too Low

- pilot will not stay lit
- burner will have delayed ignition
- appliance will not produce maximum CO₂
- (Propane Only) propane/LP gas supply may be low

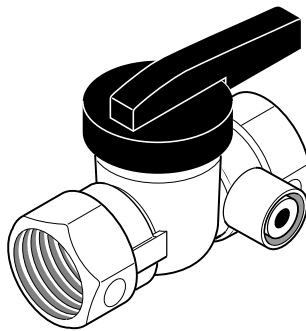
When Gas Quality Is Bad

- pilot will not stay lit
- burner will produce flames and soot
- appliance will backfire when lit

You may feel your gas pressure is too low or gas quality is bad. If so, contact your local propane/LP gas supplier.

ACCESSORIES

Purchase this CO₂ generator accessory from your local dealer. If they can not supply this accessory contact DESA International's Parts Department at 1-800-972-7879 for referral information. You can also write to the address listed on the back page of this manual.



MANUAL SHUT OFF VALVE - GA5010

Manual shutoff valve with 1/8" NPT tap.

REPLACEMENT PARTS

Note: Use only original replacement parts. This will protect your warranty coverage for parts replaced under warranty.

Parts Under Warranty

Contact authorized dealers of this product. If they can't supply original replacement part(s) contact DESA International's Technical Service Department at 1-800-323-5190.

When calling, have ready

- your name
- your address
- model number of your CO₂ generator
- how appliance was malfunctioning
- type of gas used (propane/LP or natural gas)
- purchase date

Usually, we will ask you to return the defective part to the factory.

Parts Not Under Warranty

Contact authorized dealers of this product. If they can't supply original replacement part(s) contact DESA International's Parts Department at 1-800-972-7879 for referral information.

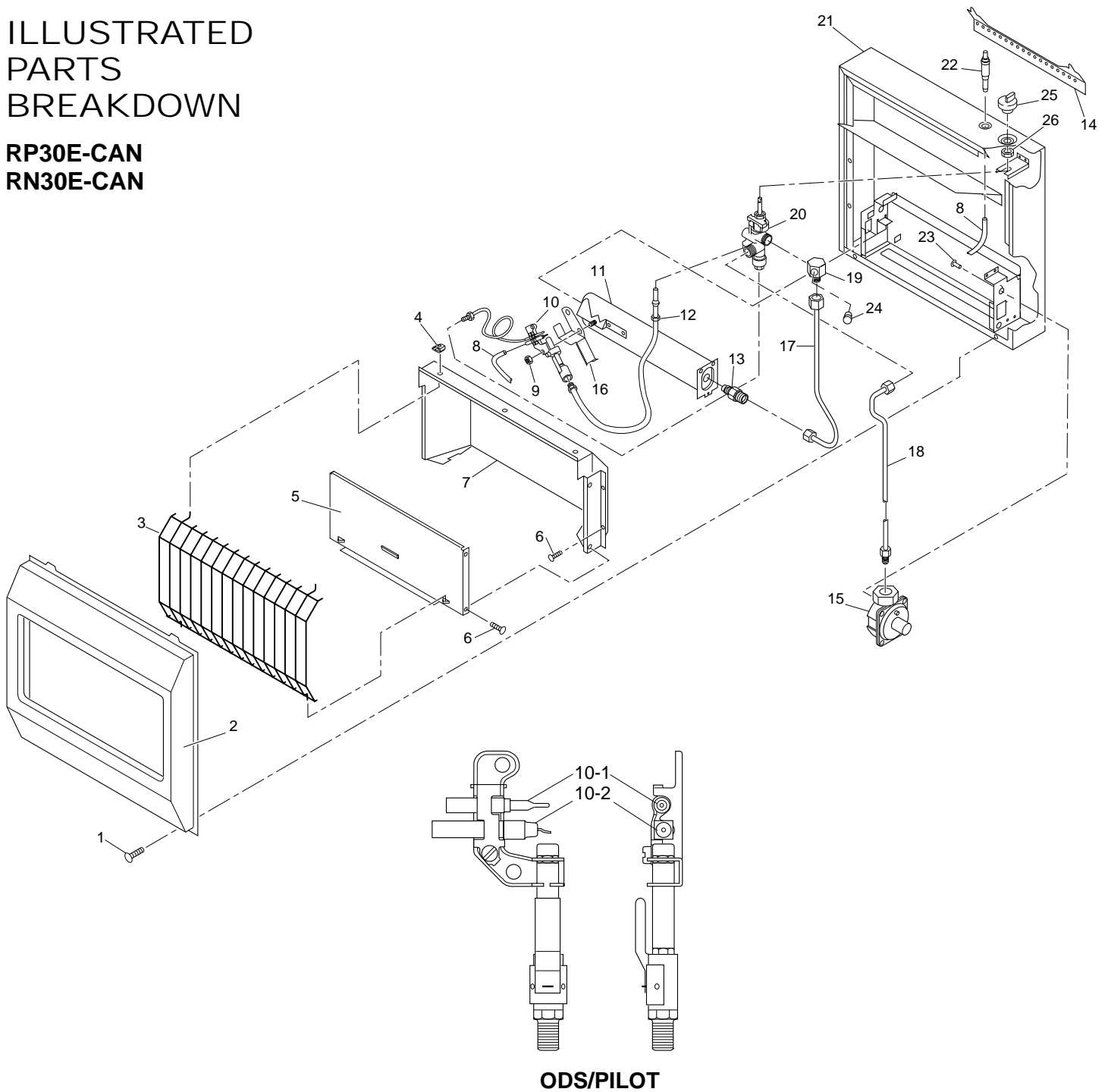
When calling, have ready

- model number of your CO₂ generator
- the replacement part number

BLUE-FLAME VENT-FREE PROPANE/LP AND NATURAL GAS GREENHOUSE CO2 GENERATOR

ILLUSTRATED PARTS BREAKDOWN

RP30E-CAN
RN30E-CAN



OWNER'S MANUAL

PARTS LIST

This list contains replaceable parts used in your appliance. When ordering parts, follow the instructions listed under *Replacement Parts* on page 17 of this manual.

RP30E-CAN RN30E-CAN

KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	098304-01	Screw, #10 x 3/8"	2
2	098345-01AC	Front Panel	1
3	103476-02	Grill Guard	1
4	101108-01	Clip, Grill Guard	2
5	104658-01BR	Heat Shield	1
6	M11084-26	Screw, #10 x 3/8"	6
7	104102-02BR	Deflector Unit	1
8	098271-03	Ignitor Cable	1
9	098249-01	Nut, M5	2
10	099059-04	ODS/Pilot, L.P.	1
	100701-01	ODS/Pilot, N.G.	1
10-1	098514-01	Thermocouple	1
10-2	098594-01	Ignitor Electrode	1
11	103447-01	Burner	1
12	099387-05	3/16" Pilot Tubing	1
13	103845-03	Injector, L.P.	1
	103845-04	Injector, N.G.	1
14	099066-01	Mounting Bracket	1
15	099415-06	Pressure Regulator, L.P.	1
	099415-11	Pressure Regulator, N.G.	1
16	099553-01	Pilot Shield	1
17	103570-01	3/8" Outlet (Burner) Tubing	1
18	103572-01	3/8" Inlet Tubing	1
19	100068-01	Pressure Tap Fitting	1
20	100047-02	Control Valve, L.P.	1
	100047-01	Control Valve, N.G.	1
21	104617-09	Cabinet	1
22	097159-04	Piezo Ignitor	1
23	098303-02	Screw, #8 x 3/8"	2
24	098276-01	1/8" NPT Plug	1
25	098354-01	Control Knob	1
26	098508-01	Valve Retainer Nut	1
PARTS AVAILABLE — NOT SHOWN			
	098306-02	Control Position Decal	1
	099261-02	Operating Instructions Decal	1
	100642-01	Assembly, Hardware	1

WARRANTY INFORMATION

KEEP THIS WARRANTY

Model _____
Serial No. _____
Date Purchased _____

Always specify model and serial numbers when communicating with the factory.

We reserve the right to amend these specifications at any time without notice. The only warranty applicable is our standard written warranty. We make no other warranty, expressed or implied.

LIMITED WARRANTY BLUE FLAME VENT-FREE CO2 GENERATOR

DESA Industries warrants this product to be free from defects in materials and components for two (2) years from the date of first purchase, provided that the product has been properly installed, operated and maintained in accordance with all applicable instructions. To make a claim under this warranty the Bill of Sale or cancelled check must be presented.

This warranty is extended only to the original retail purchaser. This warranty covers only the cost of part(s) required to restore this appliance to proper operating condition. Warranty part(s) MUST be obtained through authorized dealers of this product and/or DESA Industries who will provide original factory replacement parts. Failure to use original factory replacement parts voids this warranty. The appliance MUST be installed by a qualified installer in accordance with all local codes and instructions furnished with the unit.

This warranty does not apply to parts that are not in original condition because of normal wear and tear, or parts that fail or become damaged as a result of misuse, accidents, lack of proper maintenance or defects caused by improper installation. Travel, diagnostic cost, labor, transportation and any and all such other costs related to repairing a defective appliance will be the responsibility of the owner.

TO THE FULL EXTENT ALLOWED BY THE LAW OF THE JURISDICTION THAT GOVERNS THE SALE OF THE PRODUCT; THIS EXPRESS WARRANTY EXCLUDES ANY AND ALL OTHER EXPRESSED WARRANTIES AND LIMITS THE DURATION OF ANY AND ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE TO TWO (2) YEARS FROM THE DATE OF FIRST PURCHASE: AND DESA INDUSTRIES' LIABILITY IS HEREBY LIMITED TO THE PURCHASE PRICE OF THE PRODUCT AND DESA INDUSTRIES SHALL NOT BE LIABLE FOR ANY OTHER DAMAGES WHATSOEVER INCLUDING INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow a limitation on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitation on implied warranties, or exclusion or limitation on damages may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

For information about this warranty write:

DESA

DESA INDUSTRIES OF CANADA, INC.
Mississauga, Ontario, Canada L5N 2K7
Telephone/Téléphone 905-826-8010
Fax/Télécopieur 905-826-8236
Email desacan@sympatico.ca



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