**FOR YOUR SAFETY**
***If you smell gas:***

1. **Open windows.**
2. **DO NOT try to light any appliance.**
3. **DO NOT use electrical switches.**
4. **DO NOT use any telephone in your building.**
5. **Leave the building.**
6. **Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.**
7. **If you cannot reach your gas supplier, call the Fire Department.**

## ⚠ WARNING

**Fire Hazard**

**Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**

**Some objects will catch fire or explode when placed close to heater.**

**Failure to follow these instructions can result in death, injury or property damage.**

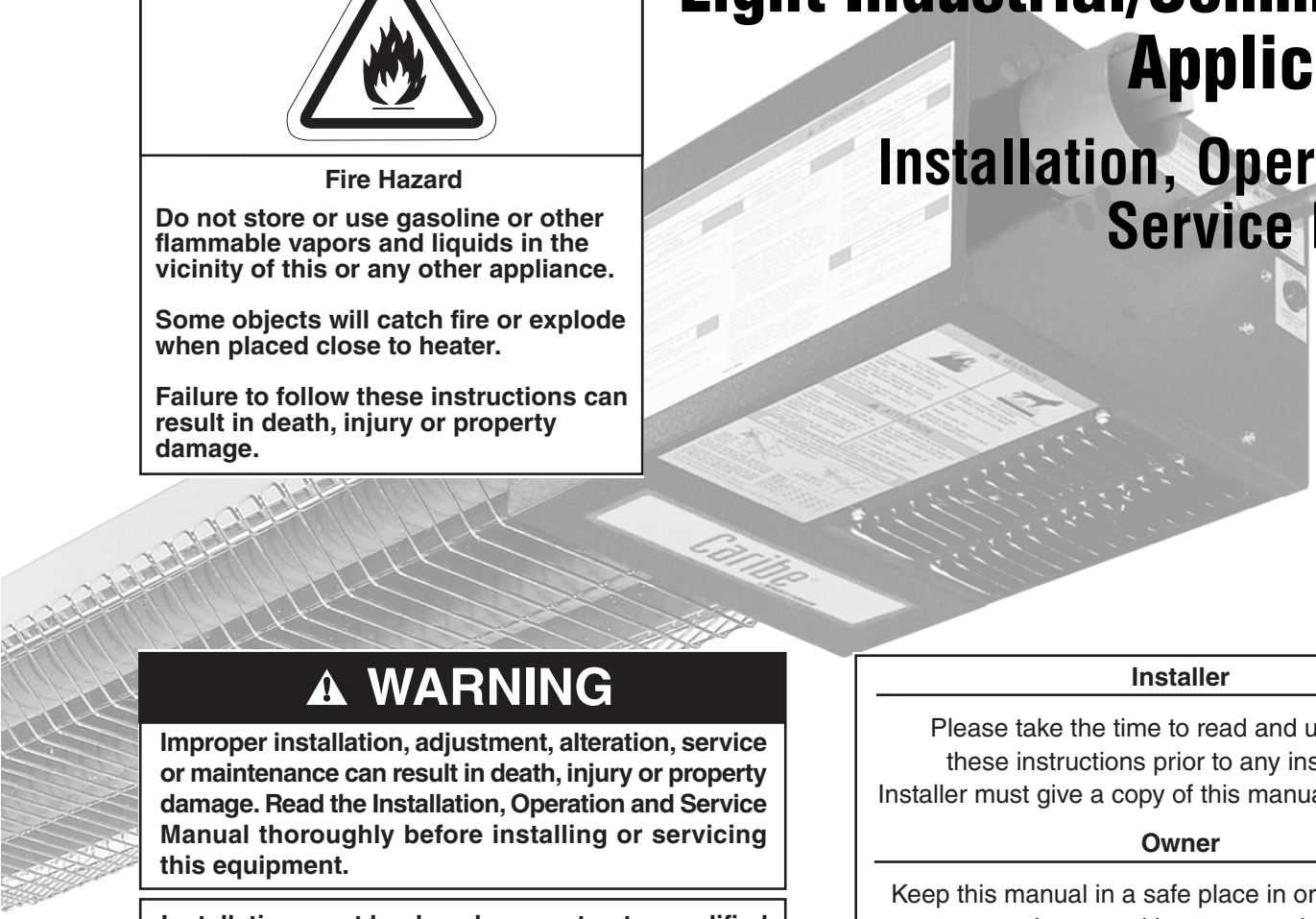
ROBERTS GORDON

# Caribe®

# Gas-Fired, Low-Intensity Infrared Heaters for Residential Garages and Light Industrial/Commercial Applications

## Installation, Operation & Service Manual

**CGTH-30**
**CGTH-40**
**CGTH-50**




## ⚠ WARNING

**Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the Installation, Operation and Service Manual thoroughly before installing or servicing this equipment.**

**Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.**

**Installer**

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

**Owner**

Keep this manual in a safe place in order to provide your serviceman with necessary information.

DESIGN CERTIFIED®

CERTIFIED®

***Quality in Any Language™***

**Roberts-Gordon, LLC**
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: 716.852.4400
Fax: 716.852.0854
Toll Free: 800.828.7450

**www.rg-inc.com**



P/N 180100NA Rev. G 11/05

## TABLE OF CONTENTS






Printed in the U.S.A.

## TABLE OF FIGURES

# SECTION 1: BEFORE YOU BEGIN

## 1.1 Read This Manual

Read this manual carefully before installing or servicing this equipment. Improper installation, servicing or maintenance can result in death, injury or property damage. Check the required safe distances from combustibles given on the outside of each burner to make sure that the product is suitable for your application. The required safe distances from combustibles are also found *on Pages 15 and 16* of this manual. Installer must be a contractor qualified in the installation and service of gas-fired heating equipment. After the installation is complete, check product operation as provided in these instructions.

## 1.2 Questions, Comments or Suggestions

Please direct any questions, comments or suggestions to:

**Roberts-Gordon, LLC**
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
Telephone: 716.852.4400
Fax: 716.852.0854
Toll Free: 800.828.7450

## SECTION 2: INTRODUCTION

### 2.1 About Roberts-Gordon

Roberts-Gordon pioneered low-intensity infrared heating systems in 1962 with the introduction of its revolutionary, custom-engineered CORAYVAC® system. After more than 40 years of infrared expertise in commercial and industrial applications, Roberts-Gordon now offers the CGTH-Series heater for use in residential garages and light industrial/commercial applications.

### 2.2 About the Heater

The CGTH-Series is a factory-assembled, gas-fired, low-intensity heating system that incorporates a balanced flue. The system has been designed for easy installation and will provide years of economical operation and trouble-free service. Not only is infrared heat efficient, it also provides the most comfortable conditions in open areas, such as garages.

**Gas-Fired** means it uses clean-burning natural or LP gas.

**Low-Intensity** means that the radiant surface of the tube does not glow red. Instead, it operates at a lower temperature (less than 1000°F) and radiates energy at a lower intensity per square foot of radiating surface. The lower temperature and intensity levels are within a range that is most effective in establishing and maintaining personal comfort levels. An aluminum reflector directs the radiant energy downward to the occupied area.

**Balanced Flue** means that the burner draws combustion air from outdoors and exhausts the products of combustion, also to the outdoors, through a shared opening. This is accomplished through two concentric tubes.

**Radiant** refers to the energy radiated by the CGTH-Series heater. Because the energy is in the form of infrared rays, it does not directly heat the air. Instead, the rays heat objects such as the floor, cars, machines and people. The warm objects, in turn, heat the air.

These combined features are the key to the exceptional comfort and fuel efficiency provided by the CGTH-Series heater.

### 2.3 Unpacking the Heater

#### 2.3.1 Manpower Requirements

To prevent personal injury and damage to the heater, two persons will be required to remove the heater from the carton. Both ends of the heater should be lifted from the carton at the same time. The burner should be lifted by gripping the bottom. The reflector of the heater should be lifted using the hanger.

#### 2.3.2 Safety

**⚠ WARNING**

**Cut Hazard**

**Wear protective gloves when handling aluminum reflectors.**

**Edges are sharp.**

**Failure to follow these instructions can result in injury.**

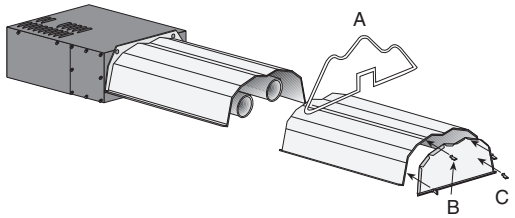
Thin sheet metal parts, such as the reflector portion of the heater and the various venting components, have sharp edges. To prevent injury, the use of work gloves is recommended. The use of gloves will also prevent the transfer of body oils from the hands to the surface of the reflector.

## 2.4 Carton Contents of Heaters with Galvanized Venting

Please check the cartons. It should contain the items shown on this page. Contact your ROBERTS GORDON® independent distributor if any items are missing.

(*) Additional package included with select models; also available as an accessory. *See Page 5*.

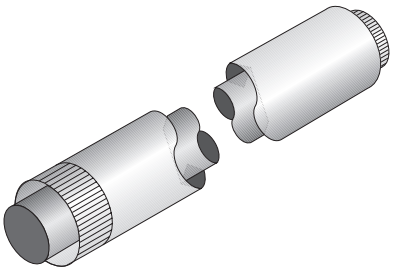
Heater Assembly:




CGTH-30; CGTH-40; CGTH-50

A.) (1) Hanger P/N 08080000
B.) (1) Reflector End Cap P/N 02750800
C.) (4) U-Clips P/N 91107720

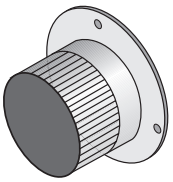
* 5' (125 mm) Balanced Flue Vent package (P/N 08039000) includes:



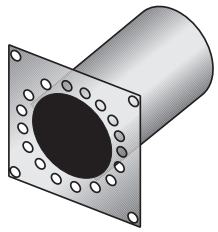
(1) 3" (80 mm) Flue Pipe 66"(168 cm) Long P/N 08035000

(1) 5" (125 mm) Vent Pipe 60" (1520 mm) Long P/N 90502800

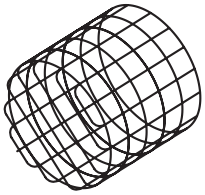

(1) Thermostat P/N 90409702



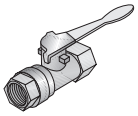
(1) Flue Collar P/N 91911701



(1) Vent Termination P/N 08031001

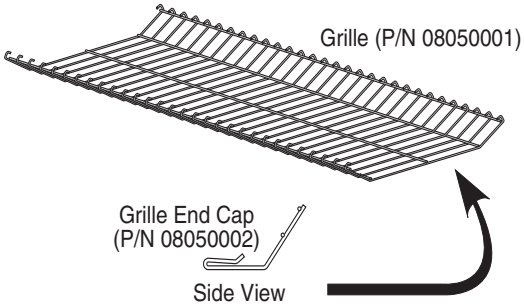


(1) Bird Screen P/N 08036000



(1) 3/8" (10 mm) Manual Gas Shut-off Valve P/N 90100200

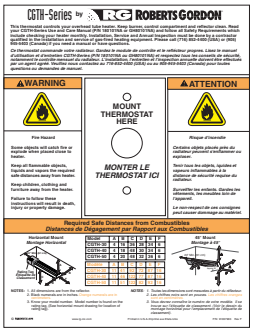
(4) Snap Hooks P/N 91903300

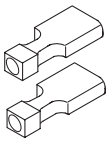



Protective Grille Kits - Included with select models. Also available as an accessory under kit part numbers.

CGTH-30 Kit (P/N 08051000) includes:
- (1) Grille End Cap P/N 08050002
- (2) Grille without End Cap P/N 08050001
- (2) Silicone Cap P/N 91915951-6P

CGTH-40 and CGTH-50 Kit (P/N 08051001) includes:
- (3) Grille without End Cap P/N 08050001
- (1) Grille End Cap P/N 08050002
- (3) Silicone Cap P/N 91915951-6P



(2) Female Terminals to connect thermostat wire P/N 91317300

(1) Thermostat Tag P/N 91037903

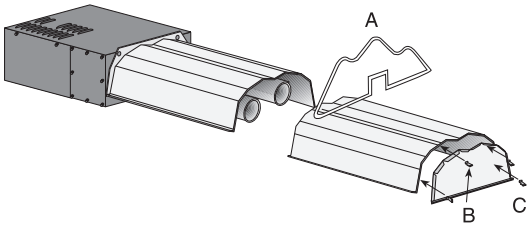
(3) Vent Collar Mounting Screws to attach vent collar to heater P/N 94118106

Documents:
(1) Installation Manual P/N 180100NA
(1) Use and Care Manual P/N180101NA
(1) Owner Warranty Registration Card: P/N CGTHWCNA

## 2.5 Carton Contents of Heaters with Cox Geelen Venting

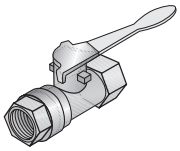
Please check the cartons. It should contain the items shown on this page. Contact your ROBERTS GORDON® independent distributor if any items are missing.

Heater Assembly:

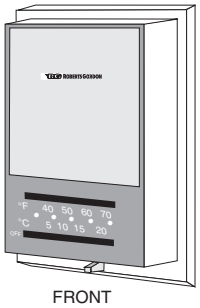



CGTH-30; CGTH-40; CGTH-50

A.) (1) Hanger P/N 08080000
B.) (1) Reflector End Cap P/N 02750800
C.) (4) U-Clips P/N 91107720

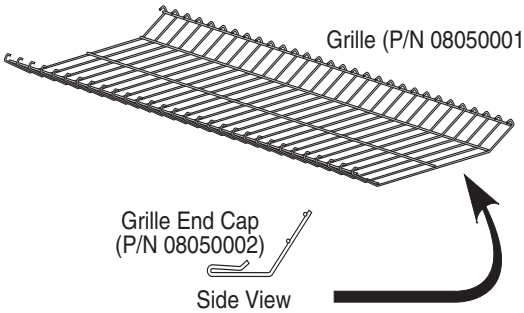


(1) 3/8" (10 mm) Manual Gas Shut-off Valve P/N 90100200




(1) Thermostat P/N 90409702

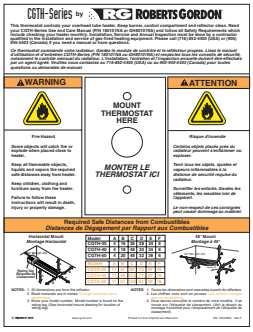
(4) Snap Hooks P/N 91903300

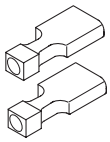



Protective Grille Kits - Included with select models. Also available as an accessory under kit part numbers.

CGTH-30 Kit (P/N 08051000) includes:
- (1) Grille End Cap P/N 08050002
- (2) Grille without End Cap P/N 08050001
- (2) Silicone Cap P/N 91915951-6P

CGTH-40 and CGTH-50 Kit (P/N 08051001) includes:
- (3) Grille without End Cap P/N 08050001
- (1) Grille End Cap P/N 08050002
- (3) Silicone Cap P/N 91915951-6P



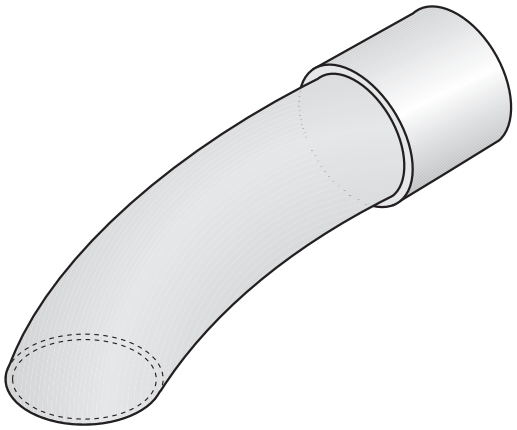
(2) Female Terminals to connect thermostat wire P/N 91317300

(1) Thermostat Tag P/N 91037903

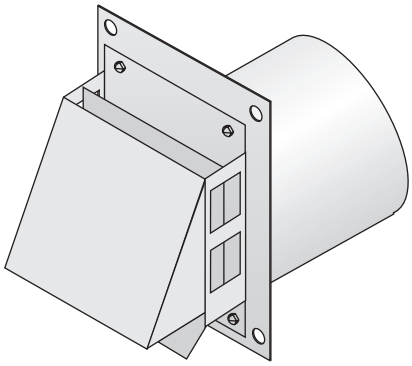
(3) Vent Collar Mounting Screws to attach vent collar to heater P/N 94118106

Documents:
(1) Installation Manual P/N 180100NA
(1) Use and Care Manual P/N180101NA
(1) Owner Warranty Registration Card: P/N CGTHWCNA

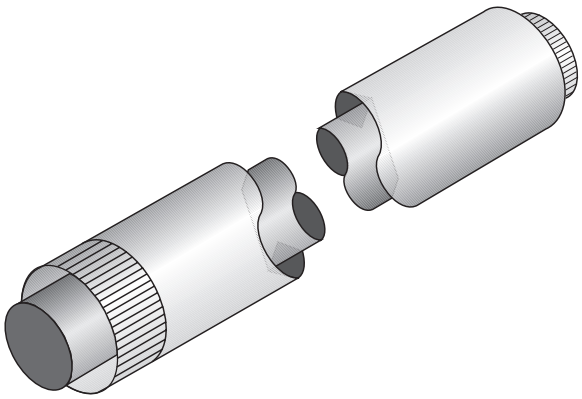
## 2.6 Available Accessories for Galvanized Vent



Vent Terminal Extension
P/N 08037000



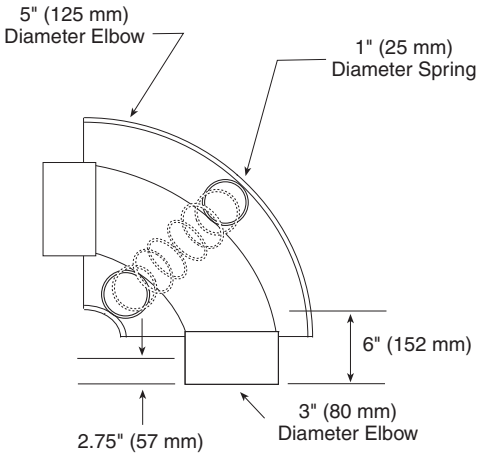
Tjernlund Wall Vent
P/N 08033000



5' (1524 mm) Balanced Flue Vent
(P/N 08039000) includes:

(1) 5" (125 mm) Vent Pipe - 60"
P/N 90502800

(1) 3" (80 mm) Flue Pipe - 66"
P/N 08035000




90° Elbow Kit (P/N 08038000) includes:

(1) 5" (125 mm) Diameter Elbow
P/N 90503000

(1) 3" (80 mm) Diameter Elbow
P/N 90503100

(1) Coil Spring Spacer P/N 90503200

## 2.7 Available Accessories for Cox Geelen Vent

**Roof Venting Kit (P/N 08032100) includes:**

(1) Roof Terminal
50.5” (1283 mm)
P/N 90506008

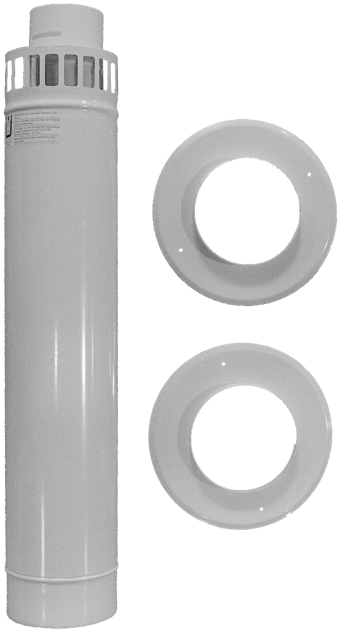
(1) Elbow 90°
P/N 90506001

(1) Storm Collar
P/N 90506015

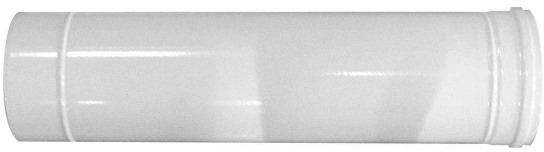
(1) Burner/Vent Adapter
P/N 90506012

**Wall Venting Kit (P/N 08032200) includes:**

(1) Burner/Vent Adapter P/N 90506012



(1) Wall Terminal 25” (635 mm)
with wall plate (P/N 90506011) includes:
(4) Screws P/N 94118106
(2) Wall Plates P/N 90506013

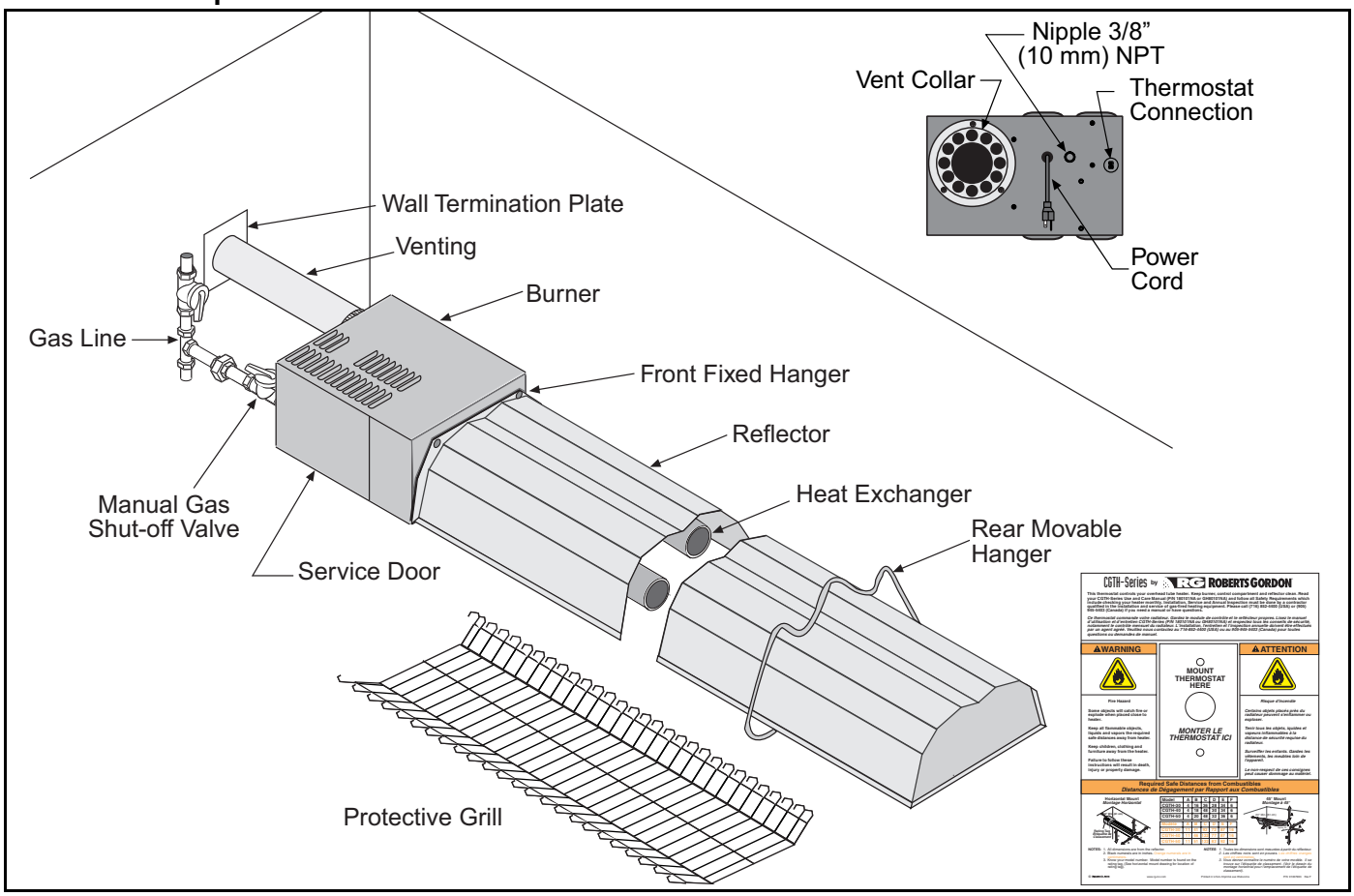


Concentric Flue 250 mm = 10” P/N 90506003
Concentric Flue 500 mm = 20” P/N 90506004
Concentric Flue 1000 mm = 39” P/N 90506005

Elbow 45° = 39” P/N 90506002

## 2.8 Components Identification

**FIGURE 1: Components Identification**




**Burner** - Contains the electrical components (i.e. blower motor, power transformer, etc.) and gas distribution components (i.e. gas valve, etc.) that make the heater work. There are no owner serviceable items contained in this box.

**Front Fixed Hanger** - Provides rigid support and mounting surface for the reflector. Holes are provided in the upper corners of the bulkhead to accommodate suspension hardware required for installation of the heater.

**Reflector** - The reflector is made from formed aluminum and reflects the radiant energy downward to the space to be heated.

**Heat Exchanger** - A U-shaped tube through which the heated products of combustion pass.

**Rear Movable Hanger** - Provides support for the tube and reflector at the end that is furthest from the burner. The support may be moved (within limits) to accommodate hanging of the unit.

**Service Door** - To be removed only by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier. Removal of this service door provides access to the electrical and gas distribution components.

**Gas Line** - Must only be installed and serviced by a licensed contractor or gas fitter.

**Wall Termination Plate** - Placed on the outside wall over the venting.

**Venting** - Installer must properly exhaust the heater outside. The 5” outer duct carries fresh air to the burner. The 3” inner duct carries the products of combustion to the outside.

**Thermostat** - 24 Volt Thermostat mounted with Safety Tag.

**Protective Grille** - Included with select models. *See Page 20, Section 4.14* for details.

**Vent Collar** - Accommodates a 5" (125 mm) diameter combustion air inlet duct that delivers fresh air to the burner. The fresh air enters the burner through the twelve equally spaced holes shown above. The 3" (80 mm) diameter hole in the center of the flue collar accommodates the venting duct that carries the products of combustion to be vented outdoors.

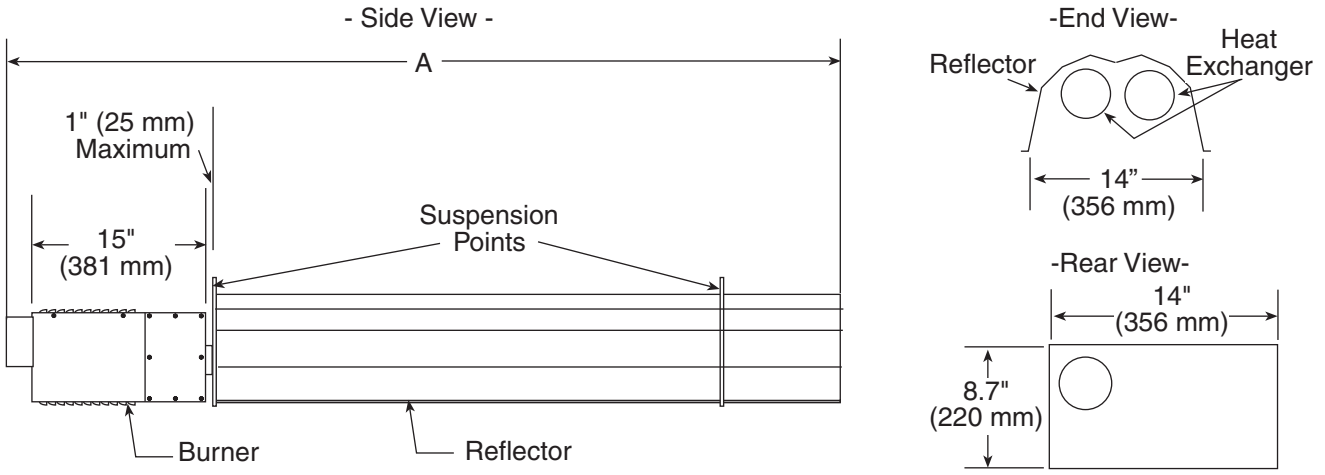
**Nipple-3/8" (10 mm) NPT** - Point at which the gas supply is connected to the heater.

**Thermostat Connection** - Two terminals to which the thermostat wires will be connected.

**Power Cord** - Includes a three-prong plug that must be connected to a dedicated and properly grounded three-prong ceiling outlet.

### 2.9 Technical Specifications

**FIGURE 2: Specifications**




**Inputs and Dimensions**

| Model No. | BTU/hr | Weight | A |
|---|---|---|---|
| CGTH-30 | 30,000 | 85 lbs. | 8'0" (2438 mm) |
| CGTH-40 | 40,000 | 96 lbs. | 11'6" (3505 mm) |
| CGTH-50 | 50,000 | 96 lbs. | 11'6" (3505 mm) |

**HEATER SPECIFICATIONS**

**Electrical**

Rating: 120 V, 60 Hz, 1 Ø, 1 A
Connection: 3 pin molded plug

**Gas Inlet Connection**

Connection: 3/8" Male NPT

**Gas Inlet Pressure**

Natural Gas:
Minimum:Inlet5.0" w.c. (12.4 mbar)
Maximum:Inlet14.0" w.c. (34.8 mbar)

LP Gas (Propane):
Minimum:Inlet11.0" w.c. (37.4 mbar)
Maximum:Inlet14.0" w.c. (34.8 mbar)

**Manifold Pressure**

Natural Gas: 3.5" w.c. (8.7 mbar)
LP Gas (Propane): 10.5" w.c. (26.1 mbar)

**VENTING SPECIFICATIONS**

**Vent/Flue**

Length:10' (3 m) (Maximum)
2' - 6" (1 m 15 cm) (Minimum)

Flue Pipe:3.0" (80 mm) diameter

Vent Pipe:5.0" (125 mm) diameter

### 2.10 Where Can the Heater Be Installed?

The CGTH-Series heater is intended for installation in the following areas:

- Residential applications, such as:
  - garages
  - hobby greenhouses
  - workshops
- Light industrial/commercial applications, such as:
  - entranceways
  - lobby areas
  - lunch rooms
  - aircraft hangars (*See Page 11, Section 3.5.1* for restrictions)
  - public garages (*See Page 11, Section 3.5.2* for restrictions)

### 2.11 Where Can't the Heater Be Installed?

The CGTH-Series heater **is not intended** for installation in the following areas:

- Residential living or sleeping areas
- Basements

**Due to high temperatures, ensure that the heater area is kept clear of furniture, draperies, clothing or other combustible materials. Children and adults should be alerted to the hazard of high surface temperatures and should stay away to avoid burns and clothing ignition. Young children should be carefully supervised when they are in the same room as the heater.**

### 2.12 Installer's Responsibility

The CGTH-Series heater, the gas and electrical supplies, as well as the venting, must be installed in accordance with applicable specifications and codes. Only firms (or individuals) well qualified in this type of work should install the system. Consult local Building Inspectors, Fire Marshals or your local ROBERTS GORDON® independent distributor for guidance.

Use the information given in this manual together with the cited codes and regulations to perform the installation. If any aspects of the installation are unclear, consult your ROBERTS GORDON® independent distributor for clarification. The installer must furnish all needed materials that are not furnished as standard equipment. It is also the installer's responsibility to see that the materials and installation methods used result in a job that is workmanlike in appearance and is in compliance with the requirements of this manual. The installer must give this manual and the Use and Care Manual to the owner.

## SECTION 3: PLANNING

### 3.1 General

This section provides the following information:

- Defines the gas, electric and venting requirements for the CGTH-Series heater.
- Specifies the national standards and applicable codes that apply to the gas, electric and venting requirements.
- Specifies the national standards and applicable codes that apply to non-residential installations.

### 3.2 Gas Service Requirements:

#### 3.2.1 Gas Type

The type of gas appearing on the nameplate must be the type of gas used. Installation must comply with local codes and recommendations of the local gas company. United States: Refer to National Fuel Gas Code, ANSI Z223.1 - latest revision (same as NFPA Bulletin 54). Canada: Refer to CSA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

#### 3.2.2 Gas Supply Lines

The size of the gas supply lines must comply with local codes and recommendations of the local gas company. United States: Refer to National Fuel Gas Code, ANSI Z223.1 - latest revision (same as NFPA Bulletin 54). Canada: Refer to CSA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

A 1/8" NPT plugged tap must be installed in the gas line connection immediately upstream of the burner that is farthest from the gas supply meter. The tap is required for checking system gas pressure.

#### 3.2.3 Meter and Service

Meter and service must be large enough to handle all the heaters being installed plus any other connected load. The gas line which feeds the system must be large enough to supply the required gas with a maximum pressure drop of 1/2" (13 mm) w.c. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

### 3.3 Electrical Service Requirements

**⚠ WARNING**

**Electrical Shock Hazard**

**Plug heater into grounded three-prong ceiling receptacle.**

**Do not cut or remove the grounding prong from this plug.**

**Do not use with an extension cord.**

**Failure to follow these instructions can result in death or electrical shock.**

#### 3.3.1 Grounding

The heater must be electrically grounded in accordance with the following codes: United States: Refer to National Electrical Code, ANSI/NFPA-70 - latest revision. Wiring must conform to the most current National Electrical Code and local ordinances. Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

#### 3.3.2 Thermostat

It is important to note that the CGTH-Series heater is controlled by a low voltage (24V AC) thermostat supplied with the heater. The control transformer located inside the burner supplies the necessary electrical power to operate the thermostat. No other electrical power to the thermostat is required.

### 3.4 Venting Requirements

#### 3.4.1 System Requirements

The CGTH-Series heater must be installed with the venting system supplied or with the optional venting kit available from Roberts-Gordon. DO NOT connect this heater to a separate chimney and do not common vent with any other fuel burning appliance.

The CGTH-Series heater employs a balanced flue/air venting duct system and must conform to the following length requirements:

Maximum Length:10' (3048 mm)
Minimum Length:2' - 6" (760 mm)
Maximum Elbows:Two (2) with natural gas units, one (1) with propane gas units

#### 3.4.2 Venting Codes

**⚠ WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

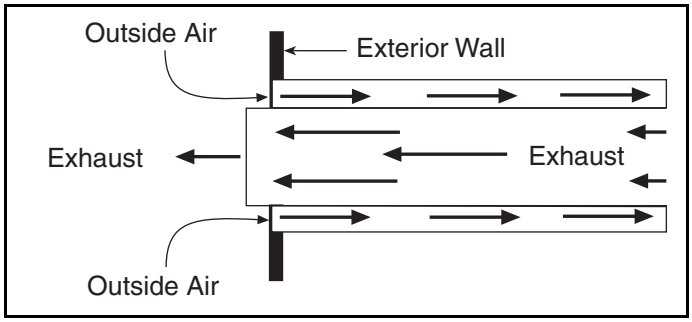
The location, size, installation and termination of vents, as well as the required safe distances from combustibles when penetrating combustible walls, must comply with local codes and recommendations of the local gas company. United States: Refer to National Fuel Gas Code, ANSI Z223.1 - latest revision (same as NFPA Bulletin 54). Canada: Refer to CSA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

#### 3.4.3 Balanced Flue Construction

The balanced flue consists of a 3" (80 mm) diameter flue which is concentrically positioned inside a 5" (125 mm) diameter vent pipe (*See Figure 3*). The 5" (125 mm) diameter vent supplies outside air for combustion while the 3" (80 mm) diameter flue carries the products of combustion from the heater.

The balanced flue is applicable for both horizontal and vertical venting arrangements. Vertical venting will require the optional roof venting kit available from Roberts-Gordon.

**FIGURE 3: Balanced Flue**




### 3.5 Non-Residential Installations

#### 3.5.1 Aircraft Hangars

The CGTH-Series heater may be used in certain areas of aircraft hangars. Installation in aircraft hangars must be in accordance with the following codes: United States: Refer to Standard for Aircraft Hangars, ANSI/NFPA-409 - latest revision. Canada: Refer to Standard CSA B149.1 and B149.2.

- Heaters in aircraft storage or service areas must be installed a minimum of 10' (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft which may be housed in the hangar. (This should be measured from the bottom of the heater to the top of the wing, or engine enclosure, whichever is highest from the floor).
- In other sections of aircraft hangars, such as shops or offices, heaters must be installed a minimum of 8' (2438 mm) above the floor.
- Heaters installed in aircraft hangars shall be located so as not to be subject to damage by aircraft, cranes, movable scaffolding or other objects.
- When installed over hoists, the required safe distances from combustibles must be maintained from the uppermost point of the combustible materials placed on the hoist.

#### 3.5.2 Public Garages

The CGTH-Series heater may be used in public garages. Installation in public garages must be in accordance with the following codes: United States: Standard for Parking Structures NFPA-88A - latest revision or the Code for Fuel Dispensing Facilities and Repair Garages, NFPA-30A - latest revision. Canada: Refer to CSA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

- Heaters must be installed a minimum of 8' (2438 mm) above the floor. Required safe distances to

combustibles must be maintained from vehicles parked below the heater.

- When installed over hoists, the required safe distances from combustibles must be maintained from the uppermost point of the combustible materials placed on the hoist.

### 3.5.3 Hazardous Locations

Where there is the possibility of exposure to combustible airborne material or vapor, consult the local Fire Marshal, the Fire Insurance Carrier or other authorities for approval of the proposed installation.

## SECTION 4: INSTALLATION

**⚠ WARNING**

**Several steps are involved in the installation of the heater.**

**Do not attempt to operate the heater until all steps of the installation have been accomplished.**

**Failure to follow these instructions can result in death, injury or property damage.**

### 4.1 Safety Equipment

Use of the following safety equipment is recommended for installation of the CGTH-Series heater:

- Work gloves
- Safety glasses

### 4.2 Installation Tools

Tools required for the installation of the CGTH-Series heater include at a minimum the following:

- Tape measure
- Electric drill (with an assortment of drill bits)
- Pipe wrenches - 2 required
- Screwdriver
- Tin snips
- Hacksaw
- Wire strippers
- Staple gun
- Level
- Pliers
- Crimping tool
- Hole saw - 5” (125 mm)
- Stud Finder (if garage is finished)

### 4.3 Installation Materials

Materials required for the installation of the CGTH-Series heater include at a minimum the following:

- High temperature silicone sealant (such as General Electric RTV106 or Permatex® Form-A-Gasket® Red)
- Suspension hooks (capable of supporting 75 lbs. each)
- Sheetmetal screws

The following items may be required for your particular installation:

- Plastic drain hose
- Additional vent pipe
- Roof flashing
- Rain collar
- Chain - 75 lbs., or equivalent
- Snap hooks (as required)

### 4.4 Choose Location for Heater

When selecting a suitable mounting location for the CGTH-Series heater it is important to consider the following:

- The heater must meet the minimum mounting height requirement of 7' (2134 mm) above the floor. For aircraft hangars and public garages, the heater must meet the minimum mounting height requirement of 8' (2438 mm) above the floor.
- The proposed mounting location allows for the required safe distances from combustibles such as vehicles, wood, gasoline and flammable objects, liquids and vapors.
- The proposed location of the heater will not restrict motion of passageway doors or windows.
- The proposed location will not interfere with operation of the overhead garage door or allow the door to enter the required safe distances from combustibles.
- The proposed location will provide the best coverage of the total area to be heated.
- Consideration be given to the types of vehicles that will be parked in the garage (cars, vans, boats, RV's, etc.).
- The proposed location will allow for the required safe distances from combustibles with respect to the vehicles parked in the garage.
- The proposed location will allow the required utilities (i.e.: gas and electric) and venting to be installed (maximum vent length is 10' [3048 mm]).
- Sufficient clearances will exist to allow for easy access to the service door.
- Overhead structural members (rafters, beams, etc.) are accessible for attaching the heater.

### 4.5 General Venting Guidelines

Regardless of the venting arrangement that will be connected to the heater, the following general guidelines for venting must be followed:

1. The 3" (80 mm) flue pipe must be centered inside the 5" (125 mm) air supply pipe.
2. The total length of vent pipe (horizontal and vertical runs combined, plus the length of the exterior termination) must not exceed 10' (3048 mm), and must not be less than 2' 6" (762 mm). A maximum of two elbows are allowed with natural gas, one elbow with propane.
3. The vent terminal, mounted outside of the building, should not be located above walkways. Condensate produced during operation of the heater could drip onto the walkway forming ice during cold weather.
4. Be sure that the venting installation is in accordance with all applicable local codes and recommendations of the local gas company.
5. DO NOT connect this heater to a separate chimney and DO NOT common vent with any other fuel burning appliance.

   **IMPORTANT:** For standard flue, seal all vent pipe connections with high temperature silicone sealant. Where required, drill holes and secure each connection with three sheetmetal screws.

   **NOTE:** Failure to seal all flue connections 3" (80 mm) will result in erratic heater operation.

### 4.6 Required Safe Distances from Combustibles

In all situations, the required safe distances from combustibles must be maintained. Combustibles are materials which may catch fire and include many common items such as wood, paper, rubber, fabrics, etc. Combustible materials such as those noted, and any other combustible materials, must not be placed closer to any base or side of the CGTH-Series heater than the distances noted in the diagrams on the following page. If you have any questions about the required safe distances from combustibles, or the associated diagrams, please contact your installer, ROBERTS GORDON® independent distributor, or Roberts-Gordon at 716.852-4400 or 1.800.828.7450, during normal business hours which are Monday through Friday, 8:15 a.m. to 4:45 p.m., Eastern Time.

For owner safety, a thermostat tag is supplied with the CGTH-Series as a permanent reminder of the importance of maintaining the required safe distances from combustibles. Instructions for installing the tag are located on *Page 31, Section 6.5*. Immediately contact your ROBERTS GORDON® independent distributor or Roberts-Gordon if the tag is missing.

It is important to keep the required safe distances from combustibles at all times. Clearances from vehicles parked beneath heaters must be maintained. The thermostat tag (included with the heater) must be posted to identify any possible violation of the clearance distances from the heater in vehicle areas. Maximum allowable stacking height in storage areas should be identified with signs or appropriate markings. *See Page 16, Figure 4 and Figure 5* for the required safe distances from combustibles.

**Due to high temperature, ensure that the heater area is kept clear of furniture, draperies, clothing or other combustible materials. Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns and clothing ignition. Young children should be carefully supervised when they are in the same room as the heater.**

| ⚠ WARNING | |
|---|---|
|  |  |
| **Fire Hazard** | **Burn Hazard** |
| **Some objects will catch fire or explode when placed close to heater.**<br>**Keep all flammable objects, liquids and vapors the required safe distances to combustibles away from heater.**<br>**Failure to follow these instructions can result in death, injury or property damage.** | **Keep all persons, especially children, away from heater.**<br>**Do not touch any part of the heater.**<br>**Heater is very hot.**<br>**Failure to follow these instructions can result in death, injury or property damage.** |

**FIGURE 4: Horizontal Installations**

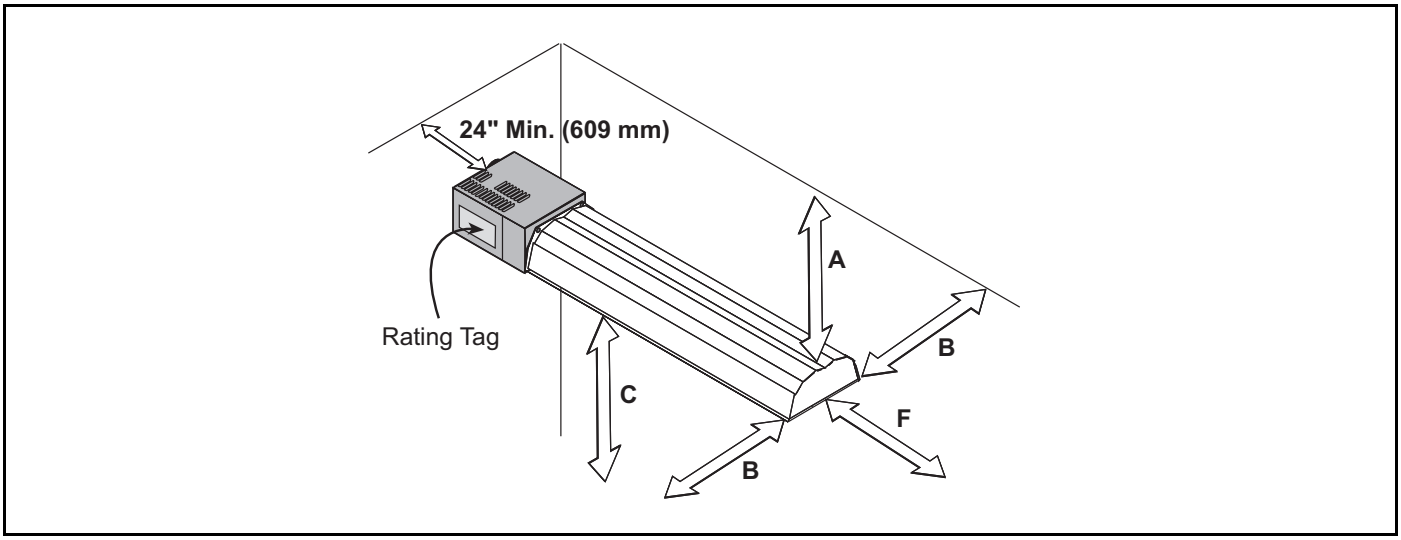
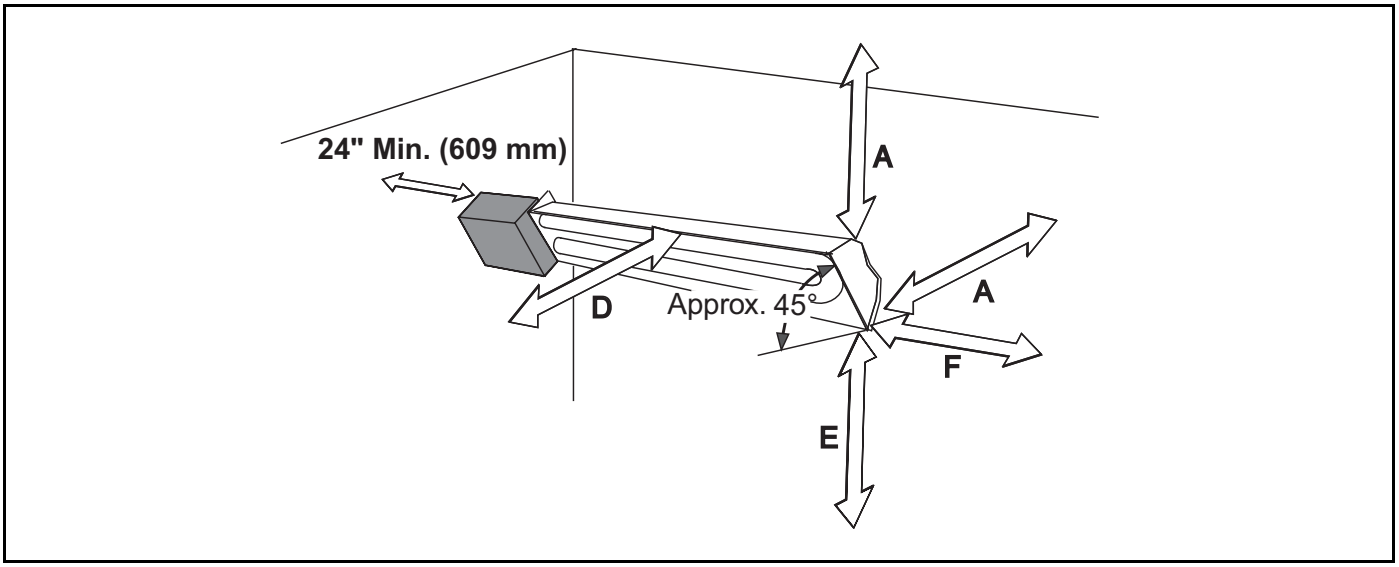



**FIGURE 5: 45° Tilted Installations**




| Required safe distances from combustibles* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inches | | | | | | Metric (cm) | | | | | |
| Model | A | B | C | D | E | F | A | B | C | D | E | F |
| CGTH-30 | 4 | 16 | 36 | 28 | 34 | 6 | 11 | 41 | 92 | 72 | 87 | 16 |
| CGTH-40 | 4 | 18 | 48 | 30 | 34 | 6 | 11 | 46 | 122 | 77 | 87 | 16 |
| CGTH-50 | 4 | 20 | 48 | 32 | 36 | 6 | 11 | 51 | 122 | 82 | 92 | 16 |

*All dimensions are from the reflector.

**NOTE:** All dimensions indicate the required safe distances from combustibles. Dimensions "C" and "E" DO NOT indicate the required mounting height. The minimum mounting height is 7' (2133 mm), except for aircraft hangars and public garages (*See Page 11*, *Sections 3.5.1 and 3.5.2*).

Flue clearances from combustibles are zero. It is not necessary to provide additional clearance on penetrations through the wall or roof.

Know your model number. Model number is found on the rating tag.

### 4.7 Hang the Heater

Residential garages come in a variety of sizes, shapes, styles and methods of construction. Because of all these variables, it is not possible to include mounting hardware with the CGTH-Series heater. Although wooden rafters and joists are the most common overhead structural members in residential garage applications, other structural configurations are also illustrated below.

In the typical suspension methods shown *in Figure 7*, lengths of chain are shown as a means of lowering the heater.

Whichever method of suspension is selected, the three required suspension points must be capable of supporting a minimum of 75 lbs. (33 kg) each.

**⚠ WARNING**

**Suspension Hazard**

**Hang heater with materials with a minimum working load of 75 lbs (33 kg).**

**Failure of the supports can result in death, injury or property damage.**

### 4.8 Remove Shipping Screw from Control Housing Door

The blower inside the burner box has a shipping screw installed to protect the blower from damage in shipping. Before hanging or operating heater, remove the shipping screw and paper label from the control housing door, *see Figure 6*. A nylon washer inside the control housing will fall loose. It is not mandatory to remove the washer from the control housing.

**FIGURE 6: Shipping Screw**

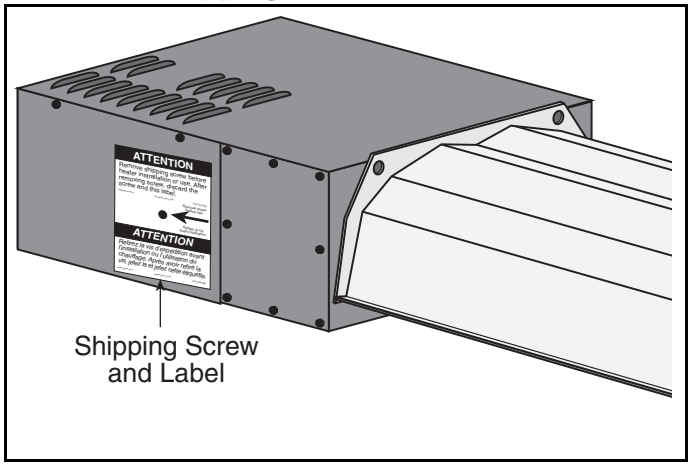
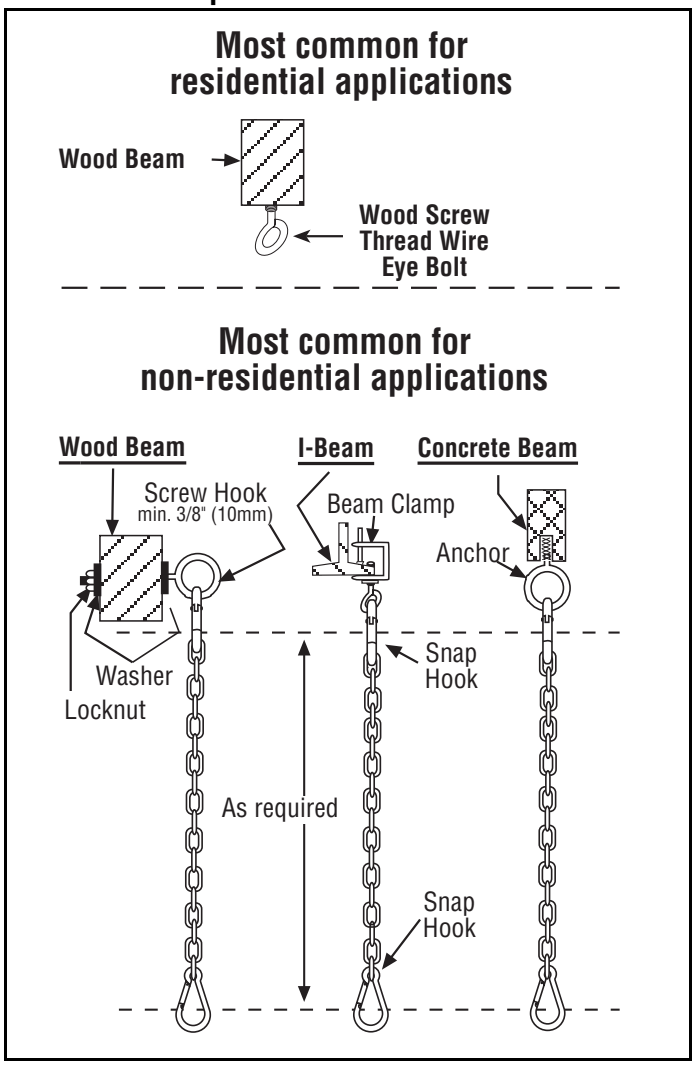


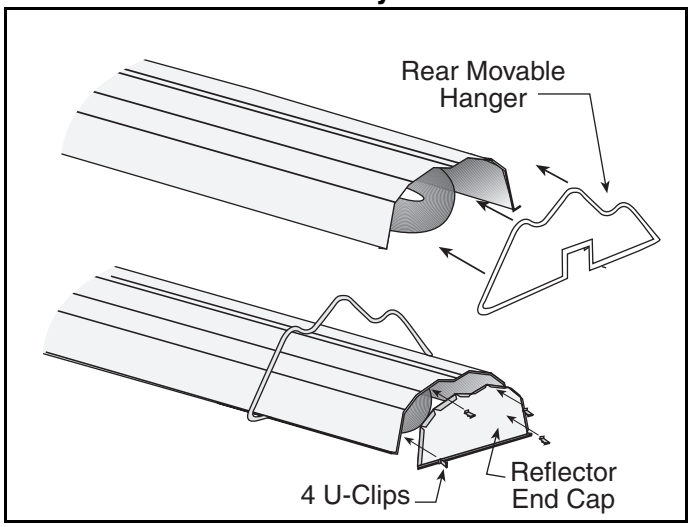

**FIGURE 7: Suspension Details**




### 4.9 Heater Assembly

- Slide rear movable hanger onto reflector as shown *in Figure 8*.
- Attach reflector end cap with U-Clips as shown *in Figure 8*.

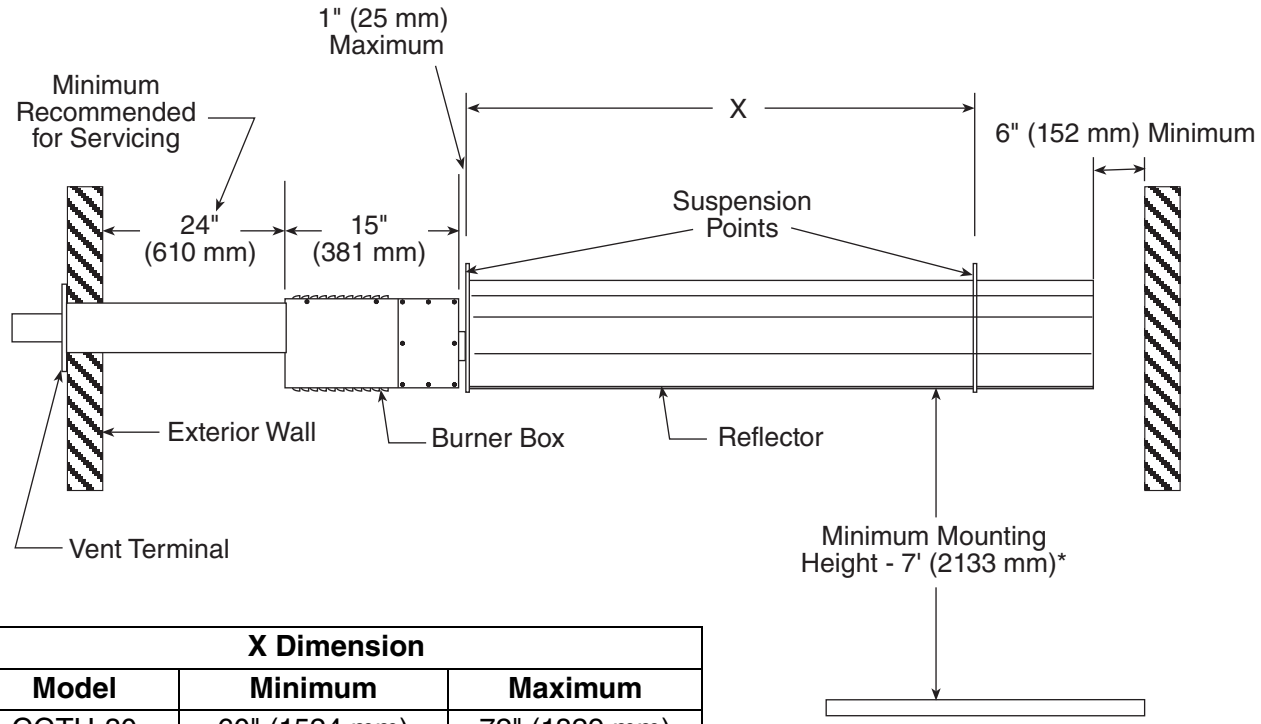
**FIGURE 8: Heater Assembly**



### 4.10 Typical Installation

*Figure 9* is a typical installation of the CGTH-Series heater. The installation drawing shown has a straight horizontal venting arrangement and specifies the minimum space required for maintenance, as well as the allowable range of distances between the two suspension points.
Detailed venting arrangements are illustrated in the venting section of this manual.

**FIGURE 9: Typical Installation**




| X Dimension | | |
|---|---|---|
| **Model** | **Minimum** | **Maximum** |
| CGTH-30 | 60" (1524 mm) | 72" (1829 mm) |
| CGTH-40 | 102" (2590 mm) | 114" (2895 mm) |
| CGTH-50 | 102" (2590 mm) | 114" (2895 mm) |

(*) For minimum mounting height in aircraft hangars and public garages, *See Page 11*, *Sections 3.5.1 and 3.5.2*.

### 4.11 Heater Orientation

The CGTH-Series heater may be installed in any of the three orientations indicated below. Select the heater orientation that is best suited for the location that you have chosen for your heater.

- Horizontal
- Tilted 45° Right
- Tilted 45° Left

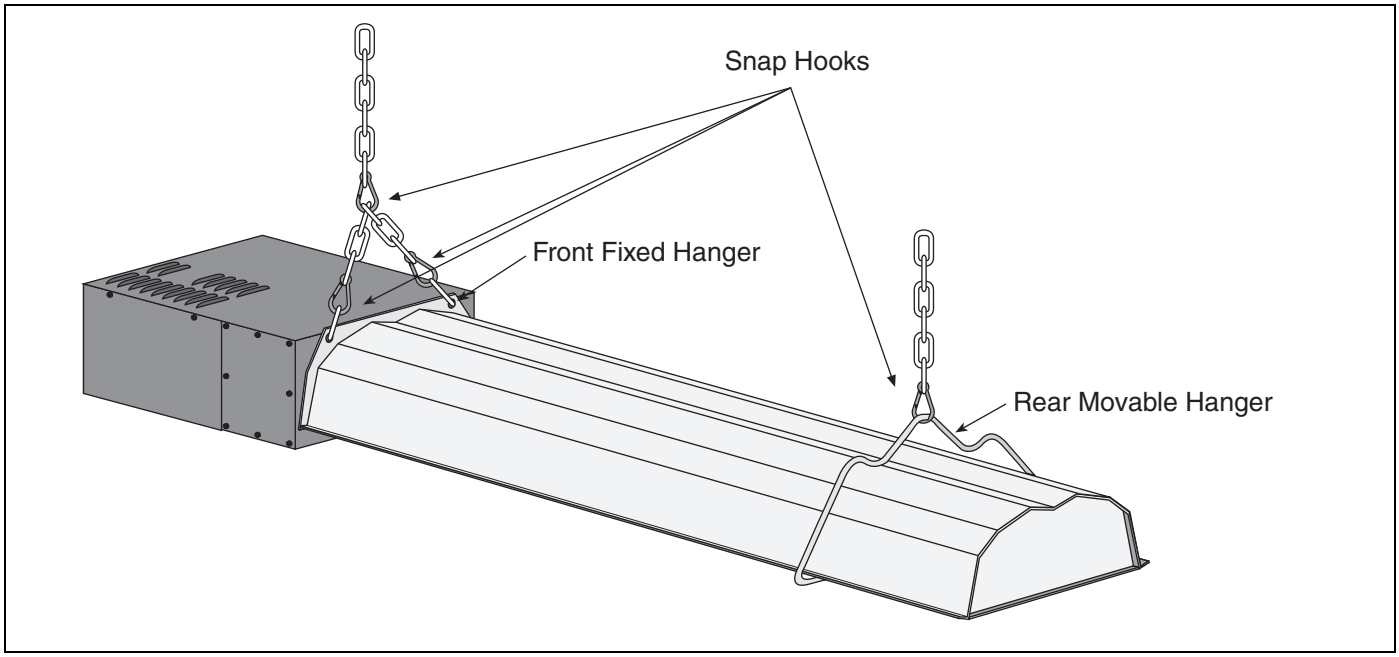
**NOTE**: If the heater is going to be vented through the roof, be sure to carefully review the roof option installation instructions *on Pages 29 and 30*. Ensure that the selected mounting site will satisfy the measurement parameters (vent length not to exceed 10' [3048 mm]) described in that section.

### 4.12 Horizontal Installation

For Horizontal Installation:

1. Using snap hooks, attach two equal lengths of welded steel chain 75 lbs. (33 kg), to the two uppermost holes in the front fixed hanger.
2. Slip the free end of both chains onto another snap hook (*See Page 19, Figure 10*).
3. The uppermost snap hook can now be installed on the suspension hardware that you have installed for suspension of the unit. An additional length of chain may also now be installed, if required, to lower the heater.

**FIGURE 10: Horizontal Installation**

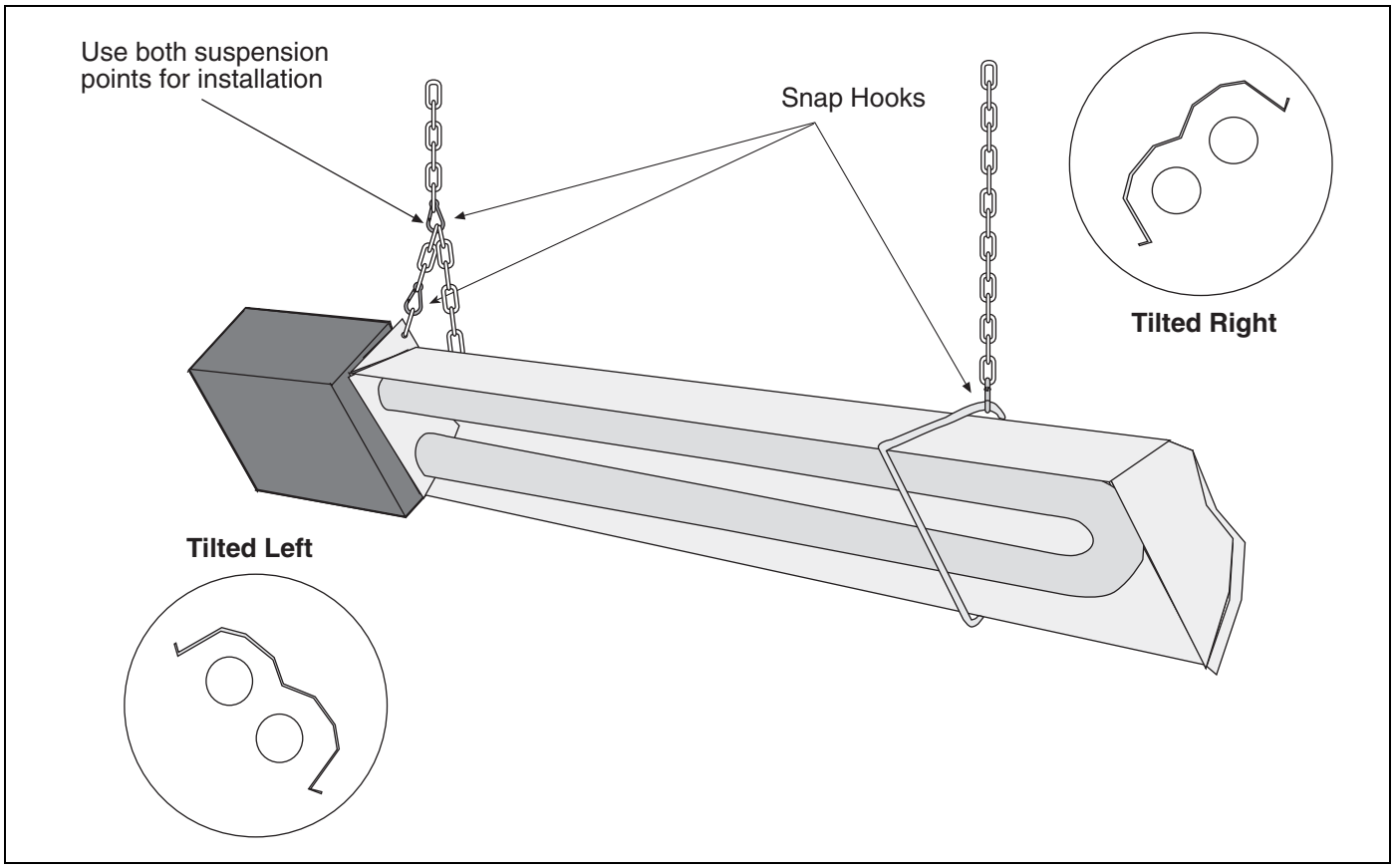



### 4.13 45° Tilted Installation

For tilted installations:

1. Determine if the heater is going to be tilted left or tilted right (*Figure 11*). Select the suspension point for left or right tilting. Two suspension points must be used for the front hanger.
2. The uppermost snap hook can now be installed on the suspension hardware that you have installed for suspension of the unit. An additional length of chain may also now be installed, if required, to lower the heater.

**FIGURE 11: 45° Tilted Installation**



### 4.14 Grille Installation (for Select Models Only)

A protective grille is included with select models of the CGTH-Series heater. This grille is supplied in sections and must be installed on the underside of the reflector prior to operation.

Grille sections are held in position by a channel formed by the rolled edge of the reflector. The shorter length 8' (2438 mm) heater requires installation of two protective grille sections, while the longer heater (11' 6") (3505 mm) requires three protective grille sections.

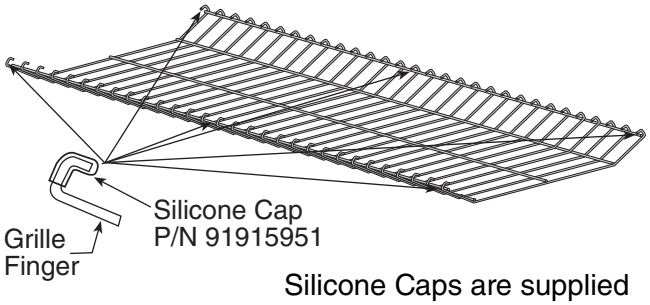
Grille Section (P/N 08050001) is open-ended and installed along the length of the reflector. Grille End Cap (P/N 08050002) is the formed end cap and is installed at the end of the grille that is furthest from the burner.

Installation:

**Step 1.** Silicone Cap Installation (*See Figure 12*).

- Silicone caps (P/N 91915951) are to be placed along each side of the grille at both end fingers and the center finger.

**FIGURE 12: Silicone Cap Installation**




Silicone Caps are supplied for the ends of the grille.

**Step 2.** Attach grille end cap to final grille section (*See Figure 13*).

**Step 3.** Install grille sections as follows: (*See Figure 14*)

- Attach first grille section(s) (P/N 08050001) to underside of reflector as shown. The wires of the grille will rest in the channel formed by the rolled edges of the reflector. Be certain the silicone caps have been installed.
- Attach final grille section with end cap to under side of reflector. Butt grille toward the front fixed hanger that is adjacent to the burner and to each other as shown.

**FIGURE 13: Grille End Cap Installation**

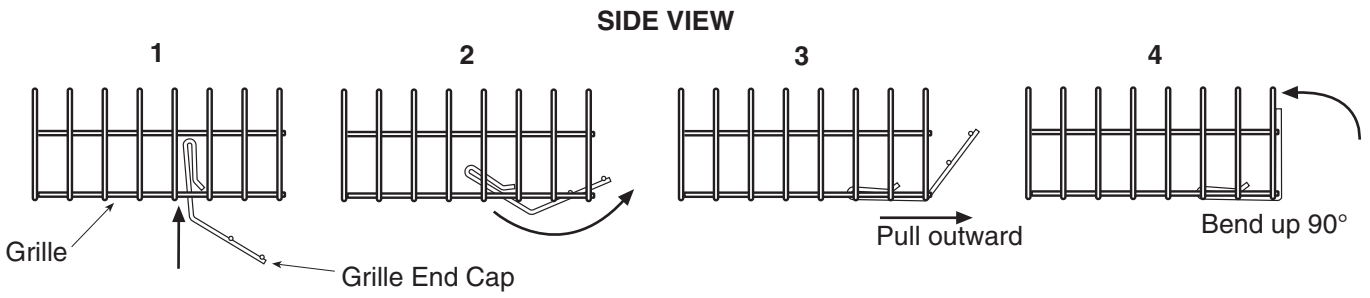
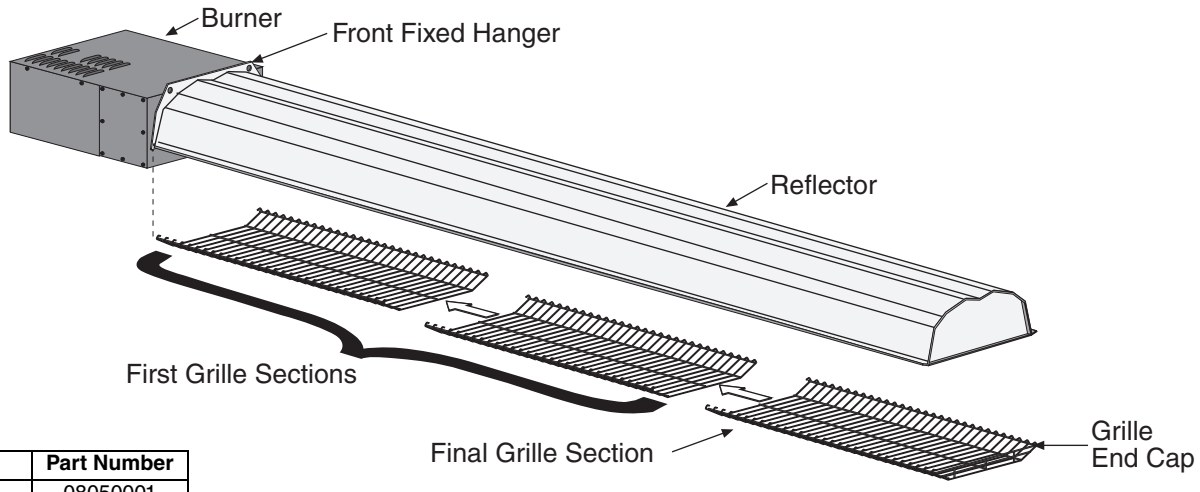



**FIGURE 14: Reflector and Grille**




| Description | Part Number |
|---|---|
| Grille Section | 08050001 |
| Grille End Cap | 08050002 |

## SECTION 5: VENTING INSTALLATION

Vent configuration 1 is for the galvanized vent material, *See Pages 22 through 25*. Vent configuration 2 is for the Cox Geelen vent material, *See Pages 26 through 30*. The galvanized vent material is available for horizontal installation only. The Cox Geelen vent style can be installed horizontally or vertically. The maximum overall vent length is 10’ (3 m) with only one 90° elbow. The flue must be self supporting.

**⚠ WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

### 5.1 General Venting Requirements

This heater must be vented in accordance with the following national codes and any local codes which may apply:

United States: Refer to ANSI Z223.1 - latest revision.

Canada: Refer to CAN/CGA-B149.1 and B149.2 - latest revision.

Vent terminal must be installed at a height sufficient to prevent blockage by snow and protect building materials from degradation by flue gasses.

Vent must exit a building not less than 7' (2.1 m) above grade when located adjacent to public walkways.

For galvanized venting, seal all joints with high temperature silicone sealant.

#### United States Requirements

Vent must terminate at least 3' (.9 m) above any forced air inlet located within 10' (3 m).

Vent must terminate at least 4' (1.3 m) below, 4' (1.3 m) horizontally from, or 1' (.3 m) above any door, window, or gravity inlet into any building.

Vent terminal shall be located at least 1' (.9 m) from any opening through which vent gasses could enter a building.

#### Canadian Requirements

Vent terminal must not be installed less than 3' (.9 m) from any building opening.

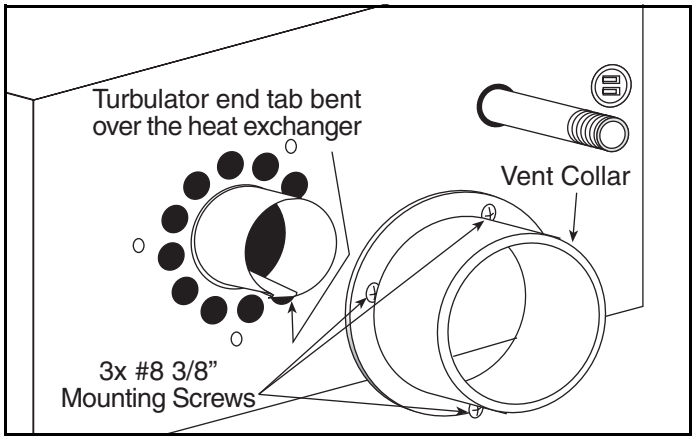
Vent terminal must be installed at least 3' (.9 m) above grade.

### 5.2 Install Galvanized Collar

For all galvanized flue installations, the galvanized collar (*See Figure 15*) is shipped loose in the carton. For ease of installation, the vent collar should be installed on the rear surface of the burner before the heater is suspended. Install the galvanized collar as follows:

1. Apply a bead of high temperature silicone sealant to the mating surface of the galvanized collar mounting flange.
2. Align the three mounting holes of the galvanized collar with the three galvanized collar mounting holes on the rear surface of the burner.
3. Using a #2 phillips head screwdriver, or 1/4" nut driver, secure the galvanized collar to the rear surface of the burner with the three screws (#8 x 3/8" 10 mm long) provided in the accessories bag supplied with the heater.

**FIGURE 15: Rear View**



### 5.3 Galvanized Horizontal Venting

**⚠ WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

After the heater has been properly suspended in accordance with the preceding headings of this section, proceed to install the venting as described below (*See Page 23, Figure 16*):

1. Using a tape measure, measure the distance from the floor to the center of the vent collar on the rear surface of the burner. Note this dimension here _____.
2. Using the tape measure, transfer this measurement to the inside surface of the exterior wall that the vent will penetrate; make a reference mark. Check the location of the hole to ensure that there are no internal wall structures (i.e. studs) to prevent penetration. Also check that the outlet of the vent does not compromise the general venting requirements, *See Section 5.1*.
3. Using the tape measure, measure the distance between the rear surface of the heater and the exterior wall. Note this dimension here _____.

**NOTE:** If the distance between the rear surface of heater and the exterior wall is greater than 5' (1.5 m), a 5’ (1.5 m) balanced flue vent extension kit (P/N 08039000) will be required.

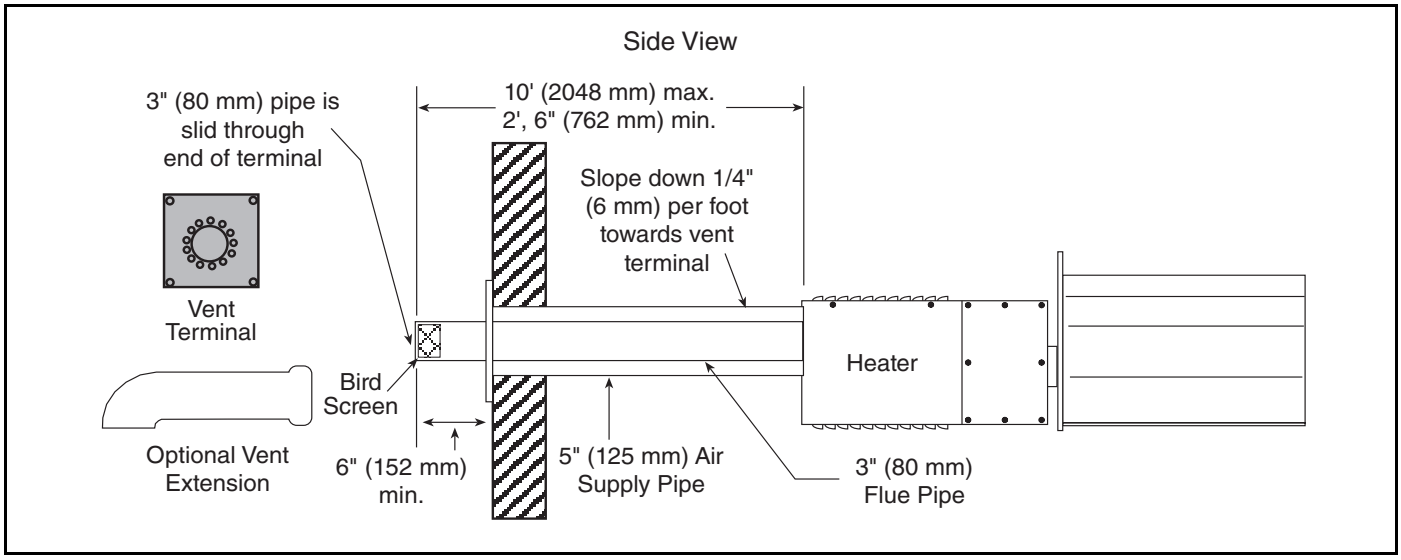
4. From the reference mark made in step 2, measure down vertically 1/4" (6 mm) per foot measured in step 3. Cut 5” (125 mm) vent terminal clearance hole at the lower reference.
5. Install 3" (80 mm) flue pipe from the vent collar, on the rear surface of the burner, and through the exterior wall. Be sure to seal any joints in the 3" (80 mm) flue pipe with high temperature silicone sealant and secure them with three sheetmetal screws.

**IMPORTANT:** The 3" (80 mm) flue pipe must extend a minimum of 6" (150 mm) beyond the exterior surface of wall/fresh air intake.

6. Assemble or cut the 5" (125 mm) air supply pipe to run between the vent collar on the rear surface of the burner and the outside surface of the exterior wall. Be sure to seal any joints in the 5" (125 mm) air supply pipe with high temperature silicone sealant and secure them with three sheetmetal screws.
7. From the exterior of the building, slip the assembled or cut 5" (125 mm) air supply pipe over the installed 3" (80 mm) flue pipe. Connect the 5" (125 mm) pipe to the vent collar on the rear surface of the burner with high temperature silicone sealant and secure the connection with three sheetmetal screws.
8. From the exterior of the building, slip the vent terminal onto the 3" (80 mm) flue pipe and guide the sleeve portion of the vent terminal over the 5" (125 mm) air supply pipe that is flush with exterior surface of wall. Secure air vent pipe to the vent terminal collar with silicone sealant.
9. Secure the vent terminal to the exterior surface of the wall.

**NOTE:** If the protruding 3" (80 mm) flue pipe is directly below and within 24" (609 mm) of the building soffit, the optional vent extension should be used.

**FIGURE 16: Horizontal Installation Side View**




### 5.3.1 Bird Screen Installation

The bird screen supplied with the heater must always be installed with the galvanized vent option. The screen is to be installed directly in the end of the 3" (80 mm) flue pipe or in the vent terminal extension available as an option. Both screen installations are described below.

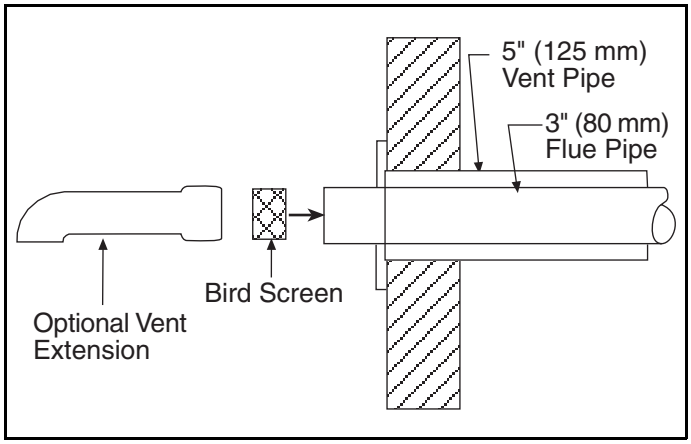
Installing bird screen in 3" (80 mm) flue pipe:

1. Insert the bird screen into the inside diameter of the 3" (80 mm) flue pipe as shown *on Page 23, Figure 17*.
2. Secure the bird screen in position with a sheet-metal screw.

Installing bird screen in optional vent terminal extension:

1. Insert the bird screen into the inside diameter of the vent terminal extension as shown *on Page 23, Figure 17*.
2. Using the handle from a hammer, or other similar device, push the bird screen into the vent extension as far as possible.
3. Orient the vent extension as shown *in Figure 17*. Slip the extension onto 3" (80 mm) flue pipe as far as possible; secure the vent extension to the flue pipe with three sheetmetal screws.

**FIGURE 17: Bird Screen Installation**




### 5.3.2 Galvanized Horizontal Venting with an Elbow

**⚠ WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

After the heater has been properly suspended in accordance with the preceding headings of this section, proceed to install the venting as described below:

**NOTE:** The 90° elbow kit (P/N 08038000) will be required for this installation.

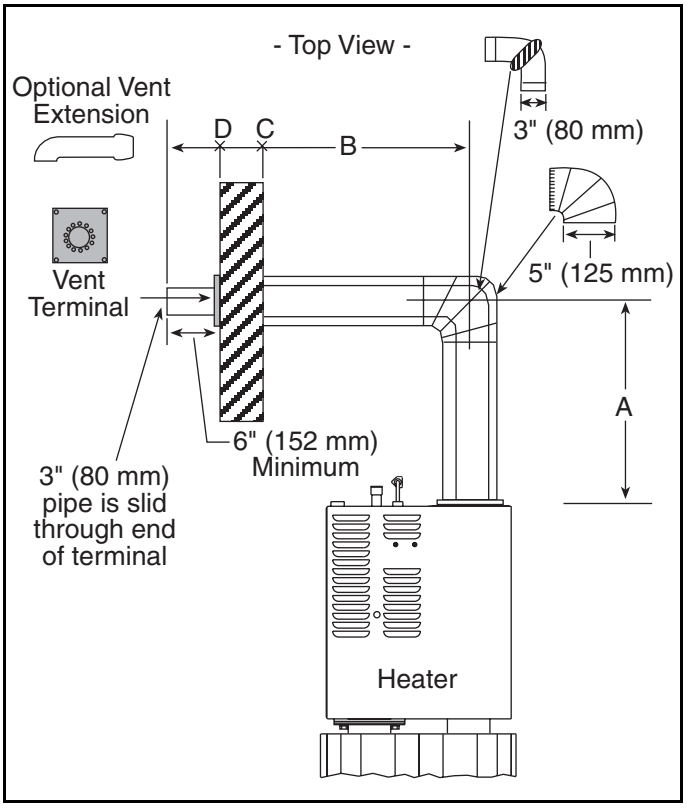
1. Using a tape measure, measure the distance from the floor to the center of the vent collar on the rear

surface of the burner. Note this dimension here _____.

2. Using the tape measure, transfer this measurement to the inside surface of the exterior wall that the vent will penetrate; make a reference mark. Check the location of the hole to ensure that there are no internal wall structures (i.e. studs) to prevent penetration. Also check that the outlet of the vent does not compromise the general venting requirements, *See Section 5.1*.
3. Using a tape measure, measure distances 'A', 'B', 'C' and 'D' as shown *in Figure 18*. Note these dimensions here (A= _____, B= _____, C=_____, D=_____) and add them together.

NOTE: If the total of dimensions above are greater than 5' (1524 mm), a 5' (1524 mm) balanced flue vent extension kit (P/N 08039000) will be required.

**FIGURE 18: Horizontal Installation Top View**




4. From the reference mark made in step 2, measure down vertically 1/4" (6 mm) per foot measured in step 3. Cut 5" (125 mm) vent terminal clearance hole at the lower reference.
5. Cut the 3" (80 mm) vent to length as follows:

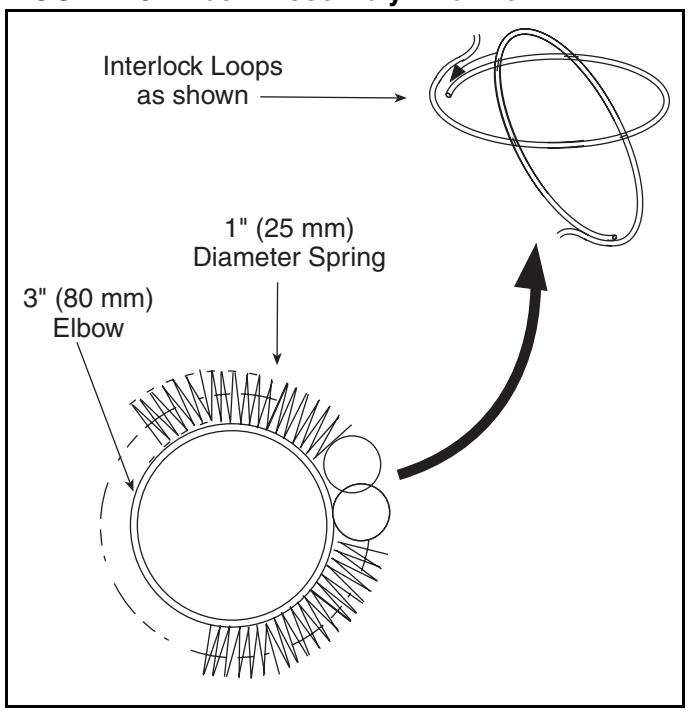
   Length A
   3" diameter = A – 8"

   Length B
   3" diameter = B + C + D – 7 3/4"

Always cut a non-swaged end.

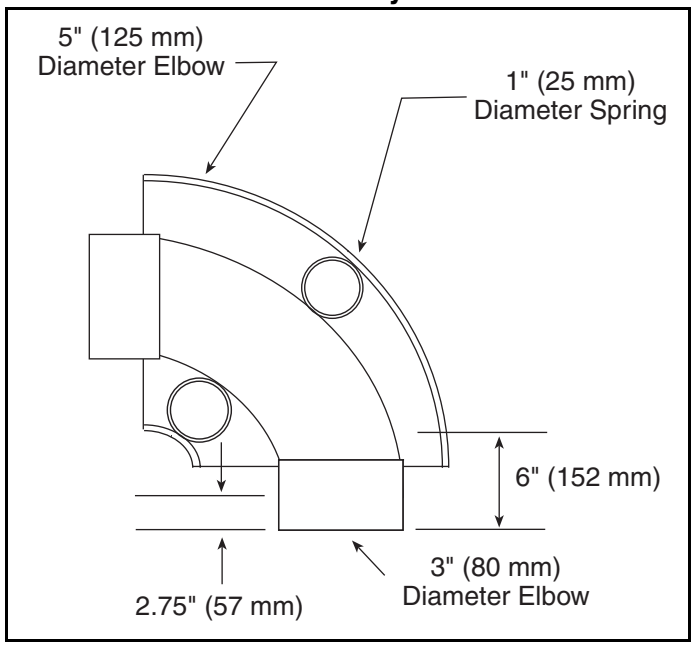
6. Wrap the 1" (2.5 cm) diameter spring around the outside diameter of the 3" (80 mm) elbow as shown *in Figure 19*.

**FIGURE 19: Elbow Assembly End View**



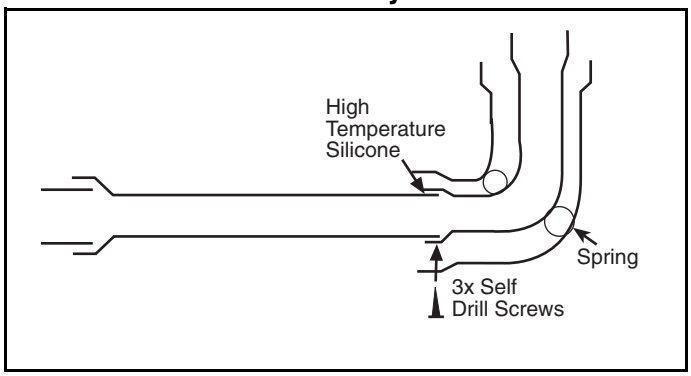

7. Interlock the loops at each end of the spring coils together as shown *in Figure 19*. The loops will lock together to produce a continuous coil spring spacer around the outside diameter of the 3" (80 mm) elbow.
8. Fit the 5" (125 mm) elbow over the 3" (80 mm) elbow (*Figure 20*).

**FIGURE 20: Elbow Assembly Cross Section View**



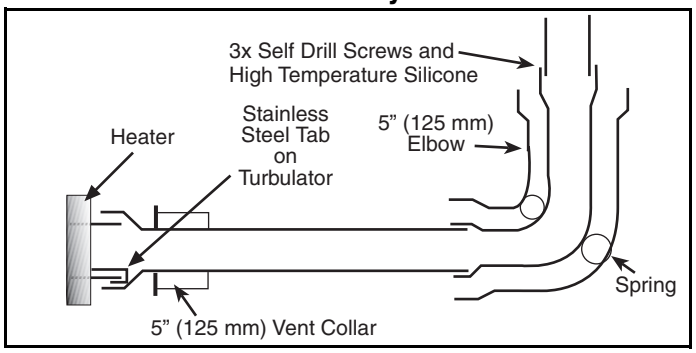
9. Attach 3" (80 mm) elbow portion of 90° elbow kit to the 3" (80 mm) flue pipe (length 'A'). **Use high temperature silicone sealant and 3 sheetmetal screws.** (*See Figure 21*)

**FIGURE 21: Elbow Assembly**



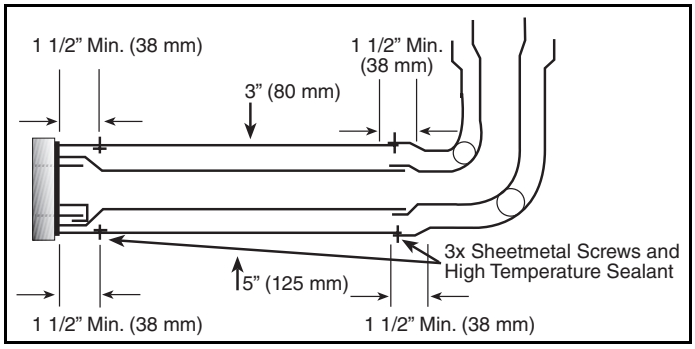

10. Completely assemble the 3” (80 mm) vent lengths A, B and elbow and attach to the heater. Put the vent collar on the 3” (80 mm) vent. All joints must be sealed with high temperature sealant and sheet metal screws. (*See Figure 22*)

**FIGURE 22: Elbow Assembly for Vent Collar**




11. Attach the vent collar to the heater. Hold the 5” (125 mm) vent material up to the 3" (80 mm) vent and mark the required length. Note the length must be sufficient for a minimum of 1 1/2” (38 mm) overlap at both ends. Cut the vent to length from the non crimped end. Wrap the 3” (80 mm) tube with the 5” (125 mm) vent and snap the vent together. Attach the 5” (125 mm) vent at both ends. All joints must be sealed with high temperature sealant and sheet metal screws. (*See Figure 23*)

**FIGURE 23: Vent Collar and 5" Vent Attachment**




12. Insert vent terminal and repeat step 11 for 5” (125 mm) from the elbow through the wall. Secure the vent terminal to the exterior surface of the wall.

**NOTE:** If the protruding 3" (80 mm) flue pipe is directly below and within 24" (610 mm) of the building soffit, the optional vent extension should be used and secured with three sheet-metal screws.

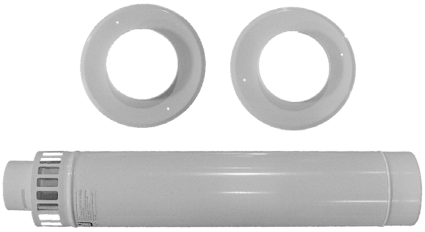
### 5.3.3 Vent Assembly Overview

The figures in this section provide a general overview of a Cox Geelen vent for the CGTH-Series burner. Assemble the heater components as shown *in Figure 24*.

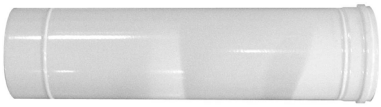
**FIGURE 24: Assembly Overview**

Roof Terminal
1283 mm = 50.5”
P/N 90506008

Burner/Vent Adapter
P/N 90506012



Wall Terminal 570 mm = 22.5”
P/N 90506011



Concentric Flue
254 mm = 10”
P/N 90506003

Concentric Flue 500 mm = 20”
P/N 90506004

Concentric Flue 1000 mm = 39”
P/N 90506005

Elbow 90°
P/N 90506001

Elbow 45°
P/N 90506002

Storm Collar 690 mm = 25.5"
P/N 90506015

### 5.4 Cox Geelen Horizontal Venting

**⚠ WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

After the heater has been properly suspended in accordance with the preceding headings of this section, proceed to install the venting as described below:

1. Using a tape measure, measure the distance from the floor to the center of the vent collar on the rear surface of the burner. Note this dimension here _____.
2. Using the tape measure, transfer this measurement to the inside surface of the exterior wall that the vent will penetrate; make a reference mark. Check the location of the hole to ensure that there are no internal wall structures (i.e. stud) to prevent penetration. Also check that the outlet of the vent does not compromise the general venting requirements, *See Section 5.1*. Cut 5” (125 mm) vent terminal clearance hole as required.
3. Using the tape measure, measure the distance between the rear surface of the heater and the exterior wall. Note this dimension here _____.

   A. The following combinations will result in dimension B from *Figure 25*:

   Horizontal Wall Vent Kit (P/N 08032200) = 25" (690 mm)

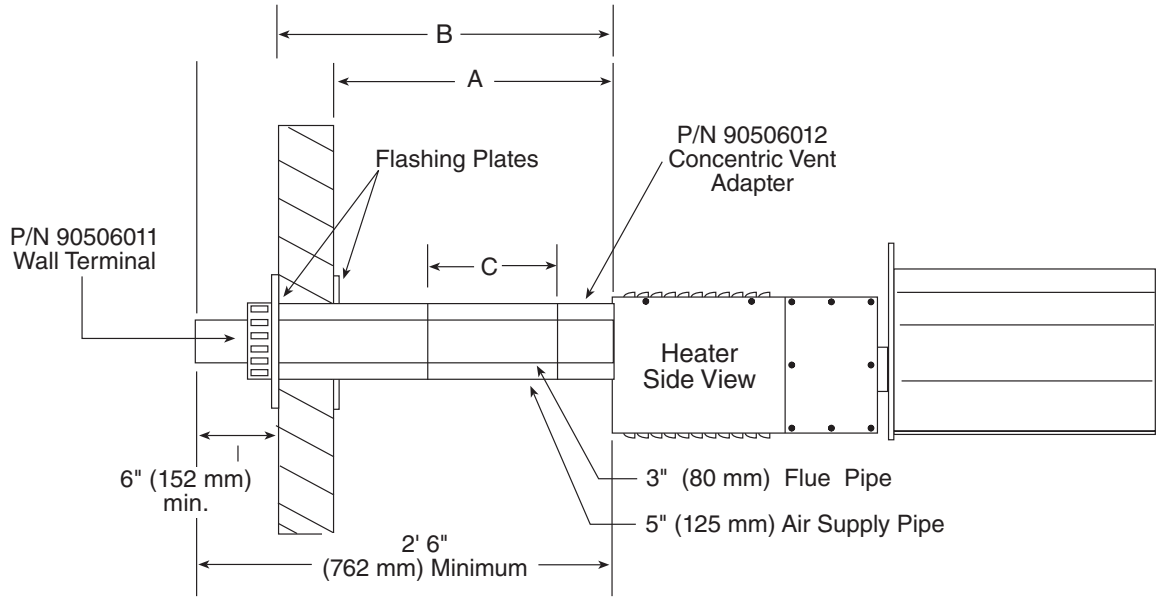
   Horizontal Wall Vent Kit (P/N 08032200) + Concentric Flue 10” (P/N 90506003) = 35" (889 mm)

   Horizontal Wall Vent Kit (P/N 08032200) + Concentric Flue 20” (P/N 90506004) = 45" (1143 mm)

   Horizontal Wall Vent Kit (P/N 08032200) + Concentric Flue 39” (P/N 90506005) = 64" (1626 mm)

   Select the appropriate combination for the distance required. If a shorter distance is required, *see Page 28, Step* 5 for cutting instructions.

**FIGURE 25: Horizontal Installation Side View Cox Geelen Venting**



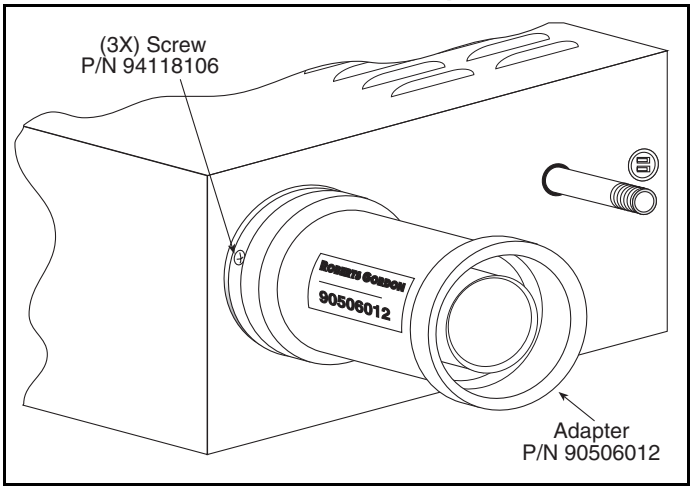

Slope venting down 1/4" (6 mm) per foot towards wall.

4. Install the vent adapter (P/N 90506012) and secure with #8 x 3/8" sheet metal screws as shown *in Figure 26*.

5. If the concentric vent has to be cut (*see note on Page 28*), follow instructions A-E (*see Figure 27*). If the concentric vent does not have to be cut, *see note on Page 28*. Follow instructions A & F below (*See Figure 27*).

   A. Install the horizontal vent terminal (P/N 90506011) ensure that the air holes intake hole are facing down. Install the flashing plates with the hardware supplied. (*See Figure 27*.)

**FIGURE 26: Flue Collar and Adapter**




   B. Measure from the end of the adapter to the end of the vent terminal, dimension C, *Page 27, Figure 25*. Note the dimension here, _____.

   C. Separate the 3" (80 mm) and the 5" (125 mm) vent by pulling the 3" (80 mm) vent out from the end with the internal silicone gasket. Remove the internal spring from the non-silicone gasket end of the 5" (125 mm) vent.

   D. Add 3.5" (90 mm) to the dimension noted in step B, this is to allow for the internal joint of the vent. Cut both the 3" (80 mm) and 5" (125 mm) vent to this length and de-burr the ends. Always cut from the non-silicone gasket end.

   E. Re-assemble the 3" (80 mm) and 5" (125 mm) vent with the internal spacer at the silicone gasket end only.

**FIGURE 27: Horizontal Venting Configurations**

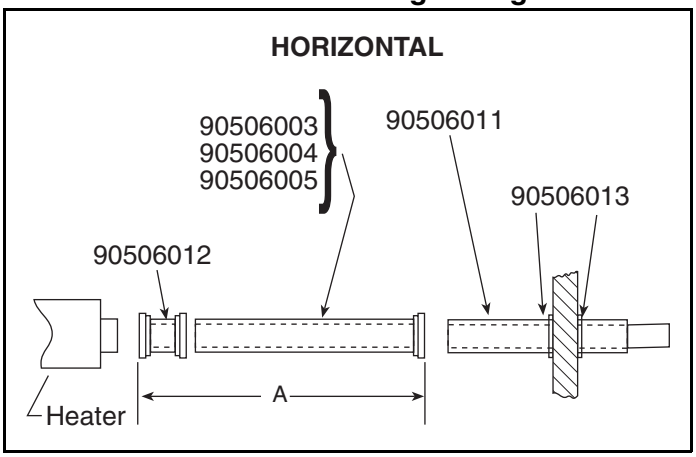



**Table 1:** Components

| Part Number | Description |
|---|---|
| 90506003 | Concentric Flue 10" (254 mm) |
| 90506004 | Concentric Flue 20" (500 mm) |
| 90506005 | Concentric Flue 39" (1000 mm) |
| 90506011 | Storm Collar 27.5" (690 mm) |
| 90506012 | Burner/Vent Adapter |
| 90506013 | Wall Plate |

   F. Push vent terminal away from heater. Insert the cut vent in between the adapter and the vent terminal. Starting at the adapter end, push the plain end of the vent into the silicone gaskets. The connection will fit firmly together. If undue force is required to assemble the parts, first check the cut length for burrs, second apply warm soapy water to the silicone gaskets.

**Note**: The gasket construction of this venting is designed to make a permanent airtight connection, additional silicone sealant and securing screws are not to be used.

### 5.5 Cox Geelen Vertical Venting

**⚠WARNING**

**Carbon Monoxide Hazard**

**Heater must be exhausted outside.**

**Use materials supplied.**

**This heater needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air.**

**Failure to follow these instructions can result in death or injury.**

After the heater has been properly suspended in accordance with the preceding headings of this section, proceed to install the venting as described below. Be sure to observe the General Venting Guidelines *on Page 14, Section 4.5*.

**FIGURE 28: Vertical Venting Configurations**

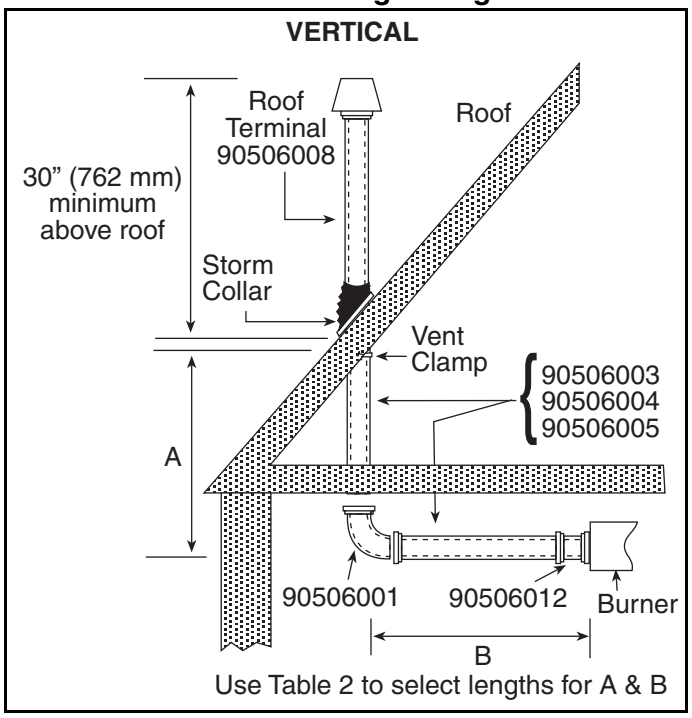



**Table 2:** Components

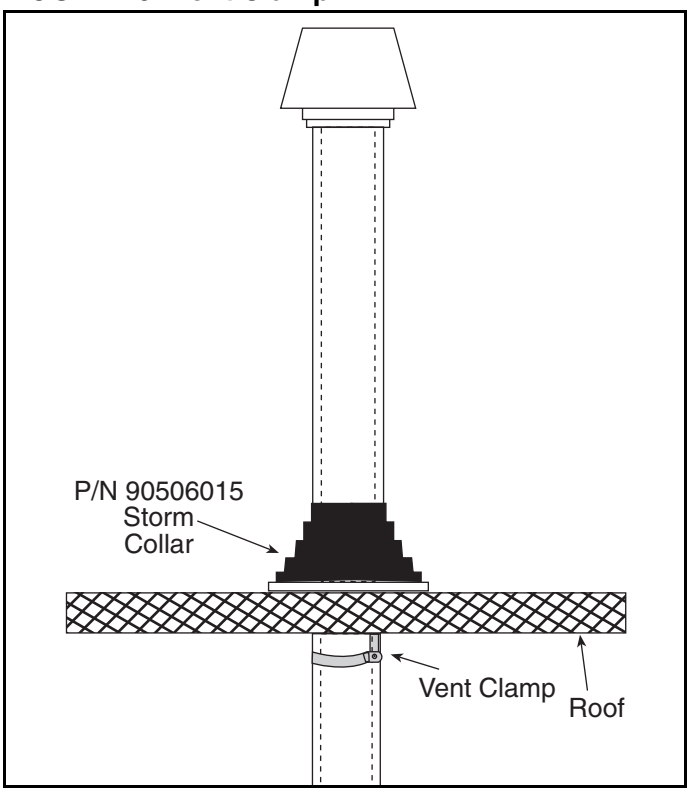
| Part Number | Description |
|---|---|
| 90506001 | Elbow 90° |
| 90506003 | Concentric Flue 10" (254 mm) |
| 90506004 | Concentric Flue 20" (500 mm) |
| 90506005 | Concentric Flue 39" (1000 mm) |
| 90506008 | Roof Terminal 50.5" (1283 mm) |
| 90506012 | Burner/Vent Adapter |

1. Using a saw, cut an appropriate size clearance hole in the roof to accommodate the vertical run of vent pipe and the vent termination (minimum 5" [125 mm]).
2. Install the vent adapter (P/N 90506012) and secure with #8 x 3/8" sheet metal screws as shown *on Page 28, Figure 26*.
3. Measure the distance to the center of the hole from the vent adapter. Note this dimension here _____. If the concentric vent has to be cut, use the following guidelines:
   A. Subtract 1.5" (38 mm) to allow for the elbow and both joints.
   B. Separate the 3" (80 mm) and the 5" (125 mm) vent by pulling the 3" (80 mm) vent out from the end with the internal silicone gasket. Remove the internal spring from the non-silicone gasket end of the 5" (125 mm) vent.
   C. Always cut the 3" (80 mm) and 5" (125 mm) vent separately to avoid damage.
   D. Always cut from the non-silicone gasket end and deburr thoroughly.
4. Install a 4-7" EPDM storm collar (P/N 90506015) following the instruction below:
   A. Slide storm collar down over lower section of the vertical vent. Water can be used as a lubricant. Apply silicone sealant on underside of flange. Turning back flexible flange makes this simple.
   B. Press pipe flashing into contours of roof panel configuration. If there is a sharp angle in the panel, a blunt tool can be used to press the flashing into place.
   C. Lower roof terminal (P/N 90506008) through the 5" (125 mm) hole. From the inside ensure the vent is square. Secure the vent clamp to the inside of the roof. *See Figure 28*.
   D. Apply silicone sealant between base and roof. Drill and fasten flashing to surface. Use a blunt tool to press base into sharp corners of valleys while drilling; and against to insert rivet or screw.
   E. Follow the sequence: drill two holes on opposite sides of aluminum base through sheet.

Fit fasteners progressively outwards in pairs avoiding gaps over 1.5” (38 mm).

5. With the vent collar on the burner, install the additional vent pipe. Push the plain end of the vent into the silicone gaskets. The connection will fit firmly together. If undue force is required to assemble the parts, first, check the cut length for burrs, second, apply warm soapy water to the silicone gaskets.

**FIGURE 29: Vent Clamp**



# SECTION 6: ELECTRICAL SERVICE INSTALLATION

## 6.1 System Requirements

The CGTH-Series heater requires a grounded three-prong electrical outlet to be installed within 18" (46 cm) of the rear surface of the heater's burner. It is recommended that the outlet for the heater be ceiling-mounted and should be on a dedicated circuit. DO NOT use an electrical extension cord to operate the heater.

**Heater Rating: 120V, 60 Hz, Single Phase, 1A**

**⚠ WARNING**

**Electrical Shock Hazard**

**Plug heater into grounded three-prong ceiling receptacle.**

**Do not cut or remove the grounding prong from this plug.**

**Do not use with an extension cord.**

**Failure to follow these instructions can result in death or electrical shock.**

## 6.2 Grounding

The heater must be electrically grounded in accordance with the following codes: United States: Refer to National Electrical Code, ANSI/NFPA-70 - latest revision. Wiring must conform to the most current National Electrical Code and local ordinances. Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

## 6.3 Important Notes

1. The CGTH-Series heater is controlled by a low voltage (24V AC) thermostat supplied with the heater. The control transformer located inside the burner supplies the necessary electrical power to operate the thermostat. No other electrical power to the thermostat is required.
2. The wire for connecting the thermostat to the heater is not supplied. Refer to the installation instructions supplied with the thermostat for correct wire sizing.

## 6.4 Thermostat Placement

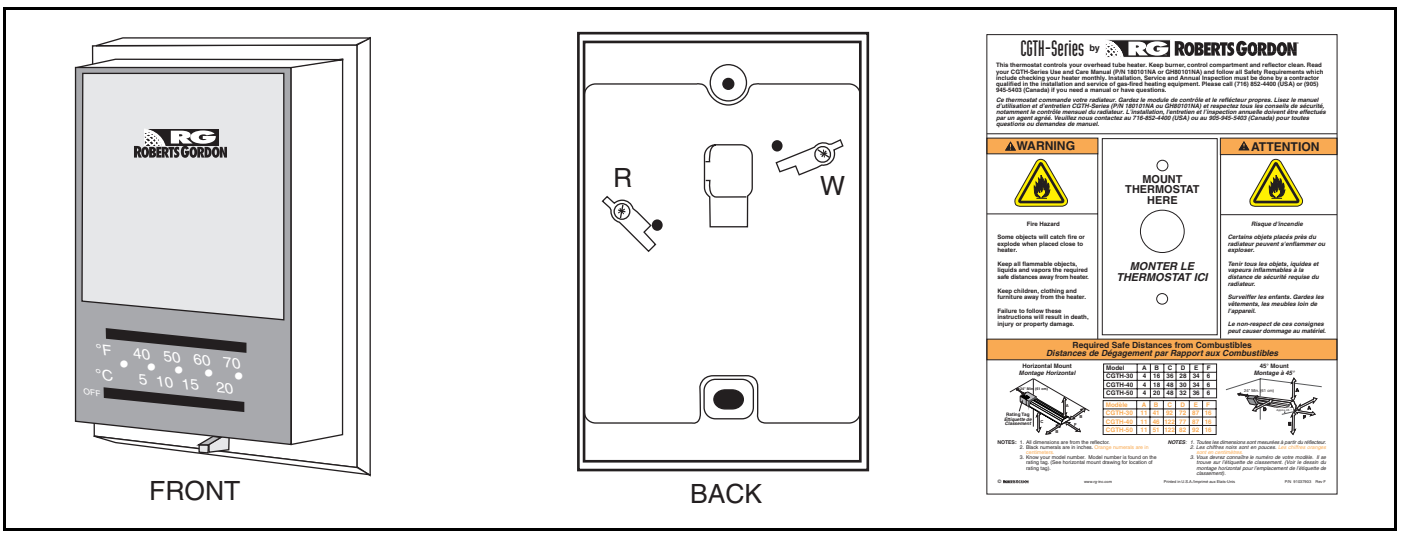
For best results, locate the thermostat as follows:

- Mount the thermostat on an interior wall whenever possible.
- Mount the thermostat approximately 60" (1524 mm) from the floor.
- Mount the thermostat so that it is shielded from the heat that is radiated from the heater.
- Mount the thermostat over the thermostat tag that is provided in the accessories bag. The thermostat tag contains important safety information and **must** be used.

## 6.5 Thermostat Installation

1. Connect thermostat wiring to the thermostat as follows:
   A. Attach one wire of the thermostat wires to the **"R"** terminal on the rear of the thermostat; attach the remaining wire to the **"W"** terminal (*See Figure 30*).
   B. Peel off backing of adhesive strips on the rear surface of the thermostat tag and position the tag against the wall; secure thermostat over tag using two screws.

**FIGURE 30: Thermostat Installation**




FRONT BACK

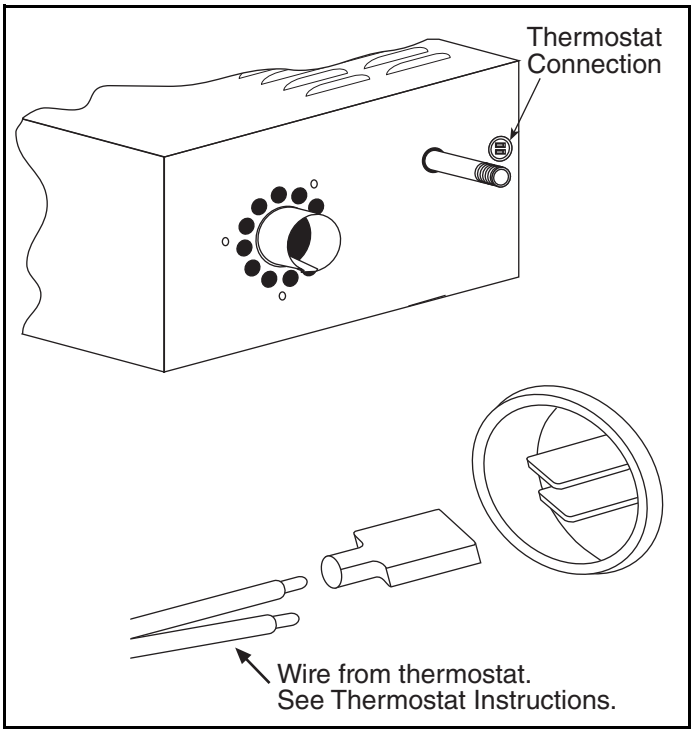
2. Route thermostat wiring between the thermostat and the rear of the heater. Carefully staple the wires so as not to damage them and to produce a professional appearing installation.

3.Connect thermostat wires to the "THERMOSTAT CONNECTION" (*See Figure 31*) on the rear surface of the burner as follows:

   A. Using an appropriate crimping tool, install the female terminals (included in accessories bag) on the two wires from the thermostat.

   B. Push the female terminals on the male terminals. The thermostat terminals are not polarity sensitive.

**FIGURE 31: Thermostat Installation Rear View**



## SECTION 7: GAS SERVICE INSTALLATION

### 7.1 Install Gas Supply Lines

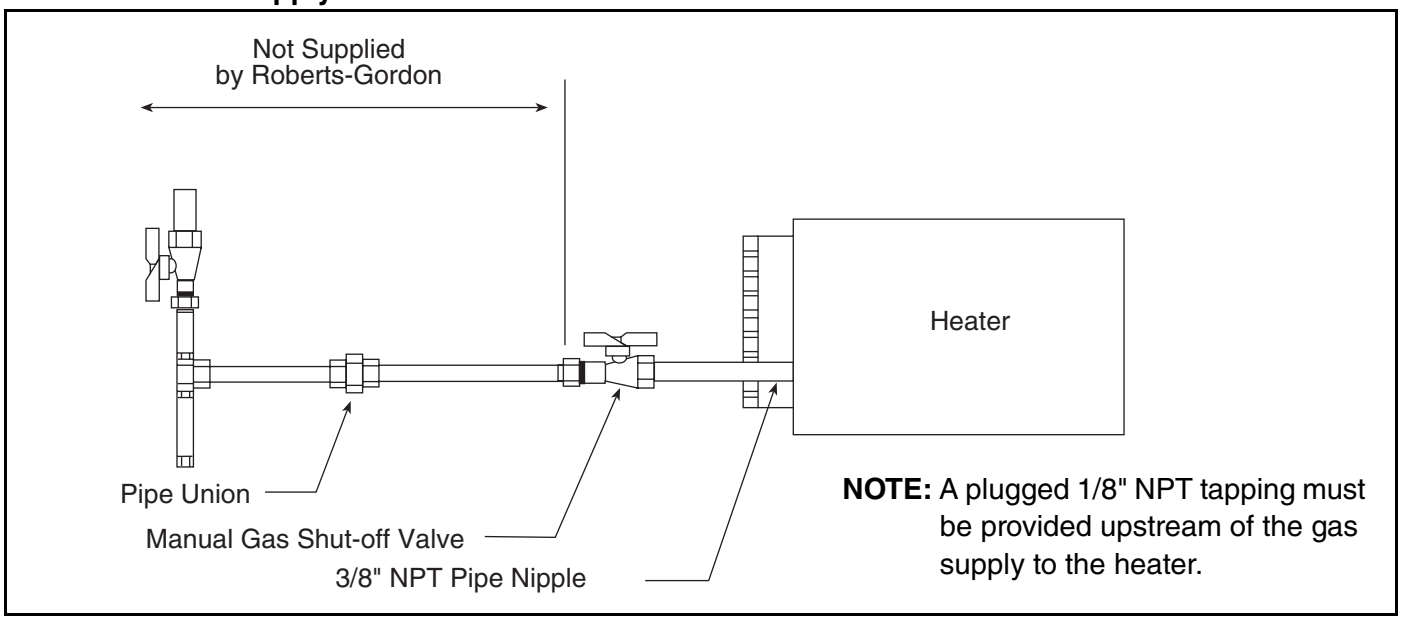
A 3/8" gas supply connection is required as shown in Figure 32. To check system pressure, a plugged 1/8" NPT tapping is required upstream of the manual gas shut-off valve supplied with the heater.

Before connecting the heater to the supply system, (*Figure 32*) verify that all high pressure testing of the gas piping has been completed. Do not high pressure test (greater than 1/2" psi/3.5 kPa) the gas piping with the burner connected. The appliance must be isolated from the gas piping system by closing manual gas shut-off valve during any pressure testing at pressures less than or equal to 1/2" psi (3.5 kPa).

Follow these instructions to ensure a safe gas supply system installation:

1. Support all gas piping with suitable pipe hanging materials.
2. Use wrought iron or wrought steel pipe and malleable iron fittings. The use of copper tube and brass fittings is acceptable when such use is in compliance with local codes. All pipe, tube and fittings should be new and free from defects. Carefully ream the pipe and tube ends to remove obstructions and burrs.
3. Use LP gas resistant joint compound on all threads.
4. Check the pipe and tube connections for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; **never use an open flame**.

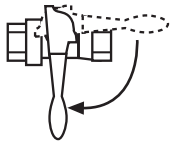
**FIGURE 32: Gas Supply Lines**



## SECTION 8: OPERATION

### 8.1 Operating Instructions

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the heater.
3. Do not try to light the burner by hand.
4. Turn off the manual gas valve in the heater supply line.



5. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! If you do not smell gas, go to the next step.
6. Open the manual gas valve in the heater supply line.
7. Turn on electric power to the heater.
8. Set the thermostat to the desired setting.
9. If the heater will not operate, *See Section 8.2* and call your service technician or gas supplier.

### 8.2 To Turn Off Gas To Heater

1. Set the thermostat to the lowest setting.
2. Turn off all electric power to the heater if service is to be performed.
3. Turn off the manual gas valve in the heater supply line.

### 8.3 Sequence of Operation

1. When the thermostat calls for heat, the blower motor will energize.
2. When the motor approaches nominal running speed, the pressure switch closes and activates the ignition module which in turn initiates the purge.
3. The ignition module then energizes the spark igniter.
4. When sparking begins, the gas valve is energized.
5. If a flame is detected, the gas valve remains open. When the call for heat is satisfied, the system control mechanism de-energizes and the gas valve is turned off.
6. If no flame is detected, the gas valve is closed, and a purge period begins. After the purge period, the ignition module energizes the spark igniter and the gas valve. If a flame is still not established, a third and final purge/ignition sequence is begun. After three failed attempts, the system control mechanism will lock out for a period of one hour or until the unit is reset. Reset is accomplished by removing power from the heater for at least five seconds.
7. With a three-try module, when the flame is established and then lost on the first or second trial, the gas valve will automatically turn off. A purge and trial for ignition will then occur.

### 8.4 Testing

Establish that a satisfactorily purged gas supply and an electrical supply is available to the heater.

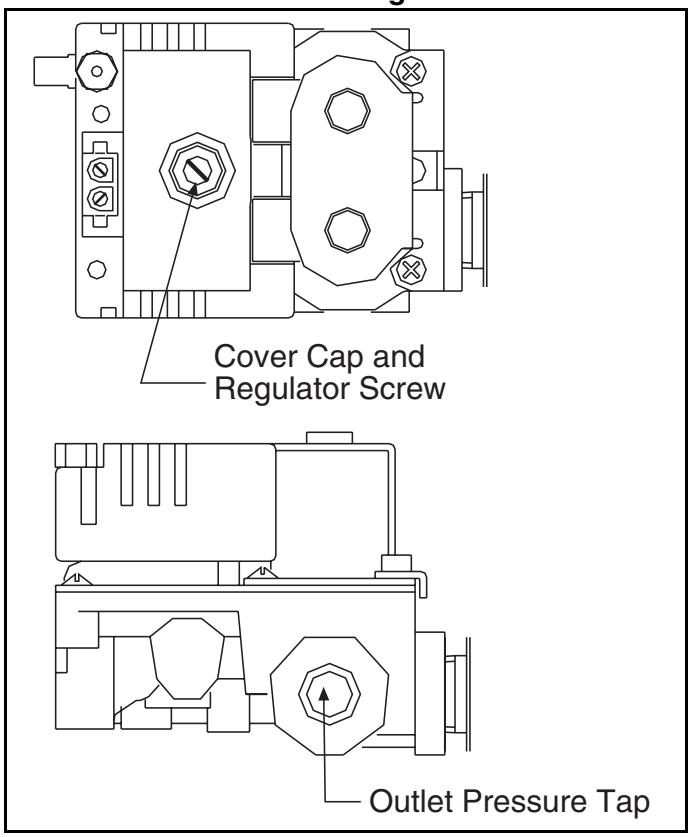
With the gas supply turned off at the gas valve, and the electrical supply isolated by switching off at the local switch and removing the appliance electrical plug, open the control chamber secured by the four screws. Remove the sealing screw from the outlet pressure tap with a 3/16" Hex Key Allen Wrench and install a test tap and hose. Remove the cover cap from the regulator screw with a straight slot screwdriver through the top hole of the burner. (*See Figure 33*).

Turn on appliance gas valve and connect appliance electrical plug. Ensure that the timer or thermostat, if fitted, is set to call for heat. Switch on power at the local switch. If necessary, the sequence as described above, in the first and second paragraphs, should take place. If not, refer to detailed fault finding sequence. When flame is established, check the gas pressure reading and adjust if necessary. See data label or *Page 8*, Section 2, for required gas pressure setting.

Check the gas pressure at the outlet of the gas valve to ensure minimum pressure. *See Page 8, Section 2.9*, for required gas pressure settings.

Switch off the electrical supply (shutting down the heater), remove pressure gauge and refit plug at outlet pressure tap, ensuring a tight gas seal. Replace cap and regulator screw. Close burner side cover.

**FIGURE 33: Pressure Testing**



## SECTION 9: TROUBLESHOOTING

### 9.1 General

This troubleshooting guide has been designed to assist you in locating and correcting minor problems that may occur with the CGTH-Series heater.

**Installation Code and Annual Inspections:** All installations and service of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of gas-fired heating equipment and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts

**BLOWER DOES NOT COME ON**

| Possible Cause | Try this.... |
|---|---|
| Power cord is not plugged in. | Plug power cord into a grounded three prong outlet. |
| Thermostat setting is too low. | Increase thermostat temperature setting. |
| DSI module needs to be reset. | Unplug heater power cord from the electrical outlet; wait for a minimum of five seconds. Plug heater cord back into outlet. |
| No power at electrical outlet. | Replace fuse or reset circuit breaker. |
| Faulty thermostat wiring or faulty thermostat. | Install jumper wire across THERMOSTAT CONNECTION wires on the rear of the burner. If blower starts, remove jumper wire and proceed as follows: Check wiring between thermostat and heater. If wiring is OK, then, replace thermostat. |

**IGNITER DOES NOT SPARK**

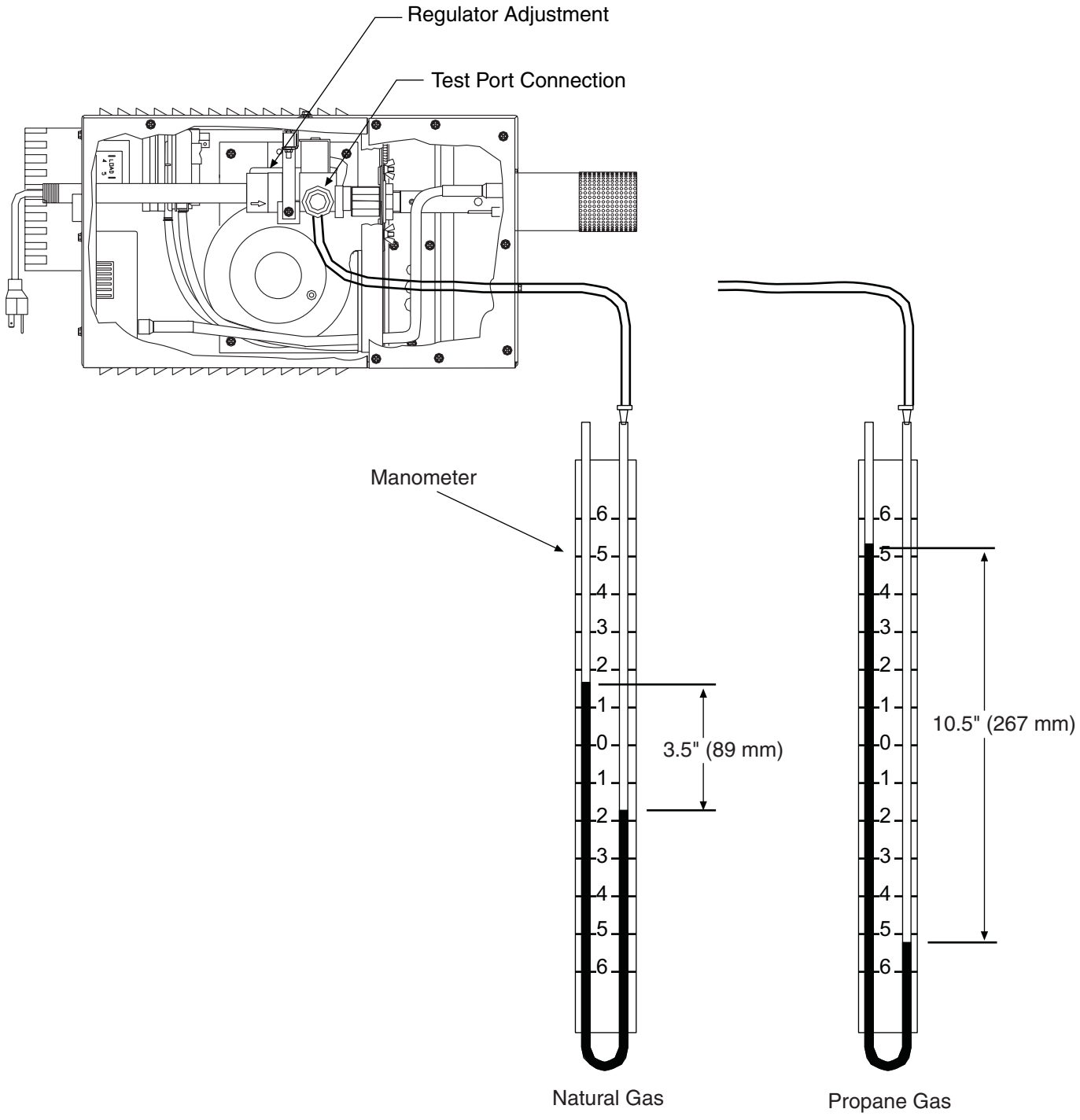
| Possible Cause | Try this.... |
|---|---|
| DSI module needs to be reset. | Unplug heater power cord from the electrical outlet; wait for a minimum of five seconds. Plug heater cord back into outlet. |
| Faulty igniter or ignition wire. | Unplug heater power cord from the electrical outlet; check igniter and ignition wire for damage. If damaged, replace igniter and/or ignition cable . |

| | |
|---|---|
| Pressure switch does not operate. | Check flue/air supply duct for obstructions; remove any obstructions. Check for loose/leaky air hoses to the pressure switch; repair/ replace/tighten hoses as required. Check for 24V across the secondary terminals 4 and 5 (red and yellow wires) of the transformer.<br>IF NO: Check for 120V across the primary terminals 1 and 3 (black and white wires) of the transformer. If 120V is present, replace transformer. If 120V is not present, check wiring between power cord, blower motor and transformer.<br>IF YES: Connect a jumper wire across pressure switch terminals; if jumper wire allows blower to operate, replace pressure switch (*See Page 45, Section 12.1.1* for part number that applies to your unit rating). Do not resume normal heater operation until replacement pressure switch has been installed. |
| Igniter spark gap incorrect. | Reset spark gap to 1/8" (3.175 mm). |

**BURNER DOES NOT LIGHT**

| **Possible Cause** | **Try this....** |
|---|---|
| Air in the gas line. | Purge gas lines. |
| Improper gas inlet pressure. | Check gas inlet pressure at the supply line. Gas inlet pressure should be as follows:<br>**Natural Gas:** 5.0" w.c. (12.4 mbar) minimum; 14.0" w.c. (34.8 mbar) maximum<br>**LP Gas:** 11.0" w.c. (27.4 mbar) minimum; 14.0" w.c. (34.8 mbar) maximum<br>If gas inlet pressure does not meet inlet pressure requirements, contact the gas company. |
| Gas valve does not open. | Check for 24V across valve terminals.<br>IF NO: Check wiring between the ignition module and the valve. Repair/ replace wires as required. If wiring is OK, replace ignition module.<br>IF YES: Replace gas valve. |
| Low gas outlet pressure. | Check gas manifold pressure. Measure manifold pressure at the pressure tap on the gas valve. *See Page 35, Figure 33 and Page 38, Figure 34*.<br>**Natural Gas:** 3.5" w.c. (8.7 mbar)<br>**LP Gas:** 10.5" w.c. (26.1 mbar)<br>If manifold pressure does not meet requirements, adjust valve outlet pressure with the adjustment screw on the valve.<br>**NOTE:** Proper inlet gas pressure must be verified before performing outlet pressure testing. |

**FIGURE 34: Manometer Reading**

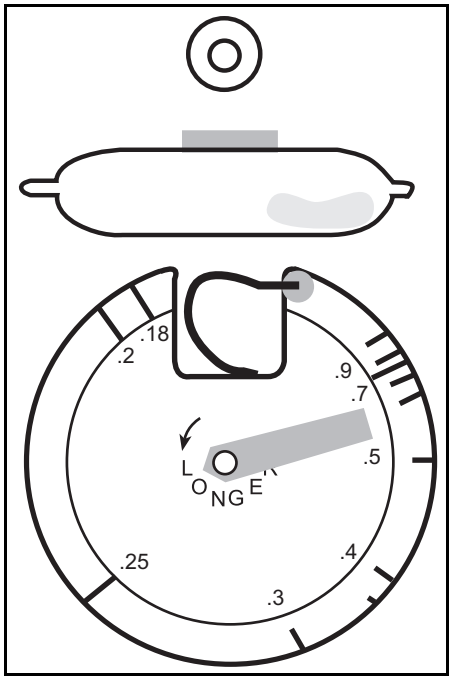


## BURNER DOES NOT STAY LIT

| Possible Cause | Try this.... |
|---|---|
| Damaged wires between DSI module and sensing electrode. | Replace wires as required. |
| Faulty DSI module. | Replace DSI module. |
| Cracked ceramic at the sensing electrode. | Replace electrode. |
| Recirculation of exhaust gases. | Check that the 3” (80 mm) inner vent pipe is completely sealed. |

## BURNER CYCLES ON AND OFF TOO QUICKLY

| Possible Cause | Try this.... |
|---|---|
| Anticipator setting on the thermostat is too low | Adjust the anticipator setting to 0.6. *See Page 20, Figure 12*. |



## BURNER MAKES VIBRATING NOISES WHILE RUNNING

| Possible Cause | Try this.... |
|---|---|
| Motor Vibration | Ensure that the shipping screw has been removed from the control housing door. *See Page 17, Section 4.8*. |
| Protective Grille metal fingers touch reflector | Isolate the grille finger that is making the noise and cap it with a silicone cap. *See Page 20, Figure 12*. |

## SECTION 10: MAINTENANCE

### 10.1 Pre-Season Maintenance

**⚠ WARNING**

**Turn off gas and electrical supplies before performing service or maintenance.**

**Failure to follow these instructions can result in death, injury or property damage.**

For best performance, the following maintenance procedures must be performed by a contractor qualified in the installation and service of gas-fired heating equipment before each heating season:

1. **Due to high temperature, ensure that the heater area is kept clear of clothing, furniture, draperies or other combustible materials, gasoline and other flamable vapors and liquids.** *See Page 15, Section 4.6*, **the thermostat wall tag or clearance to combustibles label on heater.**
2. Turn off gas and electrical supplies to the heater.
3. Check condition of burner. Carefully remove any dust or debris from inside the burner.
4. Inspect the igniter. Replace igniter if there is excessive carbon residue, erosion of electrodes or other defects.
5. Check to see that the burner observation window is clean and free of cracks or holes. Clean or replace as required.
6. Check the flue pipe for soot or dirt. After cleaning as necessary, re-attach the flue pipe to the heater.
7. Keep surfaces of burner, control compartment and reflector clean by wiping with a dry cloth. More frequent cleaning may be required due to excessive dirt, dust, lint material, etc.
8. Check vent terminal and outside air inlet to see that they have not become blocked during the non-heating season. If either pipe is restricted, the pressure switch will not close, resulting in a no-heat situation.

## SECTION 11: WIRING DIAGRAMS

### 11.1 Connection Diagram

**⚠ WARNING**

**Fire Hazard**

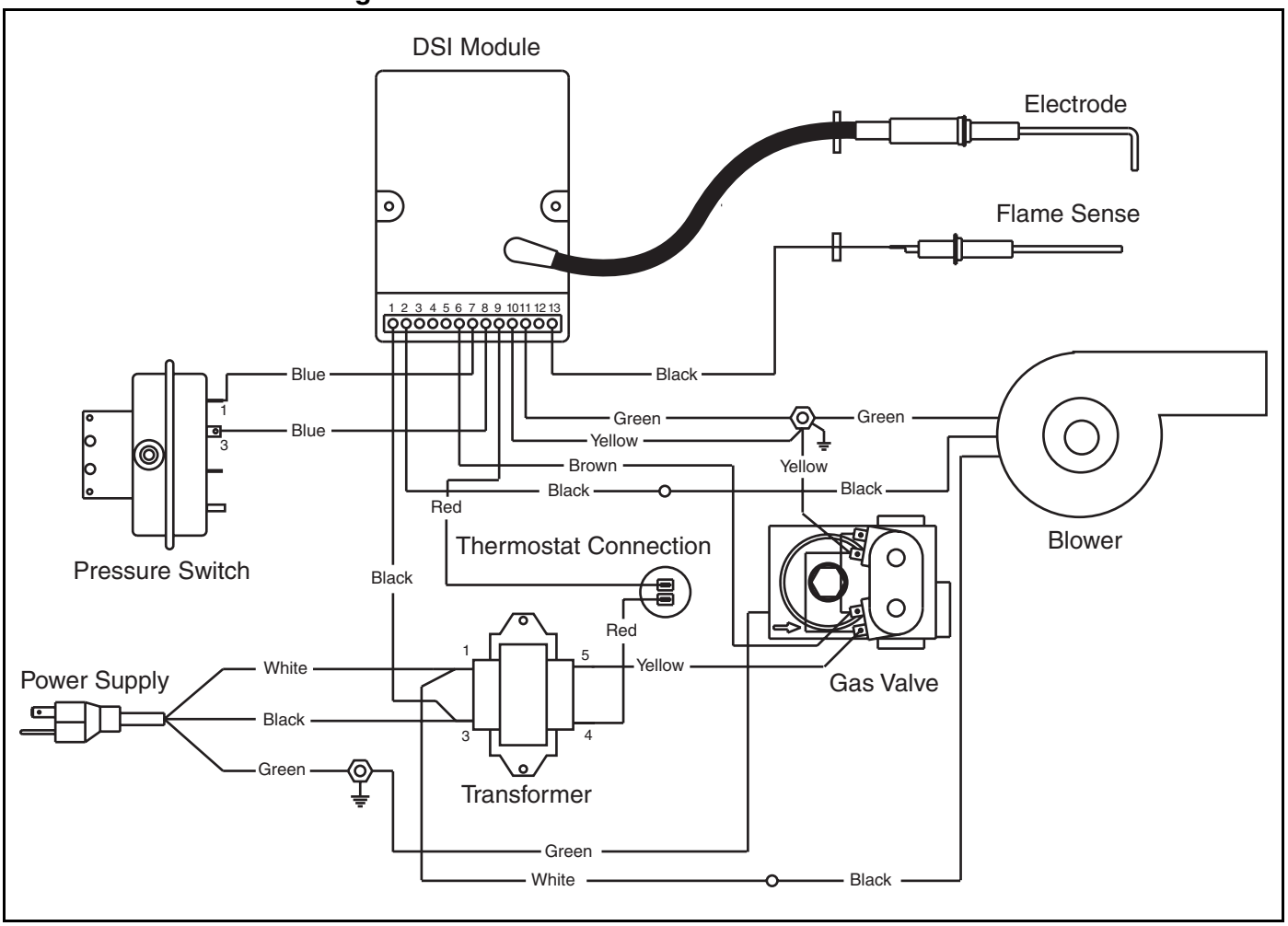
**Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.**

**Verify proper operation after servicing.**

**Failure to follow these instructions will result in death, injury or property damage.**

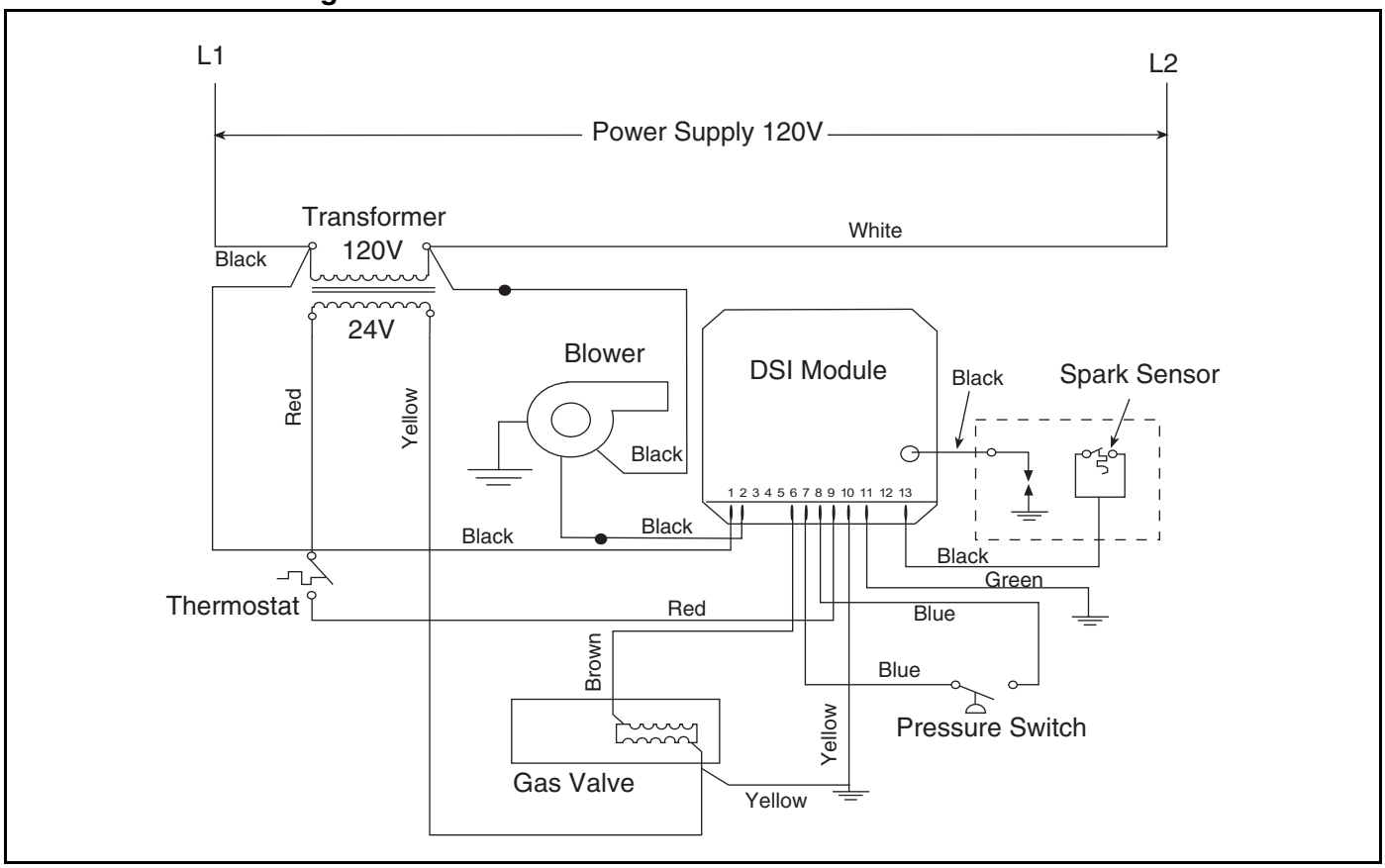
If any of the original wire as supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C and 600 volts.

**FIGURE 35: Connection Diagram**



## 11.2 Ladder Diagram

**FIGURE 36: Ladder Diagram**



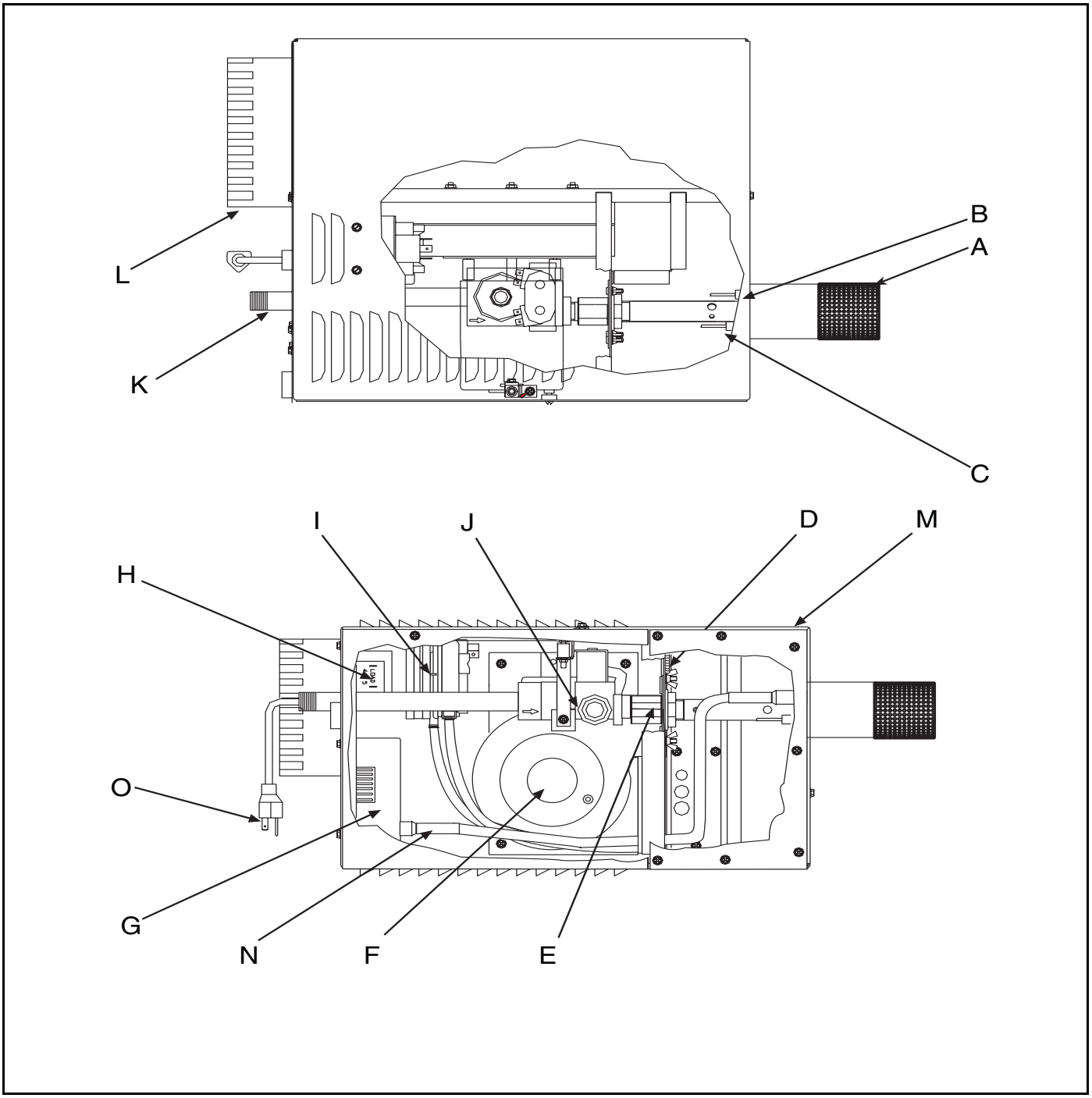
## SECTION 12: REPLACEMENT PARTS

**Use only genuine ROBERTS GORDON® replacement parts. Use of parts not specified by Roberts-Gordon voids warranty. Failure to follow these instructions can result in property damage.**

This section contains the part numbers and pictorials for components of the CGTH-Series heater. Callout letters on the illustrations refer directly to the associated parts list.

### 12.1 Illustrated Parts List for Burner

**FIGURE 37: Illustrated Parts List**

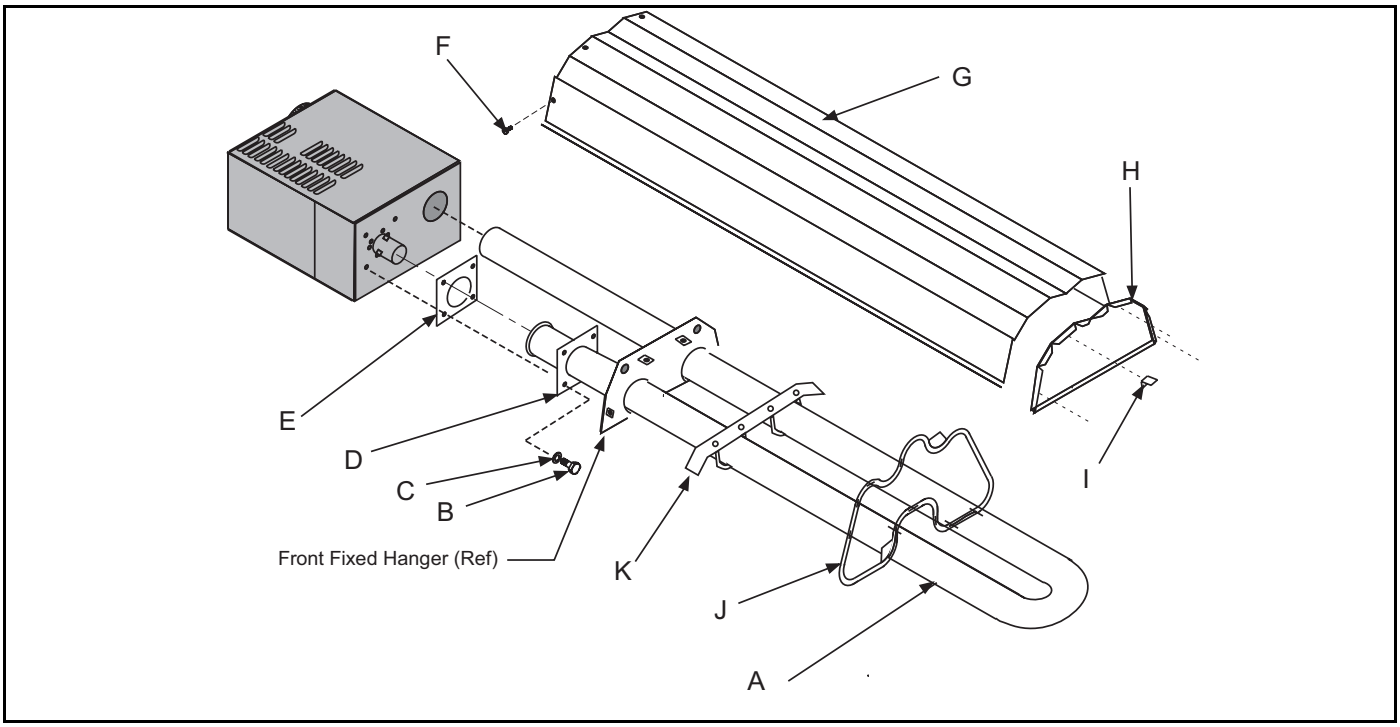


### 12.1.1 Replacement Parts List for Burner

| Item | Part Number | Description | CGTH-30 | CGTH-40 | CGTH-50 |
|---|---|---|---|---|---|
| A | 08117000 | Burner Cup Assembly | 1 | 1 | 1 |
| B | 90439300 | Flame Sensor | 1 | 1 | 1 |
| C | 90439101K | Igniter, Primary | 1 | 1 | 1 |
| D | 02553203 | Mica Window Assembly | 1 | 1 | 1 |
| E | 08018000 | Adapter, Orifice Holder | 1 | 1 | 1 |
| F | 90710201 | Motor/Blower | 1 | 1 | 1 |
| G | 90434005 | Ignition Module | 1 | 1 | 1 |
| H | 90436900K | Transformer | 1 | 1 | 1 |
| I | 90439806K | Pressure Switch | 1 | - | - |
| | 90439804K | Pressure Switch | - | 1 | - |
| | 90439802K | Pressure Switch | - | - | 1 |
| J | 90034500 | Gas Valve (Natural Gas) | 1 | 1 | 1 |
| | 90034600 | Gas Valve (LP Gas) | 1 | 1 | 1 |
| K | 91201618 | Pipe Nipple | 1 | 1 | 1 |
| L | 91911701 | Flue Collar 5" (125 mm) | 1 | 1 | 1 |
| M | 08115100 | Door Gasket | 1 | 1 | 1 |
| N | 90427706 | Ignition Cable | 1 | 1 | 1 |
| O | 91306405 | Power Cord | 1 | 1 | 1 |

## 12.2 Illustrated Parts List for Tube and Reflector

**FIGURE 38: Tube and Reflector**




## 12.3 Replacement Parts List for Tube & Reflector

| Item | Part Number | Description | CGTH-30 | CGTH-40 | CGTH-50 |
|---|---|---|---|---|---|
| A | 08020001 | Heat Exchanger Assembly (8') (2438 mm) | 1 | - | - |
| | 08021001 | Heat Exchanger Assembly (11'6") (3505 mm) | - | 1 | 1 |
| B | 94273914 | Bolt Rolok® Hex HD 5/16-18 x 7/8 | 4 | 4 | 4 |
| C | 96411600 | Lockwasher 5/16 Helical Spring | 4 | 4 | 4 |
| D | 08061000 | Support Plate | 1 | 1 | 1 |
| E | 08070000 | Burner Tube Gasket | 1 | 1 | 1 |
| F | - | Screw (#8 x 3/8" (10 mm) | 4 | 4 | 4 |
| G | 08090000 | Reflector (80") (2032 mm) | 1 | - | - |
| | 08090001 | Reflector (120") (3048 mm) | | 1 | 1 |
| H | 02750800 | End Cap | 1 | 1 | 1 |
| I | *91107720 | U-Clips | 4 | 4 | 4 |
| J | 08080000 | Rear Reflector Hanger (Moveable) | 1 | 1 | 1 |
| K | 08061000 | Support Plate | - | 1 | 1 |
| | 08062000 | Support U-bolt | 2 | 2 | 2 |

(*) Part number shown is for reorder purposes and represents a package of 20 pieces.

# SECTION 13: THE ROBERTS GORDON® CARIBE® LIMITED WARRANTY

## ROBERTS-GORDON WILL PAY FOR:

Within 42 months from date of shipment from Roberts-Gordon, replacement parts will be provided free of charge for any part of the product which fails due to a manufacturing or material defect.

Roberts-Gordon will require the part in question to be returned to the factory. Roberts-Gordon will, at its sole discretion, repair or replace after determining the nature of the defect and disposition of part in question.

ROBERTS GORDON® Replacement Parts are warranted for a period of 18 months from date of shipment from Roberts-Gordon or the remaining ROBERTS GORDON® CARIBE® warranty.

## ROBERTS-GORDON WILL NOT PAY FOR:

Service trips, service calls and labor charges.

Shipment of replacement parts.

Claims where the total price of the goods have not been paid.

Damage due to:

- Improper installation, operation or maintenance.
- Misuse, abuse, neglect, or modification of the ROBERTS GORDON® CARIBE® in any way.
- Use of the ROBERTS GORDON® CARIBE® for other than its intended purpose.
- Incorrect gas or electrical supply, accident, fire, floods, acts of God, war, terrorism, or other casualty.
- Improper service, use of replacement parts or accessories not specified by Roberts-Gordon.
- Failure to install or maintain the ROBERTS GORDON® CARIBE® as directed in the Installation, Operation and Service manual.
- Relocation of the ROBERTS GORDON® CARIBE® after initial installation.
- The use of the ROBERTS GORDON® CARIBE® in a corrosive atmosphere containing contaminants.
- The use of the ROBERTS GORDON® CARIBE® in the vicinity of a combustible or explosive material.
- Any defect in the ROBERTS GORDON® CARIBE® arising from a drawing, design, or specification supplied by or on behalf of the consumer.
- Damage incurred during shipment. Claim must be filed with carrier.

## WARRANTY IS VOID IF:

The ROBERTS GORDON® CARIBE® is not installed by an electrician qualified in the installation and service of control systems for heating equipment.

You cannot prove original purchase date and required annual maintenance history.

The data plate and/or serial number are removed, defaced, modified or altered in any way.

The ownership of the ROBERTS GORDON® CARIBE® is moved or transferred. This warranty is nontransferable.

Roberts-Gordon is not permitted to inspect the damaged controller and/or component parts.

## READ YOUR INSTALLATION, OPERATION AND SERVICE MANUAL

If you have questions about your controller, contact your installing professional. Should you need Replacement Parts or have additional questions, call or write Roberts-Gordon:

**U.S.A.**
1250 William Street
P.O. Box 44
Buffalo, New York 14240-0044
716.852.4400

**On the web at:** www.rg-inc.com

**Roberts-Gordon's liability, and your exclusive remedy, under this warranty or any implied warranty (including the implied warranties of merchantability and fitness for a particular purpose) is limited to providing replacement parts during the term of this warranty.** Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you. There are no rights, warranties or conditions, expressed or implied, statutory or otherwise, other than those contained in this warranty.

**Roberts-Gordon shall in no event be responsible for incidental or consequential damages or incur liability for damages in excess of the amount paid by you for the ROBERTS GORDON® CARIBE®.** Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

Roberts-Gordon shall not be responsible for failure to perform under the terms of this warranty if caused by circumstances out of its control, including but not limited to war, fire, flood, strike, government or court orders, acts of God, terrorism, unavailability of supplies, parts or power. No person is authorized to assume for Roberts-Gordon any other warranty, obligation or liability.

## LIMITATIONS ON AUTHORITY OF REPRESENTATIVES:

No representative of Roberts-Gordon, other than an Executive Officer, has authority to change or extend these provisions. Changes or extensions shall be binding only if confirmed in writing by Roberts-Gordon's duly authorized Executive Officer.

ROBERTS GORDON
Infrared Heating

# OWNER WARRANTY REGISTRATION CARD

**Mail or Fax to:**

**Roberts Gordon •1250 William Street, P.O. Box 44 • Buffalo, NY 14240-0044 • Phone: 716-852-4400 • Fax: 716-852-0854**
**Toll Free: 800-828-7450 • www.rg-inc.com**

***About the Owner:***

Name:_____

Address:_____ City: _____ State:_____ Zip Code:_____

Phone:_____ Fax: _____ E-mail:_____

***About the Installer:***

Name:_____

Address:_____ City: _____ State:_____ Zip Code:_____

Phone:_____ Fax: _____ E-mail:_____

***Purchased From (if different than installer):***

Name:_____

Address:_____ City: _____ State:_____ Zip Code:_____

Phone:_____ Fax: _____ E-mail:_____

***About your Heater:***

Model#:_____ Serial #:_____ Fuel: _____ Installation Date: _____

***Type of Installation (check one):***

o Automotive o Manufacturing o Warehouse o Recreational o Aircraft

o Public Building o Office o Retail o Agricultural o Other _____

**Installation Code and Annual Inspections:**
All installations and service of ROBERTS GORDON® products must be performed by a contractor qualified in the installation and service of gas-fired heating equipment and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment.

To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor annually inspect your ROBERTS GORDON® products and perform service where necessary, using only ROBERTS GORDON® replacement parts.